

August 10, 2023

BCC Agenda Date/Item: _____

Board of County Commissioners
Clackamas County

Approval of a Public Improvement Contract with Desgrosellier Development, Inc., for the Clackamas Service Center Expansion Project. Contract value is \$1,417,637 for 6 months. Funding is through Federal HUD Community Development Block Grant (CDBG). No County General Funds are involved.

Previous Board Action/Review	<ul style="list-style-type: none"> November 4, 2021 Board approval of the Cooperation Agreement with Clackamas Service Center. August 8, 2023, Presented at Issues Session 		
Performance Clackamas	<ul style="list-style-type: none"> Increase self-sufficiency for our clients. Ensure safe, healthy, and secure communities. 		
Counsel Review	Yes	Procurement Review	Yes
Contact Person	Korene Mather	Contact Phone	971-806-7413

EXECUTIVE SUMMARY: The Housing & Community Development Division (HCDD) of the Health, Housing, and Human Services Department requests the approval of the Public Improvement Agreement to renovate and expand Clackamas Service Center West Building for homeless services. The facility will be owned and operated by the Clackamas Service Center.

This project was bid publicly, and Desgrosellier Development, Inc. was the lowest responsive bidder and awarded the construction contract. This Agreement covers the construction budget, materials, and responsibilities to ensure that the project is completed to specifications within approximately 200 days. The CSC West Building Expansion will result in additional services at the site, including a health clinic, exam rooms, laboratory, laundry services, a clothing center, accessible restrooms, several administrative offices, and a conference room.

Project Funding:

\$ 650,000	Community Development Block Grant (CDBG) COVID funds (<i>BCC approval November 4, 2021</i>)
\$ 300,000	Community Development Block Grant (CDBG) funds (<i>Amendment pending BCC approval on 8/3/2023</i>)
<u>\$ 467,637</u>	<u>Clackamas Service Center funds</u>
\$1,417,637	Total Construction Costs

RECOMMENDATION: Staff recommends BCC approval of the Public Improvement Agreement.

Respectfully submitted,

Rodney A. Cook

Rodney A. Cook
Director of Health, Housing & Human Services

For Filing Use Only



CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT
H3S Contract #11239

This Public Improvement Contract (the “Contract”), is made by and between the Clackamas County, a political subdivision of the State of Oregon (“Owner”), and Desgrosellier Development, Inc. (the “Contractor”), both collectively the “Parties.” This Contract shall become effective on the date this Contract has been signed by all the Parties and shall expire upon completion the completion of all obligations under the terms of this Contract unless terminated earlier by the Parties.

All capitalized terms in this Contract shall have the meanings identified in the Clackamas County General Conditions for Public Improvement Contracts (10/13/2021) (“General Conditions”) referenced within the Instructions to Bidders.

Project Name: **Clackamas Service Center West Building Project**
Project Location: **8800 SE 80th Avenue, Portland, OR 97206**

1. Contract Price, Contract Documents and Work.

The Contractor hereby agrees to perform all Work described in, and reasonably inferred from, the Contract Documents. In consideration of the Contractor performing the Work in accordance with the terms of the Contract, the Owner agrees to pay the Contractor the sum of **One Million Four Hundred Seventeen Thousand Six Hundred Thirty Seven Dollars (\$1,417,637.00)** (the "Contract Price"). Payment will be made in accordance with the terms and conditions provided in the Contract Documents. The Contract Price is the amount contemplated by the Base Bid, as indicated in the accepted Bid.

The following documents are incorporated by reference in this Contract and made a part hereof:

- Notice of Contract Opportunity
- Supplemental Instructions to Bidders
- Bid Form
- Clackamas County General Conditions
- Prevailing Wage Rates
- Plans, Specifications and Drawings
- Instructions to Bidders
- Bid Bond
- Performance Bond and Payment Bond
- Supplemental General Conditions
- Payroll and Certified Statement Form
- Addendums 1 & 2

2. Representatives.

Contractor has named Desgrosellier Development, Inc., as its Authorized Representative to act on its behalf. Owner designates, or shall designate, its Authorized Representative as indicted below (check one):

Unless otherwise specified in the Contract Documents, the Owner designates Mark Bierwagen, Project Manager for Clackamas Service Center, Steve Kelly, Project Coordinator is designated by Clackamas County s as its Authorized Representative for the administration of this Contract. The above-named individual shall be the initial point of contact for matters related to Contract performance, payment, authorization, and to carry out the responsibilities of the Owner.

Name of Owner’s Authorized Representative shall be submitted by Owner in a separate writing.

3. Key Persons.

The Contractor’s personnel identified below shall be considered Key Persons and shall not be replaced during the project without the written permission of Owner, which shall not be unreasonably withheld. If the Contractor intends to substitute personnel, a request must be given to Owner at least 30 days prior to the

intended time of substitution. When replacements have been approved by Owner, the Contractor shall provide a transition period of at least 10 working days during which the original and replacement personnel shall be working on the project concurrently. Once a replacement for any of these staff members is authorized, further replacement shall not occur without the written permission of Owner. The Contractor's project staff shall consist of the following personnel:

Project Executive: Bryan Desgrosellier/ 360-601-5541 shall be the Contractor's project executive, and will provide oversight and guidance throughout the project term.

Project Manager: Sean Howard/ 360-907-8864 shall be the Contractor's project manager and will participate in all meetings throughout the project term.

Job Superintendent: John Shields/ 360-907-0118 shall be the Contractor's on-site job superintendent throughout the project term.

Project Engineer: Kyle Skinner/ 360-907-8782 shall be the Contractor's project engineer, providing assistance to the project manager, and subcontractor and supplier coordination throughout the project term.

4. Contract Dates.

The Contractor agrees to complete the Work in accordance with the following key dates:

COMMENCEMENT DATE: Tentative - **August 15, 2023**, Upon Issuance of Notice to Proceed

SUBSTANTIAL COMPLETION DATE: Tentative - **January 18, 2024** (150 days)

FINAL COMPLETION DATE: Tentative - **February 17, 2024** (180 days)

Time is of the essence for this Contract. It is imperative that the Work in this Contract reach Substantial Completion and Final Completion by the above specified dates.

5. Insurance Certificates.

In accordance with Section G.3.5 of the General Conditions [and item x of Supplemental General Conditions as applicable], Contractor shall furnish proof of the required insurance naming Clackamas County – Health, Housing & Human Services Department as an additional insured. Insurance certificates may be returned with the signed Contract or may be emailed to stevekel@clackamas.us.

6. Liquidated Damages

The Owner and the Contractor acknowledge and agree that if the Contractor fails to reach Substantial Completion of the entire Work by the Substantial Completion Date identified in Section 4 above, the Owner will suffer damages, which are both extremely difficult and impracticable to ascertain, and on that basis agree to the assessment by Owner of liquidated damages as provided in this Section. These damages may include, but are not limited to, use of the Project, costs associated with Contract administration, and use of temporary facilities. The liquidated damages amount is not a penalty, but a reasonable estimate of the amount of losses the Owner will suffer. The Owner may deduct such liquidated damages as are payable under this Section from money due or to become due to the Contractor or, at its election, pursue any other legal remedy to collect such liquidated damages from the Contractor and/or its Surety.

If the Contractor fails to achieve Substantial Completion of the entire Work by the Substantial Completion Date identified in Section 4, the Contractor shall pay the Owner as liquidated damages:

6.1. \$1,000.00 per Calendar day past the Substantial Completion date.

Payment of liquidated damages shall not release Contractor from its obligation with respect to the complete performance of the Work, nor shall the payment of liquidated damages constitute a waiver of Owner's right to collect any additional damages that it may sustain by failure of Contractor to fully perform the Work, as it is the intent of the parties that the liquidated damages are a full and complete payment only for failure of Contractor to complete the Work on time. Owner expressly reserves the right to make claims for any and all other damages that Owner may incur due to contractor's failure to perform in strict accordance with this Contract.

7. Tax Compliance.

The Contractor shall comply with all federal, state and local laws, regulation, executive orders and ordinances applicable to this Contract. Contractor represents and warrants that it has complied, and will continue to comply throughout the duration of this Contract and any extensions, with all tax laws of this state or any political subdivision of this state, including but not limited to ORS 305.620 and ORS chapters 316, 317, and 318. Any violation of this section shall constitute a material breach of this Contract and shall entitle County to terminate this Contract, to pursue and recover any and all damages that arise from the breach and the termination of this Contract, and to pursue any or all of the remedies available under this Contract or applicable law.

8. Confidential Information.

Contractor acknowledges that it and its employees or agents may, in the course of performing their responsibilities under this Contract, be exposed to or acquire information that is confidential to Owner. Any and all information of any form obtained by Contractor or its employees or agents in the performance of this Contract shall be deemed confidential information of Owner ("Confidential Information"). Contractor agrees to hold Confidential Information in strict confidence, using at least the same degree of care that Contractor uses in maintaining the confidentiality of its own confidential information, and not to copy, reproduce, sell, assign, license, market, transfer or otherwise dispose of, give, or disclose Confidential Information to third parties or use Confidential Information for any purpose unless specifically authorized in writing under this Contract.

9. Counterparts.

This Contract may be executed in several counterparts, all of which when taken together shall constitute an agreement binding on all Parties, notwithstanding that all Parties are not signatories to the same counterpart. Each copy of the Contract so executed shall constitute an original.

10. Integration.

All provisions of state law required to be part of this Contract, whether listed in the General or Special Conditions or otherwise, are hereby integrated and adopted herein. Contractor acknowledges the obligations thereunder and that failure to comply with such terms is a material breach of this Contract.

The Contract Documents constitute the entire agreement between the parties. There are no other understandings, agreements or representations, oral or written, not specified herein regarding this Contract. Contractor, by the signature below of its authorized representative, hereby acknowledges that it has read this Contract, understands it, and agrees to be bound by its terms and conditions.

11. Compliance with Applicable Law. Contractor shall comply with all federal, state, county, and local laws, ordinances, and regulations applicable to the Work to be done under this Contract including, but not limited to, compliance with the prohibitions set forth in ORS 652.220, compliance of which is a material element of this Contract and failure to comply is a material breach that entitles County to exercise any rights and remedies available under this Contract including, but not limited to, termination for default.

12. Responsibility for Taxes. Contractor is solely responsible for payment of any federal, state, or local taxes required as a result of the Contract or the Work including, but not limited to, payment of the corporate activity tax imposed under enrolled HB 3427 (2019 Oregon regular legislative session). Contractor may not include its federal, state, or local tax obligations as part of the cost to perform the Work.

13. Compliance with Applicable Funding Source Requirements. Contractor shall further comply with any and all terms, conditions, and other obligations as may be required by the applicable State or Federal agencies providing funding for performance under this Contract, whether or not specifically referenced herein. Contractor agrees to take all necessary steps, and execute and deliver any and all necessary written instruments, to perform under this Contract including, but not limited to, executing all additional documentation necessary for County to comply with applicable State or Federal funding requirements.

14. Clackamas Service Center. Clackamas Service Center is a third-party beneficiary with respect to Owner's rights and remedies for Work performed by Contractor under this contract.

In witness whereof, Owner executes this Contract and the Contractor does execute the same as of the day and year first above written.

Contractor DATA:

Desgrosellier Development, Inc.
3100 E. Evergreen Blvd.
Vancouver, WA 98661

Contractor must complete each item below:

Contractor CCB # 222531 Expiration Date: 8/31/2024
Oregon Business Registry # 147281091 Entity Type: DBC State of Formation: OR

Payment information will be reported to the IRS under the name and taxpayer ID# provided by the Contractor. Information must be provided prior to contract approval. Information not matching IRS records could subject Contractor to 28 percent backup withholding.

Desgrosellier Development, Inc.

Clackamas County

Bry J. Desgrosellier 7/24/23
Authorized Signature Date

Tootie Smith, Chair Date
Board of County Commissioners

PRESIDENT
Authorized Personal/ Owner

APPROVED AS TO FORM

[Signature] 08/02/2023
County Counsel Date

Tax ID#: 47-4495611



INVITATION TO BID #S-C01010-00006281
**Clackamas Service Center West Building
 Project (CD #1803)**

ADDENDUM NUMBER #2
 May 1-2, 2023

On 03/28 /2023, Clackamas County (“County”) published Invitation to Bid **Clackamas Service Center West Building Project (CD #1803)**, (“BID”). The County has found that it is in its interest to amend the BID through the issuance of this Addendum #2. Except as expressly amended below, all other terms and conditions of the original BID and subsequent Addenda shall remain unchanged.

Below is new Request for Information (RFI’s) log, highlighting questions and answers, in an attempt to provided clarification(s) to potential bidders for this project:

No.	Question(s):	Answer(s):	Int(s).
1	Has either, State of Oregon (BOLI) or Federal (Davis-Bacon) Prevailing Wage Rates (PWR) Changed for this project?	<p>Yes, the Federal (Davis-Bacon) Prevailing Wage Rate (PWR) HAS CHANGED. Bidders are to use the follow:</p> <p>General Decision No.: <u>OR20230023</u> State: <u>Oregon</u> Modification No.: <u>9, April 21, 2023</u> Construction Type: <u>Building</u> County: Clackamas</p> <p>See the following sheets attached to Addendum #2.</p> <p>Important Note: Please remember to compare both the State of Oregon (aka BOLI) PWR to the Federal (Davis Bacon) PWR to pay the higher for each classification. This will apply to the awarded General Contractor, and their Subcontractors.</p>	SK
2	The New Trash Enclosure, per the drawings, whether to build out or provide more information?	No , remove the Trash Enclosure from your bid.	DS

End of Addendum

Superseded General Decision Number: OR20220023

State: Oregon

Construction Type: Building

County: Clackamas County in Oregon.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least \$16.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2023.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least \$12.15 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2023.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

Modification Number	Publication Date
0	01/06/2023
1	01/20/2023

2	01/27/2023
3	02/24/2023
4	03/03/2023
5	03/10/2023
6	03/17/2023
7	03/31/2023
8	04/07/2023
9	04/21/2023

BROR0001-014 06/01/2020

	Rates	Fringes
BRICK FINISHER.....	\$ 26.94	14.94
BRICKLAYER.....	\$ 41.20	22.39
TILE FINISHER.....	\$ 26.94	14.81
TILE SETTER.....	\$ 35.35	20.42

CARP1503-007 06/01/2021

	Rates	Fringes
Carpenters:		
Hardwood floors and batt insulation.....	\$ 43.97	18.56
Including metal stud installation, from work and scaffold building.....	\$ 43.80	18.56

CARP9001-003 06/01/2022

	Rates	Fringes
Acoustical Ceiling Installer & Drywall Hanger.....	\$ 44.74	18.91
LATHER.....	\$ 44.74	18.91

ELEC0048-018 01/01/2023

	Rates	Fringes
ELECTRICIAN.....	\$ 57.35	27.54

ELEC0048-019 01/01/2023

	Rates	Fringes
ELECTRICIAN		
Computer Installation, telephone installation, HVAC temperature control installation, Electrical low voltage wiring installer and sound technician only.....	\$ 38.22	20.44
Electrical installer alarms and Low voltage wiring for alarms only.....	\$ 47.66	21.67

ENGI0701-020 01/01/2023

	Rates	Fringes
POWER EQUIPMENT OPERATOR GROUP 1.....	\$ 54.13	16.65

GROUP 1A.....	\$ 56.29	16.65
GROUP 1B.....	\$ 58.45	16.65
GROUP 2.....	\$ 52.22	16.65
GROUP 3.....	\$ 51.07	16.65
GROUP 4.....	\$ 47.74	16.65
GROUP 5.....	\$ 46.50	16.65
GROUP 6.....	\$ 43.28	16.65

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: CRANE: Helicopter Operator, when used in erecting work; Whirley Operator, 90 ton and over; LATTICE BOOM CRANE: Operator 200 tons through 299 tons, and/or over 200 feet boom; HYDRAULIC CRANE: Hydraulic Crane Operator 90 tons through 199 tons with luffing or tower attachments

GROUP 1A: HYDRAULIC CRANE: Hydraulic Operator, 200 tons and over (with luffing or tower attachment); LATTICE BOOM CRANE: Operator, 200 tons through 299 tons, with over 200 feet boom;

GROUP 1B: LATTICE BOOM CRANE: Operator, 300 tons through 399 tons with over 200 feet boom; Operator 400 tons and over

GROUP 2: CRANE: Cableway Operator, 25 tons and over; HYDRAULIC CRANE: Hydraulic crane operator 90 tons through 199 tons (without luffing or tower attachment); TOWER/WHIRLEY OPERATOR: Tower Crane Operator; Whirley Operator, under 90 tons; LATTICE BOOM CRANE: 90 through 199 tons and/or 150 to 200 feet boom; HYDRAULIC CRANE: Hydraulic crane operator, 50 tons through 89 tons (with luffing or tower attachment); BLADE: Auto Grader; Blade Operator-Robotic; Rubber tired scraper with tandem scrapers, multi-engine Trenching Machine-Wheel Operator

GROUP 3: HYDRAULIC CRANE: Hydraulic crane operator, 50 tons through 89 tons (without luffing or tower attachment); LATTICE BOOM CRANES: Lattice Boom Crane-50 through 89 tons (and less than 150 feet boom); Rubber Tired Scraper: with tandem scrapers; self loading, paddle wheel, auger type, finish and/or 2 or more units.

GROUP 4: CRANE: Hydraulic Crane Operator, under 50 tons; LATTICE BOOM CRANE OPERATOR: Lattice Boom Crane Operator, under 50 tons; TRACKHOE-ROBOTIC: up to and including 20,000 lbs. with any or all attachments; BLADE: Blade operator; Tractor operator with boom attachment; DRILLING: Churn Drill and Earth Boring Machine Operator; Directional Drill Operator over 20,000 lbs pullback; CRANE: Chicago boom and similar types; Boom type lifting device, 5 ton capacity or less; HYDRAULIC HOES: Robotic Hydraulic backhoe operator, track and wheel type up to and including 20,000 lbs. with any or all attachments; Asphalt Paver; Screed Operator; Rubber-Tired Scraper, single engine, single scraper; Compactor-Self Propelled; Trenching Machine, digging capacity over 3 ft Depth.

GROUP 5: TRACKHOE-HYDRAULIC: up to and including 20,000 lbs.; Boom truck operator; DRILLING: Churn Drill and Earth Boring Machine Operator; Directional Drill Operator less than 20,000 lbs pullback; HYDRAULIC HOES: Hydraulic Backhoe Operator, wheel type (Ford, John Deere, Case type); Hydraulic Backhoe Operator track type up to and including 20,000 lbs.; Concrete Pumper; Concrete Paver; Compactor

GROUP 6: LOADERS: (less than 1 cu yd.); Roller (Non-Asphalt); Oiler; Bobcat/Skid Loader; Grade Checker; Crane oiler

Zone Differential (add to Zone 1 rates):
Zone 2 - \$3.00
Zone 3 - \$6.00

For the following metropolitan counties: MULTNOMAH; CLACKAMAS; MARION; WASHINGTON; YAMHILL; AND COLUMBIA; CLARK; AND COWLITZ COUNTY, WASHINGTON WITH MODIFICATIONS AS INDICATED:

All jobs or projects located in Multnomah, Clackamas and Marion Counties, West of the western boundary of Mt. Hood National Forest and West of Mile Post 30 on Interstate 84 and West of Mile Post 30 on State Highway 26 and West of Mile Post 30 on Highway 22 and all jobs or projects located in Yamhill County, Washington County and Columbia County and all jobs or projects located in Clark & Cowlitz County, Washington except that portion of Cowlitz County in the Mt. St. Helens ""Blast Zone"" shall receive Zone I pay for all classifications.

All jobs or projects located in the area outside the identified boundary above, but less than 50 miles from the Portland City Hall shall receive Zone II pay for all classifications.

All jobs or projects located more than 50 miles from the Portland City Hall, but outside the identified border above, shall receive Zone III pay for all classifications.

For the following cities: ALBANY; BEND; COOS BAY; EUGENE; GRANTS PASS; KLAMATH FALLS; MEDFORD; ROSEBURG

All jobs or projects located within 30 miles of the respective city hall of the above mentioned cities shall receive Zone I pay for all classifications.

All jobs or projects located more than 30 miles and less than 50 miles from the respective city hall of the above mentioned cities shall receive Zone II pay for all classifications.

All jobs or projects located more than 50 miles from the respective city hall of the above mentioned cities shall receive Zone III pay for all classifications.

IRON0029-011 01/02/2023

	Rates	Fringes
IRONWORKER (Ornamental, Reinforcing, and Structural).....	\$ 42.27	32.57

LAB00737-005 06/01/2022

	Rates	Fringes
Laborers: (Mason Tender-Cement/Concrete).....	\$ 38.79	16.85

LAB00737-006 06/01/2022

	Rates	Fringes
Laborers: (Mason Tender-Brick)...	\$ 38.79	16.85

LABO0737-007 06/01/2022

	Rates	Fringes
Laborers: (Mason Tender-Stone)...	\$ 38.79	16.85

LABO0737-014 06/01/2022

	Rates	Fringes
Laborers:		
GROUP 1.....	\$ 34.98	16.85
GROUP 2.....	\$ 36.25	16.85

LABORER CLASSIFICATIONS

GROUP 1: Form-Stripping; Demolition, General Laborer, Power Tool Operator

GROUP 2: Vibrating Plate, Grade Checker, Asphalt Raker

PAIN0010-004 07/01/2022

	Rates	Fringes
Painters:		
Brush, Roller and Spray.....	\$ 30.72	14.04

PAIN0101-001 07/01/2022

	Rates	Fringes
DRYWALL FINISHER/TAPER.....	\$ 42.52	19.13

PAIN0740-002 01/01/2023

	Rates	Fringes
GLAZIER.....	\$ 49.31	21.81

PAIN1236-007 07/01/2022

	Rates	Fringes
FLOOR LAYER: Vinyl Flooring.....	\$ 35.12	15.66

PLAS0082-004 07/01/2022

	Rates	Fringes
PLASTERER		
Including Stucco.....	\$ 41.16	19.23

PLAS0555-006 06/01/2022

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	\$ 39.97	21.17

PLUM0290-009 04/01/2022

	Rates	Fringes
PIPEFITTER		
Including HVAC Pipe		
Installation.....	\$ 50.68	31.16

PLUM0290-010 04/01/2022

	Rates	Fringes
PLUMBER.....	\$ 50.68	31.16

ROOF0049-004 07/01/2021

	Rates	Fringes
ROOFER		
Excluding Metal Roof.....	\$ 37.43	20.18

SF00669-002 04/01/2023

	Rates	Fringes
SPRINKLER FITTER		
Fire Sprinklers.....	\$ 46.18	26.40

* SHEE0016-013 07/01/2022

	Rates	Fringes
Sheet Metal Worker		
Excluding HVAC Duct		
Installation.....	\$ 47.05	24.16

* SUOR2009-021 11/09/2009

	Rates	Fringes
LABORER: Landscape.....	\$ 12.38 **	0.00
LABORER: Pipelayer.....	\$ 22.63	6.07
MILLWRIGHT.....	\$ 17.62	3.19
OPERATOR: Grader/Blade.....	\$ 16.00 **	2.80
SHEET METAL WORKER (HVAC Duct		
Installation Only).....	\$ 24.58	5.76
TRUCK DRIVER: Dump Truck.....	\$ 15.67 **	4.33
TRUCK DRIVER: Water Truck.....	\$ 18.11	5.05

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.

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** Workers in this classification may be entitled to a higher
minimum wage under Executive Order 14026 (\$16.20) or 13658
(\$12.15). Please see the Note at the top of the wage
determination for more information.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all

rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator

(See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

=====

END OF GENERAL DECISION"



INVITATION TO BID #S-C01010-00006281
**Clackamas Service Center West Building
 Project (CD #1803)**

ADDENDUM NUMBER #1
 April 26, 2023

On 3/28/2023, Clackamas County (“County”) published Invitation to Bid **Clackamas Service Center West Building Project (CD #1803)**, (“**BID**”) The County has found that it is in its interest to amend the **BID** through the issuance of this Addendum #1. Except as expressly amended below, all other terms and conditions of the original **BID** and subsequent Addenda shall remain unchanged.

Below is a Request for Information (RFI’s) log, highlighting questions and answers, in an attempt to provided clarification(s) to potential bidders for this project:

No.	Question(s):	Answer(s):	Int(s).
1	Demo. / Can the demolition be bid separate from the new construction building?	Yes , as a Subcontractor can bid this, by submitting to a General Contractor.	SK
2	Low Voltage/ Should Bidders be prepared to match the existing CSC network infrastructure system that is in place?	<p>Yes, Bidders should prepare for the following connection information provided by Clackamas Service Center:</p> <p><u>Our network is:</u> Comcast Business</p> <p><u>Access Control:</u> we currently use a lock and key system, no badge system. However, we are talking with ADT about security needs for the Center and the west building project. A badge system is likely as there will be medications, needles, and medical equipment that will be located inside the building.</p> <p><u>CSC's current network infrastructure is:</u> wireless for the Center. There is no current network for the existing Annex. However, CSC must change to fiber optic cable to meet HIPAA compliance for the Annex rebuild and the Center. Fiber Optic will either be ground or aerial as per city requirements. CSC is in</p>	JO

		the process of developing an estimate with Comcast Business.	
3	Windows & Storefront/ where and what is the difference for windows and storefront?	Vinyl Windows are to be provided as called out in the plans and specifications, except where “store front” glass is specified.	MB
4	Are Structural Drawings for this project?	Yes , there are two Structural Drawings (S1 and S2), they were not with the Architectural Drawings and are a part of Addendum No.1	DS
5	Is this project to be bid as a Prevailing Wage Rate(PWR), if so, what PWR is applicable?	Yes , Bidders are to apply both the Federal, Davis-Bacon PWR and State of Oregon BOLI PWR, and pay the higher of each classification.	SK
6	Is the Scope of Work Correct?	The Notice of Public Improvement, on Oregonbuys is the correct, However , please see attached to this Addendum No. 1, <u>2 updates</u> : SUPPLEMENTAL GENERAL CONDITIONS, (B-7, 2 pages) AND PROJECT INFORMATION, PLANS, SPECIFICATIONS AND DRAWINGS (B-12, 1 page).	SK

End of Addendum

STRUCTURAL NOTES

GENERAL

THE CONTRACTOR IS RESPONSIBLE FOR CHECKING THE PLANS PRIOR TO THE START OF CONSTRUCTION AND SHALL NOTIFY THE ENGINEER OF ANY ERRORS OR INCONSISTENCY WITH THE ARCHITECTURAL OR SUPPLIER DRAWINGS. SHOULD QUESTIONS ARISE REGARDING THE INFORMATION SHOWN ON THESE DRAWINGS THE CONTRACTOR SHALL CONTACT THE ENGINEER BEFORE PROCEEDING. THE ENGINEER IS NOT RESPONSIBLE FOR IMPROPER CONSTRUCTION PRACTICES DUE TO MISUNDERSTANDING OR MISUSE OF THE INFORMATION ON THESE DRAWINGS.

THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE DURING THE CONSTRUCTION PERIOD FOR ALL CONDITIONS AT THE CONSTRUCTION SITE, INCLUDING SAFETY OF PROPERTY AND PERSONS. THE ENGINEER'S VISITS TO THE SITE ARE NOT INTENDED, NOR SHALL THEY BE CONSTRUED TO INCLUDE A REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STRENGTH AND STABILITY OF ALL SHORING, BRACING, SCAFFOLDING AND TEMPORARY SUPPORTS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE WATERPROOFING AND FLASHING DETAILS OF ALL STRUCTURAL ELEMENTS INDICATED ON THESE DRAWINGS.

WRITTEN DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALE DIMENSIONS. DO NOT SCALE DRAWINGS. ALL STRUCTURAL DIMENSIONS ARE TO FACE OF FRAMING, UNLESS NOTED OTHERWISE.

CONTRACTOR SHALL REVIEW DRAWINGS WITH RESPECT TO MATERIALS, LAYOUT, ELEVATIONS, AND DIMENSIONS BEFORE STARTING WORK. ANY APPARENT DISCREPANCY, AMBIGUITY, OR CONFLICT IN THESE DRAWINGS SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION. ANY REVISION TO THESE DRAWINGS SHALL BE COMPLETED BEFORE PROCEEDING WITH THE WORK AFFECTED.

CODES AND STANDARDS

2019 OREGON STRUCTURAL SPECIALTY CODE

DESIGN LOADS

DEAD LOAD - ALL COMPONENT WEIGHTS WIND LOAD - DESIGN PER 2019 OSSC
 FLOOR LIVE LOAD - 50 PSF OFFICE 120 MPH ULT. (3 SEC GUST) RISK
 ROOF SNOW LOAD - 25 PSF CATEGORY II; EXPOSURE C
 SEISMIC LOAD - $S_s=0.40g$; $S_1=0.350g$ (SITE SPECIFIC) SOIL CLASS D (ASSUMED)

CONCRETE

28 DAY CONCRETE STRENGTH: $F'_c=2500$ PSI AT FOOTINGS AND WALLS, $F'_c=3500$ PSI AT ENTRY SLAB FOR APPEARANCE. MAXIMUM CONCRETE SLUMP 4 INCHES, AIR ENTRAIN ALL CONCRETE EXPOSED TO WEATHER 4% TO 6% PER C.Y.

ALL REINFORCING STEEL - ASTM A615, GRADE 60, UNLESS OTHERWISE NOTED. REINFORCING BARS SHALL BE LAPPED 24 DIAMETERS OR A MINIMUM OF 12 INCHES. STEEL REINFORCING SHALL HAVE MINIMUM CONCRETE COVER OF 3 INCHES AGAINST EARTH; 2" COVER AGAINST FORMS.

FRAMING LUMBER

SAWN LUMBER SHALL CONFORM TO WEST COAST INSPECTION BUREAU OR WESTERN WOOD PRODUCTS ASSOCIATION GRADING RULES. BLOCKING PLATES & NAILERS TO BE DOUGLAS FIR #2. ALL FRAMING NAILS SHALL BE COMMON NAILS UNLESS SHOWN OTHERWISE AND SHALL BE OF SIZE AND NUMBER INDICATED ON DRAWINGS. NAILING NOT SHOWN SHALL BE AS INDICATED ON I.B.C. FASTENING SCHEDULE ON TABLE 2304.9.1 FRAMING ACCESSORIES AND PRE-ENGINEERED STRUCTURAL FASTENERS SHALL BE MANUFACTURED BY SIMPSON OR APPROVED EQUAL.

ANY NAILS OR SCREWS THAT ARE IN CONTACT WITH P.T. WOOD SHALL BE HOT DIPPED GALVANIZED; STEEL FRAMING CONNECTORS IN CONTACT WITH P.T. WOOD (HANGERS, STRAPS, CLIPS ETC) SHALL EITHER HAVE A ZINC COATING OF 1.85 OZ/SQ FT (SIMPSON ZMAX) OR BE FABRICATED FROM STAINLESS STEEL.

"PSL" HIGH-STRENGTH BEAM MEMBERS SHALL HAVE THE FOLLOWING MINIMUM SPECIFICATIONS: $F_b=3000$ PSI, $F_v=285$ PSI; $E=2,100,000$ PSI
 "1" W/ PT BRAM/ANFR/MFR/FR SHALL HAVE THE FOLLOWING MINIMUM SPECIFICATIONS: $F_b=2600$ PSI, $F_v=285$ PSI; $E=1,900,000$ PSI
 "LSL" RM JOIST/BLOCKING MEMBERS SHALL HAVE THE FOLLOWING MINIMUM SPECIFICATIONS: $F_b=1700$ PSI, $F_v=285$ PSI; $E=1,300,000$ PSI

SHEATHING

PLYWOOD PANELS SHALL CONFORM TO THE REQUIREMENTS OF "U.S. PRODUCT STANDARD PS 1 FOR CONSTRUCTION AND INDUSTRIAL PLYWOOD" OR APA PRP-108 PERFORMANCE STANDARDS. PANELS SHALL BE APA RATED SHEATHING, EXPOSURE 1 WITH EXTERIOR GLUE, OF THE THICKNESS AND SPAN RATING SHOWN ON THE DRAWINGS AND OUTLINED BELOW.

PANEL INSTALLATION SHALL BE IN CONFORMANCE WITH APA RECOMMENDATIONS. ALLOW 1/8" SPACING AT PANEL ENDS AND TOPS UNLESS OTHERWISE RECOMMENDED BY THE MANUFACTURER. PANEL ROOF AND FLOOR SHEATHING SHALL BE LAID WITH END JOINTS STAGGERED, LAY OUT PLYWOOD TO ELIMINATE ANY WIDTH LESS THAN 2" - ALL ROOF AND FLOOR SHEATHING SHALL BE INSTALLED WITH THE FACE GRAIN PERPENDICULAR TO SUPPORTS, EXCEPT AS INDICATED ON THE DRAWINGS.

FLOOR SHEATHING: 3/4" (NOM) APA RATED T&G STURD-I-FLOOR SHALL BE NAILED TO FRAMING WITH 8d COMMON NAILS @ 6" O.C. AT ALL PANEL EDGES AND AT 12" O.C. AT INTERMEDIATE SUPPORTS, UNLESS NOTED OTHERWISE.

WALL SHEATHING: 1/2" (NOM) APA RATED SHEATHING, MIN SPAN RATING 24/16, NAIL SHEATHING TO FRAMING WITH 8d COMMON NAILS @ 6" O.C. AT ALL PANEL EDGES AND AT 12" O.C. AT INTERMEDIATE SUPPORTS, UNLESS NOTED OTHERWISE - SEE SW PLAN & SCH. ALL PANEL EDGES SHALL BE BACKED BY SOLID 2x MEMBER AT INDICATED SHEARWALLS. SEE DETAIL 5/S1 FOR SHEATHING JOINT LOCATIONS AT SIP PANELS.

ROOF SHEATHING: 1/2" (NOM) APA RATED SHEATHING, MIN SPAN RATING 32/16, OVER 2x6 T&G DECKING. ROOF SHEATHING NAILING AT TO BE 12d BOX AT 6" O.C. AT BEAMS, BLKG AND 2x TRIM BOARDS; #9x1 1/2" SCREWS (SIMP WSV1345 OR EQUIV) AT 6" O.C. EA WAY AT 2x6 DECKING FIELD FASTENING.

PRESSURE TREATED LUMBER

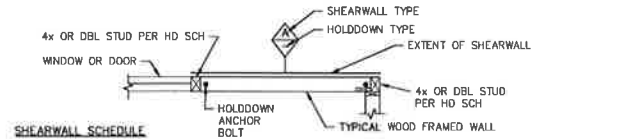
ANY LUMBER EXPOSED TO WEATHER, IN DIRECT CONTACT WITH CONCRETE, SOIL OR ANY OTHER MOIST CONDITION, SHALL BE "PRESSURE TREATED" (PT) MATERIAL SHALL BE TREATED WITH THE FOLLOWING COPPER-BASED FORMULATIONS: "MCA", "MCO", "MCA-C" OR THE FOLLOWING CARBON-BASED FORMULATIONS: "EL2", "PT1". ANY CUTS MADE TO THE PT LUMBER SHALL BE FIELD TREATED WITH A COPPER NAPHTHENATE PRESERVATIVE CONTAINING AT LEAST A 1% CONCENTRATION OF COPPER. FASTENERS IN CONTACT WITH PT LUMBER SHALL BE HOT-DIPPED GALVANIZED, STAINLESS STEEL OR BE APPROVED BY THE ACCEPTANCE CRITERIA IN THE ICC-ES AC208 DOCUMENT. LIGHT GAGE STEEL FRAMING ACCESSORIES SUCH AS CLIPS, HANGERS, ANGLES ETC SHALL BE GALVANIZED TO MEET THE G-185 STANDARD (SIMPSON ZMAX OR EQUIV.)

REQUIRED STRUCTURAL SPECIAL INSPECTIONS				
SYSTEM OR MATERIAL	IBC CODE REFERENCE	CODE OR STANDARD REFERENCE	FREQUENCY	REMARKS
CONCRETE ANCHOR BOLT INSTALLATION IN EXISTING CONCRETE	1703.4.2 1704.3.3	ICC EVALUATION REPORT	CONTINUOUS/PERIODIC	SPECIAL INSPECTION APPLIES TO PRODUCT NAME TYPE AND DIMENSIONS. HOLE DIMENSIONS, CLEARANCE OF THE HOLE AND ANCHOR ANCHOR INSTALLATION PROCEDURE & ANCHOR EMBEDMENT

STRUCTURAL ABBREVIATIONS

AB	ANCHOR BOLT	JST	JOIST
ARCH	ARCHITECTURAL	LAM	LAMINATE
BM	BEAM	LVL	LAMINATED VENEER LUMBER
BOT	BOTTOM	MAX	MAXIMUM
BTWN	BETWEEN	MIN	MINIMUM
CJ	CONTROL JOINT	NOM	NOMINAL
CL	CENTER LINE	NTS	NOT TO SCALE
CLR	CLEAR	OC	ON CENTER
COL	COLUMN	REQ	REQUIRED
CONC	CONCRETE	RO	ROUGH OPENING
CONT	CONTINUOUS	SCH	SCHEDULE
CTR	CENTER	SHT	SHEET
DBL	DOUBLE	SIM	SIMILAR
DIA	DIAMETER	SIMP	SIMPSON STRONG-TIE
DWG	DRAWING	SIP	STRUCTURAL INSULATED PANEL
DTL	DETAIL	SQ	SQUARE
EA	EACH	SW	SHEAR WALL
EQ	EQUAL	T & B	TOP AND BOTTOM
EW	EACH WAY	THK	THICK
EXT	EXTERIOR	TYP	TYPICAL
FDN	FOUNDATION	UNO	UNLESS NOTED OTHERWISE
FTG	FOOTING	VERT	VERTICAL
HD	HOLDDOWN	W/	WITH
HORIZ	HORIZONTAL	//	PARALLEL
INT	INTERIOR	⊥	PERPENDICULAR

SHEARWALL AND HOLDDOWN KEY



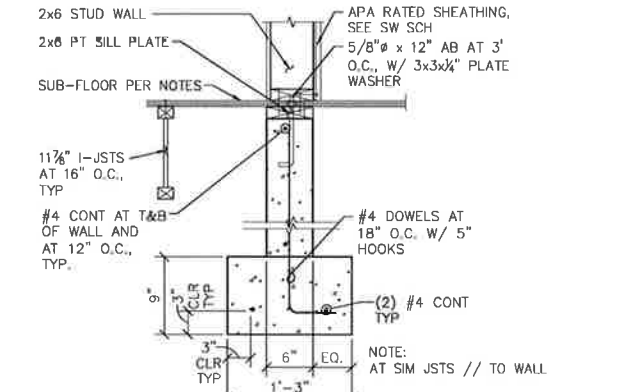
SHEARWALL SCHEDULE

- A = 1/2" (NOM) APA RATED SHEATHING W/ 8d COMMON NAILS AT 6" O.C. AT ALL SHEATHING EDGES; 12" O.C. AT FIELD STUDS. ALL PANEL EDGES MUST BE BACKED W/ A SOLID 2x MEMBER, SHEAR CAPACITY = 260 PLF ANCHOR BOLTS: 3/8" x 12" U-BOLTS W/ SIMP BP3-3 PLATE WASHER AT 4' O.C. AT 2x6 PT SILL PLATE.
- B = 1/2" (NOM) APA RATED SHEATHING W/ 8d COMMON NAILS AT 4" O.C. AT ALL SHEATHING EDGES; 12" O.C. AT FIELD STUDS. ALL PANEL EDGES MUST BE BACKED W/ A SOLID 2x MEMBER, SHEAR CAPACITY = 380 PLF ANCHOR BOLTS: 3/8" x 12" U-BOLTS W/ SIMP BP3-3 PLATE WASHER AT 3' O.C. AT 2x6 PT SILL PLATE.

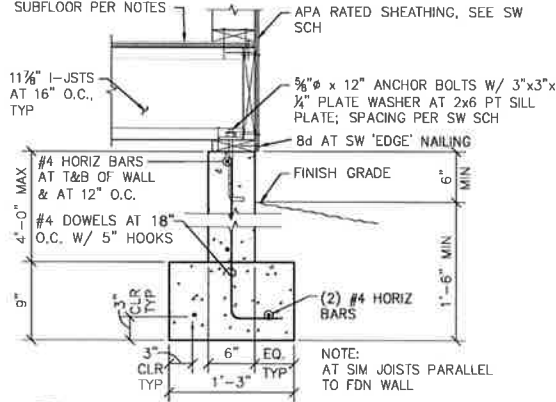
SHEARWALL NOTES:
 1. NAILS TO BE DRIVEN FLUSH. NAIL HEAD CANNOT BREAK THROUGH OUTER PLY OF SHEATHING PANEL.
 2. MINIMUM OF (2) ANCHOR BOLTS PER SHEARWALL.

HOLDDOWN SCHEDULE

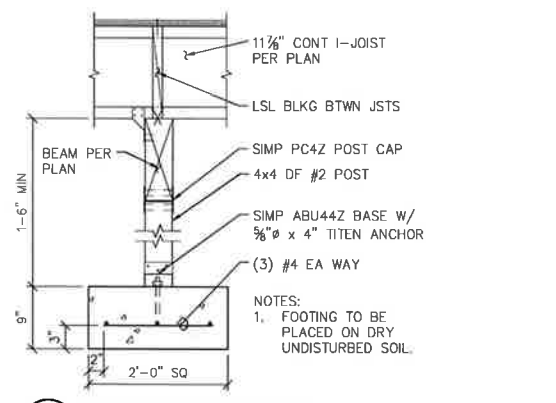
- NO HOLDDOWN REQUIRED
- 1 = SIMPSON HDU2-SDS2.5 HOLDDOWN (2x WALL TO FDN) AT DBL STUD W/ (6) SDS4x2 1/2 SCREWS AND 3/8" x 16" SSTB ANCHOR BOLT. CAPACITY = 3075 LBS. SEE DETAIL 5/S1
- 2 = SIMPSON HDU4-SDS2.5 HOLDDOWN (2x WALL TO FDN) AT DBL STUD W/ (6) SDS4x2 1/2 SCREWS AND 3/8" x 28" SSTB ANCHOR BOLT. CAPACITY = 3075 LBS. SEE DETAIL 6/S1



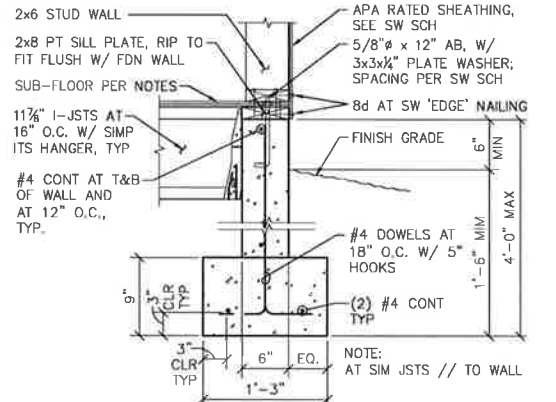
3 SI 1" = 1'-0" WFDN-06B



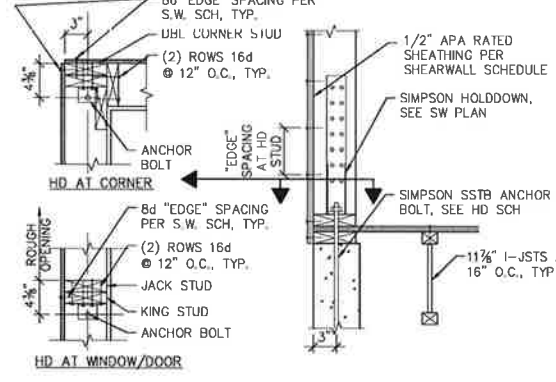
1 SI 1" = 1'-0" WFDN-06B



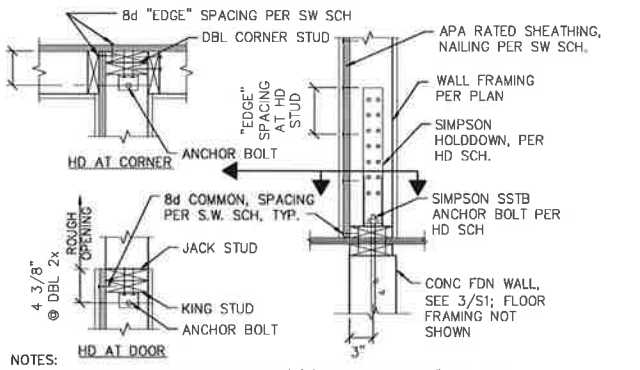
4 SI 1" = 1'-0" WFDN-03A



2 SI 1" = 1'-0" WFDN-08D

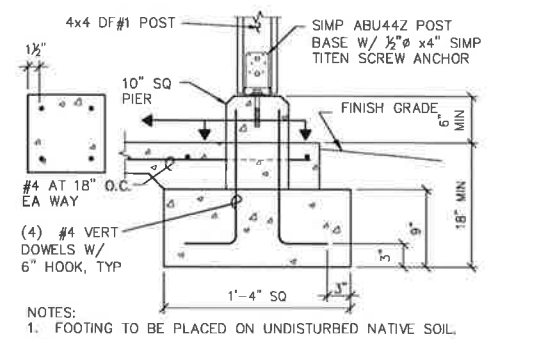


5 SI 1" = 1'-0" WFDN-02

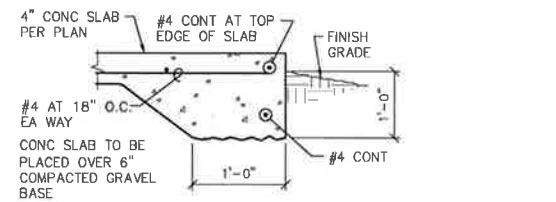


NOTES:
 1. LAM DBL STUDS AT HOLDDOWNS W/ (2) ROWS 16d @ 12" O.C., TYP.
 2. AT HOLDDOWN ANCHOR BOLTS SEE EMBEDMENT REQUIREMENTS ON HD SCH. AB MAY NEED TO BE INSTALLED IN FTG

6 SI 1" = 1'-0" WFDN-07D



7 SI 1" = 1'-0" WFDN-7



8 SI 1" = 1'-0" S06-4

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NO.	DATE	DESCRIPTION
1	1/9/2023	REVISIONS PER PLAN CHECK



CLACKAMAS SERVICE CENTER - EAST BLDG.
 5500 SE 80TH AVE
 GLADSTONE, OR

ARCHER ENGINEERING LLC.
 2345 NE 37th Avenue, Portland, OR 97212 503.750.3357 archereng@comcast.net

CLIENT
 DMS ARCHITECTS
 2325 NE 19TH AVE,
 PORTLAND, OR 97212

SHEET CONTENTS
STRUCTURAL NOTES DETAILS
DESIGNED BY MDA
APPROVED BY
SCALE AS NOTED
DATE 8/12/2022
JOB NUMBER AE2239
SHEET NUMBER S1

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NO.	DATE	DESCRIPTION



CLACKAMAS SERVICE CENTER - EAST BLDG.
 5500 SE 80TH AVE.
 GLADSTONE, OR

ARCHER ENGINEERING L.L.C.
 2345 NE 37th Avenue, Portland, OR 97212 503.750.1357 archerengllc.com/estnet

CLIENT
 DMS ARCHITECTS
 2325 NE 19TH AVE.
 PORTLAND, OR 97212

SHEET CONTENTS
 DETAILS

DESIGNED BY
 MDA

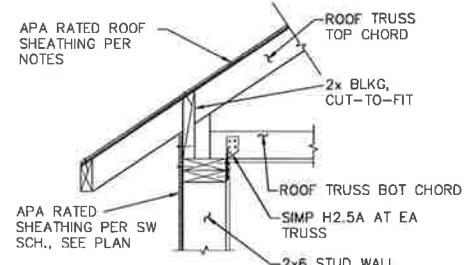
APPROVED BY

SCALE
 AS NOTED

DATE
 8/12/2022

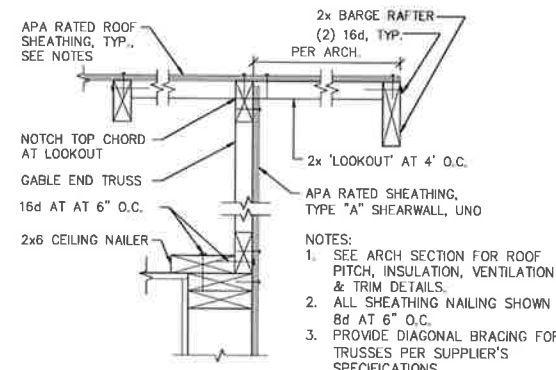
JOB NUMBER
 AE2239

SHEET NUMBER
S2

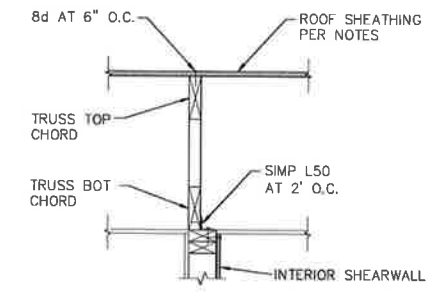


NOTES:
 1. SEE ARCH DWGS FOR ROOF PITCH, VENTILATION AND TRIM DETAILS.
 2. ALL SHEATHING NAILING SHOWN 8d AT 6" O.C.

1 SHEARWALL AT ROOF
 1" = 1'-0" WRF-211

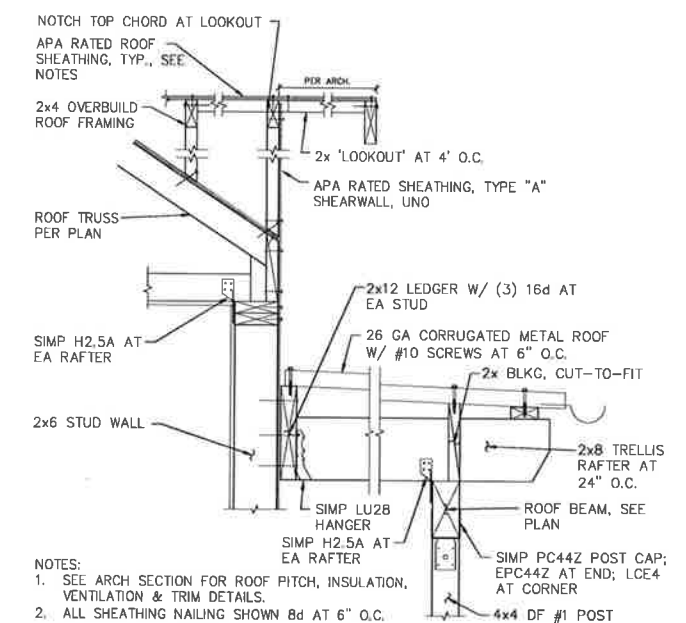


2 GABLE-END WALL DETAIL
 1 1/2" = 1'-0" WRF-211



NOTE: TRUSS ALIGNED W/ SHEARWALL DESIGNED TO TRANSFER 6300 LB (225 PLF) HORIZONTAL LOAD FROM ROOF SHEATHING TO WALL BELOW

3 SHEARWALL AT ROOF TRUSS
 1" = 1'-0" WRF-221



4 ROOF FRAMING DETAIL
 1" = 1'-0" WRF-226



**CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT
SUPPLEMENTAL GENERAL CONDITIONS**

**PROJECT: Clackamas Service County West Building Project (CD #1803)
(Portland, OR)**

The following modifies the October 13, 2021 Clackamas County General Conditions for Public Improvement Contracts (“County General Conditions”) for this Contract. Except as modified below, all other terms and conditions of the County General Conditions shall remain in effect.

SC – 1: Permits

Section B.4-Permits of the County General Conditions is hereby deleted in its entirety and replaced with the following:

B.4 PERMITS

The General Contractor awarded this construction contract will receive the Permit from the DMS Architects. Clackamas Service Center is paying from all the permits associated with the new building.

SC – 2: Liquidated Damages

The following sections are added to Section D.2 - Delays:

D.2.3 DAMAGES FOR DELAY – LIQUIDATED DAMAGES

- (a) It is imperative that the Work in this Contract reach Substantial Completion, **150 days from issuance from Notice to Proceed, Estimated to be June 1st – 8th, 2023**, and as further required in the Plans and Specifications and Section 13 of the Contract to be completed, TBD from Notice to Proceed. Time will be of the essence to open the new building for operation of a new clinic, therefore the Owner requires the firm deadline. The Contractor represents and agrees that the Substantial Completion date is reasonable, that it can meet the Substantial Completion date, and it has taken into account in its Offer the requirements of the Contract Documents, the location, the time allowed for the Work, local conditions, weather, availability of materials, equipment, and labor, and any other factor which may affect performance of the Work.

Below is a matrix for Project Contract Amounts regarding Liquidated Damages provide to the Contractor by the Owner, please review carefully:

Levels:	Project Contract Amounts:	Liquidated Damages Amounts:
One	\$5,000 to \$25,000 dollars	\$0 dollars per day
Two	\$25,000+ to \$50,000 dollars	\$250 dollars per day
Three	\$50,000+ to \$100,000 dollars	\$500 dollars per day
Four	\$100,000+ to \$200,000 dollars	\$750 dollars per day

Five	\$200,000+ and Above	\$1,000 dollars per day
------	----------------------	-------------------------

- (b) If the Contactor fails to achieve Substantial Completion as specified above, then the Contractor and Owner agree that it would be extremely difficult to ascertain the damages incurred by Owner for the Contractor's failure. Therefore, Owner and the Contractor agree that in lieu of actual damages for delay, the Contractor shall reimburse Owner a stipulated sum of \$1,000 per calendar day beyond the Substantial Completion Date. The Contractor further agrees the stipulated sum is not a penalty.

Likewise, if the Work does not reach Final Completion defined in Section 4 of the Contract, then the Contractor shall owe to the Owner, not as a penalty but as liquidated damages, the sum of one thousand dollars (\$1,000.00) per day for each and every calendar day of delay until Final Completion.

SC – 3: Good Faith Effort

As a condition of Contractor being awarded a Contract for this Project, Contractor must complete Good Faith Effort outreach and documentation as described in the Supplemental Instructions to Bidders of the Solicitation Document.

The Contractor may not change who is performing each Division of Work identified in Form 1 of the Good Faith Effort without the express written advance approval of Owner. This includes substituting identified subcontractors, self-performance of a Division of Work that was identified to be performed by a subcontractor, or the Contractor subcontracting a Division of Work that was identified to be self-performed by the Contractor.

Contractor shall be required to submit the completed Form 3 with its final pay application as a condition of final payment.



**CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT
PROJECT INFORMATION, PLANS, SPECIFICATIONS AND DRAWINGS**

**PROJECT: Clackamas Service Center West Building Project
(Portland, OR)**

Background: The existing old one story building will be demolished, and completely and removed, including all foundational supports. Minor excavation will occur for the new Clackamas Service Center West Building. This new one level building will provide the following spaces: four restrooms, two showers, five offices, two examination rooms, one laboratory, a health clinic, one large laundry with two washers and two dryers, clothing center, and a storage room. The approximate size of the new building footprint is 106 feet x 28 feet, equaling 2,968 SF. This new facility will service the citizens in need.

Project Estimate: \$900,000 - \$1.1 million dollars

Key Dates:

All Basic Bid Work may begin as soon as the Notice to Proceed (“NTP”) is issued

Substantial Completion: 150 Days from NTP

Final Completion: 180 Days from NTP – estimated to be December 1, 2023

Federal Holidays will not be include in this number of days (Example Labor Day etc).

Time is of the essence for this Project. Note the Liquidated Damages requirements as described in the Supplemental General Conditions.

The Scope further includes the following Plans, Specifications and Drawings:

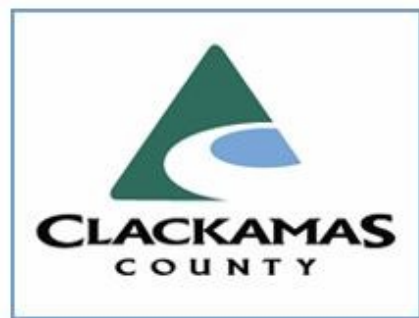
There are no drawings for this Scope.

CONSTRUCTION PROJECT MANUAL

for

Clackamas Service Center West Building Project (Portland, Oregon)

March 28, 2023



FEDERALLY FUNDED

by

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

through

**CLACKAMAS COUNTY
DEPARTMENT OF HEALTH, HOUSING and HUMAN SERVICES
COMMUNITY DEVELOPMENT DIVISION
2051 Kaen Road, Suite 245, Oregon City, OR
(503) 655-8591**



CLACKAMAS COUNTY
NOTICE OF PUBLIC IMPROVEMENT CONTRACT OPPORTUNITY

INVITATION TO BID
Clackamas Service Center West Building Project (CD #1803)
March 28, 2023

Clackamas County (“County”), on behalf of Community Development Division, through their Board of County Commissioners is accepting sealed bids for the Clackamas Service Center West Building Project until **May 9, 2023, 2:00 PM**, Pacific Time, (“Bid Closing”). The project site is located at 8800 SE 80th Avenue, Portland, OR, 97206.

Bidding Documents can be downloaded from the state of Oregon procurement website (“OregonBuys”) at the following address: <https://oregonbuys.gov/bsv/view/login/login.xhtml>, Document No.S-C01010-000006281.

Prospective Bidders will need to sign in to download the information and that information will be accumulated for a Plan Holder's List. Prospective Bidders are responsible for obtaining any Addenda from Website listed above.

DELIVER BIDS VIA EMAIL:

Steve Kelly, Project Coordinator: stevekel@clackamas.us

Project Estimate: \$900,000 to 1.1 million dollars

Project Schedule: Notice to Proceed, 150 Days to Substantial Completion and 180 Days to Final Completion.

Project Key Note(s):

- 1) Clackamas County is issuing the Building Permit and other associated Permits.

Contact Information:

Government Documents – Steve Kelly, Project Coordinator: stevekel@clackamas.us

Project Mgmt. – Mark Beirwagen, Project Manager: mark@stonecreekbuilding.net

Project Design – Dave Spitzer, Project Architect: dave@dmsarchitects.com

Mandatory walk-throughs and site access:

There is no mandatory Walk-through, contractors can go online via Google Earth, or observe the existing structure schedule for demolition. Once this old building is removed, this will be the location for the new CSC West Building Project. Bidders can view from SE 80th Avenue and SE 79th Ave.

Bids will be opened and read at the above Delivery Address via Emailed Address after the Bid Closing. Bid results will also be posted to the OregonBuys project site shortly after the opening.

State of Oregon Prevailing Wage:

Prevailing Wage Rates requirements apply to this Project because the maximum compensation for all Owner-contracted Work is more than \$50,000. Contractor and all subcontractors shall comply with the provisions of ORS 279C.800 through 279C.870, relative to Prevailing Wage Rates. The Bureau of Labor and Industries (“BOLI”) wage rates and requirements set forth in the following BOLI booklet (and any listed amendments to that booklet), which are incorporated herein by reference, apply to the Work authorized under this Agreement:

PREVAILING WAGE RATES for Public Works Contracts in Oregon, January 5, 2023, which can be downloaded at the following web address: [PWR Rate Book for January 5, 2023.pdf \(oregon.gov\)](#)
The Work will take place in Clackamas County, Oregon.

NOTE 1: Contractors are required to pay the higher wage classification between State (“BOLI”) and Federal (Davis-Bacon) for all Community Development Block Grant (“CDBG”) funded projects.

Federal Prevailing Wage Rates:

Prevailing Wage Rates requirements apply to this Project because the maximum compensation for all Owner-contracted Work is more than \$2,000. Contractor and all subcontractors shall comply with the provisions of the David-Bacon Act (40 U.S.C. 3141 et seq).

PREVAILING WAGE RATES for BUILDING shall be used for Clackamas County, March 17, 2023, Modification 5, Type: Building, which can be downloaded at the following web address: [SAM.gov](#)

If the Davis-Bacon Prevailing Wage Rates change 10 days before the Bid Opening Date, Clackamas County Community Development Division will issue an Addendum providing the new wage rates.

NOTE 2: Contractors are required to pay the higher wage classification between State (“BOLI”) and Federal (Davis-Bacon) for all Community Development Block Grant (“CDBG”) funded projects.

Other Federal Requirements:

This project is financed through the Community Development Block Grant Program with funds obtained from the U.S. Department of Housing and Urban Development. The Contract will be subject to regulations of the federal Department of Labor (“DOL”) and Department of Housing and Urban Development (“HUD”). The successful Bidder will be required to comply with the provisions of section 3 of the Housing and Urban Development Act of 1968 as amended (herein referred to as section 3 requirements). Such provisions require that economic opportunities generated by HUD financial assistance shall, to the greatest extent feasible, be given to low income residents of the metropolitan area in which the project is located and to businesses that provide economic opportunities for these persons. Bids exceeding \$100,000 must include an indication of whether or not the firm submitting the bid is a “section 3 business concern.” The Contractor shall commence no work on the project until the Contractor and every subcontractor has a public works bond filed with the Construction Board in accordance with ORS 279C.830 and all other bonding and insurance requirements have been met and a Notice to Proceed has been issued.

This project will be above \$100,000 dollars and will qualify as a “HUD Section 3” covered contract. This desired designation means: Contracts exceeding \$100,000 are considered “Section 3 covered contracts.” Bids exceeding \$100,000 must include an indication of whether or not the firm submitting the bid is a “section 3 business concern.”

A Section 3 business concern is defined by HUD regulations as a business concern:

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

A Section 3 resident means:

- (1) A public housing resident, or
- (2) An individual who resides in the metropolitan area in which the section 3 covered assistance is expended, and who is a low-income person or a very low-income person. For purposes of this project, residents of the Portland-Vancouver-Hillsboro Area who are

members of families meeting the following income limits are considered low or very low-income persons.

HUD 2022 Annual Income Limits for the Portland-Vancouver-Hillsboro Area								
	1 Person	2 Person	3 Person	4 Person	5 Person	6 Person	7 Person	8 Person
Low Income	\$37,300	\$42,600	\$47,950	\$53,250	\$57,550	\$61,800	\$66,050	\$70,300
Moderate Income	\$59,650	\$68,200	\$76,700	\$85,200	\$92,050	\$98,850	\$105,650	\$112,500

Clackamas County encourages bids from Minority, Women, and Emerging Small Businesses.



CLACKAMAS COUNTY PUBLIC IMPROVEMENT CONTRACT OPPORTUNITY

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CLACKAMAS COUNTY PUBLIC IMPROVEMENT CONTRACT

INSTRUCTIONS TO BIDDERS

Clackamas County Local Contract Review Board Rules (“LCRB Rules”) govern this procurement process. LCRB Rules may be found at: <http://www.clackamas.us/code/documents/appendixc.pdf>. The Instructions to Bidders is applicable to the procurement process for Clackamas County, or any component unit thereof identified on the Notice of Public Improvement Contract Opportunity, herein after referred to as the “Owner.”

Article 1. Scope of Work

The work contemplated under this contract with the Owner, includes all labor, materials, transportation, equipment and services necessary for, and reasonably incidental to, the completion of all construction work in connection with the project described in the Project Manual which includes, but is not necessarily limited to, the Notice of Public Improvement Contract Opportunity, Instructions to Bidders, Supplemental Instructions to Bidders, Bid Form, Bid Bond, Public Improvement Contract Form, Performance Bond, Payment Bond, Clackamas County General Conditions for Public Improvement Contracts (1/1/2017), Supplemental General Conditions, and Plans, Specifications and Drawings.

Article 2. Examination of Site and Conditions

Before making a Bid, the Bidder shall examine the site of the work and ascertain all the physical conditions in relation thereto. The Bidder shall also make a careful examination of the Project Manual including the plans, specifications, and drawings and other contract documents, and shall be fully informed as to the quality and quantity of materials and the sources of supply of the materials. Failure to take these steps will not release the successful Bidder from entering into the contract nor excuse the Bidder from performing the work in strict accordance with the terms of the contract at the price established by the Bid.

The Owner will not be responsible for any loss or for any unanticipated costs, which may be suffered by the successful Bidder, as a result of such Bidder's failure

to be fully informed in advance with regard to all conditions pertaining to the work and the character of the work required, including site conditions. No statement made by an elected official, officer, agent, or employee of the Owner in relation to the physical or other conditions pertaining to the site of the work will be binding on the Owner, unless covered by the Project Manual or an Addendum.

Article 3. Interpretation of Project Manual and Approval of Materials Equal to Those Provided in the Specifications

If any Bidder contemplating submitting a Bid for the proposed contract is in doubt as to the true meaning of any part of the plans, specifications or forms of contract documents, or detects discrepancies or omissions, such Bidder may submit to the Engineer (read "Architect" throughout in lieu of Engineer as appropriate) a written request for an interpretation thereof at least ten (10) calendar days prior to the date set for the Bid Closing.

When a prospective Bidder seeks approval of a particular manufacturer's material, process or item of equal value, utility or merit other than that designated by the Engineer in the Project Manual, the Bidder may submit to the Engineer a written request for approval of such substitute at least ten (10) calendar days prior to the date set for the Bid Closing. The prospective Bidder submitting the request will be responsible for its prompt delivery.

Requests of approval for a substitution from that specified shall be accompanied by samples, records of performance, certified copies of tests by impartial and recognized laboratories, and such other information as the Engineer may request.

To establish a basis of quality, certain processes, types of machinery and equipment or kinds of materials may be specified in the Project Manual either by description of process or by designating a manufacturer by name and referring to a brand or product designation or by specifying a kind of

material. Whenever a process is designated or a manufacturer's name, brand or item designation is given, or whenever a process or material covered by patent is designated or described, it shall be understood that the words "or approved equal" follow such name, designation or description, whether in fact they do so or not.

Any interpretation of the Project Manual or approval of manufacturer's material will be made only by an Addendum duly issued. The Owner will not be responsible for any other explanation or interpretation of the Project Manual nor for any other approval of a particular manufacturer's process or item for any Bidder.

When the Engineer approves a substitution by Addendum, it is with the understanding that the Contractor guarantees the substituted article or material to be equal or better than the one specified.

Article 4. Security to Be Furnished by Each Bidder

Each Bid must be accompanied by either 1) a cashier's check or a certified check drawn on a bank authorized to do business in the State of Oregon, or 2) a Bid bond described hereinafter, executed in favor of the Owner, for an amount equal to ten percent (10%) of the total amount Bid as a guarantee that, if awarded the contract, the Bidder will execute the contract and provide a performance bond and payment bond as required. The successful Bidder's check or Bid bond will be retained until the Bidder has entered into a contract satisfactory to Owner and furnished a one hundred percent (100%) performance bond and one hundred percent (100%) payment bond. The Owner reserves the right to hold the Bid security as described in Article 10 hereof. Should the successful Bidder fail to execute and deliver the contract as provided for in Article 12 hereof, including a satisfactory performance bond and payment bond within twenty (20) calendar days after the Bid has been accepted by the Owner, then the contract award made to such Bidder may be considered canceled and the Bid security may be forfeited as liquidated damages at the option of the Owner. The date of the acceptance of the Bid and the award of the contract as contemplated by the Project Manual shall mean the date of acceptance specified in the Notice of Intent to Award.

Article 5. Execution of Bid Bond

Should the Bidder elect to utilize a Bid bond as described in Article 4 in order to satisfy the Bid security requirements, such form must be completed in the following manner:

- A. Bid bonds must be executed on the County forms, which will be provided to all prospective Bidders by the Owner.
- B. The Bid bond shall be executed on behalf of a bonding company licensed to do business in the State of Oregon.
- C. In the case of a sole individual, the bond need only be executed as principal by the sole individual. In the case of a partnership, the bond must be executed by at least one of the partners. In the case of a corporation, the bond must be executed by stating the official name of the corporation under which is placed the signature of an officer authorized to sign on behalf of the corporation followed by such person's official capacity, such as president, etc. The corporation seal should then be affixed to the bond.
- D. The name of the surety must be stated in the execution over the signature of its duly authorized attorney-in-fact and accompanied by the seal of the surety corporation.

Article 6. Execution of the Bid Form

Each Bid shall be made in accordance with: (i) the sample Bid Form accompanying these instructions; (ii) the appropriate signatures for a sole individual, partnership, corporation or limited liability corporation shall be added as noted in Article 5C above; (iii) numbers pertaining to base Bids shall be stated both in writing and in figures; and (iv) the Bidder's address shall be typed or printed.

The Bid Form relates to Bids on a specific Project Manual. Only the amounts and information asked for on the Bid Form furnished will be considered as the Bid. Each Bidder shall Bid upon the work exactly as specified and provided in the Bid Form. The Bidder shall include in the Bid a sum to cover the cost of all items contemplated by the Contract. The Bidder shall Bid upon all alternates that may be indicated on the Bid Form. When Bidding on an alternate for which there is no charge, the Bidder shall write the words "No Charge" in the space provided on the Bid Form. If one or more alternates are shown on the Bid Form, the Bidder shall indicate whether each is "add" or "deduct."

Article 7. Prohibition of Alterations to Bid

Bids that are incomplete, or contain ambiguities or have differing conditions required by the Bidder, including requested changes or exceptions to the Public Improvement Contract form or other portions of the Project Manual, may be rejected in Owner's sole and absolute discretion.

Article 8. Submission of Bid

Each Bid shall be sealed in an envelope, properly addressed to the Owner, showing on the outside of the envelope the name of the Bidder and the name of the project. Bids will be received at the time and place stated in the Notice of Public Improvement Contract Opportunity.

Article 9. Bid Closing and Opening of Bids

All Bids must be received by the Owner at the place and time set for the Bid Closing. Any Bids received after the scheduled Bid Closing time for receipt of Bids will be rejected.

At the time of opening and reading of Bids, each Bid received will be publicly opened and read aloud, irrespective of any irregularities or informalities in such Bids.

Generally, Bid results will be posted to the OregonBuys Website within a couple hours of the opening.

Article 10. Acceptance or Rejection of Bids by Owner

Unless all Bids are rejected, the Owner will award a contract based on the lowest responsive Bid from a responsible Bidder. If that Bidder does not execute the contract, it will be awarded to the next lowest responsible Bidder or Bidders in succession.

The Owner reserves the right to reject all Bids and to waive minor informalities. The procedures for contract awards shall be in compliance with the provisions of the LCRB Rules in effect at that time.

The Owner reserves the right to hold the Bid and Bid security of the three lowest Bidders for a period of thirty (30) calendar days from and after the time of Bid opening pending award of the contract. Following award of the contract the Bid security of the three lowest Bidders may be held twenty (20) calendar days pending execution of the contract. All other Bids will be rejected and Bid security will be returned.

In determining the lowest Bidder, the Owner reserves the right to take into consideration any or all authorized base Bids as well as alternates or combinations indicated in the Bid Form.

If no Bid has been accepted within thirty (30) calendar days after the opening of the Bids, each of the three lowest Bidders may withdraw the Bid submitted and request the return of the Bid security.

Article 11. Withdrawal of Bid

At any time prior to the Bid Closing, a Bidder may withdraw its Bid. This will not preclude the submission of another Bid by such Bidder prior to the time set for the Bid Closing.

After the time set for the Bid Closing, no Bidder will

be permitted to withdraw its Bid within the time frames specified in Article 10 for award and execution, except as provided for in that Article.

Article 12. Execution of Contract, Performance Bond and Payment Bond

The Owner will provide the successful Bidder with contract forms within seven (7) calendar days after the completion of the award protest period. The Bidder is required to execute the contract forms as provided, including a performance bond and a payment bond from a surety company licensed to do surety business in the State of Oregon, within seven (7) calendar days after receipt of the contract forms. The contract forms shall be delivered to the Owner in the number called for and to the location as instructed by the Owner.

Article 13. Recyclable Products

Contractors will use recyclable products to the maximum extent economically feasible in the performance of the Contract.

Article 14. Clarification or Protest of the Solicitation Document or Specifications

Any request for clarification or protest of the solicitation document or specifications must be submitted in the manner provided for in the applicable section of the LCRB Rules to the Procurement Representative referenced in the Notice of Public Improvement Contract Opportunity.

A protest of the Solicitation Document must be received within seven (7) business days of the issuance of the Bid or within three (3) business days of issuance of an addendum.

Requests for clarification may be submitted no less than five (5) business days prior to the Bid Closing Date.

Article 15. Protest of Intent to Award

Owner will name the apparent successful Bidder in a "Notice of Intent to Award" letter. Identification of the apparent successful Bidder is procedural only and creates no right in the named Bidder to the award of the contract. Competing Bidders will be notified by publication of the Notice of Intent to

Award on the OregonBuys Website of the selection of the apparent successful Bidder(s) and Bidders shall be given seven (7) calendar days from the date on the "Notice of Intent to Award" letter to review the file at the Procurement Division office and file a written protest of award, pursuant to C-049-0450. Any award protest must be in writing and must be delivered by hand delivery or mail to the Procurement Division Director at: Procurement Division, 2051 Kaen Road, Oregon City, OR 97045.

Article 16. Disclosure of First-Tier Subcontractors

Within two (2) working hours after the Bid Closing, all Bidders shall submit to the County a disclosure form identifying any first-tier subcontractors (those entities that would be contracting directly with the prime contractor) that will be furnishing labor and materials on the contract, if awarded, whose subcontract value would be equal to or greater than: (a) Five percent (5%) of the total contract price, but at least \$15,000; or (b) \$350,000, regardless of the percentage of the total contract price.

Disclosures may be submitted with the Bid or may be hand delivered to the Bid Closing address or emailed to procurement@clackamas.us.

Article 17. Federal, State and Local Provisions

This project is financed through Federal funds from Clackamas County Health, Housing and Human, Community Development Division. Bidders' attention is particularly directed to the following contract provisions:

17.1 Federal Labor Standards (Davis-Bacon) Prevailing Wage Rates (Is applicable for this project.) The Successful Bidder will be required to comply with Federal Labor Standards Provisions, pay laborers and mechanics not less than the Federal Davis-Bacon prevailing wage rates as determined by the Secretary of Labor, and require his/her subcontractors to comply with these provisions under Davis-Bacon Act, as amended (40 U.S.C. 276a). General Contractor and Subcontractors are required to pay the higher wage classification for workers between BOLI and Davis-Bacon.

17.2 State of Oregon (Bureau of Labor and Industries) Wage Rates (Is applicable for this

project.) The Successful Bidder will be required on various work classifications to comply with State of Oregon Wage Rates. The Successful Bidder will have to compare the Federal (Davis-Bacon) to the State (BOLI) wage rates and pay the higher of the two wage decisions. Public work contracts are subject to ORS 279C.800 to 279C.870 and the Davis-Bacon Act (40 U.S.C. 276a), no bid will be received or considered by the public contracting agency unless the bid contains a statement by the bidder as a part of its bid that the provisions of ORS 279C.800 through ORS 279C.870 or 40 U.S.C. 276a are to be complied with. This is mandated by the Secretary of Labor and the Bureau of Labor and Industries effective as of January 1, 2006. Subcontractors are to comply with these provisions.

17.3 Debarment and Oregon State Licensing Requirements, Local Contract Review Board (LCRB) Rules

The Bidder shall not propose or contract with any subcontractor or other person or organization included in the Debarred, Suspended, and Ineligible Contractors list(s). Furthermore, the Bidder shall not be listed on the State of Oregon Debarred Contractors list, and must be registered on the State of Oregon Construction Contractors Board and possess a current license number.

17.4 Equal Employment Opportunity (General Conditions, Paragraph 15.10)

The Successful Bidder will be required to comply with the provisions as stated in the General Conditions - Abbreviated Construction Contract.

17.5 Federal HUD Section 3 Requirements

The successful Bidder will be required to comply with the provisions of Section 3 of the Housing and Urban Development Act of 1968 as amended (herein referred to as Section 3 requirements). Such provisions require that economic opportunities generated by HUD financial assistance shall, to the greatest extent feasible, be given to low income residents of the metropolitan area in which the project is located and to businesses that provide economic opportunities for these persons.

Contracts exceeding \$100,000 are considered “Section 3 covered contracts.” Bids exceeding \$100,000 must include an indication of whether or not the firm submitting the bid is a “Section 3 business concern.”

A Section 3 business concern is defined by HUD regulations as a business concern:

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

A Section 3 resident means:

- (1) A public housing resident; or
- (2) An individual who resides in the metropolitan area in which the Section 3 covered assistance is expended, and who is a low-income person or a very low-income person. For purposes of this project residents of the Portland/Vancouver metropolitan area who are members of families meeting the following income limits are considered low or very low income persons.

HUD 2022 Income Limits- Portland-Vancouver-Hillsboro OR-WA Area		
Household Size	Very Low Income	Low Income
1 Person	\$37,330	\$59,650
2 Person	\$42,600	\$68,200
3 Person	\$47,950	\$76,700
4 Person	\$53,250	\$85,200
5 Person	\$57,550	\$92,050
6 Person	\$61,800	\$98,850
7 person	\$66,050	\$105,650
8 Person	\$70,300	\$112,500

If applicable, the Section 3 Clause required under 24 C.F.R. § 135.38 will be incorporated into this solicitation and any contract executed between Owner and Successful Bidder.

17.6 Notice of Requirement for Affirmative Action to Ensure Equal Employment

Opportunity - Executive Order 11246 (General Conditions, Paragraph 15.16):

17.7 The Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth in the Contract at Paragraphs 15.14 and 15.16 of the General Conditions.

17.8 The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate work force in each trade on all construction work in the covered area, are as follows:

MINORITY GOALS AND TIMETABLES

TIMETABLE	TRADE	GOAL (Percent)
Until further notice	All	4.5

FEMALE GOALS AND TIMETABLES

TIMETABLE	GOAL (Percent)
Until further notice	6.9

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area.

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

violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the contract is to be performed.

As used in this Notice, and in the Contract resulting from this solicitation, the "covered area" is Clackamas County, Oregon.

17.9 Certification of Nonsegregated Facilities*

By signing the Bid Proposal, the Bidder certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The Bidder certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location under his control where segregated facilities are maintained. The Bidder agrees that a breach of this certification will be a violation of the Equal Opportunity clause in any contract resulting from acceptance of this Bid. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restroom and washrooms, restaurants and other eating areas, timeclocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin, because of habit, local custom, or otherwise. The Bidder agrees that (except where he has obtained identical certification from proposed subcontractors for specific time periods) he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which

are not exempt from the provisions of the Equal Opportunity clause, and that he will retain such certifications in his files.

17.10 Submission of Compliance Documents

In order to document this compliance with Community Development Division requirements and Federal regulations, the Successful Bidder will be required to submit and to require his subcontractors to submit various forms and reports required by the Contract Documents, including: (a) Contract and Sub-Contract Activity Form; (b) Clackamas County Female Owned Business Form; (c) Contractor/Subcontractor Contract Agreement, whether the contractor or subcontractor is a sole proprietor, an owner performing all work on the project, a contractor with no employees, or otherwise.

17.11 Disclosure of Proposed Subcontractors

For Subcontractors that provide bids to the Contractor (i.e. General) for this project, amounts of \$5,000 dollars and or greater, provide the following information to Clackamas County:

- 1) Company Name
- 2) Oregon CCB Number
- 3) Full Mailing Address
- 4) Federal Tax ID Number
- 5) Type of Trade Work for Project
- 6) Contracted Dollar Amount

Clackamas County will provide a HUD 2516 Form

17.12 Affirmative Action for Handicapped Workers (General Conditions, Paragraph 15.11)

The Successful Bidder will be required to comply with the U.S. Department of Labor Regulations prohibiting employment discrimination against and requiring affirmative action to employ mentally or physically handicapped workers.

17.13 State of Oregon Equal Employment Opportunity

The Successful Bidder will be required to comply with the requirements of ORS Chapter 659 relating to equal employment opportunity, including nondiscrimination on the basis of mental or physical



**CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT**

SUPPLEMENTAL INSTRUCTIONS TO BIDDERS

**Project Name: Clackamas Service Center West Building Project (CD #1803)
(Portland, OR/ Clackamas County)**

The following modify the Clackamas County “Instructions to Bidders” for this Project. Where a portion of the Instructions to Bidders has been modified by these Supplemental Instructions to Bidders, the unaltered portions shall remain in effect.

1. Submission of Bids by email: The County is requiring all bids for this project be electronically submitted. Complete Bids (including all attachments) must be received by the closing time and date **2:00 p.m. Pacific Time, May 9, 2023**. The Bid must be emailed to the following address: stevekel@clackamas.us. The email subject line must read **“Bid for Clackamas Service Center West Building Project”**. Upon receiving of the bid, the County will send bidders an email confirmation acknowledging receipt. Bids delayed or lost by email system filtering or failures may be considered at Clackamas County’s sole and absolute discretion.

Bids will be publicly read aloud via the computer application, Zoom. Bidders will be allowed to video conference or listen by phone to the bid results. The projects Zoom meeting can be accessed via the information below:

Join Zoom Meeting

<https://clackamascounty.zoom.us/j/85603936263?pwd=ZUNLM1BaMEtnNnBqVU5oeGJ6cktjdz09>

Meeting ID: 856 0393 6263

Passcode: 129287

One tap mobile

+12532158782,,85603936263# US (Tacoma)

+13462487799,,85603936263# US (Houston)

Dial by your location

+1 253 215 8782 US (Tacoma)

+1 346 248 7799 US (Houston)

+1 408 638 0968 US (San Jose)

+1 669 444 9171 US

+1 669 900 6833 US (San Jose)

+1 719 359 4580 US

+1 253 205 0468 US

+1 305 224 1968 US

+1 309 205 3325 US

+1 312 626 6799 US (Chicago)
+1 360 209 5623 US
+1 386 347 5053 US
+1 507 473 4847 US
+1 564 217 2000 US
+1 646 876 9923 US (New York)
+1 646 931 3860 US
+1 689 278 1000 US
+1 301 715 8592 US (Washington DC)

Meeting ID: 856 0393 6263

Find your local number: <https://clackamascounty.zoom.us/j/kenGVDP8Nr>

**The Apparent Low bid results will be posted to the projects OregonBuys listing as soon as possible following the bid opening.

2. The General Contractor awarded this construction contract will be required to adhere to all work performed, as a result of this procurement shall be conducted in strict accordance with all applicable local, state and federal regulations. Even if not specifically detailed in the Scope of Work, Drawings or Specifications all work shall be accomplished in accordance with all current City, County and State building codes/requirements. The contractor shall be responsible for all permits, locates and fees necessary to perform this work.
3. **Good Faith Effort:** Clackamas County encourages participation in contracts by Historically Underrepresented Businesses. “Historically Underrepresented Businesses” are State of Oregon-certified and self-identified minority, women and emerging small business as well as firms that are certified federally or by another state or entity with substantially similar requirements as the State of Oregon.

Bidders must perform Good Faith Effort (defined below) and submit **Form 1 and Form 2** for the Bidders Bid to be considered responsive. **Form 1 and Form 2** must be submitted within **two (2) hours** after the Closing Date and Time. Form 1 and Form 2 may be submitted by hand delivery to the location the Bid was due or may email the completed Forms to stevekel@clackamas.us. “Good Faith Effort” is a requirement of a prime contractor to reach out to at least three Historically Underrepresented Business Subcontractors for each division of work that will be subcontracted out and to complete the required forms. If fewer than three Historically Underrepresented Business Subcontractors are reasonably available for a particular division of work, the Bidder must specifically note the reason for there being fewer than three contacts. The outreach should be performed with sufficient time to give the subcontractors at least 5 calendar days to respond to the opportunity. Form 3, which documents the actual amount of subcontractors on the project, must be submitted with the project final pay application. Compliance with the Good Faith Effort and submission of Forms 1, 2 and 3 is a contractual requirement for final payment.

The sufficiency of the documentation or the performance of Good Faith Effort shall be in the sole and absolute determination of Clackamas County. Only those Bidders that Clackamas County has determined have not sufficiently performed Good Faith Effort shall have protest rights of the determination for such Bidder. No Bidder shall have protest rights of the sufficiency of any other Bidder completing Good Faith Effort.

**CLACKAMAS COUNTY
GOOD FAITH EFFORT
SUBCONTRACTOR AND SELF-PERFORMED WORK LIST
(FORM 1)**

Prime Contractor Name:

Total Contract Amount:

Project Name: Clackamas Service Center West Building Project/ Portland, OR (CD# 1803)

PRIME SELF-PERFORMING: Identify below ALL GFE Divisions of Work (DOW) to be self-performed. Good Faith Efforts are otherwise required.	
<u>DOW BIDDER WILL SELF-PERFORM (GFE not required)</u>	

PRIME CONTRACTOR SHALL DISCLOSE AND LIST ALL SUBCONTRACTORS, including those Minority-owned, Woman-owned, and Emerging Small Businesses (“M/W/ESB”) that you intend to use on the project. Hand delivery to Procurement, 2051 Kaen Road, Oregon City, OR 97045 or email to stevekel@clackamas.us within 2 hours of the BID/Quote Closing Date/Time

<u>LIST ALL SUBCONTRACTORS BELOW</u> Use correct legal name of Subcontractor (No Assumed Business Names)	Division of Work (Painting, electrical, landscaping, etc.) List ALL DOW performed by Subcontractors	DOLLAR AMOUNT OF SUBCONTRACT	If Certified or self-reporting MBE/WBE/ESB Subcontractor Check box <input checked="" type="checkbox"/>		
			MBE	WBE	ESB
Name Address City/St/Zip Phone# OCCB#			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Name Address City/St/Zip Phone# OCCB#			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Name Address City/St/Zip Phone# OCCB#			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Name Address City/St/Zip Phone# OCCB#			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

GFE SUBCONTRACTOR AND SELF-PERFORMED WORK LIST (FORM 1) cont'd

Prime Contractor Name:

Total Contract Amount:

Project Name: Clackamas Service Center West Building Project
Portland, OR (CD# 1803)

<p align="center">LIST ALL SUBCONTRACTORS BELOW Use <u>correct legal name</u> of Subcontractor (No Assumed Business Names)</p>	<p align="center">Division of Work (Painting, electrical, landscaping, etc.) List ALL DOW performed by Subcontractors</p>	<p align="center">DOLLAR AMOUNT OF SUBCONTRACT</p>	<p align="center">If Certified or self-reporting MBE/WBE/ESB Subcontractor</p>		
			<p>Check box <input checked="" type="checkbox"/></p>		
			MBE	WBE	ESB
<p>Name Address City/St/Zip Phone# OCCB#</p>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>Name Address City/St/Zip Phone# OCCB#</p>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>Name Address City/St/Zip Phone# OCCB#</p>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>Name Address City/St/Zip Phone# OCCB#</p>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>Name Address City/St/Zip Phone# OCCB#</p>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>Name Address City/St/Zip Phone# OCCB#</p>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>Name Address City/St/Zip Phone# OCCB#</p>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**CLACKAMAS COUNTY
GOOD FAITH EFFORT
M/W/ESB CONTACT / BIDS RECEIVED LOG
(FORM 2)**

Prime Contractor:

Project: Clackamas Service Center West Building Project (CD #1803)

Prime Contractor must contact or endeavor to contact at least 3 M/W/ESB Subcontractors for each Division of Work. Prime Contractor shall record its contacts with M/W/ESB Subcontractors through use of this log (or equivalent) entering all required information. All columns shall be completed where applicable. Additional forms may be copied if needed.

NAME OF M/W/ESB SUBCONTRACTOR	Divisions of Work (Painting, electrical, landscaping, etc.)	Date Solicitation Letter / Fax Sent	PHONE CONTACT		BID ACTIVITY Check Yes or No			REJECTED BIDS (if bid received & not used)		Notes
			Date of Call	Person Receiving Call	Will Bid	Bid Received	Bid Used	Bid Amount	Reason Not Used (Price, Scope or Other. If Other, explain in Notes>>)	
					<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No			
					<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No			
					<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No			
					<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No			
					<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No			
					<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No			
					<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No			

**CLACKAMAS COUNTY
GOOD FAITH EFFORT
PROJECT COMPLETION REPORT
(FORM 3)**

Prime Contractor Name:

Total Contract Amount:

Project Name: Clackamas Service Center West Building Project (CD# 1803)

Complete this form and submit with your request for final payment upon the project completion. Please list all subcontractors used for the project. Use additional sheets as necessary.

<u>LIST ALL</u> SUBCONTRACTORS BELOW Use correct legal name of Subcontractor (No Assumed Business Names)	Division of Work (Painting, electrical, landscaping, etc.) List ALL DOW performed by Subcontractors	FINAL DOLLAR AMOUNT OF SUBCONTRACT	If Certified or self-reported MBE/WBE/ESB Subcontractor Check box <input checked="" type="checkbox"/>		
			MBE	WBE	ESB
Name Address City/St/Zip Phone# OCCB#			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Name Address City/St/Zip Phone# OCCB#			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Name Address City/St/Zip Phone# OCCB#			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Name Address City/St/Zip Phone# OCCB#			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Name Address City/St/Zip Phone# OCCB#			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Name Address City/St/Zip Phone# OCCB#			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

BY SIGNING BELOW, I HEREBY CERTIFY THAT THE ABOVE LISTED FIRMS HAVE BEEN UTILIZED BY OUR COMPANY IN THE AMOUNTS REPRESENTED ABOVE AND THAT THE INFORMATION CONTAINED HEREIN IS COMPLETE AND ACCURATE. .

Authorized Signature of Contractor Representative

Date



CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT

BID BOND

Project Name: Clackamas Service Center West Building Project
(CD #1803)

We, _____, as "Principal,"
(Name of Principal)

and _____, an _____ Corporation,
(Name of Surety)

authorized to transact Surety business in Oregon, as "Surety," hereby jointly and severally bind ourselves, our respective heirs, executors, administrators, successors and assigns to pay unto Clackamas County ("Obligee") the sum of (\$ _____)

_____ dollars.

WHEREAS, the condition of the obligation of this bond is that Principal has submitted its proposal or bid to an agency of the Obligee in response to Obligee's procurement document (No. _____) for the project identified above which proposal or bid is made a part of this bond by reference, and Principal is required to furnish bid security in an amount equal to ten (10%) percent of the total amount of the bid pursuant to the procurement document.

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

IN WITNESS WHEREOF, we have caused this instrument to be executed and sealed by our duly authorized legal representatives this _____ day of _____, 20_____.

Principal: _____ Surety: _____

By: _____ Signature By: Attorney-In-Fact

_____ Official Capacity _____ Name

Attest: _____ Corporation Secretary _____ Address

_____ City _____ State _____ Zip

_____ Phone _____ Fax



CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT

BID FORM

PROJECT: Clackamas Service Center West Building Project (CD #1803)
BID CLOSING: May 9, 2023, 2:00 PM, Pacific Time
BID OPENING: May 9, 2023, 2:05 PM, Pacific Time

FROM: Bidder's Name (must be full legal name, not ABN/DBA)

EMAIL: Steve Kelly, Project Manager, stevekel@clackamas.us

- 1. Bidder is (check one of the following and insert information requested):
a. An individual; or
b. A partnership registered under the laws of the State of
c. A corporation organized under the laws of the State of
d. A limited liability corporation organized under the laws of the State of

and authorized to do business in the State of Oregon hereby proposes to furnish all material and labor and perform all work hereinafter indicated for the above project in strict accordance with the Contract Documents for the Project as a Lump Sum Bid:

Dollars (\$)

and the Undersigned agrees to be bound by the following documents:

- Notice of Public Improvement Contract Opportunity
• Instructions to Bidders
• Bid Bond
• Public Improvement Contract Form
• Clackamas County General Conditions
• Prevailing Wage Rates
• Plans, Specifications and Drawings
• Supplemental Instructions to Bidders
• Bid Form
• Performance Bond and Payment Bond
• Supplemental General Conditions
• Payroll and Certified Statement Form
• ADDENDA numbered through, inclusive (fill in blanks)

Clackamas Service Center West Building Project

2. The Undersigned proposes to add to or deduct from the Base Bid indicated above the items of work relating to the following Alternate(s) as designated in the Specifications: **N/A**.
3. The Undersigned proposes to add to or deduct from the Base Bid indicated above the items or work relating to the following Unit Price(s) as designated in the Specifications, for which any adjustments in the Contract amount will be made in accordance with Section D of the Clackamas County General Conditions: **N/A**
4. The work shall be completed within the time stipulated and specified in the Clackamas County Public Works Improvements, Contract Form B-6 item 4. Contract Dates, page 2.
5. Accompanying herewith is Bid Security which is equal to ten percent (10%) of the total amount of the Lump Sum Bid, plus the total sum of all Alternatives (if any).
6. The Undersigned agrees, if awarded the Contract, to execute and deliver to Clackamas County, within twenty (20) calendar days after receiving the Contract forms, a Contract Form, and a satisfactory Performance Bond and Payment Bond each in an amount equal to one hundred percent (100%) of the Contract sum, using forms provided by the Owner. The surety requested to issue the Performance Bond and Payment Bond will be:

(name of surety company - not insurance agency)

The Undersigned hereby authorizes said surety company to disclose any information to the Owner concerning the Undersigned's ability to supply a Performance Bond and Payment Bond each in the amount of the Contract.

7. The Undersigned further agrees that the Bid Security accompanying the Bid is left in escrow with Clackamas County; that the amount thereof is the measure of liquidated damages which the Owner will sustain by the failure of the Undersigned to execute and deliver the above-named Contract Form, Performance Bond and Payment Bond, each as published, and that if the Undersigned defaults in either executing the Contract Form or providing the Performance Bond and Payment Bond within twenty (20) calendar days after receiving the Contract forms, then the Bid Security shall become the property of the Owner at the Owner's option; but if the Bid is not accepted within thirty (30) calendar days of the time set for the opening of the Bids, or if the Undersigned executes and timely delivers said Contract Form, Performance Bond and Payment Bond, the Bid Security shall be returned.
8. The Undersigned certifies that: (i) This Bid has been arrived at independently and is being submitted without collusion with and without any agreement, understanding, or planned common course of action with any other vendor of materials, supplies, equipment or services described in the invitation to bid designed to limit independent bidding or competition; and (ii) the contents of the Bid have not been communicated by the Undersigned or its employees or agents to any person not

an employee or agent of the Undersigned or its surety on any Bond furnished with the Bid and will not be communicated to such person prior to the official opening of the Bid.

9. The undersigned HAS, HAS NOT (*check one*) paid unemployment or income taxes in Oregon within the past 12 months and DOES, DOES NOT (*check one*) a business address in Oregon. The undersigned acknowledges that, if the selected bidder, that the undersigned will have to pay all applicable taxes and register to do business in the State of Oregon before executing the Contract Form.

10. The Undersigned agrees, if awarded a contract, to comply with the provisions of ORS 279C.800 through 279C.870 pertaining to the payment of the prevailing rates of wage.

11. Contractor's CCB registration number is _____. As a condition to submitting a bid, a Contractor must be registered with the Oregon Construction Contractors Board in accordance with ORS 701.035 to 701.055, and disclose the registration number. Failure to register and disclose the number will make the bid unresponsive and it will be rejected, unless contrary to federal law.

12. The successful Bidder hereby certifies that all subcontractors who will perform construction work as described in ORS 701.005(2) were registered with the Construction Contractors Board in accordance with ORS 701.035 to 701.055 at the time the subcontractor(s) made a bid to work under the contract.

13. The successful Bidder hereby certifies that, in compliance with the Worker's Compensation Law of the State of Oregon, its Worker's Compensation Insurance provider is _____, Policy No. _____, and that Contractor shall submit Certificates of Insurance as required.

14. Contractor's Key Individuals for this project (supply information as applicable):

Project Executive: _____, Cell Phone: _____,
Project Manager: _____, Cell Phone: _____,
Job Superintendent: _____, Cell Phone: _____,
Project Engineer: _____, Cell Phone: _____.

15. The Undersigned certifies that it has not discriminated against minority, women, or emerging small businesses in obtaining any subcontracts for this project.

16. The Undersigned certifies that it has a drug testing program in accordance with ORS 279C.505.

REMINDER: Bidder must submit the below First-Tier Subcontractor Disclosure Form.

By signature below, Contractor agrees to be bound by this Bid.

NAME OF FIRM _____

ADDRESS _____

TELEPHONE NO _____

EMAIL _____

SIGNATURE 1) _____
Sole Individual

or 2) _____
Partner

or 3) _____
Authorized Officer or Employee of Corporation

******* END OF BID *******

FIRST-TIER SUBCONTRACTOR DISCLOSURE FORM
PROJECT: CLACKAMAS SERVICE CENTER WEST BUILDING PROJECT
(CD #1803)

BID OPENING: May 9, 2023, Tuesday, 2:00 PM (Pacific Time)

Failure to submit this Form by the disclosure deadline will result in a nonresponsive bid.

INSTRUCTIONS:

This First-Tier Subcontractor Disclosure Form (“Form”) must be submitted and received at the location specified in the Notice of Public Improvement Contract Opportunity on the advertised Bid Closing, and within two working hours after the advertised Bid Closing Time.

The Form may be mailed, hand-delivered or emailed to: stevekel@clackamas.us It is the responsibility of Bidders to submit this Form and any additional sheets with the Project name clearly marked on the envelope or the subject line of the email.

Subcontractor lists may be submitted with the bid in the same envelope or email at the Bid Closing date and time. Subcontractor lists **MUST** be submitted within **two (2) hours** of the Bid Closing date and time.

List below the name of each subcontractor that will be furnishing labor, or labor and materials, for which disclosure is required, the category of work that the subcontractor will be performing, and the dollar value of the subcontract. Enter **“NONE”** if the value of the project bid is less than \$100,000 or there are no subcontractors that need to be disclosed. ATTACH ADDITIONAL SHEETS IF NECESSARY.

	SUBCONTRACTOR NAME	DOLLAR VALUE	CATEGORY OF WORK
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____

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

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

Firm Name: _____

Bidder Signature: _____ Phone # _____



CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT
H3S Contract #

This Public Improvement Contract (the "Contract"), is made by and between the Clackamas County, a political subdivision of the State of Oregon ("Owner"), and Name of Contractor (the "Contractor"), both collectively the "Parties." This Contract shall become effective on the date this Contract has been signed by all the Parties and shall expire upon completion the completion of all obligations under the terms of this Contract unless terminated earlier by the Parties.

All capitalized terms in this Contract shall have the meanings identified in the Clackamas County General Conditions for Public Improvement Contracts (10/13/2021) ("General Conditions") referenced within the Instructions to Bidders.

Project Name: Janssen Road Apartments Rehabilitation Projects

1. Contract Price, Contract Documents and Work.

The Contractor hereby agrees to perform all Work described in, and reasonably inferred from, the Contract Documents. In consideration of the Contractor performing the Work in accordance with the terms of the Contract, the Owner agrees to pay the Contractor the sum written amount (\$XXXXXX) (the "Contract Price"). Payment will be made in accordance with the terms and conditions provided in the Contract Documents. The Contract Price is the amount contemplated by the Base Bid, as indicated in the accepted Bid.

The following documents are incorporated by reference in this Contract and made a part hereof:

- Notice of Contract Opportunity
• Supplemental Instructions to Bidders
• Bid Form
• Clackamas County General Conditions
• Prevailing Wage Rates
• Plans, Specifications and Drawings
• Instructions to Bidders
• Bid Bond
• Performance Bond and Payment Bond
• Supplemental General Conditions
• Payroll and Certified Statement Form
• Addenda-N/A

2. Representatives.

Contractor has named [redacted] as its Authorized Representative to act on its behalf. Owner designates, or shall designate, its Authorized Representative as indicted below (check one):

[X] Unless otherwise specified in the Contract Documents, the Owner designates Mark Bierwagen, Project Manager for Clackamas Service Center, Steve Kelly, Project Coordinator is designated by Clackamas County s as its Authorized Representative for the administration of this Contract. The above-named individual shall be the initial point of contact for matters related to Contract performance, payment, authorization, and to carry out the responsibilities of the Owner.

[] Name of Owner's Authorized Representative shall be submitted by Owner in a separate writing.

3. Key Persons.

The Contractor's personnel identified below shall be considered Key Persons and shall not be replaced during the project without the written permission of Owner, which shall not be unreasonably withheld. If the Contractor intends to substitute personnel, a request must be given to Owner at least 30 days prior to the intended time of substitution. When replacements have been approved by Owner, the Contractor shall provide a transition period of at least 10 working days during which the original and replacement personnel shall be

working on the project concurrently. Once a replacement for any of these staff members is authorized, further replacement shall not occur without the written permission of Owner. The Contractor's project staff shall consist of the following personnel:

Project Executive: [REDACTED] shall be the Contractor's project executive, and will provide oversight and guidance throughout the project term.

Project Manager: [REDACTED] shall be the Contractor's project manager and will participate in all meetings throughout the project term.

Job Superintendent: [REDACTED] shall be the Contractor's on-site job superintendent throughout the project term.

Project Engineer: [REDACTED] shall be the Contractor's project engineer, providing assistance to the project manager, and subcontractor and supplier coordination throughout the project term.

4. Contract Dates.

The Contractor agrees to complete the Work in accordance with the following key dates:

COMMENCEMENT DATE: (tentative) **May 1, 2023**, Upon Issuance of Notice to Proceed

SUBSTANTIAL COMPLETION DATE: (tentative) **August 31, 2023**

FINAL COMPLETION DATE: (tentative) **September 29 2023**

Time is of the essence for this Contract. It is imperative that the Work in this Contract reach Substantial Completion and Final Completion by the above specified dates.

5. Insurance Certificates.

In accordance with Section G.3.5 of the General Conditions [and item x of Supplemental General Conditions as applicable], Contractor shall furnish proof of the required insurance naming Clackamas County – Health, Housing & Human Services Department as an additional insured. Insurance certificates may be returned with the signed Contract or may be emailed to stevekel@clackamas.us.

6. Liquidated Damages

The Owner and the Contractor acknowledge and agree that if the Contractor fails to reach Substantial Completion of the entire Work by the Substantial Completion Date identified in Section 4 above, the Owner will suffer damages, which are both extremely difficult and impracticable to ascertain, and on that basis agree to the assessment by Owner of liquidated damages as provided in this Section. These damages may include, but are not limited to, use of the Project, costs associated with Contract administration, and use of temporary facilities. The liquidated damages amount is not a penalty, but a reasonable estimate of the amount of losses the Owner will suffer. The Owner may deduct such liquidated damages as are payable under this Section from money due or to become due to the Contractor or, at its election, pursue any other legal remedy to collect such liquidated damages from the Contractor and/or its Surety.

If the Contractor fails to achieve Substantial Completion of the entire Work by the Substantial Completion Date identified in Section 4, the Contractor shall pay the Owner as liquidated damages:

6.1. \$1,000.00 per Calendar day past the Substantial Completion date.

Payment of liquidated damages shall not release Contractor from its obligation with respect to the complete performance of the Work, nor shall the payment of liquidated damages constitute a waiver of Owner's right to collect any additional damages that it may sustain by failure of Contractor to fully perform the Work, as it is the intent of the parties that the liquidated damages are a full and complete payment only for failure of

Contractor to complete the Work on time. Owner expressly reserves the right to make claims for any and all other damages that Owner may incur due to contractor's failure to perform in strict accordance with this Contract.

7. Tax Compliance.

The Contractor shall comply with all federal, state and local laws, regulation, executive orders and ordinances applicable to this Contract. Contractor represents and warrants that it has complied, and will continue to comply throughout the duration of this Contract and any extensions, with all tax laws of this state or any political subdivision of this state, including but not limited to ORS 305.620 and ORS chapters 316, 317, and 318. Any violation of this section shall constitute a material breach of this Contract and shall entitle County to terminate this Contract, to pursue and recover any and all damages that arise from the breach and the termination of this Contract, and to pursue any or all of the remedies available under this Contract or applicable law.

8. Confidential Information.

Contractor acknowledges that it and its employees or agents may, in the course of performing their responsibilities under this Contract, be exposed to or acquire information that is confidential to Owner. Any and all information of any form obtained by Contractor or its employees or agents in the performance of this Contract shall be deemed confidential information of Owner ("Confidential Information"). Contractor agrees to hold Confidential Information in strict confidence, using at least the same degree of care that Contractor uses in maintaining the confidentiality of its own confidential information, and not to copy, reproduce, sell, assign, license, market, transfer or otherwise dispose of, give, or disclose Confidential Information to third parties or use Confidential Information for any purpose unless specifically authorized in writing under this Contract.

9. Counterparts.

This Contract may be executed in several counterparts, all of which when taken together shall constitute an agreement binding on all Parties, notwithstanding that all Parties are not signatories to the same counterpart. Each copy of the Contract so executed shall constitute an original.

10. Integration.

All provisions of state law required to be part of this Contract, whether listed in the General or Special Conditions or otherwise, are hereby integrated and adopted herein. Contractor acknowledges the obligations thereunder and that failure to comply with such terms is a material breach of this Contract.

The Contract Documents constitute the entire agreement between the parties. There are no other understandings, agreements or representations, oral or written, not specified herein regarding this Contract. Contractor, by the signature below of its authorized representative, hereby acknowledges that it has read this Contract, understands it, and agrees to be bound by its terms and conditions.

11. Compliance with Applicable Law. Contractor shall comply with all federal, state, county, and local laws, ordinances, and regulations applicable to the Work to be done under this Contract including, but not limited to, compliance with the prohibitions set forth in ORS 652.220, compliance of which is a material element of this Contract and failure to comply is a material breach that entitles County to exercise any rights and remedies available under this Contract including, but not limited to, termination for default.

12. Responsibility for Taxes. Contractor is solely responsible for payment of any federal, state, or local taxes required as a result of the Contract or the Work including, but not limited, to payment of the corporate activity tax imposed under enrolled HB 3427 (2019 Oregon regular legislative session). Contractor may not include its federal, state, or local tax obligations as part of the cost to perform the Work.

13. Compliance with Applicable Funding Source Requirements. Contractor shall further comply with any and all terms, conditions, and other obligations as may be required by the applicable State or Federal agencies providing funding for performance under this Contract, whether or not specifically referenced herein. Contractor agrees to take all necessary steps, and execute and deliver any and all necessary written instruments, to perform under this Contract including, but not limited to, executing all additional documentation necessary for County to comply with applicable State or Federal funding requirements.

In witness whereof, Owner executes this Contract and the Contractor does execute the same as of the day and year first above written.

