Docusign Envelope ID: E9681645-BE5B-4648-B7CE-88540056A5C0

Contract Review Sheet

Public Improvement Agreements **BS-6386-25 - Am1**

Title: **Behavioral Health Crisis Center New Location Remodel**

Contractor's Name: **Woodburn Construction CM/GC, LLC**

Department: **Business Services Department** Contact: **Vanessa Keck**

Analyst: **Chalyce MacDonald** Phone #: **(503) 566-3910**

Term - Date From: **January 15, 2025** Expires: **February 28, 2026**

Original Contract Amount: **$ 1,284,320.00** Previous Amendments Amount: **$ -**

Current Amendment: **$ 375,001.68** New Contract Total: **$ 1,659,321.68** Amd% **29%**

Outgoing Funds ☐ Federal Funds ☐ Reinstatement ☐ Retroactive ☑ Amendment greater than 25%

Source Selection Method: **20-0255 Invitation to Bid** ITB# **BS1553-24**

Description of Services or Grant Award

Health & Human Services Behavioral Health Crisis Center new site remodel located at 1234 Commercial St SE, Salem, OR 97302.

Amendment 1 incorporates Change Orders #001-004, increasing the contract total to $1,659,321.68.

Desired BOC Session Date: **7/9/2025** Contract should be in DocuSign by: **6/18/2025**

Agenda Planning Date **6/26/2025** Printed packets due in Finance: **6/24/2025**

Management Update **6/24/2025** BOC upload / Board Session email: **6/25/2025**

BOC Session Presenter(s) **Tamra Goettsch and Wesley Miller** Code: **Y**

REQUIRED APPROVALS

DocuSigned by: A3538E7AEC704E4... 6/18/2025
Finance - Contracts — Date

DocuSigned by: Vanessa K Keck 5E8DBDD1952441E... 6/20/2025
Contract Specialist — Date

Signed by: Scott Morris 60C98A6E708240B... 6/18/2025
Legal Counsel — Date

DocuSigned by: Jan Fritz DC16351248DE4EC... 6/19/2025
Chief Administrative Officer — Date

Docusign Envelope ID: E9681645-BE5B-4648-B7CE-88540056A5C0

MARION COUNTY BOARD OF COMMISSIONERS

Board Session Agenda Review Form

Meeting date: July 9, 2025

Department: Business Services

Title: Amendment 1 to Behavioral Health Crisis Center New Location Remodel

Management Update/Work Session Date: June 24, 2025 **Audio/Visual aids** ☐

Time Required: 10 min **Contact:** Tamra Goettsch **Phone:** x3200

Requested Action:
Consider approval of Amendment 1 to the Public Improvmenet Agreement with Woodburn Construction CM/GC, LLC for the Behavioral Health Crisis Center new location remodel located at 1234 Commercial St SE, Salem, OR 97302.

Issue, Description & Background:
Tenant improvement for the newly purchased property at 1234 Commercial St SE, Salem, OR 97302. Tenant improvements are to reconfigure the space to better suit the needs of the Health & Human Services Behavioral Health Crisis Center, replace the flooring and wall base, install chair rails and corner guards, electrical and lighting upgrades, and repaint the interior of the building. During the construction phase, several unknown conditions were encountered, which have required change orders and increased the contract value for project completion.

Financial Impacts:
Original Bid Amount $1,284,320.00. Current estimate $1,659,321.68

Impacts to Department & External Agencies:
No impact to other departments

List of attachments:
Amendment 1, Change Orders #001-004

Presenter:
Tamra Goettsch and Wesley Miller

Department Head Signature:
Signed by:
Tamra Goettsch
E4D545951879444...

Docusign Envelope ID: E9681645-BE5B-4648-B7CE-88540056A5C0

Marion County
OREGON

AMENDMENT 1 to BS-6386-25
the PUBLIC IMPROVEMENT AGREEMENT
between
MARION COUNTY and WOODBURN CONSTRUCTION CM/GC, LLC

This Amendment No. 1 to the Public Improvement Agreement (as amended from time to time, the "Agreement"), dated January 15, 2025 between Marion County, a political subdivision of the State of Oregon, hereafter called OWNER, and Woodburn Construction CM/GC, LLC, hereafter called Contractor.

The Agreement is hereby amended as follows (new language is indicated by underlining and deleted language is indicated by ~~strikethrough~~): Change orders 001, 002, 003 and 004, attached to this Amendment, are hereby incorporated.

Page 1, Section 1 Contract Price, Contract Documents and Work, first sentence: "The CONTRACTOR, in consideration of the sum of $1,659,321.68 ~~$1,284,320.00~~ (the "Contract Price"), to be paid to be paid to the CONTRACTOR by OWNER…"

Except as expressly amended above, all other terms and conditions of the original contract are still in full force and effect. Contractor certifies that the representations, warranties and certifications contained in the original Contract are true and correct as of the effective date of this Amendment and with the same effect as though made at the time of this Amendment.

MARION COUNTY SIGNATURES
BOARD OF COMMISSIONERS:

Chair	Date
Commissioner	Date
Commissioner	Date
Authorized Signature: Signed by: Tamra Goettsch E4D545951879444...	6/18/2025
Department Director or designee	Date
Authorized Signature: DocuSigned by: Jan Fritz DC16351248DE4EC...	6/19/2025
Chief Administrative Officer	Date
Reviewed by Signature: Signed by: Scott Norris 60C98A6F708240B...	6/18/2025
Marion County Legal Counsel	Date

Docusign Envelope ID: E9681645-BE5B-4648-B7CE-88540056A5C0

Reviewed by Signature: DocuSigned by: A3538E7AEC704E4... 6/18/2025

Marion County Contracts & Procurement Date

WOODBURN CONSTRUCTION CM/GC, LLC SIGNATURE

Authorized Signature: _____

Date

Title: _____

Docusign Envelope ID: E9681645-BE5B-4648-B7CE-88540056A5C0

WOODBURN CONSTRUCTION
Construction Manager / General Contractor

PCCO #001

Project: 24103 - MC Crisis Center
1234 Commercial Street SE
Salem, Oregon 97302

Prime Contract Change Order #001: PCO's #001 & #003-#007

TO:	**Marion County** PO Box 14500 Salem, Oregon 97309	**FROM:**	**Woodburn Construction CM/GC** PO BOX 129 Woodburn, Oregon 97071
DATE CREATED:	3/27/2025	**CREATED BY:**	Jake Bartholomew **(Woodburn Construction CM/GC)**
CONTRACT STATUS:	Approved	**REVISION:**	0
DESIGNATED REVIEWER:		**REVIEWED BY:**	
DUE DATE:		**REVIEW DATE:**	03/27/2025
INVOICED DATE:		**PAID DATE:**	
SCHEDULE IMPACT:		**EXECUTED:**	No
REVISED SUBSTANTIAL COMPLETION DATE:		**SIGNED CHANGE ORDER RECEIVED DATE:**	
CONTRACT FOR:	24103 - 24103:24103 Prime Contract	**TOTAL AMOUNT:**	$40,808.11

DESCRIPTION:
This PCCO includes PCOs #001 & #003-#007.

ATTACHMENTS:

POTENTIAL CHANGE ORDERS IN THIS CHANGE ORDER:

PCO #	Title	Schedule Impact	Amount
001	RFI #3: Ceiling Joists Structure Issue		$11,748.05
003	RFI #4: Door #119A		$2,915.60
004	RFI #7: Basement Air Handling Unit		$4,889.76
005	RFI #5: Door Schedule Conflict		$5,359.80
006	RFI #8: Lobby 101 - Ceiling Grid Elevation		$2,380.44
007	Abatement Concrete Grinding		$13,514.46
		Total:	$40,808.11

The original (Contract Sum)	$1,284,320.00
Net change by previously authorized Change Orders	$0.00
The contract sum prior to this Change Order was	$1,284,320.00
The contract sum will be increased by this Change Order in the amount of	$40,808.11
The new contract sum including this Change Order will be	$1,325,128.11
The contract time will not be changed by this Change Order.	

Angela Flores (Facet Architects)	**Marion County** PO Box 14500 Salem, Oregon 97309	**Woodburn Construction CM/GC** PO BOX 129 Woodburn, Oregon 97071
		Roman Giberson 03/27/2025
SIGNATURE **DATE**	**SIGNATURE** **DATE**	**SIGNATURE** **DATE**

Docusign Envelope ID: E9681645-BE5B-4648-B7CE-88540056A5C0

WOODBURN CONSTRUCTION
Construction Manager / General Contractor

PCCO #002

Project: 24103 - MC Crisis Center
1234 Commercial Street SE
Salem, Oregon 97302

Prime Contract Change Order #002: PCO's #008-#019 & #021

TO:	**Marion County** PO Box 14500 Salem, Oregon 97309	**FROM:**	**Woodburn Construction CM/GC** PO BOX 129 Woodburn, Oregon 97071
DATE CREATED:	4/24/2025	**CREATED BY:**	Jake Bartholomew **(Woodburn Construction CM/GC)**
CONTRACT STATUS:	Pending - In Review	**REVISION:**	0
DESIGNATED REVIEWER:		**REVIEWED BY:**	
DUE DATE:		**REVIEW DATE:**	
INVOICED DATE:		**PAID DATE:**	
SCHEDULE IMPACT:		**EXECUTED:**	No
REVISED SUBSTANTIAL COMPLETION DATE:		**SIGNED CHANGE ORDER RECEIVED DATE:**	
CONTRACT FOR:	24103 - 24103:24103 Prime Contract	**TOTAL AMOUNT:**	$82,852.87
DESCRIPTION:			
ATTACHMENTS:			

POTENTIAL CHANGE ORDERS IN THIS CHANGE ORDER:

PCO #	Title	Schedule Impact	Amount
008	RFI #10: Gas Lines In Concrete Slab		$2,478.32
009	RFI #26: Inconsistent Drywall Finishes Option #1		$37,400.63
010	RFI #26: Inconsistent Drywall Finishes Option #2		$18,047.54
011	RFI #21: Existing Plumbing Lines		$12,219.84
012	RFI #9: Basement Bathroom EF Duct		$2,350.87
013	RFI #23 Asbestos Containing Cement Panels		$3,473.87
014	RFI #15: Panels Over Existing Windows Clarification		$529.99
015	RFI #14: Fur out Drywall at Office 143		$678.40
016	RFI #16: Exterior Hose Bib Replacement		$4,488.85
017	RFI #19 Broken Water Closet Flange		$1,620.11
018	RFI #22: Existing Slab Penetrations		$7,801.82
019	RFI #18: Window Elevevations		$3,767.35
021	Keywatcher Credit		($12,004.72)
		Total:	$82,852.87

The original (Contract Sum)	$1,284,320.00
Net change by previously authorized Change Orders	$40,808.11
The contract sum prior to this Change Order was	$1,325,128.11
The contract sum would be changed by this Change Order in the amount of	$82,852.87
The new contract sum including this Change Order will be	$1,407,980.98
The contract time will not be changed by this Change Order.	