Contractor DATA:
Company Name Address
City, State, Zip

Contractor must complete each item below:
 Contractor CCB # _____ Expiration Date: _____
 Oregon Business Registry # _____ Entity Type: _____ State of Formation: _____

Payment information will be reported to the IRS under the name and taxpayer ID# provided by the Contractor. Information must be provided prior to contract approval. Information not matching IRS records could subject Contractor to 28 percent backup withholding.

<p>Company Name _____</p> <p>_____</p> <p>Authorized Signature _____ Date _____</p> <p>_____</p> <p>Authorized Personal/ Owner _____</p> <p>Tax ID#: _____</p>	<p>Clackamas County</p> <p>_____</p> <p>APPROVED AS TO FORM</p> <p>_____</p> <p>County Counsel _____ Date _____</p>
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**CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT
SUPPLEMENTAL GENERAL CONDITIONS**

**PROJECT: Clackamas Service County West Building Project (CD #1803)
(Portland, OR)**

The following modifies the October 13, 2021 Clackamas County General Conditions for Public Improvement Contracts (“County General Conditions”) for this Contract. Except as modified below, all other terms and conditions of the County General Conditions shall remain in effect.

SC – 1: Permits

Section B.4-Permits of the County General Conditions is hereby deleted in its entirety and replaced with the following:

B.4 PERMITS

The General Contractor awarded this construction contract will receive the Permit from the DMS Architects. Clackamas Service Center is paying from all the permits associated with the new building.

SC – 2: Liquidated Damages

The following sections are added to Section D.2 - Delays:

D.2.3 DAMAGES FOR DELAY – LIQUIDATED DAMAGES

- (a) It is imperative that the Work in this Contract reach Substantial Completion, **120 days from issuance from Notice to Proceed, Estimated to be May 1, 2023**, and as further required in the Plans and Specifications and Section 13 of the Contract to be completed by May 31, 2022. Time will be of the essence to open the new building for operation of a new clinic, therefore the Owner requires the firm deadline. The Contractor represents and agrees that the Substantial Completion date is reasonable, that it can meet the Substantial Completion date, and it has taken into account in its Offer the requirements of the Contract Documents, the location, the time allowed for the Work, local conditions, weather, availability of materials, equipment, and labor, and any other factor which may affect performance of the Work.

Below is a matrix for Project Contract Amounts regarding Liquidated Damages provide to the Contractor by the Owner, please review carefully:

Levels:	Project Contract Amounts:	Liquidated Damages Amounts:
One	\$5,000 to \$25,000 dollars	\$0 dollars per day
Two	\$25,000+ to \$50,000 dollars	\$250 dollars per day
Three	\$50,000+ to \$100,000 dollars	\$500 dollars per day
Four	\$100,000+ to \$200,000 dollars	\$750 dollars per day

Five	\$200,000+ and Above	\$1,000 dollars per day
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- (b) If the Contactor fails to achieve Substantial Completion as specified above, then the Contractor and Owner agree that it would be extremely difficult to ascertain the damages incurred by Owner for the Contractor’s failure. Therefore, Owner and the Contractor agree that in lieu of actual damages for delay, the Contractor shall reimburse Owner a stipulated sum of \$1,000 per calendar day beyond the Substantial Completion Date. The Contractor further agrees the stipulated sum is not a penalty.

Likewise, if the Work does not reach Final Completion defined in Section 4 of the Contract, then the Contractor shall owe to the Owner, not as a penalty but as liquidated damages, the sum of one thousand dollars (\$1,000.00) per day for each and every calendar day of delay until Final Completion.

SC – 3: Good Faith Effort

As a condition of Contractor being awarded a Contract for this Project, Contractor must complete Good Faith Effort outreach and documentation as described in the Supplemental Instructions to Bidders of the Solicitation Document.

The Contractor may not change who is performing each Division of Work identified in Form 1 of the Good Faith Effort without the express written advance approval of Owner. This includes substituting identified subcontractors, self-performance of a Division of Work that was identified to be performed by a subcontractor, or the Contractor subcontracting a Division of Work that was identified to be self-performed by the Contractor.

Contractor shall be required to submit the completed Form 3 with its final pay application as a condition of final payment.



CLACKAMAS COUNTY GENERAL CONDITIONS FOR PUBLIC IMPROVEMENT CONTRACTS October 13, 2021

INSTRUCTIONS: The attached **Clackamas County General Conditions for Public Improvement Contracts ("County General Conditions")** apply to all designated Public Improvement contracts. Changes to the County General Conditions (including any additions, deletions or substitutions) should only be made by attaching Public Improvement Supplemental General Conditions. The text of these County General Conditions should not otherwise be altered.

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**CLACKAMAS COUNTY GENERAL CONDITIONS
FOR PUBLIC IMPROVEMENT CONTRACTS
("County General Conditions")**

**SECTION A
GENERAL PROVISIONS**

A.1 DEFINITION OF TERMS

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

APPLICABLE LAWS, means all federal, state and local laws, codes, rules, regulations and ordinances, as amended applicable to the Work, to the Contract, or to the parties individually.

APPROVED BY CONTRACTING AGENCY, for purposes of ORS 279C.570(2), means the date a progress payment is approved by the Clackamas County Treasurer's office.

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

AVOIDABLE DELAYS, mean any delays other than Unavoidable Delays, and include delays that otherwise would be considered Unavoidable Delays but that: (a) Could have been avoided by the exercise of care, prudence, foresight, and diligence on the part of the Contractor or its Subcontractors; (b) Affect only a portion of the Work and do not necessarily prevent or delay the prosecution of other parts of the Work nor the completion of the whole Work within the Contract Time; (c) Do not impact activities on the accepted critical path schedule; and (d) Are associated with the reasonable interference of other contractors employed by the Owner that do not necessarily prevent the completion of the whole Work within the Contract Time.

BIDDER, means a bidder in connection with Instructions to Bidders or a proposer in connection with a Request for Proposals, or Solicitation Document. May also be referenced as "Offeror," "Quoter" or "Proposer" based on the type of Solicitation Document.

CHANGE ORDER, means a written order which, when fully executed by the Parties to the Contract, constitutes a change to the Contract Documents. Change Orders shall be issued in accordance with the changes provisions in Section D and, if applicable, establish a Contract Price or Contract Time adjustment. A Change Order shall not be effective until executed by both parties.

CLAIM, means a demand by Contractor pursuant to Section D.3 for review of the denial of Contractor's initial request for an adjustment of Contract terms, payment of money, extension of Contract Time or other relief, submitted in accordance with the requirements and within the time limits established for review of Claims in these County General Conditions.

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

CONTRACT DOCUMENTS, means the Contract, County General Conditions, Supplemental General Conditions if any, Plans, Specifications, the accepted Offer, Solicitation Document and addenda thereto, Instructions to Offerors, and Supplemental Instructions to Offerors.

CONTRACT PERIOD, as set forth in the Contract Documents, means the total period of time beginning with the full execution of a Contract

and, if applicable, the issuance of a Notice to Proceed and concluding upon Final Completion.

CONTRACT PRICE, means the total price reflected in the Contract.

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

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

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

DEFECTIVE WORK, means Work that is not completed in accordance with the Specifications or the requirements of the Contract.

DIRECT COSTS, means, unless otherwise provided in the Contract Documents: the cost of materials, including sales tax and the cost of delivery; cost of labor which shall only include the applicable prevailing wage and fringe benefit (if applicable, and if paid to or on behalf of the employee) rate plus a maximum of a twelve percent (12%) markup on the prevailing wage (but not the fringe benefit) to cover Contractor's labor burden including but not limited to social security, Medicare, unemployment insurance, workers' compensation insurance, sick leave pay; substantiated Project cost increases for specific insurance (including, without limitation, Builder's Risk Insurance and Builder's Risk Installation Floater) or bond premiums; rental cost of equipment, and machinery required for execution of the Work; and the additional costs of field personnel directly attributable to the Work; travel expense reimbursement only if specifically authorized and only to the extent allowable under the County Contractor Travel Reimbursement Policy, hereby incorporated by reference.

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

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

NOTICE TO PROCEED, means the official written notice from the Owner stating that the Contractor is to proceed with the Work defined in the Contract Documents.

OFFER, means a bid in connection with Instructions to Bidders or a proposal in connection with a Request for Proposals, or Solicitation Document to do the work stated in the Solicitation Document at the price quoted. May also be referenced as "Bid," "Quote," or "Proposal" based on the type of Solicitation Document.

OVERHEAD, means those items which may be included in the Contractor's markup (general and administrative expense and profit) and that shall not be charged as Direct Cost of the Work, including without limitation such Overhead expenses as wages or salary of personnel above the level of foreman (i.e., superintendents and project managers), labor rates and fringe benefits above the applicable prevailing wage and fringe benefit (if applicable, and if paid to or on behalf of the employee), Contractor's labor burden for fringe benefit if paid to the employee, expenses of Contractor's offices and supplies at the Project Site (e.g. job trailer) and at Contractor's principal place of business and including expenses of personnel staffing the Project Site office and Contractor's principal place of business, and Commercial General Liability Insurance and Automobile Liability Insurance.

OWNER, means, Clackamas County or any component unit thereof including Clackamas County Development Agency, Clackamas County Service District No. 1, Surface Water Management Agency of Clackamas County, Tri-City Service District, Water Environment Services, North Clackamas Parks and Recreation District, Clackamas County Extension & 4-H Service District, Library Service District of Clackamas County, Enhanced Law Enforcement District, and Clackamas County Service District No. 5. Owner may elect, by written notice to Contractor, to delegate certain duties to more than one agent, including without limitation, to an Architect/Engineer. However, nothing in these County General Conditions is intended to abrogate the separate design professional responsibilities of Architects under ORS Chapter 671 or of Engineers under ORS Chapter 672.

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

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

PRODUCT DATA, means illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

PROJECT, means the total undertaking to be accomplished for Owner by architects/engineers, contractors, and other others, including planning, study, design, construction, testing, commissioning, start-up, of which the Work to be performed under the Contract Documents is a part.

PROJECT SITE, means the specific real property on which the Work is to be performed, including designated contiguous staging areas, that is identified in the Plans, Specifications and Drawings.

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

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

SAMPLES, means physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

SHOP DRAWINGS, means drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor (including any subsubcontractor), manufacturer, supplier, or distributor to illustrate some portion of the Work.

SOLICITATION DOCUMENT, means an Invitation to Bid, Request for Proposals, Request for Quotes, or other written document issued by Owner that outlines the required Specifications necessary to submit an Offer.

SPECIFICATION, means any description of the physical or functional characteristics of the Work, or of the nature of a supply, service or construction item included in the Solicitation Document. Specifications may include a description of any requirement for inspecting, testing or preparing a supply, service or construction item for delivery and the quantities or qualities of materials to be furnished under the Contract. Specifications generally will state the results or products to be obtained and may, on occasion, describe the method and manner of doing the

Work to be performed. Specifications may be incorporated by reference and/or may be attached to the Contract.

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

SUBSTANTIAL COMPLETION, means the date when the Owner accepts in writing the construction, alteration or repair constituting the Work or any designated portion thereof as having reached that state of completion when it may be used or occupied for its intended purpose. Substantial Completion of facilities with operating systems occurs only after thirty (30) continuous Days of successful, trouble-free operation of the operating systems as provided in Section K.3.2.

SUBSTITUTIONS, means items that in function, performance, reliability, quality, and general configuration are the same or better than the product(s) specified. Substitutions also means the performance of the Work by a labor force other than what is submitted in the Offer.

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

UNAVOIDABLE DELAYS, mean delays other than Avoidable Delays that are: (a) to the extent caused by any actions of the Owner, or any other employee or agent of the Owner, or by a separate contractor employed by the Owner; (b) to the extent caused by any Project Site conditions which differ materially from the conditions that would normally be expected to exist and inherent to the construction activities defined in the Contract Documents; or (c) to the extent caused by Force Majeure acts, or events or occurrences.

WORK, means the furnishing of all materials, equipment, labor, transportation, services, incidentals, those permits and regulatory approvals not provided by the owner necessary to successfully complete any individual item or the entire Contract and the carrying out of duties and obligations imposed by the Contract Documents for the Project.

A.2 SCOPE OF WORK

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

A.3 INTERPRETATION OF CONTRACT DOCUMENTS

A.3.1 Unless otherwise specifically defined in the Contract Documents, words which have well-known technical meanings or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings. Contract Documents are intended to be complementary. Whatever is called for in one, is interpreted to be called for in all. However, in the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following descending order of precedence:

- (a) The Contract and any amendments thereto, including Change Orders, with those of later date having precedence over those of an earlier date;
- (b) The Supplemental General Conditions;
- (c) County General Conditions;
- (d) Plans and Specifications;
- (e) The Solicitation Document, and any addenda thereto.

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

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

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

A.4 EXAMINATION OF PLANS, SPECIFICATIONS, AND PROJECT SITE

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

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

A.4.3 Any design errors or omissions noted by the Contractor shall be reported promptly to the Owner, including without limitation, any nonconformity with Applicable Laws.

A.4.4 If the Contractor believes that adjustments to cost or Contract Time are involved because of clarifications or instructions issued by the Owner (or Architect/Engineer) in response to the Contractor's notices or requests for information, the Contractor must submit a written request to the Owner, setting forth the nature and specific extent of the request, including all time and cost impacts against the Contract as soon as possible, but no later than thirty (30) Days after receipt by Contractor of the clarifications or instructions issued. If the Owner denies Contractor's request for additional compensation, additional Contract Time, or other relief

that Contractor believes results from the clarifications or instructions, the Contractor may proceed to file a Claim under Section D.3, Claims Review Process. If the Contractor fails to perform the obligations of Sections A.4.1 to A.4.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations.

A.4.5 If the Contractor believes that adjustments to cost or Contract Time are involved because of an Unavoidable Delay caused by differing Project Site conditions, the Contractor shall notify the Owner immediately of differing Project Site conditions before the area has been disturbed. The Owner will investigate the area and make a determination as to whether or not the conditions differ materially from either the conditions stated in the Contract Documents or those which could reasonably be expected in execution of this particular Contract. If Contractor and the Owner agrees that a differing Project Site condition exists, any adjustment to compensation or Contract Time will be determined based on the process set forth in Section D.2.2 for adjustments to or deletions from Work. If the Owner disagrees that a differing Project Site condition exists and denies Contractor's request for additional compensation or Contract Time, Contractor may proceed to file a Claim under Section D.3, Claims Review Process.

A.5 INDEPENDENT CONTRACTOR STATUS

The service or services to be performed under the Contract are those of an independent contractor as defined in ORS 670.600. Contractor represents and warrants that it is not an officer, employee or agent of the Owner as those terms are used in ORS 30.265.

A.6 RETIREMENT SYSTEM STATUS AND TAXES

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

A.7 GOVERNMENT EMPLOYMENT STATUS

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

SECTION B ADMINISTRATION OF THE CONTRACT

B.1 OWNER'S ADMINISTRATION OF THE CONTRACT

B.1.1 The Owner shall administer the Contract as described in the Contract Documents throughout the term of the Contract, including the one-year period for correction of Work. The Owner will act as provided in the Contract Documents, unless modified in writing in accordance with other provisions of the Contract. In performing these tasks, the Owner may rely on the Architect/Engineer or other agents to perform some or all of these tasks.

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

make exhaustive or continuous on-Project Site inspections to check the quality or quantity of the Work. Unless otherwise required in a Change Order, the Owner will neither have control over or charge of, nor be responsible for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work.

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

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

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

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

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

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

B.3 MATERIALS AND WORKMANSHIP

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

B.3.2 The Contractor is responsible to perform the Work as required by the Contract Documents. Defective Work shall be corrected at the Contractor's sole expense and within a reasonable time frame.

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

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

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

B.4 PERMITS

Contractor shall obtain and pay for all necessary permits, licenses and fees, except for those specifically excluded in the Supplemental General Conditions, as required for the project. Contractor shall be responsible for all violations of the law. Contractor shall give all requisite notices to public authorities.

B.5 COMPLIANCE WITH GOVERNMENT REGULATIONS

B.5.1 Contractor shall comply with Applicable Laws, as amended pertaining to the Work and the Contract. Failure to comply with such requirements shall constitute a breach of Contract and shall be grounds for Contract termination. Without limiting the generality of the foregoing, Contractor expressly agrees to comply with the following, as applicable and as may be amended from time to time: (i) Title VI and VII of Civil Rights Act of 1964, as amended; (ii) Section 503 and 504 of the Rehabilitation Act of 1973, as amended; (iii) the Health Insurance Portability and Accountability Act of 1996; (iv) the Americans with Disabilities Act of 1990, as amended; (v) ORS Chapter 659A; as amended; (vi) all regulations and administrative rules established pursuant to any applicable laws; and (vii) all other applicable requirements of federal, state, county or other local government entity statutes, rules and regulations.

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

(a) Contractor shall not discriminate against Disadvantaged, Minority, Women or Emerging Small Business enterprises, as those terms are defined in ORS 200.005, or a business enterprise that is owned or controlled by or that employs a disabled veteran, as that term is defined in ORS 408.225, in the awarding of subcontracts.

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

B.5.3 Contractor shall certify that it shall not accept a bid from Subcontractors to perform Work unless such Subcontractors are registered with the Construction Contractors Board in accordance with ORS 701.021 at the time they submit their bids to the Contractor.

B.5.4 Contractor shall certify that each landscape contracting business, as defined in ORS 671.520(2), performing Work under the Contract holds a valid landscape construction professional license issued pursuant to ORS 671.560.

B.5.5 The following notice is applicable to Contractors who perform excavation Work. ATTENTION: Oregon law requires you to follow rules adopted by the Oregon Utility Notification Center. Those rules are set forth in OAR 952-001-0010 through OAR 952-001-0090. You may obtain copies of the rules by calling the center at (877) 668-4001.

B.5.6 Failure to comply with any or all of the requirements of B.5.1 through B.5.5 shall be a material breach of Contract and constitute

grounds for Contract termination. Damages or costs resulting from such noncompliance shall be the responsibility of Contractor.

B.5.7 The Contractor shall include in each subcontract those provisions required under ORS 279C.580.

B.5.8 Contractor shall comply with ORS 652.220, compliance of which is a material element of this Contract and failure to comply is a material breach that entitles County to exercise any rights and remedies available under this Contract including, but not limited to, termination for default.

B.6 SUPERINTENDENCE

Contractor shall keep on the Project Site, during the progress of the Work, a competent superintendent and any necessary assistants who shall be satisfactory to the Owner and who shall represent the Contractor on the Project Site. Directions given to the superintendent by the Owner shall be confirmed in writing to the Contractor.

B.7 INSPECTION

B.7.1 Owner shall have access to the Work at all times.

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

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

B.7.4 As required by the Contract Documents, Work done or material used without required inspection or testing and/or without providing timely notice to the Owner may be ordered removed at the Contractor's expense.

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

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

B.7.7 In Owner's sole discretion, it may authorize other interested parties to inspect the Work affecting their interests or property. Their right to inspect shall not make them a party to the Contract and shall not interfere with the rights of the parties of the Contract. Instructions or orders of such parties shall be transmitted to the Contractor, through the Owner.

B.8 SUBCONTRACTS AND ASSIGNMENT

B.8.1 Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound by the terms and conditions of these General Conditions and Supplemental General Conditions, and to assume toward the Contractor all of the obligations and responsibilities which the Contractor assumes toward the Owner thereunder, unless (1) the same are clearly inapplicable to the subcontract at issue because of legal requirements or industry practices, or (2) specific exceptions are requested by Contractor and approved in writing by Owner. Where appropriate, Contractor shall require each Subcontractor to enter into similar agreements with sub-subcontractors at any level.

B.8.2 At Owner's request, Contractor shall submit to Owner prior to their execution either Contractor's form of subcontract, or the subcontract to be executed with any particular Subcontractor. If Owner disapproves such form, Contractor shall not execute the form until the matters disapproved are resolved to Owner's satisfaction. Owner's review, comment upon or approval of any such form shall not relieve Contractor of its obligations under this Agreement or be deemed a waiver of such obligations of Contractor.

B.8.3 Contractor shall not assign, sell, or transfer its rights, or delegate its responsibilities under the Contract, in whole or in part, without the prior written approval of the Owner. No such written approval shall relieve Contractor of any obligations of the Contract, and any transferee shall be considered the agent of the Contractor and bound to perform in accordance with the Contract Documents. Contractor shall remain liable as between the original parties to the Contract as if no assignment had occurred.

B.9 OWNER'S RIGHT TO DO WORK

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

B.10 OTHER CONTRACTS

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

B.11 ALLOWANCES

B.11.1 The Contractor shall include in the Contract Price all allowances stated in the Contract Documents. Items covered by allowances

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

- B.11.2 Unless otherwise provided in the Contract Documents:
- (a) when finally reconciled, allowances shall cover the cost of the Contractor's materials and equipment delivered at the Project Site and all required taxes, less applicable trade discounts;
 - (b) Contractor's costs for unloading and handling at the Project Site, labor, installation costs, Overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Price but not in the allowances;
 - (c) whenever costs are more than or less than allowances, the Contract Price shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (i) the difference between actual costs and the allowances under Section B.17.2(a) and (ii) changes in Contractor's costs under Section B.17.2(b);
 - (d) Unless Owner requests otherwise, Contractor shall provide to Owner a proposed fixed price for any allowance work prior to its performance.

B.12 SUBMITTALS, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

- B.12.1 The Contractor shall prepare and keep current, for the Architect's/Engineer's approval (or for the approval of Owner if approval authority has not been delegated to the Architect/Engineer), a schedule and list of submittals which is coordinated with the Contractor's construction schedule and allows the Architect/Engineer reasonable time to review submittals. Owner reserves the right to finally approve the schedule and list of submittals. Submittals include, without limitation, Shop Drawings, Product Data, and Samples.
- B.12.2 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. The purpose of their submittal is to demonstrate for those portions of the Work for which submittals are required by the Contract Documents the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents. Review of submittals by the Architect/Engineer is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, or for approval of safety precautions or, unless otherwise specifically stated by the Architect/Engineer, of any construction means, methods, techniques, sequences or procedures, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect/Engineer's review of the Contractor's submittals shall not relieve the Contractor of its obligations under the Contract Documents. The Architect/Engineer's approval of a specific item shall not indicate approval of an assembly of which the item is a component. Informational submittals upon which the Architect/Engineer is not expected to take responsive action may be so identified in the Contract Documents. Submittals which are not required by the Contract Documents may be returned by the Architect/Engineer without action.
- B.12.3 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect/Engineer Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. Submittals which are not marked as reviewed for compliance with the Contract Documents

and approved by the Contractor may be returned by the Architect/Engineer without action.

- B.12.4 By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.
- B.12.5 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect/Engineer.
- B.12.6 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect/Engineer's review or approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect/Engineer in writing of such deviation at the time of submittal and (i) the Architect/Engineer has given written approval to the specific deviation as a minor change in the Work, or (ii) a Change Order has been executed by Owner authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect/Engineer's review or approval thereof.
- B.12.7 In the event that Owner elects not to have the obligations and duties described under this Section B.18 performed by the Architect/Engineer, or in the event no Architect/Engineer is employed by Owner on the Project, all obligations and duties assigned to the Architect/Engineer hereunder shall be performed by the Owner.

B.13 SUBSTITUTIONS

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

B.14 USE OF PLANS AND SPECIFICATIONS

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

SECTION C
WAGES AND LABOR

C.1 PREVAILING WAGE RATES ON PUBLIC WORKS

Contractor shall comply fully with the provisions of ORS 279C.800 through 279C.870. Pursuant to ORS 279C.830(1)(d), Contractor shall pay workers at not less than the specified minimum hourly rate of wage, and shall include that requirement in all subcontracts. If the Work is subject to both the state prevailing wage rate law and the federal Davis-Bacon Act, Contractor shall pay the higher of the applicable state or federal prevailing rate of wage. Contractor shall provide written notice to all workers of the number of hours per day and days per week such workers may be required to work.

C.2 PAYROLL CERTIFICATION AND FEE REQUIREMENTS

- C.2.1 In accordance with ORS 279C.845, the Contractor and every Subcontractor shall submit written certified statements to the Owner on the form prescribed by the Commissioner of the Bureau of Labor and Industries ("BOLI"), certifying the hourly rate of wage paid each worker which the Contractor or the Subcontractor has employed on the Project and further certifying that no worker employed on the Project has been paid less than the prevailing rate of wage or less than the minimum hourly rate of wage specified in the Contract, which certificate and statement shall be verified by the oath of the Contractor or the Subcontractor that the Contractor or Subcontractor has read the certified statement, that the Contractor or Subcontractor knows the contents of the certified statement, and, that to the Contractor's or Subcontractor's best knowledge and belief, the certified statement is true. The certified statements shall set out accurately and completely the payroll records for the prior week, including the name and address of each worker, the worker's correct classification, rate of pay, daily and weekly number of hours worked, deductions made, and actual wages paid. Certified statements for each week during which the Contractor or Subcontractor has employed a worker on the Project shall be submitted once a month, by the fifth (5th) business day of the following month. The Contractor and Subcontractors shall preserve the certified statements for a period of ten (10) years from the date of completion of the Contract.
- C.2.2 Pursuant to ORS 279C.845(7), the Owner shall retain 25 percent of any amount earned by the Contractor on the Project until the Contractor has filed the certified statements required by section C.2.1. The Owner shall pay to the Contractor the amount retained under this subsection within 14 days after the Contractor files the required certified statements, regardless of whether a Subcontractor has failed to file certified statements.
- C.2.3 Pursuant to ORS 279C.845(8), the Contractor shall retain 25 percent of any amount earned by a first-tier Subcontractor on this Project until the first-tier Subcontractor has filed with the Owner the certified statements required by C.2.1. Before paying any amount retained under this subsection, the Contractor shall verify that the first-tier Subcontractor has filed the certified statement. Within 14 days after the first-tier Subcontractor files the required certified statement the Contractor shall pay the first-tier Subcontractor any amount retained under this subsection.
- C.2.4 In accordance with statutory requirements and administrative rules promulgated by the Commissioner of the Bureau of Labor and Industries, the fee required by ORS 279C.825(1) will be paid by Owner to the Commissioner.

C.3 PROMPT PAYMENT AND CONTRACT CONDITIONS

- C.3.1 As a condition to Owner's performance hereunder, the Contractor shall:
- C.3.1.1 Make payment promptly, as due, to all persons supplying to Contractor labor or materials for the prosecution of the Work provided for in the Contract.
- C.3.1.2 Pay all contributions or amounts due the State Industrial Accident Fund or successor program from such Contractor or Subcontractor incurred in the performance of the Contract.
- C.3.1.3 Not permit any lien or claim to be filed or prosecuted against the Owner on account of any labor or material furnished. Contractor will not assign any claims that Contractor has against Owner, or assign any sums due by Owner, to Subcontractors, suppliers, or manufacturers, and will not make any agreement or act in any way to give Subcontractors a claim or standing to make a claim against the Owner.
- C.3.1.4 Pay to the Department of Revenue all sums withheld from employees pursuant to ORS 316.167.
- C.3.2 If Contractor fails, neglects or refuses to make prompt payment of any claim for labor or services furnished to the Contractor of a Subcontractor by any person in connection with the Project as such claim becomes due, the proper officer(s) representing the Owner may pay the claim and charge the amount of the payment against funds due or to become due Contractor under the Contract. Payment of claims in this manner shall not relieve the Contractor or the Contractor's surety from obligation with respect to any unpaid claims.
- C.3.3 Contractor shall include in each subcontract for property or services entered into by the Contractor and a first-tier subcontractor, including a material supplier, for the purpose of performing a construction contract, a payment clause that obligates the Contractor to pay the first-tier Subcontractor for satisfactory performance under its subcontract within ten (10) Days out of such amounts as are paid to the Contractor by the Owner under such contract.
- C.3.4 If the Contractor or a first-tier subcontractor fails, neglects or refuses to pay a person that provides labor or materials in connection with the Contract within 30 days after receiving payment from the contracting agency or a contractor, the Contractor or first-tier subcontractor owes the person the amount due plus interest charges that begin at the end of the 10-day period within which payment is due under ORS 279C.580 (4) and that end upon final payment, unless payment is subject to a good faith dispute as defined in ORS 279C.580. The rate of interest on the amount due is nine percent per annum. The amount of interest may not be waived.
- C.3.5 If the Contractor or a subcontractor fails, neglects or refuses to make payment to a person furnishing labor or materials in connection with the Contract, the person may file a complaint with the Construction Contractors Board, unless payment is subject to a good faith dispute as defined in ORS 279C.580.
- C.3.6 All employers, including Contractor, that employ subject workers who work under the Contract in the State of Oregon shall comply with ORS 656.017 and provide the required Workers' Compensation coverage, unless such employers are exempt under ORS 656.126. Contractor shall ensure that each of its Subcontractors complies with these requirements.
- C.3.7 In accordance with ORS 279C.570, for all subcontracts that exceed \$500,000 that the Contractor withholds retainage, the Contractor shall place amounts deducted as retainage into an interest-bearing escrow account. Interest on the retainage amount accrues from the

date the payment request is approved until the date the retainage is paid to the Subcontractor to which it is due.

C.4 PAYMENT FOR MEDICAL CARE

As a condition to Owner's performance hereunder, Contractor shall promptly, as due, make payment to any person, co-partnership, association or corporation furnishing medical, surgical, and hospital care or other needed care and attention, incident to sickness or injury, to the employees of the Contractor, of all sums of which 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.

C.5 HOURS OF LABOR

As a condition to Owner's performance hereunder, no person shall be employed to perform Work under the Contract for more than ten (10) hours in any one day or forty (40) hours in any one week, except in cases of necessity, emergency or where public policy absolutely requires it. In such instances, Contractor shall pay the employee at least time and a half pay:

- (a) For all overtime in excess of eight (8) hours a day or forty (40) hours in any one week when the work week is five consecutive Days, Monday through Friday; or
- (b) For all overtime in excess of ten (10) hours a day or forty (40) hours in any one week when the work week is four consecutive Days, Monday through Friday; and
- (c) For all Work performed on Saturday and on any legal holiday specified in ORS 279C.540.

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

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

**SECTION D
CHANGES IN THE WORK**

D.1 CHANGES IN WORK

D.1.1 The terms of the Contract shall not be waived, altered, modified, supplemented or amended in any manner whatsoever, without prior written agreement and then only after any necessary approvals have been obtained. A Change Order is required to modify the Contract, which shall not be effective until its execution by the parties to the Contract and all approvals required by public contracting laws have been obtained.

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

- (a) Modification of specifications and design.
- (b) Increases or decreases in quantities.
- (c) Increases or decreases to the amount of Work.
- (d) Addition or elimination of any Work item.
- (e) Change in the duration of the Project.

- (f) Acceleration or delay in performance of Work.
- (g) Deductive changes.

Deductive changes are those that reduce the scope of the Work, and shall be made by mutual agreement whenever feasible. In cases of suspension or partial termination under Section J, Owner reserves the right to unilaterally impose a deductive change and to self-perform such Work, for which the provisions of Section B.13 (Owner's Right to Do Work) shall then apply. Adjustments in compensation shall be made under Section D.1.3, in which costs for deductive changes shall be based upon a Direct Costs adjustment together with the related percentage markup specified for profit, Overhead and other indirect costs, unless otherwise agreed to by Owner.

D.1.3 The Owner and Contractor agree that adjustments to or deletions from the Work shall be administered and compensated according to the following:

- (a) Unit Pricing: Unit pricing may be utilized at the Owner's option when unit prices or solicitation alternates were provided that established the cost for adjustments to Work, and a binding obligation exists under the Contract on the parties covering the terms and conditions of the adjustment to Work.
- (b) Fixed Fee: If the Owner elects not to utilize unit pricing, or in the event that unit pricing is not available or appropriate, fixed pricing may be used for adjustments to or deletions from the Work. In fixed pricing, the basis of payments or total price shall be agreed upon in writing between the parties to the Contract, and shall be established before the Work is done whenever feasible. Notwithstanding the foregoing, the mark-ups set forth in Section D.1.3(c) shall be utilized in establishing fixed pricing, and such mark-ups shall not be exceeded. Cost and price data relating to adjustments to or deletions from the Work shall be supplied by Contractor to Owner upon request, but Owner shall be under no obligation to make such requests.
- (c) Time and Material: In the event that unit pricing and fixed pricing are not utilized, then adjustments to or deletions from the Work shall be performed on a cost reimbursement basis for Direct Costs. Such Work shall be compensated on the basis of the actual, reasonable and allowable cost of labor, equipment, and material furnished on the Work performed. The Contractor or Subcontractor who performs the Work shall be allowed to add up to ten percent (10%) markup to the Direct Costs as full compensation for profit, Overhead and other indirect costs for Work performed with the Contractor's or Subcontractor's own agents

Each ascending tier Subcontractor or the Contractor that did not perform the Work, will be allowed to add up to five percent (5%) supplemental markup on the Direct Costs of the Work (but not the above allowable markups) covered by a Change Order. No additional markup shall be permitted for any third tier or greater descending Subcontractor.

Example: \$20,000 of Direct Costs Work performed by a 2nd Tier Subcontractor

	Markup	Allowed Total Fee Plus Markup
General Contractor	5%	\$1,000.00
1 st Tier Sub Contractor	5%	\$1,000.00
2 nd Tier Sub Contractor	10%	\$22,000.00

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

authorization from Owner in the form of a Change Order. Contractor shall not be required to complete such additional Work without additional authorization.

- D.1.4 Any necessary adjustment of Contract Time that may be required as a result of adjustments to or deletions from the Work must be agreed upon by the parties before the start of the revised Work unless Owner authorizes Contractor to start the revised Work before agreement on Contract Time adjustment.

Contractor shall submit any request for additional compensation (and additional Contract Time if Contractor was authorized to start Work before an adjustment of Contract Time was approved) as soon as possible but no later than thirty (30) Days after receipt of Owner's request for additional Work. If Contractor's request for additional compensation or adjustment of Contract Time is not made within the thirty (30) Day time limit, Contractor's requests pertaining to that additional Work shall be barred. The thirty (30) Day time limit for making requests shall not be extended for any reason, including without limitation Contractor's claimed inability to determine the amount of additional compensation or adjustment of Contract Time, unless an extension is granted in writing by Owner. If the Owner denies Contractor's request for additional compensation or adjustment of Contract Time, Contractor may proceed to file a Claim under Section D.3, Claims Review Process. No other reimbursement, compensation, or payment will be made, except as provided in Section D.1.5 for impact claims.

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

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

If the Owner denies the Contractor's request for adjustment to compensation or Contract Time, the Contractor may proceed to file a Claim under Section D.3, Claims Review Process.

- D.1.6 No request or Claim by the Contractor for additional costs or an adjustment of Contract Time shall be allowed if made after receipt of final payment application under the Contract. Final payment application must be made by Contractor within the time required under Section E.6.4.

- D.1.7 It is understood that changes in the Work are inherent in construction of this type. The number of changes, the scope of those changes, and the effect they have on the progress of the original Work cannot be defined at this time. The Contractor agrees that it will work in good faith with Owner to undertake changes, when agreed upon by execution of a Change Order. Each change will be evaluated for extension of Contract Time and increase or decrease in compensation based on its own merit.

D.2 DELAYS

- D.2.1 Contractor shall not be entitled to additional compensation or additional Contract Time for Avoidable Delays.

- D.2.2 In the event of Unavoidable Delays, Contractor may be entitled to the following:

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

In the event of any requests for additional compensation or additional Contract Time, or both, as applicable, arising under this Section D.2.2 for Unavoidable Delays, other than requests for differing Project Site conditions for which a review process is established under Section A.4.5, Contractor shall submit a written notification of the delay to the Owner within two (2) Days of the occurrence of the cause of the delay. This written notification shall state the cause of the potential delay, the Project components impacted by the delay, and the anticipated additional Contract Time extension or the additional compensation, or both, as applicable, resulting from the delay. Within seven (7) Days after the cause of the delay has been mitigated, or in no case more than thirty (30) Days after the initial written notification, the Contractor shall submit to the Owner, a complete and detailed request for additional compensation or additional Contract Time, or both, as applicable, resulting from the delay. If the Owner denies Contractor's request for additional compensation or adjustment of Contract Time, the Contractor may proceed to file a Claim under Section D.3, Claims Review Process.

If Contractor does not timely submit the notices required under this Section D.2, Contractor's Claim shall be barred.

D.3 CLAIMS REVIEW PROCESS

- D.3.1 All Contractor Claims shall be referred to the Owner for review. Contractor's Claims, including Claims for adjustments to compensation or Contract Time, shall be submitted in writing by Contractor to the Owner within five (5) Days after a denial of Contractor's initial request for an adjustment of Contract terms, payment of money, extension of Contract Time or other relief, provided that such initial request has been submitted in accordance with the requirements and within the time limits established in these County General Conditions. Within thirty (30) Days after the initial Claim, Owner shall receive from Contractor a complete and detailed description of the Claim (the "Detailed Notice") that includes all information required by Section D.3.2. Unless the Claim is made in accordance with these time requirements, it shall be barred.

D.3.2 The Detailed Notice of the Claim shall be submitted in writing by Contractor and shall include all information, records and documentation necessary for the Owner to properly and completely evaluate the claim, including, but not limited to a detailed, factual statement of the basis of the Claim, pertinent dates, Contract provisions which support or allow the Claim, reference to or copies of any documents which support the Claim, the dollar value of the Claim, and the Contract Time adjustment requested for the Claim. If the Claim involves Work to be completed by Subcontractors, the Contractor will analyze and evaluate the merits of the Subcontractor claim prior to forwarding it and that analysis and evaluation to the Owner. The Owner will not consider direct claims from Subcontractors, suppliers, manufacturers, or others not a party to the Contract. Contractor agrees that it will make no agreement, covenant, or assignment, nor will it commit any other act that will permit or assist any Subcontractor, supplier, manufacturer, or other to directly or indirectly make a claim against Owner.

D.3.3 The Owner, through the Architect/Engineer (or other employee or agent assigned by the Owner) will review all Claims and take one or more of the following preliminary actions within ten (10) Days of receipt of the Detailed Notice of a Claim: (1) request additional supporting information from the Contractor; (2) inform the Contractor and Owner in writing of the time required for adequate review and response; (3) reject the Claim in whole or in part and identify the reasons for rejection; (4) recommend approval of all or part of the Claim; (5) arrange a meeting with the Contractor for formal review of the Claim; or (6) propose an alternate resolution.

D.3.4 Once the Engineer or Project Manager determines the Owner is in receipt of a properly submitted claim, the Engineer or Project Manager may arrange a meeting, as agreed by the parties, with the Contractor in order to present the claim for formal review and discussion. A person authorized by the Contractor to execute Change Orders on behalf of the Contractor must be present and attend all claim meetings.

D.3.5 The Owner's decision, through the Architect/Engineer (or other employee or agent assigned by the Owner), shall be final and binding on the Contractor unless appealed by written notice to the Owner within fifteen (15) Days of receipt of the decision. The Contractor must present written documentation supporting the Claim within fifteen (15) Days of the notice of appeal. After receiving the appeal documentation, the Owner, through the appropriate department director, shall review the materials and render a decision within thirty (30) Days after receiving the appeal documents.

D.3.6 If, at any step in the claim decision or review process, the Contractor fails to promptly submit requested information or documentation that the Owner deems necessary to analyze the claim, the Contractor is deemed to have waived its right to further review, and the Claim will not be considered properly filed and preserved.

D.3.7 Both parties agree to exercise their best efforts in good faith to resolve all disputes within sixty (60) Days of the issuance of the appeal in Section D. 3.4 above. If the parties are unable to resolve their issues through mediation or otherwise, either party may seek redress through all available remedies in equity or in law.

D.3.8 Unless otherwise directed by Owner, Contractor shall proceed with the Work while any Claim, or mediation or litigation arising from a Claim, is pending. Regardless of the review period or the final decision of the Owner, the Contractor shall continue to diligently pursue the Work as identified in the Contract Documents. In no case is the Contractor justified or allowed to cease or delay Work, in whole or in part, without a written stop work order from the Owner.

SECTION E PAYMENTS

E.1 SCHEDULE OF VALUES

The Contractor shall submit, by or before the pre-construction conference (as described in Section H.1.3), a schedule of values ("Schedule of Values") for the Contract Work. This schedule shall provide a breakdown of values for the Contract Work and will be the basis for progress payments. The breakdown shall demonstrate reasonable, identifiable, and measurable components of the Work. Unless objected to by the Owner, this schedule shall be used as the basis for reviewing Contractor's applications for payment. If objected to by Owner, Contractor shall revise the schedule of values and resubmit the same for approval of Owner.

E.2 APPLICATIONS FOR PAYMENT

E.2.1 Owner shall make progress payments on the Contract monthly as Work progresses, in accordance with the requirements of this Section E.2 and ORS 279C.570. Applications for payment shall be based upon estimates of Work completed and the Schedule of Values. As a condition precedent to Owner's obligation to pay, all applications for payment shall be approved by the Owner. A progress payment shall not be considered acceptance or approval of any Work or waiver of any defects therein. Owner shall pay to Contractor interest in accordance with ORS 279C.570 for overdue invoices, not including retainage, due the Contractor. Overdue invoices will be those that have not been paid within the earlier of:

- (a) Thirty (30) days after receipt of the invoice; or
- (b) Fifteen (15) days after the payment is approved by the County.

Notwithstanding the foregoing, in instances when an application for payment is filled out incorrectly, or when there is any defect or impropriety in any submitted application or when there is a good faith dispute, Owner shall so notify the Contractor within fifteen (15) Days stating the reason or reasons the application for payment is defective or improper or the reasons for the dispute. A defective or improper application for payment, if corrected by the Contractor within seven (7) Days of being notified by the Owner, shall not cause a payment to be made later than specified in this section unless interest is also paid. Payment of interest will be postponed when payment on the principal is delayed because of disagreement between the Owner and the Contractor.

Owner reserves the right, instead of requiring the Contractor to correct or resubmit a defective or improper application for payment, to reject the defective or improper portion of the application for payment and pay the remainder of the application for such amounts which are correct and proper.

Owner, upon written notice to the Contractor, may elect to make payments to the Contractor only by means of Electronic Funds Transfers ("EFT") through Automated Clearing House ("ACH") payments. If Owner makes this election, the Contractor shall arrange for receipt of the EFT/ACH payments.

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

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

Signed: _____
Dated: _____"

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

- (a) The request for stored material shall be submitted at least thirty (30) Days in advance of the application for payment on which it appears. Applications for payment shall be entertained for major equipment, components or expenditures only.
- (b) The Contractor shall submit applications for payment showing the quantity and cost of the material stored.
- (c) The material shall be stored in a bonded warehouse and Owner shall be granted the right to access the material for the purpose of removal or inspection at any time during the Contract Period.
- (d) The Contractor shall name the Owner as co-insured on the insurance policy covering the full value of the property while in the care and custody of the Contractor until it is installed. A certificate noting this coverage shall be issued to the Owner.
- (e) Payments shall be made for materials and equipment only. The submitted amount in the application for payment shall be reduced by the cost of transportation from the storage site to the Project Site and for the cost of an inspector to verify delivery and condition of the goods at the storage site. The cost of storage and inspection shall be borne solely by the Contractor.
- (f) Within sixty (60) Days of the application for payment, the Contractor shall submit evidence of payment covering the material and/or equipment stored and of payment for the storage site.
- (g) Payment for stored materials and/or equipment shall in no way indicate acceptance of the materials and/or equipment or waive any rights under the Contract for the rejection of the Work or materials and/or equipment not in conformance with the Contract Documents.
- (h) All required documentation shall be submitted with the respective application for payment.

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

- (a) Work that is defective and not remedied, or that has been demonstrated or identified as failing to conform with Applicable Laws or the Contract Documents;
- (b) third party claims filed or evidence reasonably indicating that such claims will likely be filed unless security acceptable to the Owner is provided by the Contractor;
- (c) failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment (in which case Owner may issue checks made payable jointly to Contractor and such unpaid persons under this provision, or directly to Subcontractors and suppliers at any level under Section C.3.2);

- (d) reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Price;
- (e) damage to the Work, Owner or Owner's agent;
- (f) reasonable evidence that the Work will not be completed within the Contract Time required by the Contract, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;
- (g) failure to carry out the Work in accordance with the Contract Documents; or
- (h) assessment of liquidated damages, when withholding is made for offset purposes.

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

- (a) Take that portion of the Contract Price properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the total Contract Price allocated to that portion of the Work in the Schedule of Values, less retainage as provided in Section E.5. Pending final determination of cost to the Owner of changes in the Work, no amounts for changes in the Work can be included in applications for payment until the Contract Price has been adjusted by a Change Order;
- (b) Add that portion of the Contract Price properly allocable to materials and equipment delivered and suitably stored at the Project Site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner pursuant to Section E.2.3, suitably stored off the Project Site at a location agreed upon in writing), less retainage as provided in Section E.5;
- (c) Subtract the aggregate of previous payments made by the Owner; and
- (d) Subtract any amounts for which the Owner has withheld or nullified payment as provided in the Contract Documents.

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

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

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

E.3 PAYROLL CERTIFICATION REQUIREMENT

Owner's receipt of payroll certification pursuant to Section C.2 of the Contract shall be a condition precedent to Owner's obligation to pay any progress payments or final payment otherwise due.

E.4 DUAL PAYMENT SOURCES

Contractor shall not be compensated for Work performed under the Contract from any state agency other than the agency that is a party to the Contract.

E.5 RETAINAGE

E.5.1 Retainage shall be withheld and released in accordance with the requirements set forth in Local Contract Review Board Rules or the applicable County standard.

E.5.1.1 Owner may reserve as retainage from any progress payment an amount not to exceed five percent of the payment. As Work progresses, Owner may reduce the amount of retainage on or may eliminate retainage on any remaining monthly Contract payments after fifty (50) percent of the Work under the Contract is completed if, in the Owner's discretion, such Work is progressing satisfactorily. Elimination or reduction of retainage shall be allowed only upon written application by the Contractor, which application shall include written approval of Contractor's surety; except that when the Work is ninety-seven and a half percent (97.5%) completed in Owner's estimation, the Owner may, at its discretion and without application by the Contractor, reduce the retained amount to hundred (100) percent of the value of the Work remaining to be done. Upon receipt of written application by the Contractor, Owner shall respond in writing within a reasonable time.

E.5.1.2 If retainage is withheld, unless the Contractor requests and the Owner accepts a form of retainage described in options (a) or (b) below, the Owner (except as otherwise provided below for a contract of \$500,000 or less), will deposit the retainage in an interest-bearing escrow account as required by ORS 279C.570(2). The Contractor shall execute such documentation and instructions respecting the interest-bearing escrow account as the Owner may require to protect its interests, including but not limited to a provision that no funds may be paid from the account to anyone without the Owner's advance written authorization. For a Contract over \$500,000, if the Contractor requests that the Owner deposit the retainage in an interest-bearing account under ORS 279C.560(5), the Owner will use an interest-bearing escrow account as stated above. For a Contract of \$500,000 or less, if the Contractor requests that the Owner deposit the retainage in an interest-bearing account under ORS 279C.560(5), the Owner will use an interest-bearing account (in a bank, savings bank, trust company or savings association) as provided under ORS 279C.450(5).

In accordance with the provisions of ORS 279C.560, Local Contract Review Board Rules, or the applicable County standard, unless the Owner finds in writing that accepting bonds, securities or other instruments described in option (a) below or a security bond described in option (b) below poses an extraordinary risk that is not typically associated with the bond, security or instrument, the Owner will approve the Contractor's written request:

- a. to be paid amounts which would otherwise have been retained from progress payments where Contractor has deposited acceptable bonds, securities or other instruments of equal value with Owner or in a custodial account or other mutually-agreed account satisfactory to Owner, with an approved bank or trust company to be held in lieu of the cash retainage for the benefit of Owner. Interest or earnings on the bonds, securities or other instruments shall accrue to the Contractor. The Contractor shall execute and provide such documentation and instructions respecting the bonds, securities and other instruments as the Owner may require to protect its interests. To be permissible, the bonds, securities and other instruments must be of a character approved by Owner; or

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

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

E. 5.1.3 The retainage held by Owner shall be included in and paid to the Contractor as part of the final payment of the Contract Price. The Owner shall pay to Contractor interest at the rate of two thirds of one percent per month on the final payment due Contractor, interest to commence forty-five (45) Days after the date which Owner receives Contractor's final approved application for payment and Work under the Contract has been completed and accepted and to run until the date when final payment is tendered to Contractor. The Contractor shall notify Owner in writing when the Contractor considers the Work complete and deliver to Owner its final application for payment and Owner shall, within fifteen (15) Days after receiving the written notice and the application for payment, either accept the Work or notify the Contractor of Work yet to be performed on the Contract. If Owner does not within the time allowed notify the Contractor of Work yet to be performed to fulfill contractual obligations, the interest provided by this subsection shall commence to run forty-five (45) Days after the end of the fifteen (15) Day period.

E.5.1.4 Owner will reduce the amount of the retainage if the Contractor notifies the Owner that the Contractor has deposited in an escrow account with a bank or trust company, in a manner authorized by the Owner, bonds and securities of equal value of a kind approved by the Owner and such bonds and securities have in fact been deposited.

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

E.5.1.6 The Contractor shall comply with all applicable legal requirements for withholding and releasing retainage and for prompt payments, including but not limited to those in ORS Chapters 279C and 701, and 49 CFR 26.29.

E.6 FINAL PAYMENT

E.6.1 Upon completion of all the Work under the Contract, the Contractor shall notify the Owner, in writing, that Contractor has completed Contractor's obligations under the Contract and shall prepare its application requesting final payment. The amount of final payment will be the difference between the total amount due the Contractor pursuant to the Contract Documents and the sum of all payments previously made. Upon receipt of such notice and application for payment, the Owner will inspect the Work, and, if acceptable, submit to Contractor a recommendation as to acceptance of the completed Work and the final estimate of the amount due the Contractor. If the Work is not acceptable, Owner will notify Contractor within fifteen (15) Days of Contractor's request for final payment. Upon approval of this final application for payment by the Owner and compliance by the Contractor with

provisions in Section K, and Contractor's satisfaction of other provisions of the Contract Documents as may be applicable, the Owner shall pay to the Contractor all monies due under the provisions of these Contract Documents.

- E.6.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Owner (1) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least thirty (30) Days' prior written notice has been given to the Owner, (2) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (3) consent of surety, if any, to final payment and (4), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien.
- E.6.3 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final application for payment.
- E.6.4 Contractor agrees to submit its final payment application within ninety (90) Days after Substantial Completion, unless written extension is granted by Owner. Contractor shall not delay final payment application for any reason, including without limitation nonpayment of Subcontractors, suppliers, manufacturers or others not a party to the Contract, or lack of resolution of a dispute with Owner or any other person of matters arising out of or relating to the Contract. If Contractor fails to submit its final payment application within ninety (90) Days after Substantial Completion, and Contractor has not obtained written extension by Owner, all requests or Claims for additional costs or an extension of Contract Time shall be barred.

SECTION F PROJECT SITE CONDITIONS

F.1 USE OF PREMISES

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

F.2 PROTECTION OF WORKERS, PROPERTY AND THE PUBLIC

- F.2.1 Contractor shall maintain continuous and adequate protection of all of the Work from damage and shall protect the Owner, workers and property from injury or loss arising in connection with the Contract. Contractor shall remedy acceptably to the Owner any damage, injury, or loss, except such as may be directly due to errors in the Contract Documents or caused by authorized representatives or personnel of the Owner. Contractor shall adequately protect adjacent property as provided by law and the Contract Documents.
- F.2.2 Contractor shall take all necessary precautions for the safety of all personnel on the Project Site or otherwise engaged in the undertaking of the Work and shall comply with the Contract Documents, best practices and all applicable provisions of federal, state and municipal safety laws and building codes to prevent

accidents or injury to persons on, about or adjacent to the premises where the Work is being performed. Contractor shall erect and properly maintain at all times, as required by the conditions and progress of the Work, all necessary safeguards for protection of workers and the public against any hazards created by construction. Contractor shall designate a responsible employee or associate on the Project Site, whose duty shall be the prevention of accidents. The name and position of the person designated shall be reported to the Owner. The Owner has no responsibility for Project Site safety. Project Site safety shall be the responsibility of the Contractor.

- F.2.3 Contractor shall not enter upon private property without first obtaining permission from the property owner or its duly authorized representative. Contractor shall be responsible for the preservation of all public and private property along and adjacent to the Work contemplated under the Contract and shall use every precaution necessary to prevent damage thereto. In the event the Contractor damages any property, the Contractor shall at once notify the property owner and make, or arrange to make, full restitution. Contractor shall, immediately and in writing, report to the Owner, all pertinent facts relating to such property damage and the ultimate disposition of the claim for damage.
- F.2.4 Contractor shall be responsible for protection of adjacent work areas including impacts brought about by activities, equipment, labor, utilities, vehicles and materials on the Project Site.
- F.2.5 Contractor shall at all times direct its activities in such a manner as to minimize adverse effects on the environment. Handling of all materials shall be conducted so no release will occur that may pollute or become hazardous.
- F.2.6 In an emergency affecting the safety of life or limb or of the Work or of adjoining property, the Contractor, without special instruction or authorization from the Owner, shall act reasonably to prevent threatened loss or injury, and shall so act, without appeal, if instructed by the Owner. Any compensation claimed by the Contractor on account of emergency work shall be determined in accordance with section D.
- F.2.7 Contractor shall comply with all Owner safety rules and regulations, if applicable. Prior to commencement of any Work, Contractor and Subcontractors shall be required to complete an Owner Contractor Safety Orientation and submit all Owner required safety plans.
- F.2.8 Contractor shall demonstrate that an employee drug testing program is in place.

F.3 CUTTING AND PATCHING

- F.3.1 If applicable, Contractor shall be responsible for coordinating all cutting, fitting, or patching of the Work to make its several parts come together properly and fit to receive or be received by work of other contractors or Subcontractors shown upon, or reasonably implied by, the Contract Documents.
- F.3.2 If applicable, Contractor shall be responsible for restoring all cut, fitted, or patched surfaces to an original condition; provided, however, that if a different condition is specified in the Contract Documents, then Contractor shall be responsible for restoring such surfaces to the condition specified in the Contract Documents.

F.4 CLEANING UP

From time to time as may be prudent or ordered by the Owner and, in any event, immediately after completion of the Work, the Contractor shall, at its own expense, clean up and remove all refuse and unused materials of any kind resulting from the Work. If Contractor fails to do so within twenty-four (24) hours after notification by the Owner the work may be

done by others and the cost charged to the Contractor and deducted from payment due the Contractor.

F.5 ENVIRONMENTAL CONTAMINATION

F.5.1 Contractor shall be held responsible for and shall indemnify, defend (with counsel of Owner’s choice), and hold harmless Owner from and against any costs, expenses, damages, claims, and causes of action, or any of them, resulting from all spills, releases, discharges, leaks and disposal of environmental pollution, including storage, transportation, and handling during the performance of the Work or Contractor’s obligations under the Contract which occur as a result of, or are contributed by, the negligence or actions of Contractor or its personnel, agents, or Subcontractors or any failure to perform in accordance with the Contract Documents (except to the extent otherwise void under ORS 30.140). Nothing in this section F.5.1 shall limit Contractor’s responsibility for obtaining insurance coverages required under Section G.3 of the Contract, and Contractor shall take no action that would void or impair such coverages.

F.5.1.1 Contractor agrees to promptly dispose of such spills, releases, discharge or leaks to the satisfaction of Owner and regulatory agencies having jurisdiction in a manner that complies with Applicable Laws. Cleanup shall be at no cost to the Owner and shall be performed by properly qualified and, if applicable, licensed personnel.

F.5.1.2 Unless otherwise approved in the Solicitation Document, Contractor shall obtain the Owner’s written consent prior to bringing onto the Project Site any (i) environmental pollutants or (ii) hazardous substances or materials, as the same or reasonably similar terms are used in any Applicable Laws. In any event, Contractor shall provide prior written notice to Owner when hazardous materials are brought on to the Project Site. The Contractor, at all times, shall:

- (a) properly handle, use and dispose of all environmental pollutants and hazardous substances or materials on the Project Site, in accordance with all Applicable Laws;
- (b) be responsible for any and all spills, releases, discharges, or leaks of (or from) environmental pollutants or hazardous substances or materials which Contractor has brought onto the Project Site; and
- (c) promptly clean up and remediate, without cost to the Owner, such spills, releases, discharges, or leaks to the Owner’s satisfaction and in compliance with all Applicable Laws.

F.5.2 Contractor shall report all reportable quantity releases, as such releases are defined in Applicable Laws. Upon discovery, regardless of quantity, Contractor must verbally report all releases to the Owner in a prompt manner. A written follow-up report shall be submitted to Owner within 48 hours of the telephonic report. Such written report shall contain, as a minimum:

- (a) Description of items released (identity, quantity, manifest numbers, and any and all other documentation required by law).
- (b) Whether amount of items released is EPA/DEQ reportable, and, if so, when reported.
- (c) Exact time and location of release, including a description of the area involved.
- (d) Containment procedures initiated.

- (e) Summary of communications about the release between Contractor and State, local or federal officials other than Owner. Any communication to the press will be done by Owner and Contractor will defer to Owner.
- (f) Description of cleanup procedures employed or to be employed at the Project Site, including disposal location of spill residue.
- (g) Personal injuries, if any, resulting from, or aggravated by, the release.

F.6 ENVIRONMENTAL CLEAN-UP

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

F.6.2 Upon being notified by Contractor of the presence of hazardous substance(s) on the Project Site, not brought on to the Project Site by Contractor, Owner shall arrange for the proper disposition of such hazardous substance(s).

F.7 DEMOLITION

F.7.1 For demolition tasks, if any, the Contractor shall salvage or recycle construction and demolition debris, if feasible and cost-effective.

**SECTION G
INDEMNITY, BONDING, AND INSURANCE**

G.1 RESPONSIBILITY FOR DAMAGES / INDEMNITY

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

G.1.2 To the fullest extent permitted by law, Contractor shall indemnify, defend (with counsel approved by Owner) and hold harmless the Owner and its elected officials, officers, directors, agents, and employees (collectively "Indemnitees") from and against all liabilities, damages, losses, claims, expenses, demands and actions of any nature whatsoever which arise out of, result from or are related to: (a) any damage, injury, loss, expense, inconvenience or delay described in this Section G.1; (b) any accident or occurrence which happens or is alleged to have happened in or about the Project Site or any place where the Work is being performed, or in the vicinity of either, at any time prior to the time the Work is fully completed in all respects; (c) any failure of the Contractor to

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

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

G.2 PERFORMANCE AND PAYMENT SECURITY; PUBLIC WORKS BOND

G.2.1 When the Contract Price is \$50,000 or more, the Contractor shall furnish and maintain in effect at all times during the Contract Period a performance bond in a sum equal to the Contract Price and a separate payment bond also in a sum equal to the Contract Price. Contractor shall furnish such bonds even if the Contract Price is less than the above thresholds if otherwise required by the Contract Documents.

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

G.2.3 Before execution of the Contract, the Contractor shall file with the Construction Contractors Board, and maintain in full force and effect, the separate public works bond required by Oregon Revised Statutes, Chapter 279C.830 and 279C.836, unless otherwise exempt under those provisions. The Contractor shall also include in every subcontract a provision requiring the Subcontractor to have a public works bond filed with the Construction Contractors Board before starting Work, unless otherwise exempt, and shall verify that the Subcontractor has filed a public works bond before permitting any Subcontractor to start Work.

G.3 INSURANCE

G.3.1 Primary Coverage: Insurance carried by Contractor under the Contract shall be the primary coverage. The coverages indicated are minimums unless otherwise specified in the Contract Documents.

G.3.2 Workers' Compensation: All employers, including Contractor, that employ subject workers who work under the Contract in the State of Oregon shall comply with ORS 656.017 and provide the required Workers' Compensation coverage, unless such employers are exempt under ORS 656.126. This shall include Employer's Liability Insurance with coverage limits of not less than the minimum amount required by statute for each accident. Contractors who perform the Work without the assistance or labor of any employee need not obtain such coverage if the Contractor certifies so in writing. Contractor shall ensure that each of its Subcontractors complies with these requirements. The Contractor shall require proof of such Workers' Compensation coverage by receiving and keeping on file a certificate of insurance from each

Subcontractor or anyone else directly employed by either the Contractor or its Subcontractors.

G.3.3 Builder's Risk Insurance:

G.3.3.1 Builder's Risk: During the term of the Contract, for new construction the Contractor shall obtain and keep in effect Builder's Risk insurance on an all risk forms, including earthquake and flood, for an amount equal to the full amount of the Contract, plus any changes in values due to modifications, Change Orders and loss of materials added. Such Builder's Risk shall include, in addition to earthquake and flood, theft, vandalism, mischief, collapse, transit, debris removal, and architect's fees "soft costs" associated with delay of Project due to insured peril. Any deductible shall not exceed \$50,000 for each loss, except the earthquake and flood deductible which shall not exceed 2 percent of each loss or \$50,000, whichever is greater. The deductible shall be paid by Contractor. The policy will include as loss payees Owner, the Contractor and its Subcontractors as their interests may appear.

G.3.3.2 Builder's Risk Installation Floater: For Work other than new construction, Contractor shall obtain and keep in effect during the term of the Contract, a Builder's Risk Installation Floater for coverage of the Contractor's labor, materials and equipment to be used for completion of the Work performed under the Contract. The minimum amount of coverage to be carried shall be equal to the full amount of the Contract. The policy will include as loss payees Owner, the Contractor and its Subcontractors as their interests may appear. Owner may waive this requirement at its sole and absolute discretion.

G.3.3.3 Such insurance shall be maintained until Owner has occupied the facility.

G.3.3.4 A loss insured under the Builder's Risk insurance shall be adjusted by the Owner and made payable to the Owner as loss payee. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner. The Owner shall have power to adjust and settle a loss with insurers.

G.3.4 General Liability Insurance:

G.3.4.1 Commercial General Liability: Upon execution of a Contract, Contractor shall obtain, and keep in effect at Contractor's expense for the term of the Contract, Commercial General Liability Insurance ("CGL") covering bodily injury and property damage in the amount of not less than \$1,000,000 per claim and \$2,000,000 per occurrence in a form satisfactory to Owner. This insurance shall include personal injury liability, products and completed operations, and contractual liability coverage for the indemnities provided under the Contract (to the extent contractual liability coverage for the indemnity is available in the marketplace), and shall be issued on an occurrence basis written on ISO Form GC 00 01 (12 04 or later) or an equivalent form approved in advance by Owner. The CGL shall provide separation of insured language. The policy or policies obtained by Contractor for purposes of fulfilling the requirements of this section shall be primary insurance with respect to the Owner. Any insurance or self-insurance maintained by the County shall be excess and shall not contribute to it.

G.3.4.2 Automobile Liability: Contractor shall obtain, at Contractor's expense, and keep in effect during the term of the Contract, Automobile Liability Insurance covering owned, and/or hired vehicles, as applicable. The coverage may be written in combination with the Commercial General Liability Insurance. Contractor shall provide proof of insurance of not less than \$1,000,000 per claim and \$2,000,000 per occurrence. Contractor

and its Subcontractors shall be responsible for ensuring that all non-owned vehicles maintain adequate Automobile Liability insurance while on Project Site.

- G.3.4.3 Owner may adjust the insurance amounts required in Section G.3.4.1 and G.3.4.2 based upon institution specific risk assessments through the issuance of Supplemental General Conditions and a Contract.
- G.3.4.4 To the extent that the Contract Documents require the Contractor to provide professional design services, design-build, or certifications related to systems, materials, or equipment, the Contractor shall (1) purchase and maintain professional liability/errors-and-omissions insurance with limits of not less than \$1,000,000 for each claim and \$2,000,000 general annual aggregate and (2) cause those Subcontractors (of any tier) who are providing professional design services including any design-build services to procure and maintain professional liability/errors-and-omissions insurance with limits of not less than \$1,000,000 for each claim and \$2,000,000 general annual aggregate. This policy shall be for the protection of the Owner, its elected officials, officers, agents and employees against liability for damages because of personal injury, bodily injury, death, or damage to property, including loss of use thereof, and damages because of negligent acts, errors and omissions in any way related to the Contract. The Owner, at its option, may require a complete copy of the above policy.
- G.3.4.5 "Tail" Coverage: If any of the required liability insurance is arranged on a "claims made" basis, "tail" coverage will be required at the completion of the Contract for a duration of 36 months or the maximum time period available in the marketplace if less than 36 months. Contractor shall furnish certification of "tail" coverage as described or continuous "claims made" liability coverage for 36 months following Final Completion. Continuous "claims made" coverage will be acceptable in lieu of "tail" coverage, provided its retroactive date is on or before the effective date of the Contract. Owner's receipt of the policy endorsement evidencing such coverage shall be a condition precedent to Owner's obligation to make final payment and to Owner's final acceptance of Work or services and related warranty (if any).
- G.3.4.6 Umbrella Liability (if required by Owner through issuance of Supplemental General Conditions): Contractor shall obtain, at Contractor's expense, and keep in effect during the term of the Contract, Umbrella liability Insurance over and above the general liability, automobile liability and workers' compensation coverage if required by Owner in specified limits at time of requirement.
- G.3.4.7 Pollution Liability may be required by Owner through issuance of Supplemental General Conditions.
- G.3.5 Additional Insured: The general liability insurance coverage, automobile liability, umbrella, and pollution liability if required, shall include the Owner as additional insureds but only with respect to the Contractor's activities to be performed under the Contract. The additional-insured endorsement for CGL insurance must be written on ISO Form CG 20 10 (10 01) and CG 20 37 (10 01), or their equivalent, but shall not use either of the following forms: CG 20 10 (10 93) or CG 20 10 (03 94). Proof of insurance must include a copy of the endorsement showing "Clackamas County, its elected officials, agents, officers, and employees" as scheduled insureds.

If Contractor cannot obtain an insurer to name the Owner as additional insureds, Contractor shall obtain at Contractor's expense, and keep in effect during the term of the Contract, Owners and Contractors Protective Liability Insurance, naming the Owner as additional insureds with not less than a \$2,000,000

limit per occurrence. This policy must be kept in effect for 36 months following Final Completion. As evidence of coverage, Contractor shall furnish the actual policy to Owner prior to execution of the Contract.

- G.3.6 Notice of Cancellation or Change: If the Contractor receives a non-renewal or cancellation notice from an insurance carrier affording coverage required herein, or receives notice that coverage no longer complies with the insurance requirements herein, Contractor agrees to notify Owner by fax within five (5) business days with a copy of the non-renewal or cancellation notice, or written specifics as to which coverage is no longer in compliance. When notified by Owner, the Contractor agrees to stop Work pursuant to the Contract at Contractor's expense, unless all required insurance remain in effect. Any failure to comply with the reporting provisions of this insurance, except for the potential exhaustion of aggregate limits, shall not affect the coverages provided to the Owner and its institutions, divisions, officers, and employees.
- Owner shall have the right, but not the obligation, of prohibiting Contractor from entering the Project Site until a new certificate(s) of insurance is provided to Owner evidencing the replacement coverage. The Contractor agrees that Owner reserves the right to withhold payment to Contractor until evidence of reinstated or replacement coverage is provided to Owner.
- G.3.7 Certificate(s) of Insurance/Insurance Carrier Qualification: As evidence of the insurance coverage required by the Contract, the Contractor shall furnish certificate(s) of insurance to the Owner prior to execution of the Contract. The certificate(s) will specify all of the parties who are additional insureds or loss payees for the Contract. A renewal certificate shall be sent to Owner at least 10 days prior to coverage expiration. Insurance coverage required under the Contract shall be obtained from insurance companies or entities acceptable to the Owner and that are eligible to provide such insurance under Oregon law. Eligible insurers include admitted insurers that have been issued a certificate of authority from the Oregon Department of Consumer and Business Services authorizing them to conduct an insurance business and issue policies of insurance in the state of Oregon, and certain non-admitted surplus lines insurers that satisfy the requirements of applicable Oregon law and which are subject to approval by the Owner. The Contractor shall be financially responsible for all deductibles, self-insured retentions and/or self-insurance included hereunder. Any deductible, self-insured retention and/or self-insurance in excess of \$50,000 shall be subject to approval by the Owner in writing and shall be a condition precedent to the effectiveness of any Contract.

SECTION H SCHEDULE OF WORK

H.1 CONTRACT PERIOD

- H.1.1 Time is of the essence. The Contractor shall at all times carry on the Work diligently, without delay and punctually fulfill all requirements herein.
- H.1.2 Notice to Proceed. Unless otherwise directed in the Contract Documents, Contractor shall commence Work on the Project Site within fifteen (15) Days of the Notice to Proceed. Notwithstanding the Notice to Proceed, Contractor shall not be authorized to proceed with the Work until all initial Contract requirements, including the Contract, performance bond and payment bond, and certificates of insurance, have been fully executed and submitted in a form acceptable to Owner.
- H.1.3 Unless otherwise not required in the Construction Documents, Contractor shall participate in a pre-construction conference with the Owner's representative and designated design team. The

purpose of this pre-construction conference is to review the Contractor's proposed Schedule of Values and to review any other Project logistics to be coordinated between the parties.

H.1.4 Unless specifically extended by a Change Order, all Work shall be complete by the date contained in the Contract Documents. The Owner shall have the right to accelerate the completion date of the Work, which may require the use of overtime. Such accelerated Work schedule shall be an acceleration in performance of Work under Section D.1.2(f) and shall be subject to the provisions of Section D.1.

H.1.5 The Owner shall not waive any rights under the Contract by permitting the Contractor to continue or complete in whole or in part the Work after the date described in Section H.1.2 above.

H.2 SCHEDULE

H.2.1 Contractor shall provide, by or before the pre-construction conference, the initial as-planned schedule for review and acceptance by the Owner. The submitted schedule must illustrate Work by Project components, labor trades, and long lead items broken down by building and/or floor where applicable. If Owner shall so elect, Contractor shall provide the schedule in CPM format showing the graphical network of planned activities, including i) a reasonably detailed list of all activities required to complete the Work; ii) the time and duration that each activity will take to completion; and iii) the dependencies between the activities. Schedules lacking adequate detail, or unreasonably detailed, will be rejected. The schedule shall include the following: Notice to Proceed or the date the Work commences, if no Notice to Proceed is issued by Owner, Substantial Completion, and Final Completion. Schedules shall be updated monthly, unless otherwise required by the Contract Documents, and submitted with the monthly application for payment. Acceptance of the Schedule by the Owner does not constitute agreement by the Owner as to the Contractor's sequencing, means, methods, or durations. Any positive difference between the Contractor's scheduled completion and the Contract completion date is float owned by the Owner. Owner reserves the right to negotiate the float if it is deemed to be in Owner's best interest to do so. In no case shall the Contractor make a claim for delays if the Work is completed within the Contract Time but after Contractor's scheduled completion.

H.2.2 All Work shall be completed during normal weekdays (Monday through Friday) between the hours of 7:00 a.m. and 5:00 p.m. unless otherwise specified in the Contract Documents. Unless otherwise specified in the Contract Documents, no Work shall be performed during the following holidays:

- New Year's Day
- Martin Luther King Day
- Memorial Day
- Independence Day
- Labor Day
- Veterans Day
- Thanksgiving Day
- Christmas Day
- President's Day

When a holiday falls on a Sunday, the following Monday shall be recognized as a legal holiday. When a holiday falls on Saturday, the preceding Friday shall be recognized as a legal holiday.

H.3 PARTIAL OCCUPANCY OR USE

The Owner may occupy or use any completed or partially completed portion of the Work at any stage, provided such occupancy or use is consented to by public authorities having

jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have reasonably accepted in writing the responsibilities assigned to each of them. Approval by the Contractor to partial occupancy or use shall not be unreasonably withheld. Immediately prior to such partial occupancy or use, the Owner and Contractor shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work. Partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

SECTION I CORRECTION OF WORK

I.1 CORRECTION OF WORK BEFORE FINAL PAYMENT

The Contractor warrants to the Owner that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects, and that the Work will conform to the requirements of the Contract Documents. Work failing to conform to these requirements shall be deemed defective. Contractor shall promptly remove from the premises and replace all defective materials and equipment as determined by the Owner, whether incorporated in the Work or not. Removal and replacement shall be without loss or expense to the Owner, and Contractor shall bear the cost of repairing all Work destroyed or damaged by such removal or replacement. Contractor shall be allowed a period of no longer than thirty (30) Days after Substantial Completion for completion of defective (Punch List) work. At the end of the thirty-day period, or earlier if requested by the Contractor, Owner shall arrange for inspection of the Work by the Architect/Engineer. Should the work not be complete, and all corrections made, the costs for all subsequent reinspections shall be borne by the Contractor. If Contractor fails to complete the Punch List work within the thirty (30) Day period, Owner may perform such work and Contractor shall reimburse Owner all costs of the same within ten (10) Days after demand without affecting Contractor's obligations.

I.2 WARRANTY WORK

I.2.1 Neither the final certificate of payment nor any provision of the Contract Documents shall relieve the Contractor from responsibility for Defective Work and, unless a longer period is specified, Contractor shall correct all defects that appear in the Work within a period of one year from the date of issuance of the written notice of Substantial Completion by the Owner except for latent defects which will be remedied by the Contractor at any time they become apparent. The Owner shall give Contractor notice of defects with reasonable promptness. Contractor shall perform such warranty work within a reasonable time after Owner's demand and at Contractor's sole expense. If Contractor fails to complete the warranty work within such period as Owner determines reasonable, or at any time in the event of warranty work consisting of emergency repairs, Owner may perform such work and Contractor shall reimburse Owner all costs of the same within ten (10) Days after demand, without affecting Contractor's obligations. The Contractor shall perform the warranty Work by correcting defects within twenty-four (24) hours of notification by Owner, unless otherwise specified in the Contract Documents. Should the Contractor fail to respond within the specified response time, the Owner may, at its option, complete the necessary repairs using another contractor or its agents. If Owner completes the repairs using Owner's agent, Contractor shall pay Owner at the rate of one and one-half (1½) times the standard hourly rate of Owner's agent, plus related overhead and any direct non-salary costs. If Owner completes the repairs using another contractor, Contractor shall pay Owner the amount of Owner's direct costs billed by the other contractor for the work, plus the direct salary costs and related overhead and direct non-salary expenses of Owner's agents who

are required to monitor that contractor's work. Work performed by Owner using Owner's own agents or those of another contractor shall not affect the Contractor's contractual duties under these provisions, including warranty provisions.

- I.2.2 Nothing in this Section I.2 provision shall negate guarantees or warranties for periods longer than one year including without limitation, such guarantees or warranties required by other sections of the Contract Documents for specific installations, materials, processes, equipment or fixtures.
- I.2.3 In addition to Contractor's warranty, manufacturer's warranties shall pass to the Owner and shall not take effect until such portion of the Work covered by the applicable warranty has been accepted in writing by the Owner.
- I.2.4 The one-year period for correction of Work shall be extended with respect to portions of Work performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work, and shall be extended by corrective Work performed by the Contractor pursuant to this Section, as to the Work corrected. The Contractor shall remove from the Project Site portions of the Work which are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.
- I.2.5 Nothing contained in this Section I.2 shall be construed to establish a period of limitation with respect to other obligations which the Contractor might have under the Contract Documents. Establishment of the period for correction of Work as described in this Section I.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.
- I.2.6 If the Owner prefers to accept Work which is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Price will be reduced as appropriate and equitable as determined by Owner. Such adjustment shall be effected whether or not final payment has been made.

SECTION J

SUSPENSION AND/OR TERMINATION OF THE WORK

J.1 OWNER'S RIGHT TO SUSPEND THE WORK

- J.1.1 The Owner has the authority to suspend portions or all of the Work due to the following causes:
 - (a) Failure of the Contractor to correct unsafe conditions;
 - (b) Failure of the Contractor to carry out any provision of the Contract;
 - (c) Failure of the Contractor to carry out orders;
 - (d) Conditions, in the opinion of the Owner, which are unsuitable for performing the Work;
 - (e) Time required to investigate differing Project Site conditions; or
 - (f) Any reason considered to be in the public interest.
- J.1.2 The Owner shall notify Contractor and the Contractor's Surety in writing of the effective date and time of the suspension, and Owner shall notify Contractor and Contractor's surety in writing to resume Work.

J.2 CONTRACTOR'S RESPONSIBILITIES

- J.2.1 During the period of the suspension, Contractor is responsible to continue maintenance at the Project just as if the Work were in progress. This includes, but is not limited to, protection of completed Work, maintenance of access, protection of stored materials, temporary facilities, and clean-up.
- J.2.2 When the Work is recommenced after the suspension, the Contractor shall replace or renew any Work damaged during the suspension, remove any materials or facilities used as part of temporary maintenance, and complete the Work in every respect as though its prosecution had been continuous and without suspension.

J.3 COMPENSATION FOR SUSPENSION

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

J.4 OWNER'S RIGHT TO TERMINATE CONTRACT

- J.4.1 The Owner may, without prejudice to any other right or remedy, and after giving Contractor seven (7) Days' written notice and an opportunity to cure, terminate the Contract in whole or in part under the following conditions:
 - (a) If Contractor should, voluntarily or involuntarily, seek protection under the United States Bankruptcy Code and Contractor as debtor-in-possession or the Trustee for the estate fails to assume the Contract within a reasonable time;
 - (b) If Contractor should make a general assignment for the benefit of Contractor's creditors;
 - (c) If a receiver should be appointed on account of Contractor's insolvency;
 - (d) If Contractor should repeatedly refuse or fail to supply an adequate number of skilled workers or proper materials to carry on the Work as required by the Contract Documents, or otherwise fail to perform the Work in a timely manner;
 - (e) If Contractor should repeatedly fail to make prompt payment to Subcontractors or for material or labor, or should disregard laws, ordinances or the instructions of the Owner;
 - (f) If Contractor is otherwise in breach of any part of the Contract; or
 - (g) If Contractor is in violation of Applicable Laws, either in the conduct of its business or in its performance of the Work.

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

the Owner's cost of finishing the Work exceeds the unpaid balance of the Contract Price, Contractor shall pay the difference to the Owner.

J.5 TERMINATION FOR CONVENIENCE, NON-APPROPRIATION OF FUNDS, OR FORCE MAJEURE

- J.5.1 Owner may terminate the Contract in whole or in part whenever Owner determines: (a) that termination of the Contract is in the best interest of Owner or the public; (b) that the Owner failed to receive funding, appropriations, allocations or other expenditure authority as contemplated by Owner's budget and Owner determines, in its sole determination, and its assessment and ranking of the policy objectives explicit or implicit in Owner's budget, Owner may determine it is necessary to and may terminate the Contract.; or (c) in the event of Force Majeure.
- J.5.2 The Owner shall provide the Contractor with seven (7) Days prior written notice of a termination for Owner's or for public convenience. After such notice, the Contractor shall provide the Owner with immediate and peaceful possession of the premises and materials located on and off the premises for which the Contractor received progress payment under Section E. Compensation for Work terminated by the Owner under this provision will be according to Section E. In no circumstance shall Contractor be entitled to lost profits for Work not performed due to termination. If the Contract is terminated for public convenience, neither the Contractor nor its Surety shall be relieved of liability for damages or losses suffered by the Owner as a result of defective, unacceptable or unauthorized Work completed or performed.

J.6 ACTION UPON TERMINATION

- J.6.1 Upon receiving a notice of termination, and except as directed otherwise by the Owner, Contractor shall immediately cease placing further subcontracts or orders for materials, services, or facilities. In addition, Contractor shall terminate all subcontracts or orders to the extent they relate to the Work terminated and, with the prior written approval of the Owner, settle all outstanding liabilities and termination settlement proposals arising from the termination of subcontracts and orders.
- J.6.2 As directed by the Owner, Contractor shall, upon termination, transfer title and deliver to the Owner all Record Documents, information, and other property that, if the Contract had been completed, would have been required to be furnished to the Owner.
- J.6.3 Upon Owner's notice of termination pursuant to either Section J.4 or J.5, if Owner shall so elect, Contractor shall assign to the Owner such subcontracts and orders as Owner shall specify. In the event Owner elects to take assignment of any such subcontract or order, Contractor shall take such action and shall execute such documents as Owner shall reasonably require for the effectiveness of such assignment and Contractor shall ensure that no contractual arrangement between it and its subcontractors or suppliers of any tier or sub-tier shall prevent such assignment.

SECTION K CONTRACT CLOSE OUT

K.1 RECORD DOCUMENTS

As a condition of final payment (refer also to section E.6), Contractor shall comply with the following: Contractor shall provide Record Documents for the entire Project to Owner. Record Documents shall depict the Project as constructed and shall reflect each and every change, modification, and deletion made during the construction. Record Documents are part of the Work and shall be provided prior to the Owner's issuance of final payment. Record Documents include all modifications to the Contract Documents unless otherwise directed.

K.2 OPERATION AND MAINTENANCE MANUALS

As part of the Work, Contractor shall submit two completed operation and maintenance manuals ("O & M Manuals") for review by the Owner prior to submission of any pay request for more than 75% of the Work. Owner's receipt of the O & M Manuals shall be a condition precedent to any payment thereafter due. The O & M Manuals shall contain a complete set of all submittals, all product data as required by the specifications, training information, telephone list and contact information for all consultants, manufacturers, installer and suppliers, manufacturer's printed data, record and shop drawings, schematic diagrams of systems, appropriate equipment indices, warranties and bonds. The Owner shall review and return one O & M Manual for any modifications or adjustments required. Prior to submission of its final pay request, Contractor shall deliver two (2) complete and approved sets of O & M Manuals in paper form and one (1) complete and approved set in electronic form to the Owner and Owner's receipt of the O & M Manuals shall be a condition precedent to Owner's obligation to make final payment.

K.3 COMPLETION NOTICES

- K.3.1 Contractor shall provide Owner written notice of both Substantial and Final Completion. The certificate of Substantial Completion shall state the date of Substantial Completion, the responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and the time within which the Contractor shall finish all items on the Punch List accompanying the Certificate. Both completion notices must be signed and notarized by the Contractor and signed by the Architect/Engineer (if applicable) and Owner to be valid. The Owner shall provide the final signature on the notices. The notices shall take effect on the date they are signed by the Owner.
- K.3.2 Substantial Completion of a facility with operating systems (e.g., mechanical, electrical, HVAC) shall be that degree of completion that has provided a minimum of thirty (30) continuous Days of successful, trouble-free operation, which period shall begin after all performance and acceptance testing has been successfully demonstrated to the Owner. All equipment contained in the Work, plus all other components necessary to enable the Owner to operate the facility in the manner that was intended, shall be complete on the Substantial Completion date. The Contractor may request that a Punch List be prepared by the Owner with submission of the request for the Substantial Completion notice.

K.4 TRAINING

As part of the Work, and prior to submission of the final application for payment, the Contractor shall schedule with the Owner training sessions for all equipment and systems as required by the Contract Documents. Contractor shall schedule training sessions at least two weeks in advance of the date of training to allow Owner to provide its personnel with adequate notice. If assignments arise because of termination under Section J.4, then such assignments shall not relieve Contractor of liability hereunder. The O & M Manual shall be used as a basis for training. In addition to any off-Project Site training required by the Contract Documents, training shall include a formal session conducted at the Project Site after the equipment and/or system is completely installed and operational in its normal operating environment.

K.5 EXTRA MATERIALS

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

K.6 ENVIRONMENTAL CLEAN-UP

As part of the Final Completion notice, or as a separate written notice submitted with or before the notice of Final Completion, the Contractor shall notify the Owner that all environmental and pollution clean-up, remediation and closure have been completed in accordance with all Applicable Laws and pursuant to the authority of all agencies having jurisdiction, and Contractor shall provide Owner with any and all documentation related to the same, including but not limited to directives, orders, letters, certificates and permits related to or arising from such environmental pollution. The notice shall reaffirm the indemnification given under Section F.5.1 above. Contractor's completion of its obligations under this Section K.6 and Owner's receipt of documents evidencing such completion shall be a condition precedent to Owner's obligation to make final payment.

K.7 CERTIFICATE OF OCCUPANCY

Owner's receipt of an unconditioned certificate of occupancy from the appropriate state and/or local building officials shall be a condition precedent to Owner's obligation to make final payment, except to the extent failure to obtain an unconditional certificate of occupancy is due to the fault or neglect of Owner.

K.8 OTHER CONTRACTOR RESPONSIBILITIES

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

The Owner's property is drug free and weapons free areas and the use of tobacco products is only allowed in designated areas. Contractor shall be required to ensure that its employees, Subcontractors and agents shall comply with these requirements.

SECTION L GENERAL PROVISIONS

L.1 NO THIRD PARTY BENEFICIARIES

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

L.2 SEVERABILITY

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

L.3 ACCESS TO RECORDS

L.3.1 Contractor shall keep, at all times on the Project Site, one record copy of the complete Contract Documents, including the Plans, Specifications, addenda, and Change Orders (if any) in good order and marked currently to record field changes and selections made during construction, and one record copy of Shop Drawings, Product Data, Samples and similar submittals, and shall at all times give the Owner access thereto.

L.3.2 Contractor shall retain and the Owner and its duly authorized representatives shall have access, for a period not less than ten (10)

years, to all Record Documents, financial and accounting records, and other books, documents, papers and records of Contractor which are pertinent to the Contract, including records pertaining to Overhead and indirect costs, for the purpose of making audit, examination, excerpts and transcripts. If for any reason, any part of the Work or the Contract shall be subject to litigation, Contractor shall retain all such records until all litigation is resolved and Contractor shall continue to provide Owner and/or its agents with full access to such records until such time as all litigation is complete and all periods for appeal have expired and full and final satisfaction of any judgment, order or decree is recorded and Owner receives a record copy of documentation from Contractor.

L.4 WAIVER

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

L.5 SUCCESSORS IN INTEREST

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

L.6 GOVERNING LAW

The Contract shall be governed by and construed in accordance with the laws of the State of Oregon without giving effect to the conflict of law provisions thereof.

L.7 APPLICABLE LAW

Contractor hereto agrees to comply in all ways with applicable local, state and federal ordinances, statutes, laws and regulations.

L.8 NON-EXCLUSIVE RIGHTS AND REMEDIES

Except as otherwise expressly provided herein, the rights and remedies expressly afforded under the provisions of the Contract shall not be deemed exclusive, and shall be in addition to and cumulative with any and all rights and remedies otherwise available at law or in equity. The exercise by either Party of any one or more of such remedies shall not preclude the exercise by it, at the same or different times, of any other remedies for the same default or breach, or for any other default or breach, by the other Party.

L.9 INTERPRETATION

The titles of the sections of the Contract are inserted for convenience of reference only and shall be disregarded in construing or interpreting any of its provisions.

L.10 DEBT LIMITATION

The Contract is expressly subject to the debt limitation of Oregon counties set forth in Article XI, Section 10, of the Oregon Constitution, and is contingent upon funds being appropriated therefore. Any provisions herein which would conflict with law are deemed inoperative to that extent.

L.11 LITIGATION

Any Claim between Owner and Contractor that arises from or relates to the Contract and that is not resolved through the Claims Review Process in Section D.3 shall be brought and conducted solely and exclusively within the Circuit Court of Clackamas County for the State of Oregon; provided, however, if a Claim must be brought in a federal forum, then it shall be brought and conducted solely and exclusively within the United States District Court for the District of Oregon. In no event shall this section be construed as a waiver by the County of any form of defense or

immunity, whether sovereign immunity, governmental immunity, immunity based on the Eleventh Amendment to the Constitution of the United States or otherwise, from any claim or from the jurisdiction of any court. CONTRACTOR, BY EXECUTION OF THE CONTRACT, HEREBY CONSENTS TO THE IN PERSONAM JURISDICTION OF THE COURTS REFERENCED IN THIS SECTION.

L. 12 SURVIVAL

All warranty, indemnification, and record retention provisions of the Contract, and all of Contractor's other obligations under the Contract that are not fully performed by the time of Final Completion or termination, and all other rights and obligations which by their context are intended to survive, shall survive Final Completion or any termination of the Contract.

L.13 ACCESS TO RECORDS

L.13.1. Contractor shall keep, at all times on the Work site, one record copy of the complete Contract Documents, including the Plans, Specifications, Construction Change Directives and addenda, in good order and marked currently to record field changes and selections made during construction, and one copy of Shop Drawings, Project Data, Samples and similar submittals, and shall at all times give the Owner access thereto.

L.13.2 Contractor shall retain and the Owner and its duly authorized representatives shall have access, for a period not less than ten (10) years, to all Record Documents, financial and accounting records, and other books, documents, papers and records of Contractor which are pertinent to the Contract, including records pertaining to Overhead and indirect costs, for the purpose of making audit, examination, excerpts and transcripts. If for any reason, any part of the Work or this Contract shall be subject to litigation, Contractor shall retain all such records until all litigation is resolved and Contractor shall continue to provide Owner and/or its agents with full access to such records until such time as all litigation is complete and all periods for appeal have expired and full and final satisfaction of any judgment, order or decree is recorded and Owner receives a record copy of documentation from Contractor.

L.14 WAIVER

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

L. 15 NO ATTORNEY FEES.

In the event any arbitration, action or proceeding, including any bankruptcy proceeding, is instituted to enforce any term of this Contract, each party shall be responsible for its own attorneys' fees and expenses.



CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT

PERFORMANCE BOND

Bond No.:
Project Name: Clackamas Service Center West Building Project (CD#1803)

(Surety #1) Bond Amount No. 1: \$
(Surety #2)* Bond Amount No. 2:* \$
Total Penal Sum of Bond: \$

* If using multiple sureties

We, as Principal, and the above identified Surety(ies), authorized to transact surety business in Oregon, as Surety, hereby jointly and severally bind ourselves, our respective heirs, executors, administrators, successors and assigns firmly by these presents to pay unto Clackamas County, the sum of (Total Penal Sum of Bond) (Provided, that we the Sureties bind ourselves in such sum "jointly and severally" as well as "severally" only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, for the payment of such sum only as is set forth opposite the name of such Surety); and

WHEREAS, the Principal has entered into a contract with Clackamas County, along with the plans, specifications, terms and conditions of which are contained in the above-referenced Solicitation; and

WHEREAS, the terms and conditions of the contract, together with applicable plans, standard specifications, special provisions, schedule of performance, and schedule of contract prices, are made a part of this Performance Bond by reference, whether or not attached to the contract (all hereafter called "Contract"); and

WHEREAS, the Principal has agreed to perform the Contract in accordance with the terms, conditions, requirements, plans and specifications, and all authorized modifications of the Contract which increase the amount of the work, the amount of the Contract, or constitute an authorized extension of the time for performance, notice of any such modifications hereby being waived by the Surety:

NOW, THEREFORE, THE CONDITION OF THIS BOND IS SUCH that if the Principal herein shall faithfully and truly observe and comply with the terms, conditions and provisions of the Contract, in all respects, and shall well and truly and fully do and perform all matters and things undertaken by Contractor to be performed under the Contract, upon the terms set forth therein, and within the time prescribed therein, or as extended as provided in the Contract, with or without notice to the Sureties, and shall defend, indemnify, and save harmless Clackamas County and its elected officials, officers, employees and agents, against any direct or indirect damages or claim of every kind and description that shall be suffered or claimed to be suffered in connection with or arising out of the performance of the Contract by the Principal or its subcontractors, and shall in

all respects perform said contract according to law, then this obligation is to be void; otherwise, it shall remain in full force and effect for so long as any term of the Contract remains in effect.

Nonpayment of the bond premium will not invalidate this bond nor shall Clackamas County, be obligated for the payment of any premiums.

This bond is given and received under authority of Oregon Revised Statutes Chapter 279C and the Clackamas County Local Contractor Review Board Rules, the provisions of which hereby are incorporated into this bond and made a part hereof.

IN WITNESS WHEREOF, WE HAVE CAUSED THIS INSTRUMENT TO BE EXECUTED AND SEALED BY OUR DULY AUTHORIZED LEGAL REPRESENTATIVES.

Dated this _____ day of _____, 20____.

PRINCIPAL: _____

By: _____

Signature

Official Capacity

Attest: _____

Corporation Secretary

SURETY: _____

[Add signatures for each if using multiple bonds]

BY ATTORNEY-IN-FACT:

[Power-of-Attorney must accompany each bond]

Name

Signature

Address

City

State

Zip

Phone

Fax



CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT

PAYMENT BOND

Bond No.:
Project Name: Clackamas Service Center West Building Project
(CD #1803)

(Surety #1) Bond Amount No. 1: \$
(Surety #2)* Bond Amount No. 2:* \$
* If using multiple sureties Total Penal Sum of Bond: \$

We, as Principal, and the above identified Surety(ies), authorized to transact surety business in Oregon, as Surety, hereby jointly and severally bind ourselves, our respective heirs, executors, administrators, successors and assigns firmly by these presents to pay unto Clackamas County, the sum of (Total Penal Sum of Bond) (Provided, that we the Sureties bind ourselves in such sum "jointly and severally" as well as "severally" only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, for the payment of such sum only as is set forth opposite the name of such Surety); and

WHEREAS, the Principal has entered into a contract with Clackamas County, along with the plans, specifications, terms and conditions of which are contained in above-referenced Solicitation; and

WHEREAS, the terms and conditions of the contract, together with applicable plans, standard specifications, special provisions, schedule of performance, and schedule of contract prices, are made a part of this Payment Bond by reference, whether or not attached to the contract (all hereafter called "Contract"); and

WHEREAS, the Principal has agreed to perform the Contract in accordance with the terms, conditions, requirements, plans and specifications, and schedule of contract prices which are set forth in the Contract and any attachments, and all authorized modifications of the Contract which increase the amount of the work, or the cost of the Contract, or constitute authorized extensions of time for performance of the Contract, notice of any such modifications hereby being waived by the Surety:

NOW, THEREFORE, THE CONDITION OF THIS BOND IS SUCH that if the Principal shall faithfully and truly observe and comply with the terms, conditions and provisions of the Contract, in all respects, and shall well and truly and fully do and perform all matters and things by it undertaken to be performed under said Contract and any duly authorized modifications that are made, upon the terms set forth therein, and within the time prescribed therein, or as extended therein as provided in the Contract, with or without notice to the Sureties, and shall defend, indemnify, and save harmless Clackamas County and its elected officials, officers, employees and agents, against any claim for direct or indirect damages of every kind and description that shall be suffered or claimed to be suffered in connection with or arising out of the performance of the Contract by the Contractor or its subcontractors, and shall promptly pay all persons supplying labor, materials or both to the Principal or its subcontractors for prosecution of the work provided in the Contract; and shall promptly pay all contributions due the State Industrial Accident Fund and the State Unemployment Compensation Fund from the Principal or its subcontractors in connection with the performance of the Contract; and shall pay over to the Oregon Department of Revenue all sums required to be deducted and retained from the wages of employees of the Principal and its subcontractors pursuant to ORS 316.167, and

shall permit no lien nor claim to be filed or prosecuted against Clackamas County on account of any labor or materials furnished; and shall do all things required of the Principal by the laws of this State, then this obligation shall be void; otherwise, it shall remain in full force and effect for so long as any term of the Contract remains in effect.

Nonpayment of the bond premium will not invalidate this bond nor shall Clackamas County be obligated for the payment of any premiums.

This bond is given and received under authority of Oregon Revised Statutes Chapter 279C and the Clackamas County Local Contractor Review Board Rules, the provisions of which hereby are incorporated into this bond and made a part hereof.

IN WITNESS WHEREOF, WE HAVE CAUSED THIS INSTRUMENT TO BE EXECUTED AND SEALED BY OUR DULY AUTHORIZED LEGAL REPRESENTATIVES:

Dated this _____ day of _____, 20____.

PRINCIPAL: _____

By: _____
Signature

Official Capacity

Attest: _____
Corporation Secretary

SURETY: _____

[Add signatures for each if using multiple bonds]

BY ATTORNEY-IN-FACT:

[Power-of-Attorney must accompany each bond]

Name

Signature

Address

City State Zip

Phone Fax

Oregon Bureau of Labor and Industries

Prevailing Wage Rates for Public Works Contracts

Christina E. Stephenson
Labor Commissioner
Rates Effective January 5, 2023





CHRISTINA E. STEPHENSON
Labor Commissioner

In this rate book are the new prevailing wage rates for Oregon non-residential public works projects, effective January 5, 2023.

Prevailing wage rates are the minimum hourly wages that must be paid to all workers employed on all public works projects. Thank you for your engagement in the process and commitment to Oregon law.

Our team is ready to help support you with any questions you have. We also offer regular, free, informational seminars and webinars for contractors and public agencies. Contact us at PWR.Email@boli.oregon.gov or (971) 353-2416.

A handwritten signature in blue ink, appearing to read "C. Stephenson".

Christina E. Stephenson
Labor Commissioner

More information about prevailing wage rates:

The Oregon Bureau of Labor & Industries publishes the prevailing wage rates (PWR) that are required to be paid to workers on non-residential public works projects in Oregon.

A separate document, [Definitions of Covered Occupations for Public Works Contracts in Oregon](#), provides occupational definitions used to classify the duties performed on public works projects. These definitions are used to find the correct prevailing wage rate.

The rate book and definition publications are available online at <https://www.oregon.gov/boli>, as well as additional information, supporting documents, and forms.

Please contact us at PWR.Email@boli.oregon.gov or (971) 353-2416, for additional information such as:

- Applicable prevailing wage rates for projects (Generally, the rates in effect at the time the bid specifications are first advertised are those that apply for the duration of the project.)
- Federal Davis-Bacon rates (In cases where projects are subject to both state PWR and federal Davis-Bacon rates, the higher wage must be paid.)
- Required PWR provisions for specifications and contracts
- Apprenticeship rates



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Public Works Bonds.....	2
Finding the Correct Prevailing Wage Rate.....	3
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List of Ineligible Contractors.....	28

Forms necessary to comply with ORS 279C.800 through ORS 279C.870 can be found on our website at <https://www.oregon.gov/boli/employers/Pages/prevailing-wage.aspx>. Contractors are encouraged to use and keep on file the forms provided as master copies for use on future prevailing wage rate projects.

All of the information in this booklet can be accessed and printed from the Internet at: www.oregon.gov/BOLI

Pursuant to ORS 279C.800 to ORS 279C.870, the prevailing wage rates contained in this booklet have been adopted for use on public works contracts in Oregon.

Required Postings for Prevailing Wage Contractors and Subcontractors

PREVAILING WAGE RATES

Every contractor and subcontractor engaged in work on a public works must post the applicable prevailing wage rates for that project in an obvious place on the worksite so workers have ready access to the information.

DETAILS OF FRINGE BENEFIT PROGRAMS

When a contractor or subcontractor provides or contributes to a health and welfare plan or a pension plan, or both, for employees who are working on a public works project, the details of all fringe benefit plans or programs must be posted on the worksite.

The posting must include a description of the plan or plans, information about how and where claims can be made and where to obtain more information. The notice must be posted in an obvious place on the work site in the same location as the prevailing wage rates.

WORK SCHEDULE

Contractors and subcontractors must give workers the regular work schedule (days of the week and number of hours per day) in writing before beginning work on the project.

Contractors and subcontractors may provide the schedule at the time of hire, prior to starting work on the contract, or by posting the schedule in a location frequented by employees, along with the prevailing wage rate information and any fringe benefit information.

If an employer fails to give written notice of the worker's schedule, the work schedule will be presumed to be a five-day schedule. The schedule may only be changed if the change is intended to be permanent and is not designed to evade the PWR overtime requirements.

*ORS 279C.840(4); OAR 839-025-0033(1). ORS 279C.840(5); OAR 839-025-0033(2).
ORS 279C.540(2); OAR 839-025-0034.*

PUBLIC WORKS BONDS

Every contractor and subcontractor who works on public works projects subject to the prevailing wage rate (PWR) law is required to file a \$30,000 **“PUBLIC WORKS BOND”** with the Construction Contractors’ Board (CCB). This includes flagging and landscaping companies, temporary employment agencies, and sometimes sole proprietors.

The key elements of ORS 279C.830(2) and ORS 279C.836 specify that:

- Specifications for every contract for public works must contain language stating that the contractor and every subcontractor must have a public works bond filed with the CCB before starting work on the project, unless otherwise exempt.
- Every contract awarded by a contracting agency must contain language requiring the contractor:
 - To have a public works bond filed with the CCB before starting work on the project, unless otherwise exempt; and
 - To include in every subcontract a provision requiring the subcontractor to have a public works bond filed with the CCB before starting work on the project unless otherwise exempt
- Every subcontract that a contractor or subcontractor awards in connection with a public works contract between a contractor and a public agency must require any subcontractor to have a public works bond filed with the CCB before starting work on the public works project, unless otherwise exempt.
- Before permitting a subcontractor to start work on a public works project, contractors must first verify their subcontractors either have filed the bond, or have elected not to file a public works bond due to a bona fide exemption.
- The PWR bond is to be used exclusively for unpaid wages determined to be due by the Bureau of Labor & Industries.
- The bond is in effect continuously (you do not have to have one per project).
- A public works bond is in addition to any other required bond the contractor or subcontractor is required to obtain.

Exemptions:

- Allowed for a disadvantaged business enterprise, a minority-owned business, woman-owned business, a business that a service-disabled veteran owns or an emerging small business certified under ORS 200.055, for the first FOUR years of certification;
 - Exempt contractor must still file written verification of certification with the CCB, and give the CCB written notice that they elect not to file a bond.
 - The prime contractor must give written notice to the public agency that they elect not to file a public works bond.
 - Subcontractors must give written notice to the prime contractor that they elect not to file a public works bond.
- For projects with a total project cost of \$100,000 or less, a public works bond is not required. (Note this is the total project cost, not an individual contract amount.)
- Emergency projects, as defined in ORS 279A.010(f).

PREVAILING WAGE RATES

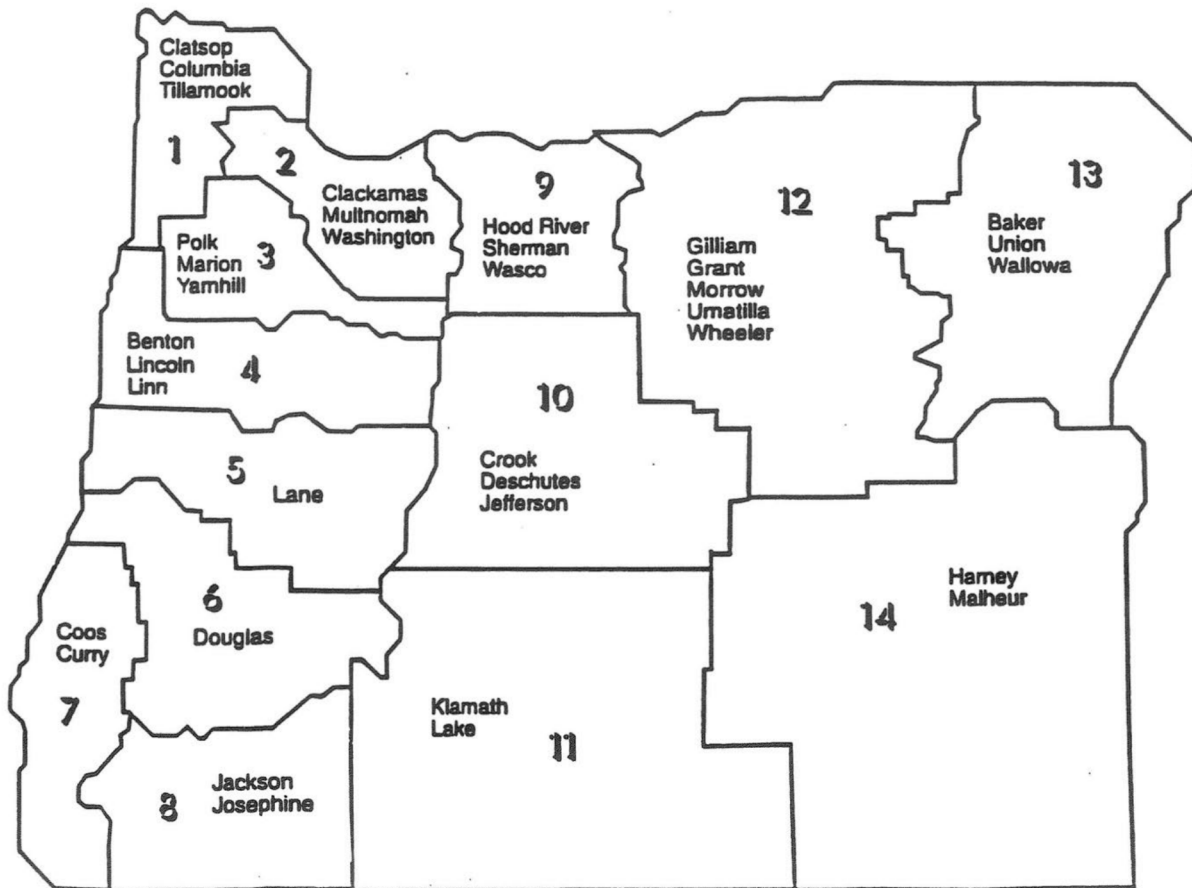
FINDING THE CORRECT PREVAILING WAGE RATE

To find the correct rate(s) required on your public works project, you will need:

- the date the project was first advertised for bid
- the county your project is in
- the duties of workers on the job

Generally, the rate you should look for is based on the date the project was first advertised for bid. (See OAR 839-025-0020(8) for information about projects that contract through a CM/GC, or contract manager/general contractor.)

The Labor Commissioner must establish the prevailing rate of wage for each region as defined in law. (See ORS 279C.800.) Each region is comprised of one to five counties. See below instructions on locating the correct prevailing wage rate for your public works project.



To find the correct rate in this rate book:

1. Determine the duties that are being performed by each worker. Use the booklet Definitions of Covered Occupations to find the definition that most closely matches the actual work performed by the worker. You can find this publication online at <https://www.oregon.gov/boli/employers/Pages/occupational-definitions.aspx>.