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WOODBURN CONSTRUCTION
Construction Manager / General Contractor

PCCO #002

Angela Flores (Facet Architects)

SIGNATURE DATE

Marion County
PO Box 14500
Salem, Oregon 97309

Jan Fritz 5/5/2025
SIGNATURE DATE

Woodburn Construction CM/GC
PO BOX 129
Woodburn, Oregon 97071

Roman Giberson 05/01/2025
SIGNATURE DATE

Docusign Envelope ID: E9681645-BE5B-4648-B7CE-88540056A5C0

WOODBURN CONSTRUCTION
Construction Manager / General Contractor

PCCO #003

Project: 24103 - MC Crisis Center
1234 Commercial Street SE
Salem, Oregon 97302

Prime Contract Change Order #003: PCOs #20, 22, 23, 24, 26-29

TO:	**Marion County** PO Box 14500 Salem, Oregon 97309	**FROM:**	**Woodburn Construction CM/GC** PO BOX 129 Woodburn, Oregon 97071
DATE CREATED:	6/05/2025	**CREATED BY:**	Jake Bartholomew **(Woodburn Construction CM/GC)**
CONTRACT STATUS:	Pending - In Review	**REVISION:**	0
DESIGNATED REVIEWER:		**REVIEWED BY:**	
DUE DATE:		**REVIEW DATE:**	
INVOICED DATE:		**PAID DATE:**	
SCHEDULE IMPACT:		**EXECUTED:**	No
REVISED SUBSTANTIAL COMPLETION DATE:		**SIGNED CHANGE ORDER RECEIVED DATE:**	
CONTRACT FOR:	24103 - 24103:24103 Prime Contract	**TOTAL AMOUNT:**	$99,849.37

DESCRIPTION:
This PCCO includes PCOs #20, #22, #23, #24, and #26-29.

ATTACHMENTS:

POTENTIAL CHANGE ORDERS IN THIS CHANGE ORDER:

PCO #	Title	Schedule Impact	Amount
020	RTU Supply Only		$61,622.08
022	RFI #29: Ceiling Exhaust Fans		$1,372.81
023	RFI #20: Gas Line Under Concrete Slab		$659.72
024	ASI #2		$20,126.72
026	RFI #28: Bathroom Drywall Demo		$1,914.76
027	RTU Demo		$9,525.78
028	RFI #31: Panel G Location		$2,889.66
029	Floor Registers Replacement		$1,737.84
		Total:	$99,849.37

The original (Contract Sum)	$1,284,320.00
Net change by previously authorized Change Orders	$123,660.98
The contract sum prior to this Change Order was	$1,407,980.98
The contract sum would be changed by this Change Order in the amount of	$99,849.37
The new contract sum including this Change Order will be	$1,507,830.35
The contract time will not be changed by this Change Order.	

Angela Flores (Facet Architects)

SIGNATURE DATE

Marion County
PO Box 14500
Salem, Oregon 97309

SIGNATURE 6/5/2025 DATE

Woodburn Construction CM/GC
PO BOX 129
Woodburn, Oregon 97071

Roman Giberson 06/05/2025
SIGNATURE DATE

Docusign Envelope ID: E9681645-BE5B-4648-B7CE-88540056A5C0

WOODBURN CONSTRUCTION
Construction Manager / General Contractor

PCCO #003

The original (Contract Sum)	$1,284,320.00
Net change by previously authorized Change Orders	$123,660.98
The contract sum prior to this Change Order was	$1,407,980.98
The contract sum would be changed by this Change Order in the amount of	$99,849.37
The new contract sum including this Change Order will be	$1,507,830.35
The contract time will not be changed by this Change Order.	

Angela Flores (Facet Architects)

SIGNATURE DATE

Marion County
PO Box 14500
Salem, Oregon 97309

SIGNATURE DATE

Woodburn Construction CM/GC
PO BOX 129
Woodburn, Oregon 97071

6/5/2025

SIGNATURE DATE

Docusign Envelope ID: E9681645-BE5B-4648-B7CE-88540056A5C0

WOODBURN CONSTRUCTION
Construction Manager / General Contractor

PCCO #004

Project: 24103 - MC Crisis Center
1234 Commercial Street SE
Salem, Oregon 97302

DRAFT

Prime Contract Change Order #004: Change Order #4

TO:	**Marion County** PO Box 14500 Salem, Oregon 97309	**FROM:**	**Woodburn Construction CM/GC** PO BOX 129 Woodburn, Oregon 97071
DATE CREATED:	6/11/2025	**CREATED BY:**	Jenny Hesse **(Woodburn Construction CM/GC)**
CONTRACT STATUS:	Draft	**REVISION:**	0
DESIGNATED REVIEWER:		**REVIEWED BY:**	
DUE DATE:		**REVIEW DATE:**	
INVOICED DATE:		**PAID DATE:**	
SCHEDULE IMPACT:		**EXECUTED:**	No
REVISED SUBSTANTIAL COMPLETION DATE:		**SIGNED CHANGE ORDER RECEIVED DATE:**	
CONTRACT FOR:	24103 - 24103:24103 Prime Contract	**TOTAL AMOUNT:**	$150,248.73
DESCRIPTION:			
ATTACHMENTS:			

POTENTIAL CHANGE ORDERS IN THIS CHANGE ORDER:

PCO #	Title	Schedule Impact	Amount
025	ASI #1 Lighting Revisions		$16,784.25
030	ASI #3 - Structural Revisions		$24,894.17
031	Ceiling Tiles GYP. BD. Overlay		$28,258.57
032	RFI #37: Attic Duct Insulation		$5,524.48
033	RFI #13: Asbestos Pipe Insulation Uncovered		$6,960.54
034	RFI #40: Break Room 145 Floor Vents		$1,024.97
035	RFI #46: Office 112 South Wall Conflict		$1,073.59
036	RFI #33: Office 143 Junction Box		$2,580.77
037	Additional Floor Prep		$3,178.55
038	RFI #34: Existing Sink Condition		$3,986.89
039	Sanitary Liner Dispenser Credit		($248.56)
040	Door #152B Electro Magnetic Hardware		$3,511.56
041	CE #050 - RTU Installation		$52,718.95
		Total:	$150,248.73

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WOODBURN CONSTRUCTION
Construction Manager / General Contractor

PCCO #004

The original (Contract Sum)	$1,284,320.00
Net change by previously authorized Change Orders	$223,510.35
The contract sum prior to this Change Order was	$1,507,830.35
The contract sum would be changed by this Change Order in the amount of	$150,248.73
The new contract sum including this Change Order will be	$1,658,079.08
The contract time will not be changed by this Change Order.	

Angela Flores (Facet Architects)

SIGNATURE DATE

Marion County
PO Box 14500
Salem, Oregon 97309

SIGNATURE DATE

Woodburn Construction CM/GC
PO BOX 129
Woodburn, Oregon 97071

Jenny Hesse 6/11/25

SIGNATURE DATE

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

Contract Review Sheet

Public Improvement Agreements **BS-6386-25**

Title: **Behavioral Health Crisis Center New Location Remodel**

Contractor's Name: **Woodburn Construction CM/GC, LLC**

Department: **Business Services Department** Contact: **Vanessa Keck**

Analyst: **Kathleen George** Phone #: **(503) 566-3910**

Term - Date From: **Execution** Expires: **February 28, 2026**

Original Contract Amount: **$1,284,320.00** Previous Amendments Amount: **$ -**

Current Amendment: **$ -** New Contract Total: **$1,284,320.00** Amd% **0%**

Outgoing Funds ☐ Federal Funds ☐ Reinstatement ☐ Retroactive ☐ Amendment greater than 25%

Source Selection Method: **20-0255 Invitation to Bid** ITB# **BS1553-24**

Description of Services or Grant Award

Public Improvement Agreement for the new site remodel of the Health & Human Services Behavioral Health Crisis Center located at 1234 Commercial St SE, Salem, OR 97302.

Desired BOC Session Date: **1/15/2025** Contract should be in DocuSign by: **12/25/2024**

Agenda Planning Date **1/2/2025** Printed packets due in Finance: **12/31/2024**

Management Update **12/31/2024** BOC upload / Board Session email: **1/1/2025**

BOC Session Presenter(s) **Terry Stoner** Code: **Y**

REQUIRED APPROVALS

DocuSigned by: E4592AE8CAA542C... 12/17/2024
Finance - Contracts — Date

DocuSigned by: Vanessa K Keck 5E8DBDD1952441F... 12/18/2024
Contract Specialist — Date

Signed by: Scott Norris 60C98A6F7082408... 12/17/2024
Legal Counsel — Date

DocuSigned by: Jan Fritz DC16354248DE4EC... 12/17/2024
Chief Administrative Officer — Date

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

MARION COUNTY BOARD OF COMMISSIONERS

Board Session Agenda Review Form

Meeting date: January 15, 2025

Department: Business Services

Title: Behavioral Health Crisis Center New Location Remodel

Management Update/Work Session Date: December 31, 2024 **Audio/Visual aids** ☐

Time Required: 10 min **Contact:** Terry Stoner **Phone:** 576-7164

Requested Action:
Consider approval of the Public Improvement with Woodburn Construction CM/GC, LLC for the remodel of the new location for Health & Human Services Behavioral Health Crisis Center located at 1234 Commercial St SE, Salem, OR 97302.

Issue, Description & Background:
Tenant improvement for the newly purchased property at 1234 Commercial St SE, Salem, OR 97302. Tenant improvements are to reconfigure the space to better suit the needs of the Health & Human Services Behavioral Health Crisis Center, replace the flooring and wall base, install chair rails and corner guards, electrical and lighting upgrades, and repaint the interior of the building,

Financial Impacts:
Total cost $1,284,320.00 CIP #23-030

Impacts to Department & External Agencies:
No other impact to other departments. Project coordination to be managed by Business Services.

List of attachments:
Public Improvement Agreement and Attachments 1-6

Presenter:
Terry Stoner

Department Head Signature:
Signed by:
Tamra Goettsch
E4D545951879444...

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MARION COUNTY PUBLIC IMPROVEMENT AGREEMENT
for
Behavioral Health Crisis Center New Location Remodel

This Agreement for the Behavioral Health Crisis Center New Location Remodel (the "Agreement"), made by and between Marion County, a political subdivision of the state of Oregon, on behalf of Business Services Department, hereinafter called OWNER, and Woodburn Construction CM/GC, LLC hereinafter called the CONTRACTOR (collectively the "Parties"), is effective on the date this Agreement has been signed by all the Parties and all required Marion County governmental approvals have been obtained. Unless otherwise defined in the Invitation to Bid or in this Agreement, the capitalized terms used herein are defined in Section A.1 of the Marion County General Conditions for Public Improvement Contracts.

WITNESSETH:

1. **Contract Price, Contract Documents and Work.**
The CONTRACTOR, in consideration of the sum of $1,284,320.00 (the "Contract Price"), to be paid to the CONTRACTOR by OWNER in the manner and at the time hereinafter provided, and subject to the terms and conditions provided for in the Invitation to Bid, this Public Improvement Agreement and other Contract Documents, all of which are incorporated herein by reference, hereby agrees to perform all Work described and reasonably inferred from the Contract Documents.

The Contract Price includes the following items: Contractor shall be responsible for furnishing all labor, materials, tools, and equipment necessary to complete the Work as described in Attachment 1 through 6.

2. **Representatives.**
Unless otherwise specified in the Contract Documents, the OWNER designates Tamra Goettsch as its Authorized Representative in the administration of this Contract. The above-named individual shall be the initial point of contact for matters related to performance, payment, authorization, and to carry out the responsibilities of the OWNER. CONTRACTOR has named Bert Bartholomew its Authorized Representative to act on its behalf.

County delegates to the individual listed below the authority and responsibility for issuing approvals, providing notices, receiving notices, issuing directives, authorizing change orders, and avoiding and resolving disputes: **Wesley Miller**

3. **Contract Dates.**
PROJECT START DATE: January 22, 2025
SUBSTANTIAL COMPLETION: December 31, 2025
FINAL COMPLETION: February 28, 2026

4. **RESERVED**

5. **Integration**
The contract documents constitute the entire agreement between the parties. no waiver, consent, modification or change of terms of this contract shall bind either party unless in writing and signed by both parties. Such waiver, consent, modification or change, if made, shall be effective only in the specific instance and for the specific purpose given. there are no other understandings, agreements, or

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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.

6. Authority to Execute

Contractor covenants, represents, and warrants to Owner that the person(s) executing this Contract on behalf of the Contractor have the actual authority to bind the Contractor to the terms of the Agreement.

In witness whereof, Marion County, a political subdivision of the state of Oregon, on behalf of Board of Commissioners, executes this Agreement and the CONTRACTOR does execute the same as of the day and year of this Agreement first above written.

In witness whereof, Marion County, a political subdivision of the state of Oregon, on behalf of Business Services Department, executes this Agreement and the CONTRACTOR does execute the same as of the day and year of this Agreement first above written.

7. CONTRACTOR DATA:

CONTRACTOR NAME: Woodburn Construction CM/GC, LLC
CONTRACTOR ADDRESS: 683 RJ Glatt Circle
CONTRACTOR ADDRESS: Woodburn, OR 97071
CONTRACTOR'S CCB # & Expiration Date: 221992, August 1, 2026

CONTRACTOR'S SIGNATURE: DocuSigned by: 3EE1647FA3D8445... 1/22/2025
Date

MARION COUNTY SIGNATURES
BOARD OF COMMISSIONERS:

Chair 1/15/2025
Date

Commissioner 1/15/2025
Date

Commissioner 1.15.2025
Date

Authorized Signature: Signed by: Tamra Goettsch E4D545951879444 12/17/2024
Department Director or designee Date

Authorized Signature: DocuSigned by: Jan Fritz DC16351248DE4EC 12/17/2024
Chief Administrative Officer Date

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

Reviewed by Signature: Signed by: Scott Norris 60C98A6E708240B... 12/17/2024

Marion County Legal Counsel Date

Reviewed by Signature: DocuSigned by: E4592AE8CAA542C... 12/17/2024

Marion County Contracts & Procurement Date

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

MARION COUNTY
GENERAL CONDITIONS FOR
PUBLIC IMPROVEMENT CONTRACTS

September 1. 2014 Edition, Revised February 14, 2022

Changes to the General Conditions (including any additions, deletions, or substitutions) should only be made by Supplemental General Conditions, unless the General Conditions are specifically modified in the Public Improvement Agreement (which has a higher order of precedence under Section A.3 of the General Conditions). The text of these General Conditions should not otherwise be altered.

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MARION COUNTY
GENERAL CONDITIONS FOR PUBLIC IMPROVEMENT CONTRACTS
("General Conditions")

SECTION A GENERAL PROVISIONS

A.1 DEFINITION OF TERMS

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

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

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

CLAIM means a demand 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 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 Solicitation Document and addenda thereto, the Marion County Public Improvement Agreement Form, General Conditions, Supplemental General Conditions, if any, the accepted Offer, Plans, Specifications, amendments, and Change Orders.

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

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

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

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

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

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DIRECT COSTS means, unless otherwise provided in the Contract Documents, the cost of materials, including sales tax, cost of delivery; cost of labor, including social security, old age and unemployment insurance, and fringe benefits required by agreement or custom; worker's compensation insurance; project specific insurance (including, without limitation, Builder's Risk Insurance and Builder's Risk Installation Floater); bond premiums, rental cost of equipment, and machinery required for execution of the work; and the additional costs of field personnel directly attributable to the Work.

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

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

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

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

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

OVERHEAD means those items which may be included in the Contractor's markup (general and administrative expense and profit) 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), expenses of Contractor's offices at the job site (e.g. job trailer) including expenses of personnel staffing the job site office, and Commercial General Liability Insurance and Automobile Liability Insurance.

OWNER means Marion County acting by and through the governmental entity identified in the Solicitation Document.

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

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

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

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

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

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

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

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

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

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

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

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

A.2 SCOPE OF WORK

The Work contemplated under this Contract includes all labor, materials, transportation, equipment, and services for, and incidental to, the completion of all construction work in connection with the project

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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.3.1.1 Contract amendments and Change Orders, with those of later date having precedence over those of an earlier date;

A.3.1.2 The Supplemental General Conditions;

A.3.1.3 The Marion County Public Improvement Agreement Form;

A.3.1.4 The General Conditions

A.3.1.5 The Plans and Specifications

A.3.1.6 The Solicitation Document and any addenda thereto;

A.3.1.7 The accepted Offer.

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

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

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

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A.4 EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE

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

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

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

A.4.4 If the Contractor believes that additional cost or Contract Time is involved because of clarifications or instructions issued by the Owner's Authorized Representative (or Architect/Engineer) in response to the Contractor’s notices or requests for information, the Contractor must submit a written request to the Owner’s Authorized Representative, setting forth the nature and specific extent of the request, including all time and cost impacts against the Contract as soon as possible, but no later than thirty (30) Days after receipt by Contractor of the clarifications or instructions issued. If the Owner’s Authorized Representative 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.5 INDEPENDENT CONTRACTOR STATUS

The service or services to be performed under this 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.

A.6 RETIREMENT SYSTEM STATUS AND TAXES

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

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A.7 GOVERNMENT EMPLOYMENT STATUS

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

A.7.2 Contractor represents and warrants that Contractor is not an employee of the Marion County for purposes of performing Work under this Contract.

SECTION B ADMINISTRATION OF THE CONTRACT

B.1 OWNER'S ADMINISTRATION OF THE CONTRACT

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

B.1.2 The Owner's Authorized Representative will visit the site at intervals appropriate to the stage of the Contractor's operations (1) to become generally familiar with and to keep the Owner informed about the progress and quality of the portion of the Work completed, (2) to endeavor to guard the Owner against defects and deficiencies in the Work, and (3) to determine in general if Work is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. The Owner's Authorized Representative will not make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Owner's Authorized Representative will neither have control over or charge of, nor be responsible for the construction means, methods, techniques, sequences, or procedures, or for the safety precautions and programs in connection with the Work.

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

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

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

B.2.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the Work under the

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Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures.

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

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

B.2.4 Contractor agrees that it will commence performance of the Work in a timely manner and will achieve the Contract Times in the Contract Documents.

B.3 MATERIALS AND WORKMANSHIP

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

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

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

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

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

B.4 PERMITS

Contractor shall obtain and pay for all necessary permits and licenses, except for those specifically excluded in the Supplemental General Conditions, for the construction of the Work, for temporary obstructions, enclosures, opening of streets for pipes, walls, utilities, environmental Work, etc., as required for the project. Contractor shall be responsible for all violations of the law, in connection with the construction or caused by obstructing streets, sidewalks or otherwise. Contractor shall give all requisite notices to public authorities. The Contractor shall pay all royalties and license fees. The

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Contractor shall defend all suits or claims for infringement of any patent or other proprietary rights and save harmless and blameless from loss, on account thereof, Marion County, and its departments, divisions, members, and employees.