2. *Find the correct occupation in the “Prevailing Wage Rate for Public Works Contracts” below.* The prevailing wage rate is made up of an hourly base rate and an hourly fringe rate. The combination of these two amounts must be paid to each worker. Watch for possible zone differential, shift differential, and/or hazard pay. If the occupation lists different rates for different Areas of the state, locate the Area that includes the county where the project is located.

Apprentices must be paid consistent with their registered apprenticeship program standard. You can find apprenticeship rates on our website at <https://www.oregon.gov/boli/employers/Pages/prevailing-wage-rates.aspx>. You may also contact the agency to confirm the correct apprenticeship rate.

The “Prevailing Wage Rate Laws” handbook provides specific information and answers questions regarding prevailing wage laws and is available on our website at <https://www.oregon.gov/boli/employers/Pages/prevailing-wage.aspx>.

If you have any questions about any of this information, please contact the Bureau of Labor & Industries at PWR.Email@boli.oregon.gov or (971) 353-2416.

Prevailing Wage Rates by Occupations—Table of Contents

Using the booklet, Definitions of Covered Occupations, find the definition and group number, if applicable, that most closely matches the actual work being performed by the worker.

<u>Asbestos Worker/Insulator</u>	<u>6</u>
<u>Boilermaker</u>	<u>6</u>
<u>Bricklayer/Stonemason</u>	<u>6</u>
<u>Bridge and Highway Carpenter (See Carpenter Group 5)</u>	<u>6</u>
<u>Carpenter</u>	<u>6</u>
<u>Cement Mason</u>	<u>7</u>
<u>Diver</u>	<u>8</u>
<u>Diver Tender</u>	<u>8</u>
<u>Dredger</u>	<u>9</u>
<u>Drywall, Lather, Acoustical Carpenter & Ceiling Installer</u>	<u>10</u>
<u>Drywall Taper (See Painter & Drywall Taper)</u>	<u>18</u>
<u>Electrician</u>	<u>10</u>
<u>Elevator Constructor, Installer and Mechanic</u>	<u>14</u>
<u>Fence Constructor (Non-Metal)...</u>	<u>14</u>
<u>Fence Erector (Metal)...</u>	<u>14</u>
<u>Flagger (Laborer Group 3)...</u>	<u>15</u>
<u>Glazier</u>	<u>14</u>
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<u>Highway/Parking Striper</u>	<u>15</u>
<u>Ironworker</u>	<u>15</u>
<u>Laborer</u>	<u>15</u>
<u>Landscape Laborer/Technician</u>	<u>16</u>
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<u>Line Constructor</u>	<u>17</u>
<u>Marble Setter</u>	<u>17</u>
<u>Millwright Group 1 (See Carpenter Group 3)</u>	<u>6</u>
<u>Painter & Drywall Taper</u>	<u>17</u>
<u>Piledriver (See Carpenter Group 6)</u>	<u>6</u>
<u>Plasterer and Stucco Mason</u>	<u>18</u>
<u>Plumber/Pipefitter/Steamfitter</u>	<u>19</u>
<u>Power Equipment Operator</u>	<u>20</u>
<u>Rofer</u>	<u>22</u>
<u>Sheet Metal Worker</u>	<u>23</u>
<u>Soft Floor Layer</u>	<u>24</u>
<u>Sprinkler Fitter</u>	<u>25</u>
<u>Tender to Mason Trades (Brick and Stonemason, Mortar Mixer, Hod Carrier)</u>	<u>25</u>
<u>Tender to Plasterer and Stucco Mason</u>	<u>25</u>
<u>Testing and Balancing (TAB) Technician</u>	<u>26</u>
<u>Tile Setter/Terrazzo Worker: Hard Tile Setter</u>	<u>26</u>
<u>Tile, Terrazzo, and Marble Finisher</u>	<u>26</u>
<u>Truck Driver</u>	<u>26</u>

<u>ASBESTOS WORKER/INSULATOR</u>	57.17	22.27
Firestop Containment	42.38	16.19
<u>BOILERMAKER</u>	40.40	31.90
<u>BRICKLAYER/STONEMASON</u>	43.00	24.25

This trade is tended by "Tenders to Mason Trades."

Add \$1.00 per hour to base rate for refractory repair work.

CARPENTER

Zone A (Base Rate)

Group 1	44.80	19.21
Group 2	44.97	19.21
Group 3	50.24	19.21
Group 4		Eliminated
Group 5	45.40	19.21
Group 6	45.74	19.21

Zone Differential for Carpenters

Add to Zone A Base Rate

Zone B	1.25 per hour
Zone C	1.70 per hour
Zone D	2.00 per hour
Zone E	3.00 per hour
Zone F	5.00 per hour
Zone G	10.00 per hour

Zone A: Projects located within 30 miles of the respective city hall of the cities listed. Zone B: More than 30 miles but less than 40 miles.

Zone C: More than 40 miles but less than 50 miles.

Zone D: More than 50 miles but less than 60 miles.

Zone E: More than 60 miles but less than 70 miles.

Zone F: More than 70 miles but less than 100 miles.

Zone G: More than 100 miles.

Reference Cities for Group 1 and 2 Carpenters

Albany	Goldendale	Madras	Roseburg
Astoria	Grants Pass	Medford	Salem
Baker City	Hermiston	Newport	The Dalles
Bend	Hood River	Ontario	Tillamook
Brookings	Klamath Falls	Pendleton	Vancouver
Burns	La Grande	Portland	
Coos Bay	Lakeview	Port Orford	
Eugene	Longview	Reedsport	

See more Reference Cities for Zone Differential on page 7

CARPENTER (continued)

Reference Cities for Group 3 Carpenters

Eugene	Medford	Portland	Vancouver
Longview	North Bend	The Dalles	

Reference Cities for Group 5 and 6 Carpenters

Bend	Longview	North Bend
Eugene	Medford	Portland

Zones for **Group 6** Carpenter are determined by the distance between the project site and **either**

- 1) The worker's residence; **or**
- 2) City Hall of a reference city listed, whichever is closer.

Note: All job or project locations shall be computed (determined) on the basis of road miles and in the following manner. A mileage measurement will start at the entrance to the respective city hall, facing the project (if possible), and shall proceed by the normal route (shortest time--best road via Google Maps) to the geographical center on the highway, railroad, and street construction projects (end of measurement). On all project contracts, the geographical center where the major portion of the construction is located, shall be considered the center of the project (end measurement).

Group 2, 5 and 6:

Welders shall receive a 5% premium per hour based on their Group's journeyman wage rate, with an 8-hour minimum.

Group 1 and 3:

When working with toxic treated wood, workers shall receive \$.25/hour premium pay for minimum of eight (8) hours.

Group 5 and 6:

When working with creosote and other toxic treated wood, workers shall receive \$.25/hour premium pay for minimum of eight (8) hours.

Group 6:

When working in sheet pile coffer dams or cells up to the external water level, workers shall receive \$.15/hour premium pay for minimum of eight (8) hours.

CEMENT MASON

This trade is tended by "Concrete Laborer."

Group 1	39.97	23.00
Group 2	40.81	23.00
Group 3	40.81	23.00
Group 4	41.64	23.00

Zone Differential for Cement Mason

Add to Basic Hourly Rate

Zone A	3.00 per hour
Zone B	5.00 per hour
Zone C	10.00 per hour

Zone A: Projects located 60-79 miles of the respective city hall of the Reference Cities listed below.

Zone B: Projects located 80-99 miles of the respective city hall of the Reference Cities listed below.

Zone C: Projects located 100 or more miles of the respective city hall of the Reference Cities listed below (Page 8).

CEMENT MASON (continued)

Reference Cities for Cement Mason

Bend	Eugene	Pendleton	Salem	Vancouver
Corvallis	Medford	Portland	The Dalles	

When a contractor takes current employees to a project that is located more than 59 miles from the city hall of the Reference City that is closest to the contractor’s place of business, Zone Pay is to be paid for the distance between the city hall of the identified Reference City and the project site.

Note: All miles are to be determined on the basis of road miles using the normal route (shortest time – best road), from the city hall of the Reference City closest to the contractor’s place of business and the project.

DIVER & DIVER TENDER

Zone 1 (Base Rate)

DIVER	95.32	19.21
DIVER TENDER	51.32	19.21

- 1) For those workers who reside within a reference city below, their zone pay shall be computed from the city hall of the city wherein they reside.
- 2) For those workers who reside nearer to a project than is the city hall of any reference city below, the mileage from their residence may be used in computing their zone pay differential.
- 3) The zone pay for all other projects shall be computed from the city hall of the nearest reference city listed below.

Zone Differential for Diver/Diver Tender

Add to Zone 1 Base Rate

Zone 2	1.25 per hour
Zone 3	1.70 per hour
Zone 4	2.00 per hour
Zone 5	3.00 per hour
Zone 6	5.00 per hour
Zone 7	10.00 per hour

- Zone 1: Projects located within 30 miles of city hall of the reference cities listed.
- Zone 2: More than 30 miles, but less than 40 miles.
- Zone 3: More than 40 miles, but less than 50 miles.
- Zone 4: More than 50 miles, but less than 60 miles.
- Zone 5: More than 60 miles, but less than 70 miles.
- Zone 6: More than 70 miles, but less than 100 miles.
- Zone 7: More than 100 miles.

Reference Cities for Diver/Diver Tender

Bend	Longview	North Bend
Eugene	Medford	Portland

See more information on Zone Pay calculation and Diver Depth/Enclosure Pay on Page 9.

DIVER & DIVER TENDER (continued)

Note: All job or project locations shall be computed (determined) on the basis of road miles and in the following manner. A mileage measurement will start at the entrance to the respective city hall, facing the project (if possible), and shall proceed by the normal route (shortest time--best road via Google Maps) to the geographical center on the highway, railroad, and street construction projects (end of measurement). On all project contracts, the geographical center where the major portion of the construction is located, shall be considered the center of the project (end measurement).

Diver Depth Pay:

<u>Depth Below Water Surface (FSW)</u>	<u>Daily Depth Pay</u>
50-100 ft.	\$2.00 per foot over 50 feet
101-150 ft.	\$3.00 per foot over 100 feet
151-220 ft.	\$4.00 per foot over 150 feet
Over 220 ft.	\$5.00 per foot over 220 feet

The actual depth in FSW shall be used in determining depth premium.

Diver Enclosure Pay (working without vertical escape):

<u>Distance Traveled in the Enclosure</u>	<u>Daily Enclosure Pay</u>
0 – 25ft.	N/C
25 – 300 ft.	\$1.00 per foot from the entrance
300 – 600 ft.	\$1.50 per foot beginning at 300 ft.
Over 600 ft.	\$2.00 per foot beginning at 600 ft.

DREDGER

Zone A (Base Rate)

Leverman (Hydraulic & Clamshell)	53.94	16.45
Assistant Engineer (Watch Engineer, Mechanic Machinist)	50.78	16.45
Tenderman (Boatman Attending Dredge Plant), Fireman	49.29	16.45
Fill Equipment Operator	48.12	16.45
Assistant Mate	45.42	16.45

Zone Differential for Dredgers

Add to Zone A Base Rate

Zone B	3.00 per hour
Zone C	6.00 per hour

Zone mileage based on road miles:

- Zone A: Center of jobsite to no more than 30 miles from the city hall of Portland.
- Zone B: More than 30 miles but not more than 60 miles.
- Zone C: Over 60 miles.

DRYWALL, LATHER, ACOUSTICAL CARPENTER & CEILING INSTALLER

Zone 1 (Base Rate)

1. DRYWALL INSTALLER	44.74	18.91
2. LATHER, ACOUSTICAL CARPENTER & CEILING INSTALLER	44.74	18.91

Zone Differential for Lather, Acoustical Carpenter & Ceiling Installer

Zone mileage based on road miles:

Zone B	61-80 miles	6.00 per hour
Zone C	81-100 miles	9.00 per hour
Zone D	101 or more	12.00 per hour

The correct transportation allowance shall be based on AAA road mileage from the City Hall of the transportation reference cities herein listed.

Reference Cities for Drywall, Lather, Acoustical Carpenter & Ceiling Installer

Albany	Bend	Grants Pass	Medford	Portland	Seaside
Astoria	Brookings	Hermiston	Newport	Reedsport	The Dalles
Baker	Coquille	Klamath Falls	North Bend	Roseburg	Tillamook
Bandon	Eugene	Kelso-Longview	Pendleton	Salem	Vancouver

Certified welders shall receive 5% over the base wage rate, with an eight (8) hour minimum.

ELECTRICIAN

Area 1 (Region 14)

Electrician	43.97	19.26
Lighting Maintenance and Material Handler	21.55	10.30

Reference County

Malheur

Shift Differential*

1 st Shift "day"	Between the hours of 8:00am and 4:30pm	8 hours pay for 8 hours work
2 nd Shift "swing"	Between the hours of 4:30pm and 12:30am	8 hours pay for 8 hours work plus 7.5% for all hours worked
3 rd Shift "graveyard"	Between the hours of 12:30am and 8:00am	8 hours pay for 8 hours work plus 15% for all hours worked.

* The Employer shall be permitted to adjust the starting hours of the shift by up to two (2) hours.

See more information on Premium Pay on Page 11.

ELECTRICIAN (continued)

When workers are required to work under compressed air or to work from trusses, scaffolds, swinging scaffolds, bosun’s chair or on building frames, stacks or towers at a distance, the following should be added to base rate.

50 – 90 feet to the ground	Add 1 ½ x the base rate
90+ feet to the ground	Add 2 x the base rate

Pursuant to ORS 279C.815(2)(b), the Electrician Area 6 rate is the highest rate of wage among the collective bargaining agreements for Electrician Areas 1 and 6.

Area 2 (Regions 12 and 13)

Electrician	51.75	24.18
Cable Splicer	54.34	24.26
Certified Welder	56.93	24.34
Material Handler	31.05	13.06

Reference Counties

Baker	Grant	Umatilla	Wallowa
Gilliam	Morrow	Union	Wheeler

Add 50% of the base rate when workers are required to work under the following conditions:

- 1) Under compressed air with atmospheric pressure exceeding normal pressure by at least 10%.
- 2) From trusses, swing scaffolds, bosun’s chairs, open platforms, unguarded scaffolds, open ladders, frames, tanks, stacks, silos and towers where the workman is subject to a direct fall of (a) more than 60 feet or (b) into turbulent water under bridges, powerhouses or spillway faces of dams.

Area 3 (Regions 4, 5, 6 and 7)

Electrician	48.58	23.20
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Reference Counties

Coos	Curry	Douglas
Lane – See Area 4	Lincoln – See Area 4	

Shift Differential*

1 st Shift “day”	Between the hours of 8:00am and 4:30pm	8 hours pay for 8 hours work
2 nd Shift “swing”	Between the hours of 4:30pm and 1:00am	8 hours pay for 8 hours work plus 17% for all hours worked
3 rd Shift “graveyard”	Between the hours of 12:30am and 9:00am	8 hours pay for 8 hours work plus 31% for all hours worked.

* The Employer shall be permitted to adjust the starting hours of the shift by up to two (2) hours.

See more information on Premium Pay on Page 12.

ELECTRICIAN (continued)

When workers are required to work under compressed air or where gas masks are required, or to work from trusses, all scaffolds including mobile elevated platforms, any temporary structure, bosun’s chair or on frames, stacks, towers, tanks, within 15’ of the leading edges of any building at a distance of:

- 50 – 75 feet to the ground Add 1 ½ x the base rate
- 75+ feet to the ground Add 2 x the base rate

High Time is not required to be paid on any permanent structure with permanent adequate safeguards (handrails, mid-rails, and toe guards). Any vehicle equipped with outriggers are exempted from this section.

Area 4 (Regions 3, 4, 5, and 10)

Electrician	51.67	20.58
Cable Splicer	56.84	20.74
Lighting Maintenance/Material Handler	24.29	10.38

Reference Counties for Area 4

Benton	Deschutes	Lane	Lincoln
Crook	Jefferson	Linn	
Marion – See Area 5 rate	Polk – See Area 5 rate	Yamhill – See Area 5 rate	

Shift Differential*

1 st Shift “day”	Between the hours of 8:00am and 4:30pm	8 hours pay for 8 hours work
2 nd Shift “swing”	Between the hours of 4:30pm and 1:00am	8 hours pay for 8 hours work plus 17% for all hours worked
3 rd Shift “graveyard”	Between the hours of 12:30am and 9:00am	8 hours pay for 8 hours work plus 31.4% for all hours worked.

* The Employer shall be permitted to adjust the starting hours of the shift by up to two (2) hours.

Area 5 (Regions 1, 2, 3 and 9)

Electrician	57.35	28.94
Electrical Welder	63.09	29.11
Material Handler/Lighting Maintenance	32.69	19.45

Reference Counties

Clackamas	Hood River	Polk	Wasco
Clatsop	Marion	Sherman	Washington
Columbia	Multnomah	Tillamook	Yamhill

See more information on Shift Differentials and Zone Pay on Page 13.

ELECTRICIAN (continued)

Shift Differential*

1 st Shift “day”	Between the hours of 7:00am and 5:30pm	8 hours pay for 8 hours work
2 nd Shift “swing”	Between the hours of 4:30pm and 3:00am	8 hours pay for 8 hours work plus 17.3% for all hours worked
3 rd Shift “graveyard”	Between the hours of 12:30am and 11:00am	8 hours pay for 8 hours work plus 31.4% for all hours worked.

* The Employer shall be permitted to adjust the starting hours of the shift by up to two (2) hours.

Zone Pay for Area 5 – Electrician and Electrical Welder

Add to Basic Hourly Rate

Zone mileage based on air miles:

Zone 1	31-50 miles	1.50 per hour
Zone 2	51-70 miles	3.50 per hour
Zone 3	71-90 miles	5.50 per hour
Zone 4	Beyond 90	9.00 per hour

There shall be a 30-mile free zone from downtown Portland City Hall and a similar 15-mile free zone around the following cities:

Astoria	Seaside	Tillamook
Hood River	The Dalles	

Further, the free zone at the Oregon coast shall extend along Hwy 101 west to the ocean Hwy 101 east 10 miles if not already covered by the above 15-mile free zone.

Area 6 (Regions 6, 8, 11 and 14)

Electrician	43.97	19.26
Lighting Maintenance and Material Handler	21.55	10.30

Reference Counties

Harney	Josephine	Lake
Jackson	Klamath	Malheur

Douglas – **See Area 3 rate**

Shift Differential

1 st Shift “day”	Between the hours of 8:00am and 4:30pm	8 hours pay for 8 hours work
2 nd Shift “swing”	Between the hours of 4:30pm and 1:00am	8 hours pay for 8 hours work plus 7.5% for all hours worked
3 rd Shift “graveyard”	Between the hours of 12:30am and 9:00am	8 hours pay for 8 hours work plus 15% for all hours worked.

* The Employer shall be permitted to adjust the starting hours of the shift by up to two (2) hours.

ELECTRICIAN (continued)

When workers are required to work under compressed air or to work from trusses, scaffolds, swinging scaffolds, bosun's chair or on building frames, stacks or towers at a distance, the following should be added to base rate.

50 – 90 feet to the ground Add 1 ½ x the base rate
 90+ feet to the ground Add 2 x the base rate

ELEVATOR CONSTRUCTOR, INSTALLER AND MECHANIC

Area 1 (Regions 12 and 13)

Mechanic **62.25 42.32**

Reference Counties

Baker Union Wallowa

Umatilla – **See Area 2 rate**

Area 2 (Regions 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, and 14)

Mechanic **62.51 42.34**

Reference Counties

Benton	Douglas	Klamath	Multnomah	Deschutes
Clackamas	Gilliam	Lake	Polk	Josephine
Clatsop	Grant	Lane	Sherman	Morrow
Columbia	Harney	Lincoln	Tillamook	Wheeler
Coos	Hood River	Linn	Umatilla	Yamhill
Crook	Jackson	Malheur	Wasco	
Curry	Jefferson	Marion	Washington	

FENCE CONSTRUCTOR (NON-METAL) **34.98 16.55**

FENCE ERECTOR (METAL) **34.98 16.55**

GLAZIER **45.82 25.40**

Add \$1.00 to base rate when employee works from a swing stage, scaffold, suspended contrivance or mechanical apparatus from the third floor up or thirty feet of free fall (whichever is less), and employee is required to wear a safety belt.

Add twenty percent (20%) to base rate when employee works from a bosun chair (non-motorized single-man apparatus), regardless of height.

Certified welders shall receive twenty percent (20%) above the base rate for actual time spent performing welding duties.

HAZARDOUS MATERIALS HANDLER **29.03 15.18**

HIGHWAY/PARKING STRIPER

38.18 15.08

Shift Differential

Add \$1.85/hour to base rate for shifts that start between 3:00pm and 4:00am.

IRONWORKER

Zone 1 (Base Rate):

42.27 32.53

Zone Differential for Ironworker

Add to Basic Hourly Rate

- Zone 2 **6.88/hr.** or \$55.00 maximum per day
- Zone 3 **10.00/hr.** or \$80.00 maximum per day
- Zone 4 **12.50/hr.** or \$100.00 maximum per day

Zone 1: Projects located within 45 miles of city hall in the reference cities listed below.

Zone 2: More than 46 miles, but less than 60 miles.

Zone 3: More than 61 miles, but less than 100 miles.

Zone 4: More than 100 miles.

Note: Zone pay for Ironworkers shall be determined using the quickest route per Google Maps and computed from the city hall or dispatch center of the reference cities listed below **or** the residence of the employee, whichever is nearer to the project.

Reference Cities and Dispatch Center

Medford Portland

LABORER

Zone A (Base Rate):

Group 1	34.98	16.55
Group 2	36.25	16.55
Group 3 (Flagger)	30.38	16.55
Group 4 (Landscape Laborer)	24.17	16.55

Zone Differential for Laborers

Add to Zone A Base Rate

- Zone B **.85** per hour
- Zone C **1.25** per hour
- Zone D **2.00** per hour
- Zone E **4.00** per hour
- Zone F **5.00** per hour

Zone A: Projects located within 30 miles of city hall in the reference cities listed.

Zone B: More than 30 miles but less than 40 miles.

Zone C: More than 40 miles but less than 50 miles.

Zone D: More than 50 miles but less than 80 miles.

Zone E: More than 80 miles but less than 100 miles.

Zone F: More than 100 miles.

See Reference Cities for Zone Differentials on Page 16.

LABORER (continued)

Reference Cities for Laborer

Albany	Burns	Hermiston	Roseburg
Astoria	Coos Bay	Klamath Falls	Salem
Baker City	Eugene	Medford	The Dalles
Bend	Grants Pass	Portland	

Note: All job or project locations shall be computed (determined) on the basis of road miles and in the following manner. A mileage measurement will start at the entrance to the respective city hall, facing the project (if possible), and shall proceed by the normal route (shortest time, best road) to the geographical center on the highway, railroad, and street construction projects (end of measurement). On all other project contracts, the geographical center where the major portion of the construction is located, shall be considered the center of the project (end measurement).

Any Laborer working in Live Sewers shall receive forty dollars (\$40) per day in addition to their regular pay.

LANDSCAPE LABORER/TECHNICIAN (Laborer Group 4) **24.17** **16.55**

LIMITED ENERGY ELECTRICIAN

Area 1 (Region 14) **33.76** **17.24**

Reference County

Malheur

Pursuant to ORS 279C.815(2)(b), the Limited Energy Electrician Area 6 rate is the highest rate of wage among the collective bargaining agreements for Limited Energy Electrician Areas 1 and 6.

Area 2 (Regions 12 and 13) **34.51** **16.04**

Reference Counties

Baker	Grant	Umatilla	Wallowa
Gilliam	Morrow	Union	Wheeler

Area 3 (Regions 4, 5, 6 and 7) **38.86** **20.81**

Reference Counties

Benton	Curry	Lane	Linn
Coos	Douglas	Lincoln	

Area 4 (Regions 3, 4, 5 and 10) **38.44** **17.62**

Reference Counties

Deschutes	Jefferson
Crook	

Benton – See Area 3 rate	Linn – See Area 3 rate	Polk – See Area 5 rate
Lane – See Area 3 rate	Marion – See Area 5 rate	Yamhill – See Area 5 rate

LIMITED ENERGY ELECTRICIAN (continued)

Area 5 (Regions 1, 2, 3 and 9) **47.66** **22.97**

Reference Counties

Clackamas	Hood River	Polk	Wasco
Clatsop	Marion	Sherman	Washington
Columbia	Multnomah	Tillamook	Yamhill

Area 6 (Regions 6, 8, 11 and 14) **33.76** **17.24**

Reference Counties

Harney	Josephine	Lake
Jackson	Klamath	Malheur

Douglas – See Area 3 rate

LINE CONSTRUCTOR

Area 1 (All Regions)

Group 1	64.58	24.31
Group 2	57.66	23.99
Group 3	35.58	15.44
Group 4	49.59	20.43
Group 5	43.25	17.50
Group 6	35.75	17.16
Group 7	20.71	12.56

Reference Counties

All counties

Pursuant to ORS 279C.815(2)(b), the Line Constructor Area 1 rate is the highest rate of wage among the collective bargaining agreements for Line Constructor Area 1 and Area 2.

MARBLE SETTER **44.00** **24.25**

This trade is tendered by “Tile, Terrazzo, & Marble Finishers.”

Add \$1.00 per hour to base rate for refractory repair work.

PAINTER & DRYWALL TAPER

COMMERCIAL PAINTING	30.72	14.18
INDUSTRIAL PAINTING	32.52	14.18
BRIDGE PAINTING	38.19	14.18

Shift Differential for Painter

Add \$2.00/hour to base rate for entire shift if any hours are worked outside of 5:00 a.m. to 5:00 p.m.

PAINTER & DRYWALL TAPER (continued)

DRYWALL TAPER

Zone A (Base Rate) **42.52** **19.13**

Zone Differential for Drywall Taper Add to Zone A Base Rate

Zone B **6.00** per hour
Zone C **9.00** per hour
Zone D **12.00** per hour

Dispatch Cities for Drywall Taper

Albany	Bend	Grants Pass	Medford	Portland	Seaside
Astoria	Brookings	Hermiston	Newport	Reedsport	The Dalles
Baker	Coquille	Klamath Falls	North Bend	Roseburg	Tillamook
Bandon	Eugene	Kelso-Longview	Pendleton	Salem	Vancouver

Zone A: Projects located less than 61 miles of the respective city hall of the dispatch cities listed.
Zone B: Projects located 61 miles to 80 miles.
Zone C: Projects located 81 miles to 100 miles.
Zone D: Projects located 101 miles or more.

Note: Zone pay is based on AAA Road Mileage.

PLASTERER AND STUCCO MASON

This trade is tended by "Tenders to Plasterers."

Zone A (Base Rate) **41.16** **19.23**

Zone Differential for Plasterer and Stucco Mason Add to Zone A Base Rate

Zone B **6.00** per hour
Zone C **9.00** per hour
Zone D **12.00** per hour

Zone A: Projects located less than 61 miles of the respective city hall of the reference cities listed below.
Zone B: Projects located 61 miles to 80 miles.
Zone C: Projects located 81 miles to 100 miles.
Zone D: Projects located 101 miles or more.

Reference Cities for Plasterer & Stucco Mason

Bend	Eugene	Medford	Portland	Seaside
Coos Bay	La Grande	Newport	Salem	The Dalles

Add \$1.00 to base rate for swinging scaffold work.

Add \$2.00 to base rate for nozzle technicians on plastering machines.

PLUMBER/PIPEFITTER/STEAMFITTER

Area 1 (Regions 13 and 14)

34.00

17.07

Reference Counties

Harney Malheur

Baker – **See Area 2 rates**

Zone Differential for Area 1

Add to Base Rate

- Zone 1 **2.50** per hour
- Zone 2 **3.50** per hour
- Zone 3 **5.00** per hour

Zone mileage based on road miles:

Zone 1: Forty (40) to fifty five (55) miles from City Hall in Boise, Idaho.

Zone 2: Fifty five (55) to one hundred (100) miles from City Hall in Boise, Idaho.

Zone 3: Over one hundred (100) miles from City Hall in Boise, Idaho.

Add \$2.21 to base rate if it is possible for worker to fall 30 ft. or more, or if required to wear a fresh-air mask or similar equipment for 2 hours or more.

Area 2 (Regions 12 and 13)

54.00

34.11

Reference Counties

Baker	Grant	Umatilla	Wallowa
Gilliam	Morrow	Union	Wheeler

Zone Differential for Area 2

Add to Base Rate

Zone 2 **10.62/hr.** not to exceed \$80.00 day.

Zone 2: Eighty (80) miles or more from City Hall in Pasco, Washington.

Zone mileage based on road miles:

Add \$1.00 to base rate in one-hour minimum increments if it is possible for worker to fall 35 ft. or more.

Add \$1.00 to base rate in one-hour minimum increments if worker is required to wear a mask in hazardous areas.

Area 3 (Regions 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12)

50.68

35.00

Reference Counties

Benton	Deschutes	Lake	Sherman
Clackamas	Douglas	Lane	Tillamook
Clatsop	Hood River	Lincoln	Wasco
Columbia	Jackson	Linn	Washington
Coos	Jefferson	Marion	Yamhill
Crook	Josephine	Multnomah	
Curry	Klamath	Polk	

Gilliam – **See Area 2 rate**

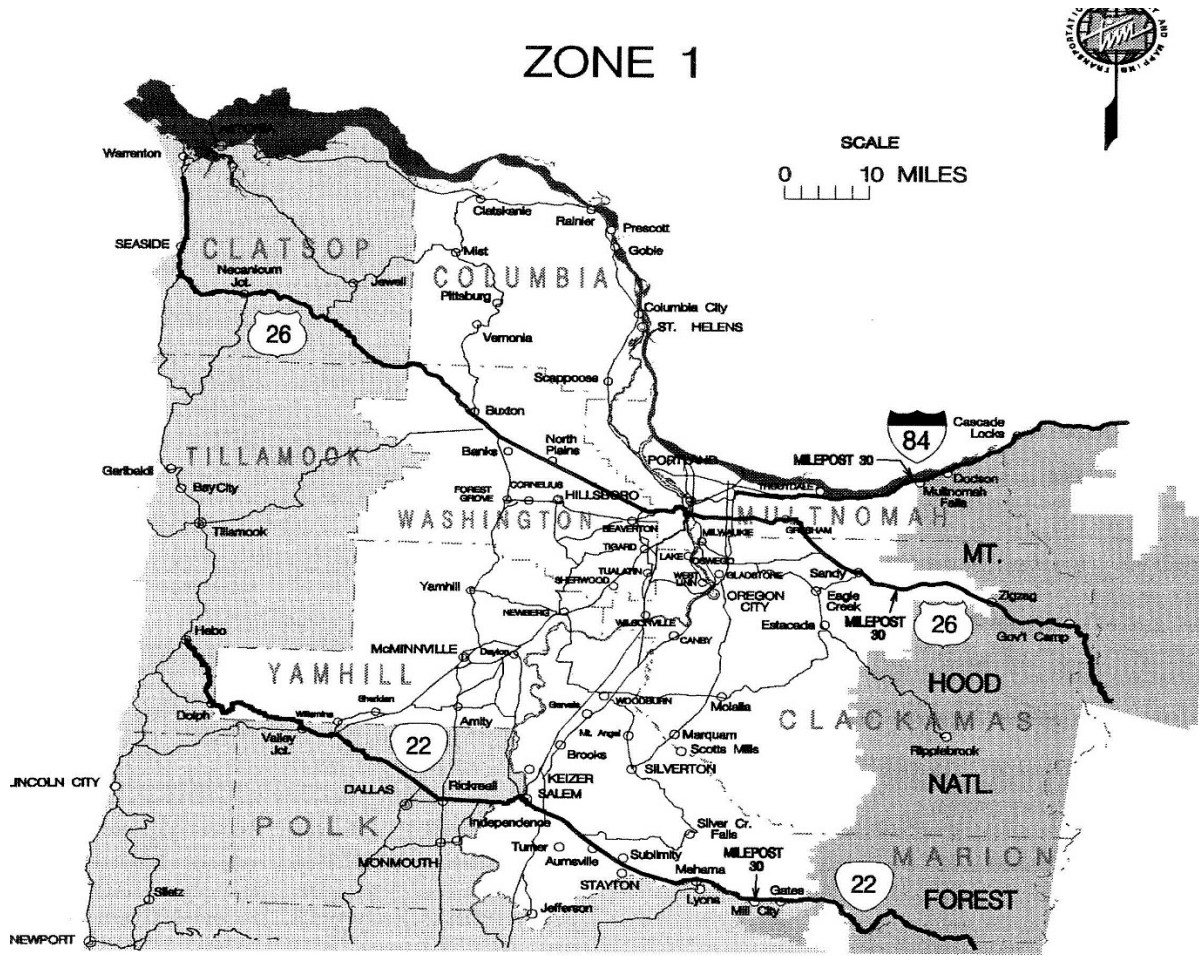
Wheeler – **See Area 2 rate**

POWER EQUIPMENT OPERATOR

Zone 1 (Base Rate)

Group 1	54.13	18.15
Group 1A	56.29	18.15
Group 1B	58.45	18.15
Group 2	52.22	18.15
Group 3	51.07	18.15
Group 4	47.74	18.15
Group 5	46.50	18.15
Group 6	43.28	18.15

POWER EQUIPMENT OPERATOR MAP



Zone Pay Differential for Power Equipment Operator
Add to Zone 1 Base Rate

Zone 2	3.00 per hour
Zone 3	6.00 per hour

For projects in the following metropolitan counties:

- | | | |
|-----------|-----------|------------|
| Clackamas | Marion | Washington |
| Columbia | Multnomah | Yamhill |

POWER EQUIPMENT OPERATOR (continued)

- (A) All jobs or projects located in Multnomah, Clackamas and Marion counties, West of the western boundary of Mt. Hood National Forest and West of Mile Post 30 on Interstate 84 and West of Mile Post 30 on State Hwy 26 and West of Mile Post 30 on Hwy 22 and all jobs located in Yamhill County, Washington County and Columbia County shall receive Zone 1 pay for all classifications.
- (B) All jobs or projects located in the area outside the *identified boundary* above, but less than 50 miles from the Portland City Hall shall receive Zone 2 pay for all classifications.
- (C) All jobs or projects located more than 50 miles from the Portland City Hall, but outside the identified border above, shall receive Zone 3 pay for all classifications.

Reference cities for projects in all remaining counties:

Albany	Coos Bay	Grants Pass	Medford
Bend	Eugene	Klamath Falls	Roseburg

- (A) All jobs or projects located within 30 miles of the respective city hall of the above mentioned cities shall receive Zone 1 pay for all classifications.
- (B) All jobs or projects located more than 30 miles and less than 50 miles from the respective city hall of the above mentioned cities shall receive Zone 2 for all classifications.
- (C) All jobs or projects located more than 50 miles from the respective city hall of the above mentioned cities shall receive Zone 3 pay for all classifications.

Note: All job or project locations shall be computed (determined) on the basis of road miles and in the following manner. A mileage measurement will start at the entrance to the respective city hall, facing the project (if possible), and shall proceed by the normal route (shortest time-best road) to the geographical center on the highway, railroad, and street construction projects (end of measurement). On all other project contracts, the geographical center where the major portion of the construction is located, shall be considered the center of the project (end measurement).

Add \$10.00/hour hyperbaric pay for Group 4 Tunnel Boring Machine Mechanic.

Add \$0.40 to the base rate for any and all work performed underground, including operating, servicing and repairing of equipment.

Add \$0.50 to the base rate per hour for any employee who works suspended by a rope or cable.

Add \$0.50 to the base rate for employees who do "pioneer" work (break open a cut, build road, etc.) more than one hundred fifty (150) feet above grade elevation.

Note: A Hazardous Waste Removal Differential must be added to the base rate if work is performed inside the boundary of a Federally Designated Waste Site. For information on this differential, call the Prevailing Wage Rate Coordinator at (971) 353-2416.

Shift Differential

Two-Shift Operations:

On a two-shift operation, when the second shift starts after 4:30 p.m., second-shift workers shall be paid the base hourly wage rate plus 5% for all hours worked.

When the second shift starts at 8:00 p.m. or later, the second-shift workers shall be paid at the base hourly wage rate plus 10% for all hours worked.

See more information on Shift Differentials on Page 22.

POWER EQUIPMENT OPERATOR (continued)

Three-Shift Operations:

On a three-shift operation, the base hourly wage rate plus five percent (5%) shall be paid to all second-shift workers for all hours worked, and the base hourly wage rate plus ten percent (10%) shall be paid to all third shift workers for all hours worked.

ROOFER

Area 1 (Regions 1, 2, 9, 10, 12 and 13)

38.78

20.48

Reference Counties

Baker	Deschutes	Morrow	Union
Clackamas	Gilliam	Multnomah	Wasco
Clatsop	Grant	Sherman	Wallowa
Columbia	Hood River	Tillamook	Washington
Crook	Jefferson	Umatilla	Wheeler

Add 10% to the base rate for handling coal tar pitch or coal tar-based materials.

Add 10% to the base rate for handling fiberglass insulation.

Area 2 (Regions 3, 4, 5, 6, 7, 8, 10, 11 and 14)

32.55

18.65

Reference Counties

Benton	Harney	Lake	Malheur
Coos	Jackson	Lane	Marion
Curry	Josephine	Lincoln	Polk
Douglas	Klamath	Linn	Yamhill

Crook – **See Area 1 rates** Deschutes – **See Area 1 rates**

Add \$2.00 to the base rate for handling coal tar products.

Add \$1.50 to the base rate for handling fiberglass insulation.

Area 4 (Regions 12 and 13)

38.78

20.48

Reference Counties

Umatilla	Union	Wallowa
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Pursuant to ORS 279C.815(2)(b), the Roofer Area 1 rate is the highest rate of wage among the collective bargaining agreements for Roofer Areas 1, 4 and 5.

Add 10% to the base rate for handling coal tar pitch or coal tar-based materials.

Add 10% to the base rate for handling fiberglass insulation.

ROOFER (Continued)

Area 5 (Region 12) **38.78** **20.48**

Reference County

Morrow

Pursuant to ORS 279C.815(2)(b), the Roofer Area 1 rate is the highest rate of wage among the collective bargaining agreements for Roofer Areas 1, 4 and 5.

Add 10% to the base rate for handling coal tar pitch or coal tar-based materials.

Add 10% to the base rate for handling fiberglass insulation.

SHEET METAL WORKER

Area 1 (Regions 1, 2, 3, 4, 9 and 12) **45.80** **25.46**

Reference Counties

Benton	Grant	Morrow	Umatilla
Clackamas	Hood River	Multnomah	Wasco
Clatsop	Lincoln	Polk	Washington
Columbia	Linn	Sherman	Wheeler
Gilliam	Marion	Tillamook	Yamhill

Add \$1.00 to base rate for work performed on any swinging platform, swinging chair or swinging ladder.

Add \$1.00 to base rate for work where a worker is exposed to resins, chemicals or acid.

Area 2 (Regions 13 and 14) ----- -----

Reference Counties

Baker – **See Area 3 rate** Malheur – **See Area 6 rate**

Area 3 (Regions 12 and 13) **44.09** **25.28**

Reference Counties

Baker	Union	Wallowa
Morrow – See Area 1 rate	Umatilla – See Area 1 rate	

Add \$.45 to base rate for work performed on any swinging stage, swinging scaffold or boson chair in excess of thirty (30) feet above the ground.

Add \$1.00 to base rate for work where it is necessary to wear a chemically activated type face mask.

SHEET METAL WORKER (continued)

Area 4 (Regions 5 and 6) **37.78** **22.72**

Reference Counties

Douglas Lane

Add \$1.00 to base rate for work performed on any swinging platform, swinging chair or swinging ladder.

Add \$1.00 to base rate for work where a worker is exposed to resins, chemicals or acid.

Area 5 (Region 7) **38.14** **23.76**

Reference Counties

Coos Curry

Add \$1.00 to base rate for work performed on any swinging platform, swinging chair or swinging ladder.

Add \$1.00 to base rate for work where a worker is exposed to resins, chemicals or acid.

Area 6 (Regions 7, 8, 11 and 14) **32.12** **21.39**

Reference Counties

Harney Josephine Lake
Jackson Klamath Malheur

Curry – **See Area 5 rate**

Add \$1.00 to base rate for work performed on any swinging platform, swinging chair or swinging ladder.

Add \$1.00 to base rate for work where a worker is exposed to resins, chemicals or acid.

Area 7 (Region 10) **35.36** **21.31**

Reference Counties

Crook Deschutes Jefferson

Add \$1.00 to base rate for work performed on any swinging platform, swinging chair or swinging ladder.

Add \$1.00 to base rate for work where a worker is exposed to resins, chemicals or acid.

SOFT FLOOR LAYER **37.23** **18.17**

SPRINKLER FITTER

Area 1 (Regions 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, and 14)

44.13 25.84

Reference Counties

Benton	Douglas	Klamath	Multnomah
Clackamas	Gilliam	Lake	Polk
Clatsop	Grant	Lane	Sherman
Columbia	Harney	Lincoln	Tillamook
Coos	Hood River	Linn	Umatilla
Crook	Jackson	Malheur	Wasco
Curry	Jefferson	Marion	Washington
Deschutes	Josephine	Morrow	Wheeler
			Yamhill

Area 2 (Regions 12, 13, 14)

37.81 25.84

Reference Counties

Baker	Union	Wallowa	
Gilliam – See Area 1 rate	Malheur – See Area 1 rate	Umatilla – See Area 1 rate	
Grant – See Area 1 rate	Morrow – See Area 1 rate		

TENDER TO MASON TRADES (Brick and Stonemason, Mortar Mixer, Hod Carrier)

38.79 16.55

Add \$0.50 to base rate for refractory repair work.

TENDER TO PLASTERER AND STUCCO MASON

Zone A (Base Rate)

37.62 16.55

Zone Differential for Tender to Plasterer and Stucco Mason

Add to Zone A Base Rate

Zone B	6.00 per hour
Zone C	9.00 per hour
Zone D	12.00 per hour

- Zone A: Projects located within 60 miles of city hall in the reference cities listed.
- Zone B: More than 61 miles but less than 80 miles.
- Zone C: More than 81 miles but less than 100 miles.
- Zone D: More than 101 miles

Reference Cities

Bend	Eugene	Medford	Portland	Seaside
Coos Bay	La Grande	Newport	Salem	The Dalles

Add \$0.50 to base rate for refractory repair work.

TESTING AND BALANCING (TAB) TECHNICIAN

For work performed under the [Sheet Metal](#) classification, including Air-Handling Equipment, Ductwork

See [SHEET METAL WORKER RATE](#)

For work performed under the [Plumber/Pipefitter/Steamfitter](#) classification, including Water Distribution Systems

See [PLUMBER/PIPEFITTER/STEAMFITTER RATE](#)

TILE SETTER/TERRAZZO WORKER: Hard Tile Setter **37.65** **20.83**

This trade is tended by "Tile, Terrazzo, & Marble Finisher."

Add \$1.00 when performing terrazzo work.

Add \$1.00 when working with epoxy, furnane, or alkox acetylene.

TILE, TERRAZZO, AND MARBLE FINISHER

1. TILE, TERRAZZO FINISHER **28.29** **15.30**

Add \$1.00 when performing terrazzo work.

Add \$1.00 when working with epoxy, furnane, or alkox acetylene.

2. BRICK & MARBLE FINISHER **28.29** **15.43**

Add \$1.00 per hour to base rate for refractory repair work.

TRUCK DRIVER

Zone A (Base Rate)

Group 1	30.09	16.73
Group 2	30.23	16.73
Group 3	30.37	16.73
Group 4	30.67	16.73
Group 5	30.91	16.73
Group 6	31.10	16.73
Group 7	31.32	16.73

Zone differential for Truck Drivers

Add to Zone A Base Rate

Zone B	.65 per hour
Zone C	1.15 per hour
Zone D	1.70 per hour
Zone E	2.75 per hour

See more information on Zone Differentials on Page 27.

TRUCK DRIVER (Continued)

Zone A: Projects within 30 miles of the cities listed.
Zone B: More than 30 miles but less than 40 miles.
Zone C: More than 40 miles but less than 50 miles.
Zone D: More than 50 miles but less than 80 miles.
Zone E: More than 80 miles.

Reference Cities

Albany	Burns	Hermiston	Madras	Oregon City	Roseburg
Astoria	Coos Bay	Hood River	Medford	Pendleton	Salem
Baker	Corvallis	Klamath Falls	McMinnville	Portland	The Dalles
Bend	Eugene	La Grande	Newport	Port Orford	Tillamook
Bingen	Goldendale	Lakeview	Ontario	Reedsport	Vancouver
Brookings	Grants Pass	Longview			

Note: All job or project locations shall be computed (determined) on the basis of road miles and in the following manner. A mileage measurement will start at the entrance to the respective city hall, facing the project (if possible), and shall proceed by the normal route (shortest time-best road) to the geographical center on the highway, railroad, and street construction projects (end of measurement). On all other project contracts, the geographical center where the major portion of the construction is located, shall be considered the center of the project (end measurement).

**LIST OF CONTRACTORS INELIGIBLE
TO RECEIVE PUBLIC WORKS CONTRACTS
PUBLICATION DATE: JANUARY 5, 2023**

To: All Oregon Contracting Agencies

Pursuant to ORS 279C.860, contractors on this list are ineligible to receive public works contracts subject to the Prevailing Wage Rate Law. These contractors and subcontractors, as well as any firm, corporation, partnership or association in which the contractor or subcontractor has a financial interest are ineligible to receive public works contracts until removed from this list. You can find the most current and up to date list of contractors ineligible to receive public works contracts on our website at <https://www.oregon.gov/boli/employers/Pages/pwr-ineligible-contractors.aspx>.

If you have questions regarding the list or for the most current information regarding persons ineligible to receive prevailing wage contracts, please contact the Prevailing Wage Rate Coordinator in Portland at (971) 353-2416.

	<u>CONTRACTOR NAME</u>	<u>DATE PLACED</u>	<u>REMOVAL DATE</u>
1.	A1 Dumptruck Services LLC 703 N Hayden Meadows Dr., #206 Portland, OR 97213 731 N Hayden Meadows Dr., #206 Portland, OR 97217 2408 NE 164 th Avenue Vancouver, WA 98684	February 24, 2020	February 23, 2027
2.	Advanced Flagging & Pilot Car Inc. 16400 NE Las Brisas Ct., Apt. 43 Portland, OR 97230 650 NE Holladay St. Portland, OR 97232 16400 NE Las Brisas Ct. Portland, OR 97230	February 5, 2021	February 4, 2024
3.	Barker, Michael 32966 Tennessee Road Lebanon, OR 97355	January 5, 2021	January 4, 2024
4.	Bell-Eddy, Kimberly 8535 Woodard Ave. SE Salem, OR 97317	January 12, 2016	January 11, 2023
5.	Cameron Creations Steven Cameron Nancy Cameron PO Box 2 Lowell, OR 97452	May 25, 2000	Not to be Removed
6.	Canell's Flagging LLC 731 N Hayden Meadows Dr., Ste 107 Portland, OR 97217	November 24, 2020	November 23, 2023
7.	Canell, Angela 2416 NE 11 th Avenue Portland, OR 97212 529 SE Grand #307 Portland, OR 97214	November 24, 2020	November 23, 2023
8.	CJ Construction, Inc. 2969 Ferguson St NW Salem, OR 97304 846 55 th Ave. Salem, OR 97304	December 11, 2020	November 6, 2023

**LIST OF CONTRACTORS INELIGIBLE
TO RECEIVE PUBLIC WORKS CONTRACTS
PUBLICATION DATE: JANUARY 5, 2023**

	<u>CONTRACTOR NAME</u>	<u>DATE PLACED</u>	<u>REMOVAL DATE</u>
9.	Covington, Timothy aka Tim York 16055 NE Stanton St. Portland, OR 97230 2933 NE 11 th Ave. Portland, OR 97212 12231 NE Stanton St. Portland, OR 97230	April 13, 2021	April 12, 2024
10.	Diversified Masonry LLC PO Box 144 Ranchester, WY 82839	January 5, 2021	January 4, 2024
11.	Friedman, Jennifer 2526 Ellen Lane NW Salem, OR 97304 4400 Shaw St NW Salem, OR 97304 4400 Salem-Dallas Hwy Salem, OR 97304 PO Box 5172 Salem, OR 97304	December 11, 2020	October 10, 2023
12.	Friedman, Scott 2969 Ferguson St NW Salem, OR 97304 4400 Dallas Hwy Salem, OR 97304 PO Box 5172 Salem, OR 97304	December 11, 2020	October 10, 2023
13.	Graeme, Eugene 169 SE Cody Lane Madras, OR 97741	July 3, 2017	July 2, 2027
14.	Green Thumb Landscape and Maintenance, Inc., aka Green Thumb Landscaping, aka GT General Contracting 4400 Dallas Hwy Salem, OR 97304 PO Box 5172 Salem, OR 97304	December 11, 2020	October 10, 2023
15.	Green Thumb LLC, aka Green Thumb Contracting 4400 Salem-Dallas Hwy Salem, OR 97304 4400 Shaw St NW Salem, OR 97304 PO Box 5172 Salem, OR 97304	December 11, 2020	October 10, 2023
16.	High-N-Shine Concrete Floors 9024 Silver Star Ave. Vancouver, WA 98664	February 3, 2020	February 2, 2023

**LIST OF CONTRACTORS INELIGIBLE
TO RECEIVE PUBLIC WORKS CONTRACTS
PUBLICATION DATE: JANUARY 5, 2023**

	<u>CONTRACTOR NAME</u>	<u>DATE PLACED</u>	<u>REMOVAL DATE</u>
17.	Hoang, Lisa aka Kim Lien Hoang, aka Lien Kim Hoang, aka Kim Hope, aka Lisa K Ryan, aka Ryan Lien Hoang, aka Kim L Hoang, aka Lien Hoang Ryan, aka Lien K Hoang-Ryan, aka Hoang K Lien, aka Lisa Hall, aka Lisa Kim Ryan, aka Lien Ryan, aka Lien Hoang Ryan, aka Kim Hoang Lien, aka K Lisa Hoang 703 N Hayden Meadows Dr, #206 Portland, OR 97213 731 N Hayden Meadows Dr, #206 Portland, OR 97217 2408 NE 164 th Avenue Vancouver, WA 98684	February 24, 2020	February 23, 2027
18.	Ingram, Christina 2676 Copeland Road Harper, Oregon 97906	May 6, 2022	May 5, 2025
19.	Ingram, Tyrell 2676 Copeland Road Harper, Oregon 97906	May 6, 2022	May 5, 2025
20.	Kim Bell Flagging, Inc. 8535 Woodard Ave. SE Salem, OR 97317	January 12, 2016	January 11, 2023
21.	Miller, David 731 NW Naito Parkway, #215 Portland, OR 97209	June 17, 2020	Not to be Removed
22.	Nam, Sang In dba Cornerstone Janitorial Services 130 NE Danbury Ave. Hillsboro, OR 97124	September 20, 2016	Not to be Removed
23.	Nguyen, Hai T. 9024 Silver Star Ave. Vancouver, WA 98664	February 3, 2020	February 2, 2023
24.	NW Flagging LLC 703 N Hayden Meadows Dr., #206 Portland, OR 97213 731 N Hayden Meadows Dr., #206 Portland, OR 97217 2408 NE 164 th Avenue Vancouver, WA 98684	February 24, 2020	February 23, 2027

**LIST OF CONTRACTORS INELIGIBLE
TO RECEIVE PUBLIC WORKS CONTRACTS
PUBLICATION DATE: JANUARY 5, 2023**

	<u>CONTRACTOR NAME</u>	<u>DATE PLACED</u>	<u>REMOVAL DATE</u>
25.	Oregon Building & Landscaping Services LLC 703 N Hayden Meadows Dr., #206 Portland, OR 97213 731 N Hayden Meadows Dr., #206 Portland, OR 97217 2408 NE 164 th Avenue Vancouver, WA 98684	February 24, 2020	February 23, 2027
26.	Pacific NW Drywall & Acoustics LLC aka Pacific NW Drywall& Acoustics LLC 731 NW Naito Parkway #215 Portland, OR 97209	June 17, 2020	Not to be Removed
27.	Polson, Pacharee 9024 Silver Star Ave. Vancouver, WA 98664	February 3, 2020	February 2, 2023
28.	Regional Traffic Management LLC 703 N Hayden Meadows Dr., #206 Portland, OR 97213 731 N Hayden Meadows Dr., #206 Portland, OR 97217 2408 NE 164 th Avenue Vancouver, WA 98684	February 24, 2020	February 23, 2027
29.	Snake River Construction and Excavation LLC 2676 Copeland Road Harper, Oregon 97906	May 6, 2022	May 5, 2025
30.	Tatom, Alan 168 Clearwater Avenue NE Salem, OR 97301	July 10, 2015	July 9, 2025
31.	Thomas, Antonio 16400 NE Las Brisas Ct., Apt. 43 Portland, OR 97230 650 NE Holladay St. Portland, OR 97232 16400 NE Las Brisas Ct. Portland, OR 97230	February 5, 2021	February 4, 2024
32.	Walker, Phillip 580 Market Street NE Salem, OR 97301	July 10, 2015	July 9, 2025
33.	WCI Construction LLC 169 SE Cody Lane Madras, OR 97741	July 3, 2017	July 2, 2027
34.	WWJD Traffic Control, Inc. 168 Clearwater Avenue NE Salem, OR 97301	July 10, 2015	July 9, 2025

**CHRISTINA E. STEPHENSON, COMMISSIONER
BUREAU OF LABOR AND INDUSTRIES**

Prevailing Wage Rate Laws Handbook

The 2022 edition of the ***Prevailing Wage Rate Laws Handbook*** is now available on our website at <https://www.oregon.gov/boli/employers/Pages/prevailing-wage.aspx>.

In addition to providing this and other PWR publications, Oregon BOLI Labor & Industries' PWR Unit regularly offers free, informational seminars for both public agencies and contractors. The current schedule is available online at <https://www.oregon.gov/boli/employers/Pages/prevailing-wage-seminars.aspx>.

If you are interested in being included on our mailing lists for future seminar notifications, please contact us at PWR.Email@boli.oregon.gov or (971) 353-2416.

"General Decision Number: OR20230023 03/17/2023

Superseded General Decision Number: OR20220023

State: Oregon

Construction Type: Building

County: Clackamas County in Oregon.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least \$16.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2023.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least \$12.15 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2023.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

Modification Number	Publication Date
0	01/06/2023
1	01/20/2023

2 01/27/2023
 3 02/24/2023
 4 03/03/2023
 5 03/10/2023
 6 03/17/2023

BROR0001-014 06/01/2020

	Rates	Fringes
BRICK FINISHER.....	\$ 26.94	14.94
BRICKLAYER.....	\$ 41.20	22.39
TILE FINISHER.....	\$ 26.94	14.81
TILE SETTER.....	\$ 35.35	20.42

 CARP1503-007 06/01/2021

	Rates	Fringes
Carpenters:		
Hardwood floors and batt insulation.....	\$ 43.97	18.56
Including metal stud installation, from work and scaffold building.....	\$ 43.80	18.56

 CARP9001-003 06/01/2022

	Rates	Fringes
Acoustical Ceiling Installer & Drywall Hanger.....	\$ 44.74	18.91
LATHER.....	\$ 44.74	18.91

 ELEC0048-018 01/01/2023

	Rates	Fringes
ELECTRICIAN.....	\$ 57.35	27.54

 ELEC0048-019 01/01/2023

	Rates	Fringes
ELECTRICIAN		
Computer Installation, telephone installation, HVAC temperature control installation, Electrical low voltage wiring installer and sound technician only.....	\$ 38.22	20.44
Electrical installer alarms and Low voltage wiring for alarms only.....	\$ 47.66	21.67

 * ENGI0701-020 01/01/2023

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1.....	\$ 54.13	16.65
GROUP 1A.....	\$ 56.29	16.65
GROUP 1B.....	\$ 58.45	16.65
GROUP 2.....	\$ 52.22	16.65

GROUP 3.....	\$ 51.07	16.65
GROUP 4.....	\$ 47.74	16.65
GROUP 5.....	\$ 46.50	16.65
GROUP 6.....	\$ 43.28	16.65

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: CRANE: Helicopter Operator, when used in erecting work; Whirley Operator, 90 ton and over; LATTICE BOOM CRANE: Operator 200 tons through 299 tons, and/or over 200 feet boom; HYDRAULIC CRANE: Hydraulic Crane Operator 90 tons through 199 tons with luffing or tower attachments

GROUP 1A: HYDRAULIC CRANE: Hydraulic Operator, 200 tons and over (with luffing or tower attachment); LATTICE BOOM CRANE: Operator, 200 tons through 299 tons, with over 200 feet boom;

GROUP 1B: LATTICE BOOM CRANE: Operator, 300 tons through 399 tons with over 200 feet boom; Operator 400 tons and over

GROUP 2: CRANE: Cableway Operator, 25 tons and over; HYDRAULIC CRANE: Hydraulic crane operator 90 tons through 199 tons (without luffing or tower attachment); TOWER/WHIRLEY OPERATOR: Tower Crane Operator; Whirley Operator, under 90 tons; LATTICE BOOM CRANE: 90 through 199 tons and/or 150 to 200 feet boom; HYDRAULIC CRANE: Hydraulic crane operator, 50 tons through 89 tons (with luffing or tower attachment); BLADE: Auto Grader; Blade Operator-Robotic; Rubber tired scraper with tandem scrapers, multi-engine Trenching Machine-Wheel Operator

GROUP 3: HYDRAULIC CRANE: Hydraulic crane operator, 50 tons through 89 tons (without luffing or tower attachment); LATTICE BOOM CRANES: Lattice Boom Crane-50 through 89 tons (and less than 150 feet boom); Rubber Tired Scraper: with tandem scrapers; self loading, paddle wheel, auger type, finish and/or 2 or more units.

GROUP 4: CRANE: Hydraulic Crane Operator, under 50 tons; LATTICE BOOM CRANE OPERATOR: Lattice Boom Crane Operator, under 50 tons; TRACKHOE-ROBOTIC: up to and including 20,000 lbs. with any or all attachments; BLADE: Blade operator; Tractor operator with boom attachment; DRILLING: Churn Drill and Earth Boring Machine Operator; Directional Drill Operator over 20,000 lbs pullback; CRANE: Chicago boom and similar types; Boom type lifting device, 5 ton capacity or less; HYDRAULIC HOES: Robotic Hydraulic backhoe operator, track and wheel type up to and including 20,000 lbs. with any or all attachments; Asphalt Paver; Screed Operator; Rubber-Tired Scraper, single engine, single scraper; Compactor-Self Propelled; Trenching Machine, digging capacity over 3 ft Depth.

GROUP 5: TRACKHOE-HYDRAULIC: up to and including 20,000 lbs.; Boom truck operator; DRILLING: Churn Drill and Earth Boring Machine Operator; Directional Drill Operator less than 20,000 lbs pullback; HYDRAULIC HOES: Hydraulic Backhoe Operator, wheel type (Ford, John Deere, Case type); Hydraulic Backhoe Operator track type up to and including 20,000 lbs.; Concrete Pumper; Concrete Paver; Compactor

GROUP 6: LOADERS: (less than 1 cu yd.); Roller (Non-Asphalt); Oiler; Bobcat/Skid Loader; Grade Checker; Crane oiler

Zone Differential (add to Zone 1 rates):

Zone 2 - \$3.00

Zone 3 - \$6.00

For the following metropolitan counties: MULTNOMAH; CLACKAMAS; MARION; WASHINGTON; YAMHILL; AND COLUMBIA; CLARK; AND COWLITZ COUNTY, WASHINGTON WITH MODIFICATIONS AS INDICATED:

All jobs or projects located in Multnomah, Clackamas and Marion Counties, West of the western boundary of Mt. Hood National Forest and West of Mile Post 30 on Interstate 84 and West of Mile Post 30 on State Highway 26 and West of Mile Post 30 on Highway 22 and all jobs or projects located in Yamhill County, Washington County and Columbia County and all jobs or projects located in Clark & Cowlitz County, Washington except that portion of Cowlitz County in the Mt. St. Helens ""Blast Zone"" shall receive Zone I pay for all classifications.

All jobs or projects located in the area outside the identified boundary above, but less than 50 miles from the Portland City Hall shall receive Zone II pay for all classifications.

All jobs or projects located more than 50 miles from the Portland City Hall, but outside the identified border above, shall receive Zone III pay for all classifications.

For the following cities: ALBANY; BEND; COOS BAY; EUGENE; GRANTS PASS; KLAMATH FALLS; MEDFORD; ROSEBURG

All jobs or projects located within 30 miles of the respective city hall of the above mentioned cities shall receive Zone I pay for all classifications.

All jobs or projects located more than 30 miles and less than 50 miles from the respective city hall of the above mentioned cities shall receive Zone II pay for all classifications.

All jobs or projects located more than 50 miles from the respective city hall of the above mentioned cities shall receive Zone III pay for all classifications.

IRON0029-011 07/04/2022

	Rates	Fringes
IRONWORKER (Ornamental, Reinforcing, and Structural).....	\$ 41.62	31.72

LAB00737-005 06/01/2022

	Rates	Fringes
Laborers: (Mason Tender-Cement/Concrete).....	\$ 38.79	16.85

LAB00737-006 06/01/2022

	Rates	Fringes
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Laborers: (Mason Tender-Brick)...\$ 38.79 16.85

LAB00737-007 06/01/2022

Rates Fringes

Laborers: (Mason Tender-Stone)...\$ 38.79 16.85

LAB00737-014 06/01/2022

Rates Fringes

Laborers:

GROUP 1.....\$ 34.98 16.85
GROUP 2.....\$ 36.25 16.85

LABORER CLASSIFICATIONS

GROUP 1: Form-Stripping; Demolition, General Laborer, Power
Tool Operator

GROUP 2: Vibrating Plate, Grade Checker, Asphalt Raker

PAIN0010-004 07/01/2022

Rates Fringes

Painters:

Brush, Roller and Spray.....\$ 30.72 14.04

PAIN0101-001 07/01/2022

Rates Fringes

DRYWALL FINISHER/TAPER.....\$ 42.52 19.13

PAIN0740-002 01/01/2023

Rates Fringes

GLAZIER.....\$ 49.31 21.81

PAIN1236-007 07/01/2022

Rates Fringes

FLOOR LAYER: Vinyl Flooring.....\$ 35.12 15.66

PLAS0082-004 07/01/2022

Rates Fringes

PLASTERER

Including Stucco.....\$ 41.16 19.23

PLAS0555-006 06/01/2022

Rates Fringes

CEMENT MASON/CONCRETE FINISHER...\$ 39.97 21.17

PLUM0290-009 04/01/2022

Rates Fringes

PIPEFITTER

Including HVAC Pipe Installation.....\$ 50.68 31.16

PLUM0290-010 04/01/2022

Rates Fringes

PLUMBER.....\$ 50.68 31.16

ROOF0049-004 07/01/2021

Rates Fringes

ROOFER

Excluding Metal Roof.....\$ 37.43 20.18

SFOR0669-002 01/01/2023

Rates Fringes

SPRINKLER FITTER

Fire Sprinklers.....\$ 44.13 26.40

SHEE0016-013 07/01/2019

Rates Fringes

Sheet Metal Worker

Excluding HVAC Duct Installation.....\$ 41.55 20.44

* SUOR2009-021 11/09/2009

Rates Fringes

LABORER: Landscape.....\$ 12.38 ** 0.00

LABORER: Pipelayer.....\$ 22.63 6.07

MILLWRIGHT.....\$ 17.62 3.19

OPERATOR: Grader/Blade.....\$ 16.00 ** 2.80

SHEET METAL WORKER (HVAC Duct Installation Only).....\$ 24.58 5.76

TRUCK DRIVER: Dump Truck.....\$ 15.67 ** 4.33

TRUCK DRIVER: Water Truck.....\$ 18.11 5.05

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 (\$16.20) or 13658 (\$12.15). Please see the Note at the top of the wage determination for more information.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the

Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average

calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator

U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISIO"

Applicability

The Project or Program to which the construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions are included in this Contract pursuant to the provisions applicable to such Federal assistance.

A. 1. (i) Minimum Wages. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section I(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible, place where it can be easily seen by the workers.

(ii) (a) Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefor only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(b) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB control number 1215-0140.)

(c) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

(d) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(ii)(b) or (c) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part

of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

2. Withholding. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee or helper, employed or working on the site of the work, all or part of the wages required by the contract, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the contractor, disburse such amounts withheld for and on account of the contractor or subcontractor to the respective employees to whom they are due. The Comptroller General shall make such disbursements in the case of direct Davis-Bacon Act contracts.

3. (i) Payrolls and basic records. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in Section 1(b)(2)(B) of the Davis-bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5 (a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been

communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs. (Approved by the Office of Management and Budget under OMB Control Numbers 1215-0140 and 1215-0017.)

(ii) (a) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i) except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this subparagraph for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to HUD or its designee. (Approved by the Office of Management and Budget under OMB Control Number 1215-0149.)

(b) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under 29 CFR 5.5 (a)(3)(ii), the appropriate information is being maintained under 29 CFR 5.5(a)(3)(i), and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(c) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by subparagraph A.3.(ii)(b).

(d) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under subparagraph A.3.(i) available for inspection, copying, or transcription by authorized representatives of HUD or its designee or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the contractor, sponsor, applicant or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and Trainees.

(i) **Apprentices.** Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who

is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) **Trainees.** Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by

the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under 29 CFR Part 5 shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR Part 3 which are incorporated by reference in this contract

6. Subcontracts. The contractor or subcontractor will insert in any subcontracts the clauses contained in subparagraphs 1 through 11 in this paragraph A and such other clauses as HUD or its designee may by appropriate instructions require, and a copy of the applicable prevailing wage decision, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this paragraph.

7. Contract termination; debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act Requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and HUD or its designee, the U.S. Department of Labor, or the employees or their representatives.

10. (i) Certification of Eligibility. By entering into this contract the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be

awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001. Additionally, U.S. Criminal Code, Section 1 01 0, Title 18, U.S.C., "Federal Housing Administration transactions", provides in part: "Whoever, for the purpose of . . . influencing in any way the action of such Administration..... makes, utters or publishes any statement knowing the same to be false..... shall be fined not more than \$5,000 or imprisoned not more than two years, or both."

11. Complaints, Proceedings, or Testimony by Employees. No laborer or mechanic to whom the wage, salary, or other labor standards provisions of this Contract are applicable shall be discharged or in any other manner discriminated against by the Contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this Contract to his employer.

B. Contract Work Hours and Safety Standards Act. The provisions of this paragraph B are applicable where the amount of the prime contract exceeds \$100,000. As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which the individual is employed on such work to work in excess of 40 hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in subparagraph (1) of this paragraph, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in subparagraph (1) of this paragraph, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by the clause set forth in subparagraph (1) of this paragraph.

(3) Withholding for unpaid wages and liquidated damages. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contract, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act which is held by the same prime contractor such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (2) of this paragraph.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in subparagraph (1) through (4) of this paragraph and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in subparagraphs (1) through (4) of this paragraph.

C. Health and Safety. The provisions of this paragraph C are applicable where the amount of the prime contract exceeds \$100,000.

(1) No laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.

(2) The Contractor shall comply with all regulations issued by the Secretary of Labor pursuant to Title 29 Part 1926 and failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act, (Public Law 91-54, 83 Stat 96). 40 USC 3701 et seq.

(3) The contractor shall include the provisions of this paragraph in every subcontract so that such provisions will be binding on each subcontractor. The contractor shall take such action with respect to any subcontractor as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.



ANNUAL SECTION 3 SUMMARY REPORTING REQUIREMENTS

FOR RECIPIENTS OF HUD COMMUNITY PLANNING & DEVELOPMENT FUNDING

*TECHNICAL ASSISTANCE ON FORM HUD-60002

Why HUD Enforces Section 3?

Each year the U.S. Department of Housing and Urban Development invests billions of federal dollars into distressed communities for projects designed to build and rehabilitate housing, improve roads, develop community centers, and otherwise assist families achieve the American Dream.

The Section 3 regulation recognizes that HUD funding typically results in projects/activities that generate new employment, training and contracting opportunities. These economic opportunities not only provide "bricks and mortar", but can also positively impact the lives of local residents who live in the neighborhoods being redeveloped.

Section 3 of the Housing and Urban Development Act of 1968 [12 U.S.C. 1701u and 24 CFR Part 135] is HUD's legislative directive for providing preference to low- and very low-income residents of the local community (regardless of race or gender), and the businesses that substantially employ these persons, for new employment, training, and contracting opportunities resulting from HUD-funded projects.

Further, as a condition of receiving HUD Community Planning and Development assistance, recipients certify that they will comply with the requirements of Section 3 annually pursuant to 24 CFR 570.607(b). Accordingly, the Department has the legal responsibility to monitor recipients for compliance and can impose penalties upon those that fail to meet these obligations.

Applicability of Section 3 to Community Planning & Development Assistance

The requirements of Section 3 apply to recipients of HUD Community Planning and Development funding exceeding \$200,000.

Section 3 covered projects are those in which a *combined* (or aggregate) amount of covered funding exceeding \$200,000, is invested into activities involving **housing construction, demolition, rehabilitation, or other public construction**—i.e., roads, sewers, community centers, etc. [Example: Section 3 applies to the combined investment of more than \$200,000 into multiple single-family housing rehabilitation projects during a program year].

Contractors or subcontractors that receive contracts in excess of \$100,000 for Section 3 covered projects/activities are required to comply with the Section 3 regulations in the same manner as direct recipients.

If the recipient agency receives Section 3 covered funding and invests these funds into covered projects/activities, but no individual contract exceeds \$100,000, responsibility for complying with Section 3 only applies to the recipient.

Accordingly, the recipient must attempt to reach the Section 3 minimum numerical goals found at 24 CFR Part 135.30 by: 1) Awarding 10 percent of the total dollar amount of all covered construction contracts to Section 3 businesses; and 2) Offering 30 percent of new employment opportunities to Section 3 businesses.

Section 3 Covered Community Planning and Development funding

- Community Development Block Grants (CDBG)
- Home Investment Partnership Assistance
- Housing Opportunities for Persons with Aids (HOPWA)
- Economic Development Initiative (EDI)
- Brownfield Economic Development Initiative (BEDI)
- Emergency Shelter Grants
- Homeless Assistance
- University Partnership Grants
- Neighborhood Stimulus Program (NSP)
- Certain Grants Awarded Under HUD Notices of Funding Availability (NOFAs)

*NOTE: The requirements of Section 3 only apply to the portion(s) of covered funding that were used for project/activities involving housing construction, rehabilitation, demolition, or other public construction.

Section 3 applies to the entire covered project or activity regardless of whether the activity was fully or partially funded with covered assistance.

Section 3 Covered Recipient Agencies

“Recipient” refers to any entity that receives Section 3 covered financial assistance directly from HUD or from another recipient and includes, but is not limited to any of the following:

- States; Units of Local Government; Native American Tribes; or other Public Bodies
- Public or Private Nonprofit Organizations
- Private Agencies or Institutions
- Mortgagors; Developers; Limited Dividend Sponsors; Builders; Property Managers; Community Housing Development Organizations
- Successors, assignees or transferees of any such entity listed above

- Recipients do NOT include any ultimate beneficiary under the HUD program that Section 3 applies and does NOT refer to contractors.

Triggering the Requirements of Section 3

Section 3 is triggered when the normal completion of construction and rehabilitation projects creates the need for new employment, contracting, or training opportunities.

The Section 3 regulations should not be construed to mean that recipients are required to hire Section 3 residents or award contracts to Section 3 businesses other than what is needed to complete covered projects/activities.

If the expenditure of covered funding does not result in new employment, contracting, or training opportunities, the requirements of Section 3 have not been triggered. However, each agency must still submit Section 3 annual reports indicating this information.

Recipient Responsibilities Pursuant to Section 3

Each recipient (and their covered contractors, subcontractors, or subrecipients) are required to comply with the requirements of Section 3 for new employment, training, or contracting opportunities resulting from the expenditure of covered funding. This responsibility includes:

1. Implementing procedures to notify Section 3 residents and business concerns about training, employment, and contracting opportunities generated by Section 3 covered assistance;
2. Notifying potential contractors working on Section 3 covered projects of their responsibilities;
3. Incorporating the Section 3 Clause into all covered solicitations and contracts [see 24 CFR Part 135.38];
4. Facilitating the training and employment of Section 3 residents and the award of contracts to Section 3 business concerns;
5. Assisting and actively cooperating with the Department in making contractors and subcontractors comply;
6. Refraining from entering into contracts with contractors that are in violation of Section 3 regulations;
7. Documenting actions taken to comply with Section 3; and
8. Submitting Section 3 Annual Summary Reports (form HUD-60002) in accordance with 24 CFR Part 135.90.

In addition to the responsibilities described above, **State and County agencies or consortia** that distribute covered funds to units of local government, nonprofit organizations, or other subrecipients, must attempt to reach the minimum numerical goals set forth at 24 CFR Part 135.30, regardless of the number of subrecipients that receive covered funding. State or County agencies must also do the following:

1. Inform subrecipients about the requirements of Section 3;
2. Assist subrecipients and their contractors with achieving compliance;
3. Monitor subrecipients' performance with respect to meeting the requirements of Section 3; and
4. Report to HUD on the cumulative Section 3 activities taking place within their jurisdiction on an annual basis.

Section 3 Residents and Business Concerns

Section 3 Residents Are:

1. Residents of Public and Indian Housing; or
2. Individuals that reside in the metropolitan area or nonmetropolitan county in which the Section 3 covered assistance is expended and whose income do not exceed the local HUD income limits set forth for low- or very low-income households.

Section 3 Business Concerns Are One of the Following:

1. Businesses that are 51 percent or more owned by Section 3 residents;
2. Businesses whose permanent, full-time employees include persons, at least 30 percent of whom are currently Section 3 residents, or within three years of the date of first employment with the firm were Section 3 residents; or
3. Businesses that provide evidence of a commitment to subcontract in excess of 25 percent of the dollar amount of all subcontracts to be awarded to businesses that meet the qualifications described above.

In accordance with the regulation, residents and businesses concerns seeking Section 3 preference shall certify, or submit evidence to the recipient, contractor, subcontractor or subrecipient (if requested) verifying that they meet the definitions provided above.

Recipients can use their discretion for determining the type of verification that is required by prospective Section 3 residents and business concerns. Some examples include: proof of residency in a public housing authority; proof of federal subsidies for housing, food stamps, or unemployment benefits; and payroll data or other relevant business information.

Section 3 Summary Reports (Form HUD-60002)

Annually, each direct recipient of Community Planning and Development funding is required to submit form HUD-60002 to HUD's Economic Opportunity Division in Washington, DC. , preferably online from the following website: www.hud.gov/section3.

Due Date: Form HUD-60002 is due at the same time as annual performance (e.g., CAPERS) reports

The Section 3 Summary Report shall follow the same program, fiscal, or calendar year as the annual performance report and should correspond to the covered projects and activities that were administered during the reporting period.

NOTE: Section 3 reports must be submitted by all agencies that receive Community Planning and Development funding in excess of \$200,000 whether the requirements were triggered or not.

Determining What Should Be Reported on Form HUD-60002

Section 3 Annual Summary Reports are intended to measure each recipient's efforts to comply with the statutory and regulatory requirements of Section 3 in its own operations **AND** those of its covered contractors, subcontractors, and subrecipients. Each submission of form HUD-60002 should indicate the following:

- The total dollar amount of HUD funding that was received by the recipient for covered projects/activities during the specified reporting period.
- The total number of new employees that were hired by the recipient and/or its covered contractors, subcontractors, and subrecipients, as a result of performing or completing covered project/activities.
- The number of new employees that were hired by the recipient (or its covered contractors, subcontractors, and subrecipients), as a result of covered projects/activities, that met the definition of a Section 3 resident.
- The total number of man hours worked on covered projects (optional).
- The aggregate number of hours worked by Section 3 residents on covered projects (optional).
- The total number of Section 3 residents that participated in training opportunities that were made available by the recipient agency, its contractors, subrecipients, or other local community resource agencies.
- The total dollar amount of construction and/or non-construction contracts (or subcontracts) that were awarded with covered funding.
- The dollar amount of the recipient's construction or non-construction contracts (or subcontracts) that were awarded to Section 3 business concerns.
- Detailed narrative descriptions of the specific actions that were taken by the recipient (or its covered contractors, subcontractors, subrecipients, or others) to comply with the requirements of Section 3 and/or meet the minimum numerical goals for employment and contracting opportunities.

Section 3 Reporting and Compliance Determinations

Absent evidence to the contrary, the Department considers recipients of covered funding to be in compliance with Section 3 if they meet the minimum numerical goals set forth at 24 CFR Part 135.30. Specifically:

- a. 30 percent of the aggregate number of new hires shall be Section 3 residents;
- b. 10 percent of the total dollar amount of all covered construction contracts shall be awarded to Section 3 business concerns; and
- c. 3 percent of the total dollar amount of all covered non-construction contracts shall be awarded to Section 3 business concerns.

Recipients that fail to meet the minimum numerical goals above bear the burden of demonstrating why it was not possible to do so. Such justifications should describe the efforts that were taken, barriers encountered, and other relevant information that will enable the Department to make a compliance determination.

Recipients that submit Section 3 reports containing **all zeros**, without a sufficient explanation to justify their submission, are in **noncompliance** with the requirements of Section 3.

Failure to comply with the requirements of Section 3 may result in sanctions, including: debarment, suspension, or limited denial of participation in HUD programs pursuant to 24 CFR Part 24.

Recipients that are subject to annual A-133 Audits may also receive an audit finding for failure to submit form HUD-60002 to HUD.

Important Notes for Submitting Form HUD-60002

- Recipients must submit a separate form HUD-60002 for each type of covered funding (*e.g.*, separate reports must be submitted for CDBG and HOME funding).
- Use the online Section 3 Summary Reporting System at: www.hud.gov/section3 to ensure that form HUD- 60002 is received by the Economic Opportunity Division in HUD Headquarters in a timely manner.
- The "reporting period" option in the online Section 3 Summary Reporting System (box #7) lists quarters but the Section 3 reporting is an annual requirement. Accordingly, recipients should select **Quarter 4** to document the total amount of covered activities/projects that were completed during the entire reporting period.
- If the recipient (or its covered contractors, subcontractors and subrecipients) did not hire any new employees during the reporting period, and/or if no covered construction or non-construction contracts were awarded, the recipient must indicate this in Part III of form HUD-60002 and certify that this information is true and accurate by penalty of law.

Where Are Reports Submitted

Form HUD-60002 must be submitted to HUD's Economic Opportunity Division, in Washington, DC. Recipients are strongly encouraged to submit form HUD-60002 online at: www.hud.gov/section3.

Recipients can also download a hard copy of form HUD 60002 from the website listed above. Hard copies shall be submitted via fax or mail to:

U.S. Department of Housing and Urban Development
Attn: Economic Opportunity Division
451 Seventh Street, SW
Room 5235
Washington, DC 20410
202-708-1286 (fax)

Additional Section 3 Guidance and Technical Assistance

The Economic Opportunity Division is committed to providing recipient's guidance and technical assistance for compliance with the requirements of Section 3.

For additional information, please visit the Section 3 website at: www.hud.gov/section3. This webpage provides the following tools and information:

- Section 3 Statute—12 U.S.C. 1701u
- Section 3 Regulation—24 CFR Part 135
- Frequently Asked Questions
- Section 3 Model Programs
- Guidance on Section 3 and Economic Stimulus Funding
- Guidance on Section 3 and the Neighborhood Stimulus Program (NSP)
- Sample Section 3 Certification Forms (residents and business concerns)
- Link to HUD's Local Income Eligibility Calculator
- Link to Section 3 Annual Reporting System(form HUD-60002)
- Downloadable Forms
- Contact Information for Economic Opportunity Division staff
- Email inquiries on Section 3 can be sent to section3@hud.gov



CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT
PROJECT INFORMATION, PLANS, SPECIFICATIONS AND DRAWINGS

PROJECT: Janssen Road Apartments Rehab Project
(Clackamas, OR)

Background: The Housing Authority of Clackamas County (HACC) are partnering with Housing & Community Development Division (HCDD) to rehabilitate the exterior of the Janssen Road Apartments Project. This work will serve the current tenants that reside at the following addresses: West, Multi-family Building, 8930-8938 SE Janssen Road, Clackamas, OR 97015 and East Multi-family Building 8940-8948 SE Janssen Road, Clackamas, OR 97015.

Project Estimate: \$285,000 - \$310,000 dollars

Key Dates:

All Basic Bid Work may begin as soon as the Notice to Proceed (“NTP”) is issued

Substantial Completion: 90 Days from NTP

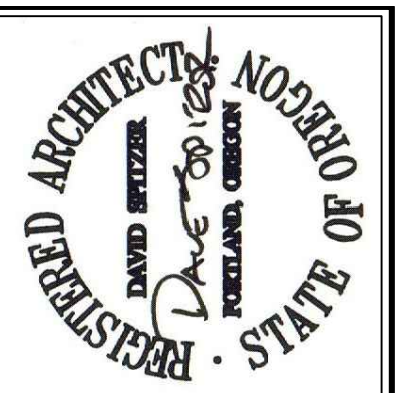
Final Completion: 100 Days from NTP – estimated to be May 30, 2023

Federal Holidays will not be included in these number of days (Example Labor Day etc).

Time is of the essence for this Project. Note the Liquidated Damages requirements as described in the Supplemental General Conditions.

The Scope further includes the following Plans, Specifications and Drawings:

There are no drawings for this Scope.



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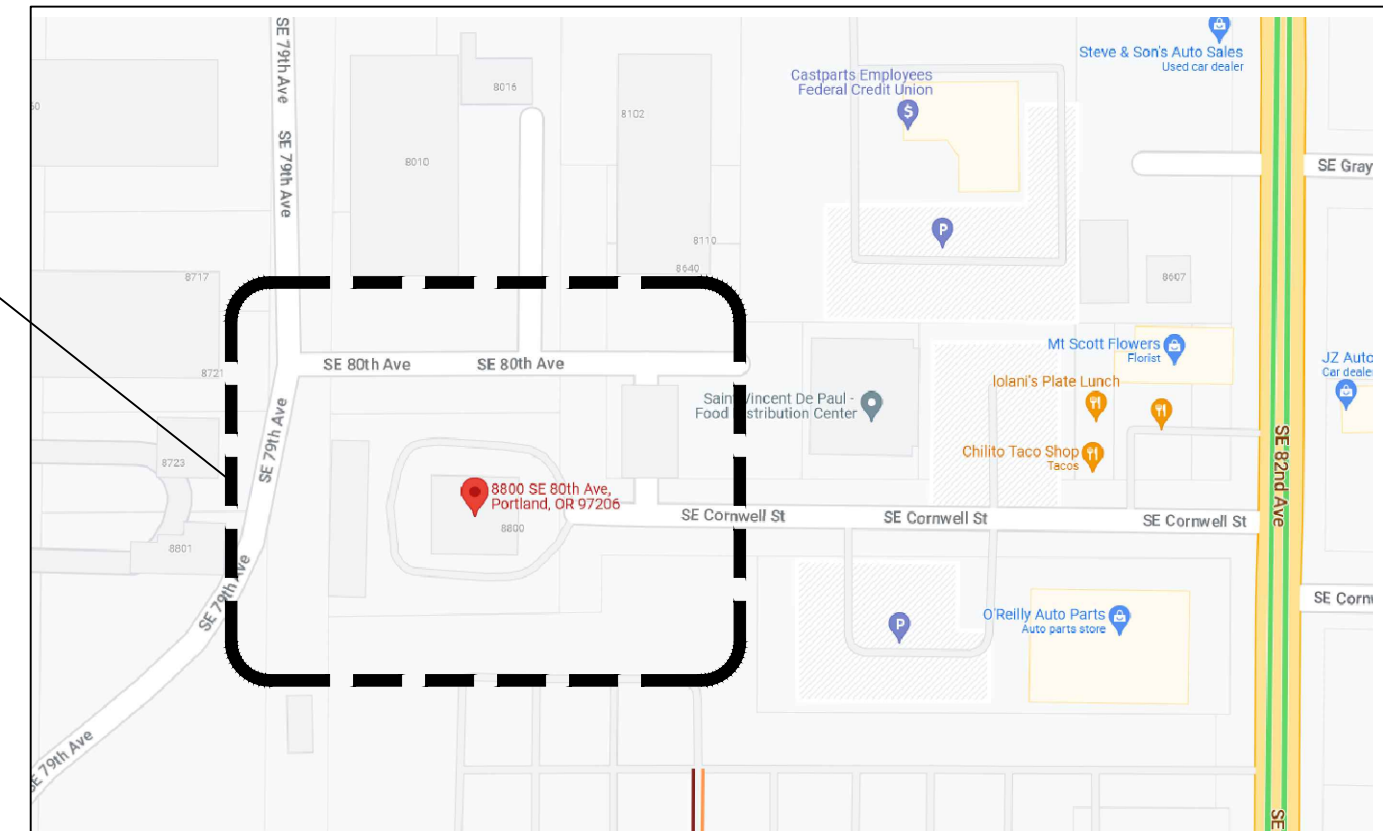
CLACKAMAS SERVICE CENTER - WEST BLDG.
 8800 SE 80TH AVE
 MILWAUKIE, OREGON 97206

SHEET CONTENT
 SITE PLAN
 NOTES
 CODE SUMMARY

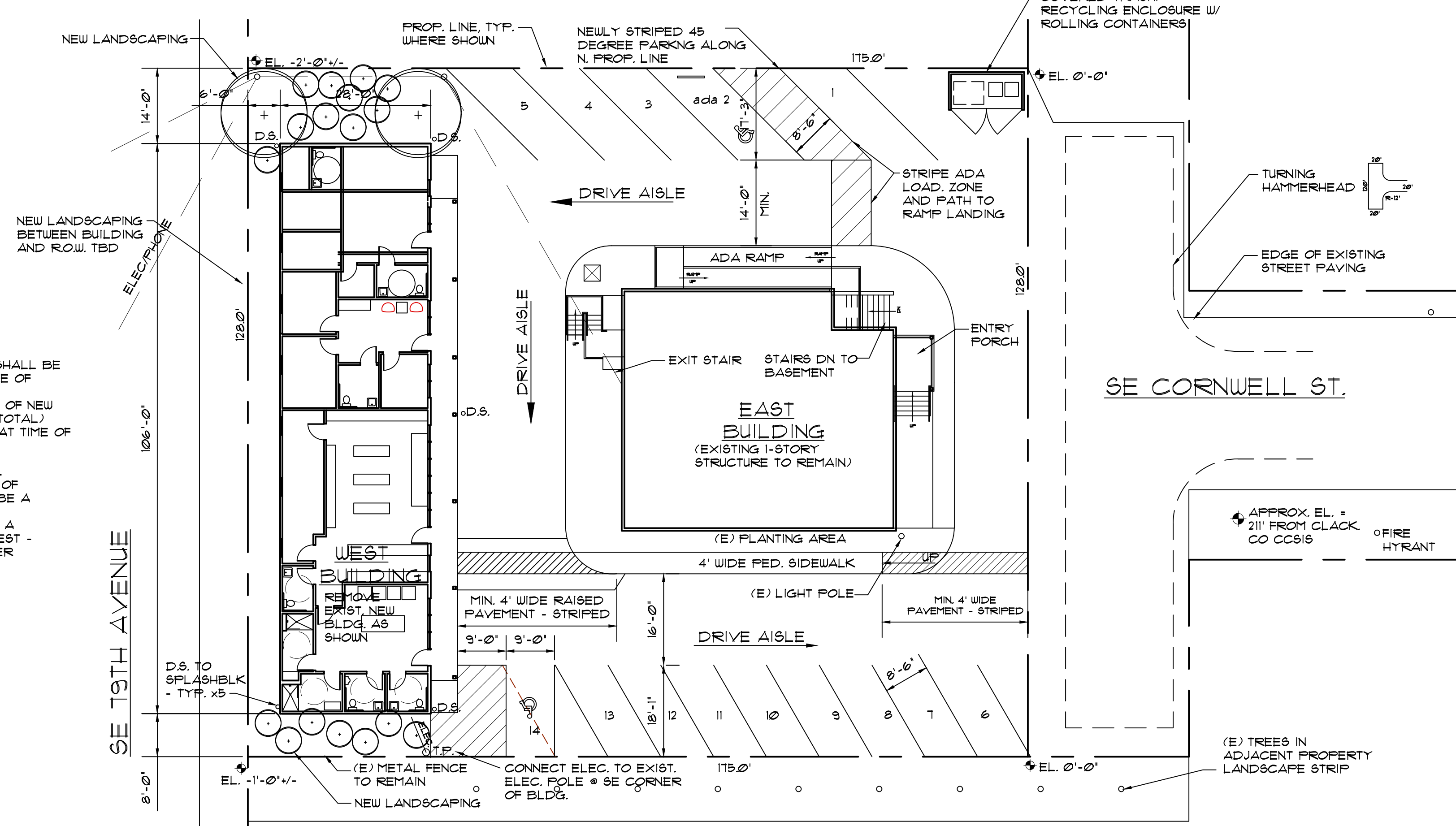
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DATE
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SHEET
T1 of 1



2 LOCATION PLAN



1 OVERALL SITE PLAN

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 DAVE@dmsarchitects.com
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 ARCHER ENGINEERING
 MIKE ARCHER - 503 730 3351
 ARCHERENG@COMCAST.NET
CSC PROJECT MANAGER
 MARK BEIRWAGEN 503 548 1383
 MARK@STONECREEKBUILDING.NET
CLACKAMAS COUNTY CONTACTS:
 BRUCE BROWN - 503-784-1116
 BBrown@clackamas.us
 PATRICK DOHERTY 971-992-6324
 PDoherty@clackamas.us

ROOM FINISH SCHEDULE

#	ROOM	FLOOR	WALLS	BASE	CEILING	NOTES
100	LAUNDRY AREA	VINYL	PAINT	INTEGRAL	GYP.	
101	W.C.	VINYL	FRP TO 48" - PAINT ABOVE	INTEGRAL	GYP.	
102	SHUR.	VINYL	FRP	INTEGRAL	GYP.	
103	SHUR.	VINYL	FRP	INTEGRAL	GYP.	
104	NOT USED					
105	W.C.	WOOD	FRP TO 48" - PAINT ABOVE	INTEGRAL	GYP.	
106	DRESSING RM.	WOOD	PAINT	INTEGRAL	GYP.	
107	STORAGE	VINYL	PAINT	INTEGRAL	GYP.	
108	CLOTHING CNTR.	WOOD	PAINT	4" WOOD	GYP.	
109	NOT USED					
110	OFFICE	WOOD	PAINT	INTEGRAL	GYP.	
111	OFFICE	WOOD	PAINT	INTEGRAL	GYP.	
112	W.C.	WOOD	FRP TO 48" - PAINT ABOVE	INTEGRAL	GYP.	
113	OFFICE	WOOD	PAINT	INTEGRAL	GYP.	
114	OFFICE	WOOD	PAINT	INTEGRAL	GYP.	
115						
116	EXAM	VINYL	PAINT	INTEGRAL	GYP.	
117	OFFICE	CRPT.	PAINT	INTEGRAL	GYP.	
118	W.C.	VINYL	FRP TO 48" - PAINT ABOVE	INTEGRAL	GYP.	
119	HALL	WOOD	PAINT	INTEGRAL	GYP.	
120	LAB	VINYL	PAINT	INTEGRAL	GYP.	
121	EXAM	VINYL	PAINT	INTEGRAL	GYP.	
122	HEALTH CNTR.	WOOD	PAINT	INTEGRAL	GYP.	

NOTE: ALL VINYL FLOORING TO HAVE A 4" INTEGRAL (CURVED) BASE
 NOTE: SEE SPECIFICATIONS FOR MATERIAL REQUIREMENTS

LANDSCAPING NOTES:
 TREES SHOWN (2 TOTAL) SHALL BE DECIDUOUS 2" DIA. AT TIME OF PLANTING.
 SHRUBS AT S AND N SIDE OF NEW BUILDING AS SHOWN (16+ TOTAL) SHALL BE MIN. 1 GALLON AT TIME OF PLANTING
 ALL LANDSCAPING SHALL MEET THE REQUIREMENTS OF ZOO 1009.01 AND SHALL BE A MIX OF EVERGREEN AND DECIDUOUS SPECIES WITH A RANGE OF SEASON INTEREST - NATIVE SPECIES WHEREVER POSSIBLE

UTILITY PROVIDERS
FGE
 PO Box 4438
 Portland, OR 97208
 503-228-6322 or 1-800-542-8818
 Account Number: 3601680000
Comcast (WiFi and land line)
 PO Box 62533
 City of Industry, CA 91716
 800-391-3000
 Account Number: 8718 10 225 319298
Water Environment Services:
 Clackamas Water Environment Services
 PO Box 6949
 Portland, OR 97228
 503-742-4567
 Account Number: 03-15249-01
Clackamas River Water:
 Payment Processing
 PO Box 3211
 Clackamas, Oregon 97208
 503-722-9220
 Account Number: 015251-02
NW Natural
 PO Box 6017
 Portland, Oregon 97228
 800-422-4012
 Account Number: 494747-9

GENERAL PROJECT INFORMATION

PROJECT ADDRESS:
 8800 SE 80TH AVE
 PORTLAND, OREGON 97206
PROPERTY OWNER:
 CLACKAMAS SERVICE CENTER
 8800 SE 80TH AVE
 PORTLAND, OREGON 97206
 CONTACT - DEBRA MASON
 503.329.1601
ARCHITECT:
 DMS ARCHITECTS
 2325 NE 18TH AVE.
 PORTLAND, OR 97212
 CONTACT - DAVE SPITZER
 503.335.9040
 DAVE@dmsarchitects.com
STRUCTURAL ENGINEER:
 ARCHER ENGINEERING LLC
 2345 NE 3TH AVE
 PORTLAND, OR 97212
 CONTACT - MIKE ARCHER
 503.730.3351
TAX LOT : 12E29AA03000 AREA +/- 0.44 AC
ZONING DESIGNATION: CC
CONSTRUCTION TYPE: V-B, NON-SPRINKLERED
OCCUPANCY: EXISTING/PROPOSED - B
BUILDING HEIGHT: NO LIMIT, +/- 22'-0" 2-STORY PROPOSED
BUILDING SETBACKS: FRONT - 15' MIN. ALLOWED, +/- 105' PROPOSED
 SIDE - 0' MIN. ALLOWED, +/- 3' MIN. PROPOSED
 REAR - 0' MIN. ALLOWED, +/- 12' PROPOSED

PARKING SUMMARY:
 WEST BUILDING:
 MEDICAL OFFICES: 5 SPACES REQUIRED
 RETAIL: 3 SPACES REQUIRED
 EAST BUILDING
 OFFICE: 9 SPACES REQUIRED
 (2,200 SF)

LAND USE CASE FILE Z0123-22-D
 DEVELOPMENT PERMIT NUMBER SC000023

BUILDING CODE SUMMARY AND PROJECT INFORMATION

PROJECT SUMMARY: DEMOLISH EXISTING 21' X 101' ONE STORY STRUCTURE. CONSTRUCT NEW 28' X 106' ONE STORY STRUCTURE IN SIMILAR LOCATION
INFORMATION SHOWN ON THIS DRAWING IS BASED ON THE CURRENT EDITION OF THE OREGON - OREGON 2019. ANY INFORMATION NOT PROVIDED OR CLEARLY IDENTIFIED SHALL MEET OR EXCEED CURRENT CODE.
BUILDING USE IS TO PROVIDE SUPPORT SERVICES FOR THE MAIN SERVICE CENTER ON SITE. SERVICES IN THIS BUILDING WILL INCLUDE THE FOLLOWING: SHOWER, BATHROOM AND LAUNDRY AREA, CLOTHING RETAIL AREA, OFFICE AREA, HEALTH CARE AREA.
PERMITS:
 PERMITS REQUIRED FROM THE CLACKAMAS COUNTY:
 A. BUILDING
 B. ELECTRICAL
 C. MECHANICAL
 D. PLUMBING

OCCUPANCY - PER CHAPTER 3 AND TABLE 1004.4

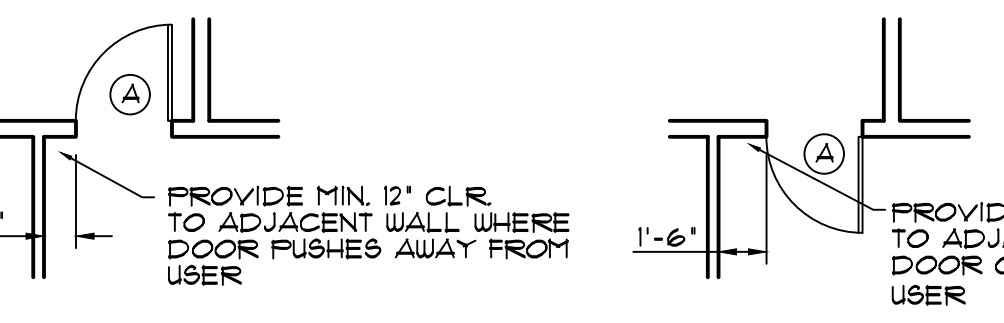
LAUNDRY AREA:	628 SF	50 SF/OCC	13 OCC.
RETAIL AREA:			
RETAIL:	590 SF	60 SF/OCC	10 OCC.
STORAGE:	310 SF	60 SF/OCC	5 OCC.
OFFICE AREA:	620 SF	150 SF/OCC	5 OCC.
HEALTH AREA:	750 SF	100 SF/OCC	8 OCC.
	2,968 SF		43 OCC.

INSULATION REQUIREMENTS

MINIMUM INSULATION REQ. (OESC 2021 TABLE 5.5-4 CLIMATE ZONE 4)
 DOORS: U = 0.63
 WINDOWS: U = 0.36
 EXTERIOR WALLS WOOD FRAMED: R-20
 ROOFS: R-43
 FLOORS - WOOD FRAMED: R-30
 SKYLIGHTS: U = 0.40

REQUIRED DOOR CLEARANCES

PROVIDE THE FOLLOWING CLEARANCES BETWEEN ALL NEW DOORS AND ADJACENT WALLS:



GENERAL RAMP NOTES

'RAMPS' AS DRAWN ARE INTENDED TO BE LESS THAN 1:20 AND ARE TECHNICALLY NOT CONSIDERED A RAMP - NOT REQUIRING RAILS, EDGE PROTECTION, ETC. (SIMILAR TO A SIDEWALK).
 If however:
 ON-SITE GRADES REQUIRE A RAMP GREATER THAN 1:20 - IT WILL BE A RAMP PER CODE AND REQUIRE THE FOLLOWING:
 • SLOPE OF MAX 1:12
 • HANDRAILS EACH SIDE 36"± 38" ABOVE WALKING SURFACES EXTENDING 12" BEYOND TOP AND BOT. OF RAMP
 • EDGE PROTECTION MIN. 2" TALL AT 'OPEN' SIDE OF RAMP
 • MIN. 60" LANDING IN THE DIRECTION OF TRAVEL.