B.5 COMPLIANCE WITH GOVERNMENT LAWS AND REGULATIONS

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

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

B.5.2.1 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.5.2.2 Contractor shall maintain, in current and valid form, all licenses and certificates required by law, regulation, or this Contract when performing the Work.

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

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

B.5.5 The following notice is applicable to Contractors who perform excavation Work. ATTENTION: Oregon law requires you to follow rules adopted by the Oregon Utility Notification Center. Those rules are set forth in OAR 952-001-0010 through OAR 952-001-0090. You may obtain copies of the rules by calling the center at (503)232-1987.

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

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B.6 SUPERINTENDENCE

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

B.7 INSPECTION

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

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

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

B.7.4 As required by the Contract Documents, Work done, or material used without inspection or testing by the Owner's Authorized Representative may be ordered removed at the Contractor's expense.

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

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

B.7.7 When the United States government participates in the cost of the Work, or the Owner has an agreement with other public or private organizations, or if any portion of the Work is being performed for a third party or near third party facilities, representatives of these organizations have the right to inspect the Work affecting their interests or property. Their right to inspect shall not make them a

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party to the Contract and shall not interfere with the rights of the parties of the Contract. Instructions or orders of such parties shall be transmitted to the Contractor, through the Owner's Authorized Representative.

B.8 SEVERABILITY

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

B.9 ACCESS TO RECORDS

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

B.9.2 Contractor shall retain and the Owner and its duly authorized representatives shall have access to, for a period not less than ten (10) years, all Record Documents, financial and accounting records, and other books, documents, papers, and records of Contractor which are pertinent to the Contract including records pertaining to Overhead and indirect costs, for the purpose of making audit, examination, excerpts, and transcripts. If for any reason, any part of the Contract is involved in litigation, Contractor shall retain all such records until all litigation is resolved. The Owner and/or its agents shall continue to be provided full access to the records during litigation.

B.10 WAIVER

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

B.11 SUBCONTRACTS AND ASSIGNMENT

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

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

B.11.3 Contractor shall not assign, sell, or transfer its rights, or delegate its responsibilities under this Contract, in whole or in part, without the prior written approval of the Owner. No such written

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approval shall relieve Contractor of any obligations of this Contract, and any transferee shall be considered the agent of the Contractor and bound to perform in accordance with the Contract Documents. Contractor shall remain liable as between the original parties to the Contract as if no assignment had occurred.

B.12 SUCCESSORS IN INTEREST

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

B.13 OWNER'S RIGHT TO DO WORK

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

B.14 OTHER CONTRACTS

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

B.15 GOVERNING LAW

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

B.16 LITIGATION

Any Claim between Owner and Contractor that arises from or relates to this Contract and that is not resolved through the Claims Review Process in Section D.3 shall be brought and conducted solely and exclusively within the Circuit Court of Marion 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 Marion County on any form of defense or immunity, whether sovereign immunity, governmental immunity, immunity based on the Eleventh Amendment to the Constitution of the United States or otherwise, from any claim or from the jurisdiction of any court. CONTRACTOR BY EXECUTION OF THIS CONTRACT HEREBY CONSENTS TO THE IN PERSONAM JURISDICTION OF THE COURTS REFERENCED IN THIS SECTION B.16.

B.17 ALLOWANCES

B.17.1 The Contractor shall include in the Contract Price all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct.

B.17.2 Unless otherwise provided in the Contract Documents:

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B.17.2.1 when finally reconciled, allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

B.17.2.2 Contractor's costs for unloading and handling at the site, labor, installation costs, Overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Price but not in the allowances;

B.17.2.3 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

(a) the difference between actual costs and the allowances under Section B.17.2.1 and

(b) changes in Contractor's costs under Section B.17.2.2.

B.17.2.4 Unless Owner requests otherwise, Contractor shall provide to Owner a proposed fixed price for any allowance work prior to its performance.

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

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

B.18.1.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor (including any sub-subcontractor), manufacturer, supplier, or distributor to illustrate some portion of the Work.

B.18.1.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

B.18.1.3 Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

B.18.2 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. The purpose of their submittal is to demonstrate for those portions of the Work for which submittals are required by the Contract Documents the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents. Review of submittals by the Architect/Engineer is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, or for approval of safety precautions or, unless otherwise specifically stated by the Architect/Engineer, of any construction means, methods, techniques, sequences or procedures, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect/Engineer's review of the Contractor's submittals shall not relieve the Contractor of its obligations under the Contract Documents. The Architect/Engineer's approval of a specific item shall not indicate approval of an assembly of which

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the item is a component. Informational submittals upon which the Architect/Engineer is not expected to take responsive action may be so identified in the Contract Documents. Submittals which are not required by the Contract Documents may be returned by the Architect/Engineer without action.

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

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

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

B.18.6 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect/Engineer's review or approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect/Engineer in writing of such deviation at the time of submittal and (i) the Architect/Engineer has given written approval to the specific deviation as a minor change in the Work, or (ii) a Change Order has been executed by Owner authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar by the Architect/Engineer's review or approval thereof.

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

B.19 SUBSTITUTIONS

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

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B.20 USE OF PLANS AND SPECIFICATIONS

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

B.21 FUNDS AVAILABLE AND AUTHORIZED

Owner reasonably believes at the time of entering into this Contract that sufficient funds are available and authorized for expenditure to finance the cost of this Contract within the Owner's appropriation or limitation. Contractor understands and agrees that, to the extent that in the event the Board of Commissioners of the County reduces, changes, eliminates, or otherwise modifies the funding the cost of this contract, the CONTRACTOR agrees to abide by any such decision, including termination of this agreement.

B.22 NO THIRD-PARTY BENEFICIARIES

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

SECTION C WAGES AND LABOR

C.1 MINIMUM WAGE RATES ON PUBLIC WORKS

Contractor shall comply fully with the provisions of ORS 279C.800 through 279C.870. Documents establishing those conditions, as determined by the Commissioner of the Bureau of Labor and Industries (BOLI), are included as attachments to or are incorporated by reference in the Contract Documents. Contractor shall pay workers at not less than the specified minimum hourly rate of wage, and shall include that requirement in all subcontracts.

C.2 PAYROLL CERTIFICATION; ADDITIONAL RETAINAGE; FEE REQUIREMENTS

C.2.1 In accordance with ORS 279C.845, the Contractor and every Subcontractor shall submit written certified statements to the Owner's Authorized Representative, on the form prescribed by the Commissioner of the Bureau of Labor and Industries, certifying the hourly rate of wage paid each worker which the Contractor or the Subcontractor has employed on the project and further certifying that no worker employed on the project has been paid less than the prevailing rate of wage or less than the minimum hourly rate of wage specified in the Contract, which certificate and statement shall be verified by the oath of the Contractor or the Subcontractor that the Contractor or Subcontractor has read 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

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worker on the project shall be submitted once a month, by the fifth business day of the following month.

The Contractor and Subcontractors shall preserve the certified statements for a period of 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 this public works 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 public works 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 Pursuant to ORS 279C.505 and as a condition to Owner's performance hereunder, the Contractor shall:

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

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

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

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

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

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

(1) A written employee drug testing policy,

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(2) Required drug testing for all new Subject Employees or, alternatively, required testing of all Subject Employees every 12 months on a random selection basis, and

(3) Required testing of a Subject Employee when the Contractor has reasonable cause to believe the Subject Employee is under the influence of drugs.

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

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

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

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

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

C.3.2.1 If Contractor fails, neglects or refuses to pay promptly a person's claim for labor or services that the person provides to the Contractor or a Subcontractor in connection with the project as such claim becomes due, the proper officer that represents the Owner may pay the amount of the claim and charge the amount of the payment against funds due or to become due Contractor under this Contract. Paying a claim in this manner shall not relieve the Contractor or the Contractor's surety from obligation with respect to an unpaid claim.

C.3.2.2 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 public contract for a public improvement within thirty (30) Days after receiving payment from Owner 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.3.2.3 If the Contractor or a Subcontractor fails, neglects or refuses to pay a person that provides labor or materials in connection with the Contract, the person may file a complaint with the Construction Contractors Board, unless payment is subject to a good faith dispute as defined in ORS 279C.580. Every contract related to this Contract must contain a similar clause.

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

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C.3.3.1 A payment clause that obligates the Contractor to pay the first-tier Subcontractor for satisfactory performance under the subcontract within ten (10) Days out of amounts the Owner pays to the Contractor under the Contract;

C.3.3.2 A clause that requires the Contractor to provide the first-tier Subcontractor with a standard form that the first-tier Subcontractor may use as an application for payment or as another method by which the Subcontractor may claim a payment due from the Contractor;

C.3.3.3 A clause that requires the Contractor, except as otherwise provided in this paragraph, to use the same form and regular administrative procedures for processing payments during the entire term of the subcontract. The Contractor may change the form or the regular administrative procedures the Contractor uses for processing payments if the Contractor:

(a) Notifies the Subcontractor in writing at least 45 days before the date on which the Contractor makes the change; and

(b) Includes with the written notice a copy of the new or changed form or a description of the new or changed procedure.

C.3.3.4 An interest penalty clause that obligates the Contractor, if the Contractor does not pay the first-tier Subcontractor within thirty (30) Days after receiving payment from Owner, to pay the first-tier Subcontractor an interest penalty on amounts due in each payment the Contractor does not make in accordance with the payment clause included in the subcontract under Section C.3.3.1 of this subsection. Contractor or first-tier Subcontractor is not obligated to pay an interest penalty if the only reason that the Contractor or first-tier Subcontractor did not make payment when payment was due is that the Contractor or first-tier Subcontractor did not receive payment from Owner or Contractor when payment was due. The interest penalty applies to the period that begins on the day after the required payment date and that ends on the date on which the amount due is paid; and is computed at the rate specified in ORS 279C.515(2).

C.3.3.5 A clause which requires each of Contractor's Subcontractors to include, in each of their contracts with lower-tier Subcontractors or suppliers, provisions to the effect that the first- tier Subcontractor shall pay its lower-tier Subcontractors and suppliers in accordance with the provisions of paragraphs C.3.3.1 through C.3.3.4 above and requiring each of their Subcontractors and suppliers to include such clauses in their subcontracts and supply contracts.