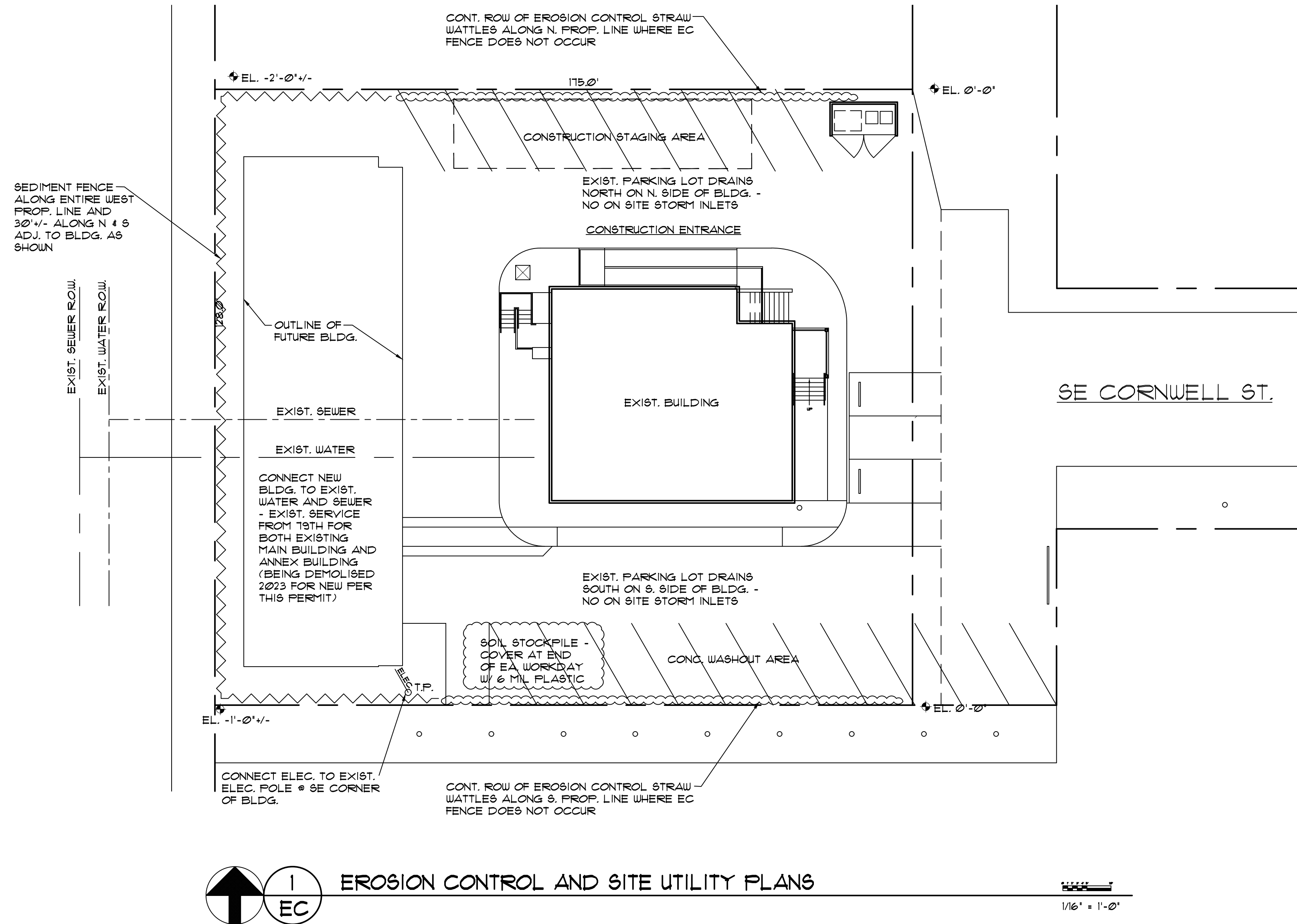
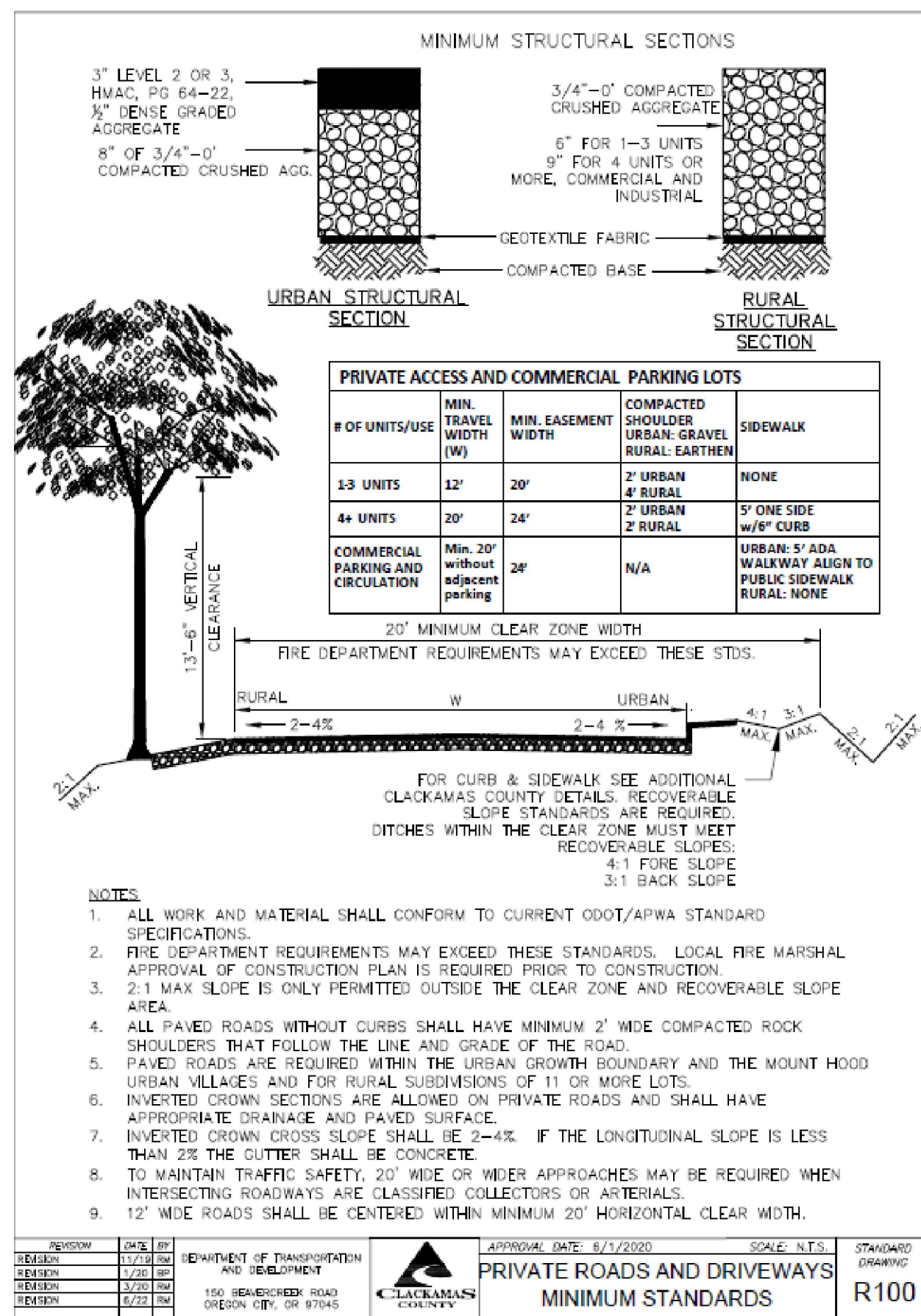
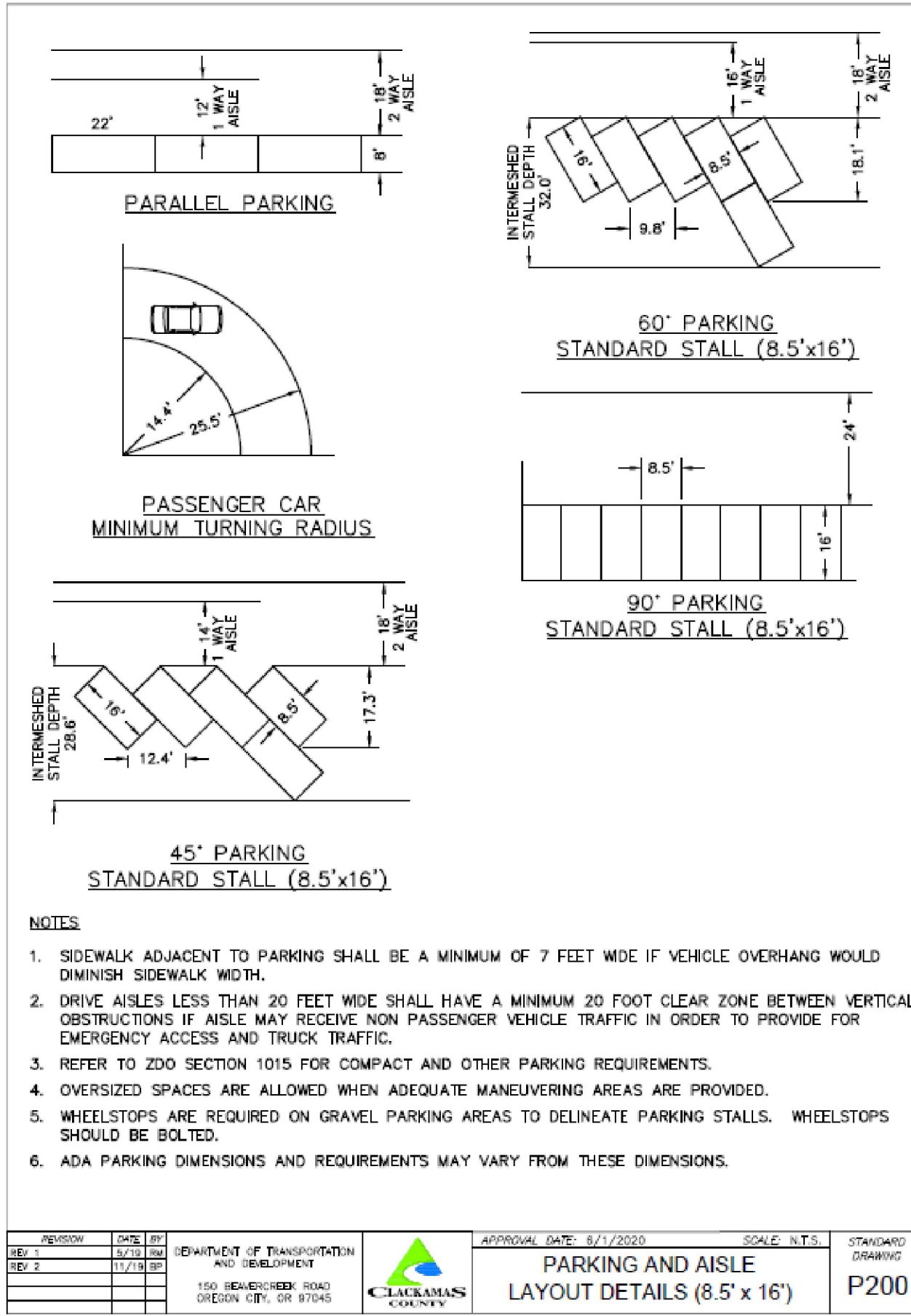
DOOR SCHEDULE

#	SIZE	TYPE	TYPE	NOTES
A	3'-0" x 1'-0"	STOREFRONT	ENTRANCE	TYP. x5
B	3'-0" x 1'-0"	SOLID CORE	PRIVACY	TYP. x6 - W/ OCC. INDICATOR
C	3'-0" x 1'-0"	SOLID CORE	STOREROOM	TYP. x3
D	3'-0" x 1'-0"	SOLID CORE	OFFICE	TYP. x3
E	3'-0" x 1'-0"	SOLID CORE	ENTRANCE	TYP. x3
F	3'-0" x 1'-0"	SOLID CORE	PASSAGE	TYP. x1
G	NOT USED	--	--	--
H	3'-0" x 1'-0"	SOLID CORE	STOREROOM	TYP. x3 - FULL LIGHT TOP 1/2 DR
J	3'-0" x 1'-0"	SOLID CORE	OFFICE	TYP. x1 - FULL LIGHT TOP 1/2 DR

*LEVERED LOCKSET TO OPEN LATCH/LOCK IN ONE MOTION. NO DEADBOLTS
 NOTE: ALL INTERIOR DOORS SHALL BE STAIN GRADE WOOD, WITH TIMELY FRAMES

DRAWING LIST

#	TITLE
T1	SITE PLAN, NOTES, CODE SUMMARY
EC	EROSION CONTROL PLAN
A1	FLOOR PLAN, EXTERIOR ELEVATION
A2	EXTERIOR ELEVATIONS
A3	BUILDING SECTIONS
A4	ACCESSIBLE DETAILS, CABINET ELEVATIONS
A5	FOUNDATION PLAN
A6	ROOF FRAMING PLAN
S1	STRUCTURAL DETAILS
S2	STRUCTURAL DETAILS



DMS
REGISTERED ARCHITECT

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SHEET CONTENT

EROSION CONTROL PLAN

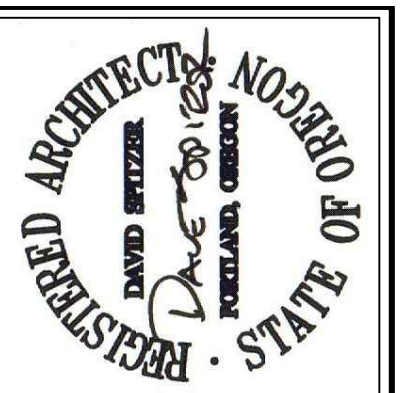
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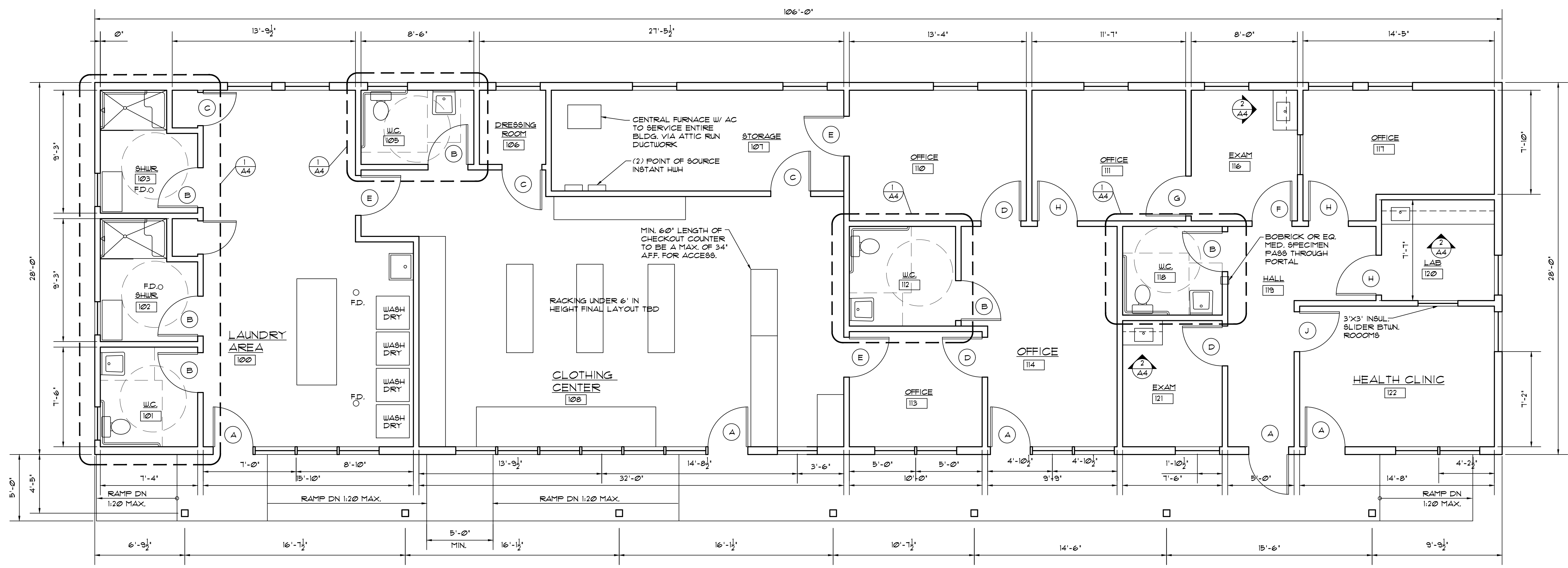
SHEET EC1 of 1



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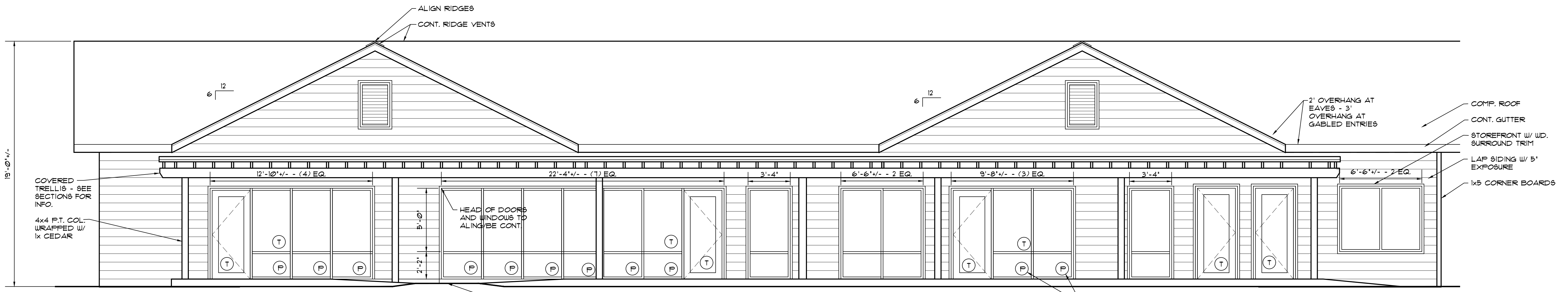
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1 FLOOR PLAN

1/4" = 1'-0"



2 EAST ELEVATION

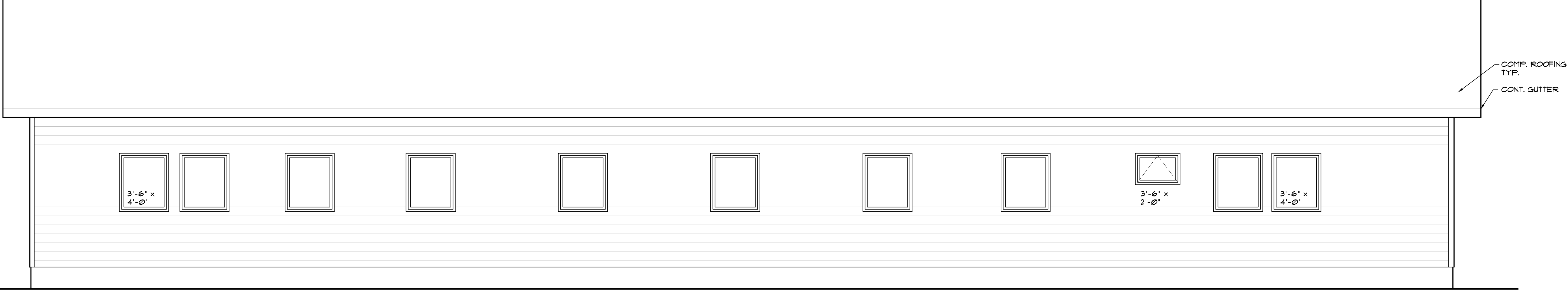
1/4" = 1'-0"

FLOOR PLAN EXTERIOR ELEVATIONS

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DATE	8-15-22
REVISIONS	



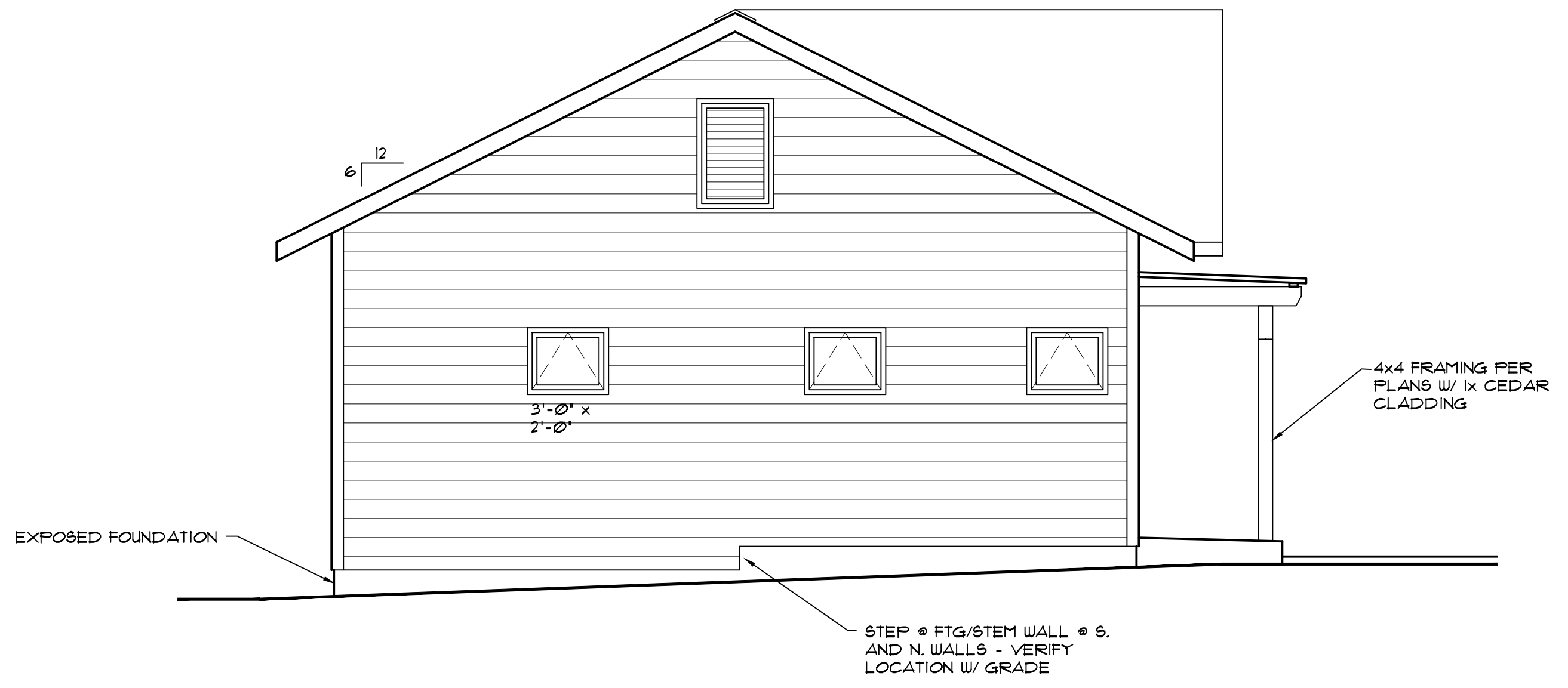
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1
A2 WEST ELEVATION

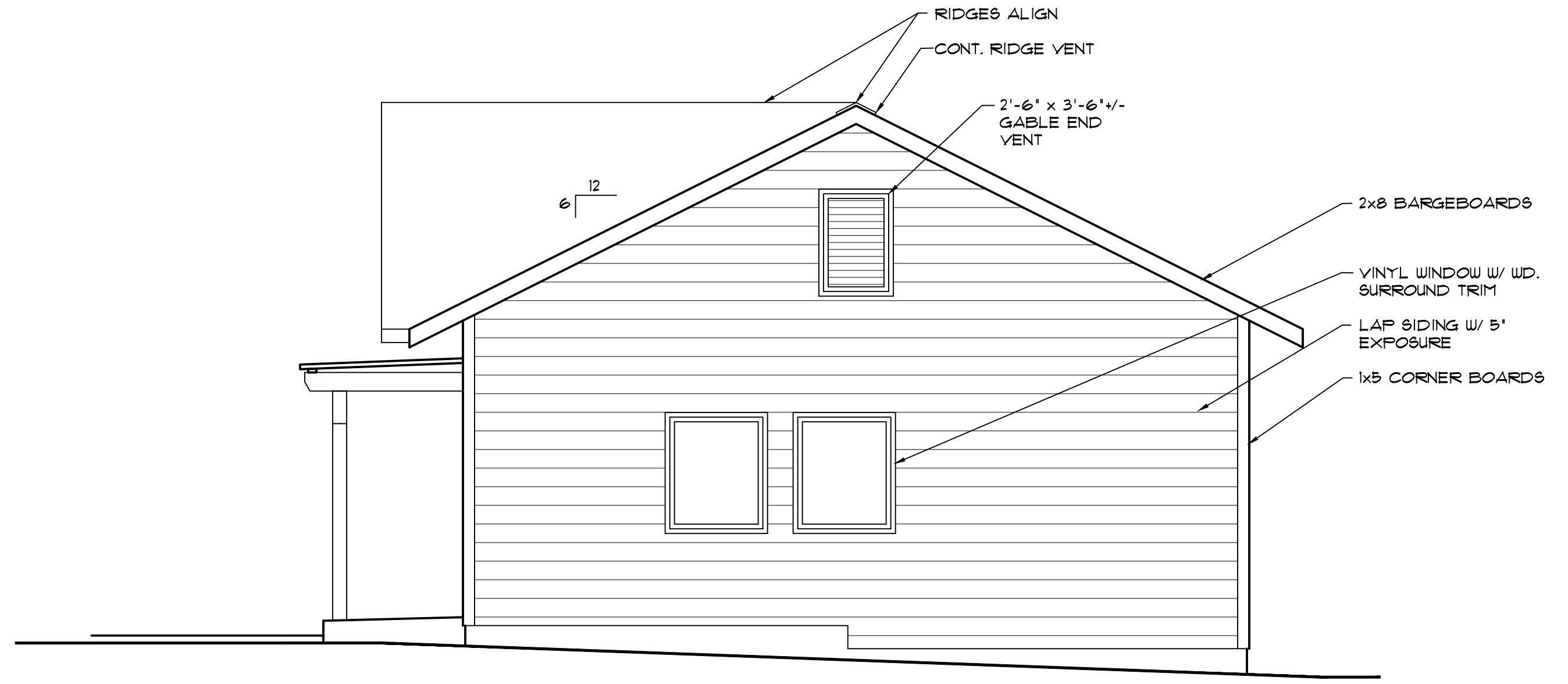
NOTE: ALL WINDOWS SHOWN ON THIS DRAWING (SIDE AND REAR ELEVATIONS - SHALL BE VINYL.
ALL WINDOWS AT FRONT (EAST) ELEVATION SHALL BE STOREFRONT

1/4" = 1'-0"



2
A2 SOUTH ELEVATION

1/4" = 1'-0"



3
A2 NORTH ELEVATION

1/4" = 1'-0"

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8800 SE 80TH AVE
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SHEET CONTENT
EXTERIOR ELEVATIONS

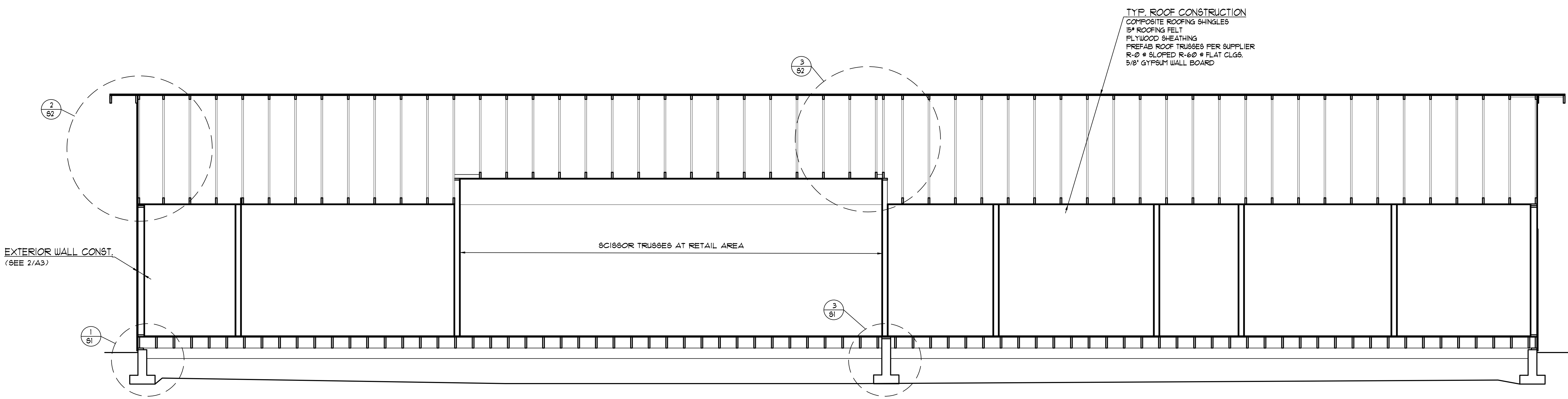
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DATE 8-15-22

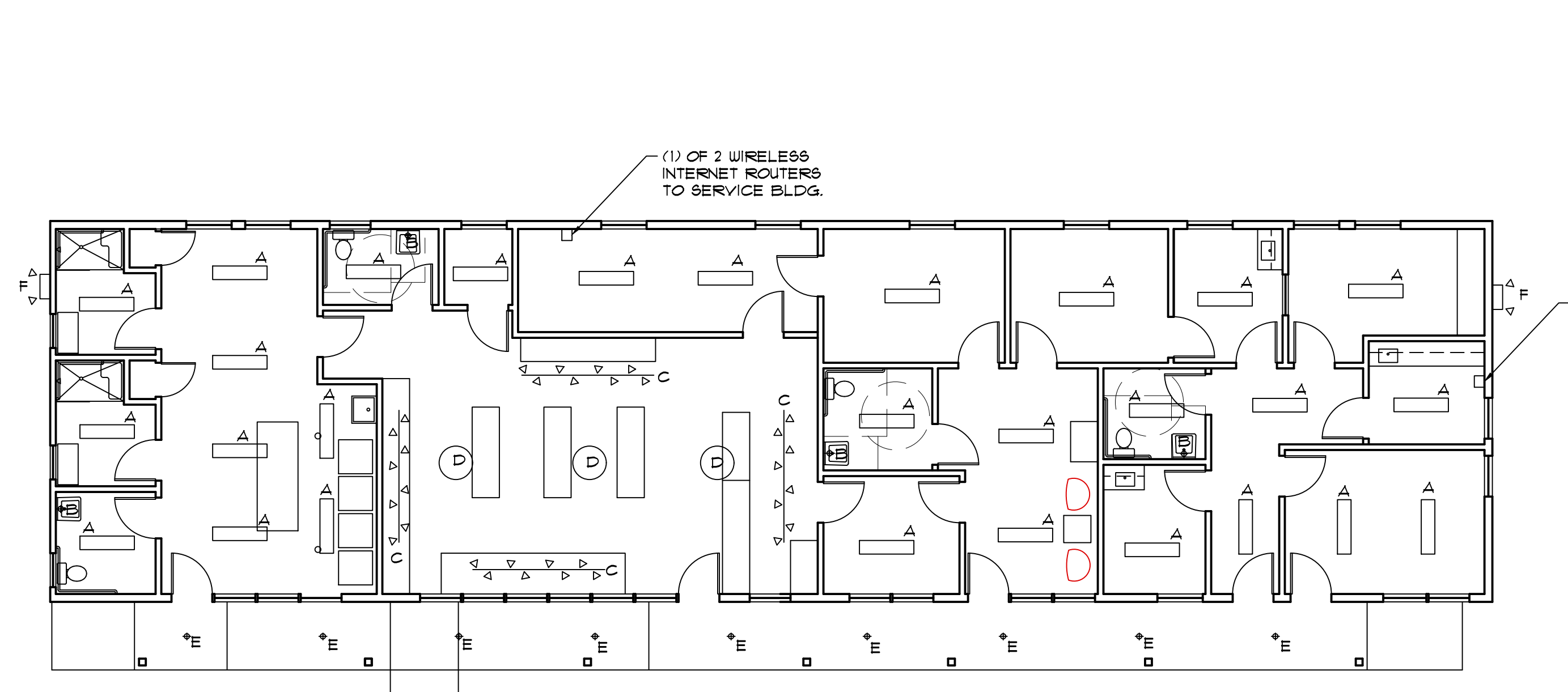
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SHEET
A2 OF 6



1 LONGITUDINAL SECTION
A3

1/4" = 1'-0"

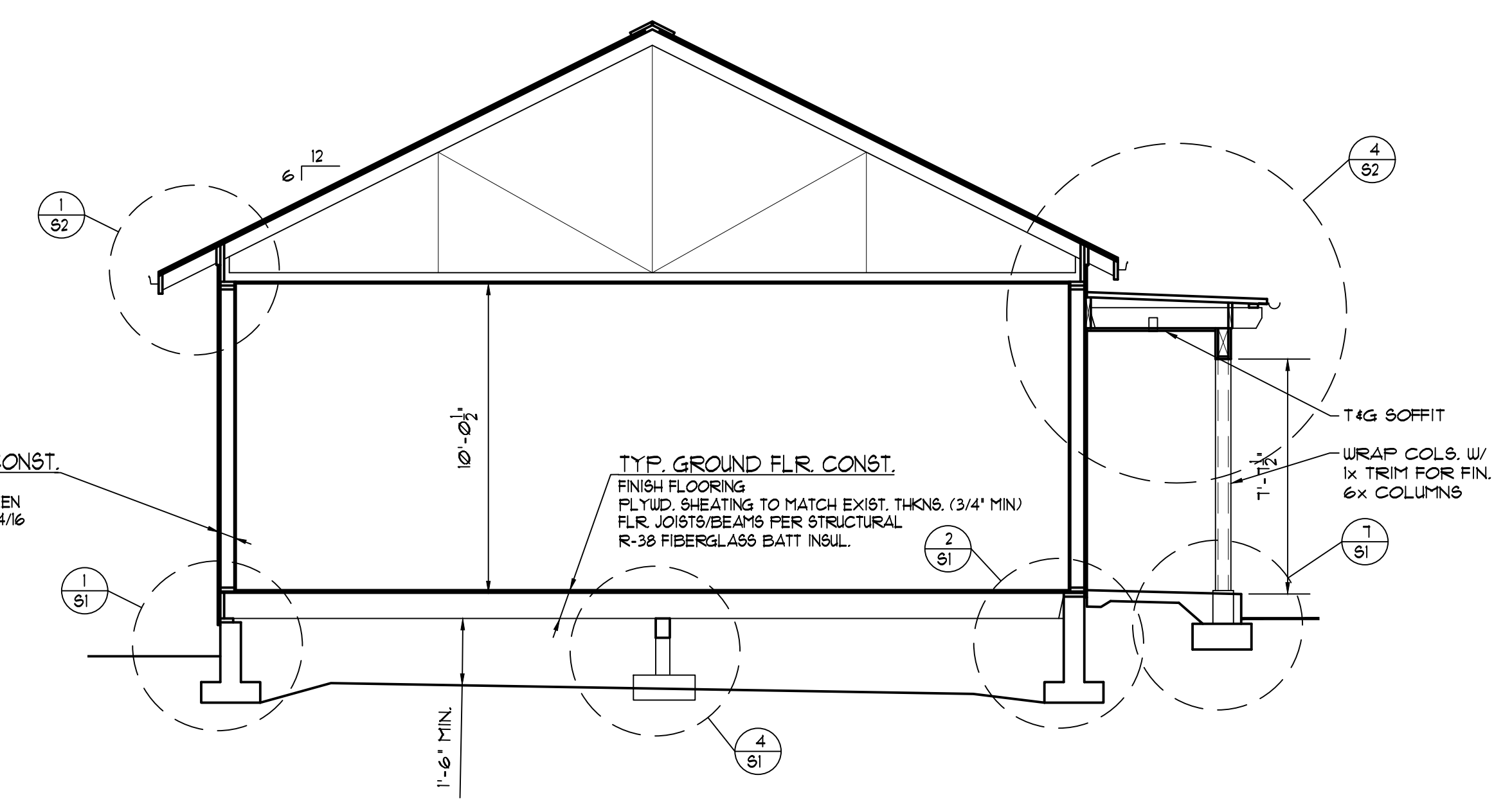


3 LIGHTING PLAN
A3

- LIGHTING LEGEND**
- A 4 LF LED CLG. MTD. LIGHT FIXTURE
 - B ABOVE SINK WALL SCONCE
 - C 10 LF TRACK LIGHTING
 - D PENDANT LIGHT
 - E RECESSED CAN @ 10' O.C.
 - F WALL MTD. MOTION SENSOR SECURITY LIGHT

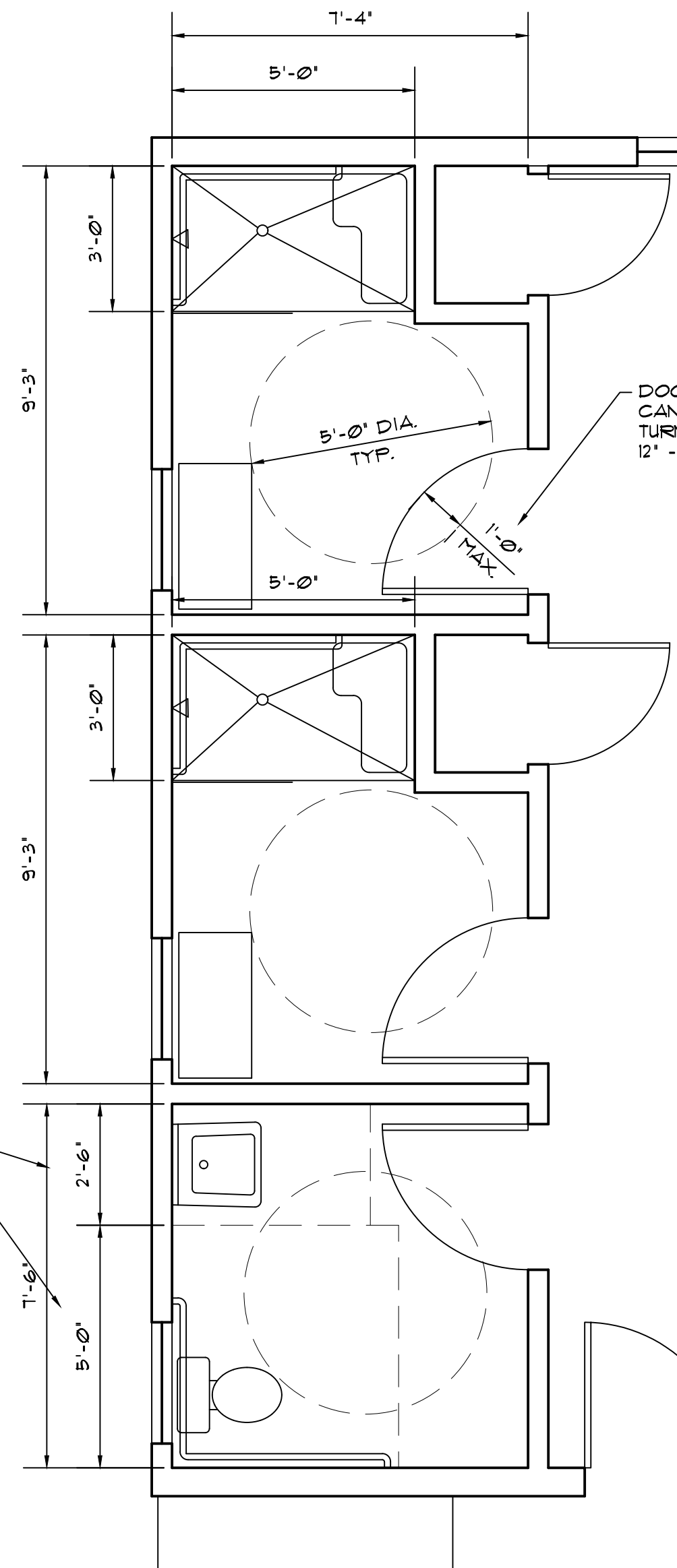
- ELEC. OUTLET SCHEDULE**
ELEC. OUTLETS SHALL BE INSTALLED AS FOLLOWS:
- 8' O.C. (MIN. 1 PER WALL) AT ALL AREAS EXCEPT BATHROOMS/SHOWERS AND AT STOREFRONT
 - 4' O.C. AT BUILT IN CABS AT LAB AND EXAM
 - ROOMS @ 44' AFF.
 - (1) GFI ADJ. TO EACH SINK AND AT EA.
 - SHOWER ROOM
 - DEDICATED OUTLETS AT EA. WASHER AND DRYER

1/8" = 1'-0"

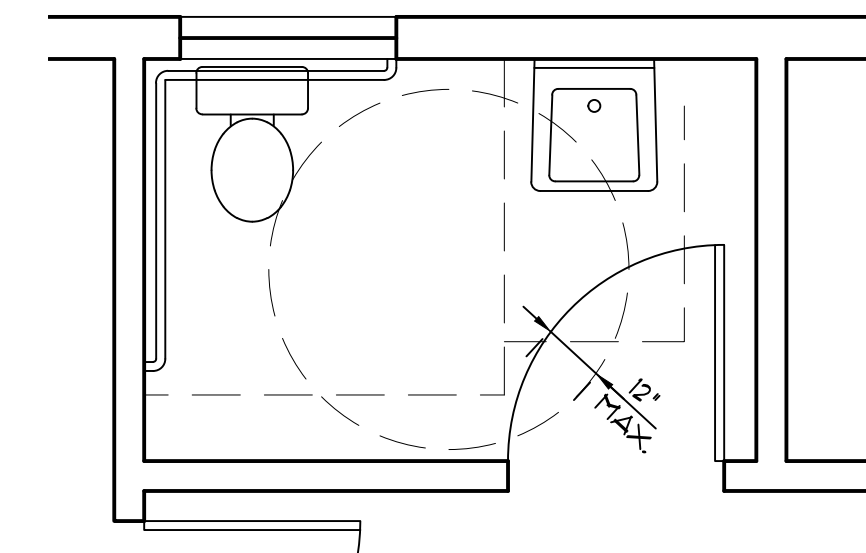


2 CROSS SECTION
A3

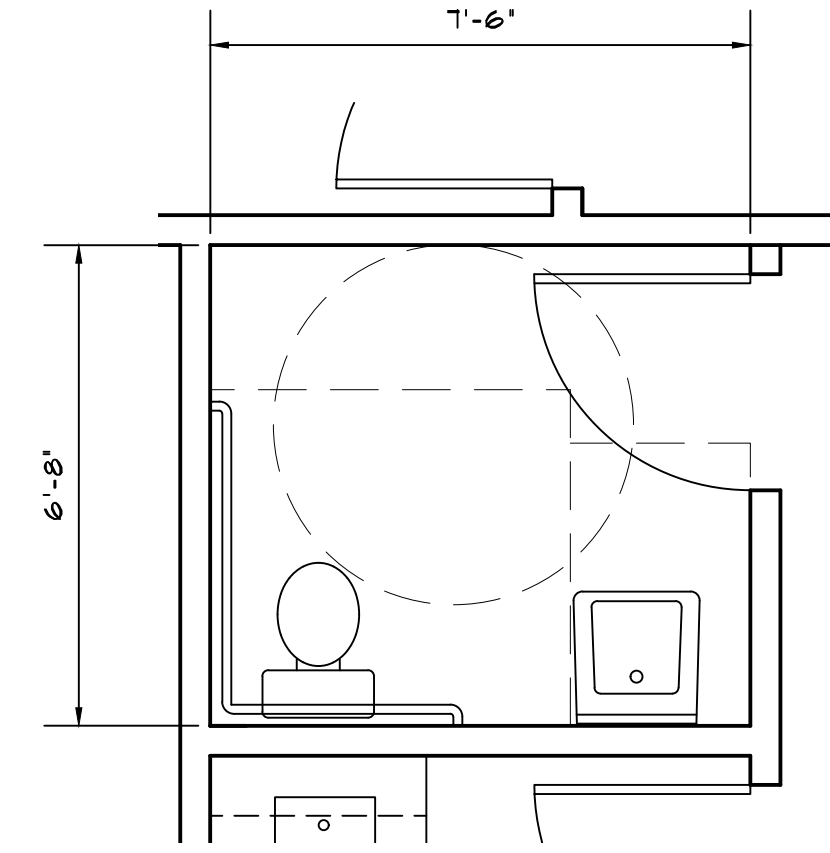
1/4" = 1'-0"



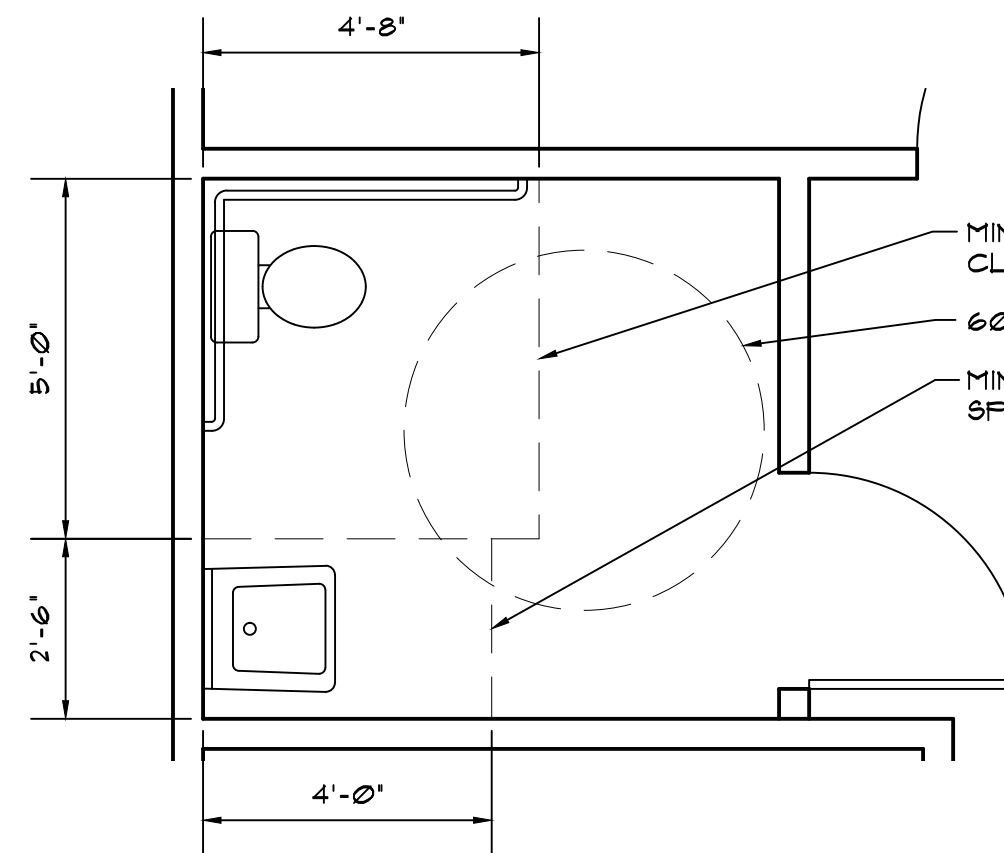
SHOWERS AND W.C.
@ LAUNDRY AREA



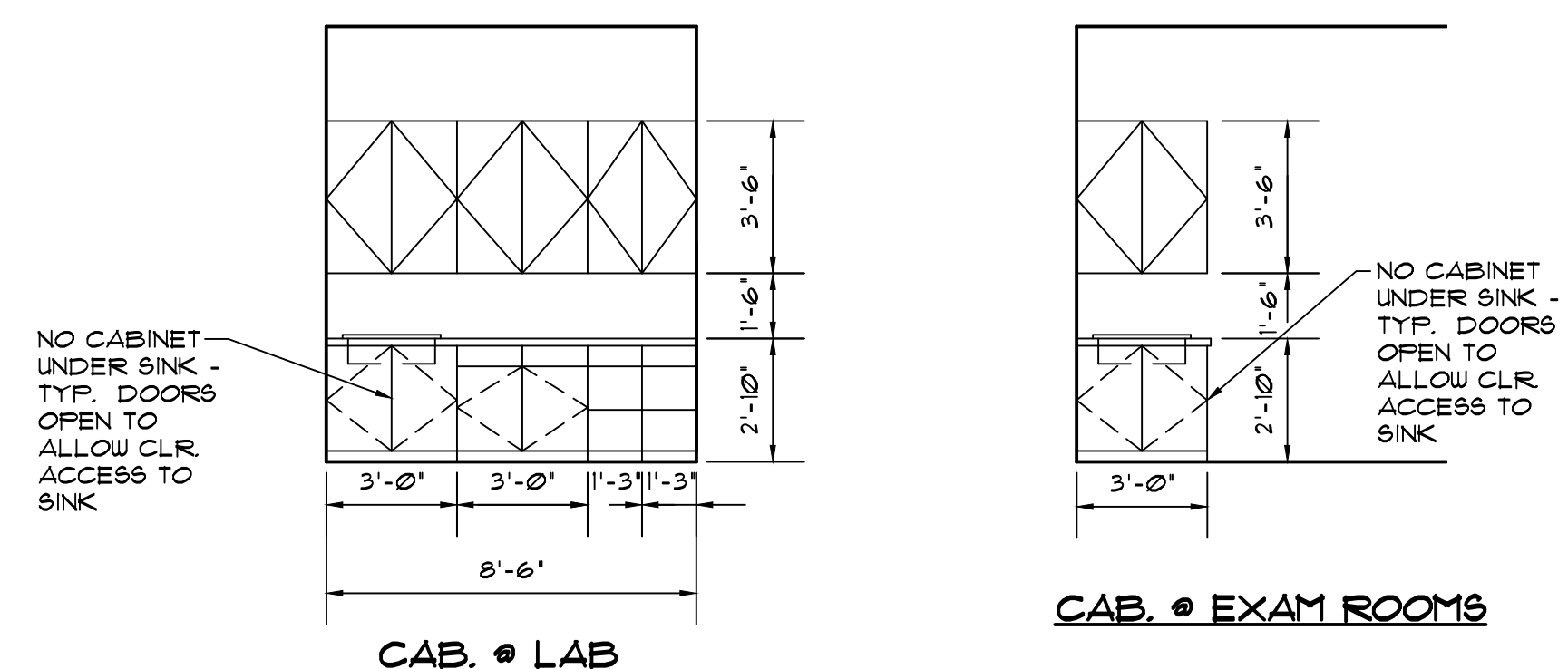
W.C. @ CLOTHING CENTER



W.C. @ OFFICES

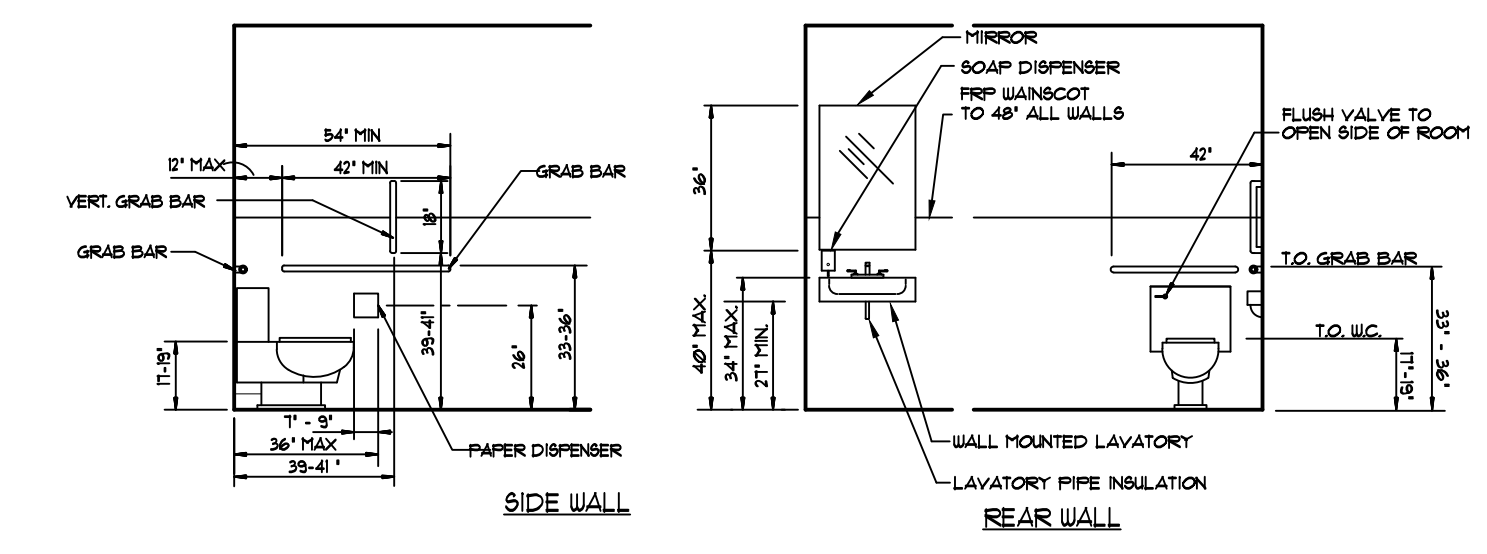


W.C. @ HEALTH CLINIC

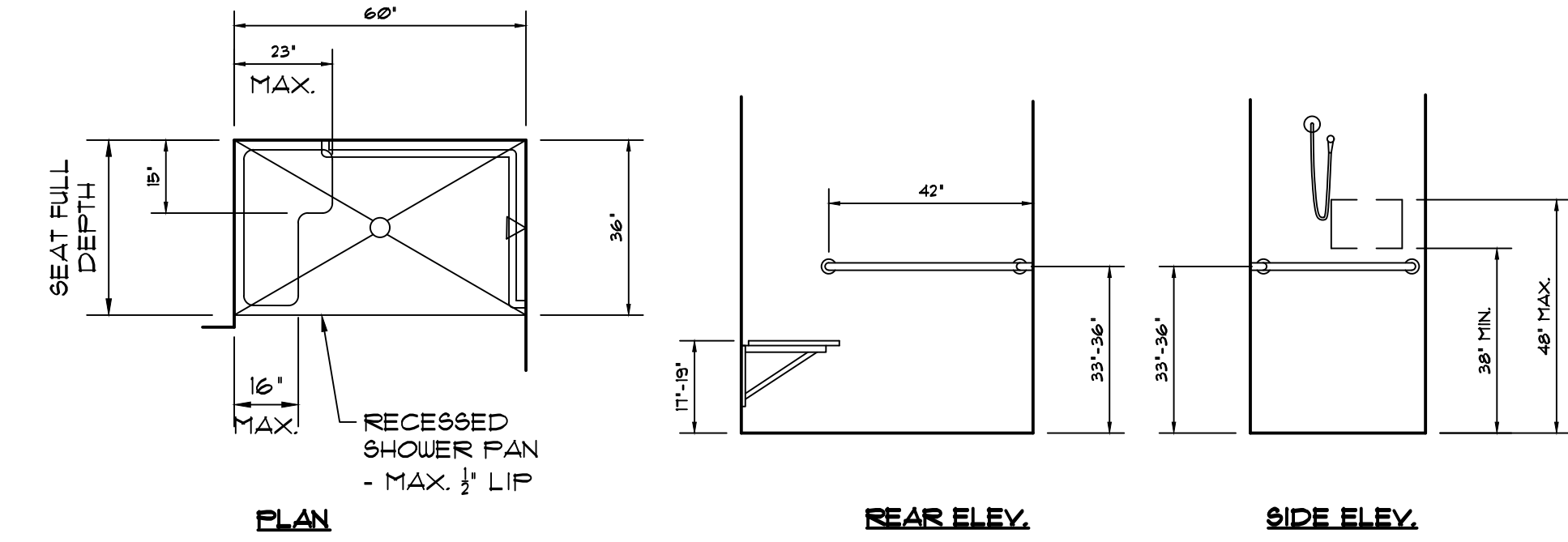


2 CABINET ELEVATIONS
A4

3/8" = 1'-0"

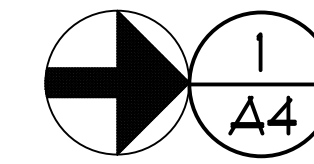


REAR AND SIDE WALL ELEVATIONS AT TOILET ROOMS



SHOWER DETAILS

3/8" = 1'-0"



1 TOILET AND SHOWER ROOM PLANS AND DETAILS
A4

NOTE: PROVIDE SOLID BLKG. WITHIN WALLS AT ALL FIXTURES, GRAB BARS, CABINETS, ETC.



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SHEET CONTENT
FOUNDATION AND
FLOOR FRAMING PLAN

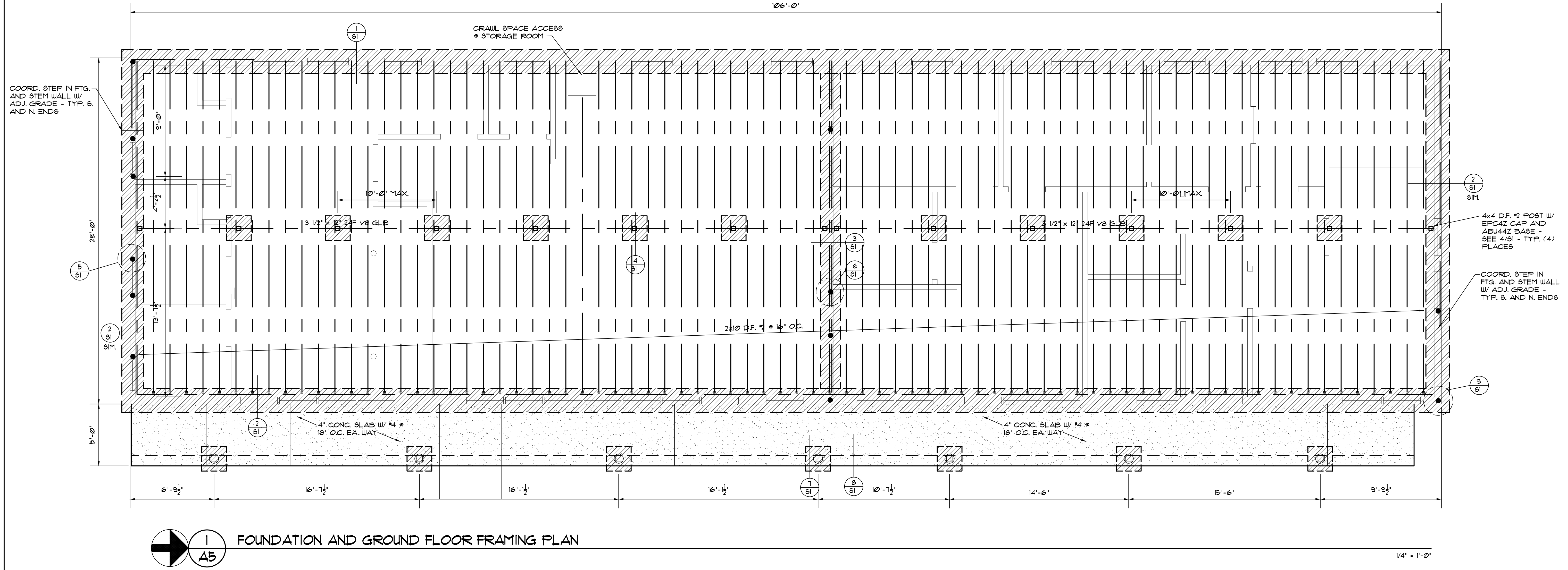
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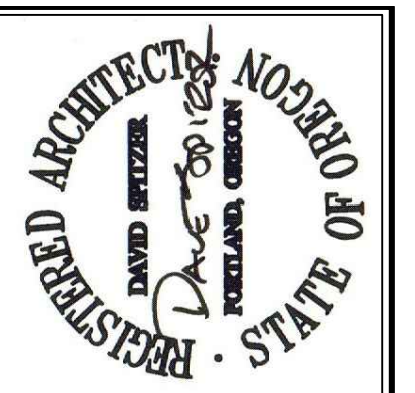
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A5 OF 6



1
A5 FOUNDATION AND GROUND FLOOR FRAMING PLAN

1/4" = 1'-0"



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SHEET CONTENT
ROOF FRAMING PLAN
TRELLIS FRAMING PLAN

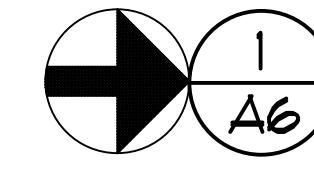
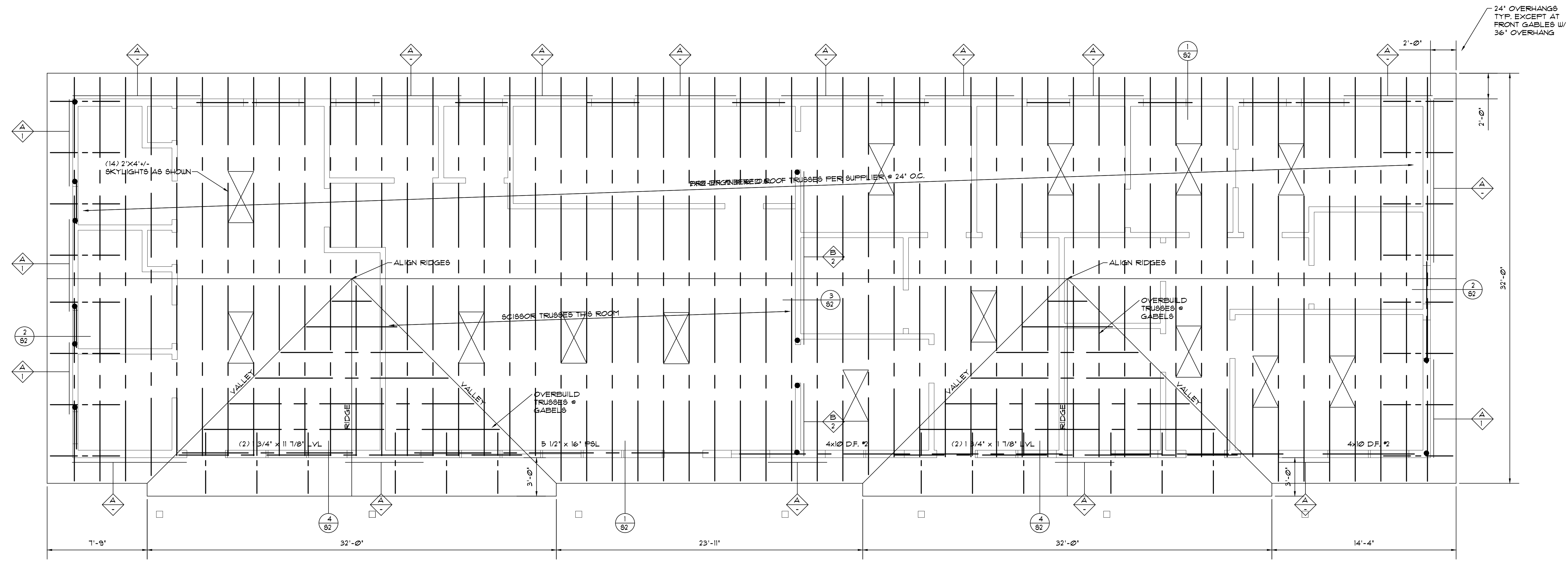
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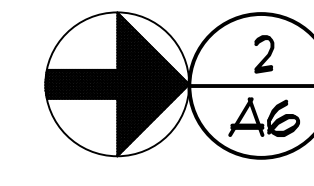
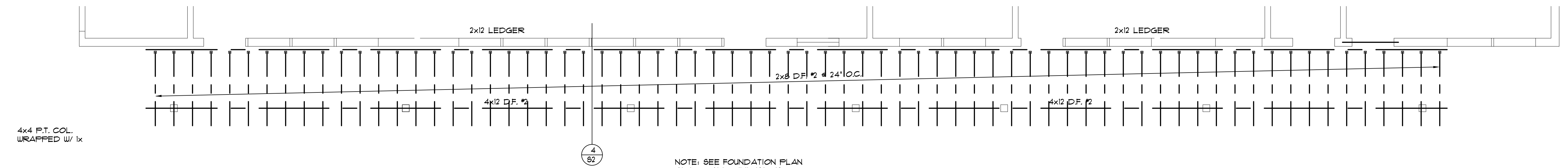
SHEET A6 OF 6



1 ROOF FRAMING PLAN

NOTE: ALL DOOR AND WINDOW HEADERS TO BE 4x6 D.F. #2 UNLESS NOTED OTHERWISE

1/4" = 1'-0"



2 TRELLIS FRAMING PLAN

NOTE: SEE FOUNDATION PLAN AS FOR ALL DIMENSIONS

1/4" = 1'-0"

CLACKAMAS SERVICE CENTER WEST BUILDING

8800 SE 80TH AVE, PORTLAND, OR 97206

PROJECT MANUAL SPECIFICATIONS DIVISIONS 01 - 33

100% CONSTRUCTION DOCUMENTS
FEBRUARY 17, 2023



SECTION 00 01 00 - SPECIFICATIONS TABLE OF CONTENTS

PROJECT MANUAL

DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS

- 00 01 00 Specifications Table of Contents
 - *Remainder provided by Owner's Project Representative –*
 - Introductory Information*
 - Procurement Requirements*
 - Contracting Requirements*

DIVISION 01 – GENERAL REQUIREMENTS

- 01 10 00 Summary
- 01 25 00 Substitution Procedures
 - 01 25 00.01 Substitution Request Form, Bid Phase
 - 01 25 00.02 Substitution Request Form, CA Phase
- 01 26 00 Contract Modification Procedures
- 01 29 00 Payment Procedures
- 01 31 00 Project Management and Coordination
- 01 32 00 Construction Progress Documentation
- 01 33 00 Submittal Procedures
- 01 40 00 Quality Requirements
- 01 50 00 Temporary Facilities and Controls
- 01 57 22 Construction Indoor Air Quality
- 01 60 00 Product Requirements
- 01 61 16 Delegated Design Requirements
- 01 73 00 Execution
- 01 74 19 Construction Waste Management and Disposal
- 01 77 00 Closeout Procedures
- 01 78 23 Operation and Maintenance Data
- 01 79 00 Demonstration and Training

DIVISION 02 – EXISTING CONDITIONS

- 02 41 16 Structure Demolition

DIVISION 03 – CONCRETE

- 03 30 00 Cast-In-Place Concrete

DIVISION 04 – MASONRY

- Not Used -

DIVISION 05 – METAL

- 05 50 00 Metal Fabrications
- 05 52 13 Pipe and Tube Railings

DIVISION 06 – WOOD AND PLASTIC

- 06 10 00 Rough Carpentry
- 06 16 00 Sheathing
- 06 17 53 Shop-Fabricated Wood Trusses
- 06 20 00 Finish Carpentry

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

- 07 11 13 Bituminous Dampproofing
- 07 21 00 Thermal Insulation
- 07 25 00 Weather Barriers
- 07 31 13 Asphalt Shingles
- 07 46 23 Wood Siding and Soffits
- 07 46 46 Fiber-Cement Siding
- 07 62 00 Sheet Metal Flashing and Trim
- 07 92 00 Joint Sealants

DIVISION 08 – OPENINGS

- 08 14 16 Flush Wood Doors
- 08 41 13 Aluminum-Framed Entrances and Storefronts
- 08 54 13 Fiberglass Windows
- 08 63 00 Metal-Framed Skylights
- 08 71 00 Door Hardware
- 08 80 00 Glazing
- 08 91 19 Fixed Louvers

DIVISION 09 – FINISHES

- 09 29 00 Gypsum Board
- 09 64 00 Wood Flooring
- 09 65 00 Resilient Flooring
- 09 65 13 Resilient Base and Accessories
- 09 68 00 Carpeting
- 09 72 12 Fiberglass Reinforced Plastic Wall Covering
- 09 91 00 Painting

DIVISION 10 – SPECIALTIES

- 10 14 00 Signage

10 26 00	Wall Protection
10 28 00	Restroom and Custodial Accessories
10 28 19	Shower Enclosures
10 41 16	Emergency Key Cabinets
10 44 00	Fire Protection Specialties

DIVISION 11 – EQUIPMENT

11 31 10	Appliances
----------	------------

DIVISION 12 – FURNISHINGS

12 35 30	Residential Casework
----------	----------------------

DIVISION 13 – SPECIAL CONSTRUCTION

- Not Used -

DIVISION 14 – CONVEYING EQUIPMENT

- Not Used -

DIVISION 21 – FIRE SUPPRESSION

- Not Used -

DIVISION 22 – PLUMBING

22 05 10	Design-Build Plumbing Systems
----------	-------------------------------

DIVISION 23 – HEATING VENTILATING AND COOLING

23 05 10	Design-Build HVAC Systems
----------	---------------------------

DIVISION 26 – ELECTRICAL

26 05 10	Design-Build Electrical Systems
----------	---------------------------------

DIVISION 27 – COMMUNICATIONS

27 05 10	Design-Build Data and Telecommunications Systems
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DIVISION 28 – ELECTRICAL SAFETY AND SECURITY

28 05 20	Design-Build Fire Detection and Alarm
28 13 10	Design-Build Access Control

DIVISION 31 – EARTHWORK

31 01 00	Design-Build Earthwork
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DIVISION 32 – EXTERIOR IMPROVEMENTS

32 05 10	Design-Build Exterior Improvements
32 12 10	Design-Build Asphalt Paving

DIVISION 33 – UTILITIES

33 01 00 Design-Build Site Utilities

END OF TABLE OF CONTENTS

SECTION 01 10 00 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Project information.
- 2. Work covered by Contract Documents.
- 3. Contractor's use of site and premises.
- 4. Coordination with occupants.
- 5. Work restrictions.
- 6. Specification and Drawing conventions.

B. Related Requirements:

- 1. Section 01 50 00 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.
- 2. Section 01 73 00 "Execution" for coordination of Owner-installed products.

1.3 PROJECT INFORMATION

A. Project Identification: Clackamas Service Center West Building.

- 1. Project Location: 8800 SE 80th Ave, Portland, OR 97206.

B. Owner:

- 1. Temporary Owner, During Project Construction: Clackamas County Housing and Community Development Division; Public Services Building, 2051 Kaen Road, Suite 245, Oregon City, OR 97045.

- a. Contact: Steve Kelly, Project Coordinator

- 1) Phone: 971-284-9949.
- 2) E-mail: stevekel@clackamas.us.

- 2. After Construction Completion: Clackamas Service Center; 8800 SE 80th Avenue
- 3. Portland, OR 97206.

- a. Contact: Jill Orr.

- 1) Phone: 971-236-2777.
- 2) E-mail: jillorr@cscoregon.org

C. Architect: DMS Architects; 2325 NE 19th Ave, Portland, OR 97212.

- 1. Contact: Dave Spitzer.

- a. Phone: 503-335-9040.
- b. E-mail: dave@dmsarchitects.com.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and includes, but is not limited to, the following:
 - 1. Demolition of existing West Annex Building and construction of new one-story facility that will provide the following: Laundry Area with two showers, four combination washer/dryers, three half restrooms, a Clothing Center with a storage room, Office Area for three center employees, Health Clinic with two exam rooms, a laboratory, and other Work indicated in the Contract Documents.
- B. Type of Contract:
 - 1. Project will be constructed under a single prime contract.

1.5 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Unrestricted Use of Site: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. Restricted Use of Site: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
- C. Limits on Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 - 1. Limits on Use of Site: Confine construction operations to areas indicated in Drawings.
 - 2. Driveways, Walkways and Entrances: Keep driveways, parking and loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- D. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.6 COORDINATION WITH OCCUPANTS

- A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.
 - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
 - 2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

1.7 WORK RESTRICTIONS

- A. Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets, work on public streets, rights of way, and

other requirements of authorities having jurisdiction.

- B. On-Site Work Hours: Limit work to between 7:30 a.m. to 4:30 p.m., Monday through Friday, unless otherwise indicated. Work hours may be modified to meet Project requirements if approved by Owner and authorities having jurisdiction.
 - 1. Weekend Hours: Not permitted unless approved ahead of time and workers are paid time and a half.
- C. Existing Utility Interruptions: Do not interrupt utilities serving adjacent facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging for temporary utility services according to requirements indicated:
 - 1. Notify Owner not less than two days in advance of proposed utility interruptions.
 - 2. Obtain Owner's written permission before proceeding with utility interruptions.
- D. Smoking and Controlled Substance Restrictions: Use of tobacco products, alcoholic beverages, and other controlled substances on Project site is not permitted.
- E. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.
 - 1. Maintain list of approved screened personnel with Owner's representative.

1.8 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 00 Contracting Requirements: General provisions of the Contract, including General and Supplementary Conditions, apply to all Sections of the Specifications.
- C. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- D. Drawing Coordination: Requirements for materials and products identified in Drawings are described in detail in the Specifications. One or more of the following are used in Drawings to identify materials and products:
 - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 - 2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings.
 - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 01 60 00 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

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

1.4 SUBMITTALS

- A. Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: For substitution tracking purposes, use applicable forms attached to this Section:
 - a. Substitution Request Form for Substitution Requests Prior to Bidding.
 - b. Substitution Request Form for Substitution Requests During Construction Administration.
 - 2. Documentation: In addition to Substitution Request Form, show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product, fabrication or installation method cannot be provided, if applicable.
 - b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by others that will be necessary to accommodate proposed substitution.
 - c. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - d. Samples, where applicable or requested.
 - e. Certificates and qualification data, where applicable or requested.
 - f. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.

- g. Research reports evidencing compliance with building code in effect for Project, from ICC-ES, if applicable.
 - h. Cost information, including a proposal of change, if any, in the Contract Sum.
 - i. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
 - j. Additionally, for Substitutions for Convenience:
 - 1) Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - 2) Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - 3) List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
 - 4) Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
 - 3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within five (5) working days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within ten(10) working days of receipt of request, or five (5) working days of receipt of additional information or documentation, whichever is later.
 - a. Forms of Acceptance: Change Order Request (COR), Construction Change Directive (CCD), or Architect's Supplemental Instructions (ASI) for minor changes in the Work.
 - b. Default to Specification: Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.
- 1.5 QUALITY ASSURANCE
- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.
- 1.6 PROCEDURES
- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.7 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than ten (10) working days prior to time required for preparation and review of related submittals.
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Requested substitution provides sustainable design characteristics that specified product provided for compliance with Project sustainability requirements.
 - c. Requested substitution provides specified warranty.
 - d. Substitution request is fully documented and properly submitted.
 - e. Requested substitution will not adversely affect Contractor's construction schedule.
 - f. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - g. Requested substitution is compatible with other portions of the Work.
 - h. Requested substitution has been coordinated with other portions of the Work.
 - i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Architect will consider requests for substitution if received within 60 calendar days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - b. Requested substitution does not require extensive revisions to the Contract Documents.
 - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - d. Requested substitution provides sustainable design characteristics that specified product provided for compliance with Project sustainability requirements.
 - e. Requested substitution provides specified warranty.
 - f. Substitution request is fully documented and properly submitted.
 - g. Requested substitution will not adversely affect Contractor's construction schedule.
 - h. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - i. Requested substitution is compatible with other portions of the Work.

- j. Requested substitution has been coordinated with other portions of the Work.
- k. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

**SUBSTITUTION REQUEST FORM
For Substitution Requests During Bid Phase**

Advancement of Construction Technology
The Construction Specifications Institute

TO: _____

PROJECT: _____

SPECIFIED ITEM:

Section	Page	Paragraph	Description
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The undersigned requests consideration of the following:

PROPOSED SUBSTITUTION: _____

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes description of changes to Contract Documents which proposed substitution will require for its proper installation.

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

1. THE PROPOSED SUBSTITUTION DOES NOT AFFECT DIMENSIONS SHOWN ON DRAWINGS.
2. THE UNDERSIGNED WILL PAY FOR CHANGES TO THE BUILDING DESIGN, INCLUDING ENGINEERING DESIGN, DETAILING AND CONSTRUCTION COSTS CAUSED BY THE REQUESTED SUBSTITUTION.
3. THE PROPOSED SUBSTITUTION WILL HAVE NO ADVERSE EFFECT ON OTHER TRADES, THE CONSTRUCTION SCHEDULE, OR SPECIFIED WARRANTY REQUIREMENTS.
4. MAINTENANCE AND SERVICE PARTS WILL BE LOCALLY AVAILABLE FOR THE PROPOSED SUBSTITUTION.

The undersigned further states that the function, appearance and quality of the Proposed Substitution are equivalent or superior to the Specified Item.

Submitted By: _____

For use by Design Consultant:

Signature: _____

Accepted Accepted as noted

Firm: _____

Not Accepted Received too late

Address: _____

By: _____

Date: _____

Date: _____

Telephone: _____

Remarks: _____

Attachments: _____

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**SUBSTITUTION REQUEST FORM
For Substitution Requests During
Construction Administration**

Advancement of Construction Technology
The Construction Specifications Institute

TO: _____

PROJECT: _____

SPECIFIED ITEM:

Section	Page	Paragraph	Description
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The undersigned requests consideration of the following:

PROPOSED SUBSTITUTION: _____

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes description of changes to Contract Documents which proposed substitution will require for its proper installation.

Substitutions for After Bidding: The undersigned states that the substitution is requested DUE TO AT LEAST ONE of the following conditions (indicate and substantiate condition in attachments; failure to identify one of these conditions will result in rejection of the substitution):

1. SPECIFIED PRODUCT IS NO LONGER AVAILABLE.
2. SPECIFIED PRODUCT IS NO LONGER COMPATIBLE, DUE TO CHANGES IN THE DESIGN DURING CONSTRUCTION.
3. A CHANGE IN GOVERNING REGULATORY REQUIREMENTS MAKES A REVISION IN DESIGN OR MATERIAL USAGE MANDATORY.
4. SUBSTITUTION OFFERS THE OWNER A SUBSTANTIAL ADVANTAGE IN COST, TIME, ENERGY CONSERVATION, OR OTHER CONSIDERATIONS (Provide substantiation for review).

The undersigned further states that the function, appearance and quality of the Proposed Substitution are equivalent or superior to the Specified Item.

Submitted By: _____

For use by Design Consultant:

Signature: _____

Firm: _____

Address: _____

Date: _____

Telephone: _____

Attachments: _____

- | | |
|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> |
| Accepted | Accepted as noted |
| <input type="checkbox"/> | <input type="checkbox"/> |
| Not Accepted | Received too late |

By: _____

Date: _____

Remarks: _____

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SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
 - 1. Section 01 25 00 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.
 - 2. Section 01 31 00 "Project Management and Coordination" for requirements for forms for contract modifications provided as part of web-based Project management software.

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue through Construction Manager supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710 "Architect's Supplemental Instructions (ASI)" or other form agreed to by Owner and Contractor.

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Construction Manager will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Construction Manager are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in Proposal Request or fourteen (14) working days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - e. Quotation Form: Use AIA Document G709 "Proposal Request (PR)" or other form acceptable to Owner and Architect.
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Construction

Manager.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Section 01 25 00 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Proposal Request Form: Use form provided by or acceptable to Owner and Architect.

1.5 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Change Proposal Request, Construction Manager will issue a Change Order for signatures of Owner and Contractor on AIA Document G701 "Change Order (CO)" or other form acceptable to Owner and Architect.

1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect or Construction Manager may issue a Construction Change Directive on AIA Document G714 "Construction Change Directive (CCD)" or other form acceptable to Owner and Architect. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 1. Construction Change Directive contains a description of change in the Work. It may also designate method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Owner's Division 00 document "Proposed Schedule of Values Form" or other similar document for requirements for furnishing proposed schedule of values with bid.
 - 2. Section 01 26 00 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 3. Section 01 32 00 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
- B. Critical Path Method (CPM) Schedule: A scheduling method for a set of project activities, wherein a critical path is determined by identifying the longest stretch of dependent activities and measuring the time required to complete them from start to finish without making the project longer.

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule. A Cost-loaded Critical Path Method (CPM) Schedule may serve to satisfy requirements for the schedule of values.
 - 1. Coordinate line items in the schedule of values with items required to be indicated as separate activities in Contractor's construction schedule.
 - 2. Submit the schedule of values to Architect at earliest possible date, but no later than five (5) working days before the date scheduled for submittal of initial Applications for Payment.
 - 3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.
 - 4. Subschedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work, provide subschedules showing values coordinated with each element.
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
 - 1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.

- b. Owner's name.
 - c. Owner's Project number.
 - d. Name of Architect.
 - e. Architect's Project number.
 - f. Contractor's name and address.
 - g. Date of submittal.
2. Arrange schedule of values consistent with format of AIA Document G703 "Continuation Sheet" or other form acceptable to Owner and Architect.
 3. Arrange the schedule of values in tabular form, with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent. Round dollar amounts to whole dollars, with total equal to Contract Sum.
 - 1) Labor.
 - 2) Materials.
 - 3) Equipment.
 4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide multiple line items for principal subcontract amounts in excess of five (5) percent of the Contract Sum.
 5. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site.
 6. Purchase Contracts: Provide a separate line item in the schedule of values for each Purchase contract. Show line-item value of Purchase contract. Indicate Owner payments or deposits, if any, and balance to be paid by Contractor.
 7. Overhead Costs, Separate Line Items: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
 8. Temporary Facilities: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
 9. Closeout Costs. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling five (5) percent of the Contract Sum and subcontract amount.
 10. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments, as certified by Architect and Construction Manager and paid for by Owner.
- B. Payment Application Times: The date for each progress payment is indicated in the Owner/ Contractor Agreement, or date as agreed to by Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Times: Submit Application for Payment to Architect by the date agreed to by Owner and Contractor.
- D. Application for Payment Forms: Use AIA Document G702 "Application and Certificate for Payment" and AIA Document G703 "Continuation Sheet" as form for Applications for Payment.
 - 1. Other Application for Payment forms proposed by the Contractor may be acceptable to Architect, Construction Manager and Owner. Submit forms for approval with initial submittal of schedule of values.
- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect and Construction Manager will return incomplete applications without action.
 - 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 - 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 - 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
 - 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- F. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
 - 1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment for stored materials.
 - 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 - 3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- G. Transmittal: Submit three (3) signed and notarized original copies of each Application for Payment to Architect and Construction Manager by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
 - 1. Alternatively, submit Application for Payment in Portable Document Format (PDF) with digital signatures.

2. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- H. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 5. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- I. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of values.
 3. Contractor's construction schedule (preliminary if not final).
 4. Products list (preliminary if not final).
 5. Submittal schedule (preliminary if not final).
 6. List of Contractor's staff assignments.
 7. List of Contractor's principal consultants.
 8. Copies of building permits.
 9. Copies of authorizations and licenses from authorities having jurisdiction (AHJ) for performance of the Work.
 10. Initial progress report.
 11. Report of preconstruction conference.
 12. Submit the following, if not submitted before executing the Contract:
 - a. Certificates of insurance and insurance policies.
 - b. Performance and payment bonds.
 - c. Data needed to acquire Owner's insurance.
- J. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 - a. Complete administrative actions, submittals, and Work preceding this application, as described in Section 01 77 00 "Closeout Procedures."
 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- K. Final Payment Application: After completing Project closeout requirements, submit final

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

1. Evidence of completion of Project closeout requirements.
2. Certification of completion of final punch list items.
3. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
4. Updated final statement, accounting for final changes to the Contract Sum.
5. AIA Document G706 "Contractor's Affidavit of Payment".
6. AIA Document G706A "Contractor's Affidavit of Release of Liens".
7. AIA Document G707 "Consent of Surety to Final Payment".
8. Evidence that claims have been settled.
9. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
10. Final liquidated damages settlement statement.
11. Proof that taxes, fees, and similar obligations are paid.
12. Waivers and releases.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project, including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. Requests for Information (RFIs).
 - 4. Digital project management procedures.
 - 5. Project meetings.
- B. Related Requirements:
 - 1. Section 01 32 00 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
 - 2. Section 01 73 00 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Section 01 77 00 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

- A. BIM: Building Information Modeling.
- B. RFI: Request for Information. Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.
- B. Key Personnel Names: Within ten (10) working days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses, cellular telephone numbers, and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
 - 1. Post copies of list in Project meeting room, in temporary field office. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results, where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's construction schedule.
 - 2. Preparation of the schedule of values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. Preinstallation conferences.
 - 7. Project closeout activities.
 - 8. Startup and adjustment of systems.

1.6 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
 - 1. Exception: Coordination drawings are not required if installation is completely indicated and adequately coordinated on Shop Drawings prepared by a single fabricator. Ensure coordination with individual Sections.
 - a. Confirm coordination requirements with Project utilities.
 - 2. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
 - b. Coordinate the addition of trade-specific information to coordination drawings in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.

- c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
 - e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
 - f. Indicate required installation sequences.
 - g. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:
1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
 2. Plenum Space: Indicate subframing for support of ceiling, raised access floor where applicable, and wall systems, mechanical and electrical equipment, and related Work. Locate components within plenums to accommodate layout of light fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
 3. Mechanical Rooms: Provide coordination drawings for mechanical rooms, showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
 4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
 5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
 6. Mechanical and Plumbing Work: Show the following:
 - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
 - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
 - c. Fire-rated enclosures around ductwork.
 7. Electrical Work: Show the following:
 - a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.
 - b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
 - c. Panel board, switchboard, switchgear, transformer, busway, generator, and motor-control center locations.
 - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
 8. Fire-Protection System: Show the following:
 - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.

9. Review: Architect will review coordination drawings to confirm that, in general, the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make suitable modifications and resubmit.
 10. Coordination Drawing Deliverables: Prepare coordination drawing prints and/ or digital data files according to requirements in Section 01 33 00 "Submittal Procedures."
- C. Coordination Drawing Process: Prepare coordination drawings in the following manner:
1. Schedule submittal and review of Fire Sprinkler, Plumbing, HVAC, and Electrical Shop Drawings to make required changes prior to preparation of coordination drawings.
 2. Commence routing of coordination drawing files with HVAC Installer, who will provide drawing plan files denoting approved ductwork. HVAC Installer will locate ductwork and piping, using orange color. Forward drawings to Plumbing Installer.
 3. Plumbing Installer will locate plumbing and equipment, using blue color. Forward drawings to Fire Sprinkler Installer.
 4. Fire Sprinkler Installer will locate piping and equipment, using red color. Forward drawing files to Electrical Installer.
 5. Electrical Installer will indicate service and feeder conduit runs and equipment, using green color. Forward drawing files to Communications and Electronic Safety and Security Installer.
 6. Communications and Electronic Safety and Security Installer will indicate cable trays and cabling runs and equipment, using purple color. Forward completed drawing files to Contractor.
 7. Contractor shall perform the final coordination review. As each coordination drawing is completed, Contractor will meet with Architect to review and resolve conflicts on the coordination drawings.
- D. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:
1. File Preparation Format:
 - a. Same digital data software program, version, and operating system as original Drawings.
 - b. DWG, DXF, or DGN, most current version, operating in Microsoft Windows operating system.
 2. File Submittal Format: Submit or post coordination drawing files using format same as file preparation format and PDF format.
 3. BIM File Incorporation: Develop and incorporate Contractor's coordination drawing files into BIM established for Project.
 - a. Perform three-dimensional component conflict analysis as part of preparation of coordination drawings. Resolve component conflicts prior to submittal. Indicate where conflict resolution requires modification of design requirements by Architect.
 4. Architect will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.
 - a. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.
 - b. Digital Drawing Software Program: Drawings will be made available in version of digital drawing software program used by Architect.

- c. Contractor shall execute a data licensing agreement in the form of AIA Document C106 "Digital Data Licensing Agreement" or an agreement form acceptable to Owner and Architect.

1.7 REQUEST FOR INFORMATION (RFI)

- A. General: On discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
 2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 1. Project name.
 2. Owner name.
 3. Owner's Project number.
 4. Name of Architect.
 5. Architect's Project number.
 6. Date.
 7. Name of Contractor.
 8. RFI number, numbered sequentially.
 9. RFI subject.
 10. Specification Section number and title and related paragraphs, as appropriate.
 11. Drawing number and detail references, as appropriate.
 12. Field dimensions and conditions, as appropriate.
 13. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 14. Contractor's signature.
 15. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: AIA Document G716 "Request for Information (RFI)" or form with substantially the same content as indicated above, acceptable to Architect.
 1. Attachments shall be electronic files in PDF format.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow five (5) working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day. For RFIs requiring Architect's subconsultant review, allow ten (10) working days for Architect's response for each RFI.
 1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.

- b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.
 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 01 26 00 "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within three (3) working days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log prior to each progress meeting. Include the following:
1. Project name.
 2. Name and address of Contractor.
 3. Name and address of Architect.
 4. RFI numbers, including RFIs that were returned without action or withdrawn.
 5. RFI descriptions.
 6. Date the RFIs were submitted.
 7. Date Architect's responses were received.
 8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
- F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within three (3) working days if Contractor disagrees with response.

1.8 DIGITAL PROJECT MANAGEMENT PROCEDURES

- A. Use of Architect's Digital Data Files: Digital data files of Architect's BIM or CAD drawings will be provided by Architect for Contractor's use during construction.
1. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project Record Drawings.
 2. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.
 3. Digital Drawing Software Program: Contract Drawings will be made available in version of digital drawing software program used by Architect.
 4. Contractor and their subcontractors shall execute a data licensing agreement in the form of AIA Document C106 "Digital Data Licensing Agreement" or other agreement form acceptable to Owner and Architect.

5. For projects without BIM model, the following CAD files will be furnished for each appropriate discipline:
 - a. Floor plans.
 - b. Reflected ceiling plans.
 - B. Portable Document Format (PDF) File Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:
 1. Assemble complete submittal package into a single indexed file, incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 2. Name file with submittal number or other unique identifier, including revision identifier.
 3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.
- 1.9 PROJECT MEETINGS
- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times a minimum of five (5) working days prior to meeting.
 2. Agenda: Prepare the meeting agenda for distribution at the meeting. Distribute a draft agenda in digital format to all invited attendees prior to the meeting.
 3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three (3) working days of the meeting.
 - B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than ten (10) working days after execution of the Agreement.
 1. Attendees: Authorized representatives of Owner Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Responsibilities and personnel assignments.
 - b. Tentative construction schedule.
 - c. Critical work sequencing and long lead items.
 - d. Designation of key personnel and their duties.
 - e. Lines of communications.
 - f. Procedures for RFIs.
 - g. Procedures for processing field decisions and Change Orders.
 - h. Procedures for testing and inspecting.
 - i. Procedures for processing Applications for Payment.
 - j. Distribution of the Contract Documents.
 - k. Submittal procedures.

- l. Preparation of Record Documents.
 - m. Use of the premises and existing building(s), if any.
 - n. Work restrictions.
 - o. Working hours.
 - p. Owner's occupancy requirements, if applicable.
 - q. Responsibility for temporary facilities and controls.
 - r. Procedures for moisture and mold control.
 - s. Procedures for disruptions and shutdowns.
 - t. Construction waste management and recycling.
 - u. Parking availability.
 - v. Office, work, and storage areas.
 - w. Equipment deliveries and priorities.
 - x. Health, safety and site security.
 - y. Progress cleaning.
 - 3. Minutes: Record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other Sections and when required for coordination with other construction.
 - 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect, **[and Owner's Commissioning Authority]** of scheduled meeting dates.
 - 2. Agenda: Review progress of other construction activities and preparations for the activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Related RFIs.
 - c. Related Change Orders.
 - d. Submittals.
 - e. Purchases.
 - f. Deliveries.
 - g. Review of mockups, where applicable.
 - h. Coordination with other work.
 - i. Possible conflicts.
 - j. Compatibility requirements.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer's written instructions.
 - n. Warranty requirements.
 - o. Compatibility of materials.

- p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction (AHJ).
 - t. Protection of adjacent work.
 - u. Installation procedures.
 - v. Required performance results.
 - w. Testing and inspecting requirements.
 - x. Protection of construction and personnel.
- 3. Record significant conference discussions and major decisions, including required corrective measures and actions.
 - 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 - 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than thirty (30) calendar days prior to the scheduled date of Substantial Completion.
- 1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 - 2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of Record Documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Requirements for preparing operations and maintenance data.
 - d. Requirements for delivery of material samples, attic stock, and spare parts.
 - e. Requirements for demonstration and training.
 - f. Preparation of Contractor's punch list.
 - g. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - h. Closeout submittal procedures, including written warranties.
 - i. Responsibility for removing temporary facilities and controls.
 - 4. Minutes: Record and distribute meeting minutes.
- E. Progress Meetings: Conduct progress meetings at weekly intervals.
- 1. Coordinate dates of meetings with preparation of payment requests.

2. Attendees: In addition to representatives of Owner and Architect, each subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Resolution of BIM component conflicts.
 - 4) Status of submittals.
 - 5) Deliveries.
 - 6) Off-site fabrication.
 - 7) Access.
 - 8) Site use.
 - 9) Temporary facilities and controls.
 - 10) Progress cleaning.
 - 11) Quality and work standards.
 - 12) Status of correction of deficient items.
 - 13) Field observations.
 - 14) Status of RFIs.
 - 15) Status of Proposal Requests.
 - 16) Pending changes.
 - 17) Status of Change Orders.
 - 18) Pending claims and disputes.
 - 19) Documentation of information for payment requests.
 4. Minutes: Record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- F. Coordination Meetings: Conduct Project coordination meetings at intervals as necessary to coordinate specific portions of Project work. Project coordination meetings are in addition to

specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - b. Schedule Updating: Revise Contractor's construction schedule after each coordination meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
 - c. Review present and future needs of each contractor present, including the following, where applicable to coordination meeting:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Resolution of BIM component conflicts.
 - 4) Status of submittals.
 - 5) Deliveries.
 - 6) Off-site fabrication.
 - 7) Access.
 - 8) Site use.
 - 9) Temporary facilities and controls.
 - 10) Work hours.
 - 11) Hazards and risks.
 - 12) Progress cleaning.
 - 13) Quality and work standards.
 - 14) Status of RFIs.
 - 15) Proposal Requests.
 - 16) Change Orders.
 - 17) Pending changes.
3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Startup construction schedule.
 - 2. Contractor's Construction Schedule.
 - 3. Construction schedule updating reports.
 - 4. Daily construction reports.
 - 5. Material location reports.
 - 6. Site condition reports.
 - 7. Unusual event reports.
- B. Related Requirements:
 - 1. Section 01 29 00 "Payment Procedures" for schedule of values and requirements for use of cost-loaded schedule for Applications for Payment.
 - 2. Section 01 40 00 "Quality Requirements" for schedule of tests and inspections.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. Bar Chart-Type Schedule: For Project construction value greater than \$2,000,000.00, or as required by Owner, provide CPM-Type schedule defined below. Bar Chart-Type schedules e.g., Gantt, are otherwise acceptable.
- C. CPM-Type Schedule Definitions:
 - 1. Cost Loading: The allocation of the schedule of values for completing an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum.
 - 2. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine the critical path of Project and when activities can be performed.
 - 3. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
 - 4. Event: The starting or ending point of an activity.

5. Float: The measure of leeway in starting and completing an activity.
 - a. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 - b. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 - c. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
6. Resource Loading: The allocation of manpower and equipment necessary for completing an activity as scheduled.

1.4 SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 1. Working electronic copy of schedule file.
 2. Portable Document Format (PDF) file.
 3. Where required by Owner, provide three (3) paper copies, of sufficient size to display entire period or schedule, as required.
- B. Startup construction schedule.
 1. If Application for Payment submittals are required to use network cost- and resource-loaded reporting per Section 01 29 00 "Payment Procedures", submittal of cost-loaded startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.
- C. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.
- D. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
 1. Submit a working digital copy of schedule, using software indicated, and labeled to comply with requirements for submittals.
- E. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
 1. Activity Report: List of activities sorted by activity number and then early start date, or actual start date if known.
 2. Logic Report: List of preceding and succeeding activities for each activity, sorted in ascending order by activity number and then by early start date, or actual start date if known.
 3. Total Float Report: List of activities sorted in ascending order of total float.
 4. Earnings Report: Compilation of Contractor's total earnings from the Notice to Proceed until most recent Application for Payment.
- F. Construction Schedule Updating Reports: Submit with Applications for Payment.
- G. Daily Construction Reports: Submit at weekly intervals.
- H. Material Location Reports: Submit at weekly intervals.
- I. Site Condition Reports: Submit at time of discovery of differing conditions.

- J. Unusual Event Reports: Submit at time of unusual event.
- K. Qualification Data: For projects requiring CPM-type schedule, provide qualification data for scheduling consultant.

1.5 QUALITY ASSURANCE

- A. Scheduling Consultant Qualifications: For projects requiring CPM-type schedule, an experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Architect's request.
- B. Prescheduling Conference: Conduct conference at Project site or other location as agreed to comply with requirements in Section 01 31 00 "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's Construction Schedule, including, but not limited to, the following:
 - 1. Review software capabilities and content and format for reports.
 - 2. Identify qualified personnel responsible to develop and update schedule.
 - 3. Discuss constraints.
 - 4. Review submittal requirements and procedures.
 - 5. Review time required for review of submittals and resubmittals.
 - 6. Review requirements for tests and inspections by independent testing and inspecting agencies.
 - 7. Review time required for Project closeout and Owner startup procedures.
 - 8. Review and finalize list of construction activities to be included in schedule.
 - 9. Review procedures for updating schedule.

1.6 COORDINATION

- A. Coordinate Contractor's Construction Schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities, and schedule them in proper sequence.

1.7 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Computer Scheduling Software: For projects requiring CPM-type schedule, prepare schedules using current version of a program that has been developed specifically to manage construction schedules.
 - 1. Use Microsoft Project, Oracle Primavera, Meridian Prolog, or scheduling component of Project management software package specified in Section 01 31 00 "Project Management and Coordination," for current Windows operating system.
- B. Scheduling Consultant: For projects requiring CPM-type schedule, engage a consultant to provide planning, evaluation, and reporting, using CPM scheduling.
 - 1. In-House Option: Owner may waive requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.

2. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.
- C. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.
1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- D. Activities: Treat each floor or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
1. Activity Duration: Define activities so no activity is longer than 20 calendar days, unless specifically allowed by Architect.
 2. Temporary Facilities: Indicate start and completion dates for the following as applicable:
 - a. Securing of approvals and permits required for performance of the Work.
 - b. Temporary facilities.
 - c. Construction of mockups, prototypes and samples.
 - d. Regulatory agency approvals.
 - e. Punch list.
 3. Procurement Activities: Include procurement process activities for the following long lead-time items and major items, requiring a cycle of more than 60 calendar days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 4. Submittal Review Time: Include review and resubmittal times indicated in Section 01 33 00 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.
 5. Startup and Testing Time: Include no fewer than 10 working days for startup and testing.
 6. Commissioning Time: Include no fewer than 10 working days for commissioning.
 7. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's and Construction Manager's administrative procedures necessary for certification of Substantial Completion.
 8. Punch List and Final Completion: Include not more than 30 calendar days for completion of punch list items and Final Completion.
- E. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
1. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 01 10 00 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 2. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Seasonal variations.
 - c. Environmental control.
 3. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards.
 - b. Submittals.

- c. Purchases.
 - d. Mockups.
 - e. Fabrication.
 - f. Sample testing.
 - g. Deliveries.
 - h. Installation.
 - i. Tests and inspections.
 - j. Adjusting.
 - k. Curing.
 - l. Building flush-out, where required in other Sections.
 - m. Startup and placement into final use and operation.
- F. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, [temporary enclosure and space conditioning,] Substantial Completion, and Final Completion.
- G. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.
- 1. Refer to Section 01 29 00 "Payment Procedures" for cost reporting and payment procedures.
- H. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
- 1. Unresolved issues.
 - 2. Unanswered Requests for Information.
 - 3. Rejected or unreturned submittals.
 - 4. Notations on returned submittals.
 - 5. Pending modifications affecting the Work and the Contract Time.
- I. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule three (3) working days before the next occurring scheduled progress meeting.
- 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - 3. As the Work progresses, indicate Final Completion percentage for each activity.
- J. Recovery Schedule: When periodic update indicates the Work is ten (10 or more working days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance, and date by which recovery will be accomplished.

- K. Distribution: Distribute copies of approved schedule to Architect, Construction Manager, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
 - 1. Post copies in Project meeting rooms and temporary field offices.
 - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

1.8 STARTUP CONSTRUCTION SCHEDULE

- A. Bar Chart-Type Schedule: Submit startup, horizontal, bar chart-type construction schedule within ten (10) working days of date established for the Notice to Proceed.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 90 calendar days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

1.9 BAR CHART-TYPE SCHEDULE REQUIREMENTS

- A. Bar Chart-Type Schedule: Submit a comprehensive, fully developed, horizontal, bar chart-type (e.g., Gantt), Contractor's Construction Schedule within 30 calendar days after date established for the Notice to Proceed.
 - 1. Base schedule on the startup construction schedule and additional information received since the start of Project.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
 - 1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in ten (10) percent increments within time bar.

1.10 CPM-TYPE SCHEDULE REQUIREMENTS

- A. Prepare network diagrams using activity-on-node (AON) format.
- B. Startup Network Diagram: Submit diagram within 14 calendar days of date established for the Notice to Proceed. Outline significant construction activities for the first 90 calendar days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.
- C. CPM-Type Schedule: Prepare Contractor's Construction Schedule using a cost- and resource-loaded, time-scaled CPM network analysis diagram for the Work.
 - 1. Develop network diagram in sufficient time to submit CPM-type schedule, so it can be accepted for use no later than 60 calendar days after date established for the Notice to Proceed.
 - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates.
 - 2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM-type schedule information.
 - 3. Establish procedures for monitoring and updating CPM-type schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.

4. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule to coordinate with the Contract Time.
- D. CPM-Type Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the startup network diagram, prepare a skeleton network to identify probable critical paths.
1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Mobilization and demobilization.
 - c. Purchase of materials.
 - d. Delivery.
 - e. Fabrication.
 - f. Utility interruptions.
 - g. Installation.
 - h. Testing and inspection.
 - i. Punch list and Final Completion.
 - j. Activities occurring following Final Completion.
 2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
 3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM-type schedule within the limitations of the Contract Time.
 4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
 5. Cost- and Resource-Loading of CPM-Type Schedule: Assign cost to construction activities on the CPM-type schedule. Do not assign costs to submittal activities. Obtain Architect's approval prior to assigning costs to fabrication and delivery activities. Assign costs under main subcontracts for testing and commissioning activities, operation and maintenance manuals, punch list activities, Project record documents, sustainable design documentation, and demonstration and training (if applicable), in the amount of five (5) percent of the Contract Sum.
 - a. Total cost assigned to activities shall equal the total Contract Sum.
- E. Contract Modifications: For each proposed Contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall Project schedule.
- F. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:
1. Contractor or subcontractor and the Work or activity.
 2. Description of activity.
 3. Main events of activity.

4. Immediate preceding and succeeding activities.
 5. Early and late start dates.
 6. Early and late finish dates.
 7. Activity duration in workdays.
 8. Total float or slack time.
 9. Average size of workforce.
 10. Dollar value of activity (coordinated with the schedule of values).
- G. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
 2. Changes in early and late start dates.
 3. Changes in early and late finish dates.
 4. Changes in activity durations in workdays.
 5. Changes in the critical path.
 6. Changes in total float or slack time.
 7. Changes in the Contract Time.
- H. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.
1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
 2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
 3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
 4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.
 - a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
 - b. Submit value summary printouts three (3) working days before each regularly scheduled progress meeting.
- 1.11 REPORTS
- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
1. List of subcontractors at Project site.
 2. List of separate contractors at Project site.
 3. Approximate count of personnel at Project site.
 4. Equipment at Project site.
 5. Material deliveries.
 6. High and low temperatures and general weather conditions, including presence of rain or snow.
 7. Testing and inspection.

8. Accidents.
 9. Meetings and significant decisions.
 10. Unusual events.
 11. Stoppages, delays, shortages, and losses.
 12. Meter readings and similar recordings.
 13. Emergency procedures.
 14. Orders and requests of authorities having jurisdiction.
 15. Change Orders received and implemented.
 16. Construction Change Directives received and implemented.
 17. Services connected and disconnected.
 18. Equipment or system tests and startups.
 19. Partial completions and occupancies.
 20. Substantial Completions authorized.
- B. Material Location Reports: At weekly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:
1. Material stored prior to previous report and remaining in storage.
 2. Material stored prior to previous report and since removed from storage and installed.
 3. Material stored following previous report and remaining in storage.
- C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.
- D. Unusual Event Reports: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, responses by Contractor's personnel, evaluation of results or effects, and similar pertinent information.
1. Advise Owner in advance when these events are known or predictable.
 2. Submit unusual event reports directly to Owner within one (1) working day of an occurrence. Distribute copies of report to parties affected by the occurrence.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Submittal schedule requirements.
2. Administrative and procedural requirements for submittals.

B. Related Requirements:

1. Section 01 29 00 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
2. Section 01 31 00 "Project Management and Coordination" for submitting coordination drawings and subcontract list and for requirements for web-based Project software.
3. Section 01 32 00 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
4. Section 01 40 00 "Quality Requirements" for submitting test and inspection reports, and schedule of tests and inspections.
5. Section 01 77 00 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
6. Section 01 78 23 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
7. Section 01 79 00 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's and Construction Manager's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's and Construction Manager's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.3 SUBMITTAL SCHEDULE

- A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and Construction Manager and additional time for handling and reviewing submittals required by those corrections.
 1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
 2. Initial Submittal Schedule: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 3. Final Submittal Schedule: Submit concurrently with the first complete submittal of

Contractor's construction schedule.

- a. Submit revised submittal schedule as required to reflect changes in current status and timing for submittals.
4. Format: Arrange the following information in a tabular format:
- a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal Category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Architect's and Construction Manager's final release or approval.
 - g. Scheduled dates for purchasing.
 - h. Scheduled date of fabrication.
 - i. Scheduled dates for installation.
 - j. Activity or event number.

1.4 SUBMITTAL FORMATS

A. Submittal Information: Include the following information in each submittal:

1. Project name.
2. Date.
3. Name of Architect.
4. Name of Construction Manager.
5. Name of Contractor.
6. Name of firm or entity that prepared submittal.
7. Names of subcontractor, manufacturer, and supplier.
8. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier and alphanumeric suffix for resubmittals.
9. Category and type of submittal.
10. Submittal purpose and description.
11. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
12. Drawing number and detail references, as appropriate.
13. Indication of full or partial submittal.
14. Location(s) where product is to be installed, as appropriate.
15. Other necessary identification.
16. Remarks.
17. Signature of transmitter.

B. Options: Identify options requiring selection by Architect.

C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include

relevant additional information and revisions, other than those requested by Architect and Construction Manager on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

- D. Electronic Mail (Email) Submittals: Prepare submittals as Portable Document Format (PDF) package, incorporating complete information into each PDF file. Name PDF file with submittal number.
- E. Submittals Utilizing Web-Based Project Software: Prepare submittals as PDF files or other format indicated by Project management software.

1.5 SUBMITTAL PROCEDURES

- A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 - 1. Email: Prepare submittals as PDF package and transmit to Architect by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Architect.
 - a. Architect, through Construction Manager, will return annotated file. Annotate and retain one copy of file as a digital Project Record Document file.
 - 2. Web-Based Project Management Software: Prepare submittals in PDF form, and upload to web-based Project management software website. Enter required data in web-based software site to fully identify submittal.
 - 3. Paper: Prepare submittals in paper form and deliver to Architect.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 - 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 - 4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections, so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect and Construction Manager reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Construction Manager's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 1. Initial Review: Allow 10 working days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Construction Manager will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Resubmittal Review: Allow 10 working days for review of each resubmittal.
 - 4. Sequential Review: Where sequential review of submittals by Architect's consultants,

- Owner, or other parties is indicated, allow 15 working days for initial review of each submittal.
5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 10 working days for review of each submittal. Submittal will be returned to Construction Manager, through Architect, before being returned to Contractor.
 - a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect and Construction Manager.
- D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block, and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval notation from Architect's and Construction Manager's action stamp.
- E. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's and Construction Manager's action stamp.
- 1.6 SUBMITTAL REQUIREMENTS
- A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams that show factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before Shop Drawings, and before or concurrently with Samples.
- B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 2. PDF Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42 inches.
 - a. Paper Shop Drawings: Three opaque copies of each submittal. Architect and Construction Manager will retain two copies; remainder will be returned.
 3. Building Information Model (BIM) Incorporation: Develop and incorporate Shop Drawing files into BIM established for Project.
- C. Samples: Submit Samples for review of type, color, pattern, and texture for a check of these characteristics with other materials.
1. Transmit Samples that contain multiple, related components, such as accessories together in one submittal package.
 2. Identification: Permanently attach label on unexposed side of Samples that includes the following:
 - a. Project name and submittal number.
 - b. Generic description of Sample.
 - c. Product name and name of manufacturer.
 - d. Sample source.
 - e. Number and title of applicable Specification Section.
 - f. Specification paragraph number and generic name of each item.
 3. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics and identification information for record.
 4. Web-Based Project Management Software: Prepare submittals in PDF form, and upload to web-based Project software website. Enter required data in web-based software site to fully identify submittal.
 5. Paper Transmittal: Include paper transmittal, including complete submittal information indicated.
 6. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time

- of use.
- b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
- 7. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units, showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect, through Construction Manager, will return submittal with options selected.
 - 8. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit three sets of Samples. Architect and Construction Manager will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record Sample.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- D. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 - 1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 - 2. Manufacturer and product name, and model number if applicable.
 - 3. Number and name of room or space.
 - 4. Location within room or space.
 - E. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
 - F. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.
 - G. Certificates:
 - 1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
 - 2. Installer Certificates: Submit written statements on manufacturer's letterhead, certifying

that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead, certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
4. Material Certificates: Submit written statements on manufacturer's letterhead, certifying that material complies with requirements in the Contract Documents.
5. Product Certificates: Submit written statements on manufacturer's letterhead, certifying that product complies with requirements in the Contract Documents.
6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of AWS B2.1 on AWS forms. Include names of firms and personnel certified.

H. Test and Research Reports:

1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for substrate preparation and primers required.
2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - a. Name of evaluation organization.
 - b. Date of evaluation.
 - c. Time period when report is in effect.
 - d. Product and manufacturers' names.
 - e. Description of product.
 - f. Test procedures and results.
 - g. Limitations of use.

1.7 DELEGATED DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products

and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.
- C. BIM Incorporation: Incorporate delegated design drawing and data files into BIM established for Project.
 1. Prepare delegated design drawings in the same digital data software program, version, and operating system as original Drawings.

1.8 CONTRACTOR'S REVIEW

- A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect and Construction Manager.
- B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
 1. Architect and Construction Manager will not review submittals received from Contractor that do not have Contractor's review and approval.

1.9 ARCHITECT'S AND CONSTRUCTION MANAGER'S REVIEW

- A. Submittals: Architect and Construction Manager will review each submittal, indicate corrections or revisions required, and return.
 1. PDF Submittals: Architect and Construction Manager will indicate, via markup on each submittal, the appropriate action.
 2. Submittals by Web-Based Project Management Software: Architect and Construction Manager will indicate, on Project management software website, the appropriate action.
- B. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect and Construction Manager.
- C. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- D. Submittals received from sources other than Contractor will be returned without review.
- E. Submittals not required by the Contract Documents will be returned without action.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, Owner, Construction Manager, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Requirements:
 - 1. Section 01 21 00 "Allowances" for testing and inspection allowances.

1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced," unless otherwise further described, means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests and Inspections: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
 - 1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).
- D. Mockups: Physical assemblies of portions of the Work constructed to establish the standard by which the Work will be judged. Mockups are not Samples.
 - 1. Mockups are used for one or more of the following:
 - a. Verify selections made under Sample submittals.
 - b. Demonstrate aesthetic effects.
 - c. Demonstrate the qualities of products and workmanship.

- d. Demonstrate successful installation of interfaces between components and systems.
 - e. Perform preconstruction testing to determine system performance.
 - 2. Product Mockups: Mockups that may include multiple products, materials, or systems specified in a single Section.
 - 3. In-Place Mockups: Mockups constructed on-site in their actual final location as part of permanent construction.
 - E. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.
 - F. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
 - G. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source (e.g., plant, mill, factory, or shop).
 - H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. The term "testing laboratory" has the same meaning as the term "testing agency."
 - I. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work, to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
 - J. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work, to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Architect or Construction Manager.
- 1.4 DELEGATED DESIGN SERVICES
- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
 - B. Delegated Design Services Statement: Submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.
- 1.5 CONFLICTING REQUIREMENTS
- A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the Architect regarding the conflict and obtain clarification prior to proceeding with the Work. Refer conflicting requirements that are different, but apparently equal, to Architect for clarification before proceeding.
 - B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified is the minimum provided or performed. The actual installation may comply exactly with the minimum

quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.6 SUBMITTALS

- A. Mockup Shop Drawings:
 - 1. Include plans, sections, elevations, and details, indicating materials and size of mockup construction.
 - 2. Indicate manufacturer and model number of individual components.
 - 3. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.
- B. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- C. Qualification Data: For Contractor's quality-control personnel.
- D. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility submitted to authorities having jurisdiction before starting work on the following systems:
 - 1. Seismic-force-resisting system, designated seismic system, or component listed in the Statement of Special Inspections.
 - 2. Primary wind-force-resisting system or a wind-resisting component listed in the Statement of Special Inspections.
- E. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- F. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Entity responsible for performing tests and inspections.
 - 3. Description of test and inspection.
 - 4. Identification of applicable standards.
 - 5. Identification of test and inspection methods.
 - 6. Number of tests and inspections required.
 - 7. Time schedule or time span for tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.
- G. Reports: Prepare and submit certified written reports and documents as specified.
- H. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.7 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities and to

coordinate Owner's quality-assurance and quality-control activities. Coordinate with Contractor's Construction Schedule.