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

C.4 PAYMENT FOR MEDICAL CARE

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

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C.5 HOURS OF LABOR

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

Pursuant to ORS 279C.520 and as a condition to Owner's performance hereunder, no person shall be employed to perform Work under this Contract for more than ten (10) hours in any one day or forty (40) hours in any one week, except in cases of necessity, emergency or where public policy absolutely requires it. In such instances, Contractor shall pay the employee at least time and a half pay:

C.5.1 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

C.5.2 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.5.3 For all Work performed on Saturday and on any legal holiday specified in ORS 279C.540.

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

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

SECTION D CHANGES IN THE WORK

D.1 CHANGES IN WORK

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

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

D.1.2.1 Modification of specifications and design.

D.1.2.2 Increases or decreases in quantities.

D.1.2.3 Increases or decreases to the amount of Work.

D.1.2.4 Addition or elimination of any Work item.

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D.1.2.5 Change in the duration of the project.

D.1.2.6 Acceleration or delay in performance of Work.

D.1.2.7 Deductive changes.

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

Adjustments in compensation shall be made under the provisions of D.1.3, in which costs for deductive changes shall be based upon 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 Change Order Work shall be administered and compensated according to the following:

D.1.3.1 Unit pricing may be utilized at the Owner's option when unit prices or solicitation alternates were provided that established the cost for additional Work, and a binding obligation exists under the Contract on the parties covering the terms and conditions of the additional Work.

D.1.3.2 If the Owner elects not to utilize unit pricing, or in the event that unit pricing is not available or appropriate, fixed pricing may be used for Change Order Work. In fixed pricing the basis of payments or total price shall be agreed upon in writing between the parties to the Contract, and shall be established before the Work is done whenever feasible. The mark-ups set forth in D.1.3.3 shall be utilized by the parties as a guide in establishing fixed pricing, and will not be exceeded by Owner without adequate justification. Cost and price data relating to Change Orders shall be supplied by Contractor to Owner upon request, but Owner shall be under no obligation to make such requests.

D.1.3.3 In the event that unit pricing and fixed pricing are not utilized, then Change Order Work shall be performed on a cost reimbursement basis for Direct Costs. Such Work shall be compensated on the basis of the actual, reasonable and allowable cost of labor, equipment, and material furnished on the Work performed. In addition, the following markups shall be added to the Contractor's or Subcontractor's Direct Costs as full compensation for profit, Overhead and other indirect costs for Work directly performed with the Contractor's or Subcontractor's own forces:

On Labor..... 15%
On Equipment..... 10%
On Materials..... 10%

When Change Order Work under D.1.3.3 is invoiced by an authorized Subcontractor at any level, each ascending tier Subcontractor or Contractor will be allowed a 5% supplemental mark-up on each piece of subcontract Work covered by such Change Order.

Payments made to the Contractor shall be complete compensation for Overhead, profit, and all costs that were incurred by the Contractor or by other forces furnished by the Contractor,

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including Subcontractors, for Change Order Work. Owner may establish a maximum cost for Change Order Work under this Section D.1.3.3, which shall not be exceeded for reimbursement without additional written authorization from Owner. Contractor shall not be required to complete such Change Order Work without additional authorization.

D.1.4 Any necessary adjustment of Contract Time that may be required as a result of a Change Order must be agreed upon by the parties before the start of the Change Order Work unless Owner's Authorized Representative authorizes Contractor to start the Work before agreement on Contract Time adjustment. Contractor shall submit any request for additional compensation (and additional Contract Time if Contractor was authorized to start Work before an adjustment of Contract Time was approved) as soon as possible but no later than thirty (30) Days after receipt of the Change Order. If Contractor's request for additional compensation or adjustment of Contract Time is not made within the thirty (30) day time limit, Contractor's requests pertaining to that Change Order are barred. The thirty (30) day time limit for making requests shall not be extended for any reason, including without limitation Contractor's claimed inability to determine the amount of additional compensation or adjustment of Contract Time, unless an extension is granted in writing by Owner. If the Owner's Authorized Representative 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 Change Order Work under Section D.1.3 causes an increase or decrease in the Contractor's cost of, or the Contract Time required for the performance of, any other part of the Work under this Contract, the Contractor must submit a written request to the Owner's Authorized Representative, setting forth the nature and specific extent of the request, including all time and cost impacts against the Contract as soon as possible, but no later than thirty (30) Days after receipt of the Change Order by Contractor.

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

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If the Owner's Authorized Representative denies the Contractor's request for additional compensation or an extension of 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 extension of Contract Time shall be allowed if made after receipt of final payment application under this Contract. Contractor agrees to submit its final payment application within ninety (90) days after Substantial Completion, unless written extension is granted by Owner. Contractor shall not delay final payment application for any reason, including without limitation nonpayment of Subcontractors, suppliers, manufacturers or others not a party to this Contract, or lack of resolution of a dispute with Owner or any other person of matters arising out of or relating to the Contract. If Contractor fails to submit its final payment application within ninety (90) days after Substantial Completion, and Contractor has not obtained written extension by Owner, all requests or Claims for additional costs or an extension of Contract Time shall be waived.

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

D.2 DELAYS

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

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

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

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

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

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

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

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

(b) Caused by any site conditions which differ materially from what was represented in the Contract Documents or from conditions that would normally be expected to exist and be

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inherent to the construction activities defined in the Contract Documents. The Contractor shall notify the Owner's Authorized Representative immediately of differing site conditions before the area has been disturbed, but not more than fourteen (14) days after the condition has been encountered. The Owner's Authorized Representative will investigate the area and make a determination as to whether or not the conditions differ materially from either the conditions stated in the Contract Documents or those which could reasonably be expected in execution of this particular Contract. If Contractor and the Owner's Authorized Representative agree that a differing site condition exists, any additional compensation or additional Contract Time will be determined based on the process set forth in Section D.1.5 for Change Order Work. If the Owner's Authorized Representative disagrees that a differing 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.

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

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

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

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

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

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

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

D.2.3.1 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).

D.2.3.2 Contractor may be entitled to additional Contract Time for Unavoidable Delays described in Section D.2.1.2 (c) and (d).

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In the event of any requests for additional compensation or additional Contract Time, or both, as applicable, arising under this Section D.2.3 for Unavoidable Delays, other than requests for additional compensation or additional Contract Time for differing site conditions for which a review process is established under Section D.2.1.2 (b), Contractor shall submit a written notification of the delay to the Owner's Authorized Representative within two (2) Days of the occurrence of the cause of the delay. This written notification shall state the cause of the potential delay, the project components impacted by the delay, and the anticipated additional Contract Time or the additional compensation, or both, as applicable, resulting from the delay. Within seven (7) Days after the cause of the delay has been mitigated, or in no case more than thirty (30) Days after the initial written notification, the Contractor shall submit to the Owner's Authorized Representative, a complete and detailed request for additional compensation or additional Contract Time, or both, as applicable, resulting from the delay.

If the Owner's Authorized Representative 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., then unless otherwise prohibited by law, Contractor's Claim shall be barred.

D.3 CLAIMS REVIEW PROCESS

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

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

D.3.3 The Owner's Authorized Representative will review all Claims and take one or more of the following preliminary actions within ten (10) Days of receipt of the Detailed Notice of a Claim: (1) request additional supporting information from the Contractor; (2) inform the Contractor and Owner in writing of the time required for adequate review and response; (3) reject the Claim in whole or in part

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and identify the reasons for rejection; (4) based on principles of equitable adjustment, recommend approval of all or part of the Claim; or (5) propose an alternate resolution.

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

D.3.5 The decision of the Owner shall be final and binding unless the Contractor delivers to the Owner its requests for mediation, which shall be a non-binding process, within fifteen (15) Days of the date of the Owner's decision.

D.3.6 The parties are fully committed to working with each other throughout the Project and agree to communicate regularly with each other at all times so as to avoid or minimize disputes or disagreements. If disputes or disagreements do arise, Contractor and Owner each commit to resolving such disputes or disagreements in an amicable, professional and expeditious manner so as to avoid unnecessary losses, delays and disruptions to the Work.

D.3.7 The mediation process will be considered to have commenced as of the date the Contractor delivers the request. Both parties acknowledge and agree that participation in mediation is a prerequisite to commencement of litigation of any disputes relating to the Contract. Both parties further agree to exercise their best efforts in good faith to resolve all disputes within sixty (60) Days of the commencement of the mediation through the mediation process set forth herein.

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

D.3.8 The mediator shall be an individual mutually acceptable to both parties, but in the absence of agreement each party shall select a temporary mediator and the temporary mediators shall jointly select the permanent mediator. Each party shall pay its own costs for the time and effort involved in mediation. The cost of the mediator shall be split equally between the two parties. Both parties agree to exercise their best effort in good faith to resolve all disputes in mediation. Participation in mediation is a mandatory requirement of both the Owner and the Contractor. The schedule, time and place for mediation will be mutually acceptable, or, failing mutual agreement, shall be as established by the mediator. The parties agree to maintain the confidentiality of mediation, if any, and shall execute all necessary documents to give effect to such confidentiality to the extent allowed by law. In any event, the parties shall not subpoena the mediator or otherwise require the mediator to produce records, notes or work product, or to testify in any future proceedings as to information disclosed or representations made in the course of mediation, except to the extent disclosure is required by law.

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D.3.9 Owner may at any time and at its discretion issue a construction change directive adding to, modifying or reducing the scope of Work. Contractor and Owner shall negotiate the need for any additional compensation or additional Contract Time related to the change, subject to the procedures for submitting requests or Claims for additional compensation or additional Contract Time established in this Section D. Unless otherwise directed by Owner's Authorized Representative, Contractor shall proceed with the Work while any request or Claim is pending, including but not limited to, a request or Claim for additional compensation or additional Contract Time resulting from Work under a Change Order or construction change directive. Regardless of the review period or the final decision of the Owner's Authorized Representative, the Contractor shall continue to diligently pursue the Work as identified in the Contract Documents. In no case is the Contractor justified or allowed to cease Work without a written stop work order from the Owner or Owner's Authorized Representative.