- B. Quality-Control Personnel Qualifications: Engage qualified personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
 - 1. Project quality-control manager may also serve as Project superintendent.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
 - 1. Contractor-performed tests and inspections, including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections. Distinguish source quality-control tests and inspections from field quality-control tests and inspections.
 - 2. Special inspections required by authorities having jurisdiction and indicated on the Statement of Special Inspections.
 - 3. Owner-performed tests and inspections indicated in the Contract Documents.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring the Work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports, including log of approved and rejected results. Include Work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming Work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.8 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, telephone number, and email address of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Record of temperature and weather conditions at time of sample-taking and testing and inspection.
 - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.

12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, telephone number, and email address of technical representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.
 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement of whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, telephone number, and email address of factory-authorized service representative making report.
 2. Statement that equipment complies with requirements.
 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 4. Statement of whether conditions, products, and installation will affect warranty.
 5. Other required items indicated in individual Specification Sections.

1.9 QUALITY ASSURANCE

- A. Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar in material, design, and extent to those indicated for this Project.

- F. Specialists: Certain Specification Sections require that specific construction activities be performed by entities who are recognized experts in those operations. Specialists will satisfy qualification requirements indicated and engage in the activities indicated.
1. Requirements of authorities having jurisdiction supersede requirements for specialists.
- G. Testing and Inspecting Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented in accordance with ASTM E329, and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect, demonstrate, repair, and perform service on installations of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following Contractor's responsibilities, including the following:
1. Provide test specimens representative of proposed products and construction.
 2. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 3. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 4. Build site-assembled test assemblies and mockups, using installers who will perform same tasks for Project.
 5. When testing is complete, remove test specimens and test assemblies, and mockups; do not reuse products on Project.
 6. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, through Construction Manager, with copy to Contractor. Interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from the Contract Documents.
- K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
1. General:
 - a. Build mockups of size indicated.
 - b. Build mockups in location indicated or, if not indicated, as directed by Architect **or** Construction Manager.
 - c. Notify Architect and Construction Manager five working days in advance of dates and times when mockups will be constructed.
 - d. Employ supervisory personnel who will oversee mockup construction. Employ workers who will be employed to perform same tasks during the construction at Project.
 - e. Demonstrate the proposed range of aesthetic effects and workmanship.

- f. Obtain Architect's and Construction Manager's approval of mockups before starting corresponding Work, fabrication, or construction.
 - 1) Allow five working days for initial review and each re-review of each mockup.
- g. Promptly correct unsatisfactory conditions noted by Architect's preliminary review, to the satisfaction of the Architect, before completion of final mockup.
- h. Approval of mockups by the Architect does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
- i. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
- j. Demolish and remove mockups when directed unless otherwise indicated.

1.10 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
 - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
 - 2. Costs for retesting and reinspecting construction that replaces or is necessitated by Work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.
 - 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 - 2. Engage a qualified testing agency to perform quality-control services.
 - a. Contractor will not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 - 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.
 - 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 - 5. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 - 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- D. Testing Agency Responsibilities: Cooperate with Architect, Construction Manager, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - 1. Notify Architect, Construction Manager, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform duties of Contractor.
- E. **Manufacturer's Field Services:** Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01 33 00 "Submittal Procedures."
- F. **Manufacturer's Technical Services:** Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- G. **Contractor's Associated Requirements and Services:** Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspection equipment at Project site.
- H. **Coordination:** Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- I. **Schedule of Tests and Inspections:** Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's Construction Schedule. Update and submit with each Application for Payment.
1. **Schedule Contents:** Include tests, inspections, and quality-control services, including Contractor- and Owner-retained services, commissioning activities, and other Project-required services paid for by other entities.
 2. **Distribution:** Distribute schedule to Owner, Architect, Construction Manager, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.11 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, as indicated in the Statement of Special Inspections attached to this Section, and as follows:
1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures, and reviewing the completeness and adequacy of those procedures to perform the Work.
 2. Notifying Architect, Construction Manager, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect, Construction Manager, with copy to Contractor and to authorities having jurisdiction.
 4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 5. Interpreting tests and inspections, and stating in each report whether tested and inspected Work complies with or deviates from the Contract Documents.
 6. Retesting and reinspecting corrected Work.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Architect.
 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's, Construction Manager's and authorities' having jurisdiction (AHJ) reference during normal working hours.
1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspection, sample-taking, and similar services, repair damaged construction and restore substrates and finishes.
1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 73 00 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

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SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary" for work restrictions and limitations on utility interruptions.

1.3 USE CHARGES

- A. Installation, removal, and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Architect, testing agencies, and authorities having jurisdiction (AHJ).
- B. Sewer Service: Pay sewer-service use charges for sewer usage by all entities for construction operations.
- C. Water Service: Pay water-service use charges for water used by all entities for construction operations.
- D. Electric Power Service: Pay electric-power-service use charges for electricity used by all entities for construction operations.

1.4 SUBMITTALS

- A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.
- B. Implementation and Termination Schedule: Within 10 working days of date established for commencement of the Work, submit schedule indicating implementation and termination dates of each temporary utility.
- C. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.
- D. Provide erosion and sedimentation control plan. Show compliance with Authority Having Jurisdiction (AHJ) and state regulations.
- E. Fire-Safety Program: Show compliance with requirements of NFPA 241 and AHJ. Indicate Contractor personnel responsible for management of fire-prevention program.
- F. Moisture- and Mold-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage and mold. Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.
 - 1. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and requirements for replacing water-damaged Work.
 - 2. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials,

and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

3. Indicate methods to be used to avoid trapping water in finished work.
- G. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Include the following:
1. Locations of dust-control partitions at each phase of work.
 2. HVAC system isolation schematic drawing.
 3. Location of proposed air-filtration system discharge.
 4. Waste-handling procedures.
 5. Other dust-control measures.
- H. Noise and Vibration Control Plan: Identify construction activities that may impact the occupancy and use of existing spaces within the building or adjacent existing buildings, whether occupied by the Owner or others. Include the following:
1. Methods used to meet the goals and requirements of the Owner.
 2. Concrete cutting method(s) to be used.
 3. Location of construction devices on the site.
 4. Show compliance with the use and maintenance of quieted construction devices for the duration of the Project.
 5. Indicate activities that may disturb building occupants of adjacent buildings on site and that are planned to be performed during non-standard working hours as coordinated with the Owner.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for AHJ to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in the United States Access Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.6 PROJECT CONDITIONS

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

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less in accordance with ASTM E84 and passing NFPA 701 Test Method 2.
- B. Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats, minimum 36 by 60 inches.
- C. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

2.2 TEMPORARY FACILITIES

- A. Field Offices: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, Construction Manager, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:
 - 1. Furniture required for Project-site documents, including file cabinets, plan tables, plan racks, and bookcases.
 - 2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-VAC duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot-square tack and marker boards.
 - 3. Drinking water dispenser.
 - 4. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
 - 5. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.
- C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
 - 1. Do not store combustible materials in Project building.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL-rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - 1. Use of gasoline- or kerosene-burning space heaters, open-flame heaters, salamander-type heaters, or other portable forced-air or convection heater units that produce heat by using a fan or other means to push cold air though a flame is prohibited.
 - 2. Heating, Cooling, and Dehumidifying Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to AHJ, and marked for intended location and application.
 - 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 01 77 00 "Closeout Procedures."
- C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

- A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
 - 1. Coordinate with Section 01 74 19 "Construction Waste Management and Disposal."

2. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

3.2 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
 1. Locate facilities to limit site disturbance as specified in Section 01 10 00 "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.3 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
 1. Connect temporary sewers to municipal system as directed by AHJ.
- C. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
 1. If facilities are unavailable or if their use is not permitted even if available, install water service and distribution piping in sizes and pressures adequate for construction.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, safety shower and eyewash facilities where required for construction activities, and drinking water for use of construction personnel. Comply with requirements of AHJ for type, number, location, operation, and maintenance of fixtures and facilities.
 1. Use of Permanent Toilets: Use of Owner's existing or new toilet facilities is not permitted.
- E. Temporary Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
 1. Provide temporary dehumidification systems when required to reduce ambient and substrate moisture levels to level required to allow installation or application of finishes and their proper curing or drying.
- F. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner. At Substantial Completion, restore these service to condition existing before initial use.
 1. Connect temporary service to Owner's existing power source, as directed by Owner.
 2. If service is unavailable or if use is not permitted even if available, install electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations. Install electric power service underground unless otherwise indicated.
- G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

- H. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install **one** land-based telephone line for each field office.
 - 1. At each telephone, post a list of important telephone numbers.
 - a. Police and fire departments.
 - b. Ambulance service.
 - c. Contractor's main office.
 - d. Contractor's emergency after-hours telephone number.
 - e. Architect's office.
 - f. Construction Manager's office.
 - g. Engineers' offices.
 - h. Owner's office.
 - i. Principal subcontractors' field and main offices.
- I. Electronic Communication Service: Provide secure WiFi wireless connection to internet with provisions for access by Architect and Owner.
 - 1. Internet Service: Broadband modem, router, and ISP, equipped with hardware firewall, providing minimum 10-Mbps upload and 15-Mbps download speeds at each computer.

3.4 VIRTUAL/ REMOTE MEETING EQUIPMENT

- A. Virtual/ Remote Meeting Computer: Provide a desktop computer in the primary field office adequate for use by Architect and Owner to access Project electronic documents and maintain electronic communications. Equip computer with not less than the following:
 - 1. Processor: Intel Core i5 or i7.
 - 2. Memory: 16 gigabyte.
 - 3. Disk Storage: 1-terabyte hard-disk drive and combination DVD-RW/CD-RW drive.
 - 4. Storage Backup: External hard drive, minimum 2 terrabytes, with automated backup software providing daily backups.
 - 5. Display: 42-inch minimum LCD monitor and wall-mounting hardware; display driver 256-Mb dedicated video RAM.
 - 6. Full-size, wireless keyboard and mouse.
 - 7. Network Connectivity: 10/100BaseT [**Gigabit**] ethernet.
 - 8. Operating System: Microsoft Windows 10 Professional, or other latest version.
 - 9. Productivity Software:
 - a. Adobe Reader DC, latest version.
 - b. Bluebeam Revu, latest version.
 - c. Google Chrome internet browser, latest version.
 - d. Microsoft Office Professional 2021, or other latest version, including Word, Excel, and Outlook.
 - e. WinZip 10.0, or other latest version.
 - 10. Internet Security: Integrated software, providing software firewall, virus, spyware, phishing, and spam protection in a combined application.
- B. Printer: "All-in-one" unit equipped with printer server, combining color printing, photocopying,

scanning, and faxing, or separate units for each of these three functions.

3.5 SUPPORT FACILITIES INSTALLATION

A. Comply with the following:

1. Provide construction for temporary field offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible in accordance with ASTM E136. Comply with NFPA 241.
2. Utilize designated area within existing building for temporary field offices.
3. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas within construction limits indicated in Drawings.

1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.

C. Temporary Use of Planned Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.

1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
2. Prepare subgrade and install subbase and base for temporary roads and paved areas in accordance with Section 31 20 00 "Earth Moving."
3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course in accordance with Section 32 12 16 "Asphalt Paving."

D. Traffic Controls: Comply with requirements of AHJ.

1. Protect existing site improvements to remain, including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

E. Parking: Provide temporary offsite parking areas for construction personnel.

F. Storage and Staging: Provide temporary offsite area for storage and staging needs.

G. Dewatering Facilities and Drains: Comply with requirements of AHJ and soil-conservation district requirements, where applicable. Maintain Project site, excavations, and construction free of water.

1. Refer to Geotechnical Report for expected ground water.
2. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
3. Remove snow and ice as required to minimize accumulations.

H. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.

1. Identification Signs: Provide Project identification signs as indicated in Drawings.
2. Temporary Signs: Provide other signs as indicated and as required to inform public and

individuals seeking entrance to Project.

- a. Provide temporary, directional signs for construction personnel and visitors.
3. Maintain and touch up signs, so they are legible at all times.
- I. Waste Disposal Facilities: Comply with requirements of AHJ.
 1. Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."
 2. Provide waste-collection containers in sizes adequate to handle waste from construction operations.
 3. Comply with progress cleaning requirements in Section 01 73 00 "Execution."
- J. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
 1. For Cost-Plus Contracts: Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.6 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
 1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
 1. Comply with work restrictions specified in Section 01 10 00 "Summary."
- C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings, requirements of EPA Construction General Permit, or AHJ, whichever is more stringent.
 1. Requirements specified in Section 31 10 00 "Site Clearing" shall govern where more stringent.
 2. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant-protection zones.
 3. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
 4. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
 5. Remove erosion and sedimentation controls, and restore and stabilize areas disturbed during removal.
- D. Stormwater Control: Comply with requirements of AHJ. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- E. Tree and Plant Protection: Comply with requirements specified in Section 01 56 39 "Temporary Tree and Plant Protection."
 1. Lacking this Division 01 Section, install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations.

Protect tree root systems from damage, flooding, and erosion.

- F. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals, so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using materials approved by AHJ.
 - G. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people from easily entering site except by entrance gates.
 - 1. Extent of Fence: As indicated on Drawings, as required to enclose entire Project site, or portion determined sufficient to accommodate construction operations.
 - H. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.
 - I. Barricades, Warning Signs, and Lights: Comply with requirements of AHJ for erecting structurally adequate barricades, including warning signs and lighting.
 - J. Temporary Egress: Provide temporary egress from existing occupied facilities as indicated and as required by AHJ. Provide signage directing occupants to temporary egress.
 - K. Covered Walkway: Erect protective, covered walkway for passage of individuals through or adjacent to Project site. Coordinate with entrance gates, other facilities, and obstructions. Comply with regulations of AHJ and requirements indicated in Drawings.
 - 1. Provide overhead decking, protective enclosure walls, handrails, barricades, warning signs, exit signs, lights, safe and well-drained walkways, and similar provisions for protection and safe passage.
 - 2. Paint and maintain appearance of walkway for duration of the Work.
 - L. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
 - 1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.
 - M. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
 - 1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition in accordance with requirements of AHJ.
 - 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
 - 4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign, stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.
- 3.7 MOISTURE AND MOLD CONTROL
- A. Moisture and Mold Protection: Protect stored materials and installed Work in accordance with Moisture and Mold Protection Plan.
 - B. Exposed Construction Period: Before installation of weather barriers, when materials are subject

to wetting and exposure and to airborne mold spores, protect as follows:

1. Protect porous materials from water damage.
2. Protect stored and installed material from flowing or standing water.
3. Keep porous and organic materials from coming into prolonged contact with concrete.
4. Remove standing water from decks.
5. Keep deck openings covered or dammed.

C. Partially Enclosed Construction Period: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:

1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
2. Keep interior spaces reasonably clean and protected from water damage.
3. Periodically collect and remove waste containing cellulose or other organic matter.
4. Discard or replace water-damaged material.
5. Do not install material that is wet.
6. Discard and replace stored or installed material that begins to grow mold.
7. Perform work in a sequence that allows wet materials adequate time to dry before enclosing the material in gypsum board or other interior finishes.

D. Controlled Construction Period: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:

1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
2. Use temporary or permanent HVAC system to control humidity within ranges specified for installed and stored materials.
3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
 - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective and require replacing.
 - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
 - c. Remove and replace materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.8 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection

facilities to permanent facilities until Substantial Completion.

- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by AHJ.
 3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 "Closeout Procedures."

END OF SECTION

SECTION 01 57 22 - CONSTRUCTION INDOOR AIR QUALITY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section describes Construction Indoor Air Quality (IAQ) goals and includes administrative and procedural requirements for the development and execution of a construction air quality management plan.
- B. Related Requirements:
 - 1. Section 01 25 00 "Submittal Procedures" for required submittal procedures.
 - 2. Section 01 50 00 "Temporary Facilities and Controls" requirements for installation, maintenance and removal of temporary utilities, controls, and facilities during construction.
 - 3. Section 01 60 00 "Product Requirements" procedures for storage of interior materials to prevent exposure to moisture and pollutants.
 - 4. Division 23 "Heating Ventilating and Cooling" sections for duct cleaning procedures.

1.3 INDOOR AIR QUALITY MANAGEMENT

- A. The Owner has established that the contractor shall prevent indoor air quality problems resulting from the construction process, to sustain long term installer and occupant health and comfort.
- B. Protect the ventilation system components during construction and clean contaminated components after construction is complete.
- C. Control sources of potential IAQ pollutants by controlling selection of materials and processes used in project construction.

1.4 SUBMITTALS

- A. IAQ Management Plan for the construction and pre-occupancy phases of the project.
- B. Photographs documenting construction IAQ management measures implemented during construction such as duct protection measures and measures to protect on-site stored or installed absorptive materials from moisture.
- C. Cut sheets of filtration media used during construction with MERV values highlighted.

1.5 CONSTRUCTION AIR QUALITY MANAGEMENT PLAN

- A. Develop a Draft Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building as follows:
 - 1. During construction meet or exceed the minimum requirements of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 2nd edition 2007, ANSI/ SMACNA 008-2008 (Chapter 3).
 - 2. Protect stored on-site or installed absorptive materials from moisture damage.
- B. The SMACNA IAQ Guidelines for Occupied Buildings under Construction provides an overview of air pollution associated with construction, control measures, construction process management, quality control, communicating with occupants, and case studies. These guidelines can be accessed at www.smacna.org. Chapter 3 of the SMACNA Guidelines

recommends Control Measures in five areas: HVAC protection, source control, pathway interruption, housekeeping, and scheduling. Review the applicability of each Control Measure and include those that apply in the Draft IAQ Management Plan.

1. HVAC Protection: Shut down the return side of the HVAC system whenever possible during heavy construction. If the system must remain operational during construction include the following strategies that apply:
 - a. Fit the return side of the HVAC system with temporary filters with a Minimum Efficiency Reporting Value (MERV) of 8.
 - b. Isolate the return side of the HVAC system from the surrounding environment as much as possible (e.g., place all tiles for the ceiling plenum, repair all ducts and air handler leaks).
 - c. Damper off the return system in the heaviest work areas and seal the return system openings with plastic.
 - d. Upgrade the filter efficiency where major loading is expected to affect operating HVAC system.
 - e. Clean permanent return air ductwork per National Air Duct Cleaning Association standards upon completion of all construction and finish installation work.
 - f. Replace all filtration media prior to occupancy.
2. Source Control: Propose the substitution of non-toxic formulations of materials that are generally the responsibility of the contractor such as caulks, sealants, and cleaning products.
3. Pathway Interruption: Prevent contamination of clean spaces. Include the following strategies that apply:
 - a. Use 100 percent outside air ventilation (when outside temperatures are between 55 deg F and 85 deg F and humidity is between 30 percent and 60 percent) with air exhausted directly to the outside during installation of finishes and other VOC emitting materials.
 - b. Erect some type of barrier between work areas or between the inside and outside of the building to prevent unwanted airflow from dirty to clean areas.
4. Housekeeping: Reduce construction contamination in the building prior to occupancy through HVAC and regular space cleaning activities.
 - a. Store building materials in a weather tight, clean area prior to unpacking for installation.
 - b. Check for possible damage to building materials from high humidity.
 - c. Clean all coils, air filters, and fans before testing and balancing procedures are performed.
5. Scheduling: Specify construction sequencing to reduce absorption of VOC's by materials that act as sinks or contaminant sources. Complete application of wet and odor-emitting materials such as paints, sealants, and coatings before installing sink materials such as ceiling tiles, carpets, insulation, gypsum products, and fabric-covered furnishings are installed.
 - a. Protect stored on-site or installed absorptive materials from exposure to moisture through precipitation, plumbing leaks, or condensation from the HVAC system to prevent microbial contamination.

- C. Draft IAQ Management Plan Review Meeting: Once the Owner and Architect have reviewed the Draft IAQ Management Plan and prior to construction at the site, schedule and conduct a meeting to review the Draft IAQ Management Plan and discuss procedures, schedules and specific requirements for IAQ during the construction and pre-construction phases of the building. Discuss coordination and interface between the Contractor and other construction activities. Identify and resolve problems with compliance to the requirements. Record minutes of the meeting, identify all conclusions reached and matters requiring further resolution.
 - 1. Attendees: The Contractor and related Contractor personnel associated with the work of this section, including personnel to be in charge of the IAQ management program, Architect, Owner and such additional personnel as the Architect or Owner deem appropriate.
- D. Final IAQ Management Plan: Make any revisions to the Draft IAQ Management Plan agreed upon during the meeting identified in item (C) above and incorporate resolutions agreed to be made subsequent to the meeting. Submit the revised plan to the Owner and Architect for approval within 10 calendar days of the meeting.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 IMPLEMENTATION OF IAQ MANAGEMENT PLAN

- A. Manager: The Contractor shall designate an on-site party (or parties) responsible for instructing workers and overseeing and the IAQ Management Plan for the Project.
- B. Progress Meetings: Construction related IAQ procedures shall be included in the pre-construction and construction progress meeting agendas.
- C. Distribution: The Contractor shall distribute copies of the IAQ Management Plan to the Job Site Foreman, each Subcontractor, the Owner, and the Architect.
- D. Instruction: The Contractor shall provide on-site instruction of the IAQ procedures and ensure that all participants in the construction process understand the importance of the goals of the IAQ Management Plan.

END OF SECTION

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SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary" for Contractor requirements related to Owner-furnished products.
 - 2. Section 01 25 00 "Substitution Procedures" for requests for substitutions.
 - 3. Section 01 42 00 "References" for applicable industry standards for products specified.
 - 4. Section 01 77 00 "Closeout Procedures" for submitting warranties.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
- B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics of products.
 - 1. Evaluation of Comparable Products: In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification.
- C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure.
- D. Comparable Product Request Submittal: A submittal requesting consideration of a comparable product, including the following information:
 - 1. Identification of basis-of-design product or fabrication or installation method to be replaced, including Specification Section number and title and Drawing numbers and titles.
 - 2. Data indicating compliance with the requirements specified in Part 2 "Products" Articles.
- E. Basis-of-Design Product Specification Submittal: A submittal complying with requirements in Section 01 33 00 "Submittal Procedures."
- F. Substitution: Refer to Section 01 25 00 "Substitution Procedures" for definition and limitations on substitutions.

1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
1. Resolution of Compatibility Disputes between Multiple Contractors:
 - a. Contractors are responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 - b. If a dispute arises between the multiple contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.
- B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.
1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is not conspicuous.
 2. Equipment Nameplates: Provide a permanent nameplate on each item of service- or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:
 - a. Name of product and manufacturer.
 - b. Model and serial number.
 - c. Capacity.
 - d. Speed.
 - e. Ratings.
 3. See individual identification Sections in Divisions 21, 22, 23, 26, 27, and 28 for additional equipment identification requirements.

1.5 COORDINATION

- A. Modify or adjust affected work as necessary to integrate work of approved comparable products and approved substitutions.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

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

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
1. Manufacturer's Warranty: Written standard warranty form furnished by individual manufacturer for a particular product and issued in the name of the Owner or endorsed by manufacturer to Owner.
 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner and issued in the name of the Owner or endorsed by manufacturer to Owner.

- B. Submittal Time: Comply with requirements in Section 01 77 00 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Architect will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
 6. For products specified by name and accompanied by the term "approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
 - a. Submit additional documentation required by Architect in order to establish equivalency of proposed products. Unless otherwise indicated, evaluation of "approved" product status is by the Architect, whose determination is final.
- B. Product Selection Procedures:
1. Approved Manufacturers and Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements.
 - a. Approved manufacturers and products may be indicated by the phrase "Subject to compliance with requirements, provide one of the following."
 - b. For approval of unspecified manufacturers or products, comply with requirements in Section 01 25 00 "Substitution Procedures" for substitutions for convenience.
 2. Available Manufacturers and Products: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed or an unnamed product that complies with requirements.
 - a. Available manufacturers and products are indicated by the phrase "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following."
 - b. For Available Manufacturers and Products: Provision of an unnamed manufacturer or product is not considered a substitution, if the product complies with requirements.
 3. Basis-of-Design Manufacturers and Products: Where Specifications name a manufacturers or product, or refer to a manufacturer or product indicated in Drawings, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications may additionally indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
 - a. For approval of unspecified manufacturers or products, comply with requirements in

Section 01 25 00 "Substitution Procedures" for substitutions for convenience.

- C. Visual Matching Specification: Where Specifications require the phrase "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
 - 1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 01 25 00 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or a similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, texture, or other similar characteristic from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration of Comparable Products: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with the following requirements:
 - 1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.
 - 2. Detailed comparison of significant qualities of proposed product with those of the named basis-of-design product. Significant product qualities include attributes, such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
 - 3. Evidence that proposed product provides specified warranty.
 - 4. List of similar installations for completed projects, with project names and addresses and names and addresses of architects and owners, if requested.
 - 5. Samples, if requested.
- B. Architect's Action on Comparable Products Submittal: If necessary, Architect will request additional information or documentation for evaluation, as specified in Section 01 33 00 "Submittal Procedures."
 - 1. Form of Approval of Submittal: As specified in Section 01 33 00 "Submittal Procedures."
 - 2. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- C. Submittal Requirements, Two-Step Process: Approval by the Architect of Contractor's request for use of comparable product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.
 - 1. When acceptable to Architect, incorporate specified submittal requirements of individual Specification Section in combined submittal for comparable products. Approval by the Architect of Contractor's request for use of comparable product and of individual submittal requirements will also satisfy other submittal requirements.

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 61 16 - DELEGATED DESIGN REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. General: This Section specifies administrative and procedural requirements for delegated design indicated in the various Sections of these Specifications.
- B. Section Includes: Structural and other design requirements for delegated design components, otherwise known as fabricator-designed, bidder-designed or bidder design-build components.
- C. This Section applies to Technical Specification Sections, and supplements requirements indicated in the General and Supplementary Conditions.
- D. Delegated design does not mean deferred submittal. See Drawings for deferred submittals.
- E. Related Requirements:
 - 1. Refer to the following sections for specific delegated design requirements with deferred submittal:
 - a. Section 05 50 00 "Metal Fabrications" for equipment supports, ladders, canopies and other applications where required by Code and not detailed in Structural Drawings.
 - b. Section 05 52 13 "Pipe and Tube Railings".
 - c. Section 06 10 00 "Rough Carpentry" for bidder-engineered framing.
 - d. Section 06 17 53 "Shop-Fabricated Wood Trusses".
 - e. Section 08 41 13 "Aluminum-Framed Entrances and Storefronts".
 - f. Section 08 54 13 "Fiberglass Windows"
 - g. Section 08 63 00 "Metal-Framed Skylights".
 - h. Section 08 71 00 "Door Hardware".
 - i. Section 08 91 19 "Fixed Louvers".
 - j. Division 21 "Fire Suppression" Sections for hangers, supports, vibration and seismic controls for plumbing piping and equipment.
 - k. Division 22 "Plumbing" Sections for hangers, supports, vibration and seismic controls for plumbing piping and equipment.
 - l. Division 23 "HVAC" Sections for hangers, supports, vibration and seismic controls for HVAC equipment.
 - m. Division 26 "Electrical" Sections for hangers, supports, vibration and seismic controls for electrical and low-voltage equipment.
 - n. Division 28 "Fire Detection and Alarm System" Sections for system design, including hangers, supports, vibration and seismic controls for fire detection and alarm system.

1.3 DEFINITIONS

- A. Contractor Design Requirements: Where occurs, same meaning as Delegated Design Requirements.
- B. Delegated Design Work: Design services and certifications provided by a Professional Engineer registered as such in the State where the Project is located related to systems, materials or equipment required for the Work to satisfy design and performance criteria established by the Contract Documents. Delegated Design does not include professional services the Contractor needs to fulfill their responsibilities under the Contract including but not limited to construction means, methods and sequence.
- C. Seal: Certification that builder design plans, computations and specifications were designed and prepared under the direct supervision of the Architect or Engineer whose name appears thereon.
- D. Approval Stamp: Certification obtained by the Contractor that the Building Official has reviewed a submittal, and finds it acceptable with respect to applicable regulatory requirements.
- E. Bidder-Design: Design services provided by an installer or manufacturer complying with quality assurance, performance requirements and design requirements indicated and established by the Contract Documents. Bidder-design does not include Professional Engineering unless indicated otherwise.

1.4 DELEGATED- AND BIDDER-DESIGN SERVICES

- A. Where referenced in these specifications, Delegated Design components and their attachments to the structure shall comply with the currently adopted edition of all applicable state and local ordinances, with parameters as specified in this individual sections.
- B. Where referenced in these specifications, Bidder-Design components and installation shall comply with the currently adopted edition of all applicable state and local ordinances, with parameters specified in this and individual sections.
- C. Permitting Agency Requirements: Follow the requirements for permits current at the time of submission. The General Contractor is responsible to coordinate and submit all material required, so the permitting agency's review will not adversely affect the construction schedule. At or near time of application, the General Contractor shall meet with the permitting agency to identify Delegated Design components and how they are to be submitted and processed for permits.
- D. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

1.5 SUBMITTALS

- A. General: Submit complete Delegated Design Submittals to meet permitting agency requirements for permits. Include drawings and calculations for that portion of the Work signed and sealed by a registered engineer in the State where the Project is located. Incomplete submittals or submittals not previously reviewed and so stamped by General Contractor will not be accepted for review by the Architect or Engineer of Record.
- B. These submittal requirements are in addition to other submittal requirements stated elsewhere in the contract documents.

1.6 QUALITY ASSURANCE

- A. Where referenced in these specifications, Delegated Design components and their attachments to the structure shall comply with the currently adopted edition of all applicable state and local ordinances, with parameters as specified in this section.

- B. Permitting Agency Requirements: Follow the requirements for permits current at the time of submission. The General Contractor is responsible to coordinate and submit all material required, so the permitting agency's review will not adversely affect the construction schedule. At or near time of application, the General Contractor shall meet with the permitting agency to identify Delegated Design components and how they are to be submitted and processed for permits.

1.7 INSURANCES

- A. Refer to General Conditions for Insurance and Bonds.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 WORK INCLUDED

- A. General: Certain of the components of the Work under this project are Delegated Design. It is the General Contractor's responsibility to coordinate and assume or assign to subcontractors the complete responsibility for the design, calculations, submittals, fabrication, transportation and installation of the Delegated Design portions or components as required in this Section.
- B. The General Contractor is responsible to submit all documents required by the permitting agency for the separate approval and permit for each Delegated Design item. Delegated Design components of this Work are defined as complete, operational systems, provided for their intended use.
- C. All permit plan review and permit fees for Delegated Design items are the responsibility of the submitting General Contractor.

3.2 DOCUMENTS REQUIRED

- A. General: Delegated Design documents and related permits issuance must be completed prior to fabrication. The General Contractor must complete and submit a Contractor Design Summary Sheet listing Delegated Design Subcontractors and their registered engineer's names and phone numbers prior to submission of the Delegated Design documents for review.
- B. Scope of Documents: Delegated Design components are shown in the Contract Documents for design intent. The purpose is to have the General Contractor responsible to provide, coordinate and install each Delegated Design component.
 - 1. Delegated Design components attached to the structural frame or supplemental to the structural frame shall be designed for the anticipated loads as outlined in the Contract Documents. These Delegated Design components are all to be coordinated with appropriate subcontractors.
 - 2. Load reactions at the interface between the Delegated Design components and the structural frame shall be clearly defined to allow for a review by the Architect and Engineer of Record.
- C. Component Certification: Certify that mechanical and electrical components comply with the structural provisions of all applicable codes.
 - 1. Shop Drawings: Submit shop drawings for all attachments to the structure for all elements requiring structural design per these specifications. These attachments include, but are not limited to, structural bracing for equipment, conveyances, and architectural components; seismic restraints of vibration isolation systems; and details of lateral bracing and attachment systems designed to accommodate differential movement between building levels.
 - 2. Shop Drawings shall be sealed by the structural engineer responsible for their design.

- D. Quality Assurance Plan: Submit a quality assurance plan for the designated structural system of all elements requiring structural design per these specifications. Quality assurance plan shall comply with Owner's requirements and all applicable codes.

END OF SECTION

SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Cutting and patching.
 - 4. Installation of the Work.
 - 5. Progress cleaning.
 - 6. Starting and adjusting.
 - 7. Protection of installed construction.
 - 8. Correction of the Work.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary" for coordination of limits on use of Project site.
 - 2. Section 01 31 00 "Project Management and Coordination" for requirements for requests for information.
 - 3. Section 01 33 00 "Submittal Procedures" for submitting surveys.
 - 4. Section 01 77 00 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.
 - 5. Section 02 41 16 "Structure Demolition" for demolition and removal of existing structures.
 - 6. Section 07 84 13 "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.2 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.3 PREINSTALLATION MEETINGS

- A. Layout Conference: Conduct conference at Project site.
 - 1. Prior to establishing layout of new perimeter and structural column grid(s), review building location requirements. Review benchmark, control point, and layout and dimension requirements. Inform Architect of scheduled meeting. Require representatives of each entity directly concerned with Project layout to attend, including the following:
 - a. Contractor's superintendent.
 - b. Individual responsible for performing Project surveying and layout.
 - c. Individual responsible for performing site survey serving as basis for Project design.

2. Review meanings and intent of dimensions, notes, terms, graphic symbols, and other layout information indicated on the Drawings.
3. Review requirements for including layouts on Shop Drawings and other submittals.
4. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.4 SUBMITTALS

- A. Qualification Data: For land surveyor or Professional Engineer.
- B. Certified Surveys: Submit two copies signed by land surveyor or Professional Engineer. Provide electronic Portable Document Format (PDF) of certified surveys to the Architect.
- C. Certificates: Submit certificate signed by land surveyor or Professional Engineer, certifying that location and elevation of improvements comply with requirements.
- D. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

1.5 CLOSEOUT SUBMITTALS

- A. Final Property Survey: Submit 2 copies showing the Work performed and record survey data. Provide a PDF file to the Architect of final property survey.

1.6 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Professional Engineer Qualifications: Refer to Section 01 40 00 "Quality Requirements."
- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.
- C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
 1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of utilities and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, gas service, water-service, electrical service, and any other utilities.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Examine roughing-in for utilities and systems to verify actual locations of connections before equipment and fixture installation.
 - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 3. Verify compatibility with and suitability of surfaces and substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - 1. Description of the Work, including Specification Section number and paragraph, and Drawing sheet number and detail, where applicable.
 - 2. List of detrimental conditions, including substrates.
 - 3. List of unacceptable installation tolerances.
 - 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces, substrates and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utilities located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each component. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements prior to fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically in Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately upon discovery of the need for clarification of the Contract Documents, submit a request for information to Architect in accordance with requirements in Section 01 31 00 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks and existing conditions. If discrepancies are discovered, notify Architect promptly.
- B. Engage a land surveyor or professional engineer experienced in laying out the Work, using the following accepted surveying practices:
 - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 - 2. Establish limits on use of Project site.
 - 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 4. Inform installers of lines and levels to which they must comply.
 - 5. Check the location, level and plumb, of every major element as the Work progresses.
 - 6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
 - 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
 - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
 - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of two (2) permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 - 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.

3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- D. Certified Survey: When required by Owner or authorities having jurisdiction, upon completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.
- E. Final Property Survey: When required by Owner, engage a land surveyor or professional engineer to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor or professional engineer, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
 1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
 2. Recording: When required by Owner, at Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

- A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 1. Make vertical work plumb, and make horizontal work level.
 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 4. Maintain minimum headroom clearance of 8 feet in occupied spaces and 7 feet 6 inches in unoccupied spaces, unless otherwise indicated in Drawings.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure satisfactory results as judged by Architect. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations, so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.
- F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.
 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.

2. Allow for building movement, including thermal expansion and contraction.
 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Architect. Fit exposed connections together to form hairline joints.

3.6 CUTTING AND PATCHING

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of Work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements in Section 01 10 00 "Summary."
- F. Existing Utility Services and Mechanical/ Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/ systems prior to cutting to prevent interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 6. Proceed with patching after construction operations requiring cutting are complete.
- H. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 PROGRESS CLEANING

- A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 01 50 00 "Temporary Facilities and Controls." and Section 01 74 19 "Construction Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

- D. Manufacturer's Field Service: Comply with qualification requirements in Section 01 40 00 "Quality Requirements."

3.9 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- C. Comply with manufacturer's written instructions for temperature and relative humidity.

3.10 CORRECTION OF THE WORK

- A. Repair or remove and replace damaged, defective, or nonconforming Work. Restore damaged substrates and finishes.
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.
- C. Restore permanent facilities used during construction to their specified condition.
- D. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- E. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- F. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION

SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition and construction waste.
 - 2. Recycling nonhazardous demolition and construction waste.
 - 3. Disposing of nonhazardous demolition and construction waste.

1.3 DEFINITIONS

- A. Construction Waste: Building, structure, and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.
- C. Disposal: Removal of demolition or construction waste and subsequent salvage, sale, recycling, or deposit in landfill, incinerator acceptable to authorities having jurisdiction, or designated spoil areas on Owner's property.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition and construction waste becomes property of Contractor.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within thirty (30) calendar days of date established for the Notice of Award.

1.6 INFORMATIONAL SUBMITTALS

- A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Include the following information:
 - 1. Material category.
 - 2. Generation point of waste.
 - 3. Total quantity of waste in tons.
 - 4. Quantity of waste salvaged, both estimated and actual in tons.

5. Quantity of waste recycled, both estimated and actual in tons.
 6. Total quantity of waste recovered (salvaged plus recycled) in tons.
 7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. Qualification Data:
1. For waste management coordinator.
 2. For refrigerant recovery technician.
- H. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.
- I. Refrigerant Recovery: Comply with requirements in Section 02 41 16 "Structure Demolition" for refrigerant recovery submittals.

1.7 QUALITY ASSURANCE

- A. Waste Management Coordinator Qualifications: Experienced firm, or individual employed and assigned by General Contractor, with a record of successful waste management coordination of projects with similar requirements. Superintendent [may] [may not] serve as Waste Management Coordinator.
- B. Refrigerant Recovery Technician Qualifications: Universal certified by EPA-approved certification program.
- C. Regulatory Requirements: Comply with transportation and disposal regulations of authorities having jurisdiction.
- D. Waste Management Conference(s): Conduct conference(s) at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:
1. Review and discuss waste management plan including responsibilities of each contractor and waste management coordinator.
 2. Review requirements for documenting quantities of each type of waste and its disposition.
 3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.

5. Review waste management requirements for each trade.

1.8 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of site-clearing, demolition and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work in compliance with Section 02 41 16 "Structure Demolition."
 2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
 3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - a. Salvaged Materials for Donation in Portland City Limits: Coordinate with Procurement Manager at Rebuilding Center to receive preapproval for material donations to the City of Portland Empowered Neighborhoods Program.
 - 1) Contact: Quinton Laatz, Procurement Manager: 503-310-7701; quinton@rebuildingcenter.org.
 4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
 5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
 6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.
- D. Cost/ Revenue Analysis: Indicate total cost of waste disposal as if there were no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Include the following:
 1. Total quantity of waste.
 2. Estimated cost of disposal (cost per unit). Include transportation and tipping fees and cost of collection containers and handling for each type of waste.
 3. Total cost of disposal (with no waste management).
 4. Revenue from salvaged materials.
 5. Revenue from recycled materials.
 6. Savings in transportation and tipping fees by donating materials.
 7. Savings in transportation and tipping fees that are avoided.
 8. Handling and transportation costs. Include cost of collection containers for each type of waste.

9. Net additional cost or net savings from waste management plan.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Project rates for salvage/recycling of 50 percent by weight of total nonhazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials, including the following:

1. Demolition Waste:
 - a. Asphalt paving.
 - b. Concrete.
 - c. Concrete reinforcing steel.
 - d. Brick.
 - e. Concrete masonry units.
 - f. Wood studs.
 - g. Wood joists.
 - h. Plywood and oriented strand board.
 - i. Wood paneling.
 - j. Wood trim.
 - k. Structural and miscellaneous steel.
 - l. Rough hardware.
 - m. Roofing.
 - n. Insulation.
 - o. Doors and frames.
 - p. Door hardware.
 - q. Windows.
 - r. Glazing.
 - s. Metal studs.
 - t. Gypsum board.
 - u. Acoustical tile and panels.
 - v. Carpet.
 - w. Carpet pad.
 - x. Demountable partitions.
 - y. Equipment.
 - z. Cabinets.
 - aa. Plumbing fixtures.
 - bb. Piping.
 - cc. Supports and hangers.

- dd. Valves.
- ee. Sprinklers.
- ff. Mechanical equipment.
- gg. Refrigerants.
- hh. Electrical conduit.
- ii. Copper wiring.
- jj. Lighting fixtures.
- kk. Lamps.
- ll. Ballasts.
- mm. Electrical devices.
- nn. Switchgear and panelboards.
- oo. Transformers.
- 2. Construction Waste:
 - a. Masonry and CMU.
 - b. Lumber.
 - c. Wood sheet materials.
 - d. Wood trim.
 - e. Metals.
 - f. Roofing.
 - g. Insulation.
 - h. Carpet and pad.
 - i. Gypsum board.
 - j. Piping.
 - k. Electrical conduit.
 - l. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
 - 1) Paper.
 - 2) Cardboard.
 - 3) Boxes.
 - 4) Plastic sheet and film.
 - 5) Polystyrene packaging.
 - 6) Wood crates.
 - 7) Wood pallets.
 - 8) Plastic pails.
 - m. Construction Office Waste: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following

construction office waste materials:

- 1) Paper.
- 2) Aluminum cans.
- 3) Glass containers.

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 1. Comply with operation, termination, and removal requirements in Section 01 50 00 "Temporary Facilities and Controls."
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site full time for duration of Project.
- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
 1. Distribute waste management plan to everyone concerned within three days of submittal return.
 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged and recycled.
 2. Comply with Section 01 50 00 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

- A. Comply with requirements in Section 02 41 16 "Structure Demolition" for salvaging demolition waste.
- B. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:
 1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
 3. Store items in a secure area until installation.
 4. Protect items from damage during transport and storage.
 5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
- C. Salvaged Items for Sale and/ or Donation: Not permitted on Project site.

- D. Salvaged Items for Owner's Use: Salvage items for Owner's use and handle as follows:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area off-site, or on-site area designated by Owner.
 - 5. Protect items from damage during transport and storage.
 - E. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.
 - F. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.
 - G. Plumbing Fixtures: Separate by type and size.
 - H. Lighting Fixtures: Separate lamps by type and protect from breakage.
 - I. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.
- 3.3 RECYCLING CONSTRUCTION AND DEMOLITION WASTE, GENERAL
- A. General: Recycle paper and beverage containers used by on-site workers.
 - B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.
 - C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
 - D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
 - 1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.
 - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - 4. Store components off the ground and protect from the weather.
 - 5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor as often as required to prevent overfilling bins.
- 3.4 RECYCLING DEMOLITION WASTE
- A. Asphalt Paving: Grind asphalt to maximum 1-1/2-inch size.
 - 1. Crush asphaltic concrete paving and screen to comply with requirements in Section 31 20 00 "Earth Moving" for use as general fill, as approved by Civil Engineer.
 - B. Asphalt Paving: Break up and transport paving to asphalt-recycling facility.

- C. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
 - 1. Pulverize concrete to maximum 1-1/2-inch size.
 - 2. Crush concrete and screen to comply with requirements in Section 31 20 00 "Earth Moving" for use as satisfactory soil for fill or subbase, as approved by Civil Engineer.
 - D. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
 - 1. Clean and stack undamaged, whole masonry units on wood pallets.
 - 2. Pulverize damaged masonry units to maximum 1-1/2-inch size.
 - 3. Crush damaged masonry units and screen to comply with requirements in Section 31 20 00 "Earth Moving" for use as general fill or as satisfactory for subbase, as approved by Civil Engineer.
 - E. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
 - F. Metals: Separate metals by type.
 - 1. Structural Steel: Stack members according to size, type of member, and length.
 - 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
 - G. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.
 - H. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
 - I. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
 - J. Metal Suspension System: Separate metal members, including trim and other metals from acoustical panels and tile, and sort with other metals.
 - K. Carpet[**and Pad**]: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
 - 1. Store clean, dry carpet[**and pad**] in a closed container or trailer provided by carpet reclamation agency or carpet recycler.
 - L. Carpet Tile: Remove debris, trash, and adhesive.
 - 1. Stack tile on pallet and store clean, dry carpet in a closed container or trailer provided by carpet reclamation agency or carpet recycler.
 - M. Piping: Reduce piping to straight lengths and store by material and size. Separate supports, hangers, valves, sprinklers, and other components by material and size.
 - N. Conduit: Reduce conduit to straight lengths and store by material and size.
 - O. Lamps: Separate lamps by type and store according to requirements in 40 CFR 273.
- 3.5 RECYCLING CONSTRUCTION WASTE
- A. Packaging:
 - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - 2. Polystyrene Packaging: Separate and bag materials.
 - 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.

- 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
 - B. Wood Materials:
 - 1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - 2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
 - C. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.
 - 1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.
 - D. Paint: Seal containers and store by type.
- 3.6 DISPOSAL OF WASTE
- A. General: Except for items or materials to be salvaged or recycled, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - B. General: Except for items or materials to be salvaged or recycled, remove waste materials and legally dispose of at designated spoil areas on Owner's property.
 - C. Burning: Do not burn waste materials.

END OF SECTION

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SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for Contract closeout, including, but not limited to, the following:
 - 1. Substantial completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
- B. Related Requirements:
 - 1. Section 01 29 00 "Payment Procedures" for requirements for Applications for Payment for Substantial Completion and Final Completion.
 - 2. Section 01 78 23 "Operation and Maintenance Data" for additional operation and maintenance manual requirements.
 - 3. Section 01 79 00 "Demonstration and Training" for requirements to train the Owner's maintenance personnel to adjust, operate, and maintain products, equipment, and systems.

1.3 DEFINITIONS

- A. List of Incomplete Items: Contractor-prepared list of items to be completed or corrected, prepared for the Architect's use prior to Architect's inspection, to determine if the Work is substantially complete.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of cleaning agent.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.5 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest-control inspection.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items required by other Sections.

1.7 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's "punch list"), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 working days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction, permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 2. Submit closeout submittals specified in other Division 01 Sections, including Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
 - 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.
 - 5. Submit testing, adjusting, and balancing records.
 - 6. Submit sustainable design submittals not previously submitted.
 - 7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 working days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Advise Owner of pending insurance changeover requirements.
 - 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 - 3. Complete startup and testing of systems and equipment.
 - 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 - 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
 - 6. Advise Owner of changeover in utility services.
 - 7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
 - 8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 - 9. Complete final cleaning requirements.
 - 10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate

visual defects.

- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 working days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for Final Completion.

1.8 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining Final Completion, complete the following:
1. Submit a final Application for Payment in accordance with Section 01 29 00 "Payment Procedures."
 2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Submit pest-control final inspection report.
 5. Submit Final Completion photographic documentation.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 working days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.9 LIST OF INCOMPLETE ITEMS

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor, listed by room or space number.
 2. Organize items applying to each space by major element, including categories for ceilings, individual walls, floors, equipment, and building systems.
 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.

- e. Page number.
- 4. Submit list of incomplete items in one of the following formats:
 - a. MS Excel Electronic File: Architect will return annotated file.
 - b. Web-Based Project Software Upload: Utilize software feature for creating and updating list of incomplete items (punch list).

1.10 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 calendar days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
- D. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
 - 1. Submit by uploading to web-based project software site.
- E. Provide additional copies of each warranty to include in Operation and Maintenance (O&M) Manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
 - 1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are not planted, mulched, or paved to a smooth, even-textured surface.

- d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited-access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Clean flooring, removing debris, dirt, and staining; clean according to manufacturer's recommendations.
 - i. Vacuum and mop concrete.
 - j. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - k. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - l. Remove labels that are not permanent.
 - m. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - p. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
 - 1) Where required by the Project's sustainable design requirements, clean HVAC system in compliance with NADCA ACR. Provide written report on completion of cleaning.
 - q. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.
 - r. Clean strainers.
 - s. Leave Project clean and ready for occupancy.
- C. Pest Control: Comply with pest control requirements in Section 01 50 00 "Temporary Facilities and Controls." Prepare written report.
- D. Construction Waste Disposal: Comply with waste-disposal requirements in Sections 01 50 00 "Temporary Facilities and Controls" and 01 74 19 "Construction Waste Management and Disposal."
- 3.2 REPAIR OF THE WORK
- A. Complete repair and restoration operations required by Section 01 73 00 "Execution" before requesting inspection for determination of Substantial Completion.

END OF SECTION

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SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory manuals.
 - 2. Emergency manuals.
 - 3. Systems and equipment operation manuals.
 - 4. Systems and equipment maintenance manuals.
 - 5. Product maintenance manuals.
- B. Related Requirements:
 - 1. Section 01 33 00 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

- A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Architect will comment on whether content of operation and maintenance submittals is acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operation and maintenance manuals in the following format:
 - 1. Submit by uploading to web-based project software site. Enable reviewer comments on draft submittals.
 - 2. Submit copy on digital media acceptable to Architect.
- C. Draft Manual Submittal: Submit draft copy of each manual at least 30 calendar days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 10 working days before commencing demonstration and training. Architect will return copy with comments.
 - 1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 10 working days of receipt of Architect's comments and prior to

commencing demonstration and training.

- E. Comply with Section 01 77 00 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.5 FORMAT OF OPERATION AND MAINTENANCE MANUALS

- A. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.

- 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
- 2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

- B. Manuals, Paper Copy: Submit manuals in the form of hard-copy, bound and labeled volumes.

- 1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
- 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
- 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment. Enclose title pages and directories in clear plastic sleeves.
- 4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
- 5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages for use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.
 - c. Provide photographs instead of drawings to demonstrate unusual installations.

1.6 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 - 1. Title page.
 - 2. Table of contents.
 - 3. Manual contents.
- B. Title Page: Include the following information:
 - 1. Subject matter included in manual.
 - 2. Name and address of Project.
 - 3. Name and address of Owner.
 - 4. Date of submittal.
 - 5. Name and contact information for Contractor.
 - 6. Name and contact information for Construction Manager.
 - 7. Name and contact information for Architect.
 - 8. Name and contact information for Commissioning Authority.
 - 9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 - 10. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
 - 1. For manuals provided in paper format, if operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

1.7 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY MANUAL

- A. Operation and Maintenance Documentation Directory: For complex projects, prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals. List items and their location to facilitate ready access to desired information. Include the following:
 - 1. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
 - 2. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
 - 3. Tables of Contents: Include a table of contents for each emergency, operation, and

maintenance manual.

1.8 EMERGENCY MANUALS

- A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated. Include information that must be immediately available during emergency situations to protect life and property and to minimize disruptions to building occupants.
- B. Content: Organize manual into a separate section for each of the following:
 - 1. Type of emergency.
 - 2. Emergency instructions.
 - 3. Emergency procedures.
- C. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 - 1. Fire.
 - 2. Flood.
 - 3. Gas leak.
 - 4. Water leak.
 - 5. Power failure.
 - 6. Water outage.
 - 7. System, subsystem, or equipment failure.
 - 8. Chemical release or spill.
- D. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- E. Emergency Procedures: Include the following, as applicable:
 - 1. Instructions on stopping.
 - 2. Shutdown instructions for each type of emergency.
 - 3. Operating instructions for conditions outside normal operating limits.
 - 4. Required sequences for electric or electronic systems.
 - 5. Special operating instructions and procedures.

1.9 SYSTEMS AND EQUIPMENT OPERATION MANUALS

- A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- B. Content: In addition to requirements in this Section, include operation data required in individual

Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor has delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

C. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

D. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

F. Piped Systems: Diagram piping as installed, and identify color coding where required for identification.

1.10 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds as described below.
- C. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
 - 1. For less complex projects that require few manuals, source information may be included on title page.
- D. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:
 - 1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
 - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 - 3. Identification and nomenclature of parts and components.
 - 4. List of items recommended to be stocked as spare parts.
- E. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
 - 1. Test and inspection instructions.
 - 2. Troubleshooting guide.
 - 3. Precautions against improper maintenance.
 - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - 5. Aligning, adjusting, and checking instructions.
 - 6. Demonstration and training video recording, if available.
- F. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and

service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- G. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- H. Maintenance Service Contracts: Where service contracts are specified for systems, subsystems, or equipment, include copies of maintenance agreements with name, electronic mail (email) address and telephone number of service agent.
- I. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.
- J. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
1. Do not use original project record documents as part of maintenance manuals.

1.11 PRODUCT MAINTENANCE MANUALS

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- B. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
1. For less complex projects that require few manuals, content information may be included on title page.
- C. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D. Product Information: Include the following, as applicable:
1. Product name and model number.
 2. Manufacturer's name.
 3. Color, pattern, and texture.
 4. Material and chemical composition.
 5. Reordering information for specially manufactured products.
- E. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.
 2. Types of cleaning agents to be used and methods of cleaning.
 3. List of cleaning agents and methods of cleaning detrimental to product.
 4. Schedule for routine cleaning and maintenance.

- 5. Repair instructions.
- F. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 79 00 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Instruction in operation and maintenance of systems, subsystems, and equipment.
 - 2. Demonstration and training video recordings.

1.3 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
 - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.
- B. Qualification Data: For facilitator, instructor and videographer.
- C. Attendance Record: For each training module, submit list of participants and length of instruction time.
- D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.4 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Video Recordings: Submit within seven days of end of each training module.
 - 1. Identification: On each copy, provide an applied label with the following information:
 - a. Name of Project.
 - b. Name and address of videographer.
 - c. Name of Architect.
 - d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Date of video recording.
 - 2. Transcript: Prepared and bound in format matching Operation and Maintenance (O&M) Manuals. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding video recording. Include name of Project and date of video recording on each page.
 - a. Electronic Copy: Prepared in PDF electronic format. Include a cover sheet with same label information as the corresponding video recording and a table of contents with links to corresponding training components. Include name of Project and date of

video recording on each page.

3. Training Manual: At completion of training, submit complete Training Manual(s) for Owner's use prepared in same paper and electronic file formats required for Operation and Maintenance (O&M) Manuals specified in Section 01 78 23 "Operation and Maintenance Data."

1.5 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 01 40 00 "Quality Requirements," experienced in operation and maintenance procedures and training.
- C. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.
- D. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:
 1. Inspect and discuss locations and other facilities required for instruction.
 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
 3. Review required content of instruction.
 4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.6 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data have been reviewed and approved by Architect.

1.7 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
 1. Various individual Specification Sections include requirements for demonstration and training. Refer to applicable Sections and requirements for development of instruction program.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or

component:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.
2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Systems and equipment operation manuals.
 - c. Systems and equipment maintenance manuals.
 - d. Product maintenance manuals.
 - e. Project Record Documents.
 - f. Identification systems.
 - g. Warranties and bonds.
 - h. Maintenance service agreements and similar continuing commitments.
3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
4. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.

- k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.
 - 5. Adjustments: Include the following:
 - a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
 - 6. Troubleshooting: Include the following:
 - a. Diagnostic instructions.
 - b. Test and inspection procedures.
 - 7. Maintenance: Include the following:
 - a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning.
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
 - 8. Repairs: Include the following:
 - a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.
 - 9. Proficiency: Include the following as recommended by systems' manufacturers, where applicable:
 - a. Evaluation of level of proficiency of participants after instruction.
 - b. Percentage of participants passing evaluation test.
- 1.8 PREPARATION
- A. Training Manual: Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a Training Manual organized in coordination with requirements in Section 01 78 23 "Operation and Maintenance Data."
 - B. Set up instructional equipment at instruction location.
- 1.9 INSTRUCTION
- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of

participants, instruction times, and location.

- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Owner will furnish Contractor with names and positions of participants.
- C. Scheduling: Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with Owner, with at least five working days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
 - 1. If Project circumstances make training for certain components unfeasible or undesirable, make arrangements for training at a remote location or via remote video conference.
 - 2. Coordinate with requirements for scheduling of operation and maintenance data and demonstration and training.
- E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of an oral, written or demonstration performance-based test, as appropriate.
- F. Cleanup: Collect used and leftover educational materials and remove from Project site. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 02 41 16 - STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Demolition and removal of existing West Building and site improvements.
 - a. Demolish the entire West Building.
 - 2. Removing below-grade construction.

1.3 DEFINITIONS

- A. Demolish: Completely remove and legally dispose of off-site.
- B. Recycle: Recovery of demolition waste for subsequent processing in preparation for reuse.
- C. Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse. Include fasteners or brackets needed for reattachment elsewhere.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 SUBMITTALS

- A. Schedule of Structure Demolition Activities: Indicate the following:
 - 1. Detailed sequence of demolition work, with starting and ending dates for each activity.
 - 2. Temporary interruption of utility services.
 - 3. Shutoff and capping or re-routing of utility services.
- B. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.
- C. Predemolition Photographs or Video: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by building demolition operations.
- D. Delegated Design Submittal: Including engineered design calculations for temporary shoring and underpinning stamped by professional engineer registered in State of Oregon.
- E. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.6 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI A10.6 and NFPA 241.
- C. Predemolition Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination."

1.7 PROJECT CONDITIONS

- A. Buildings and structures to be demolished will be vacated and their use discontinued before start of the Work.
- B. Buildings immediately adjacent to demolition area will be occupied. Conduct building demolition so operations of occupied buildings will not be disrupted.
 - 1. Provide not less than 72 hours' notice of activities that will affect operations of adjacent occupied buildings.
 - 2. Provide underpinning and/or shoring as required to protect adjacent occupied building from damage.
 - 3. Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.
 - a. Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction.
- C. Owner assumes no responsibility for buildings and structures to be demolished.
 - 1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- D. Hazardous Materials: Hazardous materials may be encountered in existing building and during the Work to demolish the existing West Building.
 - 1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. On-site storage or sale of removed items or materials is not permitted.

1.8 COORDINATION

- A. Arrange demolition schedule so as not to interfere with operations of adjacent occupied buildings.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. Satisfactory Soils: Comply with requirements in Division 31 Section "Earth Moving."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting demolition operations.
- B. Review Project Record Documents of existing construction if provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- C. Inventory and record the condition of items to be removed and salvaged.

- D. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

3.2 PREPARATION

- A. Existing Utilities: Locate, identify, disconnect, and seal or cap off indicated utilities serving buildings and structures to be demolished.
 - 1. Owner will arrange to shut off indicated utilities when requested by Contractor.
 - 2. Arrange to shut off indicated utilities with utility companies.
 - 3. If removal, relocation, or abandonment of utility services will affect adjacent occupied buildings, then provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
 - 4. Cut off pipe or conduit a minimum of 24 inches below grade. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing according to requirements of authorities having jurisdiction.
- B. Existing Utilities: Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.
- C. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.
 - 1. Strengthen or add new supports when required during progress of demolition.
 - 2. Provide engineered design for temporary shoring and deferred submittal for jurisdiction review.

3.3 PROTECTION

- A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.
- B. Existing Utilities: Maintain utility services to remain and protect from damage during demolition operations.
 - 1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
 - 2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and authorities having jurisdiction.
 - a. Provide at least 72 hours' notice to occupants of affected buildings if shutdown of service is required during changeover.
- C. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction, and as indicated. Comply with requirements in Section 01 50 00 "Temporary Facilities and Controls."
 - 1. Protect adjacent buildings and facilities from damage due to demolition activities.
 - 2. Protect existing site improvements, appurtenances, and landscaping to remain.
 - 3. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 4. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
 - 5. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.

- D. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.4 DEMOLITION, GENERAL

- A. General: Demolish indicated existing buildings and site improvements completely. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
 - 2. Maintain fire watch during and for at least 4 hours after flame cutting operations.
 - 3. Maintain adequate ventilation when using cutting torches.
 - 4. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
- B. Engineering Surveys: During demolition, perform surveys to detect hazards that may result from building demolition activities.
- C. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
 - 2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
- D. Explosives: Use of explosives is not permitted.

3.5 DEMOLITION BY MECHANICAL MEANS

- A. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.
- B. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 - 1. Remove structural framing members and lower to ground by method suitable to minimize ground impact and dust generation.
- C. Salvage: Not all items to be salvaged are indicated on Drawings, contractor to coordinate with owner.
- D. Below-Grade Construction: Demolish foundation walls and other below-grade construction.
 - 1. Remove below-grade construction, including basements, foundation walls, and footings, completely.
- E. Existing Utilities: Abandon existing utilities and below-grade utility structures. Cut utilities flush with grade.

- F. Existing Utilities: Demolish existing utilities and below-grade utility structures that are within 5 feet outside footprint indicated for new construction. Abandon utilities outside this area.
 - 1. Fill abandoned utility structures with satisfactory soil materials or recycled pulverized concrete according to backfill requirements in Division 31 Section "Earth Moving."
- G. Existing Utilities: Demolish and remove existing utilities and below-grade utility structures.

3.6 SITE RESTORATION

- A. Below-Grade Areas: Rough grade below-grade areas ready for further excavation or new construction.
- B. Below-Grade Areas: Completely fill below-grade areas and voids resulting from building demolition operations with satisfactory soil materials, recycled pulverized concrete or recycled pulverized masonry according to backfill requirements in Division 31 Section "Earth Moving."
- C. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

3.7 REPAIRS

- A. Promptly repair damage to adjacent buildings caused by demolition operations.

3.8 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and legally dispose of them in an EPA-approved landfill acceptable to authorities having jurisdiction.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Do not burn demolished materials.

3.9 CLEANING

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

END OF SECTION

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SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes for building construction, including the following applications:
 - a. Horizontal and vertical concrete footings, foundations, and site-specific work.
2. Concrete finishes and treatments.
3. Under-slab and perimeter insulation.
4. Fixed, extruded-aluminum louvers for passive crawl space ventilation.
5. Vapor/ radon barrier.
6. Void-filling.

B. Related Requirements:

1. Section 05 50 00 "Metal Fabrications" for coordination and provision of embedments and nosings to this Section for installation in forms prior to concrete placement.
2. Section 07 21 00 "Thermal Insulation" for other building insulations, including perimeter insulation at back-fill locations.
3. Section 31 20 00 "Earth Moving" for drainage fill under slabs-on-grade.

1.3 DEFINITIONS

A. Finished Appearance Concrete:

1. Concrete Slabs Exposed to View: Smooth-formed finish concrete, exposed to view on surfaces where indicated, and that requires special concrete materials, formwork, placement, and finishes to obtain specified finish appearance.
2. Exposed Concrete Walls: Smooth-formed finish concrete, exposed to view on surfaces of completed walls or other site components where indicated, and that requires special concrete materials, formwork, placement, and finishes to obtain specified finish appearance.

- B. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

C. STG: Surface Texture Grade.

1. Ra: Roughness Average.

D. COF: Coefficient of friction.

- E. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 SUBMITTALS

- A. Product Data: For each type of product.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
1. Indicate amounts of mixing water to be withheld for later addition at Project site.
- C. Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement. The steel reinforcement detailer shall generate all shop drawing bending and installation details from the structural and architectural drawings and specifications. The use of reproductions or photocopies of the contract drawings shall not be permitted.
1. Provide details of fabrication, bending, and placement prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement." Include special reinforcement required for openings through concrete structures.
 2. Shop drawings re-submittals shall clearly identify all revisions to previous submittals.
 - a. Heavy ink clouded outlines (revision clouds) shall be drawn around revised areas of individual sheets.
 - b. Architect/ Engineer will not review information outside of revision clouds on resubmitted drawings.
 3. Separate shop drawing submittal packages shall be made for each of the building sectors shown on the contract drawings. The submittal for each sector shall contain complete fabrication and installation/ erection information for all elements within that sector. References to shop drawings contained in other shop drawing submittal packages shall not be permitted. Submittal packages for each sector shall be staggered at least 14 calendar days.
- D. Formwork Shop Drawings: Prepared by or under the supervision of a structural engineer licensed in the State in which the Project is located detailing fabrication, assembly, and support of formwork.
1. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and installing and removing reshoring.
 2. For Finished Appearance Concrete include the following with the formwork shop drawings:
 - a. Formwork Tie Layout and Configuration: Refer to Drawings for formwork tie layout requirements. Provide tie configuration based on 1-1/2 in. nominal breakback and resulting in 1-1/4 in. diameter tie hole.
 - 1) Proposed construction tie patterns, tie locations, bar sizes, spacings, clearances and disposition related to adjacent items and other items that visually affect.
 - b. Construction Joint Layout and Pour Sequence. Include details at construction joints, pour strips, and form joint sealant details conforming with design intent.
 - 1) Location of construction joints for finished appearance concrete is subject to approval of the Architect.

- E. Vapor Barrier Shop Drawings: Show termination details, penetration details and transition details coordinated with other work.
 - 1. Drawing Format, Plans: Use of Drawings is acceptable where PDF-writer is used. Hand drawing is prohibited.
 - 2. Provide manufacturer's standard details or other CAD-generated drawings.
 - F. Samples: Vapor/ radon barrier.
 - G. Qualification Data: For Installer, manufacturer, and testing agency.
 - 1. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of Architects and owners, and other information specified.
 - H. Welding certificates.
 - I. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Form materials and form-release agents.
 - 4. Steel reinforcement and accessories.
 - 5. Fiber reinforcement.
 - 6. Curing compounds.
 - 7. Floor and slab treatments.
 - 8. Bonding agents.
 - 9. Adhesives.
 - 10. Vapor/ radon barrier.
 - 11. Semirigid joint filler.
 - 12. Joint-filler strips.
 - 13. Repair materials.
 - J. Material Test Reports: For the following, from a qualified testing agency:
 - 1. Aggregates: Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.
 - K. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.
 - L. Field quality-control reports.
 - M. Minutes of preinstallation conference.
- 1.6 QUALITY ASSURANCE
- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

- B. 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."
 - C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C1077 and ASTM E329 for testing indicated.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
 - 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.
 - D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.
 - E. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4.
 - F. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
 - 2. ACI 301, "Specification for Structural Concrete", Sections 1 through 5.
 - 3. ACI 303.R-12, "Guide to Cast-in-Place Architectural Concrete Practice".
 - 4. ACI 305 "Recommended Practice for Hot Weather Concreting".
 - 5. ACI 306 "Recommended Practice for Cold Weather Concreting".
 - 6. ACI 315 "Details and Detailing of Concrete Reinforcement".
 - 7. ACI 318 "Building Code Requirements for Reinforced Concrete".
 - G. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.
- 1.7 DELIVERY, STORAGE, AND HANDLING
- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.
 - B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.
- 1.8 FIELD CONDITIONS
- A. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

- B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:
 - 1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 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 PERFORMANCE REQUIREMENTS

- A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 301.
 - 2. ACI 117.
 - 3. ACI 303R, for architectural concrete finishes.
- B. Redesign or Departures from Requirements of the Contract Documents Initiated by Contractor:
 - 1. Obtain written acceptance from the Architect and Architect's consultants.
 - 2. Bear costs for Contractor-initiated or construction error due to changes in type, form, system, or details of construction from those indicated by the contract documents.
 - 3. Costs of review of such changes by Architect and Architect's consultants will be deducted from the Contract Sum by Change Order.
- C. Match Existing: Where concrete is indicated to match existing, concrete appearance shall match existing concrete in finish and quality. Installer shall select mix designs complying with requirements.
- D. Recycled Content:
 - 1. Concrete Mix: Provide cement with minimum 25 percent recycled content, with Structural Engineer's approval.

2.2 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 - 1. Plywood, metal, glass-fiber-reinforced plastic, or other approved panel materials.
 - 2. Exterior-grade plywood panels, nonabsorptive, that will provide continuous, true, and smooth architectural concrete surfaces, complying with DOC PS 1, and as follows:
 - a. High-density overlay, Class 1, or better.
 - b. Medium-density overlay, Class 1, or better, nonabsorptive, mill-release agent treated and edge sealed.
- B. Finished Appearance Concrete: Form-facing panels that provide continuous and true concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 - 1. Smooth-Formed Concrete: As indicated for panels at Smooth-Formed Finished Concrete articles above, except:
 - a. High-density overlay, Class 1, or better.
 - 2. Do not provide chamfers at corners of smooth-formed concrete.

3. Sealant Corners: Seal interior corners of formwork with joint sealant to avoid excess drainage of "cream" from concrete during placement.
- C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, or smooth surface paper or fiber tubes that produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.
- D. Chamfer Strips: Wood, metal, or rubber strips, 3/8 by 3/8 inch for rectangular concrete columns indicated to remain exposed in final construction.
- E. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- F. Form Ties: Factory-fabricated, removable or snap-off metal and/or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 1. Furnish ties with integral water-barrier plates at walls indicated to receive dampproofing or waterproofing.
 2. At formed concrete exposed to view in the final construction, furnish units that provide 1-1/2 inch nominal break back and leave no corrodible metal closer than 1-1/2 inch to the plane of exposed concrete surface.
 - a. Tie Cones: As indicated above for finished appearance concrete.
 3. At formed concrete NOT exposed to view in the final construction, furnish units that provide 1 inch nominal break back and leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.

2.3 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A615, Grade 60, deformed. Refer to Structural Notes or structural drawings.
- B. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25.
- C. Low-Alloy-Steel Reinforcing Bars: ASTM A706, deformed.
- D. Plain-Steel Welded-Wire Reinforcement: ASTM A1064, plain, fabricated from as-drawn steel wire into flat sheets.

2.4 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A615, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 1. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.5 CONCRETE MATERIALS

- A. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- B. Cementitious Materials:
 - 1. Portland Cement: ASTM C150, Type I/II.
 - 2. Fly Ash: ASTM C618, Class F or C. Refer to Structural Notes in Drawings for allowed quantities.
 - 3. Silica Fume: ASTM C1240, amorphous silica.
- C. Normal-Weight Aggregates: ASTM C33, coarse aggregate or better, graded. Provide aggregates from a single source.
 - 1. Maximum Coarse-Aggregate Size: Refer to Structural Notes in Drawings.
 - 2. Combined Aggregate Gradation: Well graded from coarsest to finest with not more than 18 percent and not less than 8 percent retained on an individual sieve, except that less than 8 percent may be retained on coarsest sieve and on No. 50 sieve, and less than 8 percent may be retained on sieves finer than No. 50.
 - 3. Aggregate for Polished Concrete Floors: Seed floors to receive polished exposed finish with aggregate as selected by Architect or Owner's Authorized Representative.
- D. Water: ASTM C94 and potable.

2.6 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C260.
- B. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C494, Type A.
 - 2. Retarding Admixture: ASTM C494, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C494, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C494, Type F.
 - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C494, Type G.
 - 6. Plasticizing and Retarding Admixture: ASTM C1017, Type II.
- C. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C494, Type C.
- D. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.

2.7 FIXED, EXTRUDED-ALUMINUM HORIZONTAL-BLADE CRAWL SPACE VENTILATION LOUVERS

- A. Provide custom louver as indicated at exterior wall openings for passive ventilation of crawl space.
 - 1. Basis-of-Design Product: Model no. 128 FL, FL Vent by Sun Vent Industries; www.sunventindustries.com.

2. Other Approved: Model BVF Brick Vent Extruded Aluminum by Greenheck Fan Corp.; www.greenheck.com.
3. Size: As indicated.
4. Aluminum Finish: Clear anodized.
5. Application: At cast-in-place concrete stem walls surrounding crawl space, instead of conventional slab-on-grade construction with earthwork fill, provide crawl space ventilation louvers as indicated in Drawings.

2.8 VAPOR/ RADON BARRIER

- A. Vapor/ Radon Barrier: ASTM E1745, Class A; not less than 15 mils thick Include manufacturer's recommended adhesive or pressure-sensitive tape.
 1. Water-Vapor Permeance: Not exceeding 0.01 Perms as tested in accordance with mandatory conditioning tests per ASTM E1745, Section 7.1.
 2. Radon Diffusion Coefficient: Not exceeding 9.9×10^{-12} m²/second per ASTM E2178 and K124/02/95 (method C of ISO/TS 11665-13).
 3. Basis-of-Design Product: Vapor Block VB15 by Raven Industries Inc.; www.ravenefd.com.
 4. Accessories: Manufacturer's recommended tape and mastic for sealing at overlaps and openings.

2.9 CONCRETE CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz/ sq. yd. when dry.
- C. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Clear, Waterborne, Membrane-Forming Curing Compound/ Sealer: ASTM C309, Type 1, Class B, dissipating.
 1. Approved Products:
 - a. MasterKure CC 200 WB by BASF Corp. Construction Systems; www.master-builders-solutions.basf.us.
 - b. Safe-Cure Clear by ChemMasters, Inc.; www.chemmasters.net.
 - c. KUREZ W VOX by Euclid Chemical Co. (The); www.euclidchemical.com.
 - d. TAMMSCURE WB 30 by Euclid Chemical Co. (The).
 - e. L&M Cure R by Laticrete International, Inc.; www.laticrete.com.
 - f. 1100 (formerly 1100-CLEAR) by W. R. Meadows, Inc.; www.wrmeadows.com.

2.10 RELATED MATERIALS

- A. Reglets: Fabricate reglets of not less than 0.022-inch-thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

- B. Epoxy-Bonding Adhesive: ASTM C881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class, suitable for application temperature and grade to suit requirements, and as follows:
 - 1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- C. Bonding Agent: ASTM C1059, Type II, non-redispersable, acrylic emulsion or styrene butadiene.

2.11 CONCRETE MIXTURES, GENERAL

- 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, according to ACI 301.
 - 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 - 1. Fly Ash: 25 percent.
 - 2. Combined Fly Ash or Pozzolan and Slag Cement: 20 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
 - 3. Silica Fume: 10 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
- D. Synthetic Fiber: uniformly disperse in concrete mix at manufacturer's recommended rate, but not less than 1.5 lb/cu. yd.
- E. Admixtures: Use admixtures according to manufacturer's written instructions.
 - 1. Use high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
 - 2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 - 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a w/c ratio below 0.50.
 - 4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

2.12 FABRICATING REINFORCEMENT

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

2.13 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C94 and ASTM C1116 and furnish batch ticket information.
 - 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. Verification of Conditions:

1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
 - a. Remove standing water from vapor barriers using methods that do not compromise the integrity of the membrane nor displace the membrane at edges, overlaps and terminations, such as sweeping, vacuuming, or blowing. Do not puncture the membrane to drain standing water.
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 FORMWORK INSTALLATION

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
 1. Class A, 1/8 inch for smooth-formed finished surfaces, including finished appearance concrete.
 2. Class B, 1/4 inch for rough-formed finished surfaces and concrete NOT exposed to view in the final construction.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Construct forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 1. Install keyways, reglets, recesses, and the like, for easy removal.
 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of exposed cast-in-place concrete.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.
- M. Additional Requirements for Finished Appearance Concrete:
 - 1. Do not locate form ties at formwork joints.
 - 2. Reusable portions of form ties to be maintained free of rust and damage.
 - 3. Provide sealant at all form tie holes after formwork has been removed; refer to Section 07 92 00 "Joint Sealants" for exterior sealant type and requirements; sealant color shall match concrete color.

3.4 INSTALLATION OF FOUNDATION WALL INSULATION

- A. Butt panels together for tight fit.
- B. Adhesive Installation: Install with adhesive or press into tacky waterproofing or dampproofing according to manufacturer's written instructions.

3.5 EMBEDDED ITEM INSTALLATION

- 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. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.
 - 2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.6 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations, and curing and protection operations need to be maintained.
 - 1. Leave formwork for beam soffits, joists, slabs, and other structural elements that support weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
 - 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material are not acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.7 VAPOR BARRIER INSTALLATION

- A. Sheet Vapor Barriers: Place, protect, and repair sheet vapor barrier according to ASTM E1643 and manufacturer's written instructions.
 - 1. Install vapor barrier with longest dimension parallel with direction of concrete pour.
 - 2. Face laps away from exposed direction of concrete pour.
 - 3. Lap vapor barrier over footings and grade beams not less than 6 inches, sealing vapor retarder to concrete.
 - 4. Lap joints 12 inches and seal with manufacturer's recommended tape and mastic or sealed with continuous bead of polyurethane caulk.
 - 5. Terminate vapor barrier at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
 - 6. Seal penetrations in accordance with vapor barrier manufacturer's instructions.
 - 7. Protect vapor barrier during placement of reinforcement and concrete.
 - a. Repair damaged areas by patching with vapor barrier material, overlapping damages area by 6 inches on all sides, and sealing to vapor barrier.
 - 8. Caulk slab joints.

3.8 STEEL REINFORCEMENT INSTALLATION

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
 - 1. Do not cut or puncture vapor barrier. Repair damage and reseal vapor barrier before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
 - 1. Weld reinforcing bars according to AWS D1.4, where indicated.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire fabric in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.9 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated.
 - 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
 - 3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 - 4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
 - 5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
 - 6. Use a bonding agent or roughen interface to 1/4 inch amplitude at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 - C. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated, or if not indicated, then following column center lines.
 - 1. Slabs Exposed to View: Saw cuts (scoring) are required at exposed slabs-on-grade and elevated slabs as an aesthetic feature to minimize visibility and direct cracking along the cut.
 - 2. Sawed Joints: Cut contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete to a depth equal to at least one-fourth of concrete thickness. Perform when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks, but no more than 12 hours after the slab has been placed.
 - D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
 - 2. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
 - E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.
- 3.10 INSTALLATION OF LOUVERS
- A. Locate and place louvers and vents level, plumb, and at indicated alignment with adjacent work.
 - B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
 - C. Form closely fitted joints with exposed connections accurately located and secured.
 - D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.
 - E. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.
 - F. Protect galvanized and nonferrous-metal surfaces from corrosion or galvanic action by applying a heavy coating of bituminous paint on surfaces that will be in contact with concrete, masonry, or dissimilar metals.

- G. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Section 07 92 00 "Joint Sealants" for sealants applied during louver installation.

3.11 CONCRETE PLACEMENT

- 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 per manufacturer's instructions.
 - 2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. 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. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. 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.
- E. 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. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Maintain reinforcement in position on chairs during concrete placement.
 - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 4. Slope surfaces uniformly to drains where required.
 - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When average high and low temperature is expected to fall below 40 deg F, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.

2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mixture designs.

G. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.12 FINISHING FORMED SURFACES

- A. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering materials applied directly to concrete.
 2. Finished Appearance Concrete: Smooth-formed finish concrete as indicated above, except as indicated elsewhere in this Section to obtain finished appearance.
- B. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.13 FLOOR FLATNESS AND LEVELNESS TOLERANCES

- A. General: Levelness requirements do not apply where sloped surface is required.
- B. Flat and Level: Comply with the following requirements, as evaluated by ASTM E1155.
1. Special Finish Work:
 - a. At slabs-on-grade where indicated to receive other floor finish: FF 50, FF 30 and FL 20, minimum values not less than FF 15 and FL 10.
 - b. At concrete toppings where indicated to receive other floor finish: FF 50, FF 30 and FL 20, minimum values not less than FF 15 and FL 10.
- C. Ramps: Provide maximum slope as described in Drawings, but not to exceed 1:12 when measured with a 24 inch level at any point in the direction of slope.
- D. Except as otherwise required, correct surfaces that do not conform to tolerance limitations by grinding high points and filling low points with approved leveling compound, or by removal and replacement of defective work. Areas requiring corrective work will be identified by the Architect. Re-measure corrected areas by the same process.

3.14 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

- B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch in one direction.
 - 1. Apply scratch finish to surfaces to receive concrete floor toppings.
 - C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.
 - 1. Apply float finish to surfaces to receive trowel finish and to be covered with fluid-applied or sheet waterproofing.
 - D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
 - 1. Apply a trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system.
 - 2. Finish surfaces to the following tolerances, according to ASTM E1155, for a randomly trafficked floor surface:
 - a. At Slabs-on-Grade: Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17.
 - b. At Formed Suspended Slabs: Specified overall values of flatness, F(F) 30; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 15.
 - c. At Suspended Slabs on Metal Deck and Framing: Specified overall values of flatness, F(F) 25, with minimum local values of flatness, F(F) 20; levelness values, F(L), not required. Suspended slabs shall be placed level (flat).
 - 3. The concrete thicknesses indicated are minimums; Contractor shall anticipate additional concrete at center of structural bays where framing will deflect with placement.
 - 4. Concrete floor placement and sequencing shall consider cambers and deflections of steel floor framing; deflections are indicated in General Structural Notes in order to facilitate level placement.
 - 5. At Coated Finish Slabs: For slabs indicated to receive coatings, including clear sealers, lightly machine grind floor surfaces, equivalent to Level 1: Matte finish, 100 grit.
 - 6. Sealed Concrete: At locations indicated provide sealer.
 - E. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.
 - 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.
 - 2. Coordinate and confirm approval of required final finish with Architect prior to application.
- 3.15 MISCELLANEOUS CONCRETE ITEM INSTALLATION
- A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

3.16 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 305.1 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed 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.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
 - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies does not interfere with bonding of floor covering used on Project.
 - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project.
 - 4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written

instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.17 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
 - 1. Defer joint filling until concrete has aged at least six months. Do not fill joints until construction traffic has permanently ceased.
- 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. Overfill joint and trim joint filler flush with top of joint after hardening.

3.18 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried.
 - 2. Fill form-tie hole voids with patching preformed cone-shaped tie-hole plugs secured in place with bonding agent.
 - 3. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar matches surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 - 4. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
 - 1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 - 2. After concrete has cured at least 14 days, correct high areas by grinding.
 - 3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.

4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
 5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.19 VOID-FILLING

- A. Fill voids at cast-in-place concrete and masonry throughout the project to prevent access to interior spaces, both occupied and not-occupied, by insects and rodents. This includes at openings created for the passage of piping, wiring, or other work which creates openings that could provide access to vermin.
- B. Void-Filling Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

3.20 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. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- C. Inspections: As indicated in the General Structural Notes.
- D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C172 shall be performed according to 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 50 cu. yd. or fraction thereof.
 2. Testing Frequency: Obtain at least one composite sample for each 150 cu. yd. or fraction thereof of each concrete mixture placed each day.
 - a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

3. Slump: ASTM C143; 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.
4. Air Content: ASTM C231, pressure method, for normal-weight concrete; ASTM C173, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
5. Concrete Temperature: ASTM C1064; 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.
6. Unit Weight: ASTM C567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
7. Compression Test Specimens: ASTM C31.
 - a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
 - b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.
8. Compressive-Strength Tests: ASTM C39; test one set of two laboratory-cured specimens at 7 days, one set of two specimens at 28 days, and one set of two specimens at 90 days when indicated in the general structural notes.
 - a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
 - b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
10. Strength of each concrete mixture will be satisfactory if every 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.
11. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days and 90 days if applicable, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7-, 28-, and 90-day tests where required in the general structural notes.
12. 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.
13. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C43 or by other methods as directed by Architect.
14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

15. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

E. Measure floor and slab flatness and levelness according to ASTM E1155 within 48 hours of finishing.

3.21 ADJUSTING AND CLEANING OF LOUVERS

A. Clean exposed surfaces of louvers and vents that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate until final cleaning.

B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.

C. Restore louvers and vents damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Contracting Officer, remove damaged units and replace with new units.

1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION

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SECTION 05 50 00 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. The General Structural Notes shall be used in conjunction with these specifications. The General Structural Notes shall supersede items in this specification when discrepancies exist.

1.2 SUMMARY

A. Section Includes:

- 1. Steel framing and supports, including but not limited to the following:
 - a. For applications where framing and supports are not specified in other Sections.
 - b. For countertops.
 - c. For mechanical and electrical equipment.
- 2. Slotted channel framing for re-configurable structures (Unistrut).
- 3. Loose bearing and leveling plates for applications where they are not specified in other Sections.
- 4. Shelf angles.
- 5. Exterior canopy.
- 6. Delegated design.

B. Products furnished, but not installed, under this Section include the following:

- 1. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
- 2. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

C. Related Requirements:

- 1. Section 01 61 16 "Delegated Design Requirements".

1.3 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 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.

1.4 SUBMITTALS

A. Product Data: For the following:

- 1. Paint products.
- 2. 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 all items specified in this Section, including but not limited to all items indicated in "Summary" Article above.
- C. Delegated-Design Submittal: For all items requiring engineering, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Samples for Verification: For each type and finish where not field painted.
- E. Mill Certificates: Signed by stainless-steel manufacturers, certifying that products furnished comply with requirements.
- F. Welding certificates.
- G. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- H. Research/Evaluation Reports: For post-installed anchors, from ICC-ES.

1.5 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code - Steel."
- B. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1, "Structural Welding Code - Steel."
 - 2. AWS D1.2, "Structural Welding Code - Aluminum."
 - 3. AWS D1.6, "Structural Welding Code - Stainless Steel."

1.6 FIELD CONDITIONS

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

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 61 16 "Delegated Design Requirements," to design items requiring design and attachment to structure, including, but not limited to the following:
 - 1. Mechanical and electrical support framing.
- B. Structural Performance of Fabricated Aluminum Railings: Aluminum hand- and guardrails shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.
 - 1. Handrails and Top Rails of Guards:
 - a. Uniform load of 50 lbf/ ft. applied in any direction.
 - b. Concentrated load of 200 lbf applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 - 2. Infill of Guards:
 - a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft.
 - b. Infill load and other loads need not be assumed to act concurrently.

- C. Seismic Performance: Metal fabrications shall withstand the effects of earthquake motions determined according to ASCE/SEI 7 and as indicated.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
- E. Interior Paints, Primers and Sealers: Comply with low/ no VOC requirements.

2.2 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 or A529 GR.50 as indicated in structural drawings.
- C. Stainless-Steel Sheet, Strip, and Plate: ASTM A240 or ASTM A666, Type 304 at interior locations, Type 316L at exterior locations.
- D. Stainless-Steel Bars and Shapes: ASTM A276, Type 304 at interior locations, Type 316L at exterior locations.
- E. Steel Tubing: ASTM A500, cold-formed steel tubing.
- F. Steel Pipe: ASTM A53, Standard Weight (Schedule 40) unless otherwise indicated.
- G. Slotted Channel Framing (Unistrut): Cold-formed metal box channels (struts) complying with MFMA-4.
 - 1. Size of Channels: Size and configuration as required.
 - 2. Material, Exterior and Garage and Other Unconditioned/ Uncontrolled Humidity Locations: Galvanized steel, ASTM A653, structural steel, Grade 33 (Grade 230), with G90 (Z275) coating; thickness indicated.
 - 3. Material, Interior (Conditioned/ Controlled Humidity) Locations: Cold-rolled steel, ASTM A1008, structural steel, Grade 33 (Grade 230); with G40 (Z120) coating; thickness indicated.
 - 4. Recycled Content: 25% minimum post-consumer recycled content.
- H. Aluminum Plate and Sheet: ASTM B209, Alloy 6061-T6.
- I. Aluminum Extrusions: ASTM B221, Alloy 6063-T6.
- J. Aluminum-Alloy Rolled Tread Plate: ASTM B632, Alloy 6061-T6.
- K. Aluminum Castings: ASTM B26, Alloy 443.0-F.

2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
 - 1. Provide stainless-steel fasteners for fastening aluminum.
 - 2. Provide stainless-steel fasteners for fastening stainless steel.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A (Property Class 4.6); with hex nuts, ASTM A563; and, where indicated, flat washers.
- C. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A325, Type 3; with hex nuts, ASTM A563, Grade C3; and, where indicated, flat washers.

- D. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F593; with hex nuts, ASTM F594; and, where indicated, flat washers; Alloy Group 2 (A4).
- E. 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.
- F. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E488, conducted by a qualified independent testing agency.
- G. Post-Installed Anchors: As indicated on Structural Drawings.
- H. Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4, 1-5/8 by 7/8 inches by length indicated with anchor straps or studs not less than 3 inches long at not more than 8 inches o.c. Provide with temporary filler and tee-head bolts, complete with washers and nuts, all zinc-plated to comply with ASTM B633, Class Fe/Zn 5, as needed for fastening to inserts.

2.4 MISCELLANEOUS MATERIALS

- A. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.
- B. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187.
- D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- E. Shop Primer, Interior: Zinc-rich, compatible with Section 09 91 00 "Painting" system for steel substrates.
- F. Shop Primer, Exterior: Refer to Section 09 96 00 "High-Performance Coatings."

2.5 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch 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 to NOMMA's "Voluntary Joint Finish Standards" for Finish No. 3: Partially dressed weld with spatter removed. No roughness or burrs permitted. Weld appearance shall be consistent and even.
- 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. Evidence of grinding on surfaces is not permitted on fabrications. Surfaces shall match adjacent base surface without imperfections.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
 1. Fabricate units from slotted channel framing where indicated.
 2. Furnish inserts for units installed after concrete is placed.
- C. Galvanize miscellaneous framing and supports where indicated.
- D. Prime miscellaneous framing and supports with primer specified where indicated.

2.7 STEEL SHAPES

- A. Fabricate from steel angles and shapes of size indicated. Fabricate in single lengths unless otherwise indicated. Weld adjoining members together where indicated.
- B. Galvanize and prime steel located in exterior walls.
 1. Prime steel items located in exterior walls with zinc-rich primer.

2.8 MISCELLANEOUS STEEL TRIM

- A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.
- B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
- C. Galvanize and prime exterior miscellaneous steel trim.

2.9 LOOSE BEARING AND LEVELING PLATES

- A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.
- B. Galvanize plates.
- C. Prime plates with zinc-rich primer.

2.10 STEEL WELD PLATES AND ANGLES

- A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.11 EXTERIOR CANOPY

- A. General: Provide Structural steel shapes for frame and brackets for canopy framing as indicated.
 - 1. Refer to Structural Drawings for requirements.
 - 2. Steel shall be free from twists, kinks, warping, gouges, and other imperfections.
- B. Fabricate canopy framing to the fullest extents in shop.
 - 1. Oversize weld sizes to accommodate finishing indicated.
 - 2. Orient tube steel to conceal seam welds on face. Indicate seam location for review in shop drawings.
 - 3. Welding: At exposed faces, finish welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- C. Canopy: Steel plate; 1/4-inch thick minimum, or thicker as indicated or required to comply with performance requirements.
- D. Erection: Erect to tolerances specified in AISC 303.

2.12 FINISHES, GENERAL

- 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.

2.13 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153 for steel and iron hardware and with ASTM A123 for other steel and iron products.
 - 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
- B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.
- C. 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 indicated.
 - 2. Shop prime with primer indicated in Section 09 96 00 "High-Performance Coatings" where finish is indicated to be high-performance or at exterior steel fabrications.
- D. Preparation for Shop Priming: Prepare surfaces to comply with requirements indicated below:
 - 1. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 2. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 3. Items Indicated to Receive Primers Specified in Section 09 96 00 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 4. Other Items: SSPC-SP 3, "Power Tool Cleaning."

- E. 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.

2.14 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.
- B. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
 - 1. Color and Gloss: As indicated.

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. Finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 welds: no evidence of a welded joint.
- 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 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.
- B. Anchor supports for ceiling hung toilet partitions, operable partitions, aluminum-framed folding storefront system, and overhead doors securely to, and rigidly brace from, building structure.

- C. Support steel girders on solid grouted masonry, concrete, or steel pipe columns. Secure girders with anchor bolts embedded in grouted masonry or concrete or with bolts through top plates of pipe columns.
 - 1. Where grout space under bearing plates is indicated for girders supported on concrete or masonry, install as specified in "Installing Bearing and Leveling Plates" Article.
- D. Install pipe columns on concrete footings with grouted baseplates. Position and grout column baseplates as specified in "Installing Bearing and Leveling Plates" Article.
 - 1. Grout baseplates of columns supporting steel girders after girders are installed and leveled.

3.3 INSTALLING BEARING AND LEVELING PLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.
- B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with nonshrink grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.4 INSTALLING FABRICATED RAILING ASSEMBLIES

- A. Install fabricated railing assemblies as recommended by manufacturer.

3.5 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - 1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
- B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 09 96 00 "High-Performance Coatings."
- C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780.

3.6 FIELD QUALITY CONTROL

- A. Tests and Inspections: The owner will employ the services of an independent testing laboratory for performing test and to conduct inspection services on all shop fabricated and on-site structural welding and bolting plus expansion anchor, grouted anchor, and adhesive anchor placement required for this construction and as required per the Statement of Special Inspections within the Structural Drawings.

END OF SECTION

SECTION 05 52 13 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Pipe and tube handrails for exterior applications.
 - 2. Delegated design.
- B. Related Requirements:
 - 1. Section 01 61 16 "Delegated Design Requirements".

1.3 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 handrails. 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.
- C. Schedule installation so wall attachments are made only to completed walls. Do not support handrails temporarily by any means that do not satisfy structural performance requirements.

1.4 SUBMITTALS

- A. Product Data: For the following:
 - 1. Manufacturer's product lines of mechanically connected handrails.
 - 2. Handrail brackets.
 - 3. Grout, anchoring cement, and paint products.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
- C. Samples: For each type of exposed finish required.
 - 1. Sections of each distinctly different linear handrail member, including handrails, top rails, posts, and balusters.
 - 2. Fittings and brackets.
- D. Delegated-Design Submittal: For handrails indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- E. Qualification Data:
 - 1. For testing agency.
 - 2. For professional engineer.
- F. Welding certificates.

- G. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.
 - H. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.
 - I. Product Test Reports: For pipe and tube railings, for tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.
 - J. Evaluation Reports: For post-installed anchors, from ICC-ES.
- 1.5 QUALITY ASSURANCE
- A. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. Protect mechanical finishes on exposed surfaces 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 metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 61 16 "Delegated Design Requirements" to design handrails, including attachment to building construction.
- B. Structural Performance: Handrails, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Handrails and Top Rails of Guards:
 - a. Uniform load of 50 lbf/ ft. applied in any direction.
 - b. Concentrated load of 200 lbf applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 - 2. Infill of Guards:
 - a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft.
 - b. Infill load and other loads need not be assumed to act concurrently.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F.

2.2 METALS, GENERAL

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

1. Provide type of bracket with flange tapped for concealed anchorage to threaded hanger bolt and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.

2.3 STEEL AND IRON

- A. Tubing: ASTM A500 (cold formed) or ASTM A513.
- B. Pipe: ASTM A53, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.
- C. Plates, Shapes, and Bars: ASTM A36.

2.4 FASTENERS

- A. Fasteners, General: Provide the following:
 1. Stainless-Steel Handrails: Type 316 stainless-steel fasteners.
 2. Provide exposed fasteners with finish matching appearance, including color and texture, of handrails.
- B. Fasteners for Anchoring Handrails to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring handrails to other types of construction indicated and capable of withstanding design loads.
- C. Fasteners for Interconnecting Handrail Components:
 1. Provide concealed fasteners for interconnecting handrail components and for attaching them to other work, unless otherwise indicated.
 2. Provide concealed fasteners for interconnecting handrail components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for handrails indicated.
 3. Provide Phillips, square or hex socket flat-head machine screws for exposed fasteners unless otherwise indicated.
- D. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to 6 times the load imposed when installed in unit masonry and 4 times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.
 1. Stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594. Provide alloy Group 1 (A1) where Type 304 stainless-steel is required; alloy Group 2 (A4) where Type 316 stainless-steel is required.

2.5 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
 1. For stainless-steel handrails, provide type and alloy as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.
- B. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

- C. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.
 - 1. Water-Resistant Product: At exterior locations and where indicated provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.6 FABRICATION

- A. General: Fabricate handrails to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
- B. Shop assemble handrails to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form work true to line and level with accurate angles and surfaces.
- E. Fabricate connections that are exposed to weather in a manner that excludes water. Provide weep holes where water may accumulate.
- F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- G. Connections: Fabricate handrails with welded connections unless otherwise indicated.
- H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove flux immediately.
 - 4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
- I. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
 - 1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.
- J. Form Changes in Direction as Follows:
 - 1. For stainless-steel handrails: As detailed.
- K. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- L. Close exposed ends of handrail members with prefabricated end fittings.
- M. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.

- N. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect handrail members to other work unless otherwise indicated.
 - 1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.
- O. Provide inserts and other anchorage devices for connecting handrails to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by handrails. Coordinate anchorage devices with supporting structure.
- P. For handrail posts set in concrete, provide stainless-steel sleeves not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, with metal plate forming bottom closure.
- Q. Finish: Shop-primed and field-painted; refer to Steel Finishes Articles.

2.7 STEEL FINISHES

- A. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm). Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
 - 1. Color and Gloss: As selected by Architect.

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. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required for installing handrails. Set handrails accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
 - 1. Do not weld, cut, or abrade surfaces of handrail components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
 - 2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
 - 3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
- D. Adjust handrails before anchoring to ensure matching alignment at abutting joints.
- E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing handrails and for properly transferring loads to in-place construction.

3.3 HANDRAIL CONNECTIONS

- A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting handrail components. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of handrails.

- B. Welded Connections: Use fully welded joints for permanently connecting handrail components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.
- C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches (50 mm) beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

3.4 ANCHORING POSTS

- A. Use metal sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.
- B. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.
- C. Cover anchorage joint with flange of same metal as post, attached to post with set screws.
- D. Leave anchorage joint exposed with 1/8-inch buildup, sloped away from post.
- E. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:
 - 1. For stainless-steel pipe handrails, weld flanges to post and bolt to supporting surfaces.
- F. Install removable handrail sections, where indicated, in slip-fit metal sockets cast in concrete.

3.5 ATTACHING HANDRAILS

- A. Anchor handrail ends at walls with round flanges anchored to wall construction and welded to handrail ends.
- B. Anchor handrail ends to metal surfaces with flanges bolted to metal surfaces and welded to handrail ends.
- C. Attach handrails to wall with wall brackets, except where end flanges are used. Locate brackets as indicated or, if not indicated, at regular, equal spacing required to support structural loads.

3.6 ADJUSTING AND CLEANING

- A. Clean stainless-steel by washing thoroughly with clean water and soap and rinsing with clean water.

3.7 PROTECTION

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

END OF SECTION

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. The General Structural Notes shall be used in conjunction with this specification. The General Structural Notes shall supersede items in this specification when discrepancies exist.

1.2 SUMMARY

- A. Section Includes:
 - 1. Wood blocking, cants, and nailers.
 - 2. Dimensional lumber framing.
 - 3. Wood furring and grounds.
 - 4. Wood sleepers.
 - 5. Plywood backing panels.
 - 6. Wood I-Joists.
 - 7. Sill-sealer gaskets.
- B. Related Requirements:
 - 1. Section 06 16 00 "Sheathing" for wall sheathing, subflooring and underlayment.
 - 2. Section 06 17 53 "Shop-Fabricated Wood Trusses".

1.3 DEFINITIONS

- A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal size or greater but less than 5 inches nominal size in least dimension.

1.4 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
 - 2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
 - 3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D5664.
 - 4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

- B. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.
- C. Evaluation Reports: For the following, from ICC-ES:
 - 1. Wood-preservative-treated wood.
 - 2. Fire-retardant-treated wood.
 - 3. Engineered wood products, including LVL, PSL and LSL.
- D. Shop Drawings: Provide shop drawings which indicate sizes and spacings of I-joists and engineered lumber framing. If wood stud walls are shop fabricated, submit shop drawings for the wall panels indicating framing type and spacing, wall panel heights, wood panel nailing, and details of panel to panel connections.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.6 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, GENERAL

- A. Lumber: 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. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: All wood shall be kiln dried.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWPAC U1; Use Category UC2 for interior construction not in contact with ground.
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
 - 1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.

- D. Application: Treat items indicated on Drawings, and the following:
1. Treat all rough carpentry in contact with concrete, masonry, and where in exterior cavity walls at grade level.
 2. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
 3. Furring and blocking installed in roofing assemblies.
 4. Furring located outside of weather barrier, in cavity construction.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
1. Use treatment that does not promote corrosion of metal fasteners.
 2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated plywood by pressure process after being subjected to accelerated weathering according to ASTM D2898. Use for exterior locations and where indicated.
 3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D3201 at 92 percent relative humidity. Use where exterior type is not indicated.
 4. Design Value Adjustment Factors: Treated lumber plywood shall be tested according to ASTM D5516, and design value adjustment factors shall be calculated according to ASTM D6305. Span ratings after treatment shall be not less than span ratings specified.
- C. Kiln-dry lumber and plywood after treatment to S-DRY (19 percent maximum moisture content). Do not use material that is warped or does not comply with requirements for untreated material.
- D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
- E. Application: Treat items indicated on Drawings and the following:
1. Framing and blocking in fire-rated attic and roof construction.

2.4 DIMENSION LUMBER FRAMING

- A. Dimension Lumber Items: Construction or No. 2 grade lumber of any of the following species:
1. Douglas Fir-Larch; WWPA or WCLIB.
 2. Hem-fir (north); NLGA.
 3. Southern pine or mixed southern pine; SPIB.
 4. Spruce-pine-fir; NLGA.
 5. Hem-fir; WCLIB or WWPA.
 6. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

- B. Non-Load-Bearing Interior Partitions: No. 2 grade, unless noted otherwise on the Drawings.
 - 1. Application: Interior non-load bearing partitions.
- C. Load-Bearing Walls: As indicated on the Structural Drawings.
 - 1. Application: Exterior walls and interior load-bearing walls.
- D. Ceiling Joists: No. 2 or Better grade, unless noted otherwise on Drawings.
 - 1. Species: Douglas Fir-Larch; WWPA or WCLIP.
- E. Joists, Rafters, and Other Framing Not Listed Above: As indicated on the Structural Drawings.
- F. Concealed Boards: 19 percent maximum moisture content and the following species and grades:
 - 1. Western woods; Construction or No. 2 Common grade; WCLIB or WWPA.

2.5 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.
 - 3. Cants.
 - 4. Furring.
 - 5. Grounds.
- B. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
 - 1. Provide blocking for future installation of grab rails at Code-required locations in ALL residential units.
- C. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- D. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.6 ENGINEERED WOOD PRODUCTS

- A. Source Limitations: Obtain each type of engineered wood product from single source from a single manufacturer.
- B. Approved Manufacturers:
 - 1. Trus Joist by Weyerhaeuser; www.weyerhaeuser.com.
 - 2. RedBuilt, LLC; www.redbuilt.com.
- C. Code Reports: Materials shall comply with a current ICC Evaluation Service Report.
- D. Wood I-Joists: Prefabricated units, I-shaped in cross section, made with solid or structural composite lumber flanges and wood-based structural panel webs, let into and bonded to flanges. Comply with material requirements of and with structural capacities established and monitored according to ASTM D5055.
 - 1. Flange Material: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559.

2. Web Material: Oriented strand board complying with DOC PS 2, Exposure 1.
 3. Structural Properties: Depths and design values not less than those indicated within the Structural Drawings.
 4. Comply with APA PRI-400. Factory mark I-joists with APA-EWS trademark indicating nominal joist depth, joist class, span ratings, mill identification, and compliance with APA-EWS standard.
- E. Rim Boards: Product designed to be used as a load-bearing member and to brace wood I-joists at bearing ends, complying with research or evaluation report for I-joists.
1. Manufacturer: Provide products by same manufacturer as I-joists.
 2. Usually retain all options in "Material" Subparagraph below.
 3. Material: All-veneer product.
 4. Thickness: Minimum 1-1/2 inch.
 5. Comply with APA PRR-401, rim board grade. Factory mark rim boards with APA-EWS trademark indicating thickness, grade, and compliance with APA-EWS standard.
- F. Adhesives shall be waterproof and conform to ASTM D2559.
- G. Identification: Members shall be identified by a stamp indicating the product type, grade, manufacturer, and code report number.
- H. Structural properties of members shall be as indicated on the Structural Drawings.

2.7 PLYWOOD PANELS

- A. Equipment Backing Panels: Plywood, DOC PS 1, Exterior, A-C, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.
1. Provide void free faced plywood, compliant with ASTM E84 Class B flame spread and developed smoke index, where exposed and mounted for electrical/ telecom panels.
- B. Plywood Panels: Plywood, interior, C-D grade, plugged sanded, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.
1. Finish: Field painted with epoxy paint, refer to Section 09 91 00 "Painting".

2.8 FASTENERS

- A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
1. Provide stainless steel fasteners or hot-dipped galvanized fasteners at all wood-preservative-treated and fire-retardant treated lumber. Hot-dipped galvanized fasteners shall adhere to ASTM A153.
- B. Nails, Brads, and Staples: ASTM F1667.
- C. Wood Screws: ASME B18.6.1.
- D. Lag Bolts: ASME B18.2.1.
- E. Bolts: Steel bolts complying with ASTM A307, Grade A, with ASTM A563 hex nuts and flat washer.
- F. Fasteners for Treated Lumber: Provide galvanized adhering to ASTM A153 or Type 304 stainless steel in contact with pressure treated or fire-retardant treated wood, If connectors are utilized, the finish on the connectors and fasteners shall be of the same type.
- G. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

- H. Concrete Screw Anchors: As indicated on the Structural Drawings.
- I. Powder Actuated Fasteners: As indicated on the Structural Drawings.
- J. Metal Framing Accessory Anchors:
 - 1. Basis-of-Design Product: Subject to compliance with substitution requirements as indicated elsewhere in these Specifications and as noted on the Structural Drawings, provide product indicated on Drawings or comparable product by one of the following:
 - a. Simpson Strong-Tie Co., Inc.
 - 2. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653, G60 coating designation.
 - a. Use for interior locations unless otherwise indicated.
 - 3. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A653; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.
 - a. Use for wood-preservative-treated lumber and where indicated.

2.9 MISCELLANEOUS MATERIALS

- A. Flexible Flashing: Coordinate requirements.
- B. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4-inch-thick, selected from manufacturer's standard widths to suit width of sill members indicated.
- C. Adhesives for Gluing Furring to Concrete: Formulation complying with ASTM D3498 that is approved for use indicated by adhesive manufacturer.
- D. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chloropyrifos as its active ingredient.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- C. Set rough carpentry 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, grounds, and similar supports to comply with requirements for attaching other construction.
- D. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.
- E. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
- F. 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.

- G. Comply with AWP A M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use inorganic boron for items that are continuously protected from liquid water.
 - 2. Use copper naphthenate for items not continuously protected from liquid water.
 - H. Where wood-preservative-treated lumber is installed adjacent to or in contact with galvanized metal, metal decking, metal framing, or zinc-coated metal, install continuous flexible flashing separator between wood and metal.
 - I. Provide stainless steel or hot dipped galvanized fasteners to attach all wood-preservative-treated lumber and plywood products.
 - J. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).
 - 2. ICC-ES evaluation report for fastener.
 - K. Use steel common nails unless otherwise indicated. Unless noted otherwise within the structural drawings, select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.
 - L. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
 - M. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
 - N. Beams and Trusses: Install in locations as detailed, anchoring solidly. Stay and brace members in position until all connections are complete. Handle and protect specially wrapped or prepared items to avoid damage or scarring.
 - O. Headers at Non-Bearing Wood Stud Walls: Fabricate from two or more members on edge with shims as required, spike solidly together. Install trimmer stud below header and cripple stud above header at each rough jamb stud. Attach headers at non-bearing stud walls to jamb studs on each end with minimum (2) 10d toe nails on each face of header for a minimum total of (4) 10d toe nails at each jamb stud. Unless noted on the drawings, the minimum header sizes for non-bearing walls shall be as follows:
 - 1. Up to 4-feet inclusive: Minimum two 2x6 or one 4x6.
 - 2. 4-feet to 6-feet inclusive: Minimum two 2x8 or one 4x8.
 - 3. 6-feet to 8-feet inclusive: Minimum two 2x10 or one 4x10.
 - 4. Over 8-feet: Contact Architect and Engineer if not shown on drawings.
 - P. Do not splice structural members between supports unless otherwise indicated.
- 3.2 WOOD BLOCKING, AND NAILER INSTALLATION
- A. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
 - B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
 - C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 WOOD FURRING INSTALLATION

- A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
- B. Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3-inch nominal- size furring horizontally and vertically at 24 inches o.c.

3.4 WALL AND PARTITION FRAMING INSTALLATION

- A. General: Provide single bottom plate and double top plates using members whose widths equal that of studs, except single top plate may be used for non-load-bearing partitions. Fasten plates to supporting construction unless otherwise indicated. Stud and plate sizes shall be as indicated on the drawings.
- B. Construct corners and intersections with three or more studs, except that two studs may be used for interior non-load-bearing partitions.
- C. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Support headers on jamb studs. Provide members as indicated in the Structural Drawings.

3.5 FLOOR JOIST FRAMING INSTALLATION

- A. General: Install floor joists with crown edge up and support ends of each member with not less than 1-1/2 inches of bearing on wood or metal, or 3 inches on masonry or concrete. Attach floor joists as indicated in the Structural Drawings.
- B. Do not notch in middle third of joists; limit notches to one-sixth depth of joist, one-third at ends. Do not bore holes larger than 1/3 depth of joist; do not locate closer than 2 inches from top or bottom.
- C. Lap members framing from opposite sides of beams, girders, or partitions not less than 4 inches or securely tie opposing members together. Provide solid blocking of 2-inch nominal thickness by depth of joist over supports.
- D. Provide solid blocking between joists under jamb studs for openings.

3.6 TIMBER

- A. Store and maintain members in upright position at all times and protect from weather.
- B. Install in position and support as detailed. Maintain members plumb with chords held straight with temporary bracing in addition to required bridging to assure adequate lateral support for the system until sheathing has been applied. Temporary construction loads beyond design limits are not permitted.
- C. Install timber with crown edge up and provide not less than 4 inches of bearing on supports. Provide continuous members unless otherwise indicated; tie together over supports as indicated if not continuous.
- D. Where beams or girders are framed into pockets of exterior concrete or masonry walls, provide 1/2-inch air space at sides and ends of wood members.
- E. Install wood posts using metal anchors indicated.

3.7 WOOD I-JOISTS AND TRUSSES

- A. Store and maintain members in upright position at all times and protect from weather.

- B. Install in position and support as detailed. Maintain members plumb with chords held straight with temporary bracing in addition to required bridging to assure adequate lateral support for the system until sheathing has been applied. Temporary construction loads beyond design limits are not permitted.

3.8 DEFLECTION HEAD CONSTRUCTION

- A. Required at the top of all non-bearing wall partitions that occur under open-web type framing members and where required within drawings. Allow minimum 3/4-inch space between top plate of wall and bottom truss chord for deflection tolerance or as indicated within the Structural Drawings.

3.9 PROTECTION

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

END OF SECTION

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SECTION 06 16 00 - SHEATHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. The General Structural Notes shall be used in conjunction with this specification. The General Structural Notes shall supersede items in this specification when discrepancies exist.

1.2 SUMMARY

- A. Section Includes:
 - 1. Wall sheathing.
 - 2. Subflooring.
 - 3. Roof sheathing.
 - 4. Underlayment.
 - 5. Sheathing joint and penetration treatment.
- B. Related Requirements:
 - 1. Section 06 10 00 "Rough Carpentry" for plywood backing panels.
 - 2. Section 07 25 00 "Weather Barriers" for water-resistive barrier applied over wall sheathing.

1.3 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
- B. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Indicate type of preservative used and net amount of preservative retained.
 - 1. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Include physical properties of treated materials.
 - 2. For fire-retardant treatments, include physical properties of treated plywood both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D5516.
 - 3. For products receiving waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
- C. Evaluation Reports: For the following, from ICC-ES:
 - 1. Wood-preservative-treated plywood.
 - 2. Fire-retardant-treated plywood.

1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.5 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 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance Ratings: As tested according to ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 WOOD PANEL PRODUCTS

- A. Emissions: Products shall meet the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- B. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.
- C. Factory mark panels to indicate compliance with applicable standard.

2.3 PRESERVATIVE-TREATED PLYWOOD

- A. Preservative Treatment by Pressure Process: AWWA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.
- C. Application: Treat all plywood unless otherwise indicated.

2.4 FIRE-RETARDANT-TREATED PLYWOOD

- A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
 - 1. Use treatment that does not promote corrosion of metal fasteners.
 - 2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated plywood by pressure process after being subjected to accelerated weathering according to ASTM D2898. Use for exterior locations and where indicated.
 - 3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D3201 at 92 percent relative humidity. Use where exterior type is not indicated.

- C. Kiln-dry material after treatment to a maximum moisture content of 15 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- D. Identify fire-retardant-treated plywood with appropriate classification marking of qualified testing agency.
- E. Application: As indicated or required by Code.

2.5 WALL SHEATHING

- A. Exterior Plywood Wall Sheathing: DOC PS1, APA Rated Exposure 1, Structural 1 sheathing; FR treated within 48 inches of fire walls.
 - 1. Span Rating: Not less than 32/16.
 - 2. Nominal Thickness: Not less than 15/32 inch.

2.6 ROOF SHEATHING

- A. Plywood Sheathing: Either DOC PS 1 or DOC PS 2, APA Rated Exposure 1 sheathing; FR treated.
 - 1. Span Rating: Not less than 32/16.
 - 2. Nominal Thickness: Not less than 19/32 inch.

2.7 SUBFLOORING AND UNDERLAYMENT

- A. Plywood Combination Subfloor-Underlayment: DOC PS 1, single-floor panels.
 - 1. Basis-of-Design Product: Weyerhaeuser Edge Gold by Weyerhaeuser Company; www.weyerhaeuser.com.
 - 2. Span Rating: As indicated within the Structural Drawings.
 - 3. Nominal Thickness: As indicated within the Structural Drawings.
 - 4. Edge Detail: Tongue and groove.

2.8 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. For wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A153.
- 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. Screws for Fastening Sheathing to Wood Framing: ASTM C1002.

2.9 MISCELLANEOUS MATERIALS

- A. Adhesives for Field Gluing Panels to Wood Framing: Formulation complying with APA AFG-01 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.
 - 1. Adhesives shall have a VOC content of 50 g/L or less.
 - 2. Adhesives shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

PART 3 - EXECUTION

3.1 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 within the drawings, where not indicated, at a minimum, comply with the following:
 - 1. Table 2304.9.1, "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. Coordinate wall and sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
- G. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 WOOD SHEATHING INSTALLATION

- A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.
- B. Fastening Methods: Fasten panels as indicated below:
 - 1. Wall, Parapet and Roof Sheathing:
 - a. Fasten panels to framing as indicated on Structural Drawings.
 - b. Space panel 1/8 inch apart at edges and ends.
 - 2. Floor Sheathing:
 - a. Fasten panels to framing as indicated on Structural Drawings.
 - b. Space panel 1/8 inch apart at edges and ends.
 - c. At seams other than tongue and groove joints, provide continuous blocking at all seams.

3.3 GYPSUM SHEATHING INSTALLATION

- A. Comply with GA-253 and with manufacturer's written instructions.
 - 1. Fasten gypsum sheathing to wood framing with screws.
 - 2. Fasten gypsum sheathing to cold-formed metal framing with screws.
 - 3. Install panels with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
 - 4. Install panels with a 1/4-inch gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.

- B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.
- C. Horizontal Installation: Install sheathing with V-grooved edge down and tongue edge up. Interlock tongue with groove to bring long edges in contact with edges of adjacent panels without forcing. Abut ends over centers of studs, and stagger end joints of adjacent panels not less than one stud spacing. Attach at perimeter and within field of panel to each stud.
 - 1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of panels.
 - 2. For sheathing under stucco cladding, panels may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.
- D. Vertical Installation: Install vertical edges centered over studs. Abut ends and edges with those of adjacent panels. Attach at perimeter and within field of panel to each stud.
 - 1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch edges and ends of panels.
 - 2. For sheathing under stucco cladding, panels may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.
- E. Seal sheathing joints according to sheathing manufacturer's written instructions.
 - 1. Apply elastomeric sealant to joints and fasteners and trowel flat. Apply sufficient amount of sealant to completely cover joints and fasteners after troweling. Seal other penetrations and openings.
 - 2. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing joints and apply and trowel sealant to embed entire face of tape in sealant. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.

3.4 WOOD STRUCTURAL PANEL INSTALLATION

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

3.5 CEMENTITIOUS BACKER UNIT INSTALLATION

- A. Install panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated.

END OF SECTION

SECTION 06 17 53 - SHOP-FABRICATED WOOD TRUSSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. The General Structural Notes shall be used in conjunction with this specification. The General Structural Notes shall supersede items in this specification when discrepancies exist.

1.2 SUMMARY

- A. Section includes:
 - 1. Wood roof and girder trusses.
 - 2. Delegated design.
- B. Related Requirements:
 - 1. Section 01 61 16 "Delegated Design Requirements".

1.3 DEFINITIONS

- A. Metal-Plate-Connected Wood Trusses: Planar structural units consisting of metal-plate-connected members fabricated from dimension lumber and cut and assembled before delivery to Project site.

1.4 SUBMITTALS

- A. Product Data: For wood-preservative-treated lumber, fire-retardant-treated lumber, metal-plate connectors, metal truss accessories, and fasteners.
 - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification from treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
 - 2. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification from treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
 - 3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D5664.
 - 4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to truss fabricator.
- B. Shop Drawings: Show fabrication and installation details for trusses.
 - 1. Show location, pitch, span, camber, configuration, and spacing for each type of truss required.
 - 2. Indicate sizes, stress grades, and species of lumber.
 - 3. Indicate locations of permanent bracing required to prevent buckling of individual truss members due to design loads.
 - 4. Indicate locations, sizes, and materials for permanent bracing required to prevent buckling of individual truss members due to design loads.

5. Indicate type, size, material, finish, design values, orientation, and location of metal connector plates.
 6. Show splice details and bearing details.
- C. Delegated-Design Submittal: For metal-plate-connected wood trusses indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - D. Qualification Data: For metal connector-plate manufacturer, professional engineer and fabricator.
 - E. Material Certificates: For dimension lumber specified to comply with minimum specific gravity. Indicate species and grade selected for each use and specific gravity.
 - F. Product Certificates: For metal-plate-connected wood trusses, signed by officer of truss-fabricating firm.
 - G. Evaluation Reports: For the following, from ICC-ES:
 1. Wood-preservative-treated lumber.
 2. Fire-retardant-treated wood.
 3. Metal-plate connectors.
 4. Metal truss accessories.

1.5 QUALITY ASSURANCE

- A. Metal Connector-Plate Manufacturer Qualifications: A manufacturer that is a member of TPI and that complies with quality-control procedures in TPI 1 for manufacture of connector plates.
 1. Manufacturer's responsibilities include providing professional engineering services needed to assume engineering responsibility.
 2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
- B. Fabricator Qualifications: Shop that participates in a recognized quality-assurance program, complies with quality-control procedures in TPI 1, and involves third-party inspection by an independent testing and inspecting agency acceptable to Architect and authorities having jurisdiction.
- C. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Handle and store trusses to comply with recommendations in SBCA BCSI, "Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining, & Bracing Metal Plate Connected Wood Trusses."
 1. Store trusses flat, off ground, and adequately supported to prevent lateral bending.
 2. Protect trusses from weather by covering with waterproof sheeting, securely anchored.
 3. Provide for air circulation around stacks and under coverings.
- B. Inspect trusses showing discoloration, corrosion, or other evidence of deterioration. Discard and replace trusses that are damaged or defective.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 61 16 "Delegated Design Requirements," to design metal-plate-connected wood trusses.
- B. Structural Performance: Metal-plate-connected wood trusses shall be capable of withstanding design loads within limits and under conditions indicated. Comply with requirements in TPI 1 unless more stringent requirements are specified below.
 - 1. Design Loads: As indicated within the Structural Drawings.
 - 2. Maximum Deflection under Design Loads: Vertical live load deflection of 1/360 of span. Vertical total load deflection of 1/240 of span. However, the maximum deflection under total loads shall not exceed 1-inch. More stringent deflection criteria may exist at trusses supporting MEP equipment.
 - 3. Accommodate for forces and attachments of tie-off anchors in Section 11 81 29 "Facility Fall Protection."
- C. Comply with applicable requirements and recommendations of TPI 1, TPI DSB, and SBCA BCSI.
- D. Wood Structural Design Standard: Comply with applicable requirements in AF&PA's "National Design Specifications for Wood Construction" and its "Supplement."
- E. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency acceptable to authorities having jurisdiction.

2.2 MANUFACTURERS

- A. Basis-of-Design Manufacturer: Trus-Way, Inc.; www.trus-way.com.

2.3 DIMENSION LUMBER

- A. Lumber: DOC PS 20 and applicable rules of any rules-writing agency certified by the American Lumber Standard Committee (ALSC) Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. For exposed lumber indicated to receive a stained or natural finish, omit grade stamp and provide certificates of grade compliance issued by grading agency.
 - 3. Provide dressed lumber, S4S.
 - 4. Provide dry lumber with 19 percent maximum moisture content at time of dressing.
- B. Minimum Chord Size for Roof Trusses: 2 by 6 inches nominal for both top and bottom chords.
- C. Minimum Specific Gravity for Top Chords: 0.50.
- D. Permanent Bracing: Provide wood bracing that complies with requirements for miscellaneous lumber in Section 06 10 00 "Rough Carpentry."

2.4 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
 - 2. For exposed trusses indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
 - 1. For exposed trusses indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.
- D. Application: Treat trusses where indicated on Drawings.

2.5 FIRE-RETARDANT-TREATED WOOD

- A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products according to test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E84, with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
 - 1. Use treatment that does not promote corrosion of metal fasteners.
 - 2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D2898. Use for exterior locations and where indicated.
 - 3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D3201 at 92 percent relative humidity. Use for interior locations where exterior type is not indicated.
 - 4. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D5664, and design value adjustment factors shall be calculated according to ASTM D6841. For enclosed roof framing and framing in attic spaces, and where high-temperature fire-retardant treatment is indicated, provide material with adjustment factors of not less than 0.85 modulus of elasticity and 0.75 for extreme fiber in bending for Project's climatological zone.
- C. Kiln-dry lumber after treatment to a maximum moisture content of 15 percent.
- D. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. For exposed trusses and bracing indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.

- E. For exposed trusses indicated to receive a stained or natural finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.
- F. Application: Treat items indicated on Drawings and the following:
 - 1. Wood trusses in fire-rated attic and roof construction.

2.6 METAL CONNECTOR PLATES

- A. General: Fabricate connector plates to comply with TPI 1.
- B. Hot-Dip Galvanized-Steel Sheet: ASTM A653; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G60 coating designation; and not less than 0.036 inch thick.
 - 1. Use for interior locations unless otherwise indicated.
- C. Hot-Dip Heavy-Galvanized-Steel Sheet: ASTM A653; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.
 - 1. Use for wood-preservative-treated lumber and where indicated.
- D. Stainless-Steel Sheet: ASTM A666, Type 304, and not less than 0.035 inch thick.
 - 1. Use for exterior locations and where indicated.

2.7 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. Provide fasteners for use with metal framing anchors that comply with written recommendations of metal framing manufacturer.
 - 2. Where trusses are exposed to weather, in ground contact, made from pressure-preservative treated wood, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F1667.

2.8 METAL FRAMING ANCHORS AND ACCESSORIES

- A. Allowable design loads, as published by manufacturer, shall comply with or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
- B. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/ A653M, G60 coating designation.
 - 1. Use for interior locations unless otherwise indicated.
- C. Hot-Dip Heavy-Galvanized-Steel Sheet: ASTM A653; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.
 - 1. Use for wood-preservative-treated lumber and where indicated.
- D. Stainless-Steel Sheet: ASTM A666, Type 304.
 - 1. Use for exterior locations and where indicated.
- E. Connectors: All connectors shall be manufactured by Simpson Strong-Tie.

2.9 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: SSPC-Paint 20, with dry film containing a minimum of 92 percent zinc dust by weight.

2.10 FABRICATION

- A. Cut truss members to accurate lengths, angles, and sizes to produce close-fitting joints.
- B. Fabricate metal connector plates to sizes, configurations, thicknesses, and anchorage details required to withstand design loads for types of joint designs indicated.
- C. Assemble truss members in design configuration indicated; use jigs or other means to ensure uniformity and accuracy of assembly, with joints closely fitted to comply with tolerances in TPI 1. Position members to produce design camber indicated.
 - 1. Fabricate wood trusses within manufacturing tolerances in TPI 1.
- D. Connect truss members by metal connector plates located and securely embedded simultaneously in both sides of wood members by air or hydraulic press.

2.11 SOURCE QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform special inspections indicated within this Specification and in the Statement of Special Inspections within the Structural Drawings.
 - 1. Provide special inspector with access to fabricator's documentation of detailed fabrication and quality-control procedures that provide a basis for inspection control of the workmanship and the fabricator's ability to conform to approved construction documents and referenced standards.
 - 2. Provide special inspector with access to places where wood trusses are being fabricated to perform inspections.
- B. Correct deficiencies in Work that special inspections indicate do not comply with the Contract Documents.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install wood trusses only after supporting construction is in place and is braced and secured.
- B. If trusses are delivered to Project site in more than one piece, assemble trusses before installing.
- C. Hoist trusses in place by lifting equipment suited to sizes and types of trusses required, exercising care not to damage truss members or joints by out-of-plane bending or other causes.
- D. Install and brace trusses according to TPI recommendations and as indicated.
- E. Install trusses plumb, square, and true to line and securely fasten to supporting construction.
- F. Space trusses as indicated; adjust and align trusses in location before permanently fastening.
- G. Anchor trusses securely at bearing points; use metal truss tie-downs or floor truss hangers as applicable. Install fasteners through each fastener hole in metal framing anchors according to manufacturer's fastening schedules and written instructions.
- H. Securely connect each truss ply required for forming built-up girder trusses.
 - 1. Anchor trusses to girder trusses as indicated.

- I. Install and fasten permanent bracing during truss erection and before construction loads are applied. Anchor ends of permanent bracing where terminating at walls or beams.
 - 1. Install bracing to comply with Section 06 10 00 "Rough Carpentry."
 - 2. Install and fasten strongback bracing vertically against vertical web of parallel-chord floor trusses at centers indicated.
- J. Install wood trusses within installation tolerances in TPI 1.
- K. Do not alter trusses in field. Do not cut, drill, notch, or remove truss members.
- L. Replace wood trusses that are damaged or do not comply with requirements.
 - 1. Damaged trusses may be repaired according to truss repair details signed and sealed by the qualified professional engineer responsible for truss design, when approved by Architect.

3.2 REPAIRS AND PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect wood trusses from weather. If, despite protection, wood trusses become wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- C. Repair damaged galvanized coatings on exposed surfaces according to ASTM A780 and manufacturer's written instructions.

3.3 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform special inspections to verify that temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed in accordance with the approved truss submittal package.

END OF SECTION

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SECTION 06 20 00 - FINISH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Interior wood door frames and jambs.
2. Wood base.
3. Interior wood trim.
4. Exterior wood trim.
5. Exterior wood fascia.
6. Exterior wood posts and railings.
7. Exterior wood slat trellis and awning.

B. Related Requirements:

1. Section 06 10 00 "Rough Carpentry" for furring, blocking, and other carpentry work not exposed to view.
2. Section 07 46 23 "Wood Siding and Soffits" for coordination of exterior wood trim and fascia with wood soffits.
3. Section 08 14 16 "Flush Wood Doors" for coordination of wood frames and jambs with flush wood doors.
4. Section 09 64 00 "Wood Flooring" for coordination of wood base with wood flooring.
5. Section 09 91 00 "Painting" for priming and backpriming of interior finish carpentry for opaque finishes.

1.3 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials, dimensions, profiles, textures, and colors and include construction and application details.

1. Include data for wood-preservative treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained. Include chemical-treatment manufacturer's written instructions for finishing treated material.
2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced before shipment to Project site to levels specified.

B. Samples for Verification:

1. For each species and cut of lumber products with nonfactory-applied finish, with half of exposed surface finished, 50 sq. in. for lumber.
2. For each finish system and color of lumber products with factory-applied finish, 50 sq. in. for lumber.

1.4 QUALITY ASSURANCE

- A. Mockups: Build sample mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
- B. Overage: Ensure appropriate amount of overage to account for quality requirement; for all WD-# types allow for approximately 25 percent additional materials to allow sorting and rejecting to meet quality requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber flat with spacers between each bundle to provide air circulation. Protect materials from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.
- B. Deliver interior finish carpentry materials only when environmental conditions comply with requirements specified for installation areas. If interior finish carpentry materials must be stored in other than installation areas, store only where environmental conditions comply with requirements specified for installation areas.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install interior finish carpentry materials until building is enclosed and weatherproof, wet work in space is completed and nominally dry, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.
 - 1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 FINISH CARPENTRY, GENERAL

- A. Architectural Woodwork Standards Grade: Custom.

2.2 MATERIALS, GENERAL

- A. Regional Materials: The following wood products shall be manufactured within 100 miles of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 100 miles of Project site.
- B. Lumber: 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 American Lumber Standard Committee's Board of Review. Grade lumber by an agency certified by the American Lumber Standard Committee's Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. For exposed lumber, mark grade stamp on end or back of each piece, or omit grade stamp and provide certificates of grade compliance issued by grading agency.
- C. Softwood Plywood: DOC PS 1.
- D. Medium Density Fiberboard (MDF): ANSI A208.2, Grade 130.

- E. Combination Fiber Core (CFC): Combining MDF crossbands with softwood veneer innerplies.
 - 1. Basis-of-Design Product: SkyPly Hardwood Plywood by Roseburg Forest Products; www.roseburg.com.
 - 2. Face Veneer Species: Manufacturer's standard veneer as indicated.

2.3 INTERIOR WOOD FRAMES AND JAMBS

- A. Architectural Woodwork Standards Grade: Premium.
- B. Wood Species and Cut: Match species and cut indicated for wood veneer doors located in same area of building unless otherwise indicated.
- C. For frames or jambs wider than available lumber, use veneered construction. Do not glue for width.
 - 1. Do not use plain-sawn softwood lumber with exposed, flat surfaces more than 3 inches wide.
- D. Finish: Factory-primed for field-painted finish.
- E. Application: Provide at Unit interiors. Coordinate with Section 08 14 16 "Flush Wood Doors".

2.4 WOOD BASE

- A. Wood Base: Custom fabricated solid wood lumber base board.
 - 1. Species and Grade: As selected by Architect.
 - 2. Maximum Moisture Content: 15 percent.
 - 3. Height: As indicated in Drawings.
 - 4. Thickness: 1/2-inch.
 - 5. Profile: As indicated in Drawings.
 - 6. Face Surface: Surfaced (smooth).
 - 7. Finish: Clear shop-finish to match Architect's selection; refer to Finishes article below.

2.5 INTERIOR WOOD TRIM

- A. Lumber Trim for Opaque Finish (Painted or Primed Finish):
 - 1. Species and Grade: As selected by Architect.
 - 2. Maximum Moisture Content: 10 percent.
 - 3. Finger Jointing: Allowed.
 - 4. Face Surface: Surfaced (smooth).
 - 5. Profiles: As indicated in Drawings.

2.6 EXTERIOR WOOD TRIM

- A. Lumber Trim for Opaque Finish (Painted or Primed Finish):
 - 1. Species and Grade: Western Red Cedar; paint-grade.
 - 2. Maximum Moisture Content: 10 percent.
 - 3. Finger Jointing: Allowed.
 - 4. Face Surface: Surfaced (smooth).
 - 5. Profiles: As indicated in Drawings.

2.7 EXTERIOR WOOD FASCIA

- A. Wood Fascia: Tongue-and-groove, blind nailed; shop-finished at all sides; field-sealed at cut ends.
 - 1. Species and Grade: Western Red Cedar; paint-grade.
 - 2. Dimensions: Largest available board dimensions; laminate members where necessary to achieve monolithic appearance.
 - 3. Finger Jointing: Allowed.
 - 4. Face Surface: Surfaced (smooth).
 - 5. Profiles: As indicated in Drawings.
 - 6. Nominal Depth: As indicated.
 - 7. Orientation: As indicated.
 - 8. Spacing: As indicated.
 - 9. Finish: Mill- or shop-applied, two coat water repellent penetrating translucent exterior decorative stain. First and second coats factory-/ shop-applied. Provide same finishes at associated trim for each wood type.

2.8 EXTERIOR WOOD POSTS AND RAILINGS.

- A. Lumber for Transparent Finish:
 - 1. Species and Grade: Western Red Cedar.
 - 2. Maximum Moisture Content: 10 percent.
 - 3. Cut: As selected by Architect.
 - 4. Face Surface: Surfaced (smooth).
 - 5. Profiles: As indicated in Drawings.
 - 6. Finish: Stained and sealed; refer to Finishes article in this Section for exterior woodwork to receive transparent finishes.

2.9 EXTERIOR WOOD TRELLIS

- A. Wood Slat Trellis and Awning:
 - 1. Species and Grade: Western Red Cedar; pressure treated.
 - 2. Maximum Moisture Content: 10 percent.
 - 3. Cut: As selected by Architect.
 - 4. Face Surface: Surfaced (smooth).
 - 5. Profiles: As indicated in Drawings.
 - 6. Spacing: As indicated in Drawings.
 - 7. Finish: Stained and sealed; refer to Finishes article in this Section for exterior woodwork to receive transparent finishes.

2.10 MISCELLANEOUS MATERIALS

- A. Fasteners for Interior Finish Carpentry: Nails, screws, and other anchoring devices of type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.

- B. Low-Emitting Materials: Adhesives shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- C. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use.
- D. Multipurpose Construction Adhesive: Formulation complying with ASTM D3498 that is recommended for indicated use by adhesive manufacturer.

2.11 FABRICATION

- A. Back out or kerf backs of the following members, except those with ends exposed in finished Work:
 - 1. Interior standing and running trim, except shoe and crown molds.
- B. Ease edges of lumber less than 1 inch in nominal thickness to 1/16-inch radius and edges of lumber 1 inch or more in nominal thickness to 1/8-inch radius.

2.12 FINISHES

- A. Preparations for Finishing: Comply with the Architectural Woodwork Standards, Section 5 for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing interior architectural woodwork, as applicable to each unit of work.
- B. Interior Architectural Woodwork for Opaque Finishes: Shop prime with one coat of wood primer for field painting as specified in Section 09 91 00 "Painting."
- C. Interior Architectural Woodwork for Transparent Finish: Shop-pretaining; one coat water repellent penetrating sealer.
 - 1. Sealer: Interior, water-based (low-VOC) clear sealer.
 - a. Basis-of-Design Product: Log and Siding Smooth Formula by Timber Pro Coatings; www.timberprocoatingsusa.com.
 - b. Sheen: As selected by Architect.
- D. Exterior Architectural Woodwork for Transparent Finish: Shop-pretaining; one coat water repellent penetrating sealer.
 - 1. Sealer: Exterior, water-based (low-VOC) clear sealer.
 - a. Basis-of-Design Product: Log and Siding Smooth Formula by Timber Pro Coatings; www.timberprocoatingsusa.com.
 - b. Sheen: As selected by Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

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

- B. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours unless longer conditioning is recommended by manufacturer.

3.3 INSTALLATION, GENERAL

- A. Do not use materials that are unsound; warped; improperly treated or finished; inadequately seasoned; too small to fabricate with proper jointing arrangements; or with defective surfaces, sizes, or patterns.
- B. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
 - 1. Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
 - 2. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.
 - 3. Install to tolerance of 1/8 inch in 96 inches for level and plumb. Install adjoining interior finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.
 - 4. Coordinate interior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate interior finish carpentry.

3.4 STANDING AND RUNNING TRIM INSTALLATION

- A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches long, except where necessary. Stagger joints in adjacent and related standing and running trim. Miter at returns, miter at outside corners, and cope at inside corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints. Plane backs of casings to provide uniform thickness across joints where necessary for alignment.
 - 1. Match color and grain pattern of trim for transparent finish (stain or clear finish) across joints.
 - 2. Install trim after gypsum-board joint finishing operations are completed.
 - 3. Install without splitting; drill pilot holes before fastening where necessary to prevent splitting. Fasten to prevent movement or warping. Countersink fastener heads on exposed carpentry work and fill holes.

3.5 INSTALLATION, FRAMES

- A. Grade: Install wood frames to comply with same grade as item to be installed.
- B. Assemble wood frames and complete fabrication at Project site to the extent that it was not completed in the shop.
- C. Install wood frames level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.
- D. Scribe and cut wood frames to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

- E. Anchor wood frames to anchors or blocking built in or directly attached to substrates. Secure concealed fasteners and blind nailing.
 - 1. Install frames with concealed strap anchoring both sides of frames wall framing. Provide blocking of means of attachment for securing wood frames.
 - a. Locate anchors not more than 3 inches from top and bottom of frame. Space anchors not more than 18 inches o.c. between top and bottom anchors, or as indicated in AWI/ WI standard for grade indicated.
- F. Touch up finishing work specified in this Section after installation of wood frames. Fill nail holes with matching filler where exposed.
 - 1. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are applied in shop.

3.6 SHELVING INSTALLATION

- A. Cut shelf cleats at ends of shelves about 1/2 inch less than width of shelves and sand exposed ends smooth.
 - 1. Install shelf cleats by fastening to framing or backing with finish nails or trim screws, set below face and filled.
 - 2. Space fasteners not more than 16 inches on center. Use two fasteners at each framing member or fastener location for cleats 4 inches nominal in width and wider.
 - 3. Apply a bead of multipurpose construction adhesive to back of shelf cleats before installing.
 - 4. Remove adhesive that is squeezed out after fastening shelf cleats in place.
- B. Install shelf brackets according to manufacturer's written instructions, spaced not more than 32 inches on center. Fasten to framing members, blocking, or metal backing, or use toggle bolts or hollow wall anchors.
- C. Install standards for adjustable shelf supports according to manufacturer's written instructions. Fasten to framing members, blocking, or metal backing, or use toggle bolts or hollow wall anchors. Space fasteners not more than 12 inches on center.
- D. Cut shelves to neatly fit openings with only enough gap to allow shelves to be removed and reinstalled.
 - 1. Install shelves, fully seated on cleats, brackets, and supports.
 - 2. Fasten shelves to cleats with finish nails or trim screws, set flush.
 - 3. Fasten shelves to brackets to comply with bracket manufacturer's written instructions.

3.7 ADJUSTING

- A. Replace interior finish carpentry that is damaged or does not comply with requirements. Interior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.

3.8 CLEANING

- A. Clean interior finish carpentry on exposed and semiexposed surfaces. Restore damaged or soiled areas and touch up factory-applied finishes if any.

3.9 PROTECTION

- A. Protect installed products from damage from weather and other causes during construction.

- B. Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.
 - 1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

SECTION 07 11 13 - BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Cold-applied, emulsified-asphalt dampproofing.
 - 2. Protection course.

1.3 SUBMITTALS

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

1.4 FIELD CONDITIONS

- A. Weather Limitations: Proceed with application only when existing and forecasted weather conditions permit dampproofing to be performed according to manufacturers' written instructions.
- B. Ventilation: Provide adequate ventilation during application of dampproofing in enclosed spaces. Maintain ventilation until dampproofing has cured.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. VOC Content: Products shall comply with VOC content limits of authorities having jurisdiction unless otherwise indicated.

2.2 MANUFACTURERS

- A. Source Limitations: Obtain primary dampproofing materials and primers from single source from single manufacturer. Provide protection course and auxiliary materials recommended in writing by manufacturer of primary materials.

2.3 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

- A. Fibered Brush and Spray Coats: ASTM D1227, Type II, Class 1.
- B. Basis-of-Design Product: Masterseal 615 by BASF Corporation-Construction Systems www.master-builders-solutions.basf.us.
- C. Other Approved Products:
 - 1. Dehydratine 85 by Euclid Chemical Co.; www.euclidchemical.com.
 - 2. Sealmatic Type II by W.R.Meadows, Inc.; www.wrmeadows.com
- D. Applications: At earth-side face of cast-in-place concrete site walls, where opposite side is exposed to view.

2.4 AUXILIARY MATERIALS

- A. Furnish auxiliary materials recommended in writing by dampproofing manufacturer for intended use and compatible with bituminous dampproofing.

- B. Emulsified-Asphalt Primer: ASTM D1227, Type III, Class 1, except diluted with water as recommended in writing by manufacturer.
- C. Asphalt-Coated Glass Fabric: ASTM D1668, Type I.
- D. Patching Compound: Epoxy or latex-modified repair mortar Asbestos-free fibered mastic of type recommended in writing by dampproofing manufacturer.
- E. Protection Course: ASTM D6506, semirigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners.
 - 1. Thickness: Nominal 1/4 inch.
 - 2. Adhesive: Rubber-based solvent type recommended in writing by waterproofing manufacturer for protection course type.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for surface smoothness, maximum surface moisture content, and other conditions affecting performance of the Work.
- B. Proceed with application only after substrate construction and penetrating work have been completed and unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Mask or otherwise protect adjoining exposed surfaces from being stained, spotted, or coated with dampproofing. Prevent dampproofing materials from entering and clogging weep holes and drains.
- B. Clean substrates of projections and substances detrimental to dampproofing work; fill voids, seal joints, and remove bond breakers if any.
- C. Apply patching compound to patch and fill tie holes, honeycombs, reveals, and other imperfections; cover with asphalt-coated glass fabric.

3.3 APPLICATION, GENERAL

- A. Comply with manufacturer's written instructions for dampproofing application, cure time between coats, and drying time before backfilling unless otherwise indicated.
 - 1. Apply dampproofing to provide continuous plane of protection.
 - 2. Apply additional coats if recommended in writing by manufacturer or to achieve a smooth surface and uninterrupted coverage.
- B. Where dampproofing footings and foundation walls, apply from finished-grade line to top of footing; extend over top of footing and down a minimum of 6 inches over outside face of footing.
 - 1. Install flashings and corner protection stripping at internal and external corners, changes in plane, construction joints, cracks, and where indicated as "reinforced," by embedding an 8-inch-wide strip of asphalt-coated glass fabric in a heavy coat of dampproofing. Dampproofing coat for embedding fabric is in addition to other coats required.

3.4 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

- A. Concrete Foundations: Apply two brush or spray coats at not less than 1.5 gal./100 sq. ft. for first coat and 1 gal./100 sq. ft. for second coat.
- B. Unexposed Face of Concrete Retaining Walls: Apply one brush or spray coat at not less than 1.25 gal./100 sq. ft.

3.5 PROTECTION COURSE INSTALLATION

- A. Install protection course over completed-and-cured dampproofing. Comply with dampproofing-material and protection-course manufacturers' written instructions for attaching protection course.
 - 1. Install protection course on same day of dampproofing installation (while coating is tacky) to ensure adhesion.

3.6 PROTECTION

- A. Protect installed protection course from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where panels are subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.
- B. Correct dampproofing that does not comply with requirements; repair substrates, and reapply dampproofing.

END OF SECTION

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SECTION 07 21 00 - THERMAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Polyisocyanurate foam-plastic board.
 - 2. Glass-fiber batt insulation.
 - 3. Mineral-wool batt insulation.
 - 4. Loose fill insulation.
 - 5. Insulation for miscellaneous voids.
 - 6. Vapor retarder.
- B. Related Requirements:
 - 1. Section 09 29 00 "Gypsum Board" for acoustic insulation.

1.3 SUBMITTALS

- A. Product Data: For each type of product.
- B. Product Test Reports: For each product, for tests performed by a qualified testing agency.

1.4 DEFINITIONS

- A. Mineral-Fiber Insulation: Insulation composed of rock-wool fibers, slag-wool fibers, or glass fibers; produced in boards and blankets with latter formed into batts (flat-cut lengths) or rolls.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Protect foam-plastic board insulation as follows:
 - 1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
 - 2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.
 - 3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Source Limitations: Obtain each type of building insulation through one source.

- B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 1. Surface-Burning Characteristics: One of the following standards shall apply:
 - a. ASTM E 84 "Standard Test Method for Surface Burning Characteristics of Building Materials".
 - 2. Fire-Resistance Ratings: One of the following standard shall apply:
 - a. ASTM E 119 "Standard Test Methods for Fire Tests for Building Construction and Materials".
 - b. ISO 834 - Parts 1 and 3-9 "Fire Resistance Tests - Elements of Building Construction".
 - 3. Combustion Characteristics: One of the following standards shall apply:
 - a. ASTM E 136 "Standard Test method for Behavior of Materials in a Vertical Tube Furnace at 750 Degrees Celsius"
- C. Formaldehyde-Free: Batt insulation products shall not contain formaldehyde (or formaldehyde precursors). Provide Third Party Certification with UL Environmental Claim Validation; industries.ul.com.
- D. Recycled Content: Batt insulation products shall contain a minimum of 50 percent post-consumer recycled glass content. Provide UL Environmental Claim Validation; industries.ul.com.

2.2 POLYISOCYANURATE FOAM-PLASTIC BOARD

- A. Polyisocyanurate Board, Foil Faced: ASTM C 1289, foil faced, Type I, Class 2; designed for continuous insulation that meets or exceeds ASHRAE 90.1.
 - 1. Basis-of-Design Product: Thermax (ci) Exterior Insulation by Dow Chemical Company.
 - 2. Minimum R-Value per Inch: As indicated in Drawings.
 - 3. Thickness: As indicated in Drawings.
 - 4. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

2.3 BATT INSULATION

- A. Glass-Fiber Batt Insulation, Unfaced: ASTM C665, Type I; passing ASTM E136 for combustion characteristics.
 - 1. Basis-of-Design Product: EcoBatt (Unfaced) by Knauf; www.knaufinsulation.us.
 - 2. Other Acceptable Product: Formaldehyde-Free Fiberglass Insulation by Johns Manville; www.johnsmanville.com.
- B. Glass-Fiber Batt Insulation, Flame-Rated Foil-Scrim-Kraft (FSK) Faced, INSUL 2B: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics; R-3.2 per inch. No added formaldehyde.
 - 1. Basis-of-Design Product: EcoBatt (Faced) by Knauf; www.knaufinsulation.us.
 - 2. Other Acceptable Product: Formaldehyde-Free Fiberglass Insulation by Johns Manville; www.johnsmanville.com.

- C. Mineral-Wool Blanket Insulation, Unfaced: ASTM C665, Type IA (blankets without membrane facing); consisting of fibers; passing ASTM E136 for combustion characteristics.
 - 1. Basis-of-Design Manufacturer: Rockwool; www.rockwool.com.
 - 2. Flame-Spread Index: Not more than 25 when tested in accordance with ASTM E84.
 - 3. Smoke-Developed Index: Not more than 50 when tested in accordance with ASTM E84.

2.4 LOOSE-FILL INSULATION

- A. Glass-Fiber Loose-Fill Insulation: ASTM C764, Type I for pneumatic application.
 - 1. Basis-of-Design Product: Ultra Touch Natural Treated Cotton Fiber by bonded logic. www.bondedlogic.com.
 - a. Application: Blown-in insulation below spray foam insulation at roof voids or as indicated in Drawings.
 - 2. Flame-Spread Index: Not more than 5 when tested in accordance with ASTM E84.
 - 3. Smoke-Developed Index: Not more than 5 when tested in accordance with ASTM E84.

2.5 VAPOR RETARDER

- A. Sheet Vapor Retarder: Polyamide film vapor retarder for use with unfaced, vapor permeable glass fiber and mineral wool insulation in wall and ceiling cavities. Material shall have a permeance of 1 perm or less when tested to ASTM E 86, dry cup method and permeability shall increase to greater than 10 perms when tested to ASTM E 86, wet cup method.
 - 1. Water Vapor Permeance:
 - a. ASTM E 86, dry cup method: Maximum of 1.0 perm (57ng/Pa*s*m²).
 - b. ASTM E 86, wet cup method: Minimum of 10.0 perms (1144ng/Pa*s*m²).
 - 2. Fire Hazard Classification: ASTM E 84:
 - a. Maximum Flame Spread Index; 20.
 - b. Maximum Smoke Developed Index; 55.
 - 3. Basis-of-Design Product: MemBrain by CertainTeed, Div. of Saint Gobain; www.certainteed.com.
 - a. Application: At roof and as indicated in Drawings.
- B. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.
- C. Adhesive for Vapor Retarders: Product recommended by vapor-retarder manufacturer and has demonstrated capability to bond vapor retarders securely to substrates indicated.

2.6 DRAINAGE MAT

- A. Separation and drainage layer for at-grade foundation wall insulation behind perimeter skirt flashing, creating a drainage path to perimeter drain tile system at footing.
- B. Materials: High impact polystyrene sheets, 0.024 inch thick, formed with corrugations.
- C. Performance Criteria:
 - 1. Fungi Resistance: No Growth; ASTM C1338.
 - 2. Ultra-violet (UV) Exposure: No Peeling, chipping, cracking, flaking, pitting, crazing, erosion or other deleterious effects were observed under a 5X magnification; ASTM G154.
 - 3. Compressive Strength: 5.4 psi at 10 percent strain; ASTM D1621.

- D. Basis-of-Design Product: Model no. CC 4810 Control Cavity Basement Drainage Mat by Masonry Technology, Inc.; www.mtidry.com.
- E. Application: At face of foundation wall insulation, behind perimeter skirt flashing.

2.7 ACCESSORIES

- A. Insulation for Miscellaneous Voids:
 - 1. Glass-Fiber Insulation: ASTM C764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E84.
 - 2. Spray Polyurethane Foam Insulation: ASTM C1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84.
- B. Eave Ventilation Troughs, Insulation Baffles: Preformed, rigid plastic sheets designed and sized to fit between roof framing members and to provide ventilation between insulated attic spaces and vented eaves. Plastic or other non-absorptive material only; cardboard is not permitted.
 - 1. Product: Model no. DVB2346 Durovent Baffle by ADO Products; www.adoproducts.com.
- C. Insulation Supports, Bars: 14-gauge steel spring wire bars; mitered tips for firm attachment into wood; for retaining insulation in ceilings.
 - 1. Product: Model no. IS Insulation Supports by Simpson Strong-Tie Co., Inc.; www.strongtie.com.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation, 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. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. 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 FOUNDATION WALL INSULATION

- A. Butt panels together for tight fit.
- B. Anchor Installation: Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors as follows:
 - 1. Fasten insulation anchors to concrete substrates with insulation anchor adhesive according to anchor manufacturer's written instructions. Space anchors according to insulation manufacturer's written instructions for insulation type, thickness, and application.
 - 2. Apply insulation standoffs to each spindle to create cavity width indicated on Drawings between concrete substrate and insulation.

3. After adhesive has dried, install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation.
 4. Where insulation will not be covered by other building materials, apply capped washers to tips of spindles.
- C. Adhesive Installation: Install with adhesive or press into tacky waterproofing or dampproofing according to manufacturer's written instructions.

3.4 INSTALLATION OF CAVITY-WALL INSULATION

- A. Mineral-Wool Board Insulation: Install insulation fasteners 4 inches from each corner of board insulation, at center of board, and as recommended by manufacturer.
1. Fit courses of insulation between obstructions, with edges butted tightly in both directions, and with faces flush.
 2. Press units firmly against inside substrates.

3.5 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 metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
- 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. (40 kg/cu. m).
 2. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.
 - a. Do not apply insulation until installation of pipes, ducts, conduits, wiring, and electrical outlets in walls is completed and windows, electrical boxes, and other items not indicated to receive insulation are masked.
 - b. After insulation is applied, make flush with face of studs by using method recommended by insulation manufacturer.

3.6 INSTALLATION OF VAPOR RETARDERS ON FRAMING

- A. Place vapor retarders on side of construction indicated on Drawings.
- B. Extend vapor retarders to extremities of areas to protect from vapor transmission. Secure vapor retarders in place with adhesives, vapor retarder fasteners, or other anchorage system as recommended by manufacturer. Extend vapor retarders to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.

- C. Seal vertical joints in vapor retarders over framing by lapping no fewer than two studs and sealing with vapor-retarder tape according to vapor-retarder manufacturer's written instructions. Locate all joints over framing members or other solid substrates.
- D. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarders.
- E. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarders.

3.7 PROTECTION

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

END OF SECTION

SECTION 07 25 00 – WEATHER BARRIERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Fastened weather resistive barrier.
 - 2. Self-adhered weather resistive barrier.
 - 3. Flexible flashing.
 - 4. Sealants
 - 5. Drainage material.

1.3 SUBMITTALS

- A. Product Data: For each type of product.
 - 1. For building wrap, include data on air and water-vapor permeance based on testing according to referenced standards.
- B. Shop Drawings: Show details of building wrap at terminations, openings, penetrations and transitions. Show details of flexible and fluid-applied flashing applications.
- C. Evaluation Reports: For water-resistive barrier and flexible flashing, from ICC-ES.

PART 2 - PRODUCTS

2.1 WATER-RESISTIVE BARRIER

- A. Building Wrap: ASTM E1677, Type I air barrier; with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested according to ASTM E84; UV stabilized; and acceptable to authorities having jurisdiction.
 - 1. Basis-of-Design Product, Fastened Weather Resistive Barrier: Tyvek CommercialWrap by DuPont; www.dupont.com.
 - a. Seam Tape: Pressure-sensitive plastic tape recommended by building-wrap manufacturer for sealing joints and penetrations in building wrap.
 - 2. Basis-of-Design Product, Self-Adhered Weather Resistive Barrier: RevealShield SA by VaproShield; www.vaproshild.com.
 - a. Contractor Option: Instead of basis-of-design product, provide Delta-Fassade SA by Dörken Systems Inc.; www.dorcken.com.
 - b. Other Approved Products:
 - 1) Delta-Fassade S by Dörken Systems Inc; www.dorcken.com.
 - 2) RevealShield IT Integrated Tape by VaproShield; www.vaproshield.com.
 - 3) Sopraseal Stick VP by Soprema; www.soprema.us.
 - 3. Water-Vapor Permeance: Not less than 28 perms per ASTM E96, Desiccant Method (Procedure B).

4. Air Permeance: Not more than 0.001 cfm/sq. ft. at 0.3-inch wg when tested according to ASTM E2178.
5. Allowable UV Exposure Time: Not less than three months.
6. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285 where required.

2.2 FLEXIBLE FLASHING

- A. Butyl Rubber Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to a high-density polyethylene film to produce an overall thickness of not less than 0.030 inch (0.8 mm).
 1. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285 where required.
 2. Basis-of-Design Product: PW 100/40 by Protecto Wrap Co.; www.protectowrap.com.
 3. Other Approved Products:
 - a. Blueskin TWF by Henry Co.; www.henry.com.
 - b. CCW-705-TWF by Carlisle Coatings & Waterproofing, div. of Carlisle Construction Materials; www.carlisleccw.com.
 - c. FortiFlash 365 by Henry Co.; www.henry.com.
 - d. Perm-A-Barrier by GCP Applied Technologies Inc.; www.gcpat.com.
- B. Foil-Faced Butyl Rubber Flashing: Foil-faced composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to an aluminum foil to produce an overall thickness of not less than 0.030 inch (0.8 mm).
 1. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285 where required.
 2. Basis-of-Design Product: Protecto Seal 45 by Protecto Wrap Co.; www.protectowrap.com.
 3. Approved Products:
 - a. WaterBlock Foil Faced 40 by Water Block; www.waterblocksystems.com.
 - b. HE200AM Metal Clad Weather Barrier by Henry Co.; www.henry.com.
 - c. Aluma Flash Plus by Poly Wall; www.poly-wall.com.
 4. Application: At locations exposed to UV or where joint sealant will be applied.
- C. High-Temperature Butyl Rubber Flashing: High-temperature composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to a high-density polyethylene film to produce an overall thickness of not less than 0.030 inch (0.8 mm).
 1. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285 where required.
 2. Basis-of-Design Product: Jiffy Seal Ice & Water Guard HT by Protecto Wrap Co.; www.protectowrap.com.
 3. Approved Products:
 - a. Blueskin PE 200HT High Temperature Roof Underlayment by Henry Co.; www.henry.com.
 - b. CCW WIP 300HT High-Temperature Protection Self-Adhering Roofing Underlayment by Carlisle Coatings & Waterproofing, div. of Carlisle Construction Materials; www.carlisleccw.com.

- c. Tamko TW-60 by Tamko Building Products LLC; www.tamko.com.
 - 4. Application: At locations below metal roofing, copings, flashings and other metal envelope components.
 - D. Penetration Flashing Assembly: Single-unit flashing panel of combination of high-density polyethylene (HDPE) and low-density polyethylene (LDPE) and weatherproof seal of thermoplastic elastomer for wall penetrations and compatible with sealants indicated.
 - 1. Basis-of-Design Manufacturer: Quickflash Weatherproofing Products, Inc.; www.quickflashproducts.com.
 - 2. Application: Provide at all services penetrations.
- 2.3 SEALANTS
- A. Sealants and Backers: As recommended by weather barrier manufacturer or as indicated; refer to Section 07 92 00 "Joint Sealants".
 - B. Primers, Cleaners, and Other Sealant Materials: As recommended by sealant manufacturer, appropriate to application, and compatible with adjacent materials.
- 2.4 DRAINAGE MATERIAL
- A. Drainage Material: Product shall maintain a continuous open space between water-resistive barrier and exterior cladding to create a drainage plane and shall be used under siding and adhered cast stone veneer.
 - 1. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285 where required.

PART 3 - EXECUTION

3.1 WATER-RESISTIVE BARRIER INSTALLATION

- A. Cover exposed exterior surface of sheathing with water-resistive barrier securely fastened to framing immediately after sheathing is installed.
- B. Cover sheathing with water-resistive barrier as follows:
 - 1. Cut back barrier 1/2 inch on each side of the break in supporting members at expansion- or control-joint locations.
 - 2. Apply barrier to cover vertical flashing with a minimum 4-inch overlap unless otherwise indicated.
- C. Building Wrap: Comply with manufacturer's written instructions and warranty requirements.
 - 1. Seal seams, edges, fasteners, and penetrations with tape.
 - 2. Extend into jambs of openings and seal corners with tape.

3.2 FLEXIBLE FLASHING INSTALLATION

- A. Apply flexible flashing where indicated to comply with manufacturer's written instructions.
 - 1. Prime substrates as recommended by flashing manufacturer.
 - 2. Lap seams and junctures with other materials at least 4 inches except that at flashing flanges of other construction, laps need not exceed flange width.
 - 3. Lap flashing over water-resistive barrier at bottom and sides of openings.
 - 4. Lap water-resistive barrier over flashing at heads of openings.

5. After flashing has been applied, roll surfaces with a hard rubber or metal roller to ensure that flashing is completely adhered to substrates.

3.3 SEALANTS

- A. Apply sealants where indicated to comply with manufacturer's written instructions.

3.4 DRAINAGE MATERIAL INSTALLATION

- A. Install drainage material over building wrap and flashing to comply with manufacturer's written instructions.

3.5 FIELD QUALITY CONTROL

- A. Do not cover installed weather barriers until required inspections have been completed.

3.6 PROTECTION

- A. Do not leave materials exposed to weather longer than recommended by manufacturer.
- B. Do not leave paper- or felt-based barriers exposed to weather for longer than one week.

END OF SECTION

SECTION 07 31 13 - ASPHALT SHINGLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Asphalt shingles.
 - 2. Underlayment.
 - 3. Roof vents.
 - 4. Metal flashing and trim.
- B. Related Requirements:
 - 1. Section 06 16 00 "Sheathing" for structural concrete decking used in shingle roofing assemblies.
 - 2. Section 07 92 00 "Joint Sealants" for coordination with sealants used in roofing assemblies.

1.3 DEFINITION

- A. Roofing Terminology: See ASTM D1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 SUBMITTALS

- A. Product Data: For each type of product.
- B. Compatibility Letter and Chart:
 - 1. Provide a Compatibility Letter certifying physical and chemical compatibility of products in this section with all other dampproofing, waterproofing, weather barrier, roofing, self-adhered flashing and sealant products in the Project.
 - 2. Provide input from this work toward a single Compatibility Chart to be compiled by the General Contractor. Compatibility Chart shall indicate:
 - a. All dampproofing, waterproofing, weather barrier, roofing, self-adhered flashing and sealant products.
 - b. Which other products from this group they interface (are in contact with) in the Project.
 - c. The physical and chemical compatibility between those interfaced products.
- C. Shop Drawings: Of all transitions to flashings and gutters indicating installer's scope and coordination between other trades.
- D. Samples for Verification: For the following products, of sizes indicated:
 - 1. Asphalt Shingles: Full size.

2. Ridge and Hip Cap Shingles: Full size.
 3. Continuous Ridge Vent: Full size.
 - E. Qualification Data: For Installer.
 - F. Product Test Reports: For each type of asphalt shingle and underlayment product indicated, for tests performed by manufacturer and witnessed by a qualified testing agency or a qualified testing agency.
 - G. Evaluation Reports: For synthetic underlayment and high-temperature, self-adhering sheet underlayment, from ICC-ES or other testing and inspecting agency acceptable to authorities having jurisdiction, indicating that product is suitable for intended use under applicable building codes.
 1. Provide ICC-ES report indicating roof covering classification according to UL 790.
 - H. Sample Warranty: For manufacturer's warranty.
- 1.6 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For asphalt shingles to include in maintenance manuals.
- 1.7 MAINTENANCE MATERIAL SUBMITTALS
- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Furnish where requested by Owner.
 2. Asphalt Shingles: 100 sq. ft. of each type, in unbroken bundles.
- 1.8 QUALITY ASSURANCE
- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- 1.9 DELIVERY, STORAGE, AND HANDLING
- A. Store roofing materials in a dry, well-ventilated location protected from weather, sunlight, and moisture according to manufacturer's written instructions.
 - B. Store underlayment rolls on end on pallets or other raised surfaces. Do not double stack rolls.
 - C. Protect unused roofing materials from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.
 - D. Handle, store, and place roofing materials in a manner to prevent damage to roof deck or structural supporting members.
- 1.10 FIELD CONDITIONS
- A. Environmental Limitations: Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended in writing by manufacturer.
- 1.11 WARRANTY
- A. Verify with Owner warranty periods prior to procurement.
 - B. Manufacturer's Warranty: Manufacturer agrees to repair or replace asphalt shingles that fail within specified warranty period.
 1. Failures include, but are not limited to, the following:
 - a. Manufacturing defects.

2. Material Warranty Period: 30 years from date of Substantial Completion, prorated, with first 10 years non-prorated.
 3. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds of up to wind speed indicated on Structural Drawings but not less than 101 mph (V-asd, nominal design wind speed per OSSC chapter 16), for a period of 10 years from date of Substantial Completion.
 4. Algae-Resistance Warranty Period: Asphalt shingles will not discolor for 10 years from date of Substantial Completion.
 5. Workmanship Warranty Period: Two years from date of Substantial Completion.
- C. Roofing Installer's Warranty: On warranty, signed by Installer, in which Installer agrees to repair or replace components of asphalt-shingle roofing that fail in materials or workmanship within specified warranty period.
1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Exterior Fire-Test Exposure: Provide asphalt shingles and related roofing materials identical to those of assemblies tested for Class A fire resistance according to ASTM E108 or UL 790 by Underwriters Laboratories or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.
- B. Asphalt shingles, for the basis-of-design product indicated, shall comply with either ASTM D7158 Class G or H and ASTM D3161 Class F.
- C. Underlayments, where substitutions are proposed, shall be approved for use in UL-tested assemblies indicated on Drawings.

2.2 ASPHALT SHINGLES

- A. Laminated-Strip Asphalt Shingles: ASTM D3462, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.
 1. Basis-of-Design Product: Landmark ClimateFlex by CertainTeed; www.certainteed.com.
 2. Other Approved Manufacturers:
 - a. GAF; www.gaf.com.
 - b. Malarkey; malarkeyroofing.com.
 - c. Owens Corning; www.owenscorning.com.
 - d. TAMKO Building Products, LLC; www.tamko.com.
 3. Algae Resistance: Granules resist algae discoloration.
 4. Color: "Max Def Moiré Black", or as selected by Architect.
- B. Hip and Ridge Shingles: Manufacturer's standard units to match specified shingles.
- C. Starter Shingles: Manufacturer's standard for performance indicated.

2.3 UNDERLAYMENT MATERIALS

- A. Felt: ASTM D 4869, asphalt-saturated organic felts, nonperforated.
 1. Type: Type II.
 2. Basis-of-Design Manufacturer: CertainTeed; www.certainteed.com

3. Other Approved Manufacturer: Malarkey Roofing; www.malarkeyroofing.com.
 - B. Synthetic Underlayment: UV-resistant polypropylene, polyolefin, or polyethylene polymer fabric with surface coatings or treatments to improve traction underfoot and abrasion resistance; evaluated and documented to be suitable for use as a roof underlayment under applicable codes by a testing and inspecting agency acceptable to authorities having jurisdiction.
 1. Basis-of-Design Manufacturer: CertainTeed; www.certainteed.com
 2. Other Approved Manufacturers:
 - a. GAF; www.gaf.com.
 - b. Malarkey Roofing; malarkeyroofing.com.
 - c. Owens Corning; www.owenscorning.com.
 - d. TAMKO Building Products, LLC; www.tamko.com.
 3. Provide primer as required for substrate preparation as required for direct-application over structural concrete deck panels as recommended by manufacturer.
- 2.4 ROOF VENTS
- A. Rigid Ridge Vent: Manufacturer's standard, rigid-section, high-density, UV-stabilized HDPE plastic ridge vent for use under ridge shingles.
 1. Basis-of-Design Product: Filtered Ridge Vent by CertainTeedCo.; www.certainteed.com.
 - B. Intake Vent: For 3/12 minimum roof slope.
 1. Basis-of-Design Products:
 - a. CertainTeed Intake Vent by CertainTeedCo.; www.certainteed.com.
 - b. SmartVent Tapered Under-Shingle Attic Ventilation by DCI Products; www.dciproducts.com.
- 2.5 ACCESSORIES
- A. Asphalt Roofing Cement: ASTM D4586, Type I, Class I, asbestos free. Compatible with underlayment, self-adhered flashing and roofing materials in contact with roofing cement.
 - B. Roofing Nails: ASTM F1667; hot-dip galvanized-steel, shingle nails, 11-gauge wire, sharp-pointed, with a minimum 3/8-inch-diameter flat head; 1.20-inches long. Comply with roof deck manufacturer's requirements.
 1. Provide metal type suitable for use with substrate. Verify metal type with roof deck manufacturer for compatibility with fire-treatment materials.
 2. Shank: Barbed.
 3. Where nails are in contact with metal flashing, use stainless steel nails.
 - C. Felt-Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized-steel wire with low-profile capped heads or disc caps, 1-inch minimum diameter.
 - D. Synthetic-Underlayment Fasteners: As recommended in writing by synthetic-underlayment manufacturer for application indicated.
- 2.6 METAL FLASHING AND TRIM
- A. General: Specified in Section 07 62 00 "Sheet Metal Flashing and Trim."
 1. Provide flashings indicated.

- B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item. Unless otherwise indicated, comply with the following:
 - 1. Apron Flashings: Fabricate with lower flange a minimum of 4 inches over and 4 inches beyond each side of downslope asphalt shingles and 6 inches up the vertical surface.
 - 2. Cricket or Backer Flashings: Fabricate with concealed flange extending a minimum of 24 inches beneath upslope asphalt shingles and 6 inches beyond each side of penetrating structure and 6 inches above the roof plane.
 - 3. Drip Edges: Fabricate in lengths not exceeding 10 feet with 2-inch roof-deck flange and 1-1/2-inch fascia flange with 3/8-inch drip at lower edge.
 - 4. Gutters: Section 07 62 00 "Sheet Metal Flashing and Trim."
- C. Vent Pipe Flashings: ASTM B749, Type L51121, at least 1/16 inch thick. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof, and extending at least 4 inches from pipe onto roof.
 - 1. Provide preformed pipe-boots, compatible with shingles and underlayment materials indicated. Include compatibility documentation with product during submittals where selected for use in lieu of lead sleeve flashings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 - 1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provisions have been made for flashings and penetrations through asphalt shingles.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

- A. General: Comply with underlayment manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
- B. Self-Adhering Sheet Underlayment: Install, wrinkle free, on roof decks indicated. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install lapped in direction that sheds water. Lap sides not less than 3-1/2 inches. Lap ends not less than 6 inches staggered 24 inches between courses. Roll laps with roller. Cover underlayment within seven days.
 - 1. Prime surfaces to receive self-adhering sheet underlayment where required and recommended by manufacturer.
 - 2. Install underlayment on entire roof deck.
 - 3. Ridges: Extend without obstructing continuous ridge vent slot.
 - 4. Sidewalls: Return vertically against sidewall not less than 4 inches.

5. Dormers, Chimneys, Skylights, and Other Roof-Penetrating Elements: Return vertically against penetrating element not less than 4 inches.

3.3 METAL FLASHING INSTALLATION

- A. General: Install metal flashings and other sheet metal to comply with requirements in Section 07 62 00 "Sheet Metal Flashing and Trim."
 1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."
- B. Apron Flashings: Extend lower flange over and beyond each side of downslope asphalt shingles and up the vertical surface.
- C. Step Flashings: Install with a head lap of 2 inches and extend over the underlying asphalt shingle and up the vertical surface. Fasten to roof deck only.
- D. Cricket or Backer Flashings: Install against the roof-penetrating element extending concealed flange beneath upslope asphalt shingles and beyond each side.
- E. Open-Valley Flashings: Install centered in valleys, lapping ends at least 8 inches in direction to shed water. Fasten upper end of each length to roof deck beneath overlap.
 1. Secure hemmed flange edges into metal cleats spaced 12 inches apart and fastened to roof deck.
 2. Adhere 9-inch-wide strip of self-adhering sheet to metal flanges and to self-adhering sheet underlayment.
- F. Rake Drip Edges: Install rake drip-edge flashings over underlayment and fasten to roof deck.
- G. Eave Drip Edges: Install eave drip-edge flashings below underlayment and fasten to roof sheathing.
- H. Pipe Flashings: Form flashing around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.

3.4 ASPHALT-SHINGLE INSTALLATION

- A. General: Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and recommendations in NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."
- B. Install starter strip along lowest roof edge, consisting of an asphalt-shingle strip at least 7 inches wide with self-sealing strip face up at roof edge.
 1. Extend asphalt shingles 1/2 inch over fasciae at eaves and rakes.
 2. Install starter strip along rake edge.
- C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.
- D. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.
- E. Install asphalt shingles by single-strip column or racking method, maintaining uniform exposure. Install full-length first course followed by cut second course, repeating alternating pattern in succeeding courses.

- F. Fasten asphalt-shingle strips with number of roofing nails required for performance, located according to manufacturer's written instructions. Refer to roof deck manufacturer nailing requirements and recommendations for structural concrete decking.
 - 1. Where roof slope is less than 4:12, seal asphalt shingles with asphalt roofing cement spots.
 - 2. When ambient temperature during installation is below 50 deg F, seal asphalt shingles with asphalt roofing cement spots.
- G. Open Valleys: Cut and fit asphalt shingles at open valleys, trimming upper concealed corners of shingle strips. Maintain uniform width of exposed open valley from highest to lowest point.
 - 1. Set valley edge of asphalt shingles in a 3-inch-wide bed of asphalt roofing cement.
 - 2. Do not nail asphalt shingles to metal open-valley flashings.
- H. Roof Vents: Install roof vents of each type indicated in accordance with manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.
- I. Hip and Ridge Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.

3.5 ROOFING INSTALLER'S WARRANTY

- A. WHEREAS <Insert name> of <Insert address>, herein called the "Roofing Installer," has performed roofing and associated work ("the work") on the following project:
 - 1. Owner: <Insert name of Owner>.
 - 2. Owner Address: <Insert address>.
 - 3. Building Name/Type: <Insert information>.
 - 4. Building Address: <Insert address>.
 - 5. Area of the Work: <Insert information>.
 - 6. Acceptance Date: <Insert date>.
 - 7. Warranty Period: <Insert time>.
 - 8. Expiration Date: <Insert date>.
- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant the work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that, during Warranty Period, Roofing Installer will, at Roofing Installer's own cost and expense, make or cause to be made such repairs to or replacements of the work as are necessary to correct faulty and defective work and as are necessary to maintain the work in a watertight condition.
- D. This Warranty is made subject to the following terms and conditions:
 - 1. Specifically excluded from this Warranty are damages to the work and other parts of the building, and to building contents, caused by:
 - a. Lightning;
 - b. Peak gust wind speed exceeding <Insert wind speed> mph (m/s);
 - c. Fire;
 - d. Failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;

- e. Faulty construction of copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
 - f. Vapor condensation on bottom of roofing; and
 - g. Activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
 2. When the work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
 3. Roofing Installer is responsible for damage to the work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of the work.
 4. During Warranty Period, if Owner allows alteration of the work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of the alterations, but only to the extent the alterations affect the work covered by this Warranty. If Owner engages Roofing Installer to perform the alterations, Warranty shall not become null and void unless Roofing Installer, before starting the alterations, notified Owner in writing, showing reasonable cause for claim, that the alterations would likely damage or deteriorate the work, thereby reasonably justifying a limitation or termination of this Warranty.
 5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a use or service more severe than originally specified, this Warranty shall become null and void on date of the change, but only to the extent the change affects the work covered by this Warranty.
 6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect the work and to examine evidence of such leaks, defects, or deterioration.
 7. This Warranty is recognized to be the only warranty of Roofing Installer on the work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of the work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.
- E. IN WITNESS THEREOF, this instrument has been duly executed this <Insert day> day of <Insert month>, <Insert year>.
1. Authorized Signature: <Insert signature>.
 2. Name: <Insert name>.
 3. Title: <Insert title>.

END OF SECTION

SECTION 07 46 23 - WOOD SIDING AND SOFFITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Wood siding and soffits.
 - 2. Cladding support system slotted channel, including insect screen.
- B. Provide all accessories, fasteners, closures and profiles required for complete installation.
- C. Related Requirements:
 - 1. Section 06 10 00 "Rough Carpentry" for wood furring, grounds, nailers, and blocking.
 - 2. Section 07 05 43 "Cladding Support Systems" for thermally broken subframing.
 - 3. Section 07 92 00 "Joint Sealants".

1.3 COORDINATION

- A. Coordinate siding installation with flashings and other adjoining construction to ensure proper sequencing.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. During the pre-construction meetings, review the approved design intent and methods required. Repeat this review during the preparation for assembly of the exterior systems mockup.

1.5 SUBMITTALS

- A. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For siding. Include elevations, sections, full-size details, and attachment to other Work.
 - 1. Include details of transitions to other Work.
 - 2. Include joint pattern and horizontal and vertical joint details.
 - 3. Include fastener pattern for review for spacing. Include fastener type, size and material.
 - 4. Include expansion provisions.
 - 5. Include Project specific details.
- C. Samples for Verification: For each type, color, texture, and pattern required.
 - 1. 12-inch-long-by-actual-width Sample of siding.
 - 2. 24-inch-wide-by-36-inch-high Sample panel of siding assembled on plywood backing.
 - 3. 12-inch-long-by-actual-width Samples of trim and accessories.

- D. Product Certificates: For each type of composite siding and soffit and wood siding.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency.
- F. Research/ Evaluation Reports: For each type of siding required, from ICC-ES.
- G. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of product, including related accessories, to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish full lengths of siding and soffit including related accessories, in a quantity equal to 2 percent of amount installed.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: All products listed in this Section are to be installed by a single installer trained and approved by the siding manufacturer or manufacturer's representative.
- B. Color Evaluation: No visible change, 2,000 hours of accelerated weathering with color evaluation when calculated to ASTM D2244-09a.
- C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and to set quality standards for fabrication and installation.
 - 1. Build mockup of typical wall area as shown in Drawings.
 - a. Include outside corner on one end of mockup and inside corner on other end.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with labels intact until time of use.
- B. Store materials on elevated platforms, under cover, and in a dry location.

1.10 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits or which could involve life safety situations.
- B. Field Measurements: Verify actual measurements/ openings by field measurements performed by the installer prior to fabrication. The General Contractor or Installer shall be responsible for existing site dimensions. Recorded measurements shall be indicated on shop drawings based on field measurements provided by the installer. Coordinate field measurements and fabrication schedule.

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

1.11 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace products that fail in materials within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including cracking and deforming.
 - b. Deterioration of materials beyond normal weathering.
 - c. Manufacturing defects that result in leaks.
 - 2. Warranty Period:
 - a. Composite Materials: Manufacturer's standard but not less than 10 years from date of Substantial Completion.
 - b. Cedar Materials: Limited lifetime from date of Substantial Completion.
 - 3. Workmanship Warranty, Exterior: Application limited warranty for two years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain products, including related accessories, from single source from single manufacturer for each type of siding indicated.

2.2 WOOD SIDING AND SOFFITS

- A. Wood Siding and Soffits, General: Tongue-and-groove, blind nailed; shop-stained and ship-sealed at all sides; field-sealed at cut ends.
- B. Exterior Wood Siding and Soffits:
 - 1. Species: Western Red cedar (*Thuja plicata*).
 - 2. Grade: B Clear grade.
 - 3. Cut: Resawn.
 - 4. Profile: Tongue-and-groove (T&G); square edge or as indicated.
 - 5. Dimensions: As indicated in Drawings.
 - 6. Shop-Applied Finish: Refer to Finishes articles below.
- C. Exterior Wood Trim: Provide trim to match adjacent wood siding species, grade, cut and finish.

2.3 MISCELLANEOUS MATERIALS

- A. Furring Strips: APA Exterior rated plywood, 3 inches wide, pressure preservative treated.
 - 1. Provide kerfing at backside; 3/8-inch square kerfs at 4 inches on-center spacing.

- B. Rainscreen Venting: Provide the following assembly at top and bottom of siding area, and at sills and heads at doors, windows and other penetrations:
 - 1. Basis-of-Design Manufacturer: Cor-A-Vent, Inc.; www.cor-a-vent.com.
 - 2. Venting Channel: Ventilated batten strip for rainscreen system; 5/8-inch-thick; 3-inch width.
 - 3. Spacer: 3/4-inch APA Exterior rated plywood, 3 inches wide, pressure preservative treated.
- C. Fasteners: Provide nails or screws, in sufficient length to penetrate not less than 1-1/2 inches into wood substrate.
 - 1. Nails: ASTM F1667; Type 304 stainless steel siding head with annular ring, length as required to penetrate solid framing by 1 inch, precoated with siding stain.
 - 2. Screws: Type 304 stainless steel; wing-tipped wafer head screws.
 - a. Basis-of-Design Product: HeadLOK Wafer-Head Spider Drive Heavy-Duty by FastenMaster; www.fastenmaster.com.
 - b. Corrosion Resistance: 1000 hours of salt spray test per ASTM B117 with no visible sign of surface red rust.
- D. Insect Screen: PVC-coated, glass-fiber fabric, 18 inches by 14 inches or 18 inches by 16 inches mesh; black color.
- E. Applications: Provide at all exterior rainscreen cavity boundaries and as indicated.
 - 1. Provide vented shim as specified above, or SV-3, SV-5 by Cor-A-Vent; www.cor-a-vent.com.
 - 2. As recommended by siding manufacturer for application.

2.4 FINISHES

- A. Shop-Prestaining of Wood Siding, Ceilings, Soffits and Trim: Two coat water repellent penetrating translucent exterior decorative stain. First and second coats factory-/ shop-applied. Provide same finishes at associated trim for each wood siding type.
 - 1. Semi-Transparent Stain:
 - a. Basis-of-Design Product: C2 Guard Stain by C2 Paint; www.c2paint.com.
 - b. Color: As selected by Architect.
 - 2. Fire Retardant Treatment: Flamort WC by Flamort, Inc.; www.flamort.com.

2.5 ACCESSORIES

- A. Siding Accessories, General: Provide starter strips, edge trim, outside and inside corner caps, and other items as recommended by siding manufacturer for building configuration and as required for complete installation.
 - 1. Provide accessories matching color and texture of adjacent siding unless otherwise indicated.
- B. Flashing: Provide flashing and trim complying with Section 07 62 00 "Sheet Metal Flashing and Trim" where indicated.
- C. Fasteners: Concealed fastened.
 - 1. Exterior: For fastening to metal, use pan-head screws of sufficient length to penetrate supporting substrates as follows:
 - a. Metal: Minimum of 1/4 inch, or three screw-threads.
 - b. Wood: Minimum of 1 inch.

- D. Gutter Guard: Frost King Gutter Guard; width required.
- E. Vented Shim: Corrugated, polyethylene sheet; faced sheet with corrugated, openings; 3/8-inch thick; width to match furring width.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of siding and soffit and related accessories.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

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

3.3 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
 - 1. Do not install damaged components.
- B. Install joint sealants as recommended by siding manufacturer, where indicated, and as specified in Section 07 92 00 "Joint Sealants."
- C. Do not align siding joint ends.

3.4 ADJUSTING AND CLEANING

- A. Remove damaged, improperly installed, or otherwise defective materials and replace with new materials complying with specified requirements.
- B. Clean finished surfaces according to manufacturer's written instructions and maintain in a clean condition during construction.

END OF SECTION

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SECTION 07 46 46 - FIBER-CEMENT SIDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Fiber-cement siding for exterior applications.
 - 2. Cladding support system, including insect screen.
- B. Related Requirements:
 - 1. Section 06 10 00 "Rough Carpentry" for wood furring, grounds, nailers, and blocking.
 - 2. Section 07 62 00 "Sheet Metal Flashing and Trim" for flashings to be used in fiber-cement siding assemblies.
 - 3. Section 07 92 00 "Joint Sealants".

1.3 COORDINATION

- A. Coordinate siding installation with flashings and other adjoining construction to ensure proper sequencing.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. During the pre-construction meetings, review the approved design intent and methods required. Repeat this review during the preparation for assembly of the exterior systems mockup.

1.5 SUBMITTALS

- A. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For fiber-cement siding. Include elevations, sections, full-size details, and attachment to other Work.
 - 1. Include details of transitions to other Work.
 - 2. Include joint pattern and horizontal and vertical joint details.
 - 3. Include fastener pattern for review for spacing. Include fastener type, size and material.
 - 4. Include expansion provisions.
 - 5. Include Project specific details.
- C. Samples for Verification: For each type, color, texture, and pattern required.
 - 1. 12-inch-long-by-actual-width Sample of siding.
 - 2. 24-inch-wide-by-36-inch-high Sample panel of siding assembled on plywood backing.
- D. Product Certificates: For each type of fiber- cement siding and soffit.

- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for fiber-cement siding.
 - F. Research/Evaluation Reports: For each type of fiber-cement siding required, from ICC-ES.
 - G. Sample Warranty: For special warranty.
- 1.6 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For each type of product, including related accessories, to include in maintenance manuals.
- 1.7 MAINTENANCE MATERIAL SUBMITTALS
- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish full lengths of fiber- cement siding and soffit including related accessories, in a quantity equal to 2 percent of amount installed.
- 1.8 QUALITY ASSURANCE
- A. Installer Qualifications: All products listed in this section are to be installed by a single installer trained and approved by the fiber-cement siding manufacture or manufacturer's representative.
 - B. Color Evaluation: No visible change, 2000 hours of accelerated weathering with color evaluation when calculated to ASTM D 2244-09a.
 - C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and to set quality standards for fabrication and installation. Refer to Section 01 30 00 "Administrative Requirements".
 - 1. Build mockup of typical wall area as shown on Drawings.
 - a. Include outside corner on one end of mockup and inside corner on other end.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- 1.9 DELIVERY, STORAGE, AND HANDLING
- A. Deliver and store packaged materials in original containers with labels intact until time of use.
 - B. Store materials on elevated platforms, under cover, and in a dry location.
- 1.10 PROJECT CONDITIONS
- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits or which could involve life safety situations.
 - B. Field Measurements: Verify actual measurements/openings by field measurements performed by the installer prior to fabrication. The General Contractor or Installer shall be responsible for existing site dimensions. Recorded measurements shall be indicated on shop drawings based on field measurements provided by the installer. Coordinate field measurements and fabrication schedule.

1.11 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace products that fail in materials within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including cracking and deforming.
 - b. Deterioration of materials beyond normal weathering.
 - 2. Warranty Period:
 - a. Interior: 10 years from date of Substantial Completion for defects in materials when installation is by a contractor trained and approved by manufacturer's representative.
 - b. Exterior: 30 years from date of Substantial Completion for defects in materials when installation is by a contractor trained and approved by manufacturer's representative.
 - 3. Workmanship Warranty, Exterior: Application limited warranty for 2 years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain products, including related accessories, from single source from single manufacturer for each type of fiber-cement siding indicated.
- B. Basis-of-Design Manufacturer: James Hardie Building Products, Inc.; www.jameshardie.com.

2.2 FIBER-CEMENT SIDING

- A. General: ASTM C 1186 and EN 12467, fiber-cement board, noncombustible; with a flame-spread index of 25 or less when tested according to ASTM E 84.
 - 1. Labeling: Provide fiber-cement siding that is tested and labeled according to ASTM C 1186 or EN 12467 by a qualified testing agency acceptable to authorities having jurisdiction.
- B. Fiber-Cement Siding:
 - 1. Basis-of-Design Product: HardiePlank Cedarmill Lap Siding by James Hardie.
 - 2. Texture: Smooth.
 - 3. Size: 6-1/4 in. by 144 in.
 - 4. Thickness: 5/16-inch.
 - 5. Factory Priming: Manufacturer's standard acrylic primer.
 - 6. Installation Orientation: As indicated in Drawings.
- C. Trim: Composite cementitious composition.
 - 1. Basis-of-Design Product: Hardie Trim by James Hardie.
 - 2. Other Approved Product: TruExterior Trim by Westlake Royal Building Products; www.truexterior.com.

2.3 CLADDING SUPPORT SYSTEM

- A. Furring Strips: APA Exterior rated plywood, thickness and widths as indicated, pressure preservative treated.
- B. Shims: Load bearing, high-density multimonomer plastic, nonleaching.

- C. Mechanical Fasteners: Elco Dril-Flex or Hilti Kwik-Flex conforming to ICC Legacy Report ER-4780, or Los Angeles Department of Building and Safety Research Report RR 25095, dual hardner, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws. The self-drilling point lead tapping threads shall have a minimum hardness of HRL. The load bearing screen shank shall have a maximum of hardness of HRL 34
 - 1. Head Type: Hex washer head, Undercut flathead, custom head styles as noted on drawings.
 - 2. Finish heads to be black where exposed to view.

2.4 ACCESSORIES

- A. Siding Accessories, General: Provide starter strips, edge trim, outside and inside corner caps, and other items as recommended by siding manufacturer for building configuration and as required for complete installation.
 - 1. Provide accessories matching color and texture of adjacent siding unless otherwise indicated.
- B. Decorative Accessories: Provide the following fiber-cement decorative accessories as indicated:
 - 1. Corner posts.
 - 2. Door and window casings.
 - 3. Fasciae.
 - 4. Moldings and trim.
- C. Flashing: Provide flashing and trim complying with Section 07 62 00 "Sheet Metal Flashing and Trim" where indicated.
- D. Fasteners: Exposed stainless-steel fasteners.
 - 1. Exterior: Siding nails of sufficient length to penetrate a minimum of 1 inch into substrate.
 - 2. Furring Fastening: As determined by Project Structural Engineer to meet performance requirements.
- E. Insect Screens: Provide insect screen cloth to prevent intrusion to rainscreen cavity space behind siding.
 - 1. Glass-Fiber Mesh Fabric: Mesh of PVC-coated, glass-fiber threads; woven and fused to form a fabric mesh resistant to corrosion, shrinkage, stretch, impact damage, and weather deterioration. Comply with ASTM D3656.
 - a. Mesh Color: Black.
 - 2. Basis-of-Design Manufacturer: Cor-A-Vent; www.cor-a-vent.com.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of fiber-cement siding and soffit and related accessories.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

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

3.3 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
 - 1. Do not install damaged components.
 - 2. Provide trim profiles where indicated.
 - 3. Vent bottom of wall assemblies with continuous metal, perforated vent.
 - 4. Insect Screens: Install insect screen cloth at all openings to rainscreen cavity space behind siding.
 - 5. Fill face of countersink screws with patch material recommended by manufacturer, sand smooth and paint material to match color of fiber-cement siding.
- B. Install joint sealants as recommended by siding manufacturer, where indicated, and as specified in Section 07 92 00 "Joint Sealants."
- C. Align panels horizontally with panel stripes not varying more than 1/32 inch between panels, and 1/8 inch in 10 feet, non-cumulative.

3.4 ADJUSTING AND CLEANING

- A. Remove damaged, improperly installed, or otherwise defective materials and replace with new materials complying with specified requirements.
- B. Clean finished surfaces according to manufacturer's written instructions and maintain in a clean condition during construction.

END OF SECTION

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SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following sheet metal flashing and trim:
 - 1. Formed copings.
 - 2. Manufactured reglets.
 - 3. Formed roof drainage system.
 - 4. Formed low-slope roof flashing and trim.
 - 5. Fascia caps.
 - 6. Formed wall flashing and trim.
 - 7. Flashing at door and window openings.
 - 8. Formed window returns.
 - 9. Perimeter skirt flashing.
 - 10. Formed equipment support flashing.
 - 11. Formed overhead piping safety pans.
- B. Related Requirements:
 - 1. Section 07 25 00 "Weather Barriers" for self-adhered membrane flashing behind sheet metal flashings.
 - 2. Section 07 92 00 "Joint Sealants" for sealants used between sheet metal flashing and trim and other materials.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing, rattling, leaking, and fastener disengagement.
- B. Fabricate and install roof edge flashing and copings capable of resisting the climatic and geographical wind velocity pressure and uplift forces.
- C. Thermal Movements: Provide sheet metal flashing and trim that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of sheet metal and trim thermal movements. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- D. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Show layouts of sheet metal flashing and trim, including plans and elevations. Distinguish between shop- and field-assembled work. Include the following:
 - 1. Identify material, thickness, weight, and finish for each item and location in Project.
 - 2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
 - 3. Details for fastening, joining, supporting, and anchoring sheet metal flashing and trim, including fasteners, clips, cleats, and attachments to adjoining work.
- C. Compatibility Letter and Chart:
 - 1. Provide a compatibility letter certifying physical and chemical compatibility of products in this Section with all other dampproofing, waterproofing, weather barrier, roofing, self-adhered flashing and sealant products in the Project. Coordinate with the following Sections:
 - a. Section 07 25 00 "Weather Barriers".
 - b. Section 07 62 00 "Sheet Metal Flashing and Trim".
 - 2. Provide input from this Section toward a single Compatibility Chart to be compiled by the General Contractor. Compatibility Chart shall indicate the following:
 - a. All dampproofing, waterproofing, weather barrier, roofing, self-adhered flashing and sealant products.
 - b. Which other products from this group they interface (are in contact with) in the Project.
 - c. The physical and chemical compatibility between those interfaced products.
- D. Samples for Initial Selection: For each type of sheet metal flashing and trim indicated with factory-applied color finishes.
 - 1. Include similar Samples of trim and accessories involving color selection.

1.5 QUALITY ASSURANCE

- A. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.
 - 1. Meet with Installer, and installers whose work interfaces with or affects sheet metal flashing and trim including installers of roofing materials, roof accessories, unit skylights, and roof-mounted equipment.
 - 2. Review methods and procedures related to sheet metal flashing and trim.
 - 3. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
 - 4. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver sheet metal flashing materials and fabrications undamaged. Protect sheet metal flashing and trim materials and fabrications during transportation and handling.

- B. Unload, store, and install sheet metal flashing materials and fabrications in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack materials on platforms or pallets, covered with suitable weathertight and ventilated covering. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.
 - 1. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
 - 2. Protect stored sheet metal flashing and trim from contact with water.

1.7 COORDINATION

- A. Coordinate installation of sheet metal flashing and trim with interfacing and adjoining construction to provide a leakproof, secure, and noncorrosive installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. SPRI Wind Design Standard: Manufacture and install copings and roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressure:
 - 1. Design Pressure: As indicated in Drawings.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 SHEET METALS

- A. Stainless-Steel Sheet: ASTM A240, Type 316.
 - 1. Finish: No. 2D (dull, cold rolled) or 4 (fine reflective, polished directional satin) where exposed to view.
- B. Aluminum Sheet: ASTM B209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.
- C. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet according to ASTM A653, G90 coating designation or aluminum-zinc alloy-coated steel sheet according to ASTM A792, Class AZ50 coating designation, Grade 40 (Grade 275); prepainted by coil-coating process to comply with ASTM A755.
 - 1. Surface: Smooth, flat and with manufacturer's standard clear acrylic coating on both sides.
- D. Finishes: Refer to Finishes articles below.

2.3 UNDERLAYMENT MATERIALS

- A. Weather Barriers: Refer to Section 07 25 00 "Weather Barriers."

- B. Underlayment Accessories: Refer to Section 07 25 00 "Weather Barriers" for high temperature self-adhered butyl rubber flashing.

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.
 - 1. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.
 - 2. Blind Fasteners: High-strength aluminum or stainless-steel rivets.
 - 3. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
- C. Solder for Stainless Steel: ASTM B32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.
- D. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.
- E. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane or silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant, polyisobutylene plasticized, heavy bodied for hooked-type joints with limited movement.
- G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- H. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 16 mils (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
- I. Asphalt Roofing Cement: ASTM D4586, asbestos free, of consistency required for application.

2.5 MANUFACTURED SHEET METAL FLASHING AND TRIM

- A. Reglets: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with factory-mitered and -welded corners and junctions.
 - 1. Material: Stainless steel, 0.019 inch; Copper, 16 oz./sq. ft. thick; Aluminum, 0.024 inch thick; Galvanized steel, 0.022 inch thick.
 - 2. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
 - 3. Concrete Type: Provide temporary closure tape to keep reglet free of concrete materials, special fasteners for attaching reglet to concrete forms, and guides to ensure alignment of reglet section ends.
 - 4. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.
 - 5. Flexible Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.

6. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.

2.6 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shop fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication.
- B. Fabricate metal flashing and trim using materials matching adjacent panels where exposed.
 1. Concealed Flashing: Where concealed from view, provide stainless steel.
 2. Counter Flashings: Match coping material and finish.
 3. Where exposed to view, match adjacent metal panel material and finish.
 4. Sills, at Grade: Aluminum, finish matching window system.
 5. Jambs and Head Flashings at Framed Openings: Aluminum, finish matching window system.
 6. Openings, Fiberglass: Coated steel, or aluminum. Material and finish to match adjacent metal wall panels.
- C. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
- D. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks, and true to line and levels indicated, with exposed edges folded back to form hems.
 1. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
 2. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- E. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.
- F. Expansion Provisions: Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
- G. Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.
- H. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
 1. Thickness: As recommended by SMACNA's "Architectural Sheet Metal Manual" for application but not less than thickness of metal being secured.

2.7 ROOF DRAINAGE SHEET METAL FABRICATIONS

- A. Hanging Gutters: Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required.
 1. Fabricate in minimum 96-inch long sections.
 2. Gutter Supports: Furnish flat-stock gutter brackets and flat-stock gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard, but with thickness not less than twice the gutter thickness dimension indicated on Drawings.

3. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters. Shop fabricate interior and exterior corners.
4. Gutter Profile: As indicated on Drawings.
- B. Downspouts: Fabricate round or rectangular downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.
 1. Manufactured Hanger Style.
 2. Fabricate downspouts from the following material:
 - a. Aluminum: 0.024 inch thick; prefinished.
 3. Color: As selected by Architect.
- C. Conductor Heads: Fabricate conductor heads with flanged back and stiffened top edge and of dimensions and shape indicated complete with outlet tubes, exterior flange trim, and built-in overflows.
 1. Fabricate conductor heads from the following material:
 - a. Aluminum: 0.032 inch thick; prefinished.

2.8 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Fascia Caps: Fabricate in minimum 96 inches long, but not exceeding 12-foot-long, sections.
 1. Joint Style: Standing-seam, 1 inch high minimum.
 2. Aluminum: 20 ga. (0.037 in.) thick, prefinished.
- B. Base Flashing: Fabricate from the following material:
 1. Aluminum: 0.040 inch thick, prefinished.
- C. Counterflashing: Fabricate from the following material:
 1. Aluminum: 0.040 inch thick, prefinished.
- D. Flashing Receivers: Fabricate from the following material:
 1. Aluminum: 0.032 inch thick, prefinished.
- E. Roof-Penetration Flashing: Fabricate from the following material:
 1. Aluminum: 0.040 inch thick, prefinished.
- F. Roof-Drain Flashing: Fabricate from the following material:
 1. Aluminum: 0.032 inch thick, prefinished.
- G. Splash Pans: Fabricate from the following material:
 1. Aluminum: 0.040 inch thick, prefinished.

2.9 WALL SHEET METAL FABRICATIONS

- A. Openings Flashing in Frame Construction: Fabricate head, sill, jamb, and similar flashings and trim profiles as indicated in Drawings. Form head and sill flashing with end dams as indicated in Drawings. Fabricate from one of the following material:
 1. Aluminum: 0.032 inch thick, prefinished for trim profiles exposed to view.
 2. Galvanized Steel: 20 gauge thick, prefinished for trim profiles exposed to view.

- B. Perimeter Skirt Flashing: Fabricate skirt flashings and trim profiles for perimeter at-grade protection of insulation and drainage mat as indicated in Drawings. Fabricate from the following material:
 - 1. Stainless Steel: Thickness needed to comply with performance requirements.
- C. Formed Window Returns: Fabricate window return profiles for jambs and heads of window openings at fiberglass window systems as indicated in Drawings. Fabricate from the following material:
 - 1. Galvanized Steel: 18 gauge thick, prefinished for trim profiles exposed to view.

2.10 FINISHES

- A. Comply with NAAMM's - Metal Finishes Manual for Architectural and Metal Products, for recommendations of designating finishes.
- B. High-Performance Organic Finish: AAMA 2605, multiple-coat, thermally cured, fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in color coat and clear coats, complying with AAMA 621. Prepare, pre-treat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' installation instructions.
 - 1. Approved PVDF Resin Products:
 - a. Hylar 5000 by Solvay; www.solvay.com.
 - b. Kynar 500 by Arkema; www.kynar500.com.
 - 2. Basis-of-Design Fluoropolymer Coating Products: Fluoropon Classic and Fluoropon Premiere by Valspar Corp., div. of The Sherwin-Williams Co.; www.valsparinspireme.com.
 - 3. Other Approved Fluoropolymer Coating Products: Duranar and Duranar XL by PPG Industrial Coatings; www.ppgmetalcoatings.com.
 - 4. Exposed Finishes: Two-coat fluoropolymer finish.
 - 5. Colors: As selected by Architect.
- C. 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.
- D. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- E. Field Touch-Up Materials: As recommended by coating manufacturer for field application.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of work.
 - 1. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 1. Torch cutting of sheet metal flashing and trim is not permitted.
- B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.
 - 1. Coat side of uncoated aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
 - 2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene underlayment.
 - 3. Bed flanges in thick coat of asphalt roofing cement where required for waterproof performance.
- C. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
- D. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and elastomeric or butyl sealant.
- E. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 - 1. Space cleats not more than 12 inches apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
- F. 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 watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric or butyl sealant concealed within joints.
- G. Fasteners: Use fasteners of sizes that will penetrate substrate not less than 1-1/4 for nails and not less than 3/4-inch for wood screws.
 - 1. Galvanized or Prepainted, Metallic-Coated Steel: Use stainless-steel fasteners.
 - 2. Aluminum: Use aluminum or stainless-steel fasteners.
 - 3. Copper Use copper or stainless-steel fasteners.
 - 4. Stainless Steel: Use stainless-steel fasteners.
- H. Seal joints with elastomeric or butyl sealant as required for watertight construction.
 - 1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F, set joint members for 50 percent movement either way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
 - 2. Prepare joints and apply sealants to comply with requirements in Section 07 92 00 "Joint Sealants."

- I. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1-1/2 inches except where pretinned surface would show in finished Work.
 - 1. Do not solder prepainted, metallic-coated steel and aluminum sheet.
 - 2. Stainless-Steel Soldering: Pretin edges of uncoated sheets to be soldered using solder recommended for stainless steel and phosphoric acid flux. Promptly wash off acid flux residue from metal after soldering.
 - 3. Copper Soldering: Tin uncoated copper surfaces at edges of sheets using solder recommended for copper work.
 - 4. Do not use open-flame torches for soldering. Heat surfaces to receive solder and flow solder into joints. Fill joints completely. Completely remove flux and spatter from exposed surfaces.
- J. Aluminum Flashing: Rivet or weld joints in uncoated aluminum where necessary for strength.

3.3 ROOF DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.
- B. Splash Pans: Install where downspouts discharge on low-sloped roofs. Set in asphalt roofing cement or elastomeric sealant compatible with roofing membrane.

3.4 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal roof flashing and trim to comply with performance requirements and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations for specified wind zone and as indicated.
- C. Copings: Anchor to resist uplift and outward forces for specified wind zone and as indicated.
- D. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric or butyl sealant, extending a minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.
- E. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints a minimum of 4 inches and bed with elastomeric or butyl sealant.
 - 1. Secure in a waterproof manner.
- F. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Install flashing as follows:
 - 1. Turn lead flashing down inside vent piping, being careful not to block vent piping with flashing.
 - 2. Seal with elastomeric or butyl sealant and clamp flashing to pipes penetrating roof except for lead flashing on vent piping.

3.5 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
- B. Openings Flashing in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

3.6 MISCELLANEOUS FLASHING INSTALLATION

- A. Overhead-Piping Safety Pans: Suspend pans from pipe and install drain line to plumbing waste or drain line.
- B. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric or butyl sealant to equipment support member.

3.7 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder and sealants.
- C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain in a clean condition during construction.
- D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Silicone joint sealants.
 - 2. Nonstaining silicone joint sealants.
 - 3. Urethane joint sealants.
 - 4. Silyl-terminated polyether (STPE) joint sealants.
 - 5. Immersible joint sealants.
 - 6. Mildew-resistant joint sealants.
 - 7. Latex joint sealants.
- B. Related Requirements:
 - 1. Section 09 29 00 "Gypsum Board" for acoustical sealant.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 SUBMITTALS

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

3. Type of substrate material.
 4. Proposed test.
 5. Number of samples required.
- H. Preconstruction Laboratory Test Reports: From sealant manufacturer, indicating the following:
1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 2. Interpretation of test results and written recommendations for primers and substrate preparation are needed for adhesion.
- I. Preconstruction Field-Adhesion-Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.
- J. Field-Adhesion-Test Reports: For each sealant application tested.
- K. Sample Warranties: For special warranties.
- 1.5 QUALITY ASSURANCE
- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Product Testing: Test joint sealants using a qualified testing agency.
1. Testing Agency Qualifications: Qualified according to ASTM C1021 to conduct the testing indicated.
- C. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.
- 1.6 PRECONSTRUCTION TESTING
- A. Preconstruction Laboratory Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
1. Adhesion Testing: Use ASTM C794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 2. Compatibility Testing: Use ASTM C1087 to determine sealant compatibility when in contact with glazing and gasket materials.
 3. Stain Testing: Use ASTM C1248 to determine stain potential of sealant when in contact with porous substrates.
 4. Submit manufacturer's recommended number of pieces of each type of material, including joint substrates, joint-sealant backings, and miscellaneous materials.
 5. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 6. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures, including use of specially formulated primers.
 7. Testing will not be required if joint-sealant manufacturers submit data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, staining of, and compatibility with joint substrates and other materials matching those submitted.

- B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
 2. Conduct field tests for each kind of sealant and joint substrate.
 3. Notify Architect seven days in advance of dates and times when test joints will be erected.
 4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
 - a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1.1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.
 - 1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
 - b. Pull test quantities: At every other floor on every other elevation, pull one of each substrate and sealant combination. In the event of a failure, pull test a minimum of 2 additional joints of the same configuration to verify whether it is a one-off occurrence, or to identify a pattern of failure.
 - c. Suggested pull test methodology: Three (3) test cuts, adjacent to one another, per pull test location as follows:
 - 1) The first test cut shall be 4 to 6 inches long and identify the sealant profile (depth vs width) and sealant extension to meet the manufacturer's stated performance. To execute, cut joint parallel to joint to separate the sealant from each substrate, then cut perpendicular at the top to release a 4 to 6 inch long tail.
 - 2) The second cut shall isolate the sealant joint from the left substrate to verify pull adhesion and proper surface preparation of the right substrate. To execute, continue the first test cut on the left side another 4 to 6 inches, releasing the sealant from the left substrate.
 - 3) The third cut shall isolate the sealant joint from the right substrate to verify pull adhesion and proper surface preparation of the left substrate. To execute, continue the first test cut on the right side for another 8 to 12 inches, releasing the sealant from the right substrate.
 5. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
 6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.7 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
 2. When joint substrates are wet.
 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.

4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.8 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 1. Warranty Period: Five years from date of Substantial Completion.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
 1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 2. Disintegration of joint substrates from causes exceeding design specifications.
 3. Mechanical damage caused by individuals, tools, or other outside agents.
 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. All openings, gaps, and joints in floor and wall assemblies in contact with soil and at gaps around pipes, toilets, bathtubs, or drains penetrating these assemblies shall be filled or closed with materials that provide a permanent air-tight seal.
- B. Only smaller gaps shall be sealed with elastomeric joint sealant, as defined by ASTM C 920; maximum joint width as recommended by sealant manufacturer.
 1. Large openings shall not be sealed with elastomeric joint sealant, but rather with nonshrink grout or expanding foam materials; refer to Sections 03 30 00 "Cast-in-Place Concrete" for nonshrink grout and to Section 07 21 00 "Thermal Insulation" for expanding foam.
- C. Physical properties of elastomeric joint sealants shall meet requirements of Radon Mitigation System as indicated in Drawings.

2.2 JOINT SEALANTS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 SILICONE JOINT SEALANTS

- A. Silicone, S, NS, 100/50, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 100/50, Use NT.
1. Basis-of-Design Products:
 - a. Sealant: Spectrem 1 by Tremco; www.tremcosealants.com.
 - b. Primer Product: Silicone Porous Primer by Tremco.
 - c. Backer Rod: Type B backer rod as recommended by sealant manufacturer.
 - 1) Basis-of-Design Product: SOF Rod, Bi-Cellular Polyethylene Backer Rod by Nomaco; www.nomaco.com.
 2. Other Approved Manufacturers:
 - a. Dow Corning Corp.; www.dowcorning.com.
 - b. GE Construction Sealants; Momentive Performance Materials Inc.; www.siliconeforbuilding.com.
 3. Applications:
 - a. Non-porous dissimilar materials.
 - b. Existing tilt-up concrete panels.
 - c. Joints: 3/8 inch wide or less.
- B. Silicone, S, P, 100/50, T, NT: Single-component, pourable, plus 100 percent and minus 50 percent movement capability traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade P, Class 100/50, Uses T and NT.
1. Basis-of-Design Product: Spectrem 900SL by Tremco; www.tremcosealants.com.
 2. Other Approved Manufacturers:
 - a. Pecora Corporation; www.pecora.com.
 - b. Sika Corporation; www.sika.com.
- C. Silicone, S, NS, 50, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.
1. Basis-of-Design Product: Spectrem 2 by Tremco; www.tremcosealants.com.
 2. Other Approved Manufacturers:
 - a. Dow Corning Corporation; www.dowcorning.com.
 - b. GE Construction Sealants; Momentive Performance Materials Inc.; www.siliconeforbuilding.com.
 - c. Sika Corporation; www.sika.com.
 3. Applications: Similar materials.
- D. Silicone, S, NS, 50, T, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Uses T and NT.
1. Basis-of-Design Product: Spectrem 800 by Tremco; www.tremcosealants.com.
 2. Other Approved Manufacturers:
 - a. Dow Corning Corp.; www.dowcorning.com.

- E. Silicone, Acid Curing, S, NS, 25, NT: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.
 - 1. Basis-of-Design Product: Tremsil 200 by Tremco; www.tremcosealants.com.
 - 2. Other Approved Manufacturers:
 - a. Dow Corning Corp.; www.dowcorning.com.
 - b. Pecora Corporation; www.pecora.com.
 - c. Sika Corporation; www.sika.com.

2.4 URETHANE JOINT SEALANTS

- A. Urethane, S, NS, 100/50, T, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type S, Grade NS, Class 100/50, Uses T and NT.
 - 1. Basis-of-Design Product: Dymonic 100 by Tremco; www.tremcosealants.com.
 - 2. Other Approved Manufacturers:
 - a. Sika Corporation; www.sika.com.
 - 3. Applications: At expansion and control joints, precast concrete panel joints, perimeter caulking, aluminum, masonry and vinyl siding.
- B. Urethane, S, NS, 25, T, NT: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type S, Grade NS, Class 25, Uses T and NT.
 - 1. Basis-of-Design Product: Dymonic FC by Tremco; www.tremcosealants.com.
 - 2. Other Approved Manufacturers:
 - a. BASF Corporation; www.master-builders-solutions.basf.us.
- C. Urethane, M, P, 50, T, NT: Multicomponent, pourable, plus 50 percent and minus 50 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type M, Grade P, Class 50, Uses T and NT.
 - 1. Basis-of-Design Product: Dymeric 240FC by Tremco; www.tremcosealants.com.
 - 2. Applications: Exterior paintable surfaces and exterior and interior horizontal concrete joints.
- D. Urethane, M, P, 25, T, NT: Multicomponent, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type M, Grade P, Class 25, Uses T and NT.
 - 1. Basis-of-Design Product: THC-901 by Tremco; www.tremcosealants.com.
 - 2. Other Approved Manufacturers:
 - a. BASF Corporation; www.basf.com.

2.5 SILYL-TERMINATED POLYETHER (STPE) JOINT SEALANTS

- A. STPE, S, NS, 50, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, silyl-terminated polyether joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.
 - 1. Basis-of-Design Product: Quad Max by OSI, div. of Henkel.
 - 2. MasterSeal NP 100 by Master Builders Solutions, formerly BASF.

- B. STPE, S, NS, 100/ 50, T, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, traffic- and nontraffic-use, silyl-terminated polyether joint sealant; ASTM C920, Type S, Grade NS, Class 100, Uses T and NT.
 - 1. Basis-of-Design Product: MasterSeal NP 150 Sealant or NP 150 Tint Base Sealant by Master Builders Solutions, formerly BASF.
- C. Applications: Where exterior, paintable sealant is required.

2.6 IMMERSIBLE JOINT SEALANTS

- A. Immersible Joint Sealants. Suitable for immersion in liquids; ASTM C1247, Class 2; tested in deionized water unless otherwise indicated
- B. Urethane, Immersible, S, NS, 100/50, NT, I: Immersible, single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, urethane joint sealant; ASTM C920, Type S, Grade NS, Class 100/50, Uses NT, and I.
 - 1. Basis-of-Design Product: Vulkem 45 SSL by Tremco; www.tremcosealants.com.
- C. Urethane, Immersible, M, NS, 50, T, NT, I: Immersible, multicomponent, nonsag, plus 50 percent and minus 50 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type M, Grade NS, Class 50, Uses T, NT, and I.
 - 1. Basis-of-Design Product: Dymeric 240FC by Tremco; www.tremcosealants.com.

2.7 MILDEW-RESISTANT JOINT SEALANTS

- A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.
- B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.
 - 1. Basis-of-Design Product: Tremsil 200by Tremco; www.tremcosealants.com.
 - 2. Other Approved Manufacturers:
 - a. Dow Corning Corporation; www.dowcorning.com.
 - b. GE Construction Sealants; Momentive Performance Materials Inc.; www.siliconeforbuilding.com.
 - c. Tremco Incorporated; www.tremco.com.
- C. Applications: At joints in ceramic tile walls and floor, around equipment and around plumbing fixtures.