SECTION E PAYMENTS

E.1 SCHEDULE OF VALUES

The Contractor shall submit, at least ten (10) Days prior to submission of its first application for progress payment, a schedule of values ("Schedule of Values") for the contracted Work. This schedule will provide a breakdown of values for the contracted Work and will be the basis for progress payments. The breakdown will demonstrate reasonable, identifiable, and measurable components of the Work. Unless objected to by the Owner's Authorized Representative, this schedule shall be used as the basis for reviewing Contractor's applications for payment. If objected to by Owner's Authorized Representative, Contractor shall revise the schedule of values and resubmit the same for approval of Owner's Authorized Representative.

E.2 APPLICATIONS FOR PAYMENT

E.2.1 Owner shall make progress payments on the Contract monthly as Work progresses. Payments shall be based upon estimates of Work completed and the Schedule of Values. All payments shall be approved by the Owner's Authorized Representative. A progress payment shall not be considered acceptance or approval of any Work or waiver of any defects therein. Owner shall pay to Contractor interest on the progress payment, not including retainage, due the Contractor. The interest shall commence thirty (30) Days after the receipt of invoice ("application for payment") from the Contractor or fifteen (15) Days after the payment is approved by the Owner's Authorized Representative, whichever is the earlier date. The rate of interest shall equal three times the discount rate on 90-day commercial paper in effect at the Federal Reserve Bank in the Federal Reserve district that includes Oregon on the date that is thirty (30) Days after receipt of the application for payment from the Contract or fifteen (15) Days after the payment is approved by the Owner, whichever is the earlier date, but the rate of interest shall not exceed thirty (30) percent. Notwithstanding the foregoing, in instances when an application for payment is filled out incorrectly, or when there is any defect or impropriety in any submitted application or when there is a good faith dispute, Owner shall so notify the Contractor within fifteen (15) Days stating the reason or reasons the application for payment is defective or improper or the reasons for the dispute. A defective or improper application for payment, if corrected by the Contractor within seven (7) Days of being notified by the Owner, shall not cause a payment to be made later than specified in this section unless interest is also paid. Accrual of interest will be postponed when payment on the principal is delayed because of disagreement between the Owner and the Contractor.

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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 payment that is correct and proper. Owner makes this election; the Contractor will be required to arrange to receive EFT/ACH payments.

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

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

Signed: _____”

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

E.2.3.1 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.

E.2.3.2 The Contractor shall submit applications for payment showing the quantity and cost of the material stored.

E.2.3.3 The material shall be stored in a bonded warehouse and Owner's Authorized Representative shall be granted the right to access the material for the purpose of removal or inspection at any time during the Contract Period.

E.2.3.4 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.2.3.5 Payments shall be made for materials only. The submitted amount of the application for payment shall be reduced by the cost of transportation and for the cost of an inspector to check the delivery at out of town storage sites. The cost of said inspection shall be borne solely by the Contractor.

E.2.3.6 Within sixty (60) Days of the application for payment, the Contractor shall submit evidence of payment covering the material stored.

E.2.3.7 Payment for stored materials shall in no way indicate acceptance of the materials or waive any rights under this Contract for the rejection of the Work or materials not in conformance with the Contract Documents.

E.2.3.8 All required documentation must be submitted with the respective application for payment.

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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:

E.2.4.1 Work that is defective and not remedied, or that has been demonstrated or identified as failing to conform with the Contract Documents,

E.2.4.2 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;

E.2.4.3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment (in which case Owner may issue checks made payable jointly to Owner and such unpaid persons under this provision, or directly to Subcontractors and suppliers at any level under Section C.3.2.1);

E.2.4.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Price;

E.2.4.5 damage to the Owner or another contractor;

E.2.4.6 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;

E.2.4.7 failure to carry out the Work in accordance with the Contract Documents; or

E.2.4.8 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:

E.2.5.1 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 application for payment until the Contract Price has been adjusted by Change Order;

E.2.5.2 Add that portion of the Contract Price properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner pursuant to Section E.2.3, suitably stored off the site at a location agreed upon in writing), less retainage as provided in Section E.5;

E.2.5.3 Subtract the aggregate of previous payments made by the Owner; and

E.2.5.4 Subtract any amounts for which the Owner's Authorized Representative has withheld or nullified payment as provided in the Contract Documents.

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

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

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

E.3 PAYROLL CERTIFICATION REQUIREMENT

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

E.4 DUAL PAYMENT SOURCES

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

E.5 RETAINAGE

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

E.5.1.1 Owner reserves the right in its sole discretion to not withhold retainage from progress payments or to begin withholding retainage at any time. If Owner withholds retainage from progress payments the amount to be retained will not exceed five percent of the payment. As Work progresses, Owner may reduce the amount of the retainage and may eliminate retainage on any remaining monthly Contract payments after 50 percent of the Work under the Contract is completed if, in the Owner's opinion, such Work is progressing satisfactorily. Elimination or reduction of retainage shall be allowed only upon written application by the Contractor, which application shall include written approval of Contractor's surety; except that when the Work is 97-1/2 percent completed the Owner may, at its discretion and without application by the Contractor, reduce the retained amount to 100 percent of the value of the Work remaining to be done. Upon receipt of written application by the Contractor, Owner shall respond in writing within a reasonable time.

E.5.1.2 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 will deposit that retainage in an interest-bearing account, established through the Owner, in a bank, savings bank, trust company or savings association for the benefit of Owner, with interest from such account accruing to the Contractor as required by ORS 279C.560. In accordance with the provisions of ORS 279C.560 and any applicable administrative rules, 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)

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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 the Chief Administrative Officer, including but not limited to:

(1) Bills, certificates, notes or bonds of the United States.

(2) Other obligations of the United States or agencies of the United States.

(3) Obligations of a corporation wholly owned by the federal government.

(4) Indebtedness of the Federal National Mortgage Association.

(5) General obligation bonds of the State of Oregon or a political subdivision of the State of Oregon.

(6) Irrevocable letters of credit issued by an insured institution, as defined in ORS 706.008; or

(b) that the Contractor be allowed, with the approval of the Owner, 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 279C.570 and 279C.600 to ORS 279C.625.

Where the Owner has accepted the Contractor's election of option (a) or (b) above, 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 to deposit a surety bond under option (b), Contractor shall accept like bonds from Subcontractors and suppliers on the project from which Contractor has required retainage.

(c) For a contract over $500,000, if the Contractor requests that the Owner deposit the retainage in an interest-bearing escrow account under 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.

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(d) For a contract of $500,000 or less, the Owner shall 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.560(5).

E.5.1.3 The retainage held by Owner shall be included in and paid to the Contractor as part of the final payment of the Contract Price. The Owner shall pay to Contractor interest at the rate of one and one-half percent per month on the final payment due Contractor, interest to commence thirty (30) Days after the Work under the Contract has been completed and accepted and to run until the date Contractor shall notify Owner in writing when the Contractor considers the Work complete and Owner shall, within fifteen (15) Days after receiving the written notice, either accept the Work or notify the Contractor of Work yet to be performed on the Contract. If Owner does not within the time allowed notify the Contractor of Work yet to be performed to fulfill contractual obligations, the interest provided by this subsection shall commence to run thirty (30) Days after the end of the 15-Day period.

E.5.1.4 In accordance with the provisions of ORS 279C.560, if the Owner accepts bonds, securities or other instruments deposited as provided in paragraph (a) of subsection E.5.1.2, the Owner shall reduce the moneys held as retainage in an amount equal to the value of the bonds, securities and other instruments and pay the amount of the reduction to the Contractor in accordance with ORS 279C.570.

E.5.1.5 Contractor agrees that if Contractor elects to reserve retainage from any progress payment due to any Subcontractor or supplier, such retainage shall not exceed five percent of the payment, and the Contractor shall comply with all applicable legal requirements.

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.5.2 As provided in subsections C.2.2 and C.2.3, additional withholding in the amount of 25% of amounts earned shall be withheld and released in accordance with ORS 279C.845(7) when the Contractor fails to file certified statements as required by section C.2.1.

E.6 FINAL PAYMENT

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

E.6.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Owner’s Authorized Representative (1) a notarized affidavit/release of liens and claims in a form satisfactory to Owner that states that payrolls, bills for materials and equipment, and other

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indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least thirty (30) Days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

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

SECTION F JOB SITE CONDITIONS

F.1 USE OF PREMISES

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

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

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

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

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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's Authorized Representative, all pertinent facts relating to such property damage and the ultimate disposition of the claim for damage.

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

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

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

F.3 CUTTING AND PATCHING

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

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

F.4 CLEANING UP

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

F.5 ENVIRONMENTAL CONTAMINATION

F.5.1 Contractor will be held responsible for and shall indemnify, defend (with counsel of Owner’s choice) and hold harmless Owner from and against any costs, expenses, damages, claims, and causes of action, (including attorney fees), or any of them, resulting from all spills, releases, discharges, leaks and disposal of environmental pollution, including storage, transportation, and handling during the performance of the Contract which occur as a result of, or are contributed by, the negligence or actions of Contractor or its personnel, agents, or Subcontractors or any failure to perform in accordance with the Contract Documents (except to the extent otherwise void under ORS 30.140). Nothing in this section F.5.1 shall limit Contractor's responsibility for obtaining insurance coverages

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required under Section G.3 of these General Conditions, and Contractor shall take no action that would void or impair such coverages

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

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

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

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

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

F.5.2 Contractor shall report all reportable quantity releases to applicable federal, state, and local regulatory and emergency response agencies. Reportable quantities are found in 40 CFR Part 302, Table 302.4 for hazardous substances and in OAR 340-142-0050 for all products addressed therein. Upon discovery, regardless of quantity, Contractor must telephonically report all releases to the Owner. A written follow-up report shall be submitted to Owner within 48 hours of the telephonic report. Such written report shall contain, as a minimum:

F.5.2.1 Description of items released (identity, quantity, manifest no., and all other documentation required by law.)

F.5.2.2 Whether amount of items released is EPA/DEQ reportable, and, if so, when it was reported.