2.8 BUTYL JOINT SEALANTS

- A. Butyl-Rubber-Based Joint Sealants: ASTM C1311.
 - 1. Basis of Design Product: Tremco Butyl by Tremco; www.tremcosealants.com.
 - 2. Other Approved Manufacturers:
 - a. Pecora Corporation; www.pecora.com.
 - b. Tremco Incorporated; www.tremco.com.
- B. Applications: At curtainwall joints, metal panel joining, bedding thresholds, secondary glazing seals, and areas where a seal is required against EPDM gaskets.

2.9 LATEX JOINT SEALANTS

- A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C834, Type OP, Grade NF.
 - 1. Basis-of-Design Product: Tremflex 834 by Tremco; www.tremcosealants.com.
- B. Applications: At interior frames/ walls.

2.10 LOW EXPANDING FOAM SEALANTS

- A. Low expanding, one-component, polyurethane foam sealant, curing to a semi-rigid, closed cell urethane foam.
- B. Applications:
 - 1. Apply between top of precast concrete panels and metal framing.
 - 2. Miscellaneous openings and voids in exterior walls.

2.11 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C1330, Type C (closed-cell material with a surface skin) and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Cylindrical Sealant Backings: ASTM C1330, Type B (bicellular material with a surface skin) as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- D. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 25 deg F. Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.
- E. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.12 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 - c. Unglazed surfaces of ceramic tile.
 - d. Exterior insulation and finish systems.
 - 3. Remove laitance and form-release agents from concrete.
 - 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
 - c. Porcelain enamel.
 - d. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

3.4 PATCHING VOIDS

- A. Installation procedures of elastomeric joint sealants shall meet requirements of Radon Mitigation System as indicated in the Drawings.
- B. At above-grade applications, inject elastomeric joint sealants into all smaller openings, gaps, and joints in floor and wall assemblies in contact with soil and at gaps around all pipes, toilets, bathtubs, or drains penetrating these assemblies so no voids remain and to provide a permanent air-tight seal.
- C. Where appropriate, larger gaps shall be sealed with nonshrink grout or expanding foam; refer to Sections 03 30 00 "Cast-in-Place Concrete" and 07 21 00 "Thermal Insulation".

3.5 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
 - 1. Extent of Testing: Test completed and cured sealant joints as follows:
 - a. Perform 10 tests for the first 1000 feet of joint length for each kind of sealant and joint substrate.
 - b. Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.

2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.
 - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
 3. Inspect tested joints and report on the following:
 - a. Whether sealants filled joint cavities and are free of voids.
 - b. Whether sealant dimensions and configurations comply with specified requirements.
 - c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.
 4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
 5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.
- B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.
- 3.6 CLEANING
- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.
- 3.7 PROTECTION
- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION

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SECTION 08 14 16 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Solid-core stain-grade interior and exterior doors.
2. Hollow-core stain-grade interior doors.

B. Related Requirements:

1. Section 06 10 00 "Rough Carpentry" for coordination with framing and for blocking.
2. Section 06 20 00 "Finish Carpentry" for wood door frames and jambs.
3. Section 08 71 00 "Door Hardware" for coordination of door hardware, including hardware for pocket doors.
4. Section 09 91 00 "Painting" for field finishing doors.

1.3 SUBMITTALS

- A. Product Data: For each type of door. Include details of core and edge construction and trim for openings. Include factory-finishing specifications.

- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.

1. Indicate doors to be factory finished and finish requirements.
2. Indicate fire ratings for fire doors.

- C. Samples for Initial Selection: Color charts consisting of actual materials in small sections for the following:

1. Faces of Factory-Finished Doors: Show the full range of colors available for stained and opaque finishes.

- D. Samples for Verification:

1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches for each material and finish. For each wood species and transparent finish, provide set of three samples showing typical range of color and grain to be expected in the finished work.
2. Corner sections of doors, approximately 8 by 10 inches, with door faces and edgings representing typical range of color and grain for each species of veneer and solid lumber required. Finish sample with same materials proposed for factory-finished doors.
3. Louver blade and frame sections, 6 inches long, for each material and finish specified.
4. Frames for light openings, 6 inches long, for each material, type, and finish required.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain flush wood doors through one source from a single manufacturer.

- B. Quality Standard: Comply with AWI's "Architectural Woodwork Quality Standards Illustrated."
 - 1. Provide AWI Quality Certification Labels or an AWI letter of licensing for Project indicating that doors comply with requirements of grades specified.
- C. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.
 - 1. Test Pressure: After five minutes into the test, the neutral pressure level in furnace shall be established at 6 inches or less above the sill.
 - 2. Oversize, Fire-Rated Wood Doors: For door assemblies exceeding sizes of tested assemblies, provide oversize fire door label or certificate of inspection, from a testing and inspecting agency acceptable to authorities having jurisdiction, stating that doors comply with requirements of design, materials, and construction.
 - 3. Temperature-Rise Rating: At exit enclosures, provide doors that have a temperature-rise rating of 250 deg C maximum in 30 minutes of fire exposure.
- D. Preinstallation Conference: Conduct conference at Project site.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in cardboard cartons and wrap bundles of doors in plastic sheeting package and deliver as required.
- C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 16 and 32 deg C and relative humidity between 43 and 70 percent during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 FLUSH WOOD DOORS, GENERAL

- A. All Composite Wood products shall be made using ultra-low-emitting formaldehyde (ULEF) resins as defined in the California Air Resources Board's "Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products" (CARB Phase II) or shall be made with no added formaldehyde (NAF).
- B. Quality Standard: In addition to requirements specified, comply with AWI's, AWMAC's, and WI's "Architectural Woodwork Standards.
- C. WDMA I.S.1-A Performance Grade: Heavy-Duty unless otherwise indicated.
- D. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
- E. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control, based on testing according to UL 1784.
- F. Particleboard-Core Doors: Not permitted unless otherwise indicated.

- G. Structural-Composite-Lumber-Core Doors:
 - 1. Structural Composite Lumber: WDMA I.S.10.
 - a. Screw Withdrawal, Face: 700 lbf.
 - b. Screw Withdrawal, Edge: 400 lbf.

2.2 SOLID-CORE DOORS

- A. Exterior Stain-Grade Solid-Core Doors:
 - 1. Performance Grade: ANSI/ WDMA I.S. 1A Heavy Duty.
 - 2. Grade: Custom.
 - 3. Faces: MDO or any closed-grain hardwood of mill option.
 - a. Apply MDO to standard-thickness, closed-grain, hardwood face veneers or directly to high-density hardboard crossbands.
 - 4. Exposed Vertical and Top Edges: Any closed-grain hardwood.
 - a. Fire-Rated Single Doors: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed vertical edges.
 - 1. Core for Fire-Rated Doors: As required to achieve fire-protection rating indicated on Drawings.
 - a. Blocking for Mineral-Core Doors: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated on Drawings as needed to eliminate through-bolting hardware.
 - 2. Construction: Five plies, hot-pressed bonded (vertical and horizontal edging is bonded to core), with entire unit abrasive planed before veneering.
 - 3. Adhesives: Type I in accordance with WDMA T.M. 6.
 - 4. Finish: Factory-primed for field-painted finish or stain.
 - 5. Color: As selected by Architect. Refer to Section 09 91 00 "Painting".
 - 6. Applications: As indicated in Drawings
- B. Interior Stain-Grade Solid-Core Doors:
 - 1. Performance Grade: ANSI/ WDMA I.S. 1A Standard Duty.
 - 2. Grade: Custom.
 - 3. Faces: Hardboard or MDF.
 - a. Hardboard Faces: ANSI A135.4, Class 1 (tempered) or Class 2 (standard).
 - b. MDF Faces: ANSI A208.2, Grade 150 or Grade 160.
 - 4. Exposed Vertical and Top Edges: Any closed-grain hardwood.
 - 5. Core for Non-Fire-Rated Doors: WDMA I.S. 10 Structural-composite-lumber.
 - 6. Construction: Seven plies, hot-pressed or cold-pressed bonded (vertical and horizontal edging is bonded to core), with entire unit abrasive planed before veneering.
 - 7. Adhesives: Type I in accordance with WDMA T.M. 6.
 - 8. Finish: Factory-primed for field-painted or stained finish.

9. Applications: As indicated in Drawings

2.3 HOLLOW-CORE DOORS

A. Interior Paint-Grade Hollow-Core Doors:

1. Grade: Custom.
2. Faces: Hardboard or MDF.
 - a. Hardboard Faces: ANSI A135.4, Class 1 (tempered) or Class 2 (standard).
 - b. MDF Faces: ANSI A208.2, Grade 150 or Grade 160.
3. Construction: Standard hollow core.
4. Finish: Factory-primed for field-painted finish.
5. Colors: As selected by Architect.
6. Applications: As indicated in Drawings.

2.4 FIRE-RATED DOORS

A. Fire-Rated Doors Construction: As indicated at Veneer-Faced Solid-Core Doors for Transparent Finish and Solid-Core Doors for Opaque Finish articles above; provide fire-rating as scheduled.

1. Construction: Construction and core specified above for type of face indicated or manufacturer's standard mineral-core construction as needed to provide fire rating indicated.
2. Blocking: For mineral-core doors, provide composite blocking with improved screw-holding capability approved for use in doors of fire ratings indicated as needed to eliminate through-bolting hardware.
3. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile matching face veneer, and laminated backing at hinge stiles for improved screw-holding capability and split resistance.
4. Pairs: Provide fire-rated pairs with fire-retardant stiles matching face veneer that are labeled and listed for kinds of applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals.

2.5 FABRICATION

- A. Fabricate doors in sizes indicated for Project-site fitting.
- B. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels, unless otherwise indicated:
 1. Comply with clearance requirements of referenced quality standard for fitting. Comply with requirements in NFPA 80 for fire-rated doors.
- C. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.
 1. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.
 2. For doors scheduled to receive electrified locksets, provide factory-installed raceway and wiring to accommodate specified hardware.
 3. Metal Astragals: Premachine astragals and formed-steel edges for hardware for pairs of fire-rated doors.

2.6 FINISHING

- A. Comply with referenced quality standard for factory finishing.
 - 1. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
 - 2. Finish faces, all four edges, edges of cutouts, and mortises.
 - 3. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames before hanging doors.
 - 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation, refer to Section 08 71 00 "Door Hardware."
- B. Manufacturer's Written Instructions: Install doors to comply with manufacturer's written instructions, referenced quality standard, and as indicated.
 - 1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.
- C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.
 - 1. Clearances: Provide 1/8 inch at heads, jambs, and between pairs of doors. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold.
 - a. Comply with NFPA 80 for fire-rated doors.
 - 2. Bevel non-fire-rated doors 3-1/2 degrees at lock and hinge edges.
- D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- E. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION

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SECTION 08 41 13 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Aluminum-framed storefront system.
2. Aluminum-framed entrances.
3. Delegated design.

B. Related Requirements:

1. Section 01 61 16 "Delegated Design Requirements" for delegated design for deferred submittal.
2. Section 07 62 00 "Sheet Metal Flashing and Trim".
3. Section 07 92 00 "Joint Sealants".
4. Section 08 71 00 "Door Hardware".
5. Section 08 80 00 "Glazing".

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For aluminum-framed entrances and storefronts. Include plans, elevations, sections, full-size details, and attachments to other work.

1. Include full-size isometric details of each type of vertical-to-horizontal intersection of aluminum-framed entrances and storefronts, showing the following:
 - a. Joinery, including concealed welds.
 - b. Anchorage.
 - c. Expansion provisions.
 - d. Glazing.
 - e. Flashing and drainage.
2. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
3. Include point-to-point wiring diagrams showing the following:
 - a. Power requirements for each electrically operated door hardware.

- b. Location and types of switches, signal device, conduit sizes, and number and size of wires.
 - C. Samples for Initial Selection: For units with factory-applied color finishes.
 - D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
 - E. Delegated-Design Submittal: For aluminum-framed entrances and storefronts indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- 1.5 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For aluminum-framed entrances and storefronts to include in maintenance manuals.
 - B. Maintenance Data for Structural Sealant: For structural-sealant-glazed storefront to include in maintenance manuals. Include ASTM C 1401 recommendations for post-installation-phase quality-control program.
- 1.6 QUALITY ASSURANCE
- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
 - B. Laboratory Mockup Testing Agency Qualifications: Qualified according to ASTM E 699 for testing indicated.
 - C. Testing Agency Qualifications: Qualified according to ASTM E 699 for testing indicated and accredited by the International Accreditation Service or the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement as complying with ISO/IEC 17025.
 - D. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
 - 1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.
 - E. Mockups: Provide materials and installation to the Integrated Exterior Mockups as required; refer to Section 01 40 00 "Quality Requirements".
- 1.7 WARRANTY
- A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or 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. Noise or vibration created by wind and thermal and structural movements.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - d. Water penetration through fixed glazing and framing areas.
 - e. Failure of operating components.
 - 2. Warranty Period: 10 years from date of Substantial Completion.

- B. Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 61 16 "Delegated Design Requirements" to design aluminum-framed entrances and storefronts.
- B. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
 - 1. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure, including, but not limited to, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
 - 2. Failure also includes the following:
 - a. Thermal stresses transferring to building structure.
 - b. Glass breakage.
 - c. Noise or vibration created by wind and thermal and structural movements.
 - d. Loosening or weakening of fasteners, attachments, and other components.
 - e. Failure of operating units.
- C. Structural Loads:
 - 1. Wind Loads: As indicated on Structural Drawings.
 - 2. Other Design Loads: As indicated on Structural Drawings.
 - 3. Deflection of Framing Members: At design wind pressure, as follows:
 - a. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding 1/175 of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
 - b. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch.
 - 1) Operable Units: Provide a minimum 1/16-inch clearance between framing members and operable units.
- D. Test according to ASTM E 330 as follows:
 - 1. When tested at positive and negative wind-load design pressures, storefront assemblies, including entrance doors, do not evidence deflection exceeding specified limits.

2. When tested at 150 percent of positive and negative wind-load design pressures, storefront assemblies, including entrance doors and anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
 3. Test Durations: As required by design wind velocity, but not less than 10 seconds.
- E. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:
1. Fixed Framing and Glass Area: Maximum air leakage rate shall be 0.30 cfm/ft² of fenestration area, at a static-air-pressure differential of 6.24 lbf/sq. ft..
 2. Commercial Glazed Swinging Entrance Doors: Maximum air leakage rate shall be as follows:
 - a. Single Doors: 0.50 cfm/ft² of door area, at a static-air-pressure differential of 6.24 lbf/sq. ft..
 - b. Pair of Doors: 1.00 cfm/ft² of door area, at a static-air-pressure differential of 6.24 lbf/sq. ft..
- F. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:
1. No evidence of water penetration through fixed glazing and framing areas, including entrance doors, when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 10.0 lbf/sq. ft..
 2. Maximum Water Leakage: No uncontrolled water penetrating assemblies or water appearing on assemblies' normally exposed interior surfaces from sources other than condensation. Water leakage does not include water controlled by flashing and gutters, or water that is drained to exterior.
- G. Seismic Performance: Aluminum-framed entrances and storefronts shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
1. Seismic Drift Causing Glass Fallout: Complying with criteria for passing based on building occupancy type when tested according to AAMA 501.6 at design displacement and 1.5 times the design displacement.
- H. Thermal Transmittance (U-Factor) Requirements: Provide adequate construction and insulation to meet the following thermal transmittance requirements. Certify and label energy performance according to NFRC as follows:
1. For Exterior Fixed Glazing and Framing Assemblies: Provide assemblies that meet U-Factor 0.28 as determined according to NFRC 100.
 2. For Exterior Swinging Door Assemblies: Provide assemblies that meet U-Factor 0.70 as determined according to NFRC 100.
 3. Solar Heat Gain Coefficient (SHGC): Fixed glazing and framing areas as a system shall have SHGC of no greater than 0.27 as determined according to NFRC 200.
- I. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes.
- 2.2 MANUFACTURERS
- A. Source Limitations: Obtain all components of storefront system, including framing, entrances and accessories, from single manufacturer.
 - B. Basis-of-Design Manufacturer: Kawneer North America; www.kawneer.com.
 - C. Other Approved Manufacturers:
 1. Arcadia Inc; www.arcadiainc.com.

2. EFCO Corp; www.efcocorp.com.
3. Wausau; www.wausauwindow.com.

2.3 ALUMINUM-FRAMED STOREFRONT SYSTEMS

- A. Source Limitations: Obtain all components of storefront system, including framing, entrances and accessories, from single manufacturer.
- B. Basis-of-Design Products:
 1. Exterior: Kawneer 451T.
 2. Interior: Kawneer 451.
- C. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
 1. Framing: 2-1/4-inches wide by 4-1/2 inches deep framing members, captured offset glazed at head and sill, 2-sided structural silicone vertical joints and at corners, screw spline, shear block, or compensating stick for 1-inch thick insulating glass units.
 2. Construction: Thermally-broken at exterior installations.
 3. Glazing System: Retained mechanically with gaskets on four sides.
 4. Glazing Plane: Center or as indicated.
 5. Finish: High-performance organic finish; refer to Finishes article below.
 6. Fabrication Method: Field-fabricated stick system.
- D. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.
- E. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- F. Materials:
 1. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - a. Sheet and Plate: ASTM B 209.
 - b. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
 - c. Extruded Structural Pipe and Tubes: ASTM B 429.
 - d. Structural Profiles: ASTM B 308.
 2. Steel Reinforcement: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM, and prepare surfaces according to applicable SSPC standard.
 - a. Structural Shapes, Plates, and Bars: ASTM A 36.
 - b. Cold-Rolled Sheet and Strip: ASTM A 1008.
 - c. Hot-Rolled Sheet and Strip: ASTM A 1011.

2.4 ENTRANCE DOOR SYSTEMS

- A. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing or automatic operation. Storefront doors as indicated, with ADA actuator and egress hardware.

- B. Exterior aluminum entrance doors, basis-of-design product: As selected by Architect.
- C. Door Construction: 1-3/4-inch overall thickness, with minimum 0.125-inch-thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.
 - 1. Door Design:
 - a. Stiles: Wide stile; 5 inches
 - b. Top Rail: Wide stile; 5 inches.
 - c. Bottom Rail: 10 inches.
 - 2. Glazing Stops and Gaskets: Beveled, snap-on, extruded-aluminum stops and preformed gaskets.
 - 3. Finish: Match adjacent storefront framing finish.

2.5 ENTRANCE DOOR HARDWARE

- A. Entrance Door Hardware: Hardware not specified in this Section is specified in Section 08 71 00 "Door Hardware."
- B. Cylinders: As specified in Section 08 71 00 "Door Hardware."
- C. Butt Hinges: BHMA A156.1, Grade 1, radius corner.
 - 1. Nonremovable Pins: Provide setscrew in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while entrance door is closed.
 - 2. Exterior Hinges: Stainless steel, with stainless-steel pin Nonferrous Insert material.
 - 3. Quantities:
 - a. For doors up to 87 inches high, provide three hinges per leaf.
 - b. For doors more than 87 and up to 120 inches high, provide four hinges per leaf.
- D. Mortise Auxiliary Locks: BHMA A156.5, Grade 1.
- E. Panic Exit Devices: BHMA A156.3, Grade 1, listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305.
- F. Strikes: Provide strike with black-plastic dust box for each latch or lock bolt; fabricated for aluminum framing.
- G. Operating Trim: BHMA A156.6.
- H. Closers: As specified in Section 08 71 00 "Door Hardware."
- I. Concealed Overhead Holders and Stops: BHMA A156.8, Grade 1.
- J. Door Stops: BHMA A156.16, Grade 1, floor or wall mounted, as appropriate for door location indicated, with integral rubber bumper.
- K. Weather Stripping: Manufacturer's standard replaceable components.
 - 1. Compression Type: Made of ASTM D 2000 molded neoprene or ASTM D 2287 molded PVC.
 - 2. Sliding Type: AAMA 701/702, made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.
- L. Weather Sweeps: Manufacturer's standard exterior-door bottom sweep with concealed fasteners on mounting strip.

- M. Thresholds: BHMA A156.21 raised thresholds beveled with a slope of not more than 1:2, with maximum height of 1/2 inch.
- N. Finger Guards: Manufacturer's standard collapsible neoprene or PVC gasket anchored to frame hinge-jamb at center-pivoted doors.

2.6 GLAZING

- A. Glazing: Refer to Section 08 80 00 "Glazing."
- B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.
- C. Glazing Sealants: Comply with Section 08 80 00 "Glazing."
- D. Structural Glazing Sealants: ASTM C 1184 chemically curing silicone formulation that is compatible with system components with which it comes in contact; specifically formulated and tested for use as structural sealant and approved by structural-sealant manufacturer for use in storefront system indicated.
 - 1. Color: As selected by Architect from manufacturer's full range of colors.
- E. Weatherseal Sealants: ASTM C 920 for Type S; Grade NS; Class 25; Uses NT, G, A, and O; chemically curing silicone formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural-sealant, weatherseal-sealant, and structural-sealant-glazed storefront manufacturers for this use.
 - 1. Color: Match structural sealant.

2.7 ACCESSORIES

- A. Automatic Door Operators: Section 08 71 00 "Door Hardware".
- B. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
 - 1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
 - 2. Reinforce members as required to receive fastener threads.
 - 3. Use exposed fasteners with countersunk Phillips screw heads, fabricated from 300 series stainless steel.
- C. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
- D. Bituminous Paint: Cold-applied asphalt-mastic paint containing no asbestos, formulated for 30-mil thickness per coat.
- E. Rigid PVC Filler.

2.8 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- C. Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.
 - 2. Accurately fitted joints with ends coped or mitered.

3. Physical and thermal isolation of glazing from framing members.
 4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 5. Provisions for field replacement of glazing from exterior interior for vision glass and exterior for spandrel glazing or metal panels.
 6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- E. Structural-Sealant-Glazed Framing Members: Include accommodations for using temporary support device to retain glazing in place while structural sealant cures.
- F. Storefront Framing: Fabricate components for assembly using screw-spline system.
- G. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.
1. At interior and exterior doors, provide compression weather stripping at fixed stops.
- H. Entrance Doors: Reinforce doors as required for installing entrance door hardware.
1. At pairs of exterior doors, provide sliding-type weather stripping retained in adjustable strip and mortised into door edge.
 2. At exterior doors, provide weather sweeps applied to door bottoms.
- I. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.
- J. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.9 ALUMINUM FINISHES

- A. High-Performance Organic Finish: Two-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF or FEVE resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
1. Approved PVDF Resin Products:
 - a. Hylar 5000 by Solvay; www.solvay.com.
 - b. Kynar 500 by Arkema; www.kynar500.com.
 2. Approved Fluoropolymer Coating Products:
 - a. Duranar by PPG IdeaScapes; www.ppgideasapes.com.
 - b. Fluropon by Valspar Corp., div. of The Sherwin-Williams Co.; www.valsparcoilextrusion.com.
 3. Exposed Finish: Two-coat fluoropolymer (PVDF) finish.
 4. Color: Manufacturer's standard black as approved by Architect.

2.10 SOURCE QUALITY CONTROL

- A. Structural Sealant: Perform quality-control procedures complying with ASTM C 1401 recommendations, including, but not limited to, assembly material qualification procedures, sealant testing, and assembly fabrication reviews and checks.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- A. Prepare surfaces that are in contact with structural sealant according to sealant manufacturer's written instructions, to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.

3.3 INSTALLATION

- A. General:
 - 1. Comply with manufacturer's written instructions.
 - 2. Do not install damaged components.
 - 3. Fit joints to produce hairline joints free of burrs and distortion.
 - 4. Rigidly secure nonmovement joints.
 - 5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
 - 6. Seal perimeter and other joints watertight unless otherwise indicated.
- B. Metal Protection:
 - 1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
 - 2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- C. Install components plumb and true in alignment with established lines and grades.
- D. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.
- E. Install glazing as specified in Section 08 80 00 "Glazing."
- F. Install weatherseal sealant according to Section 07 92 00 "Joint Sealants" and according to sealant manufacturer's written instructions to produce weatherproof joints. Install joint filler behind sealant as recommended by sealant manufacturer.
- G. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.
 - 1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
 - 2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

3.4 ERECTION TOLERANCES

- A. Erection Tolerances: Install aluminum-framed entrances and storefronts to comply with the following maximum tolerances:
 - 1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.

2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
3. Alignment:
 - a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
 - b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
 - c. Where surfaces are separated by reveal or protruding element of 1 inch wide or more, limit offset from true alignment to 1/4 inch.
4. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Field Quality-Control Testing: Perform the following test on representative areas of aluminum-framed entrances and storefronts.
 1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested according to the following and shall not evidence water penetration and meet specified air-infiltration requirements.
 - a. Perform tests on 2.5 percent of total units minimum at the following three testing points during the installation: 25 percent complete, 50 percent complete and 75 percent complete, at installed locations as directed by Architect.
 2. Air Infiltration: Testing per ASTM E 783 as follows:
 - a. Test Pressure: That required to determine compliance with performance indicated.
 - b. Allowable Air-Leakage Rate: 1.5 times the applicable rate for product type and performance indicated.
 3. Water Penetration: Testing per ASTM E 1105 as follows.
 - a. Field Test Pressure: 8 lbs/sq. ft test pressure required to determine compliance with performance indicated.
 - b. Allowable Water Infiltration: No water leakage allowed as defined by ASTM E1105 for performance indicated.
 4. Testing shall be conducted after perimeter sealants have cured, but prior to exterior cladding and interior finishes installation, allowing adjacent weather barrier system to be included in testing and inspection.
 5. Test Reports: Prepared according to AAMA 503.
- C. Systems will be considered defective if they do not pass tests and inspections.
 1. Upon failure, replace defective units and retest opening plus two additional openings at no cost to Owner.
- D. Structural-Sealant Adhesion: Test structural sealant according to recommendations in ASTM C 1401, Destructive Test Method A, "Hand Pull Tab (Destructive)," Appendix X2.
 1. Test a minimum of six areas on each building facade.
 2. Repair installation areas damaged by testing.
- E. Prepare test and inspection reports.

3.6 MAINTENANCE SERVICE

A. Entrance Door Hardware:

1. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of entrance door hardware.
2. Initial Maintenance Service: Beginning at Substantial Completion, provide six months' full maintenance by skilled employees of entrance door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper entrance door hardware operation at rated speed and capacity. Use parts and supplies that are the same as those used in the manufacture and installation of original equipment.

3.7 ENTRANCE DOOR HARDWARE SETS

- A. Refer to Section 08 71 00.01 "Door Hardware Sets".

3.8 ADJUSTING, CLEANING, AND PROTECTION

- A. Lubricate hardware and moving parts.
- B. Adjust operating panels and screens to provide a tight fit at contact points and weather stripping for smooth operation, without binding, and a weathertight closure. Adjust hardware for proper alignment, smooth operation, and proper latching without unnecessary force or excessive clearance.
- C. Clean exposed surfaces immediately after installing units. Avoid damaging protective coatings and finishes. Remove nonpermanent labels, excess sealants, glazing materials, dirt, and other substances.
- D. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- E. Protect surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances contact surfaces, remove contaminants immediately according to manufacturer's written instructions.
- F. Refinish or replace units with damaged finishes.
- G. Replace damaged components.

END OF SECTION

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SECTION 08 54 13 - FIBERGLASS WINDOWS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Fiberglass windows.
 - 2. Delegated design.
- B. Related Requirements:
 - 1. Section 01 61 16 "Delegated Design Requirements" for delegated design for deferred submittal.
 - 2. Section 07 25 00 "Weather Barriers".
 - 3. Section 07 62 00 "Sheet Metal Flashing and Trim".
 - 4. Section 07 92 00 "Joint Sealants".

1.3 SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, glazing and fabrication methods, dimensions of individual components and profiles, hardware, and finishes for fiberglass windows.
- B. Shop Drawings: For fiberglass windows.
 - 1. Include plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant installation.
- C. Samples: For each exposed product and for each color specified, 2 by 4 inches in size.
- D. Samples for Initial Selection: For units with factory-applied finishes.
 - 1. Include Samples of hardware and accessories involving color selection.
- E. Samples for Verification: For fiberglass windows and components required, prepared on Samples of size indicated below:
 - 1. Exposed Finishes: 2 by 4 inches.
 - 2. Exposed Hardware: Full-size units.
- F. Delegated-Design Submittal: For fiberglass windows indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- G. Product Schedule: For fiberglass windows. Use same designations indicated on Drawings.
- H. Qualification Data: For manufacturer and Installer.
- I. Product Test Reports: For each type of fiberglass window, for tests performed by a qualified testing agency.
- J. Field quality-control reports.

- K. Sample Warranties: For manufacturer's warranties.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer capable of fabricating fiberglass windows that meet or exceed performance requirements indicated and of documenting this performance by test reports and calculations.
- B. Mockups:
 - 1. Integrated Exterior Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - a. Build mockup of typical wall area as selected by Architect.
 - b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - c. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- C. Freestanding Exterior Systems Mockup: Coordinate provision of scope in this Section to Freestanding Exterior Systems Mockup; refer to Section 01 40 00 "Quality Requirements".

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project Site.
 - 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 2. Review, discuss, and coordinate the interrelationship of fiberglass windows with other exterior wall components. Include provisions for anchoring, flashing, weeping, sealing perimeters, and protecting finishes.
 - 3. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
 - 4. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.

1.6 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace fiberglass windows that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Failure to meet performance requirements.
 - b. Structural failures including excessive deflection, water leakage, and air infiltration.
 - c. Faulty operation of movable sash and hardware.
 - d. Deterioration of materials and finishes beyond normal weathering.
 - e. Failure of insulating glass.
 - 2. Warranty Period:
 - a. Window: Ten (10) years from date of Substantial Completion.
- B. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Glass coatings include but

are not limited to low-emissivity (low-e) coatings and spandrel coatings. 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: Ten (10) years from date of Substantial Completion.

C. Manufacturer's Special Warranty for Insulating Glass Units (IGUs): 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 the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1. Warranty Period: Ten (10) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 WINDOW PERFORMANCE REQUIREMENTS

A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.

1. Window Certification: WDMA certified with label attached to each window.

B. Performance and Grade: AAMA/ WDMA/ CSA 101/ I.S.2/ A440 as follows:

1. Minimum Performance Class: CW.

2. Performance Grade: Grade as required based on location and configuration. Refer to Structural Drawings for wind criteria.

a. For Fixed Windows: Minimum CW-95.

b. For Operable Window (Inswing or Outswing): Minimum CW-45.

c. For Swinging Doors (Inswing or Outswing): Minimum CW-35.

C. Thermal Transmittance: NFRC 100 maximum whole-window U-factor of 0.28 Btu/sq. ft. x h x deg F.

D. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum whole-window SHGC of 0.31.

E. U-Factor: 0.30 Btu/(hr x sqft x °F) maximum.

F. Visible Light Transmittance (VLT): 0.70.

G. Sound Transmission Class (STC): Rated for not less than 34 STC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E413.

H. Outside-Inside Transmission Class (OITC): Rated for not less than 28 OITC when tested for laboratory sound transmission loss according to ASTM E90 and determined by ASTM E1332.

I. Water Penetration under Static Pressure: Test according to ASTM E331 as follows:

1. No evidence of water penetration through fixed glazing and framing areas of entrance doors when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 6.9 lbf/sq. ft..

2.2 MANUFACTURERS

A. Source Limitations: Obtain fiberglass windows from single source from single manufacturer.

B. Basis-of-Design Manufacturer: Milgard Manufacturing Inc.; www.milgard.com.

- C. Other Approved Manufacturers:
 - 1. Accurate Dorwin; www accuratedorwin.com.
 - 2. Alpen High Performance Products; www thinkalpen.com.
 - 3. Cascadia Windows Ltd.; www.cascadiawindows.com.
 - 4. Marvin; www.marvin.com.
 - 5. Pella Corp.; www.pella.com.

2.3 FIBERGLASS WINDOWS

- A. Basis-of-Design Product: Ultra Series C650 Picture Window by Milgard.
- B. Operating Types: Provide operating types indicated in Door Schedule in Drawings.
- C. Frames: Pultruded fiberglass complying with AAMA/WDMA/CSA 101/I.S.2/A440 and with exposed exterior fiberglass surfaces finished with manufacturer's standard enamel coating complying with AAMA 613 and AAMA 623.
 - 1. Exterior Color: Manufacturer's standard "Black".
 - 2. Interior Finish: Manufacturer's standard "White".
 - 3. Casement Depth: 1-3/8 inch setback.
- D. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.
 - 1. Insulating-Glass Units: Provide factory-glazed insulating glazing units (IGUs).
 - a. Glass: ASTM C1036, Type 1, Class 1, q3, clear.
 - b. Outer Lite: Clear float glass, thickness as indicated, with low-emissivity (low-E) coating on no. 2 surface.
 - 1) Low-E Coating Basis-of-Design Product: Solarban by Vitro Architectural Glass; www.vitroglazings.com.
 - c. Interspace Content: Argon.
 - d. Inner Lite: Clear float glass, thickness as indicated.
 - e. Edge Spacer: Gray; warm-edge.
 - f. Safety Glazing: Provide where required by Code.

2.4 HARDWARE

- A. Hardware, General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with adjacent materials; designed to smoothly operate, tightly close, and securely lock fiberglass windows, and sized to accommodate sash weight and dimensions.
 - 1. Exposed Hardware Color and Finish: As selected by Architect from manufacturer's full range.
- B. Operable Windows: For ADA compliance locate hardware below 48 inches.
- C. Projected Window Hardware:
 - 1. Gear-Type Rotary Operators: Complying with AAMA 901 when tested according to ASTM E 405, Method A. Provide operators that function without requiring the removal of interior screens or using screen wickets.
 - a. Type and Style: As selected by Architect from manufacturer's full range of types and styles.

2. Hinges: Manufacturer's standard type for sash weight and size indicated.
 3. Single-Handle Locking System: Operates positive-acting arms that pull sash into locked position. Provide one arm on sashes up to 27-1/2 inches tall and two arms on taller sashes.
 4. Limit Devices: Concealed support arms with adjustable, limited, hold-open limit devices designed to restrict sash opening.
 - a. Limit clear opening to no more than 4 inches for ventilation; with custodial key release.
- D. Integrated Louver Assemblies: Provide manufacturer's standard louvers to be integrated with window assemblies where indicated.
- E. Weather Stripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.
- F. Flashing: Provide manufacturer's standard, continuous flashing attachment angle.
- G. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.
1. Exposed Fasteners: Do not use exposed fasteners to greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.
- 2.5 ACCESSORIES
- A. Jamb Extensions: Aluminum; profiles as indicated on Drawings.
 - B. Mulling Coupler: Manufacturer's standard coupler for installation of aluminum entrances within fiberglass window framing system.
- 2.6 INSECT SCREENS
- A. General: Fabricate insect screens to integrate with window frame. Provide screen for each operable exterior sash. Screen wickets are not permitted.
 1. Type and Location: Full, inside for project-out for operable sashes.
 - B. Aluminum Frames: Manufacturer's standard aluminum alloy complying with SMA 1004 or SMA 1201. Fabricate frames with mitered or coped joints or corner extrusions, concealed fasteners, and removable PVC spline/anchor concealing edge of frame.
 1. Tubular Framing Sections and Cross Braces: Roll formed from aluminum sheet.
 2. Finish for Interior Screens: Baked-on organic coating in color selected by Architect from manufacturer's full range.
 - C. Glass-Fiber Mesh Fabric: 18-by-14 or 18-by-16 mesh of PVC-coated, glass-fiber threads; woven and fused to form a fabric mesh resistant to corrosion, shrinkage, stretch, impact damage, and weather deterioration. Comply with ASTM D 3656.
 1. Mesh Color: Manufacturer's standard.
- 2.7 FABRICATION
- A. Fabricate fiberglass windows in sizes indicated. Include a complete system for installing and anchoring windows.
 - B. Glaze fiberglass windows in the factory.
 - C. Weather strip each operable sash to provide weathertight installation.

- D. Mullions: Provide mullions and cover plates, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections. Provide mullions and cover plates capable of withstanding design wind loads of window units.
- E. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation. Allow for scribing, trimming, and fitting at Project site.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Verify rough opening dimensions, levelness of sill plate, and operational clearances.
- C. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure weathertight window installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with Architectural details where they exceed the minimum installation requirements in ASTM E2112.
- B. Install windows level, plumb, square, true to line, without distortion, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
 - 1. Testing and inspecting agency will interpret tests and state in each report whether tested work complies with or deviates from requirements.
- B. Testing Services: Test windows only; patio doors do not require testing. Testing and inspecting of installed windows shall take place as follows:
 - 1. Testing Methodology: Testing of windows for air infiltration and water resistance shall be performed according to AAMA 502 and/ or ASTM E 1105, and as indicated.
 - 2. Water-Resistance Testing: Perform regardless of Code requirements.
 - a. Test Pressure: Two-thirds times test pressure required to determine compliance with AAMA/ WDMA/ CSA 101/ I.S.2/ A440 performance grade indicated.
 - b. Allowable Water Infiltration: Pass (no water penetration).
 - 3. Testing Extent: Three windows of each type at locations as selected by Architect. Windows shall be tested after perimeter sealants have cured.
 - a. Test windows, at 15 percent, 60 percent and 85 percent competition.
 - 4. Testing shall occur prior to the installation of interior finishes and prior to exterior finishes around windows at all locations.
 - 5. Testing shall occur in conjunction with opening testing specified in other Sections.

- 6. Test Reports: Prepared according to ASTM E1105.
 - C. Windows will be considered defective if they do not pass tests and inspections.
 - 1. Upon failure, replace defective units and retest opening plus two additional openings at no cost to Owner.
 - D. Prepare test and inspection reports.
- 3.4 ADJUSTING, CLEANING, AND PROTECTION
- A. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.
 - B. Clean exposed surfaces immediately after installing windows. Remove excess sealants, glazing materials, dirt, and other substances.
 - 1. Keep protective films and coverings in place until final cleaning.
 - C. Remove and replace sashes if glass has been broken, chipped, cracked, abraded, or damaged during construction period.
 - D. Protect window surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written instructions.

END OF SECTION

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SECTION 08 63 00 - METAL-FRAMED SKYLIGHTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes:

1. Skylights with metal framing.
2. Glazing.
3. Built-in shading devices.
4. Delegated design.

- B. Related Requirements:

1. Section 01 61 16 "Delegated Design Requirements".
2. Section 06 10 00 "Rough Carpentry".
3. Section 07 62 00 "Sheet Metal Flashing and Trim" for field formed flashings and other sheet metal work.
4. Section 07 92 00 "Joint Sealers" for perimeter sealant.
5. Section 08 80 00 "Glazing".

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 SUBMITTALS

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

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for metal-framed skylights.

- B. Shop Drawings: For metal-framed skylights.

1. Include plans, elevations, sections, and attachment details.
2. Indicate structural loadings and reactions to be transmitted to supporting curbs.
3. Include details of provisions for assembly expansion and contraction and for draining moisture within the assembly to the exterior.
4. Include full-size isometric details of each vertical-to-horizontal intersection of assembly, showing the following:
 - a. Joinery including concealed welds.
 - b. Anchorage.
 - c. Expansion provisions.
 - d. Glazing.
 - e. Flashing and drainage.

- C. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
 - D. Fabrication Sample: Of each framing intersection of assemblies, made from 12-inch lengths of full-size components and showing details of the following:
 - 1. Joinery including concealed welds.
 - 2. Anchorage.
 - 3. Expansion provisions.
 - 4. Glazing.
 - 5. Flashing and drainage.
 - E. Delegated-Design Submittal: For metal-framed skylights indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - F. Qualification Data: For Installer.
 - G. Compatibility and Adhesion Test Reports: For structural-sealant-glazed skylights, test reports from sealant manufacturer indicating that joint sealants have been tested for each material that will contact sealants.
 - H. Product Test Reports: For metal-framed skylights, for tests performed by a qualified testing agency.
 - I. Field quality-control reports.
 - J. Sample Warranties: For special warranties.
- 1.5 QUALITY ASSURANCE
- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of metal-framed skylights required for this Project.
 - B. Structural-Sealant Glazing: Comply with recommendations in ASTM C 1401, "Guide for Structural Sealant Glazing," for joint design and quality-control procedures.
 - 1. Joint designs are reviewed and approved by structural-sealant manufacturer.
 - 2. Quality-control program development and reporting comply with ASTM C 1401 recommendations for material qualification procedures, preconstruction sealant-testing program, and procedures and intervals for fabrication and installation reviews and checks.
 - 3. Perform manufacturer's standard tests for compatibility and adhesion of sealants with each material that will come in contact with sealants.
 - C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 - 1. Build mockup of typical metal-framed skylights as shown on Drawings.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 WARRANTY

- A. **Manufacturer's Warranty:** Manufacturer agrees to repair or replace components of metal framed skylights 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. Noise or vibration caused by thermal movements.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - d. Adhesive or cohesive sealant failures.
 - e. Water leakage.
 - 2. Warranty Period: Five (5) years from date of Substantial Completion.
- B. **Special Aluminum-Finish Warranty:** Manufacturer agrees to repair or replace components on which finishes fail within specified warranty period. Warranty does not include normal weathering.
 - 1. Failures include, but are not limited to, checking, crazing, peeling, chalking, and fading of finishes.
 - 2. Warranty Period: Twenty (20) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. **Delegated Design:** For the following applications, if structural design is not indicated in the Drawings, provide delegated design with deferred submittal to the authority having jurisdiction (AHJ).
 - 1. Skylights with metal framing.
- B. **Delegated Design:** Engage a qualified professional engineer, as defined in Section 01 61 16 "Delegated Design Requirements," to design metal-framed skylights.
- C. **Structural Loads:** As indicated on Drawings.
 - 1. **Skylight Opening and Fall Protection:** Skylight system is to be designed to resist a concentrated load of 200 pounds, with a safety factor of 4, over one square foot area anywhere on the skylight frame or glass, providing opening protection in accordance with Oregon OSHA without the use of screens or guardrails
- D. **Deflection of Framing Members:** At design wind pressure, as follows:
 - 1. **Deflection Normal to Glazing Plane:** Limited to edge of glass in a direction perpendicular to glass plane not exceeding $L/175$ of the glass edge length for each individual glazing lite, $1/175$ of clear span for spans up to 13 feet 6 inches and to $1/240$ of clear span plus $1/4$ inch for spans more than 13 feet 6 inches, or an amount that restricts edge deflection of individual glazing lites to $3/4$ inch, whichever is less.
 - 2. **Deflection Parallel to Glazing Plane:** Limited to $L/360$ of clear span or $1/8$ inch, whichever is smaller or, amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than $1/8$ inch.
- E. **Lateral Bracing of Framing Members:** Compression flanges of flexural members are laterally braced by cross members with minimum depth equal to 50 percent of flexural member that is braced. Glazing does not provide lateral support.

- F. Structural-Test Performance: Metal-framed skylights tested according to ASTM E330, as follows:
 - 1. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified deflection limits.
 - 2. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
 - 3. Test Durations: As required by design wind velocity, but not less than 10 seconds.
- G. Air Infiltration: Metal-framed skylights with maximum air leakage through fixed glazing and framing areas of 0.06 cfm/sq. ft. of when tested according to ASTM E283 at a minimum static-air-pressure difference of 6.24 lbf/sq. ft.
- H. Water Penetration under Static Pressure: Metal-framed skylights that do not evidence water penetration through fixed glazing and framing areas when tested according to ASTM E331 at a minimum static-air-pressure difference of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft.
- I. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
- J. Condensation Resistance: Metal-framed skylights with fixed glazing and framing areas having condensation-resistance factor (CRF) of not less than 53 when tested according to AAMA 1503.
 - 1. Haze Factor: Greater than 90 percent when tested according to ASTM D1003.
- K. Structural Sealant: Capable of withstanding tensile and shear stresses imposed without failing adhesively or cohesively. When tested for preconstruction adhesion and compatibility, cohesive failure of sealant shall occur before adhesive failure.
- L. Energy Performance: Provide metal-framed skylights with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below and certified and labeled according to NFRC:
 - 1. Thermal Transmittance (U-Factor): Fixed glazing and framing areas shall have U-factor of not more than 0.50 Btu/sq. ft. x h x deg F as determined according to NFRC 100.
 - 2. Solar Heat Gain Coefficient: Fixed glazing and framing areas shall have a solar heat gain coefficient of no greater than 0.35 as determined according to NFRC 200.

2.2 METAL-FRAMED SKYLIGHTS

- A. Metal-Framed Skylights: Glazed skylight assemblies supported by aluminum framing.
- B. Basis-of-Design Product: Fixed Curb-Mounted (FCM) Skylight by Velux; www.veluxusa.com.
 - 1. Unit Shape and Size: As selected by Architect.
 - 2. Retainer Finish: As selected by Architect.
- A. Insulating Glass: Factory-assembled and -installed, UV-resistant, insulating glass unit (IGU) comprised of a tempered outer glass lite with low-emissivity (low-E) coating on #2 surface, 3/8 inch air space, and a heat-strengthened, translucent, laminated glass inner lite.
 - 1. Basis-of-Design Product, Coating: Manufacturer's standard or recommended low-E coating, or the following:
 - a. Solarban 60 by Vitro Architectural Glass; www.vitro.com.
 - 2. Basis-of-Design Product, Laminated Lite Interlayer: No. 08, "White laminated" by Velux.

- B. Condensation Control: Fabricate unit skylights with integral internal gutters and nonclogging weeps to collect and drain condensation to the exterior.
- C. Thermal Break: Fabricate unit skylights with thermal barrier separating exterior and interior metal framing.
- D. Glazing Gaskets: Manufacturer's standard.
- E. Skylight Shades:
 - 1. Basis-of-Design Product: Light filtering shades by Velux; factory pre-installed.
 - a. Shade Fabric: As selected by Architect from manufacturer's standard range.
- F. Aluminum Framing Systems: Manufacturer's standard extruded-aluminum members of thickness required and reinforced as required to support imposed loads.
- G. Aluminum: Alloy and temper as recommended in writing by manufacturer for type of use and finish indicated.
 - 1. Sheet and Plate: ASTM B209.
 - 2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B221.
 - 3. Extruded Structural Pipe and Tubes: ASTM B429.
 - 4. Structural Profiles: ASTM B308.
- H. Pressure Caps: Manufacturer's standard aluminum components that mechanically retain glazing.
 - 1. Include snap-on aluminum trim that conceals fasteners.
- I. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning skylight components.
- J. Fasteners and Accessories: Manufacturer's standard, corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
 - 1. At pressure caps, use ASTM A193 stainless-steel screws.
 - 2. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
 - 3. Reinforce members as required to receive fastener threads.
 - 4. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system, fabricated from Series 300 stainless steel.
- K. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A123 or ASTM A153 requirements.
- L. Anchor Bolts: ASTM A307, Grade A, galvanized steel.
- M. Concealed Flashing: Manufacturer's standard, corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.
- N. Exposed Flashing and Closures: Manufacturer's standard aluminum components not less than 0.060 inch thick.
- O. Framing Sealants: As specified in Section 07 92 00 "Joint Sealants."
- P. 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.

2.3 GLAZING

- A. Glazing: As specified in Section 08 80 00 "Glazing."

- B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.
- C. Spacers and Setting Blocks: As specified in Section 08 80 00 "Glazing."
- D. Glazing Sealants: As recommended in writing by manufacturer.
- E. Structural Glazing Sealants:
 - 1. Structural Sealant: ASTM C1184, neutral-curing silicone formulation compatible with system components with which it comes in contact, specifically formulated and tested for use as structural sealant, and approved by structural-sealant manufacturer for use in metal-framed skylights indicated.
 - a. Color: Black.
 - 2. Weatherseal Sealant: ASTM C920 for Type S, Grade NS, Class 25, Uses NT, G, A, and O; neutral-curing silicone formulation compatible with structural sealant and other components with which it comes in contact; and recommended in writing by structural- and weatherseal-sealant and metal-framed skylight manufacturers for this use.
 - a. Color: Matching structural sealant.
 - 3. Bond-Breaker Tape: Manufacturer's standard tetrafluoroethylene-fluorocarbon or polyethylene material to which sealants will not develop adhesion.

2.4 FABRICATION

- A. Where practical, fit and assemble metal-framed skylights in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Fabricate aluminum components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.
 - 2. Accurately fitted joints with ends coped or mitered.
 - 3. Internal guttering systems or other means to drain water passing joints and moisture migrating within skylight to exterior.
 - 4. Physical and thermal isolation of glazing from framing members.
 - 5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
- C. Fabricate aluminum sill closures with weep holes and for installation as continuous component.
- D. Reinforce aluminum components as required to receive fastener threads.
- E. Factory-Glazed, Metal-Framed Skylights:
 - 1. Factory install glazing to comply with requirements in Section 08 80 00 "Glazing."
- F. Structural-Sealant-Glazed, Metal-Framed Skylights: Prepare surfaces that will contact structural sealant according to structural-sealant manufacturer's written instructions to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.
- G. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.5 ALUMINUM FINISHES

- A. High-Performance Organic Finish: Three-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color and clear coat. Prepare,

pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Approved PVDF Resin Products:
 - a. Hylar 5000 by Solvay; www.solvay.com.
 - b. Kynar 500 by Arkema: www.kynar500.com.
2. Approved Fluoropolymer Coating Product:
 - a. Duranar by PPG IdeaScapes; www.ppgideasclapes.com.
 - b. Fluropon by Valspar Corp., div. of The Sherwin-Williams Co.; www.valsparcoilextrusion.com.
3. Color: As selected by Architect from manufacturer's full range.

2.6 SOURCE QUALITY CONTROL

- A. Structural-Sealant Glazing: Perform quality-control procedures complying with ASTM C1401 recommendations including, but not limited to, material qualification procedures, sealant testing, and fabrication reviews and checks.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 INSTALLATION

- A. General: Comply with manufacturer's written instructions.
 1. Do not install damaged components.
 2. Fit joints between aluminum components to produce hairline joints free of burrs and distortion.
 3. Rigidly secure nonmovement joints.
 4. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
 5. Seal joints watertight unless otherwise indicated.
- B. Metal Protection: Where aluminum will contact dissimilar materials, protect against galvanic action by painting contact surfaces with protective coating or by installing nonconductive spacers as recommended in writing by manufacturer for this purpose.
- C. Install continuous aluminum sill closure with weatherproof expansion joints and locked and sealed or welded corners. Locate weep holes at rafters.
- D. Install components to drain water passing joints, and moisture migrating within skylight to exterior.
- E. Install components plumb and true in alignment with established lines and elevations.
- F. Glazing: Install glazing as specified in Section 08 80 00 "Glazing."
- G. Structural-Sealant Glazing:
 1. Prepare surfaces that will contact structural sealant according to structural-sealant manufacturer's written instructions to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.

2. Install weatherseal sealant according to weatherseal-sealant manufacturer's written instructions to produce weatherproof joints. Install joint filler behind weatherseal sealant as recommended in writing by weatherseal-sealant manufacturer.
- H. Erection Tolerances: Install metal-framed skylights to comply with the following maximum tolerances:
1. Alignment: Limit offset from true alignment to 1/32 inch where surfaces abut in line, edge to edge, at corners, or where a reveal or protruding element separates aligned surfaces by less than 3 inches; otherwise, limit offset to 1/8 inch.
 2. Location and Plane: Limit variation from true location and plane to 1/8 inch in 12 but no greater than 1/2 inch over total length.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
1. Water-Spray Test: Before installation of interior finishes has begun, skylights shall be tested according to AAMA 501.2 and shall not evidence water penetration.
 2. Structural-Sealant Compatibility and Adhesion: Structural sealant shall be tested according to ASTM C1401.
 - a. Destructive test method, Method A, Hand Pull Tab (Destructive) in ASTM C1401, Appendix X2, shall be used.
 - 1) A minimum of two area(s) on each skylight face shall be tested.
 - 2) Repair installation areas damaged by testing.
 3. Structural-Sealant Glazing Inspection: After installation of metal-framed skylights is complete, structural-sealant glazing shall be inspected and evaluated according to ASTM C1401 recommendations for quality-control procedures.
- B. Repair or remove work where test results and inspections indicate that it does not comply with specified requirements.
- C. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- D. Prepare test and inspection reports.

3.4 CLEANING AND PROTECTION

- A. Clean exposed surfaces immediately after installing skylights. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- B. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- C. Protect skylights from contact with contaminating substances resulting from construction operations. If contaminating substances do contact skylight surfaces, remove contaminants immediately according to manufacturer's written instructions.

END OF SECTION

SECTION 08 71 00 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Work under this Section includes the complete finish hardware requirements for the project. Quantities listed are for the contractor's convenience only and are not guaranteed. Items not specifically mentioned, but necessary to complete the work shall be furnished, matching the items specified in quality and finish.
- B. Related Requirements:
1. Section 01 61 16 "Delegated Design Requirements".
 2. Section 08 14 16 "Flush Wood Doors".
 3. Section 08 42 13 "Aluminum-Framed Entrances and Storefronts".

1.3 QUALITY ASSURANCE

- A. Product Qualification:
1. To assure a uniform high quality of materials for the project, it is intended that only specified items be furnished. Comparable products may be accepted upon prior approval of architect.
 2. Hardware to be new, free of defects, blemishes and excessive play. Obtain each kind of hardware (Mechanical latch and locksets, exit devices, hinges and closers) from one manufacturer except where specified.
 3. Fire-Rated opening in compliance with NFPA80. Hardware UL10C/UBC-7-2 (positive pressure) compliant for given type/size opening and degree of label. Provide proper latching hardware, non-flaming door closers, approved bearing hinges and smoke seal. Furnish openings complete.
- B. Supplier Qualifications:
1. Hardware supplier will be a direct factory contract supplier who employs a certified Architectural Hardware Consultant (AHC) available at all reasonable times during the course of the work for project hardware consultation to owner, architect and contractor.
 2. Supplier will be responsible for detailing, scheduling and ordering of finish hardware.
 3. Conduct pre-installation conference at jobsite. Initiate and conduct with supplier, installer and related trades. Coordinate materials and techniques and sequence complex hardware items and systems installation.
 4. Key Conference shall be initiated and conducted with owner to determine system, keyway(s) and structure.
- C. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.4 REFERENCES

- A. NFPA80 – Fire Doors and Windows

- B. NFPA101 – Life Safety Code
- C. NFPA105 – Smoke and Draft Control Door Assemblies
- D. ANSI A117.1–Accessible and Usable Buildings and Facilities
- E. OSSC 2014 – Oregon Structural Specialty Code

1.5 SUBMITTALS

- A. Hardware Schedule: Submit digital copies of schedule. Organize vertically formatted schedule into Hardware Sets with index of doors and headings, indication complete designations of every item required for each door or opening. Include the following:
 - 1. Type, style, function, size, quantity and finish of hardware items.
 - 2. Name, part number and manufacture of each item.
 - 3. Fastenings and other pertinent information.
 - 4. Explanation of abbreviations, symbols and codes contained in schedule.
 - 5. Door and frame sizes, materials and degrees of swing.
- B. Product Data: Submit digital copies for each product indicated.
- C. Maintenance Data: For each type of door hardware to include in maintenance manuals specified in Division 01.
- D. Delegated-Design Submittal: For door hardware indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- E. Keying Schedule: Prepared by or under the supervision of supplier, after receipt of the approved finish hardware schedule, detailing Owner's final keying instructions for locks.
- F. Samples: Upon request submit material samples.
- G. Qualification Data:
 - 1. For manufacturer.
 - 2. For installer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, handle and protect products to project site under provisions of Division 01 and as specified herein.
- B. Tag each item or package separately, with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver keys to Owner by registered mail.

1.7 WARRANTY

- A. The finish hardware shall have a limited warranty against defects in workmanship and operation for a period of one year from date of substantial completions and the following items are as shown:
 - 1. Closers: Thirty years mechanical, two years electrical.
 - 2. Exit Devices: Three years mechanical, one year electrical.
 - 3. Locksets: Three years mechanical, one year electrical.

PART 2 - PRODUCTS

2.1 MATERIAL AND FABRICATION

- A. Provide all door hardware for complete work, in accordance with the drawings and as specified herein.
- B. Provide items and quantities not specifically mentioned to ensure a proper and complete operational installation.

2.2 MANUFACTURERS

- A. Approval of products from manufacturers indicated as "Approved Manufacturer" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.

ITEM	SCHEDULED MANUFACTURER	OTHER APPROVED MANUFACTURER
Hinges	Ives (IVE)	Bommer, Stanley
Pivots	Ives (IVE)	Rixson
Flush Bolts & Coordinators	Ives (IVE)	DCI
Locksets & Deadlocks	Schlage (SCH)	None
Exit Devices & Mullions	Falcon (FAL)	LCN
Electric Strikes	Von Duprin (VON)	[Owner acceptable]
Power Supplies	Schlage Electronics (SCE)	Von Duprin (VON)
Cylinders & Keying	Schlage (SCH)	None
Door Closers	LCN (LCN)	None
Floor Closers	Dorma (DO)	Rixson
Automatic Operators	LCN (LCN)	[Owner acceptable]
Door Trim	Ives (IVE)	[Owner acceptable]
Protection Plates	Ives (IVE)	Tice, Trimco
Overhead Stops	Glynn-Johnson (GLY)	Ives, Trimco
Thresholds & Weatherstrip	National Guard (NGP)	Pemko, Reese

2.3 HANGING

- A. Conventional Hinges: Hinge open width minimum, but of sufficient throw to permit maximum door swing. Steel or stainless steel pins:
 1. Three hinges per leaf to 7 feet, 6-inch height. Add one for each additional 30 inches in height or any fraction thereof.
 2. Provide 4-1/2 x 4-1/2 for 1-3/4 inch thick doors up to 35 inches. Provide heavy weight 5 x 4-1/2 for 1-3/4 inch thick doors 36 inches and over.
 3. Outswinging locked doors to have non removable (NRP) pins.
 4. Pin tips, flat button, finish to match leaves.
 5. Doors over 36 inches: Heavy weight.
 6. Doors up to 36 inches: Standard weight.

2.4 LOCKSETS, LATCHSETS, DEADBOLTS

A. Heavy Duty Mortise Locks and Latches: [Owner standard].

1. Provide mortise locks certified as ANSI A156.13, Grade 1 Operational, Grade 1 Security.
2. Provide lock case that is multi-function and field reversible for handing without opening case, and manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance.
3. Provide locks with standard 2-3/4 inches backset with full 3/4 inch throw stainless steel mechanical anti-friction latchbolt. Provide deadbolt with full 1 inch throw, constructed of stainless steel.
4. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
5. Provide electrified options as scheduled in the hardware sets. Provide electrified locksets with micro switch (RX) option that monitors retractor crank, and is actuated when rotation of inside or outside lever rotates retractor hub. Provide normally closed contacts or normally open contacts as required by security system.
6. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.
 - a. Lever Design: Owner standard.

2.5 EXIT DEVICES

A. Panic and Fire Rated Exit Devices: Owner standard.

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1, AND UL listed for Panic Exit or Fire Exit Hardware.
2. Provide touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
3. Quiet Operation: Incorporate fluid damper or other device that eliminates noise of exit device operation.
4. Touchpad: Extend minimum of one half of door width, but not the full length of exit device rail. Provide end-cap with two-point attachment to door. Provide compression springs in devices, latches, and outside trims or controls; tension springs prohibited.
5. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrical requirements.
6. Concealed Vertical Cable Exit Devices: Cable-actuated concealed vertical latch system in two-point and less bottom latch (LBL) configurations. Vertical rods not permitted.
 - a. Cable: Stainless steel core wire in stainless steel with polytetrafluoroethylene (Teflon) liner color-coded to latches and center slides. Conduit and core wire ends snap into latch and center slides without use of tools.
 - b. Latchbolts and Blocking Cams: Manufactured from sintered metal low carbon copper- infiltrated steel, with molybdenum disulfide low friction coating.
 - c. Top Latchbolt: Minimum 0.382 inch (10 mm) and greater than 90degree engagement with strike to prevent door and frame separation under high static load.
 - d. Bottom Latchbolt: Minimum of 0.44 inch (11 mm) engagement with strike.
 - e. Product Cycle Life: 1,000,000 cycles.

- f. Latch Operation: Top and bottom latch operate independently of each other. Top latch fully engages top strike even when bottom latch is compromised. Separate trigger mechanisms not permitted.
- g. Latch release does not require separate trigger mechanism.
- 7. Provide exit devices with manufacturer's approved strikes.
- 8. Provide exit devices cut to door width and height. Locate exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
- 9. Mount mechanism case flush on face of doors, or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
- 10. Removable Mullions: 2 inches x 3 inches steel tube. Where scheduled as keyed removable mullion that is removed by use of a keyed cylinder, which is self-locking when re-installed.
- 11. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.
- 12. Provide electrified options as scheduled in the hardware sets.
- 13. Where lever handles are specified as outside trim for exit devices, provide heavy-duty lever trims with forged or cast escutcheon plates. Provide vandal-resistant levers that will travel to 90-degree down position when more than 35 pounds of torque are applied, and which can easily be re-set.
 - a. Lever Style: Match lever style of locksets.

2.6 ELECTRIC STRIKES

- A. Manufacturers and Products: Owner standard.
 - 1. Provide electric strikes designed for use with type of locks shown at each opening.
 - 2. Provide electric strikes UL Listed as burglary-resistant.
 - 3. Where required, provide electric strikes UL Listed for fire doors and frames.
 - 4. Provide fail-secure type electric strikes, unless specified otherwise.
 - 5. Coordinate voltage and provide transformers and rectifiers for each strike as required.

2.7 KEYS, KEYING, AND KEY CONTROL

- A. See Keying Requirements in this section.

2.8 CLOSERS

- A. Surface Closers: Owner standard.
 - 1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
 - 2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
 - 3. Cylinder Body: 1-1/2 inch diameter with 3/4 inch diameter double heat-treated pinion journal.
 - 4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.

5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
8. Pressure Relief Valve (PRV) Technology: Not permitted.
9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.9 AUTOMATIC OPERATORS

A. Pneumatic automatic operator: Owner standard.

1. Provide low energy automatic operator units that are pneumatically powered complying with ANSI/BHMA A156.19.
2. Provide units with conventional door closer opening and closing forces unless power operator motor is activated. Provide door closer assembly with adjustable spring size, back-check, and opening and closing speed adjustment valves to control door:
 - a. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
 - b. Power: Continuously adjustable over full range of closer sizes, with reduced opening force for physically handicapped.
 - c. Regulation: By tamper-proof, non-critical valves. Provide closers with separate adjustment for latch speed, general speed, and backcheck.
3. Provide separate conduits to carry high and low voltage wiring in compliance with National Electric Code, section 725-31.
4. When obstruction or resistance to opening swing is encountered, operator continues attempting to open door.
5. Provide operator designed to prevent damage to mechanism if system is actuated while door is latched or if door is forced closed during opening cycle.
6. Locate power unit and exhaust away from door to minimize noise and vibration in pedestrian areas.
7. Provide drop plates, brackets, or adapters for arms as required for details.
8. Provide hard-wired actuator switches for operation as specified. Provide weather-resistant actuators at exterior applications.
9. Provide complete assemblies of compressor, control boxes, tubing, switches, power supplies, relays, and parts/material recommended and approved by manufacturer of automatic operator for each individual leaf. Actuators control both doors simultaneously at pairs. Sequence exterior and vestibule doors with automatic operators to allow ingress or egress through both sets of openings as directed by Architect. Locate actuators and other controls as directed by Architect. Consult manufacturer for applications where tubing is run in rated plenums.

10. Provide control box or module with inputs and outputs, which allow sequencing operation, fire alarm system connections, actuators, swing side sensors, stop sensors, and SPDT relay for interfacing with latching or locking devices. Where required provide control box for "blow open" operation controlled by smoke evacuation system.

2.10 OTHER HARDWARE

A. Pocket Door Frame, Track and Lock:

1. Basis-of-Design Product: CS CL400-ADA Magnetic Sliding Door privacy lock; Integrated D-handles; Emergency release with red/green occupancy indicator; by Cavity Sliders USA Inc. www.CavitySliders.com.
2. Other Approved Manufacturer: Cal-Royal Products, Inc.; www.cal-royal.com.

B. Pocket Door Pull:

1. Basis-of-Design Product: Baden Pull (86184) Stainless Steel Baden Pull (S86002) by Emtek Products, Inc.; an Assa Abloy Group Company; www.emtek.com.
2. Other Approved Manufacturer: Cal-Royal Products, Inc.; www.cal-royal.com.

C. Door Stops: Provide stops to protect walls, casework or other hardware.

1. Except as otherwise indicated, provide stops (wall, floor or overhead) at each leaf of every swinging door leaf.
2. Where wall or floor stops are not appropriate, provide overhead holders.

D. Weatherstrip and Gasket:

1. Provide continuous weather-strip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled.
2. Provide non-corrosive fasteners as recommended by the manufacturer for application indicated.

E. Thresholds:

1. Except as otherwise indicated, provide standard metal threshold unit of type, size and profile as detailed or scheduled.

F. Silencers:

1. Interior hollow metal frames, 3 for single doors, 2 for pairs of doors.

G. Kickplates:

1. Four beveled edges, 0.050 inches minimum thickness, height and width as scheduled. Sheet-metal screws of bronze or stainless steel to match other hardware.

2.11 HARDWARE FINISHES

A. Provide the following finishes unless noted differently in hardware groups:

1. Hinges, Exterior: 630 Stainless Steel Exterior.
2. Hinges, Interior: 626 Dull Chrome Interior.
3. Locksets: 626 Dull Chrome.
4. Exit Devices: 626 Dull Chrome.
5. Closers: 689 Aluminum.
6. Kickplates: 630 Stainless Steel.
7. Other Hardware: 626 Dull Chrome.

8. Thresholds: Clear Anodized Aluminum.
9. Weatherstrip and Sweeps: Clear Anodized Aluminum.

2.12 KEYING REQUIREMENTS

- A. All keyed cylinders shall be subject to a new existing Schlage Masterkey system.
- B. Furnish cylinders with construction cores. Following construction, Owner to supply permanent keyed cores.
- C. Cylinders to be furnished with visual key control with key code. Stamped on the face of the keys and marked on the back or side of the cylinders.
- D. Key Quantities: Coordinate with Owner for key quantities.

PART 3 - EXECUTION

3.1 ACCEPTABLE INSTALLERS:

- A. Factory trained, certified, and carries a factory-issued card certifying that person as a "Certified Installer". Alternative: can demonstrate suitably equivalent competence and experience.

3.2 PREPARATION

- A. Ensure that walls and frames are square and plumb before hardware installation.
- B. Locate hardware per SDI-100 and applicable building, fire, life-safety, accessibility, and security codes. Notify Architect of any code conflicts before ordering materials.

3.3 INSTALLATION

- A. Do not install surface mounted items until finishes have been completed on substrate. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate for proper installation and operation.
- B. Locate floor stops not more than 4 inches from the wall.
- C. Drill pilot holes for fasteners in wood doors and/or frames.

3.4 ADJUSTING

- A. Adjust and check for proper operation and function. Replace units, which cannot be adjusted to operate freely and smoothly.
- B. Hardware damaged by improper installation or adjustment methods to be repaired or replaced to Owner's satisfaction.

3.5 FOLLOW UP INSPECTION

- A. Installer to provide letter of agreement to Owner that approximately 6 months after substantial completion, installer will visit project with representative of the manufacturers of the locking devices and door closers to accomplish the following:
 1. Re-adjust locks and closers
 2. Evaluate maintenance procedures and recommend changes or additions, and instruct Owner's personnel.
 3. Identify items that have deteriorated or failed.
 4. Submit written report identifying problems and likely future problems.

3.6 DEMONSTRATION

- A. Demonstrate electrical, electronic and pneumatic hardware system including adjustment and maintenance procedures

3.7 PROTECTION/CLEANING

- A. Cover installed hardware, protect from paint, cleaning agents, weathering, carts/barrows, etc. Remove covering materials and clean hardware just prior to substantial completion. Clean adjacent wall, frame and door surfaces soiled from installation/reinstallation process.

END OF SECTION

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SECTION 08 80 00 - GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Glass for exterior windows, doors, and storefront and entrances.
 - 2. Glass for interior doors and interior borrowed lites.
 - 3. Glazing sealants and accessories.
 - 4. Mirror glass.
- B. Related Requirements:
 - 1. Section 08 14 16 "Flush Wood Doors".
 - 2. Section 08 42 13 "Aluminum-Framed Entrances and Storefronts".
 - 3. Section 08 63 00 "Metal-Framed Skylights".

1.3 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 according to ASTM C 1036.
- C. IBC: International Building Code.
- D. Interspace: Space between lites of an insulating-glass unit.

1.4 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 2. Review temporary protection requirements for glazing during and after installation.

1.6 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 Accessory Samples: For sealants and colored spacers, in 12-inch lengths. Install sealant Samples between two strips of material representative in color of the adjoining framing system.

- D. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
- E. Qualification Data: For Installer manufacturers of insulating-glass units with sputter-coated, low-E coatings.
- F. Product Certificates: For glass.
- G. Preconstruction adhesion and compatibility test report.
- H. Sample Warranties: For special warranties.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved and certified by coated-glass manufacturer.
- B. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.
 - 1. Alternatively, Bidders may be considered appropriate for the Project by providing examples and references for three projects of similar scale and type to this Project, for review and approval by the Architect and Owner.
- C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- D. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

1.8 PRECONSTRUCTION TESTING

- A. Preconstruction Adhesion and Compatibility Testing: Test each glass product, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.
 - 1. Testing is not required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.
 - 2. Use ASTM C 1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
 - 3. Test no fewer than eight Samples of each type of material, including joint substrates, shims, sealant backings, secondary seals, and miscellaneous materials.
 - 4. Schedule enough time for testing and analyzing results to prevent delaying the Work.
 - 5. For materials failing tests, submit sealant manufacturer's written instructions for corrective measures including the use of specially formulated primers.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to 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.

1.10 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.

1.11 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: Ten (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: Ten (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 the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
1. Warranty Period: Ten (10) years from date of Substantial Completion.
- D. Manufacturer's Special Warranty for Intrusion-Resistant Glass Products: 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: Ten (10) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 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 the following: 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 according to the IBC and ASTM E 1300.
1. Thickness of Patterned Glass: Base design of patterned glass on thickness at thinnest part of the glass.

2. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch, whichever is less.
3. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.
- C. Safety Glazing: Where safety glazing is indicated or required by code, provide glazing that complies with 16 CFR 1201, Category II.
- D. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
 1. For monolithic-glass lites, properties are based on units with lites 6 mm thick.
 2. For laminated-glass lites, properties are based on products of construction indicated.
 3. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F.
 4. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
 5. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.2 MANUFACTURERS

- A. Source Limitations for Glass: Obtain from single source from single manufacturer for each glass type.
- B. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.
- C. Basis-of-Design Manufacturer: Vitro Architectural Glass; www.vitroglazings.com.
- D. Other Approved Manufacturers:
 1. AGC Glass North America; www.agcglass.com.
 2. Oldcastle Building Envelope; www.obe.com.
 3. Pilkington, a div. of Nippon Sheet Glass Co., Ltd; www.pilkington.com.

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. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
 2. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR A7, "Sloped Glazing Guidelines."
 3. IGMA Publication for Sloped Glazing: IGMA TB-3001, "Guidelines for Sloped Glazing."
- B. Safety Glazing Labeling: Where safety glazing is provided, 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. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

- D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.
 - 1. Minimum Glass Thickness for Exterior Lites: 6 mm.
 - 2. Thickness of Tinted Glass: Provide same thickness for each tint color indicated throughout Project.
- E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

- A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.
- B. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
 - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
- C. Heat-Strengthened Float Glass: ASTM C 1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
 - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
- D. Printed Vision Glass: ASTM C 1048, Condition C, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3; and complying with Specification No. 95-1-31 in GANA's "Engineering Standards Manual."
 - 1. Basis-of-Design Product: High Definition Glass (HDG), 720 DPI Digitally Printed Glass by Hartung Glass Industries; www.hartung.com.
- E. Silicone-Coated Spandrel Glass: ASTM C 1048, Type I, Condition C, Quality-Q3.
- F. Interspace Content: Where indicated to provide argon-filled interspace, provide the Insulating Glass Manufacturers Association of Canada (IGMAC) accepted standard argon gas fill level of 90 percent argon and 10 percent dry air.
- G. Edge Treatment at Monolithic and Laminated Glazing: Where monolithic or laminated glazing is indicated and edges are exposed to view, provide glazing with polished edges and the following edge treatments:
 - 1. At Structural Sealant Butt Joints: Provide flat ground smooth edges.
 - 2. At Exposed Edges: Provide flat polished edges with beveled edges and corners, 1/8 inch (3 mm) at outer edges and corners.

2.5 LAMINATED GLASS

- A. Laminated Glass: meeting requirements of ASTM C1172 "Standard Specification for Laminated Architectural Flat Glass". Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
 - 1. Construction: Laminate glass with polyvinyl butyral (PVB) interlayer ionomeric polymer interlayer cast-in-place and cured-transparent-resin interlayer to comply with interlayer manufacturer's written instructions.

2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
3. Interlayer Color: Clear unless otherwise indicated.
4. Basis-of-Design Product, Clear: SentryGlas by E.I. DuPont DeNemours & Co., Inc.; www.dupont.com.

2.6 INSULATING GLASS

- A. Insulating Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E2190.
 1. Perimeter Spacer: Manufacturer's standard spacer material and construction Aluminum with black, color anodic finish.
 2. Desiccant: Molecular sieve or silica gel, or a blend of both.
 3. Basis-of-Design Manufacturer: Cardinal Glass Industries, Inc; www.cardinalcorp.com.
 1. Other Approved Manufacturer: Vitro Architectural Glass; www.vitroglazings.com.

2.7 MIRROR GLASS

- A. Mirrors, General: ASTM C1503; manufactured using copper-free, low-lead mirror coating process.
- B. Mirror Glass: Mirror Glazing Quality for blemish requirements and complying with ASTM C 1048 for Kind FT, Condition A, tempered float glass before silver coating is applied, Quality Q1 (mirror select).
 1. Silvered Flat Glass Mirrors, Acceptable Manufacturers:
 - a. Donisi Mirror Co.; www.donisimirror.com.
 - b. Gilded Mirrors, Inc.; www.gildedmirrorsinc.com.
 - c. Walker Glass Co., Ltd.; www.walkerglass.com.
 2. Provide tempered mirror units where cantilevered edges, and adhered to substrates.
 - a. Where set in channels and mechanically attached, provide annealed monolithic mirror, Select Quality with clear float glass.

2.8 GLAZING TYPES

- A. Glazing Type: Exterior clear IGU, general use and at safety glazing.
 1. Overall Unit Thickness: 1 inch (25.4 mm).
 - a. Outer Lite: 1/4 inch (6 mm) clear float glass, with low-e coating on no. 2 surface.
 - b. Interspace Content: Air.
 - c. Inner Lite: Fully tempered 1/4 inch (6 mm) clear float glass.
 - d. Edge Spacer: Black; warm-edge.
 2. Performance Requirements:
 - a. U-Factor: 0.26 Btu/(hr x sqft x °F).
 - b. Solar Heat Gain Coefficient (SHGC): 0.40.
 - c. Visual Light Transmittance (VLT): 70 percent.
 3. Provide safety glazing where required (ISG-C1).

- B. Interior Glazing: Structural, monolithic interior single lites.
 - 1. Fully tempered 1/4 inch (6 mm) clear float glass.
 - 2. Provide safety glazing where required.
- C. Mirrored, Monolithic Interior Single Lites:
 - 1. Mirror Glass: Fully tempered; 1/4-inch minimum thick.
 - a. Provide annealed mirror glass where installed in j-channels.
 - b. Sizes as indicated. Field verify openings in tile and other construction where inseting mirrors, with edge clearances indicated. Mirrors are subject to rejection where dimensional clearances indicated are not maintained.
 - 2. Select materials and/or provide supports as required to limit mirrored glass deflection to 1/200 or flexure limit of glass with full recovery of glazing materials, whichever is less.
 - 3. Provide J-channels where indicated on Drawings.
 - 4. Edge polished where exposed.
 - 5. Edge seal all mirrors.

2.9 GLAZING SEALANTS

- A. General:
 - 1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 - 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
 - 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
- B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C920, Type S, Grade NS, Class 100/50, Use NT.

2.10 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 C 1281 and AAMA 800 for products indicated below:
 - 1. AAMA 804.3 tape, where indicated.
 - 2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 - 3. 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 the 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.

2.11 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, with requirements of 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: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.12 MIRROR GLASS AND ACCESSORIES

- A. Mirror Mastic: An adhesive setting compound, asbestos-free, produced specifically for setting mirrors and certified by both mirror and mastic manufacturer as compatible with glass coating and substrates on which mirrors will be installed.
 - 1. Acceptable Manufacturers:
 - a. Franklin Intl.
 - b. C.R. Laurence, Co.
 - c. Macco Adhesives.
 - d. OSI Sealants, Inc.
 - e. Palmer Products Corp.
 - f. Pecora Corp.
 - g. Royal Adhesives & Sealants.
 - 2. Edge Profiles: Ground, polished unless indicated otherwise.
- B. Edge Sealer: Coating compatible with glass coating and approved by mirror manufacturer for use in protecting against silver deterioration at mirrored glass edges.
- C. Mirror Hardware:
 - 1. Mirror clips are not acceptable.
 - 2. Aluminum J-Channels and Cleat: Aluminum extrusions with a return deep enough to produce a glazing channel to accommodate mirrors of thickness indicated and in lengths required to cover edges of mirrors in a single piece.
 - a. Provide trim with front leg size of 1/4-inch on all sides of mirror.
 - 3. Fasteners: Fabricated of same basic metal and alloy as fastened metal and matching it in finished color and texture where fasteners are exposed.
 - 4. Anchors and Inserts: Provide devices as required for mirror hardware installation. Provide toothed or lead-shield, expansion-bolt devices for drilled-in-place anchors. Provide galvanized anchors and inserts for applications on inside face of exterior walls and where indicated.

2.13 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 Insert temperature change.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.
- C. Grind smooth and polish exposed glass edges and corners.

2.14 FABRICATION, MIRRORS

- A. Fabricate mirrors in the shop to greatest extent possible.
- B. Fabricate cutouts for notches and holes in mirrors without marring visible surfaces. Locate and size cutouts so they fit closely around penetrations in mirrors.
- C. Mirror Edge Treatment: Flat polished where exposed.
 - 1. Seal edges of mirrors with edge sealer after edge treatment to prevent chemical or atmospheric penetration of glass coating.
 - 2. Require mirror manufacturer to perform edge treatment and sealing in factory immediately after cutting to final sizes.
- D. Film-Backed Safety Mirrors: Apply film backing with adhesive coating over mirror backing paint, as recommended in writing by film-backing manufacturer, to produce a surface free of bubbles, blisters, and other imperfections.

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 according to 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 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 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket 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. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

3.6 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.

3.2 INSTALLATION, MIRROR GLASS

- A. General: Install mirrors to comply with mirror manufacturer's written instructions and with referenced GANA publications. Mount mirrors accurately in place in a manner that avoids distorting reflected images.
 - 1. GANA Publications: "Glazing Manual" and "Mirrors, Handle with Extreme Care: Tips for the Professional on the Care and Handling of Mirrors."
- B. Provide a minimum airspace of 1/8 inch between back of mirrors and mounting surface for air circulation between back of mirrors and face of mounting surface.
- C. Install mirrors with mastic and mirror hardware where frames are indicated. Attach mirror hardware securely to mounting surfaces with mechanical fasteners installed with anchors or inserts as applicable. Install fasteners so heads do not impose point loads on backs of mirrors.
 - 1. Aluminum J-Channels and Cleat: Fasten J-channel directly to wall and attach top trim to continuous cleat fastened directly to wall.

2. Install mastic as follows:
 - a. Apply barrier coat to mirror backing where approved in writing by manufacturers of mirrors and backing material.
 - b. Apply mastic to comply with mastic manufacturer's written instructions for coverage and to allow air circulation between back of mirrors and face of mounting surface.
 - c. After mastic is applied, align mirrors and press into place while maintaining a minimum airspace of 1/8 inch between back of mirrors and mounting surface.

3.7 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 come into 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

SECTION 08 91 19 - FIXED LOUVERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Fixed, extruded-aluminum louvers.
 - 2. Wood gable louver vents.
 - 3. Delegated design.
- B. Related Requirements:
 - 1. Section 07 25 00 "Weather Barriers" for perimeter weather sealing joint sealant.
 - 2. Section 07 92 00 "Joint Sealants" for perimeter beauty sealant.

1.3 DEFINITIONS

- A. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.
- B. Horizontal Louver: Louver with horizontal blades (i.e., the axes of the blades are horizontal).
- C. Vertical Louver: Louver with vertical blades (i.e., the axes of the blades are vertical).
- D. Drainable-Blade Louver: Louver with blades having gutters that collect water and drain it to channels in jambs and mullions, which carry it to bottom of unit and away from opening.
- E. Wind-Driven-Rain-Resistant Louver: Louver that provides specified wind-driven rain performance, as determined by testing according to AMCA 500-L.

1.4 SUBMITTALS

- A. Product Data: For each type of product.
 - 1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.
- B. Shop Drawings: For louvers and accessories. Include Project-specific plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.
 - 1. Show weep paths, gaskets, flashing, sealant, and other means of preventing water intrusion.
 - 2. Show perimeter integration into building air barrier system.
 - 3. Show mullion profiles and locations.
 - 4. Show screens and blank-off panels.
 - 5. Show connections and clearances to connecting ductwork and HVAC equipment, including required clearances.

- C. Delegated-Design Submittal: For louvers indicated to comply with structural and seismic performance requirements, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - D. Product Test Reports: Based on evaluation of comprehensive tests performed according to AMCA 500-L by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for each type of louver and showing compliance with performance requirements specified.
 - E. Samples: For each type of metal finish required.
 - F. Qualification Data: For professional engineer.
- 1.5 QUALITY ASSURANCE
- A. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.2, "Structural Welding Code - Aluminum."
- 1.6 FIELD CONDITIONS
- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.
- 1.7 WARRANTY
- A. Special Finish Warranty: Manufacturer agrees to repair or replace components on which finishes fail in materials or workmanship within specified warranty period.
 - 1. 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. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain louvers from single source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.
- B. Manufacturers:
 - 1. Aiolite Company, LLC; www.aiolite.com.
 - 2. Construction Specialties, Inc.; www.c-sgroup.com.
 - 3. Ekena Millwork; www.ekenamillwork.com.
 - 4. Greenheck Fan Corp.; www.greenheck.com.
 - 5. Ruskin Co.; www.ruskin.com.
 - 6. As indicated.

2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 33 16 "Delegated Design Requirements," to design louvers.

- B. Structural Performance: Louvers shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver-blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures shall be considered to act normal to the face of the building.
 - 1. Wind Loads: Determine loads based on pressures as indicated on Drawings.
 - 2. Other Design Loads: As indicated on Drawings.
- C. Seismic Performance: Louvers, including attachments to other construction, shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
 - 1. Design earthquake spectral response acceleration, short period (Sds) for Project: Refer to Drawings.
 - 2. Component Importance Factor: 1.0, unless otherwise indicated.
- D. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.
- E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- F. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.

2.3 FIXED, EXTRUDED-ALUMINUM LOUVERS

- A. Basis-of-Design Product: Model 537XP by Industrial Louvers, Inc.; industriallouvers.com.
- B. Horizontal, Storm-Resistant, Drainable-Blade Louver:
 - 1. Louver Depth: 5 inches.
 - 2. Blade Spacing: 2-1/4 inches o.c.
 - 3. Frame and Blade Nominal Thickness: As required to comply with structural performance requirements, but not less than 0.060 inches for blades and 0.080 inches for frames.
 - 4. Mullion Type: Concealed.
 - 5. Performance Requirements:
 - a. Free Area: Not less than 8.35 sq. ft. for 48-inch wide by 48-inch high louver.
 - b. Air Performance: Product standard.
 - c. Wind-Driven Rain Performance: Product standard.
 - 6. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

2.4 BLANK-OFF PANELS

- A. Blank-off Panels, General:
 - 1. Aluminum sheet for aluminum louvers, not less than 0.050-inch nominal thickness.
 - 2. Finish: Same finish applied to louvers.
 - 3. Insulation: Extruded polystyrene foam.
 - a. Edge Treatment: Trim perimeter edges of blank-off panels with louver manufacturer's standard aluminum channel frames with corners mitered and with same finish as panels.

4. Attach panels with sheet metal screws.
- B. Uninsulated, Blank-Off Panels: Metal sheet attached to back of louver.
- C. Insulated, Blank-Off Panels: Laminated panels consisting of an insulating core surfaced on back and front with metal sheets and attached to back of louver.
 1. Seal perimeter joints between panel faces and louver frames with gaskets or sealant.

2.5 LOUVER SCREENS

- A. General: Provide screen at louvers indicated.
 1. Screen Location for Fixed Louvers: Interior face.
 2. Screen Location for Adjustable Louvers, unless otherwise indicated.
 3. Screening Type: Bird screening, unless otherwise indicated; insect screening where indicated.
- B. Secure screens to louver frames with stainless-steel machine screws, spaced a maximum of 6 inches from each corner and at 12 inches o.c.
- C. Louver Screen Frames: Fabricate with mitered corners to louver sizes indicated.
 1. Metal: Same kind and form of metal as indicated for louver to which screens are attached. Reinforce extruded-aluminum screen frames at corners with clips.
 2. Finish: Same finish as louver frames to which louver screens are attached.
 3. Type: Non-rewirable, U-shaped frames.
- D. Louver Screening for Aluminum Louvers:
 1. Insect Screening: Stainless steel, 1/16 by 1/16 inch mesh, 0.009-inch wire.
 2. Edge Treatment: Trim perimeter edges of blank-off panels with louver manufacturer's standard extruded-aluminum-channel frames, not less than 0.079-inch nominal thickness, with corners mitered and with same finish as panels.

2.6 VENTS

1. Exterior Wood Gable Louver Vents:
 - a. Basis-of-Design Product: Model no. GVWVE, Vertical Wood Gable Vent by Ekena Millwork.
 - 1) Finish: As selected by Architect.
2. Interior Vents: For dryer exhaust, room exhaust and fresh air make-up.
 - a. Basis-of-Design Manufacturer: Vent Box, www.xventbox.com.
 - b. Models: #DHEB-44-S and #4SEB-S. See Drawings for installation locations.

2.7 MATERIALS

- A. Aluminum Extrusions: ASTM B221, alloy 6063-T5 or T-52.
- B. Aluminum Sheet: ASTM B209, alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.
- C. Aluminum Castings: ASTM B26, alloy 319.
- D. Galvanized Steel Sheet: ASTM A653, G90 zinc coating, mill phosphatized.

- E. Fasteners: 300 Series stainless steel, unless otherwise indicated. Do not use metals that are incompatible with joined materials.
 - 1. Use types and sizes to suit unit installation conditions.
 - 2. Use hex-head or Phillips pan-head screws for exposed fasteners, unless otherwise indicated.
- F. Postinstalled Fasteners for Concrete and Masonry: Torque-controlled expansion anchors, made from stainless-steel components, with capability to sustain, without failure, a load equal to 4 times the loads imposed, for concrete, or 6 times the load imposed, for masonry, as determined by testing per ASTM E488, conducted by a qualified independent testing agency.
- G. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187.

2.8 FABRICATION, GENERAL

- A. Assemble louvers in factory to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- B. Vertical Assemblies: Where height of louver units exceeds fabrication and handling limitations, fabricate units to permit field-bolted assembly with close-fitting joints in jambs and mullions, reinforced with splice plates.
 - 1. Continuous Vertical Assemblies: Fabricate units without interrupting blade-spacing pattern unless horizontal mullions are indicated.
 - 2. Horizontal Mullions: Provide horizontal mullions at joints where indicated.
- C. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.
- D. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
- E. Include supports, anchorages, and accessories required for complete assembly.
- F. Provide vertical mullions of type and at spacings indicated, but not more than recommended by manufacturer, or 72 inches o.c., whichever is less.
 - 1. Fully Recessed Mullions: Where indicated, provide mullions fully recessed behind louver blades. Where length of louver exceeds fabrication and handling limitations, fabricate with close-fitting blade splices designed to permit expansion and contraction.
- G. Join frame members to each other and to fixed louver blades with fillet welds concealed from view, unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

2.9 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish louvers after assembly.

2.10 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with system established by the Aluminum Association for designating aluminum finishes.
- B. High-Performance Organic-Coating Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: Acid-chromate-fluoride-phosphate conversion coating;

Organic Coating: . Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Fluoropolymer Three-Coat Coating System: Manufacturer's standard three-coat, thermocured system consisting of specially formulated inhibitive primer, fluoropolymer color and clear coats containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2605. Metallic where indicated, with suspended metallic flakes.
2. Color: Custom, as selected by Architect to match finishes indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

3.3 INSTALLATION

- A. Locate and place louvers and vents level, plumb, and at indicated alignment with adjacent work.
- B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
- C. Form closely fitted joints with exposed connections accurately located and secured.
- D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.
- E. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.
- F. Protect galvanized and nonferrous-metal surfaces from corrosion or galvanic action by applying a heavy coating of bituminous paint on surfaces that will be in contact with concrete, masonry, or dissimilar metals.
- G. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Division 07 Section "Joint Sealants" for sealants applied during louver installation.

3.4 ADJUSTING AND CLEANING

- A. Test operation of adjustable louvers and adjust as needed to produce fully functioning units that comply with requirements.
- B. Clean exposed surfaces of louvers and vents that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate until final cleaning.
- C. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.

- D. Restore louvers and vents damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.
 - 1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION

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SECTION 09 29 00 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board.
 - 2. Exterior gypsum board for ceilings and soffits.
 - 3. Cement backing panels.
 - 4. Acoustic insulation.
 - 5. Acoustical sealants.
- B. Related Requirements:
 - 1. Section 06 10 00 "Rough Carpentry" for framing substrate for gypsum board and plywood sheathing for exterior walls.

1.3 SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For the following products:
 - 1. Trim Accessories: Full-size Sample in 12-inch-long length for each trim accessory indicated.

1.4 QUALITY ASSURANCE

- A. Mockups: Build mockups of at least 100 sq. ft in surface area to demonstrate aesthetic effects and to set quality standards for materials and execution.
 - 1. Build mockups for the following:
 - a. Each level of gypsum board finish indicated for use in exposed locations.
 - b. Each texture finish indicated.
 - 2. Apply or install final decoration indicated, including painting and wallcoverings, on exposed surfaces for review of mockups.
 - 3. Simulate finished lighting conditions for review of mockups.
 - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE AND HANDLING

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

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM 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 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

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 MANUFACTURERS

- A. Approved Manufacturers:
 - 1. Custom Building Products; www.custombuildingproducts.com.
 - 2. CertainTeed Corporation; www.certainteed.com.
 - 3. Georgia-Pacific Building Products; www.buildgp.com.
 - 4. James Hardie Building Products, Inc.; www.jameshardie.com.
 - 5. National Gypsum Company; www.nationalgypsum.com.
 - 6. PABCO Gypsum; www.pabco gypsum.com.
 - 7. USG Corporation; www.usg.com.
 - 8. Westside Drywall and Insulation; www.westsidedrywall.com.

2.4 INTERIOR GYPSUM BOARD

- A. Gypsum Wallboard: ASTM C1396.
 - 1. Thickness: 5/8 inch.
 - 2. Long Edges: Tapered.
- B. Gypsum Board, Fire Rated: Type X, ASTM C1396.
 - 1. Thickness: 5/8 inch.
 - 2. Long Edges: Tapered.

- C. Gypsum Ceiling Board: ASTM C1396.
 - 1. Thickness: 1/2 inch.
 - 2. Long Edges: Tapered.
 - D. Abuse-Resistant Gypsum Board: ASTM C1396 gypsum board, tested according to ASTM C1629.
 - 1. Manufacturer: Subject to compliance with requirements, provide product by the following:
 - a. USG Corporation.
 - 2. Core: 5/8 inch, Type X.
 - 3. Surface Abrasion: ASTM C1629, meets or exceeds Level 3 requirements.
 - 4. Indentation: ASTM C1629, meets or exceeds Level 3 requirements.
 - 5. Soft-Body Impact: ASTM C1629, meets or exceeds Level 3 requirements.
 - 6. Long Edges: Tapered.
 - 7. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.
 - E. Mold-Resistant Gypsum Board: ASTM C1396. With moisture- and mold-resistant core and paper surfaces.
 - 1. Core: As indicated 5/8 inch, Type X.
 - 2. Long Edges: Tapered.
 - 3. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.
 - F. Interior Acoustic Gypsum Board: Composite board composed of viscoelastic polymer applied between two gypsum board panels to reduce sound energy and improve sound attenuation through walls and ceilings; 100 percent recycled moisture- and mold-resistant face and back paper.
 - 1. Gypsum Wallboard: ASTM C1396.
 - 2. Basis-of-Design Product:
 - a. SilentFX Noise-Reducing Gypsum Board by CertainTeed Corp., Div. of Saint Gobain; www.certainteed.com.
 - 3. Other Acceptable Products:
 - a. Gold Bond SoundBreak XP 5/8 inch Gypsum Board by National Gypsum Properties LLC; www.nationalgypsum.com.
 - b. QuietRock EZ-Snap Mold Resistant (ES MR) by QuietRock; www.quietrock.com.
 - 4. Applications: Where indicated for acoustic-rated partitions.
- 2.5 EXTERIOR GYPSUM BOARD FOR CEILINGS AND SOFFITS
- A. Exterior Gypsum Soffit Board: ASTM C1396, with manufacturer's standard edges.
- 2.6 TILE BACKING PANELS
- A. Cementitious Backer Units: ANSI A118.9 and ASTM C1288 or ASTM C1325, with manufacturer's standard edges.
 - 1. Thickness: 1/2 inch.
 - 2. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

2.7 TRIM ACCESSORIES

- A. Basis-of-Design Manufacturer: Fry Reglet; www.fryreglet.com.
- B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.
- C. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B221, Alloy 6063-T5.
 - 1. Profiles:
 - a. "Z" Reveal, Basis-of-Design Product: Z Reveal by Fry Reglet.
 - 1) Model no: As selected by Architect.
 - 2) Reveal Depth: As indicated in Drawings.
 - 3) Reveal Width: As indicated in Drawings.
 - b. "J" Reveal, Basis-of-Design Product: As selected by Architect.
 - 1) Model no: As selected by Architect.
 - 2. Applications: As indicated in Drawings.
- D. Finish: Powder-coat finish; AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
- E. Color: As selected by Architect.

2.8 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C475.
- B. Joint Tape:
 - 1. Interior Gypsum Board: Paper.
 - 2. Exterior Gypsum Soffit Board: Paper.
 - 3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
 - 4. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
 - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 - 3. Fill Coat: For second coat, use drying-type, all-purpose compound.
 - 4. Finish Coat: For third coat, use drying-type, all-purpose compound.
 - 5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.
- D. Joint Compound for Exterior Applications:
 - 1. Exterior Gypsum Soffit Board: Use setting-type taping compound and setting-type, sandable topping compound.
 - 2. Glass-Mat Gypsum Sheathing Board: As recommended by sheathing board manufacturer.

- E. Joint Compound for Tile Backing Panels:
 - 1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.
 - 2. Cementitious Backer Units: As recommended by backer unit manufacturer.

2.9 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
 - 1. Adhesives shall have a VOC content of 50 g/L or less.
 - 2. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- C. Steel Drill Screws: ASTM C1002 unless otherwise indicated.
 - 1. Use screws complying with ASTM C954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
 - 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- D. Putty Pad Sealant: At acoustic rated partitions and fire-rated partitions in order to provide noise transmission resistance and fire resistance at electrical boxes and other penetrations.
 - 1. Approved Products:
 - a. Fire Barrier Moldable Putty Pads MPP+ by 3M; www.3m.com.
 - b. Firestop Putty Pad by Acoustical Solutions; www.acousticalolutions.com.
 - c. CP 617 Firestop Putty Pad by Hilti North America; www.hilti.com.
 - d. Fire-Rated Putty Pads by Metacaulk; www.metacaulk.com.
- E. Sound-Attenuation Blankets: ASTM C665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
 - 1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
 - 2. Basis-of-Design Product: QuietZone Acoustic Batts with PureFiber Technology by Owens Corning; www.owenscorning.com.
 - a. Thickness: As required to fill stud cavity in friction-fit application.
- F. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90.
 - 1. Basis-of-Design Product: Quiet Seal Pro by Quiet Rock; www.quietrock.com.
 - 2. Other Approved Manufacturers:
 - a. Accumetric LLC.
 - b. Franklin International.
 - c. Grabber Construction Products.

- d. Hilti, Inc.
- e. Pecora Corporation.
- f. Specified Technologies, Inc.

2.10 TEXTURE FINISHES

- A. Primer: As recommended by textured finish manufacturer.
- B. Non-Aggregate Finish: Premixed, vinyl texture finish for spray application.
 - 1. 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 APPLYING AND FINISHING 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. (0.7 sq. m) in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

- I. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C919 and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
- J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Type X: As indicated on Drawings Where required for fire-resistance-rated assembly.
 - 2. Ceiling Type: Ceiling surfaces.
 - 3. Impact-Resistant Type: As indicated in Drawings.
 - 4. Mold-Resistant Type: Provide in lieu of regular gypsum board at all backsplash and surrounding areas of sinks, lavatories, drinking fountains, and mop sinks, to a distance of not less than 18 inches from edge of sinks, lavatories, drinking fountains, and mop sink, to a distance not less than 18 inches from edge of sinks, lavatories and map sinks.
 - 5. Glass-Mat Interior Type: As indicated in Drawings.
 - 6. Skim-Coated Type: As indicated in Drawings.
- B. Single-Layer Application:
 - 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
 - 2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
 - 3. On Z-shaped furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
 - 4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.
- C. Multilayer Application:
 - 1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
 - 2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
 - 3. On Z-shaped furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.

4. Fastening Methods: Fasten base layers with screws; fasten face layers with adhesive and supplementary fasteners.
- D. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written instructions and temporarily brace or fasten gypsum panels until fastening adhesive has set.
- 3.4 APPLYING EXTERIOR GYPSUM PANELS FOR CEILINGS AND SOFFITS
- A. Apply panels perpendicular to supports, with end joints staggered and located over supports.
1. Install with 1/4-inch open space where panels abut other construction or structural penetrations.
 2. Fasten with corrosion-resistant screws.
- 3.5 APPLYING TILE BACKING PANELS
- A. Cementitious Backer Units: ANSI A108.11, at showers, tubs, and where indicated to receive tile.
- B. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.
- 3.6 INSTALLING TRIM ACCESSORIES
- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints according to ASTM C840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:
1. Cornerbead: Use at outside corners, unless otherwise indicated.
 2. LC-Bead: Use at exposed panel edges.
 3. L-Bead: Use where indicated.
 4. Curved-Edge Cornerbead: Use at curved openings.
- D. Aluminum Trim: Install in locations indicated in Drawings.
- 3.7 FINISHING GYPSUM BOARD
- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, 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 1: Ceiling plenum areas, concealed areas, and where indicated.
 2. Level 2: Panels that are substrate for acoustical tile where indicated in Drawings.
 3. Level 3: At panel surfaces that will be exposed to view unless otherwise indicated.
 - a. Provide textured finish.
 - b. Primer and its application to surfaces are specified in Section 09 91 00 "Painting."

- 4. Level 4: Where indicated in Drawings.
 - a. Primer and its application to surfaces are specified in Section 09 91 00 "Painting."
 - 5. Level 5: Where indicated in Drawings.
 - a. Primer and its application to surfaces are specified in Section 09 91 00 "Painting."
 - E. Glass-Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.
 - F. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.
 - G. Cementitious Backer Units: Finish according to manufacturer's written instructions.
- 3.8 INSTALLATION 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.
- 3.9 PROTECTION
- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
 - B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
 - C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

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SECTION 09 64 00 - WOOD FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Wood flooring.
- B. Related Requirements:
 - 1. Section 06 10 00 "Rough Carpentry" for sleeper, subflooring, blocking and other carpentry work not exposed to view.
 - 2. Section 06 20 00 "Finish Carpentry" for coordination of wood base.

1.3 SUBMITTALS

- A. Product Data: For each type of product.
- B. Sustainable Design Submittals:
 - 1. Manufacturer letter of confirmation that flooring contains no added formaldehyde (NAF) and ultra-low emitting formaldehyde-based resins (ULEF).
- C. Shop Drawings: For each type of floor assembly and accessory. Include plans, sections, and attachment details. Include expansion provisions and trim details.
- D. Samples: For each exposed product and for each color and texture specified, approximately 12 inches long and of same thickness and material indicated for the Work and showing the full range of normal color and texture variations expected.
- E. Samples for Verification: For each type of wood flooring and accessory, with stain color and finish required, approximately 12 inches long and of same thickness and material indicated for the Work and showing the full range of normal color and texture variations expected.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Wood Flooring: Equal to 1 percent of amount installed for each type, color, and finish of wood flooring indicated.

1.5 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver wood flooring materials in unopened cartons or bundles.
- B. Protect wood flooring from exposure to moisture. Do not deliver wood flooring until after concrete, masonry, plaster, ceramic tile, and similar wet work is complete and dry.
- C. Store wood flooring materials in a dry, warm, ventilated, weathertight location.

1.7 FIELD CONDITIONS

- A. Conditioning period begins not less than seven days before wood flooring installation, is continuous through installation, and continues not less than seven days after wood flooring installation.
 - 1. Environmental Conditioning: Maintain ambient temperature between 65 and 75 deg F and relative humidity planned for building occupants in spaces to receive wood flooring during the conditioning period.
 - 2. Wood Flooring Conditioning: Move wood flooring into spaces where it will be installed, no later than the beginning of the conditioning period.
 - a. Do not install flooring until it adjusts to relative humidity of, and is at same temperature as, space where it is to be installed.
 - b. Open sealed packages to allow wood flooring to acclimatize immediately on moving flooring into spaces in which it will be installed.
- B. After conditioning period, maintain relative humidity and ambient temperature planned for building occupants.
- C. Install factory-finished wood flooring after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. All wood floors shall contain no added urea formaldehyde (NAUF) and ultra-low emitting formaldehyde-based resins (ULEF). This shall be documented by a letter of confirmation from the manufacturer. For laminate or engineered wood, see the requirement for Resilient Flooring. Hardwood Flooring: Comply with NWFA A500 for species, grade, and cut.
 - 1. Certification: Provide flooring that carries NWFA grade stamp on each bundle or piece.
- B. Maple Flooring: Comply with applicable MFMA grading rules for species, grade, and cut.
 - 1. Certification: Provide flooring that carries MFMA mark on each bundle or piece.

2.2 ENGINEERED WOOD FLOORING, WF-1

- A. Solid-Wood Flooring: Kiln dried to 6 to 9 percent maximum moisture content; tongue and groove and end matched; with backs channeled.
 - 1. Species: As selected by Architect.
 - 2. Grade: As selected by Architect.
 - 3. Cut: Quarter or rift sawn, as selected by Architect.
 - 4. Thickness: 3/4 inch.
 - 5. Face Width: 5 inches, or as indicated.
 - 6. Lengths: Random-length strips complying with applicable grading rules, length shall not be less than 6 inches.

7. Edge Style: Square.
8. Finish: UV urethane.
 - a. Color: As selected by Architect from manufacturer's full range.

2.3 ACCESSORY MATERIALS

- A. Vapor Retarder: ASTM D4397, polyethylene sheet not less than 6.0 mils thick.
- B. Asphalt-Saturated Felt: ASTM D4869, Type II.
- C. Wood Flooring Adhesive: Mastic recommended by flooring and adhesive manufacturers for application indicated.
- D. Trowelable Leveling and Patching Compound: Latex-modified, hydraulic-cement-based formulation approved by wood flooring manufacturer.
- E. Fasteners: As recommended by manufacturer, but not less than that recommended in NWFA's "Installation Guidelines."
- F. Thresholds and Saddles: To match wood flooring. Tapered on each side.
- G. Reducer Strips: To match wood flooring. 2 inches wide, tapered, and in thickness required to match height of flooring.
- H. Cork Expansion Strip: Composition cork strip.

2.4 FINISHES

- A. Transparent Finish:
 1. Architectural Woodwork Standards or ANSI/WDMA I.S. 1A Grade: Premium.
 2. Basis-of-Design Product: Oil Plus 2C by Rubio Monocoat USA, LLC; www.rubiomonocoatusa.com.
 - a. Color: As selected by Architect.
 - b. Sheen: Matte.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, installation tolerances, and other conditions affecting performance of wood flooring.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Concrete Slabs: Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels according to manufacturer's written instructions.
 1. Moisture Testing: Perform tests so that each test area does not exceed 1,000 sq. ft. and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
 - a. Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/ 1,000 sq. ft. in 24 hours.
 - b. Relative Humidity Test: Using in situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

- c. Perform additional moisture tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

3.2 PREPARATION

A. Concrete Slabs:

1. Grind high spots and fill low spots to produce a maximum 1/8 inch deviation in any direction when checked with a 10 foot straight edge.
2. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.
3. Remove coatings, including curing compounds, and other substances on substrates that are incompatible with installation adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

- B. Broom or vacuum clean substrates to be covered immediately before product installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

- A. Comply with flooring manufacturer's written installation instructions, but not less than applicable recommendations in NWFA's "Installation Guidelines."

- B. Wood Underlayment or Subfloor: Install according to requirements in Section 06 10 00 "Rough Carpentry" and Section 06 16 00 "Sheathing".

- C. Provide expansion space at walls and other obstructions and terminations of flooring of not less than 3/4 inch.

- D. Vapor Retarder: Comply with the following for vapor retarder installation:

1. Wood Flooring Nailed to Wood Subfloor: Install flooring over a layer of asphalt-saturated felt.
2. Wood Flooring Nailed to Sleepers over Concrete: Install flooring over a layer of polyethylene sheet with edges overlapped over sleepers and turned up behind baseboards.
3. Wood Flooring Installed Directly on Concrete: Install a layer of polyethylene sheet according to flooring manufacturer's written instructions.

- E. Sound Control Underlayment: Install over vapor retarder according to manufacturer's written instructions.

- F. Solid-Wood Flooring: Blind nail or staple flooring to substrate.

1. Plank Flooring: For flooring of face width more than 3 inches:
 - a. Hardwood: Install countersunk screws at each end of each piece in addition to blind nailing. Cover screw heads with wood plugs glued flush with flooring.
 - b. Softwood: Install no fewer than two countersunk nails at each end of each piece, spaced not more than 16 inches along length of each piece, in addition to blind nailing. Fill holes with matching wood filler.

3.4 FIELD FINISHING

- A. Machine-sand flooring to remove offsets, ridges, cups, and sanding-machine marks that are noticeable after finishing. Vacuum and tack with a clean cloth immediately before applying finish.

1. Comply with applicable recommendations in NWFA's "Installation Guidelines."

- B. Fill open-grained hardwood.
- C. Fill and repair wood flooring defects.
- D. Apply floor-finish materials in number of coats recommended by finish manufacturer for application indicated, but not less than one coat of floor sealer and three finish coats.
 - 1. Apply stains to achieve an even color distribution matching approved Samples.
 - 2. For water-based finishes, use finishing methods recommended by finish manufacturer to minimize grain raise.
- E. Cover wood flooring before finishing.
- F. Do not cover wood flooring after finishing until finish reaches full cure, and not before seven days after applying last finish coat.

3.5 PROTECTION

- A. Protect installed wood flooring during remainder of construction period with covering of heavy kraft paper or other suitable material. Do not use plastic sheet or film that might cause condensation.
 - 1. Do not move heavy and sharp objects directly over kraft-paper-covered wood flooring. Protect flooring with plywood or hardboard panels to prevent damage from storing or moving objects over flooring.

END OF SECTION

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SECTION 09 65 00 - RESILIENT FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Luxury vinyl plank flooring.
 - 2. Resilient sheet flooring.
- B. Related Requirements:
 - 1. Section 03 30 00 "Cast-in-Place Concrete" for substrate preparation.
 - 2. Section 09 65 13 "Resilient Base and Accessories" for resilient wall base and accessories installed with carpet.

1.3 SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, not less than 12 inches square.
- C. Samples for Initial Selection: For each type of product indicated.
- D. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 inches long.
- E. Product Schedule: For resilient base and accessory products. Use same designations indicated on Drawings.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish not less than 2 percent of installed area, of each type, color, pattern, and size of resilient product installed.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association.
 - 1. Alternatively, Bidders may be considered appropriate for the Project by providing examples and references for three projects of similar scale and type to this Project, for review and approval by the Architect and Owner.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Coordinate mockups in this Section with mockups specified in other Sections.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.7 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following periods:
 1. 48 hours before installation.
 2. During installation.
 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Install resilient products after other finishing operations, including painting, have been completed.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace units and components that fail in materials or workmanship within specified warranty period.
 1. Warranty Period: Not less than 5 years from Date of Substantial Completion for each flooring.
 - a. At static dissipative flooring, provide not less than 10 years from Date of Substantial Completion for dissipative properties.
- B. Limited Wear Warranty: Manufacturer's limited wear warranty of 15 years for heavy commercial traffic.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Products shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.2 MANUFACTURERS

- A. Basis-of-Design Manufacturer: Mannington Commercial; www.mannington.com.
- B. Other Approved Manufacturers:
 1. Armstrong Flooring; www.armstrongflooring.com.
 2. Forbo Flooring Systems; www.forbo.com.
 3. Tarkett; www.commercialtarkett.com.
 4. Or approved equal.

2.3 RESILIENT FLOORING

A. Luxury Vinyl Plank Flooring:

1. Basis-of-Design Product: ADURA Collection by Mannington.
 - a. Color: As selected by Architect from manufacturer's full range.
 - b. Size: 8 x 72 inches; plank.
 - c. Thickness: 8 mm total; 20 mils wear layer.
 - d. Applications: As indicated in Drawings.

B. Resilient Sheet Flooring:

2. Basis-of-Design Product: Towne Centre Collection by Mannington.
 - a. Color: As selected by Architect from manufacturer's full range.
 - b. Size: As selected by Architect from manufacturer's full range.
 - c. Thickness: 8 mm total; 20 mils wear layer.
 - d. Underlayment: Provide manufacturer's recommended underlayment.
 - e. Applications: At Exam Rooms, Lab Rooms, and Restrooms, or as indicated in Drawings.

2.4 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.
 1. Adhesives shall have a VOC content of 50 g/L or less and 60 g/L or less for rubber stair treads.
- C. Transition Strips: As specified in Section 09 65 13 "Resilient Base and Accessories."
- D. Integral-Flash-Cove-Base Accessories:
 1. Cove Strip: 1 inch radius provided or approved by resilient sheet flooring manufacturer.
 2. Cap Strip: Square metal, vinyl, or rubber cap, as selected by Architect, provided or approved by resilient sheet flooring manufacturer.
- E. Sealant: Comply with Section 07 92 00 "Joint Sealants."
 1. Provide acrylic sealant, of type recommended by flooring manufacturer.
- F. Polish: Provide protective, liquid floor-polish products recommended by flooring manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates for Resilient Flooring: Prepare horizontal surfaces according to ASTM F710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
 - 4. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
 - 5. Relative Humidity Test: Using in-situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install resilient products until materials are the same temperature as space where they are to be installed.
 - 1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT FLOORING INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient flooring.
- B. Allow resilient tile and sheets to stabilize before cutting and fitting.
- C. Lay out resilient flooring as follows:
 - 1. Maintain uniformity of flooring direction.
 - 2. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches away from parallel joints in flooring substrates.
 - 3. Match edges of flooring for color shading at seams.
 - 4. Avoid cross seams.
- D. Scribe and cut resilient flooring to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend resilient sheet flooring into toe spaces, door reveals, closets, and similar openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on resilient flooring as marked on substrates. Use chalk or other nonpermanent marking device.

- G. Install resilient flooring on covers for telephone and electrical ducts and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of flooring installed on covers and adjoining flooring. Tightly adhere flooring edges to substrates that abut covers and to cover perimeters.
 - H. Adhere resilient flooring to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
 - I. Seamless Installation, Sheet Flooring:
 - 1. Heat-Welded Seams: Comply with ASTM F1516. Rout joints and heat weld with welding bead to fuse sections permanently into a seamless flooring installation. Prepare, weld, and finish seams to produce surfaces flush with adjoining flooring surfaces.
 - 2. Chemically Bonded Seams: Bond seams with chemical-bonding compound to fuse sections permanently into a seamless flooring installation. Prepare seams and apply compound to produce tightly fitted seams without gaps, overlays, or excess bonding compound on flooring surfaces.
 - J. Integral-Flash-Cove Base: Cove resilient sheet flooring to dimension indicated up vertical surfaces. Support flooring at horizontal and vertical junction with cove strip. Butt at top against cap strip.
 - K. Install metal corners at inside and outside corners.
- 3.4 RESILIENT BASE AND ACCESSORY INSTALLATION
- A. As specified in Section 09 65 13 "Resilient Base and Accessories."
- 3.5 CLEANING AND PROTECTION
- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
 - B. Perform the following operations immediately after completing resilient-product installation:
 - 1. Remove adhesive and other blemishes from surfaces.
 - 2. Sweep and vacuum horizontal surfaces thoroughly.
 - 3. Damp-mop horizontal surfaces to remove marks and soil.
 - C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
 - D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION

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SECTION 09 65 13 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Resilient base.
 - 2. Resilient transitions and installation accessories.
- B. Related Requirements:
 - 1. Section 09 65 00 "Resilient Flooring" for coordination of resilient accessories installed with resilient flooring.
 - 2. Section 09 68 00 "Carpeting" for resilient accessories installed with carpeting.

1.3 SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, not less than 12 inches long.
- C. Samples for Initial Selection: For each type of product indicated.
- D. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 inches long.
- E. Product Schedule: For resilient base and accessory products. Use same designations indicated on Drawings.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish not less than 10 linear feet (3 linear m) for every 500 linear feet (150 linear m) or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.5 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Coordinate mockups in this Section with mockups specified in other Sections.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.7 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Products shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.2 MANUFACTURERS

- 1. Approved Manufacturers:
 - a. Mannington Commercial; www.manningtoncommercial.com.
 - b. Roppe; www.roppe.com.
 - c. Tarkett, formerly Johnsonite; www.commercial.tarkett.com.

2.3 RESILIENT RUBBER BASE

- A. Basis-of-Design Product: Traditional Vinyl Wall Base by Tarkett.
 - 1. Height: 4 inches.
 - 2. Toe Style: 1/8 inch.
 - 3. Colors: As selected by Architect from manufacturer's full range.
 - 4. Applications: Throughout, except where wood flooring occurs, or as indicated in Drawings.

2.4 RESILIENT FLOORING ACCESSORIES

- A. Metal Edge Strips: Extruded aluminum with mill finish, nominal 2 inches wide, of height required to protect exposed edges of flooring, and in maximum available lengths to minimize running joints.
- B. Rubber Edge Strips: Rubber transition strips in dimensions required to protect exposed edges of flooring.
 - 1. Basis-of-Design Manufacturer: Schluter; www.schluter.com.
 - a. Profile and Dimensions: As indicated.
 - b. Color: As selected by Architect.

2.5 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.
 - 1. Adhesives shall have a VOC content of 50 g/L or less and 60 g/L or less for rubber stair treads.
- C. Stair-Tread Nose Filler: Two-part epoxy compound recommended by resilient stair-tread manufacturer to fill nosing substrates that do not conform to tread contours.
- D. Floor Polish: Provide protective, liquid floor-polish products recommended by resilient stair-tread manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates for Resilient Stair Accessories: Prepare horizontal surfaces according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 10 pH.
 - 4. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
 - a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
 - b. Relative Humidity Test: Using in-situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install resilient products until materials are the same temperature as space where they are to be installed.
 - 1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

3.4 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Resilient Stair Accessories:
 - 1. Use stair-tread-nose filler to fill nosing substrates that do not conform to tread contours.
 - 2. Tightly adhere to substrates throughout length of each piece.
 - 3. For treads installed as separate, equal-length units, install to produce a flush joint between units.

3.5 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Perform the following operations immediately after completing resilient-product installation:
 - 1. Remove adhesive and other blemishes from surfaces.
 - 2. Sweep and vacuum horizontal surfaces thoroughly.
 - 3. Damp-mop horizontal surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION

SECTION 09 68 00 - CARPETING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Carpet tile.
 - 2. Continuous sheetgood.
 - 3. Metal transition strip.
- B. Related Requirements:
 - 1. Section 09 65 13 "Resilient Base and Accessories" for resilient wall base and accessories installed with carpet.

1.3 SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include manufacturer's written data on physical characteristics, durability, and fade resistance.
 - 2. Include manufacturer's written installation recommendations for each type of substrate.
- B. Shop Drawings: For carpet installation, plans showing the following:
 - 1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in laying carpet.
 - 2. Carpet type, color, and dye lot.
 - 3. Type of subfloor.
 - 4. Type of installation.
 - 5. Pattern of installation.
 - 6. Pattern type, location, and direction.
 - 7. Pile direction.
 - 8. Type, color, and location of insets and borders.
 - 9. Type, color, and location of edge, transition, and other accessory strips.
 - 10. Transition details to other flooring materials.
- C. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
 - 1. Carpet Tile: Full-size Sample.
 - 2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch-long Samples.

- D. Samples for Initial Selection:
 - 1. Include Samples of exposed edge, transition, and other accessory stripping involving color or finish selection.
 - E. Samples for Verification: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
 - 1. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch-long Samples.
 - F. Product Schedule: For carpet. Use same designations indicated on Drawings.
 - G. Qualification Data: For Installer.
 - H. Product Test Reports: For carpet, for tests performed by a qualified testing agency.
 - I. Sample Warranty: For special warranty.
- 1.4 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For carpet to include in maintenance manuals. Include the following:
 - 1. Methods for maintaining carpet, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
 - 2. Precautions for cleaning materials and methods that could be detrimental to carpet.
- 1.5 MAINTENANCE MATERIAL SUBMITTALS
- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Carpet: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd.
- 1.6 QUALITY ASSURANCE
- A. Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association.
 - 1. Alternatively, Bidders may be considered appropriate for the Project by providing examples and references for three projects of similar scale and type to this Project, for review and approval by the Architect and Owner.
 - B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
 - 1. Build mockups at locations and in sizes shown on Drawings or as selected by Architect.
 - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- 1.7 DELIVERY, STORAGE, AND HANDLING
- A. Comply with CRI's "CRI Carpet Installation Standard."
- 1.8 FIELD CONDITIONS
- A. Comply with CRI's "CRI Carpet Installation Standard" for temperature, humidity, and ventilation limitations.
 - B. Environmental Limitations: Do not deliver or install carpet until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and ambient temperature and humidity

conditions are maintained at levels planned for building occupants during the remainder of the construction period.

- C. Do not install carpet over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet manufacturer.
- D. Where demountable partitions or other items are indicated for installation on top of carpet, install carpet before installing these items.

1.9 WARRANTY

- A. Special Warranty for Carpet: Manufacturer agrees to repair or replace components of carpet installation that fail in materials or workmanship within specified warranty period.
 - 1. Warranty does not include deterioration or failure of carpet due to unusual traffic, failure of substrate, vandalism, or abuse.
 - 2. Failures include, but are not limited to, the following:
 - a. More than 10 percent edge raveling, snags, and runs.
 - b. Dimensional instability.
 - c. Excess static discharge.
 - d. Loss of tuft-bind strength.
 - e. Loss of face fiber.
 - f. Delamination.
 - 3. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CARPET PRODUCTS

- A. Carpet Tile:
 - 1. Basis-of-Design Product: No. 163370AK0G, Open Air 407 from Open Air Collection by Interface; www.interface.com.
 - a. Color: No. 106943 "Natural", or as selected by Architect from manufacturer's full range.
 - b. Size: 25 cm by 1 m.
 - c. Pattern: Ashlar.
 - d. Application: As indicated in Drawings.
- B. Continuous Sheetgood Carpet:
 - 1. Basis-of-Design Product: No. 147570250G, Open Air 423 from Open Air Collection by Interface; www.interface.com.
 - a. Width: 6 feet 6 inches.
 - b. Color: No. 107088 "Natural", or as selected by Architect from manufacturer's full range.
 - c. Installation Pattern: As indicated in Drawings.
 - d. Application: As indicated in Drawings.

2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that comply with flammability requirements for installed carpet, and are recommended by carpet manufacturer for releasable installation.
- C. Metal Edge/Transition Strips: Extruded aluminum with anodized finish of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.
 - 1. Approved Manufacturers:
 - a. Profilitec S.p.A.; www.profilitec.com.
 - b. Schluter Systems; www.schluter.com.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet performance.
- B. Examine carpet for type, color, pattern, and potential defects.
- C. Concrete Slabs: Verify that finishes comply with requirements specified in Section 03 30 00 "Cast-in-Place Concrete" and that surfaces are free of cracks, ridges, depressions, scale, and foreign deposits.
 - 1. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft. and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
 - a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
 - b. Relative Humidity Test: Using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
 - c. Perform additional moisture tests recommended in writing by adhesive and carpet manufacturers. Proceed with installation only after substrates pass testing.
 - d. Where necessary to reduce slab moisture for installation of carpet flooring, provide vapor emission control treatment acceptable to carpet manufacturer and compatible with products, and modify environmental conditions within acceptable range for specified Work and work sequence as required to maintain Project Schedule at no additional cost to the Owner.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Comply with CRI's "Carpet Installation Standards" and with carpet manufacturer's written installation instructions for preparing substrates indicated to receive carpet.
- B. Concrete Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using

solvents. Use mechanical methods recommended in writing by adhesive and carpet manufacturers.

1. Grind high spots and fill low spots to produce a maximum 1/8-inch deviation in any direction when checked with a 10-foot straight edge.
2. Finished concrete floor shall comply with requirements specified in this Section and in Section 03 30 00 "Cast-in-Place Concrete". Contractor, at no cost to Owner, shall provide corrective measures required to comply with floor level and flatness within acceptable limits specified.
3. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider, and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer's written instructions.

C. Broom and vacuum clean substrates to be covered immediately before installing carpet.

3.3 INSTALLATION

- A. General: Comply with CRI's "CRI Carpet Installation Standard," Section 18, "Modular Carpet" and with carpet manufacturer's written installation instructions.
- B. Installation Method: As recommended in writing by carpet manufacturer and indicated.
- C. Maintain dye-lot integrity. Do not mix dye lots in same area.
- D. Maintain pile-direction patterns indicated on Drawings and recommended in writing by carpet manufacturer.
- E. Cut and fit carpet to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet manufacturer.
- F. Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- G. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on carpet as marked on subfloor. Use nonpermanent, nonstaining marking device.
- H. Install pattern parallel to walls and borders.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet:
 1. Remove excess adhesive and other surface blemishes using cleaner recommended by carpet manufacturer.
 2. Remove yarns that protrude from carpet surface.
 3. Vacuum carpet using commercial machine with face-beater element.
- B. Protect installed carpet to comply with CRI's "Carpet Installation Standard," Section 20, "Protecting Indoor Installations."
- C. Protect carpet against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet manufacturer.

END OF SECTION

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SECTION 09 72 12 - FIBERGLASS REINFORCED PLASTIC WALL COVERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Fiberglass reinforced plastic panels (FRP).
 - 2. Moldings and accessories.
- B. Related Requirements:
 - 1. Section 07 92 00 "Joint Sealants".
 - 2. Section 09 29 00 "Gypsum Board" for panel substrate.

1.3 SUBMITTALS

- A. Product Data: For each type of fiberglass reinforced plastic wall covering and accessory.
- B. Shop Drawings: Show location and extend of each wall covering. Indicate seams and termination points.
 - 1. Include trim types and locations and section details.
- C. Samples for Initial Selection: For each type of fiberglass reinforced plastic wall covering and accessory
- D. Samples for Verification: For each type of wall covering and for each color, pattern, texture, and finish specified, 3 inches square in size.
- E. Product Schedule: For wall coverings. Use same designations indicated on Drawings.
- F. Qualification Data: For testing agency.
- G. Product Test Reports: For each wall covering, for tests performed by a qualified testing agency.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For wall coverings to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Applicator shall be experienced in manufacturer's installation procedures and be approved by the manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver finish materials to job site only when satisfactory conditions for storage can be provided. Maintain materials in manufacturer's labeled and unbroken packages.

1.7 PROJECT CONDITIONS

- A. Acclimate plastic sheet at least 24 hours in temperature and humidity conditions of final environment before beginning Work of this Section.

- B. Environmental Limitations: Do not deliver or install wall coverings until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at levels intended for occupants after Project completion during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: As determined by testing identical wall coverings applied with identical adhesives to substrates according to test method indicated below by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less.

2.2 MANUFACTURERS

- A. Basis-of-Design Manufacturer: Koroseal Interior Products, LLC.; www.koroseal.com.
- B. Other Approved Manufacturers:
 - 1. Crane Composites, Inc.; www.cranecomposites.com.
 - 2. Marlite, a Division of Nudo Products, Inc.; www.marlite.com.

2.3 FIBERGLASS REINFORCED PLASTIC PANELS

- A. Fiberglass Reinforced Plastic Panels:
 - 1. Basis-of-Design Product: Koroguard Protective Wall Covering by Koroseal.
 - 2. Height: 48 in.
 - 3. Thickness: 0.040 inch.
 - 4. Fire Hazard Classification: Class A, as tested per ASTM E84.
 - 5. Color: As selected by Architect from manufacturer's full range.
 - 6. Texture: As selected by Architect from manufacturer's full range.
 - 7. Application: As indicated.
- B. Adhesive: Low VOC as recommended by plastic sheet manufacturer for laminating over gypsum board substrate.
- C. Sealant: Silicone sealant as recommended by plastic sheet manufacturer for sealing edges and installing moldings.
- D. Moldings:
 - 1. Material: PVC in matching color.
 - 2. Manufacturer: By panel manufacturer.
 - 3. Profiles: As selected by Architect for panel splices, inside and outside corners, bottom, top and edge of panel from manufacturer's standard profiles.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:

1. Verify that all surfaces are smooth, level, clean, and free of irregularities that may be detrimental to proper application.
2. Commencement of installation denotes acceptance of substrate.
3. Do not begin installation until the work of all other trades, including painting, has been completed and the temperature of the rooms has been maintained within humidity and temperature requirements by adhesive manufacturer for at least 48 hours before commencing Work.

3.2 INSTALLATION

- A. Apply adhesive in accordance with the recommendations of the adhesive manufacturer.
- B. Handle and install wall covering in conformance with manufacturer's installation bulletin.
- C. Install wall covering to provide a proper symmetrical pattern in each area, with joints straight and true, and all panel edges concealed with appropriate molding for finished appearance; joints sealed with silicone sealant.

3.3 CLEANING AND PROTECTION

- A. Carefully clean all surfaces after application using recommended methods. Any stains or defects apparent after cleaning will require replacement of material.
- B. Protect wall coverings from damage. Replace damage coverings.

END OF SECTION

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SECTION 09 91 00 - PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes surface preparation and field painting of exposed items and surfaces, except as indicated in the Related Requirements article below.
 - 1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections. Substrates include:
 - a. Interior substrates:
 - 1) Gypsum wall and ceiling board.
 - 2) Wood.
 - b. Exterior substrates:
 - 1) Fiber-cement board
 - 2) Hollow-metal work, factory primed.
 - 3) Wood.
 - 2. Paint schedule for all finish colors in Project.
- B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.
 - 1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.
- C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.
 - 1. Prefinished items include the following factory-finished components:
 - a. Architectural woodwork.
 - b. Acoustical wall panels.
 - c. Unit kitchens.
 - d. Finished mechanical and electrical equipment.
 - e. Light fixtures.
 - 2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:
 - a. Foundation spaces.
 - b. Furred areas.
 - c. Ceiling plenums.
 - d. Utility tunnels.

- e. Pipe spaces.
 - f. Duct shafts.
 - 3. Finished metal surfaces include the following:
 - a. Anodized aluminum.
 - b. Stainless steel.
 - c. Chromium plate.
 - d. Copper and copper alloys.
 - e. Bronze and brass.
 - 4. Operating parts include moving parts of operating equipment and the following:
 - a. Valve and damper operators.
 - b. Linkages.
 - c. Sensing devices.
 - d. Motor and fan shafts.
 - 5. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.
 - D. Products and materials in this Section have been selected for indoor chemical and pollutant source control and/ or low-VOC emitting characteristics.
 - 1. Clean Air
 - a. Interior Paints, Interior Coatings, Site-applied Sealants, Insulation, and Flooring to meet California Section 01350 Specification or South Coast Air Quality Management District (SCAQMD) 1113.
 - 1) www.calrecycle.ca.gov/greenbuilding/specs/section01350/.
 - E. Related Requirements:
 - 1. Section 06 20 00 "Finish Carpentry" for transparent finishes at carpentry.
- 1.3 DEFINITIONS
- A. Volatile Organic Compounds (VOCs): Compounds as defined by the U.S. Environmental Protection Agency (EPA) in 40 CFR § 51.100 (s), (1).
 - B. Anti-Corrosive Paints: Coatings formulated and recommended for use in preventing the corrosion of ferrous metal substrates.
- 1.4 SUBMITTALS
- A. Product Data: For each type of product indicated.
 - B. Samples for Initial Selection:
 - 1. For each type of topcoat product indicated.
 - C. Samples for Verification: For each type of paint system and in each color and gloss of topcoat indicated.
 - 1. Submit Samples on rigid backing, 8 inches square.
 - 2. Step coats on Samples to show each coat required for system.
 - 3. Label each coat of each Sample.

4. Label each Sample for location and application area.
- D. Product List: For each product indicated, include the following:
 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.

1.5 PROJECT CONDITIONS

- A. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of . Maintain storage containers in a clean condition, free of foreign materials and residue.
- B. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between .
- C. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between .
- D. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Manufacturer: Sherwin-Williams Co., The; www.sherwin-williams.com.
- B. Other Approved Manufacturers:
 1. Benjamin Moore and Co.; www.benjaminmoore.com.
 2. Miller Paint; www.millerpaint.com.
 3. PPG Industries; www.ppgpaints.com.
 4. Rodda Paint Co.; www.rodmapaint.com.

2.2 PAINT MATERIALS, GENERAL

- A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
- C. Sustainability Requirements:
 1. Comply with low-emitting requirements.
- D. Chemical Components of Interior Paints and Coatings: Provide products that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24) and the following chemical restrictions.
 1. The following chemicals shall not be used as an ingredient in any of the paints or coatings applied indoors and on-site:
 - a. Aromatic Compounds: The product must contain no more than 1.0% by weight of the sum total of aromatic compounds.
 - b. Halomethanes: Methylene Chloride.

- c. Chlorinated Ethanes: 1,1,1-trichloroethane.
 - d. Aromatic Solvents: Benzene, Toluene (methylbenzene), Ethylbenzene.
 - e. Chlorinated Ethylenes: Vinyl Chloride.
 - f. Polynuclear Aromatics: Naphthalene.
 - g. Chlorobenzenes: 1,2-dichlorobenzene.
 - h. Phthalate Esters: di (2-ethylhexyl) phthalate, butyl benzyl phthalate, di-n-butyl phthalate, di-n-octyl phthalate, diethyl phthalate, dimethyl phthalate.
 - i. Miscellaneous Semi-Volatile Organics: Isophorone. Metals and their compounds: Antimony, Cadmium, Hexavalent Chromium, Lead, Mercury.
 - j. Preservatives (Anti-Fouling Agents): Formaldehyde.
 - k. Ketones: Methyl ethyl ketone, Methyl isobutyl Ketone.
 - l. Miscellaneous Volatile Organics: Acrolein, Acrylonitrile.
2. Volatile Organic Compounds: The volatile organic compound (VOC) concentrations (in grams per liter) of the paint or coating shall not exceed those listed below if the paint or coating is applied indoors, on-site. VOCs shall be tested in accordance with the U.S. Environmental Protection Agency (EPA) Test Method 24. The calculation of VOC shall exclude water, exempt solvents, and tinting color added at the point of sale.
- a. Flat Interior Coatings: 50 g/L.
 - b. Non-Flat Interior Coatings: 50 g/L.
 - c. Gloss Anti-Corrosive Interior Coatings: 50 g/L.
 - d. Semi-Gloss Anti-Corrosive Interior Coatings: 50 g/L.
 - e. Flat Anti-Corrosive Interior Coatings: 50 g/L.
 - f. Bond Breaker Coatings: 350 g/L.
 - g. Concrete Curing Compounds: 350 g/L.
 - h. Floor Coatings: 250 g/L.
 - i. Flow Coatings: 420 g/L.
 - j. Form Release Compounds: 250 g/L.
 - k. Pre-Treatment Wash Primers Coatings: 420 g/L.
 - l. Sanding Sealers (Non-Lacquer): 350 g/L.
 - m. Shellacs, Clear: 730 g/L.
 - n. Shellacs, Opaque: 550 g/L.
 - o. Specialty Primers, Sealers, and Undercoaters: 350 g/L.
 - p. Stains: 250 g/L.
 - q. Varnishes: 350 g/L.
 - r. Waterproofing Sealers: 250 g/L.
 - s. Waterproofing Sealers, Concrete/Masonry: 400 g/L.
 - t. Wood Preservatives: 350 g/L.

2.3 PREPARATORY COATS

- A. Coordinate with Sections of other trades for correct primers to ensure compatibility with subsequent coatings applied by this Section.
- B. Interior Primer: Interior latex-based or alkyd primer of finish coat manufacturer and recommended in writing by manufacturer for use with finish coat and on substrate indicated.
 - 1. Ferrous-Metal Substrates: Quick drying, rust-inhibitive metal primer.
 - 2. Zinc-Coated Metal Substrates: Galvanized metal primer.
 - 3. Where manufacturer does not recommend a separate primer formulation on substrate indicated, use paint specified for finish coat.
- C. Interior, Latex Primer Sealer: Water-based primer sealer with low-odor characteristics and a VOC of less than 10 grams per liter.
 - 1. Approved Products:
 - a. Acro Pure Interior Primer/ Sealer 210011 by Miller Paint.
 - b. Acrylitex MPI #50 Primer/Sealer 296017 (emissions tested, CDPH) by Miller Paint.
 - c. ProMar 200 0VOC Primer, B28W2600 by Sherwin-Williams.
 - d. PVA Drywall Primer, B28W8030 by Sherwin-Williams.
 - 2. Applications: New interior plaster, concrete, and gypsum wallboard surfaces that are subsequently to be painted with latex finish coats.
- D. Interior/ Exterior Latex Multipurpose Primer: Water-based primer sealer with low-odor characteristics and a VOC of less than 50 grams per liter.
 - 1. Basis-of-Design Product: PrepRite ProBlock Primer/Sealer, B51W620 by Sherwin-Williams.
 - 2. Applications: Interior/ exterior wood, gypsum, and other approved substrates.
- E. Interior/ Exterior, Latex Primer for Wood: Waterborne-emulsion primer formulated for resistance to extractive bleeding, mold, and microbials; for hiding stains.
 - 1. Approved Products:
 - a. All Purpose Stain Blocking Primer 470011 by Miller Paint.
 - b. Pro Industrial Pro-Cryl Primer, B66W1310 by Sherwin-Williams.
 - 2. Applications: Interior/ exterior wood subject to extractive bleeding.
- F. Exterior, Water-Based Wood Preservative: Water-based, penetrating inorganic boron wood preservative treatment for exterior wood; fungicidal, insecticidal and moldicidal; clear solution in propylene glycol and water.
 - 1. Active Ingredients: 19.6 percent disodium octaborate tetrahydrate; 1.0 percent didecyl dimethyl ammonium chloride.
 - 2. Basis-of-Design Product: Sansin Boracol 20-2 by Miller Paint.

2.4 WATER-BASED FINISH COATS

- A. Interior, Latex: White or colored latex paint with low-odor characteristics and a VOC of less than 10 grams per liter.
 - 1. Basis-of-Design Product: Acro Pure Interior or Acro HP by Miller Paint.
 - 2. Applications: Interior gypsum board walls, ceilings and soffits; interior wood and MDF trim where indicated to receive an opaque finish.

- B. Interior, Latex, Light-Industrial Coating: Pigmented, water-based emulsion coating formulated for moderate abrasion resistance, and mild chemical exposure and corrosive conditions.
 - 1. Basis-of-Design Products:
 - a. Wood: Acrinamel Int/ Ext Multipurpose Enamel by Miller Paint.
 - b. Metal: Acrimetal Int/ Ext DTM by Miller Paint.
 - 2. Applications: Interior, primed, wood and metal surfaces (e.g., walls, doors, frames, trim, and sash).
- C. Exterior, Latex, Light Industrial Coating: Corrosion-resistant, water-based, pigmented, emulsion coating; providing resistance to water, alkalis, moderate abrasion, and mild chemical exposure.
 - 1. Basis-of-Design Products:
 - a. Wood: Acrinamel Int/ Ext Multipurpose Enamel by Miller Paint.
 - b. Metal: Acrimetal Int/ Ext DTM by Miller Paint.
 - 2. Applications: Exterior, primed, wood and metal surfaces.

2.5 SOLVENT-BASED FINISH COATS

- A. Exterior, Quick-Drying Alkyd Enamel: Solvent-based, alkyd or modified-alkyd enamel; providing quick-drying capabilities.
 - 1. Basis-of-Design Product: PPG HPC Rust Preventative Alkyd by Miller Paint.
 - 2. Applications: Exterior, primed, metal and dimensionally stable wood surfaces.
- B. Exterior, High-Build Epoxy Paint: High-solids, two-component epoxy.
 - 1. Basis-of-Design Product: PPG Amerlock 2/400 Epoxy by Miller Paint.
 - 2. Applications: Exterior concrete, masonry, and primed metal surfaces.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with procedures specified in PDCA P4 for inspection and acceptance of surfaces to be painted.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
- C. Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
- D. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
 - 1. Provide barrier coats over incompatible primers or remove and reprime.
 - 2. Cementitious Materials: Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.

3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
 - a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
 - b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counters, cases, and paneling.
 - c. If transparent finish is required, backprime with spar varnish.
 - d. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on back side.
 - e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.
 4. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's recommendations.
 - a. Blast steel surfaces clean as recommended by paint system manufacturer and according to SSPC-SP 6/NACE No. 3, SSPC-SP 10/NACE No. 2.
 - b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
 - c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.
 5. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- E. Material Preparation:
1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
 2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
- F. Exposed Surfaces: Include areas visible when permanent or built-in fixtures, grilles, convactor covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
1. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 2. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
 3. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
 4. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.
- G. Sand lightly between each succeeding enamel or varnish coat.

- H. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
 - 1. Omit primer over metal surfaces that have been shop primed and touchup painted.
 - 2. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance.
- I. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
- J. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate. Provide total dry film thickness of the entire system as recommended by manufacturer.
- K. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.
- L. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.
- M. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
- N. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.

3.2 CLEANING AND PROTECTING

- A. At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.
- B. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.
- C. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.
 - 1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.3 INTERIOR PAINT SYSTEM SCHEDULE

- A. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint the following work where exposed to view, with paint compatible with substrate:
 - a. Plywood backing.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit where located along painted wall, as indicated in Drawings.

- f. Plastic conduit.
 - g. Tanks that do not have factory-applied final finishes.
 - B. Exposed Structure, Ceilings: Where scheduled to be painted.
 - 1. System: One coat modified acrylic dryfall.
 - 2. Verify substrate and acceptable product.
 - C. Gypsum Board Substrates:
 - 1. Acrylic Latex System, institutional low odor/ VOC.
 - a. Prime/Sealer Coat: Latex, interior.
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior.
 - 2. Sheen:
 - a. Walls:
 - 1) Typical Throughout Units: Eggshell.
 - 2) At Bathrooms: Semi-gloss.
 - b. Ceilings: Eggshell.
 - D. Gypsum Board Substrates: Moisture-resistant finish; At janitor, bath and shower enclosures, and mechanical:
 - 1. System:
 - a. Prime Coat: Acrylic, interior.
 - b. Intermediate Coat: Match topcoat.
 - c. Topcoat: Waterborne epoxy coating, interior.
 - 2. Sheen: As indicated in Drawings.
 - E. Wood Substrates, Opaque Finishes:
 - 1. Latex over Latex Primer System:
 - a. Prime Coat: Primer, latex, for interior wood.
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior.
 - 2. Sheen:
 - a. Typical: Satin sheen.
 - b. At Doors and Trim: Semi-gloss.
 - F. Wood Substrates, Transparent Finishes: Refer to Sections 06 20 00 "Finish Carpentry" and 09 64 00 "Wood Flooring".
- 3.4 EXTERIOR PAINT SYSTEM SCHEDULE
- A. Fiber Cement:
 - 1. System: Latex, exterior.
 - a. Prime Coat: Acrylic, alkali resistant, water based.
 - b. Topcoats to Cover: Topcoat: Latex, exterior.

2. Sheen: As selected by Architect.
- B. Galvanized-Metal Substrates: Miscellaneous galvanized steel and railings.
 1. Acrylic System:
 - a. Prime Coat: Primer, zinc rich, water based. Provide where not shop-primed.
 - b. Intermediate Coat: Acrylic enamel, exterior, matching topcoat.
 - c. Topcoat: Acrylic enamel, exterior, semi-gloss.
- C. Exposed Wood-Framing Substrates:
 1. Latex over Latex Primer System:
 - a. Prime Coat: Exterior, latex wood primer.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Exterior latex paint, low sheen.
- D. Dressed-Lumber Substrates: Trim, Architectural woodwork, Doors, Windows, Board siding, Railings, Fences.
 1. Latex over Latex Primer System:
 - a. Prime Coat: Exterior, latex wood primer.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Exterior latex paint, low sheen.

3.5 COLOR SCHEDULE

- A. Refer to Drawings for color schedule.
- B. Coordinate finish colors with systems indicated in other Sections.
- C. Basis-of-Design Manufacturer is for color only. Provide color match where different paint manufacturer is used.
- D. Where surfaces are scheduled for primer only, provide primer indicated for substrate in systems listed above.

END OF SECTION

SECTION 10 14 00 - SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Code-required room identification signs.
 - 2. Code-required stair identification signs.
 - 3. Code-required egress signs, except lighted egress signage.
 - 4. Exterior building identification signage.
- B. Related Requirements:
 - 1. Division 26 "Electrical" for lighted egress signage.

1.3 SUBMITTALS

- A. General: Ensure that requests for substitution have been provided to the Architect and that the Architect has provided clear approval of the proposed substitution products prior to order placement, delivery and installation of products. Refer to Section 01 25 00 "Product Substitution Procedures".
- B. Product Data: For information only, include manufacturer's printed specifications, anchorage details and installation, and maintenance instructions for products to be used in the fabrication of signage and graphics work, and installation instructions for each type of sign and graphic unit.
- C. Shop Drawings: For manufacturing including plans, elevations, sections, details, fabrication and erection of signs and graphic work at not less than 1:20 scale. Show jointage, anchorage, accessory items, and finishes. Submit full-scale drawings of typical sign faces showing copy layout. Half-scale drawings shall be sufficient for sign faces 1 m by 1 m and larger.
- D. Samples for Initial Selection: For each type of sign indicated.
 - 1. Aluminum: Samples of each finish type and color, on 150 mm long sections of extrusions and not less than 100 mm squares of sheet or plate showing the full range of colors available
 - 2. Acrylic and Polycarbonate Sheet: Samples of each paint and silkscreen ink color painted onto the required thickness of material.
- E. For identification purposes, mark samples with the appropriate sign type application.
- F. Manufacturer Certificates: Signed by manufacturers certifying that they comply with requirements.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For signs to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications.

1.6 WARRANTY

- A. Special Warranty: Manufacturer Warranty Period of Five years.

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.

2.2 SIGNS

- A. Panel Sign: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles. Provide signs as indicated in Drawings.
- B. Room-Identification Sign: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles. Provide signs as indicated in Drawings.
- C. Interior Informational Signs: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles. Provide signs as indicated in Drawings.
- D. Emergency Evacuation Maps: Provide code required signage to meet occupancy.
- E. Interior Wayfinding Signage: Hanging directional sign as indicated in Drawings.

2.3 SIGNAGE MATERIALS

- A. Aluminum Sheet and Plate: ASTM B 209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.
- B. Aluminum Extrusions: ASTM B 221, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.
- C. Steel Materials:
 - 1. Metallic-Coated Steel Sheet: ASTM A 653, G90 coating, either commercial or forming steel.
 - 2. Steel Sheet: Uncoated, cold-rolled, ASTM A 1008, commercial steel, Type B, exposed electrolytic zinc-coated, ASTM A 879, Coating Designation 08Z, with steel-sheet substrate according to ASTM A 1008, commercial steel, exposed.
 - 3. Steel Members Fabricated from Plate or Bar Stock: ASTM A 529 or ASTM A 572, 42,000-psi minimum yield strength.
- D. Stainless-Steel Sheet: ASTM A 240 or ASTM A 666, Type 304, stretcher-leveled standard of flatness.
- E. Acrylic Sheet: ASTM D 4802, category as standard with manufacturer for each sign, Type UVF (UV filtering).
- F. Polycarbonate Sheet: ASTM C 1349, Appendix X1, Type II (coated, mar-resistant, UV-stabilized polycarbonate), with coating on both sides.
- G. Fiberglass Sheet: Multiple laminations of glass-fiber-reinforced polyester resin with UV-light stable, colorfast, nonfading, weather- and stain-resistant, colored polyester gel coat, and with manufacturer's standard finish.
- H. PVC Sheet: Manufacturer's standard, UV-light stable, PVC plastic.

- I. Plastic-Laminate Sheet: NEMA LD 3, general-purpose HGS grade, 0.048-inch nominal thickness.
- J. Vinyl Film: UV-resistant vinyl film of nominal thickness indicated, with pressure-sensitive, permanent adhesive on back; die cut to form characters or images as indicated and suitable for exterior applications.
- K. Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.

2.4 EXTERIOR BUILDING IDENTIFICATION SIGNAGE

- A. Building Identification Signage: As indicated in Drawings.

2.5 MATERIALS

- A. Aluminum Extrusions: ASTM B221, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.
- B. Plastic-Laminate Sheet: NEMA LD 3, general-purpose HGS grade, 0.048-inch nominal thickness.
- C. Vinyl Film: UV-resistant vinyl film of nominal thickness indicated, with pressure-sensitive, permanent adhesive on back; die cut to form copy as indicated.

2.6 ACCESSORIES

- A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signs, noncorrosive and compatible with each material joined. Use concealed fasteners and anchors unless indicated to be exposed.
- B. Adhesive: As recommended by sign manufacturer.
- C. Two-Face Tape: Manufacturer's standard high-bond, foam-core tape, 0.045 inch thick, with adhesive on both sides.
- D. Hook-and-Loop Tape: Manufacturer's standard two-part tape consisting of hooked part on sign back and looped side on mounting surface.
- E. Magnetic Tape: Manufacturer's standard magnetic tape with adhesive on one side.

2.7 FABRICATION

- A. Surface-Engraved Graphics: Machine engrave characters and other graphic devices into indicated sign surface to produce precisely formed copy, incised to uniform depth.
- B. Subsurface-Applied Graphics: Apply graphics to back of clear face-sheet material to produce precisely formed image. Image shall be free of rough edges.
- C. Subsurface-Engraved Graphics: Reverse engrave back of clear face-sheet material. Fill resulting copy with manufacturer's standard enamel. Apply opaque manufacturer's standard background color coating over enamel-filled copy.
- D. Shop- and Subsurface-Applied Vinyl: Align vinyl film in final position and apply to surface. Firmly press film from the middle outward to obtain good bond without blisters or fishmouths.

2.8 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.

- C. Directional Finishes: Run grain with long dimension of each piece and perpendicular to long dimension of finished trim or border surface unless otherwise indicated.
- D. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting finishes on raised features unless otherwise indicated.

2.9 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, Class I, 0.018 mm or thicker.
- B. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

2.10 METALLIC-COATED STEEL FINISHES

- A. Factory Prime Finish: After cleaning and pretreating, apply an air-dried primer compatible with the organic coating to be applied over it.
- B. Baked-Enamel or Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils.

2.11 STEEL FINISHES

- A. Factory Prime Finish: After surface preparation and pretreatment, apply manufacturer's standard, fast-curing, lead- and chromate-free, universal primer.
- B. Baked-Enamel or Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils.

2.12 STAINLESS-STEEL FINISHES

- A. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
 - 1. Directional Satin Finish: No. 4.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install signs using mounting methods indicated and in accordance with manufacturer's written instructions.
- B. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
- C. Accessible Signage: Install in locations on walls as indicated and in accordance with the accessibility standards.

- D. Adhesives and Tapes: Clean substrate to remove materials that would adversely affect bond. Use materials and quantities sufficient to support weight of sign after cure without slippage. Keep adhesives and tapes away from edges to prevent visibility at sign edges.

3.3 ADJUSTING AND CLEANING

- A. Touch up factory-applied finishes to restore damaged or soiled areas.
- B. Remove temporary protective coverings and strippable films as signs are installed.

END OF SECTION

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SECTION 10 26 00 - WALL PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Corner guards.

1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, impact strength, dimensions of individual components and profiles, and finishes for each impact-resistant wall protection unit.
- B. Samples for Initial Selection: For each type of impact-resistant wall protection unit indicated.
- C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
 - 1. Impact-Resistant Wall Covering: 6 by 6 inches square.
- D. Warranty: Sample of special warranty.
- E. Maintenance Data: For each impact-resistant wall protection unit to include in maintenance manuals.
 - 1. Include recommended methods and frequency of maintenance for maintaining optimum condition of plastic covers under anticipated traffic and use conditions. Include precautions against using cleaning materials and methods that may be detrimental to plastic finishes and performance.
- F. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
- G. Include mounting and accessory components. Replacement materials shall be from same production run as installed units.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Source Limitations: Obtain impact-resistant wall protection units from single source from single manufacturer.
- C. Product Options: Drawings indicate size, profiles, and dimensional requirements of impact-resistant wall protection units and are based on the specific system indicated. Refer to Section 01 40 00 "Quality Requirements."
 - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- E. Surface-Burning Characteristics: Provide impact-resistant, plastic wall protection units with surface-burning characteristics as determined by testing identical products per ASTM E 84, NFPA 255, or UL 723 by UL or another qualified testing agency.
- F. Preinstallation Conference: Conduct conference at Project site.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store impact-resistant wall protection units in original undamaged packages and containers inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.
 - 1. Maintain room temperature within storage area at not less than 70 deg F during the period plastic materials are stored.
 - 2. Keep plastic sheet material out of direct sunlight.
 - 3. Store plastic wall protection components for a minimum of 72 hours, or until plastic material attains a minimum room temperature of 70 deg F.
Store covers in a horizontal position.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install impact-resistant wall protection units until building is enclosed and weatherproof, wet work is complete and dry, and HVAC system is operating and maintaining temperature at 70 deg F for not less than 72 hours before beginning installation and for the remainder of the construction period.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of impact-resistant wall protection units that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures.
 - b. Deterioration of plastic and other materials beyond normal use.
 - 2. Warranty Period: Five (5) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTUER

- A. Basis-of-Design Manufacturer: Construction Specialties, Inc.; www.c-sgroup.com.

2.2 CORNER GUARDS

- A. Surface-Mounted, Metal Corner Guards: Fabricated as one piece from formed or extruded metal with formed edges.
- B. Surface-Mounted, Plastic-Cover Corner Guards: Manufacturer's standard, PVC-free assembly consisting of snap-on, resilient plastic cover installed over retainer; including mounting hardware; fabricated with 90- or 135-degree turn to match wall condition.
 - 1. Finish: Painted to match adjacent wall.

2.3 MATERIALS

- A. Fasteners: Aluminum, nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Use security-type fasteners where exposed to view.
- B. Adhesive: As recommended by impact-resistant plastic wall protection manufacturer and with a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

- C. Adhesive: As recommended by impact-resistant plastic wall protection manufacturer and that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.4 FABRICATION

- A. Preform curved semirigid, impact-resistant sheet wall covering in factory for radius and sheet thickness as follows:
 - 1. Sheet Thickness of 0.040 Inch: 24-inch radius.
 - 2. Sheet Thickness of 0.060 Inch: 36-inch radius.
- B. Assemble components in factory to greatest extent possible to minimize field assembly. Disassemble only as necessary for shipping and handling.
- C. Fabricate components with tight seams and joints with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Examine walls to which impact-resistant wall protection will be attached for blocking, grounds, and other solid backing that have been installed in the locations required for secure attachment of support fasteners.
 - 1. For impact-resistant wall protection units attached with adhesive or foam tape, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Complete finishing operations, including painting, before installing impact-resistant wall protection system components.
- B. Before installation, clean substrate to remove dust, debris, and loose particles.

3.3 INSTALLATION

- A. General: Install impact-resistant wall protection units level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.
 - 1. Provide splices, mounting hardware, anchors, and other accessories required for a complete installation.
 - a. Provide anchoring devices to withstand imposed loads.
 - b. Where splices occur in horizontal runs of more than 20 feet, splice aluminum retainers and plastic covers at different locations along the run, but no closer than 12 inches.
 - c. Adjust end and top caps as required to ensure tight seams.
- B. Impact-Resistant Wall Covering: Install top and edge moldings, corners, and divider bars as required for a complete installation.

3.4 CLEANING

- A. Immediately after completion of installation, clean plastic covers and accessories using a standard, ammonia-based, household cleaning agent.
- B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION

SECTION 10 28 00 - RESTROOM AND CUSTODIAL ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Restroom Accessories:
 - a. Coat hooks.
 - b. Grab bars.
 - c. Mop sink.
 - d. Paper towel dispenser and waste receptacle.
 - e. Soap dispensers.
 - f. Sanitary napkin disposal.
 - g. Toilet paper dispenser.
- B. Related Requirements:
 - 1. Section 06 10 00 "Rough Carpentry" for coordination of blocking.

1.3 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. Coordinate blocking locations for accessory anchor and attachment to partitions.
- C. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.
- D. All locations to be confirmed during site walk with Owner prior to installation.

1.4 SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 - 2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
 - 3. Include electrical characteristics.
- B. Samples: Full size, for each exposed product and for each finish specified.
 - 1. Approved full-size Samples will be returned and may be used in the Work.
- C. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
 - 1. Identify locations using room designations indicated.

- 2. Identify accessories using designations indicated.
- D. Sample Warranty: For manufacturer's special warranty.
- 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: Fifteen (15) 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.

2.2 MANUFACTURERS

- A. Source Limitations: Obtain restroom and shower accessories from single source from single manufacturer for each type, except as otherwise indicated.
- B. Residential Bathroom Accessories:
 - 1. Approved Manufacturers:
 - a. ASI American Specialties, Inc.; www.americanspecialties.com.
 - b. Bobrick; www.bobrick.com.
 - c. Elkay Manufacturing Company; www.elkay.com.
 - d. Gatco; www.gatco-inc.com.
 - e. Hafele America Co; www.hafele.com.

2.3 RESTROOM ACCESSORIES

- A. Coat Hook:
 - 1. Basis-of-Design Product: Model no. B-9542 Fino Collection Surface Mounted Coat Hook by Bobrick.
 - 2. Finish: Satin.
 - 3. Dimensions: 1-1/2 inches H x 1-11/32 inches W x 2-1/2 inches D.
- B. Grab Bars:
 - 1. Basis-of-Design Products:
 - a. Model no. B-5806 Series Straight Grab Bar by Bobrick.
 - 1) Finish: Satin.
 - 2) Diameter: 1-1/4 inch.
 - 3) Lengths: As indicated in Drawings.

- b. Model no. B-5897 Two-Wall Toilet Compartment Grab Bar by Bobrick.
 - 1) Finish: Satin.
 - 2) Diameter: 1-1/4 inch.
 - 3) Lengths: As indicated in Drawings.
 - C. Mop Sink:
 - 1. Basis-of-Design Product: Model no. FLR-2X Stainless Steel 16 Gauge Mop Sink by Elkay.
 - 2. Finish: Stainless Steel.
 - 3. Mounting: Freestanding.
 - 4. Dimensions: 32 x 24 x 10 inches.
 - D. Paper Towel Dispenser and Waste Receptacle:
 - 1. Basis-of-Design Product: Model no. B-3803 TrimLine Series Recessed Paper Towel Dispenser/Waste Receptacle by Bobrick.
 - 2. Finish: Satin.
 - E. Soap Dispenser:
 - 1. Basis-of-Design Product: Model no. ESD-1500 Deck Mounted Foam Soap Dispenser by Sloan.
 - a. Finish: Polished Chrome.
 - 2. Application: Public Restrooms or as indicated on Drawings.
 - F. Sanitary Napkin Disposal:
 - 1. Basis-of-Design Product: Model no. B-254 ClassicSeries Surface-Mounted Sanitary Napkin Disposal by Bobrick.
 - G. Toilet Paper Dispenser:
 - 1. Basis-of-Design Product: Model no. B-3092 Recessed Mounted Toilet Tissue, Seat Cover Dispenser and Waste Disposal by Bobrick.
 - 2. Finish: Satin.
- 2.4 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 six keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

3.2 NOT IN CONTRACT (NIC)

- A. The following is provided for information only.

- B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F 446.

3.3 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Remove temporary labels and protective coatings.
- C. Clean and polish exposed surfaces according to manufacturer's written instructions.

END OF SECTION

SECTION 10 28 19 - SHOWER ENCLOSURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Fiberglass shower enclosures.
 - 2. Shower pans.
- B. Related Requirements:
 - 1. Section 05 50 00 "Metal Fabrications" for supports that attach floor-and-ceiling-anchored compartments to the overhead structural system.
 - 2. Section 06 10 00 "Rough Carpentry" for overhead support of floor-and-ceiling-anchored compartments.
 - 3. Section 10 28 00 "Restroom and Custodial Accessories" for grab bars, purse shelves, and similar accessories.
 - 4. Section 22 05 10 "Design-Build Plumbing Systems" Sections for shower heads, drains, valves, and controls.

1.3 SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For shower and dressing compartments.
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Show locations of cutouts for compartment-mounted accessories.
 - 3. Show locations of centerlines of drains.
 - 4. Show ceiling grid, ceiling-mounted items, and overhead support or bracing locations.
- C. Samples for Initial Selection: For each type of compartment material indicated.
 - 1. Include Samples of hardware and accessories for material and color selection.
- D. Samples for Verification: For the following products, in manufacturer's standard sizes unless otherwise indicated:
 - 1. Each type of material, color, and finish required for compartments, prepared on 6-inch-square Samples of same thickness and material indicated for the Work.
 - 2. Each type of hardware and accessory.
- E. Maintenance Data: For shower and dressing compartments to include in maintenance manuals.

1.4 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of fixtures, drains, walls, columns, ceilings, and other construction contiguous with shower and dressing compartments by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Smoke-Developed Index: 450 or less.
- B. Accessibility Standard: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for shower and dressing compartments designated as accessible.

2.2 SHOWER ENCLOSURES

- A. Basis-of-Design Product: Model no. S6334A Everfab ADA Roll In Shower 63 x 34 inches by Everfab; www.everfabath.com.
- B. Shower Pan: Provide manufacturer's standard, prefabricated, single piece gel fiberglass receptor complete with integral drain, or as indicated in Section 22 05 10 "Design-Build Plumbing Systems" Plumbing Schedule.

2.3 MATERIALS

- A. Aluminum Castings: ASTM B26.
- B. Aluminum Extrusions: ASTM B221.
- C. Brass Castings: ASTM B584.
- D. Brass Extrusions: ASTM B455.
- E. Stainless Steel Sheet: ASTM A666, Type 304, stretcher-leveled standard of flatness.
- F. Stainless Steel Castings: ASTM A743.

2.4 ACCESSORIES

- A. Overhead Bracing: Manufacturer's standard, continuous, extruded-aluminum headrail or cap with antigrip profile; in manufacturer's standard finish.
- B. Anchorages and Fasteners: Manufacturer's standard, exposed fasteners of stainless steel, chrome-plated steel, or solid brass, finished to match the items they are securing; with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. Use countersunk, flush-type bolt heads or otherwise make fasteners inconspicuous if exposed on opposite side of panel from hardware or accessory item. For concealed anchors, use stainless steel, hot-dip galvanized steel, or other rust-resistant, protective-coated steel.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions. Install compartments rigid, straight, level, and plumb. Secure compartments in position with manufacturer's recommended anchoring devices.

1. Clearances for Dressing Compartments: Maximum 1/2 inch between pilasters and panels; 1 inch between panels and walls.
2. Stirrup Brackets for Dressing Compartments: Secure panels to walls and to pilasters with no fewer than two brackets attached near top and bottom of panel.
 - a. Locate wall brackets so holes for wall anchors occur in masonry or tile joints.
 - b. Align brackets at pilasters with brackets at walls.
3. Full-Height (Continuous) Brackets for Dressing Compartments: Secure panels to walls and to pilasters with full-height brackets.
 - a. Locate bracket fasteners so holes for wall anchors occur in masonry or tile joints.
 - b. Align brackets at pilasters with brackets at walls.

3.2 ADJUSTING

- A. Curtain Adjustment: After hanging curtains, test and adjust each track or rod to produce unencumbered, smooth operation. Steam and dress down curtains as required to produce crease- and wrinkle-free installation. Remove and replace curtains that are stained or soiled or that have stress points or diagonal folds.
- B. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on in swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on outswinging doors to return doors to fully closed position.

END OF SECTION

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SECTION 10 41 16 - EMERGENCY KEY CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Furnish and install exterior emergency key cabinets and accessories.
- B. Related Requirements:
 - 1. Section 06 10 00 "Rough Carpentry": for blocking as required.
 - 2. Division 07 "Thermal and Moisture Protection" Sections for coordination with exterior walls to receive recess-mounted exterior emergency key cabinets.

1.3 SUBMITTALS

- A. Prepare and submit under the provisions of Division 01 Section "Submittal Procedures".
 - 1. Product Data: Submit complete manufacturer's product data consisting of product description and specifications, test data and technical characteristic, safety precautions, preparations and installation instructions, maintenance instructions, and other pertinent technical information required for product use and functionalities.
 - 2. Shop Drawings: Submit complete shop drawings of all work of this Section, showing all pertinent details of construction and installation.
 - 3. Do not order materials or begin fabrication or installation until Architect's approval of submittals has been obtained.

1.4 WARRANTY

- A. In addition to the specific warranty requirements of the Contract, Contractor shall obtain in the Owner's name the standard written manufacturer's warranty of all products furnished and installed under this Section where such warranties are offered in the manufacturer's published product data. All these warranties shall be in addition to, and not in lieu of, other liabilities which the Contractor may have by law or other provisions of the Contract Documents.
 - 1. Warranty period: Five (5) years commence from the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 EXTERIOR EMERGENCY KEY CABINETS

- A. Furnish and install recessed mounted exterior emergency key cabinets at exterior wall locations indicated adjacent to the front entrances or as directed by local Fire Department.
 - 1. Exterior emergency key cabinets shall be approximately 4 inches H x 5 inches W x 3-3/4 inches D, capable of holding up to 10 keys and access cards in interior compartment, fabricated of heavy duty drill-resistant 1/4-inch solid steel housing; all welded construction.
 - 2. High security UL listed double-action rotating tumblers and hardened steel pins accessed by a biased cut key. Lock shall have 1/8 inch thick stainless steel dust cover with tamper

- seal mounting capability. Provide 4 keys to each cabinet master-keyed to the local Fire Department keying system.
 - 3. Deadbar protected stainless steel hinge.
 - 4. 1/2 inch thick steel door with three-bolt latch and weather resistant door gasket. Hinged door shall allow single hand operation.
 - 5. Provide UL listed alarm tamper switch.
 - 6. Provide recess mounting kits (RMK) with 7x7 inches face flange for recess mounting into the concrete or masonry walls.
- B. Basis-of-Design Product: Series 3200 Rapid Entry System Hinged Door by Knox Co.; www.knoxbox.com.
- C. Finish Color: As selected by Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Inspect all surfaces and verify that they are in proper condition to receive the work of this Section. Verify that field measurements are as indicated on reviewed and approved shop drawings.
- B. Coordinate device mounting locations with authorities having jurisdiction and obtain approval in writing prior to installation.
 - 1. Exterior emergency key cabinets mounting locations shall be as directed and approved by the local Fire Department.
- C. Beginning of installation means acceptance of substrate.

3.2 INSTALLATION

- A. All items under this Section which are specified to be installed as work of this Section shall be installed in strict accordance with the approved shop drawings and the manufacturer's printed instructions and recommendations required to be submitted as specified herein above.

END OF SECTION

SECTION 10 44 00 - FIRE PROTECTION SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Fire-protection cabinets (FEC).
 - 2. Fire extinguishers (FE).

1.3 PREINSTALLATION CONFERENCE

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review methods and procedures related to fire-protection cabinets including, but not limited to, the following:
 - a. Schedules and coordination requirements.

1.4 SUBMITTALS

- A. Product Data: For each type of product. Show door hardware, cabinet type, trim style, and panel style. Include roughing-in dimensions and details showing recessed, semi-recessed, or surface-mounting method and relationships of box and trim to surrounding construction.
- B. Shop Drawings: For fire-protection cabinets. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples: For each type of exposed finish required, prepared on Samples 6 by 6 inches square.
- D. Product Schedule: For fire-protection cabinets. Indicate whether recessed, semi-recessed, or surface mounted. Coordinate final fire-protection cabinet schedule with fire-extinguisher schedule to ensure proper fit and function. Use same designations indicated on Drawings.
- E. Maintenance Data: For fire-protection cabinets to include in maintenance manuals.

1.5 COORDINATION

- A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers required by code are accommodated.
- B. Coordinate sizes and locations of fire-protection cabinets with wall depths.

1.6 SEQUENCING

- A. Apply decals and lettering on field-painted fire-protection cabinets after painting is complete.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Fire-Protection Cabinets: Listed and labeled to comply with requirements in ASTM E814 for fire-resistance rating of walls where they are installed.

- B. Electrical Components, Devices, and Accessories: For wired alarms at fire-protection cabinets, listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. NFPA Compliance, Extinguishers: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."
- D. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
 - 1. Provide fire extinguishers approved, listed, and labeled by FM Global; where required.
- E. Americans with Disabilities Act of 1990, as amended by the ADA Amendments Act of 2008, for restrictions relating to cabinet projections in corridors.

2.2 FIRE-PROTECTION CABINET

- A. Basis-of-Design Product: Ambassador Series by JL Industries, an Activar Construction Products Group, Inc.; www.activarcpg.com.
 - 1. Lettering: As selected by Architect and required by AHJ.
 - 2. Pull: Recessed, ADA compliant.
 - 3. Cabinet Style: Semi-recessed or surface-mounted, as approved by Architect.
- B. Cabinet Construction: Nonrated, except where indicated otherwise.
 - 1. Fire-Rated Cabinets: Provide fire-rated cabinets where located in fire-rated walls, matching wall rating designation. Rated cabinets shall match basis-of-design product indicated. Provide factory-drilled mounting holes.
- C. Semi-recessed Cabinet: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face.
 - 1. Square-Edge Semi-Recessed Trim: 2-1/2 inch square edge trim.
 - 2. Finish: Painted to match adjacent wall.
- D. Door Style: Flush opaque panel, frameless, with no exposed hinges.
- E. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.
 - 1. Provide recessed door pull and friction latch.
 - 2. Provide continuous hinge, of same material and finish as trim permitting door to open 180 degrees.
- F. Accessories:
 - 1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire-protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.
 - 2. Door Lock: Cylinder lock, keyed alike to other cabinets, where required by AHJ.
 - 3. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated or as directed by Architect.
 - a. Identify fire extinguisher in fire-protection cabinet with the words "FIRE EXTINGUISHER."
 - 1) Location: Applied to cabinet door.
 - 2) Application Process: Die-Cut.
 - 3) Lettering Color: Black.

4) Orientation: Vertical.

G. Materials:

1. Cold-Rolled Steel: ASTM A 1008, Commercial Steel (CS), Type B.

2.3 FIRE EXTINGUISHERS

- A. Fire Extinguisher, for cabinets and wall mounted: Multipurpose dry-chemical type, industrial grade external cartridge operated multipurpose A-B-C portable dry chemical fire extinguishers in 10 lb. size. The extinguishers shall meet or exceed the U.L. ratings.

1. Basis-of-Design Product, Fire Extinguisher (FE): Cosmic 10E by JL Industries.
2. Wall bracket mount or in cabinet, as indicated.

2.4 FABRICATION

- A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.

1. Weld joints and grind smooth.
2. Provide factory-drilled mounting holes.
3. Prepare doors and frames to receive locks.
4. Install door locks at factory.

- B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles.

1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch thick.
2. Miter and weld perimeter door frames.

- C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.5 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's AMP 500, "Metal Finishes Manual for Architectural and Metal Products," for recommendations for applying and designating finishes.

- B. Protect mechanical finishes on exposed surfaces of fire-protection cabinets from damage by applying a strippable, temporary protective covering before shipping.

- C. Finish fire-protection cabinets after assembly.

- D. 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.

- E. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

1. Color and Gloss: Finished to match adjacent wall.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in for cabinets to verify actual locations of piping connections before cabinet installation.
- B. Examine walls and partitions for suitable framing depth and blocking where recessed and semi recessed cabinets will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare recesses for recessed and semi recessed fire-protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION

- A. General: Install fire-protection cabinets in locations and at mounting heights indicated or, if not indicated, at heights acceptable to authorities having jurisdiction, but no higher than the following.
 - 1. Fire-Protection Cabinets Installation height: Install at height conforming to NFPA 10.
 - a. 54 inches above finished floor to top of cabinet.
- B. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.
 - 1. Unless otherwise indicated, provide recessed fire-protection cabinets. If wall thickness is inadequate for recessed cabinets, provide semi recessed fire-protection cabinets.
 - 2. Provide inside latch and lock for break-glass panels.
 - 3. Fasten mounting brackets to inside surface of fire-protection cabinets, square and plumb.

3.4 ADJUSTING AND CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as fire-protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.
- B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.
- C. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.
- D. Touch up marred finishes, or replace fire-protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire-protection cabinet and mounting bracket manufacturers.
- E. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 11 31 10 - APPLIANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Public-use appliances.
- B. Related Requirements:
 - 1. Section 12 35 30 "Residential Casework" for coordination with casework.
 - 2. Division 22 "Plumbing" Sections for kitchen sinks, dishwasher air-gap fittings, and refrigerator water connection.
 - 3. Division 26 "Electrical" Sections for coordinating electrical connections.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 SUBMITTALS

- A. Product Data: For each type of 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.
 - 3. Include required clearances and installation requirements.
- B. Samples: For each exposed product and for each color and texture specified, in manufacturer's standard size.
- C. Product Schedule: For appliances. Use same designations indicated on Drawings.
- D. Qualification Data: For manufacturer.
- E. Product Certificates: For each type of appliance.
- F. Field quality-control reports.
- G. Sample Warranties: For manufacturers' special warranties.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For each residential appliance to include in operation and maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Maintains, within 20 miles (32 km) of Project site, a service center capable of providing training, parts, and emergency maintenance repairs.

1.7 WARRANTY

- A. Special Warranties: Manufacturer agrees to repair or replace residential appliances or components that fail in materials or workmanship within specified warranty period, except as qualified below:
 - 1. Warranty Period: Five (5) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain residential appliances from single source and each type of residential appliance from single manufacturer unless indicated otherwise.
- B. Basis-of-Design Manufacturer: Speed Queen by Alliance Laundry Systems LLC; www.speedqueen.com.
- C. Other Approved Manufacturer: GE Appliances; www.geappliances.com.

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. Accessibility: Where residential appliances are indicated to comply with accessibility requirements, comply with applicable provisions in the DOJ's 2010 ADA Standards for Accessible Design, the ABA standards of the Federal agency having jurisdiction, and ICC A117.1.
- C. Energy Star: Provide appliances that qualify for the EPA/ DOE Energy Star product-labeling program.

2.3 APPLIANCES

- A. Commercial Washer and Dryer:
 - 1. Basis-of-Design Product: Model no. SF7003WE, Stacked Washer-Electric Dryer with Sanitize by Speed Queen by Alliance Laundry Systems.

2.4 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. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. 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.
- D. Range Anti-Tip Device: Install at each range according to manufacturer's written instructions.

3.3 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
 - 1. Perform visual, mechanical, and electrical inspection and testing for each appliance according to manufacturers' written recommendations. Certify compliance with each manufacturer's appliance-performance parameters.
 - 2. Leak Test: After installation, test for leaks. Repair leaks and retest until no leaks exist.
 - 3. Operational Test: After installation, start units to confirm proper operation.
 - 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and components.
- B. An appliance will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

3.4 DEMONSTRATION

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

END OF SECTION

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SECTION 12 35 30 - RESIDENTIAL CASEWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Upper and base cabinets for offices, kitchenettes, lab rooms and exam rooms.
 - 2. Plastic laminate countertops.
 - 3. Hardware.
 - 4. Cabinet finishes.
- B. Related Requirements:
 - 1. Section 06 10 00 "Rough Carpentry" for blocking in partitions.

1.3 DEFINITIONS

- A. MDF: Medium-density fiberboard.
- B. Exposed Surfaces of Cabinets: Surfaces visible when doors and drawers are closed, including visible surfaces in open cabinets or behind glass doors.
- C. Semiexposed Surfaces of Cabinets: Surfaces behind opaque doors or drawer fronts, including interior faces of doors, interiors and sides of drawers, and bottoms of wall cabinets.
- D. Concealed Surfaces of Cabinets: Surfaces not usually visible after installation, including sleepers, web frames, dust panels, bottoms of drawers, ends of cabinets installed directly against and completely concealed by walls or other cabinets, and tops of wall cabinets and utility cabinets.

1.4 SUBMITTALS

- A. General: Ensure that requests for substitution have been provided to the Architect and that the Architect has provided clear approval of the proposed substitution products prior to order placement, delivery and installation of products. Refer to Section 01 25 00 "Product Substitution Procedures".
- B. Product Data: For each type of product, including panel products, adhesives, fire-retardant-treated materials, and finishing materials and processes.
 - 1. Cabinets.
 - 2. Cabinet hardware.
 - 3. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.
- C. Shop Drawings: Include plans, elevations, details, and attachments to other work. Show materials, finishes, filler panels, and hardware.
- D. Samples: For cabinet finishes.
- E. Samples for Initial Selection: For cabinet finishes.

- F. Samples for Verification: 8 by 10 inch Samples for each type of finish. and the following:
 - 1. Exposed hardware, for each type of item.
- G. Qualification Data: For manufacturer, fabricator and/ or installer.
- H. Product Certificates: For each type of product.
- I. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.
- J. Evaluation Reports: For fire-retardant-treated materials from ICC-ES.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- B. Installer Qualifications: Fabricator of products.
- C. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Environmental Limitations: Do not deliver or install casework until building is enclosed, wet work is complete and dry, and temporary HVAC system is operating and maintaining temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.7 FIELD CONDITIONS

- A. Established Dimensions: Where casework is indicated to fit to other construction, establish dimensions for areas where casework is to fit. Coordinate construction to ensure that actual dimensions correspond to established dimensions. Provide fillers and scribes to allow for trimming and fitting.
- B. 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.

1.8 COORDINATION

- A. Coordinate layout and installation of blocking and reinforcement in partitions for support of casework.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Basis-of-Design Manufacturer: Belmont Cabinet Company; www.bellmontcabinets.com.

2.2 CASEWORK

- A. Quality Standard: Provide cabinets that comply with KCMA A161.1. Provide cabinets with KCMA's "Certified Cabinet" seal affixed in a semiexposed location of each unit and showing compliance with KCMA A161.1.
- B. Basis-of-Design Products:
 - 1. 1600 Series by Belmont Cabinet Company.

2. 1900 Series by Belmont Cabinet Company.
- C. Door Style: Porta.
- D. Finish: Matte laminate.
- E. Core Material: Hardwood plywood; no added urea-formaldehyde (NAUF), or manufacturer's standard core material as approved by Architect.
- F. Materials for Exposed Surfaces: High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by woodwork quality standard.
 1. Basis-of-Design Product, Plastic Laminate: Formica Infiniti Laminate by Formica Group, a div. of Fletcher Building; www.formica.com.
 - a. Finish: Manufacturer's standard "Matte".
 - b. Color: As selected by Architect from manufacturer's full range.
 2. Laminate Cladding for Exposed Surfaces:
 - a. Horizontal Surfaces: Grade HGS.
 - b. Vertical Surfaces: Grade HGS.
 - c. Edges: Grade HGS.
 - d. Pattern Direction: Always orient material same direction at all faces.
- G. Materials for Semi-Exposed Surfaces:
 1. Drawer Sides and Backs: Solid-hardwood lumber.
 2. Drawer Bottoms: Thermoset decorative panel.
 3. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, NEMA LD 3, Grade VGS.
 - a. Shelves: Faces and edges shall receive high-pressure decorative laminate, NEMA LD 3, Grade VGS.
 - b. For semi-exposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, NEMA LD 3, Grade VGS.
- H. Materials for Concealed Surfaces:
 1. Provide manufacturer's standard material as approved by Architect for the following:
 2. Back, Top, and Bottom Rails.
 3. Wall-Hung-Unit Back Panels.
 4. Base-Unit Back Panels.
 5. Front Frame Drawer Rails.
 6. Drawers, including subfronts, backs, sides, and bottoms.
 7. Shelves.
- I. Joinery: Manufacturer's standard joinery as approved by Architect.
- J. Factory Finishing: Finish cabinets at factory. Defer only final touchup until after installation.

2.3 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.
 - 1. Provide inspections of fabrication and installation together with labels and certificates from AWI certification program indicating that countertops comply with requirements of grades specified.
 - 2. The Contract Documents contain requirements that are more stringent than the referenced quality standard. Comply with requirements of Contract Documents in addition to those of the referenced quality standard.
- B. Plastic Laminate: High-pressure decorative laminate; NEMA LD 3, grades as indicated or if not indicated, as required by quality standard.
 - 1. Basis-of-Design Manufacturer: Formica Infiniti Laminate by Formica Group, a div. of Fletcher Building; www.formica.com.
 - 2. Other Approved Manufacturers:
 - a. Fenix by Arpa Industriale; www.fenixforinteriors.com.
 - b. Wilsonart; www.wilsonart.com.
 - 3. Core: Hardwood plywood; no added urea-formaldehyde (NAUF), or manufacturer's standard core material as approved by Architect.
 - 4. Adhesive: Product recommended by plastic laminate material manufacturer and suitable for substrates.
- C. Plywood Substrates: Exterior grade softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded. Waterproof. See Casework plywood for additional requirements applicable to plywood substrates used in countertop assemblies.
- D. Sealant for Countertops: Comply with applicable requirements in Section 07 92 00 "Joint Sealants."

2.4 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets except for items specified in Section 08 71 00 "Door Hardware".
- B. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 135 degrees of opening.
- C. Back-Mounted Pulls: BHMA A156.9, B02011.
 - 1. Basis-of-Design Product: No. 39660195, Contemporary Metal Edge Pull by Richelieu; www.richelieu.com.
 - a. Finish: "Brushed Nickel".
- D. Catches: Push-in magnetic catches, BHMA A156.9, B03131.
- E. Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081.
- F. Shelf Rests: BHMA A156.9, B04013; metal, two-pin type with shelf hold-down clip.
- G. Shelf Brackets, Exposed: For attachment to wall at concealed blocking; coordinate with framing/rough carpentry for blocking.
 - 1. Basis-of-Design Product: Steel Shelf J-Bracket Smokestack Studios LLC; www.thesmokestackstudio.com.
 - a. Color: As selected by Architect.

- b. Dimensions: As selected by Architect.
 - c. Applications: As indicated in Drawings.
 - H. Shelf Brackets, Concealed: For attachment to wall at concealed blocking; coordinate with framing/rough carpentry for blocking.
 - 1. Basis-of-Design Product: As selected by Architect.
 - 2. Applications: As indicated in Drawings.
 - I. Drawer Slides: BHMA A156.9.
 - 1. Grade 1: Side mounted and extending under bottom edge of drawer; full-extension type; zinc-plated steel with polymer rollers.
 - 2. Grade 1HD-100 and Grade 1HD-200: Side mounted; full-overtravel-extension type; zinc-plated-steel ball-bearing slides.
 - 3. For drawers not more than 3 inches high and not more than 24 inches wide, provide Grade 1.
 - 4. For drawers more than 3 inches high but not more than 6 inches high and not more than 24 inches wide, provide Grade 1HD-100.
 - 5. For drawers more than 6 inches high or more than 24 inches wide, provide Grade 1HD-200.
 - 6. For computer keyboard shelves, provide Grade 1HD-100.
 - 7. For trash bins not more than 20 inches high and 16 inches wide, provide Grade 1HD-200.
 - J. Aluminum Slides for Sliding Glass Doors: BHMA A156.9, B07063.
 - K. Locks:
 - 1. Door Locks: BHMA A156.11, E07121.
 - 2. Drawer Locks: BHMA A156.11, E07041.
 - 3. Applications: As indicated in Drawings.
 - L. Door and Drawer Silencers: BHMA A156.16, L03011.
 - M. Exposed Hardware Finishes: For exposed hardware, provide finish as selected by Architect from the following, that complies with BHMA A156.18 for BHMA finish number indicated.
 - 1. Dark, Oxidized, Satin Bronze, Oil Rubbed: BHMA 613 for bronze base; BHMA 640 for steel base; match Architect's sample.
 - 2. Satin Chromium Plated: BHMA 626 for brass or bronze base; BHMA 652 for steel base.
 - 3. Satin Stainless Steel: BHMA 630.
- 2.5 COUNTERTOP FABRICATION
- A. Fabricate countertops according to quartz agglomerate manufacturer's written instructions and the AWI/AWMAC/WI's "Architectural Woodwork Standards."
 - B. Configuration: As indicated in Drawings.
 - C. Joints: Fabricate countertops in sections for joining in field.

- D. Cutouts and Holes:
1. Undercounter Plumbing Fixtures: Make cutouts for fixtures using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves.
 - a. Provide vertical edges, slightly eased at juncture of cutout edges with top and bottom surfaces of countertop and projecting 3/16 inch into fixture opening.
 - b. Provide vertical edges, rounded to 3/8-inch radius at juncture of cutout edges with top surface of countertop, slightly eased at bottom, and projecting 3/16 inch into fixture opening.
 - c. Provide 3/4-inch full bullnose edges projecting 3/8 inch into fixture opening.
 2. Counter-Mounted Plumbing Fixtures: Prepare countertops in shop for field cutting openings for counter-mounted fixtures. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.
 3. Fittings: Drill countertops in shop for plumbing fittings, undercounter soap dispensers, and similar items.

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 casework.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 CABINET INSTALLATION

- A. Grade: Install cabinets to comply with same grade as item to be installed.
- B. Assemble cabinets and complete fabrication at Project site to the extent that it was not completed in the shop.
- C. Install cabinets level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.
- D. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- E. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.
 1. For shop finished items use filler matching finish of items being installed.
- F. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
 1. Install cabinets with no more than 1/8 inch in 96 inch sag, bow, or other variation from a straight line.
 2. Maintain veneer sequence matching of cabinets with transparent finish.
 3. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches on center with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.

- G. Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.
 - 1. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are applied in shop.

3.3 COUNTERTOP INSTALLATION

- A. Install countertops level to a tolerance of 1/8 inch in 8 feet, 1/4 inch maximum. Do not exceed 1/64-inch difference between planes of adjacent units.
- B. Fasten countertops by screwing through corner blocks of base units into underside of countertop. Predrill holes for screws as recommended by manufacturer. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
- C. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.
- D. Secure countertops to subtops with adhesive according to solid surface material manufacturer's written instructions. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
- E. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.
 - 1. Install metal splines in kerfs in countertop edges at joints. Fill kerfs with adhesive before inserting splines and remove excess immediately after adjoining units are drawn into position.
 - 2. Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned and joints are of specified width.
- F. Install backsplashes and end splashes by adhering to wall and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.
- G. Install aprons to backing and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears. Fasten by screwing through backing. Predrill holes for screws as recommended by manufacturer.
- H. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.
 - 1. Seal edges of cutouts in particleboard subtops by saturating with varnish.
- I. Apply sealant to gaps at walls; comply with Section 07 92 00 "Joint Sealants."

3.4 ADJUSTING AND CLEANING

- A. Adjust cabinets and hardware so doors and drawers are centered in openings and operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.
- B. Clean casework on exposed and semiexposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

END OF SECTION

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SECTION 22 05 10 - DESIGN-BUILD PLUMBING SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Plumbing systems shall be provided by design-build subcontractor as follows:
 - a. Plumbing Systems Contractor shall provide for and obtain all necessary permits and inspections as required from regulatory agencies.
 - b. Plumbing Systems Contractor shall be the permit holder and shall be responsible for the proper design and installation of the plumbing systems for the Project.
 - c. All Plumbing Systems work shall be Bidder design-build and shall comply with all governing code requirements.
 - 2. Plumbing fixture schedule.
- B. Data and telecommunications systems shall comply with the Narrative/ Standards in this Section.

1.3 SUBMITTALS

- A. Plumbing Systems Contractor shall provide:
 - 1. Product data for all piping, fixtures and devices.
 - 2. All shop drawings as required for construction. Architectural plans illustrate fixture locations only.
- B. At completion, provide the following:
 - 1. O&M manual for fixtures and devices installed.
 - 2. The contractor shall submit shop drawings complying with Closeout Requirements in Division 01.

1.4 QUALITY ASSURANCE

- A. Plumbing Systems Contractor shall coordinate mounting requirements with the intent of the Documents; Plumbing Systems Contractor shall perform calculations to verify piping is properly sized.
- B. Coordinate work with fire suppression and mechanical work on the Project.
- C. Qualifications: Plumbing Systems designers and installers shall be training and certified for systems and equipment to be provided and installed.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Provide piping and fixtures of code-required materials and properly sized for services required.
 - 1. All drain piping to be cast iron.

2. Provide fixtures and devices to match existing building standard, except as follows:
 - a. Provide fixtures with water conservation ratings meeting code requirements.
3. Provide water and sanitary connection to new dishwasher location to meet product requirements.
4. Provide sanitary connection to new disposer; coordinate with Owner-furnished equipment.

2.2 NARRATIVE/ STANDARDS

A. Design Criteria:

Domestic Water Piping	
Minimum Pressure	20 PSI at most remote outlet
Maximum Pressure	80 PSI
Static Pressure Loss	Maximum 6 psi per 100 feet
Velocity	Maximum 8 feet per second (Cold Water) Maximum 5 feet per second (Hot Water)
Storm Drainage	
Rainfall Rate	Maximum 1.0 Inch/hr
Piping Slope	Minimum 1/8" per foot
Waste and Vent Piping	
Sizing	Based on Code
Piping Slope	Minimum 1/4" per foot
Solar Hot Water Piping	
Static Pressure Loss	Maximum 6 psi per 100 feet
Velocity	Maximum 5 feet per second

Table 1: Plumbing Piping Sizing Criteria

- B. Plumbing Fixtures, Public Areas:
 1. Refer to Plumbing Fixture Schedule article in this Section.
- C. Plumbing Fixtures, Commercial Areas:
 1. Refer to Plumbing Fixture Schedule article in this Section.
- D. Plumbing Fixtures, Residential Units:
 1. Refer to Plumbing Fixture Schedule article in this Section.
- E. Water Distribution:
 1. Domestic Cold Water System: Provide 4 inch supply line into building booster pump if required to satisfy minimum pressure req a most remote fixture. Appropriate backflow preventers shall be provided at sources of possible contamination within the building. Cold water will be distributed to the plumbing fixtures and other areas requiring water. Distribution piping will be blue, PEX-A by Wirsbo or Uponor. Refer to Architectural Drawings for plumbing fixture locations. Vertical domestic water risers shall be provided which will serve valved horizontal distribution piping at each floor in each form. An enclosed water manifold with shutoff valves, with removable cover, will be provided at each unit to be located by architect in storage room walls. PEX-A tubing will be routed from the valved manifold to individual plumbing fixtures within each housing unit.
 2. Commercial Cold Water System: Provide 1-1/2 inch cold water supply to each Commercial space.
 3. Irrigation: Where required, PEX-A piping will be used for all above grade exterior water piping and HDPE piping will be used for below grade piping.

4. Domestic Hot Water System: The base domestic hot water system shall be storage tanks centrally located in both buildings. The hot water will be distributed in the same manner as the cold water. Distribution piping will be red, PEX-A. Provide 120 gallon high efficiency gas-fired water heaters, commercially rated.
 5. Commercial Hot Water System: Provide one (1) electric meter to serve Commercial spaces.
 6. Provide one (1) supply line from meter to each commercial space.
 7. Floor drain to be provided in each residential bathroom.
- F. Sanitary Waste:
1. Sanitary sewer is available at the site. Refer to Drawings for existing conditions and demolition plan for sanitary sewer lines located on the site.
 2. Sanitary waste and vent piping will be provided to toilet rooms and other spaces as required. Coordination with the Architect will be done to provide adequate furring or chase space to conceal all interior waste/ vent risers. Floor drains/ sinks will be provided. Sanitary waste piping leaving the site will connect to the sanitary system as indicated on the Civil drawings.
 3. All sanitary waste and vent piping shall be ABS (DWV).
- G. Storm Drainage:
1. Provide external gutter and downspout system as required by Code. Coordination with the Architect will be done to provide adequate furring or chase space to conceal any interior storm water risers.
 2. All storm and overflow drain piping shall be ABS (DWV).
- H. Other Plumbing Systems: Not Applicable.
- I. Plumbing System Commissioning: The commissioning process includes review of construction submittals and verification of the installation of the submitted equipment. Hot water flow rate and temperature will be verified.

PART 3 - EXECUTION

- A. Perform Work of this Section in accordance with applicable requirements of the latest edition of governing codes, rules and regulations.

3.2 PLUMBING FIXTURE SCHEDULE

- A. Basis-of-Design Manufacturers:
1. American Standard Brand; www.americanstandard-us.com.
 2. Delta; www.deltafaucet.com.
 3. ProFlo, div. of Ferguson Plumbing Supply; www.ferguson.com.
 4. Sioux Chief Mfg. Co., Inc.; www.siouxchief.com.

Plumbing Fixture Types and Locations						
Fixture	Location	Type	Control	Flow	Basis of Design	Notes
Sink Assembly	Restrooms	Wall-mounted, vitreous china		≤1.0 GPM	Faucet: Delta B501LF Sink Basin: ProFlo PF5714WH Drain: ProFlo PFGD100 Slip-Joint P-Trap: ProFlo PFPTP101 Tailpiece and P-Trap Supply Cover: ProFlo PF203WH	Faucet Finish: Polished Chrome Sink Finish: White Tailpiece and P-Trap Supply Cover Color: White
Water Closet	Restrooms	Floor-mounted, vitreous china, right handed	Tank type	1.28 GPF	Toilet: ProFlo Two-Piece Elongated Toilet with Right Hand Trip Lever PF5112RMWH/PF1403TWH Toilet Seat/Cover: ProFlo PFTSWEC2000WH	Color: White
Water Closet	Restrooms	Floor-mounted, vitreous china, left handed	Tank type	1.28 GPF	Toilet: ProFlo Two-Piece Elongated Toilet with Left Hand Trip Lever PF5112HEWH/PF1403TWH Toilet Seat/Cover: ProFlo PFTSWEC2000WH	Color: White
Shower	Shower Rooms			Showerhead: 1.75 GPM (include flow limiter at 1.5 GPM)	Valve: Delta Woodhurst Collection T14032 Inlets/Outlets: Delta R10000-UNWS Wall Supply Elbow: Delta 50560-PR Handheld Shower: Delta 51900 Shower Drain: ProFlo PF42942 Floor Drain: Sioux Chief FinishLine S8322AF; Sioux Chief FinishLine S8324HNR	Finish: Polished Chrome

Table 2: Plumbing Fixture Types and Locations

END OF SECTION

SECTION 23 05 10 - DESIGN-BUILD HVAC SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. HVAC systems shall be provided by design-build subcontractor as follows:
 - 1. HVAC Systems Contractor shall provide for and obtain all necessary permits and inspections as required from regulatory agencies.
 - 2. HVAC Systems Contractor shall be the permit holder and shall be responsible for the proper design and installation of the mechanical systems for the Project.
 - 3. All HVAC Systems work shall be Bidder design-build and shall comply with all governing code requirements.

1.3 SUBMITTALS

- A. HVAC Systems Contractor shall provide:
 - 1. HVAC Systems Contractor shall provide product data for all equipment and fixtures.
 - 2. All shop drawings as required for construction. Architectural plans illustrate supply and return only.
- A. At completion, provide the following:
 - 1. O&M manual for equipment and duct devices installed.
 - 2. The contractor shall submit shop drawings complying with Closeout Requirements in Division 01.

1.4 QUALITY ASSURANCE

- A. HVAC Systems Contractor shall coordinate power and mounting requirements with the intent of the Documents; HVAC Systems Contractor shall perform calculations to verify cabling is properly sized.
- B. Coordinate work with fire suppression, electrical, and fire alarm work on the Project.
- C. HVAC Contractor and installers shall be required to follow Energy Star guidelines related to HVAC systems, including completion of all required Energy Star HVAC System Quality Installation Contractor Checklists.
- D. Qualifications: HVAC Systems designers and installers shall be training and certified for systems to be provided and installed.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Provide piping, ductwork and equipment of code-required materials and properly sized for services required.
 - 1. Provide equipment with UL ratings.

2. Provide supply diffusers and return grilles indicated.
 - a. Provide slot diffusers as indicated, custom height and lengths; finished to match adjacent surfaces.
3. Provide controls and thermostats as selected by Architect, including faceplate color and style.

2.2 BATHROOM EXHAUST FANS

- A. Bathroom exhaust fan with built-in motion and moisture automatic sensing and activation; multiple speeds 50, 80 and 110 CFM.
- B. Basis-of-Design Product: Model no. FV-0511VQC1 WhisperSense DC Fan, 50-80-110 CFM by Panasonic Corp. of North America; www.panasonic.com.

PART 3 - EXECUTION

3.1 GENERAL

- A. Conceal controls conduit and junction boxes to the fullest extent possible. Where conduit or junction boxes cannot be concealed, notify the Architect and coordinate locations to be as unobtrusive as possible.
- B. Perform Work of this Section in accordance with applicable requirements of the latest edition of governing codes, rules and regulations.

END OF SECTION

SECTION 26 05 10 - DESIGN-BUILD ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes: Design requirements for Electrical systems.
 - 1. Electrical Systems Contractor shall provide for and obtain all necessary permits and inspections as required from regulatory agencies.
 - 2. Electrical Systems Contractor shall be the permit holder and shall be responsible for the proper design and installation of the electrical and lighting systems for the Project.
 - 3. All Electrical Systems work shall be Bidder design-build and shall comply with all governing code requirements.
- B. Related Requirements:
 - 1. Section 01 61 16 "Delegated Design Requirements".

1.3 SUBMITTALS

- A. Electrical Systems Contractor shall provide:
 - 1. Electrical systems design and design drawings as required for construction. Architectural plans illustrate fixture, equipment, switch and outlet locations only.
 - 2. Product data for all equipment and fixtures.
 - 3. All shop drawings as required for construction. Architectural plans illustrate fixture, equipment, switch and outlet locations only.
 - 4. Lighting analysis to meet Code requirements.
 - 5. Deferred Submittal for Permit: Following approval of design drawings and product data, provide deferred submittal to the Authority Having Jurisdiction (AHJ) for Permit.
- B. At completion, provide the following:
 - 1. O&M manual for equipment and lighting installed.
 - 2. The contractor shall submit shop drawings complying with Closeout Requirements in Division 01.
 - 3. Identify circuits on index in existing and new panels as applicable, before final permit inspection.

1.4 QUALITY ASSURANCE

- A. Coordinate and provide power for fire alarm, mechanical, security, audio/ visual and other equipment on the Project.
- B. Electrical systems Subcontractor shall coordinate power and mounting requirements with the intent of the Documents.
- C. Qualifications: Electrical Systems designers and installers shall be training and certified for systems to be provided and installed.

PART 2 - PRODUCTS

2.1 REQUIREMENTS

- A. Exposed conduit and boxes shall be metallic type, galvanized.
- B. Power Supply: Local utility.
- C. Power Service: Provide power service as follows:
 - 1. Provide one (1) house meter.
 - 2. Outlets: Provide power to all fixtures.
 - 3. Lighting Power: Provide power to all fixtures.
- D. Lighting: Provide fixtures as Scheduled.
- E. Smoke/ CO Alarms: Provide fixtures as Scheduled.

2.2 MATERIALS

- A. Provide conduit, raceways, cabling and conductors of code-required materials and properly sized for the loads required.
 - 1. All conductors shall be copper.
 - 2. Provide plenum-rated cabling were required by code.
 - 3. Conduit and Raceways: Provide sealed conduit penetrations to the exterior to prevent moisture from the weather or condensation from entering the building.
 - 4. Provide identification labeling on cabling terminated at panels.
 - 5. Provide additional electrical backboards and panels as required.
 - 6. Provide lighting as indicated on Drawings, with UL ratings.
- B. Lighting Fixtures: Refer to Lighting Schedule in Drawings.

PART 3 - EXECUTION

3.1 GENERAL

- A. Conceal conduit and junction boxes to the fullest extent possible. Where conduit or junction boxes cannot be concealed, notify the Architect and coordinate locations to be as unobtrusive as possible.
- B. Testing: Per Division 01 "General Commissioning" Section, where applicable.
- C. Perform Work of this Section in accordance with applicable requirements of the latest edition of governing codes, rules and regulations.

END OF SECTION

SECTION 27 05 10 - DESIGN-BUILD DATA AND TELECOMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Data and telecommunications systems shall be provided by design-build subcontractor as follows:
 - 1. Data/ Telecommunications Systems Contractor shall provide for and obtain all necessary permits and inspections as required from regulatory agencies.
 - 2. Data/ Telecommunications Systems Contractor shall be the permit holder and shall be responsible for the proper design and installation of the data and telecommunications systems for the entire renovated space.
 - 3. All Data/ Telecommunications Systems work shall be Bidder design-build and shall comply with all governing code requirements.

1.2 SUBMITTALS

- A. Data/ Telecommunications Systems Contractor shall provide:
 - 1. Product data for all equipment and cabling.
 - 2. All shop drawings as required for construction.
- B. At completion, provide the following:
 - 1. O&M manual for equipment and lighting installed.
 - 2. The contractor shall submit shop drawings as AutoCAD files to the Owner.
 - 3. Identify circuits on index in existing and new panels as applicable when complete.

1.3 QUALITY ASSURANCE

- A. Data/ Telecommunications Systems Contractor shall coordinate power and mounting requirements with the intent of the Documents; Data/ Telecommunications Systems Contractor shall perform calculations to verify cabling is properly sized.
- B. Qualifications: Data/ Telecommunications Systems designers and installers shall be training and certified for systems to be provided and installed.

PART 2 - PRODUCTS

2.1 BASIS-OF-DESIGN PRODUCTS

- A. Provide the following products requested by Owner. Product substitutions shall be reviewed by Owner prior to awarding bid.
- B. Telephone Entry Systems:
 - 1. AE-100 Commercial Telephone Entry System by Nortek Security & Control, LLC.; www.linearproaccess.com.
 - a. Finish: Stainless steel.
 - b. Mounting: Recess mounted.

2.2 MATERIALS

- A. Provide conduit, raceways and cabling of industry-standard, state-of-the-art materials.
 - 1. Provide plenum-rated cabling where required by code.

2. Provide identification labeling on cabling terminated at panels.
3. Provide additional data and telecommunications backboards and panels as required.

PART 3 - EXECUTION

3.1 GENERAL

- A. Conceal conduit and junction boxes to the fullest extent possible. Where conduit or junction boxes cannot be concealed, notify the Architect and coordinate locations to be as unobtrusive as possible.

END OF SECTION

SECTION 28 05 20 - DESIGN-BUILD FIRE DETECTION AND ALARM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Fire detection and alarm systems shall be provided by design-build subcontractor as follows:
 - 1. Fire Detection and Alarm Contractor shall provide for and obtain all necessary permits and inspections as required from regulatory agencies.
 - 2. Fire Detection and Alarm Contractor shall be the permit holder and shall be responsible for the proper design, operation and installation of the fire alarm system for the entire renovated space.
 - 3. All Fire Detection and Alarm work shall be Bidder design-build and shall comply with all governing code requirements.

1.3 SUBMITTALS

- A. Fire Detection and Alarm Contractor shall provide:
 - 1. Product data for all equipment and fixtures.
 - 2. All shop drawings as required for construction.
- B. At completion, provide the following:
 - 1. O&M manual for Fire Detection and Alarm system.
 - 2. Fire Detection and Alarm system logbook shall be installed and/or updated.
 - 3. Contact ID Codes at Fire Alarm Central Station
 - 4. Start-up Configuration Utility Programming Guidelines
 - 5. Notifier Programming Guidelines
 - 6. Quality Assurance Checklist
 - 7. The contractor shall submit shop drawings as AutoCAD files to the Owner.
 - 8. Identify circuits on index in existing and new panels as applicable when complete.

1.4 QUALITY ASSURANCE

- A. Fire Detection and Alarm Contractor shall coordinate power and mounting requirements with the intent of the Documents; Fire Detection and Alarm Contractor shall perform calculations to verify cable is properly sized.
- B. Qualifications: Fire Detection and Alarm system designers and installers shall be training and certified by the manufacturers of the equipment to be provided and installed.
- C. Fire Alarm Pre-Acceptance Test Requirements: Prior to calling for a witnessed acceptance test, all of the following conditions shall be met:
 - 1. All devices shall be tested prior to Fire Department test.
 - 2. The fire alarm communicator shall be connected to two active telephone lines and the detection system shall be on-line with the monitoring station.

3. All of the appropriate permits and required paper work shall be signed and present, including shop drawings and cut sheets.
 4. Equipment: Canned smoke shall be available; Appropriate tools shall be available to open the various circuits.
 5. Sufficient personnel from the permit holder's company shall be present to perform the test; One person is required to test devices and one person is required to reset; Radios shall be available for communication between the tester and the re-setter.
 6. All appropriate personnel and occupants in the building shall be notified that the fire alarm system will be tested.
 7. NO final inspections shall be performed prior to the completion of all construction including, including but not limited to: Painting, cleaning, carpeting, etc.
- D. Modification to Existing Fire Alarm System:
1. Maintain Existing Fire Alarm System configuration control during fire alarm system modifications.
 2. Provide connection to building's existing Fire Alarm Control Panel (FACP); Test connections through-out.
 3. All existing systems to be remodeled shall remove any and all detectors prior to the start of construction in areas affected; No installation of detectors prior to completion of construction and clean-up will be accepted.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Provide as required by Code: Circuit breakers, switches, service outlets, phone terminations and surge protection components inside the FACP.
- B. Provide conduit, raceways, cabling and conductors of code-required material and properly sized for the loads required.
 1. Provide plenum-rated cabling were required by code.
 2. Provide red-jacketed cabling.
 3. Provide multi-tone horn/ strobe units.
 4. Conduit and Raceways: Provide sealed conduit penetrations to the exterior to prevent moisture from the weather or condensation from entering the building.
 5. Provide identification labeling on fire alarm equipment and cables.
- C. Provide small auxiliary fire alarm panel above the FACP for installation of additional devices, e.g. surge protection devices, strobe synchronization modules, as required.
- D. Provide Fire Safety Disconnect Switch in FACP to allow maintenance personnel to isolate notification circuits and fire safety function controls during maintenance activities to avoid disrupting building occupants.
- E. Maintain any existing and provide new required tie-ins for HVAC equipment to be operated by the fire alarm system.
- F. Provide duct, plenum and concealed location smoke detectors, fire/smoke dampers, and the associated equipment controls where required by code.

PART 3 - EXECUTION

3.1 GENERAL

- A. Conceal conduit and junction boxes to the fullest extent possible. Where conduit or junction boxes cannot be concealed, notify the Architect and coordinate locations to be as unobtrusive as possible.
- B. Perform Fire Alarm Pre-Acceptance Test quality control review.

END OF SECTION

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SECTION 28 13 10 - DESIGN-BUILD ACCESS CONTROL

PART 1 - GENERAL

1.1 SUMMARY

- A. Access control systems shall be provided by design-build subcontractor as follows:
 - 1. Access Control Contractor shall provide for and obtain all necessary permits and inspections as required from regulatory agencies.
 - 2. Access Control Contractor shall be the permit holder and shall be responsible for the proper design, operation and installation of the Access Control system for the Project.
 - 3. All Access Control work shall be Bidder design-build and shall comply with Owner-standards for Access Control and all governing code requirements.

1.2 SUBMITTALS

- A. Access Control Contractor shall provide:
 - 1. Product data for all equipment and fixtures.
 - 2. All shop drawings as required for construction.
- B. At completion, provide the following:
 - 1. O&M manual for access control system.
 - 2. Start-up configuration guidelines.
 - 3. Quality assurance checklist.
 - 4. The contractor shall submit shop drawings complying with Closeout Requirements in Division 01.
 - 5. Identify circuits on index in existing and new panels as applicable when complete.

1.3 QUALITY ASSURANCE

- A. Access Control Contractor shall coordinate power and mounting requirements with the intent of the Documents; Access Control Contractor shall perform calculations to verify cable is properly sized.
- B. Qualifications: Access Control system designers and installers shall be training and certified by the manufacturers of the equipment to be provided and installed.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Provide as required by Code: Circuit breakers, switches, service outlets, phone terminations and surge protection components.
- B. Provide conduit, raceways, cabling and conductors of Code-required material and properly sized for the loads required.
 - 1. Provide plenum-rated cabling were required by Code.
 - 2. Conduit and Raceways: Provide sealed conduit penetrations to the exterior to prevent moisture from the weather or condensation from entering the building.
 - 3. Provide identification labeling on Access Control equipment and cables.

PART 3 - EXECUTION

3.1 GENERAL

- A. Conceal conduit and junction boxes to the fullest extent possible. Where conduit or junction boxes cannot be concealed, notify the Architect and coordinate locations to be as unobtrusive as possible.
- B. Provide small auxiliary Access Control panel for installation of additional devices, as required.
- A. Perform Access Control Pre-Acceptance Test quality control review.
- B. Perform Work of this Section in accordance with applicable requirements of the latest edition of governing codes, rules and regulations.

END OF SECTION

SECTION 31 01 00 - DESIGN-BUILD EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Removal of pavements and structures.
 - 2. Clearing, grubbing, selective thinning and tree removal.
 - 3. Site and roadway excavation and grading.
 - 4. Structure excavation and backfill.
 - 5. Erosion control.
 - 6. Utility trenching and backfill.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MATERIALS

- A. General: Refer to Drawings for general requirements and State and local jurisdiction requirements and standards for Civil Work.

PART 3 - EXECUTION

3.1 REMOVAL OF PAVEMENTS AND STRUCTURES

- A. General Removing of signs, fencing and utility poles as required to accommodate new construction.
 - 1. Demolish and remove from the site designated equipment and miscellaneous debris that are not designated for reuse.

3.2 CLEARING AND GRUBBING

- A. Clearing, Grubbing, Selective Thinning and Tree Removal:
 - 1. Thin undergrowth and remove trees as directed. Dispose of debris in accordance with local governing laws and authorities.

3.3 SITE AND ROADWAY EXCAVATION AND GRADING

- A. Strip, stockpile and place topsoil. Excavate roadway, backfill, embankment, backfill, compact backfill and place imported borrow in accordance with Drawings.
- B. Compact subgrade, gravel and do finish grading in accordance with Drawings.

3.4 STRUCTURE EXCAVATION AND BACKFILL

- A. General Site Preparation:
 - 1. Proofroll entire site after clearing, grubbing and stripping. Excavate for foundation and concrete slab-on-grade.

2. After placement of foundation, backfill and compact excavated area utilizing original soil. Density Testing will be the responsibility of the Contractor.
3. All work to be performed in accordance with Drawings.

3.5 EROSION CONTROL

- A. Furnish and implement an Erosion Control Plan per State and local requirements for erosion and sedimentation control and per the Drawings.

3.6 UTILITY TRENCHING AND BACKFILL

- A. Provide trenching and backfilling for utilities as per Drawings.

END OF SECTION

SECTION 32 05 10 - DESIGN-BUILD EXTERIOR IMPROVEMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Exterior Improvements shall be provided by design-build subcontractor as follows:
 - 1. Contractor shall provide for and obtain all necessary permits and inspections for exterior improvements as required from regulatory agencies.
 - 2. Contractor shall be the permit holder and shall be responsible for the proper design and installation of exterior Improvements for the entire space.
 - 3. All exterior Improvement work shall be Bidder design-build and shall comply with all governing code requirements.

1.3 SUBMITTALS

- A. Exterior Improvements Contractor shall provide:
 - 1. Product data for all piping, fixtures and devices.
 - 2. Shop drawings as required for construction. Architectural plans illustrate fixture locations only.
- B. At completion, provide the following:
 - 1. O&M manual for fixtures and devices installed.
 - 2. The contractor shall submit as-built drawings as AutoCAD files to the Owner.

1.4 QUALITY ASSURANCE

- A. Coordinate work with fire suppression and mechanical work on the Project.
- B. Exterior Improvements Contractor shall coordinate mounting requirements with the intent of the Documents; Exterior Improvements Contractor shall perform calculations to verify piping is properly sized.
- C. Qualifications: Exterior Improvements designers and installers shall be trained and certified for systems and equipment to be provided and installed.

PART 2 - PRODUCTS

2.1 PRODUCTS

- A. Concrete Walks and Curbs:
 - 1. Furnish Concrete walks and curbs in selected color.
- B. Irrigation System:
 - 1. Install a drip irrigation system in landscaped areas.
- C. Shrub and Tree Planting:
 - 1. Install shrubs and trees in planted areas with prepared soil amendments as Specified on the Drawings.

PART 3 - EXECUTION

3.1 GENERAL

- A. Provide exterior improvements installation to meet product requirements.

END OF SECTION

SECTION 32 12 10 – DESIGN-BUILD ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Design-build asphalt pavement for driveway.

1.3 DEFINITION

- A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.
 - 1. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.
 - 2. Job-Mix Designs: For each job mix proposed for the Work.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MATERIALS

- A. General: Refer to Drawings for general requirements and State and local jurisdiction requirements and standards for Civil Work.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Proceed with paving only after unsatisfactory conditions have been corrected.

END OF SECTION

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SECTION 33 01 00 – DESIGN-BUILD SITE UTILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Water system.
 - 2. Underdrains.
 - 3. Concrete drop inlets and catch basins.
 - 4. Storm drains and flow-through facilities.
 - 5. Sewage system.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MATERIALS

- A. General: Refer to Drawings for general requirements and State and local jurisdiction requirements and standards for Civil Work.

PART 3 - EXECUTION

3.1 WATER SYSTEM

- A. Provide a Water System including all accessories and piping from the Municipal Water Meter to building.
- B. Provide Sub-Metering where indicated in Drawings.

3.2 UNDERDRAINS

- A. Install underdrains, pipe, granular filler material and synthetic fabric as per Drawings and Specifications or Geotechnical Report, as applicable.

3.3 CONCRETE DROP INLETS AND CATCH BASINS

- A. Construct Concrete Drop Inlets and Catch Basins with Metal Grates per Drawings and Specifications.

3.4 STORM DRAINS AND FLOW-THROUGH FACILITIES

- A. Install new storm drains and end sections.
- B. Excavate, grade and provide stormwater facilities per Drawings and Specifications.

3.5 SEWAGE SYSTEM

- A. Provide a gravity fed sewage piping to main.

END OF SECTION

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CLACKAMAS SERVICE CENTER WEST BUILDING

8800 SE 80TH AVE, PORTLAND, OR 97206

100% CONSTRUCTION DOCUMENTS

FEBRUARY 17, 2023