F.5.2.3 Exact time and location of release, including a description of the area involved.

F.5.2.4 Containment procedures initiated.

F.5.2.5 Summary of communications about the release Contractor has had with members of the press or State officials other than Owner.

F.5.2.6 Description of cleanup procedures employed or to be employed at the site, including disposal location of spill residue.

F.5.2.7 Personnel injuries, if any, resulting from, or aggravated by, the release.

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F.6 ENVIRONMENTAL CLEAN-UP

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

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

F.7 FORCE MAJEURE

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

SECTION G INDEMNITY, BONDING, AND INSURANCE

G.1 RESPONSIBILITY FOR DAMAGES / INDEMNITY

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

G.1.2 Contractor agrees to indemnify, defend (with counsel approved by Owners), reimburse and hold harmless Owners, their partners, owners, board members, officers, employees, agents and volunteers (the “Indemnified Parties”) for, from and against any and all threatened, alleged or actual all claims, suits, allegations, damages, liabilities, costs, expenses, losses and judgments, including, but not limited to, those which relate to personal or real property damage (including to the Project itself or otherwise), personal injury or death, attorney and expert/consultant fees and costs, and both economic and non-economic losses, to the extent caused by the negligence, breach of contract, breach of warranty (express or implied), or other act or omission of Contractor, its employees, Agents and Subcontractors, or anyone for whose acts Contractor is responsible (the Indemnitor). If claims are asserted against any of the Indemnified Parties by an employee of the Indemnitor, the Contractor’s indemnification obligation and other obligations under this section shall not be limited by any limitation on the amount or type of damages, compensation, or benefits payable to the employee by or for the Indemnitor under workers’ compensation acts, disability benefit acts, or other employee benefit acts.

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G.2 PERFORMANCE AND PAYMENT SECURITY; PUBLIC WORKS BOND

G.2.1 When the Contract Price is $100,000 or more (or $50,000 or more in the case of Contracts for highways, bridges and other transportation projects) the Contractor shall furnish and maintain in effect at all times during the Contract Period, a performance bond in a sum equal to the Contract Price, and a separate payment bond also in a sum equal to the Contract Price. The bonds may be required if the Contract Price is less than the above thresholds, if required by the Contract Documents.

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

G.2.3 Before execution of the Contract Contractor shall file with the Construction Contractors Board, and maintain in full force and effect, the separate public works bond required by Oregon Laws 2005, Chapter 360, and OAR 839-025-0015, 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 the Subcontractor to start Work.

G.3 INSURANCE

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

G.3.2 Workers' Compensation: All employers, including Contractor, that employ subject workers who work under this contract in the State of Oregon shall comply with ORS 656.017 and provide the required Workers' Compensation coverage, unless such employers are exempt under ORS 656.126. This shall include Employer's Liability Insurance with coverage limits of not less than $100,000 for each accident. Contractors who perform the Work without the assistance or labor of any employee need not obtain such coverage if the Contractor certifies so in writing. Contractor shall ensure that each of its Subcontractors complies with these requirements. The Contractor shall require proof of such Workers' Compensation by receiving and keeping on file a certificate of insurance from each Subcontractor or anyone else directly employed by either the Contractor or its Subcontractors.

G.3.3 Builder's Risk Insurance:

G.3.3.1 Builder's Risk: During the term of this Contract, for new construction the Contractor shall obtain and keep in effect Builder's Risk insurance on an all risk form, including earthquake and flood, for an amount equal to the full amount of the Contract. Any deductible shall not exceed $50,000 for each loss, except the earthquake and flood deductible shall not exceed 2 percent of each loss or $50,000, whichever is more. The policy will include as loss payees the Owner, the Contractor and its Subcontractors as their interests may appear.

G.3.3.2 Builder's Risk Installation Floater: For other than new construction the Contractor shall obtain and keep in effect during the term of this Contract, a Builder's Risk Installation Floater for coverage of the Contractor's labor, materials and equipment to be used for completion of the

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Work performed under this Contract. The minimum amount of coverage to be carried shall be equal to the full amount of the Contract. This insurance shall include as loss payees the Owner, the Contractor and its Subcontractors as their interests may appear.

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 for the insureds, as their interests may appear. 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 Liability Insurance:

G.3.4.1 Commercial General Liability: Contractor shall obtain, at Contractor's expense, and keep in effect during the term of this Contract, Commercial General Liability Insurance covering bodily injury and property damage in a form and with coverages that are satisfactory to the Owner. This insurance shall include personal injury liability, products and completed operations, and contractual liability coverage for the indemnity provided under this Contract (to the extent contractual liability coverage for the indemnity is available in the marketplace) and shall be issued on an occurrence basis. Contractor shall provide proof of insurance of not less than combined single limit, or the equivalent, of not less than: □ $200,000; □ $500,000; □ $1,000,000; □ $2,000,000 each occurrence for Bodily Injury and Property Damage. The policy, or an endorsement or amendment to the policy, must provide that the County and its agents, board members, officers, employees, and volunteers are "additional insureds", but only with respect to the Contractor's Services to be provided under this Contract.

G.3.4.2 Automobile Liability: Contractor shall obtain, at Contractor's expense, and keep in effect during the term of this Contract, Automobile Liability Insurance covering owned, non-owned and/or hired vehicles, as applicable. The coverage may be written in combination with the Commercial General Liability Insurance. Contractor shall provide proof of insurance of not less than the amounts □ Minimum amounts required by the Oregon Financial Responsibility Law (ORS 806.060 and 806.070); □ $200,000; □ $500,000; or □ $1,000,000 per occurrence, for Bodily Injury and Property Damage, including coverage for all owned, hired, or non-owned vehicles, as applicable. The policy, or an endorsement or amendment to the policy, must provide that the County and its board members, officers, agents, employees, and volunteers are "additional insureds", but only with respect to the Consultant's Services to be provided under this Contract.

G.3.4.3 "Tail" Coverage: If any of the required liability insurance is arranged on a "claims made" basis, "tail" coverage will be required at the completion of this Contract for a duration of 24 months or the maximum time period available in the marketplace if less than 24 months. Contractor will be responsible for furnishing certification of "tail" coverage as described or continuous "claims made" liability coverage for 24 months following Final Completion. Continuous "claims made" coverage will be acceptable in lieu of "tail" coverage, provided its retroactive date is on or before the effective date of this Contract. This will be a condition of the final acceptance of Work or services and related warranty (if any).

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G.3.5 Excess/Umbrella Insurance: A combination of primary and excess/umbrella insurance is acceptable to meet the minimum coverage requirements for Commercial General Liability and Automobile Liability Insurance. In such case, the insurance certificate must include a list of the policies that fall under the excess/umbrella insurance. Sample wording is "The Excess/Umbrella policy is excess over primary Commercial General Liability and primary Automobile Liability Insurance."

G.3.6 Additional Insured: The liability insurance coverage, except Professional Liability if included, required for performance of this Contract shall include the Marion County, its departments, divisions, officers, and employees, as Additional Insureds but only with respect to the Contractor's activities to be performed under this Contract.

If Contractor cannot obtain an insurer to name the Marion County, its departments, divisions, officers and employees as Additional Insureds, Contractor shall obtain at Contractor's expense, and keep in effect during the term of this Contract, Owners and Contractors Protective Liability Insurance, naming the Marion County, its departments, divisions, officers and employees as Named Insureds with not less than a $1,500,000.00 limit per occurrence. This policy must be kept in effect for 12 months following Final Completion. As evidence of coverage, Contractor shall furnish the actual policy to Owner prior to execution of the Contract.

G.3.7 Certificate(s) of Insurance: As evidence of the insurance coverage required by this Contract, the Contractor shall furnish certificate(s) of insurance to the Owner prior to execution of the Contract. The certificate(s) will specify all of the parties who are Additional Insureds or Loss Payees. Insurance coverage required under this Contract shall be obtained from insurance companies or entities acceptable to the Owner that are allowed to provide such insurance under Oregon law. Eligible insurers include admitted insurers that have been issued a certificate of authority from the Oregon Department of Consumer and Business Services authorizing them to do an insurance business in the state of Oregon, and certain non-admitted surplus lines insurers that satisfy the requirements of applicable Oregon law and are approved by the Owner. The Contractor shall be financially responsible for all deductibles, self-insured retentions and/or self- insurance included hereunder. Any deductible, self- insured retention and/or self-insurance in excess of $50,000 shall be approved by the Owner in writing prior execution of the Contract and is subject to Owner's approval. The Contractor shall immediately notify the Owner's Authorized Representative in writing of any change in insurance coverage.

SECTION H SCHEDULE OF WORK

H.1 CONTRACT PERIOD

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

H.1.2 Unless specifically extended by Change Order, all Work shall be complete by the date contained in the Contract Documents. The Owner shall have the right to accelerate the completion date of the Work, which may require the use of overtime. Such accelerated Work schedule shall be an acceleration in performance of Work under Section D.1.2.6 and shall be subject to the Change Order process of Section D.1.

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H.1.3 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

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

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 for payments, retainage, if any, security, insurance or self-insurance, maintenance, heat, utilities, and damage to the Work, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents with respect to such portion of the Work. Approval by the Contractor to partial occupancy or use shall not be unreasonably withheld. Immediately prior to such partial occupancy or use, the Owner and Contractor shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work. Partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

SECTION I CORRECTION OF WORK

I.1 CORRECTION OF WORK BEFORE FINAL PAYMENT

The Contractor warrants to the Owner that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects, and that the Work will conform to the requirements of the Contract Documents. Work failing to conform to these requirements shall be deemed defective. Contractor shall promptly remove from the premises and replace all defective materials and equipment as determined by the Owner's Authorized Representative, whether incorporated in the Work or not. Removal and replacement shall be without loss or expense to the Owner, and Contractor shall bear the cost of repairing all Work destroyed or damaged by such removal or replacement. Contractor shall be allowed a period of no longer than thirty (30) Days after Substantial Completion for completion of defective (punch list) work, unless otherwise agreed. At the end of that period, or earlier if requested by the Contractor, Owner

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shall arrange for inspection of the Work by the Architect/Engineer. Should the Work not be complete, and all corrections made, the costs for all subsequent re-inspections shall be borne by the Contractor. If Contractor fails to complete the punch list work within the above time period, 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.

I.2.2 The Owner shall give Contractor notice of defects with reasonable promptness. Contractor shall perform such warranty work within a reasonable time after Owner's demand. If Contractor fails to complete the warranty work within such period as Owner determines reasonable, or at any time in the event of warranty work consisting of emergency repairs, 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.2.3 This provision does not negate guarantees or warranties for periods longer than one year including without limitation such guarantees or warranties required by other sections of the Contract Documents for specific installations, materials, processes, equipment or fixtures.

I.2.4 In addition to Contractor's warranty, manufacturer's warranties shall pass to the Owner and shall not take effect until affected Work has been accepted in writing by the Owner's Authorized Representative.

I.2.5 The one-year period for correction of Work shall be extended with respect to portions of Work performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work and shall be extended by corrective Work performed by the Contractor pursuant to this Section, as to the Work corrected. The Contractor shall remove from the site portions of the Work which are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

I.2.6 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.2.7 If the Owner prefers to accept Work which is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Price will be reduced as appropriate and equitable. Such adjustment shall be affected whether or not final payment has been made.

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SECTION J SUSPENSION AND/OR TERMINATION OF THE WORK

J.1 OWNER'S RIGHT TO SUSPEND THE WORK

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

J.1.1.1 Failure of the Contractor to correct unsafe conditions;

J.1.1.2 Failure of the Contractor to carry out any provision of the Contract;

J.1.1.3 Failure of the Contractor to carry out orders;

J.1.1.4 Conditions, in the opinion of the Owner's Authorized Representative, which are unsuitable for performing the Work;

J.1.1.5 Time required to investigate differing site conditions;

J.1.1.6 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 project 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 forces or another contractor to correct the problem associated with the suspension, rent of temporary facilities, and other actual costs related to the suspension. If the suspension was caused by acts or omissions of the Owner, the Contractor shall be due compensation which shall be defined using Section D, Changes in Work. If the suspension was required through no fault of the Contractor or the Owner, neither party owes the other for the impact.

J.4 OWNER'S RIGHT TO TERMINATE CONTRACT

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

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J.4.1.1 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;

J.4.1.2 If Contractor should make a general assignment for the benefit of Contractor's creditors;

J.4.1.3 If a receiver should be appointed on account of Contractor's insolvency;

J.4.1.4 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;

J.4.1.5 If Contractor should repeatedly fail to make prompt payment to Subcontractors or for material or labor, or should disregard laws, ordinances or the instructions of the Owner or its Authorized Representative; or

J.4.1.6 If Contractor is otherwise in material breach of any part of the Contract.

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

J.5 TERMINATION FOR CONVENIENCE

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

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

J.6 ACTION UPON TERMINATION

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

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

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SECTION K CONTRACT CLOSE OUT

K.1 RECORD DOCUMENTS

As a condition of final payment (refer also to section E.6), Contractor shall comply with the following: Contractor shall provide to Owner's Authorized Representative, one hard copy set and one electronic set of Record Documents of the entire project. 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") and one (1) digital copy for review by the Owner's Authorized Representative prior to submission of any pay request for more than 75% of the Work. No payments beyond 75% will be made by the Owner until the 0 & M Manuals have been received. The O & M Manuals shall contain training information, phone list of consultants, manufacturers, installer and suppliers, manufacturer's printed data, schematic diagrams of systems, appropriate equipment indices, warranties and bonds. The Owner's Authorized Representative shall review and return one O & M Manual for any modifications or additions required. Prior to submission of its final pay request, Contractor shall deliver three (3) complete and approved sets and one (1) digital copy of O & M Manuals to the Owner's Authorized Representative.

K.3 AFFIDAVIT/RELEASE OF LIENS AND CLAIMS

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

K.4 COMPLETION NOTICES

K.4.1 Contractor shall provide Owner’s Authorized Representative 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 punchlist accompanying the Certificate. Both completion notices must be signed by the Contractor and the Owner to be valid. The Owner shall provide the final signature on the notices. The notices shall take effect on the date they are signed by the Owner.

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

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Contractor may request that a punch list be prepared by the Owner's Authorized Representative with submission of the request for the Substantial Completion notice.

K.5 TRAINING

As part of the Work, and prior to submission of the request for final payment, the Contractor shall schedule with the Owner's Authorized Representative, training sessions for all equipment and systems, as required in the individual specifications sections. Contractor shall schedule training sessions at least four weeks in advance of the date of training to allow Owner personnel adequate notice. The O & M Manual shall be used as a basis for training. Training shall be a formal session, held after the equipment and/or system is completely installed and operational in its normal operating environment.

K.6 EXTRA MATERIALS

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

K.7 ENVIRONMENTAL CLEAN-UP

As part of the Final Completion notice, or as a separate written notice submitted with or before the notice of Final Completion, the Contractor shall notify the Owner that all environmental pollution clean-up performed as a part of this Contract has been disposed of in accordance with all applicable rules, regulations, laws, and statutes of all agencies having jurisdiction over such environmental pollution. The notice shall reaffirm the indemnification given under Section F.5.1 above.

K.8 CERTIFICATE OF OCCUPANCY

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

K.9 OTHER CONTRACTOR RESPONSIBILITIES

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

K.10 SURVIVAL

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

SECTION L LEGAL RELATIONS & RESPONSIBILITIES

L.1 LAWS TO BE OBSERVED

In compliance with ORS 279C.525, Sections L.2 through L.4 contain lists of federal, state, and local agencies of which the Owner has knowledge that have enacted ordinances or regulations relating to

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environmental pollution and the preservation of natural resources that may affect the performance of the Contract:

L.2 FEDERAL AGENCIES

Agriculture, Department of
Forest Service
Soil Conservation Service
Coast Guard
Defense, Department of
Army Corps of Engineers
Energy, Department of
Federal Energy Regulatory Commission
Environmental Protection Agency
Health and Human Services
Department of Housing and Urban Development
Department of Solar Energy and Energy Conservation Bank
Interior, Department of
Bureau of Land Management
Bureau of Indian Affairs
Bureau of Mines
Bureau of Reclamation
Geological Survey
Minerals Management Service
U.S. Fish and Wildlife Service
Labor, Department of
Mine Safety and Health Administration
Occupation Safety and Health Administration
Transportation, Department of
Federal Highway Administration
Water Resources Council

L.3 STATE AGENCIES

Administrative Services, Department of
Agriculture, Department of
Soil and Water Conservation Commission
Columbia River Gorge Commission
Energy, Department of
Environmental Quality, Department of
Fish and Wildlife, Department of
Forestry, Department of
Geology and Mineral Industries, Department of
Human Resources, Department of
Consumer and Business Services, Department of
Land Conservation and Development Commission
Parks and Recreation, Department of
State Lands, Division of
Water Resources Department of

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L.4 LOCAL AGENCIES

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

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ATTACHMENT 1

MARION COUNTY
BEHAVIORAL HEALTH CRISIS CENTER REMODEL

PROJECT MANUAL

June 6, 2024

REGISTERED ARCHITECT
ANGELA M. FLORES
SALEM, OREGON
STATE OF OREGON

Project Address:
1234 Commercial Street SE
Salem, Oregon 97302

Architect's Project Number:
01623

CARLSON VEIT JUNGE ARCHITECTS PC
ARCHITECTURE • INTERIOR DESIGN
WWW.CARLSONVEIT.COM 3095 RIVER RD N, SALEM, OR 97303

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The following Specifications have been organized under the format of the Construction Specifications Institute (CSI). Section numbers listed are for identification, and may not be consecutive. The Contractor shall check his copy of the Specifications against the Table of Contents to be sure his copy is complete.

Section No.	Section Title	Pages
DIVISION 00 – PROCUREMENT AND CONTRACTING		
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01 21 00	Allowances	1
01 22 00	Unit Prices	1
01 23 00	Alternates..	1
01 25 00	Substitution Procedures	1
	Substitution Request Form	1
01 31 19	Project Meetings	2
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01 42 00	References	3
01 45 00	Quality Control	2
01 50 00	Temporary Facilities and Controls	4
01 60 00	Product Requirements	2
01 71 23	Field Engineering	1
01 73 29	Cutting and Patching	2
01 74 19	Recycling and Environmental Requirements	1
01 74 23	Final Cleaning	1
01 77 00	Closeout Procedures	2
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DIVISION 07 - THERMAL AND MOISTURE PROTECTION		
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08 71 00 Door Hardware 18
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DIVISION 21 – FIRE SUPPRESSION
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DIVISION 22 - PLUMBING
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22 05 05 Selective Demolition for Plumbing 3
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22 05 29 Hangers and Supports for Plumbing Piping and Equipment 3
22 05 53 Identification for Plumbing Piping and Equipment 2
22 07 19 Plumbing Piping Insulation 8
22 11 16 Domestic Water Piping 8
22 11 19 Domestic Water Piping Specialties 5
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DIVISION 23 – HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)
23 00 00 General Mechanical Provisions 5
23 05 05 Selective Demolition for HVAC 3
23 05 93 Testing, Adjusting and Balancing 3
23 07 13 Duct Insulation…… 4
23 11 23 Natural-Gas Piping 10
23 23 00 Refrigerant Piping 3
23 30 00 HVAC Air Distribution 8
23 37 13 Diffusers, Registers, Grilles and Louvers 3

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DIVISION 26 - ELECTRICAL
26 00 01 General Electrical Provisions 3
26 00 20 Electrical Demolition 2
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26 00 26 Submittals and Shop Drawings 2
26 05 19 Building Wire and Cables 2
26 05 26 Grounding…… 3
26 05 29 Supporting Devices 1
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26 05 33.16 Outlet, Junction, and Pull Boxes 2
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26 05 83 Wire Connections 2
26 24 17 Panelboards…… 3
26 24 18 SPD (Surge Protection) Equipment 2
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26 29 12 Disconnects and Manual Starters 2
26 33 13 Emergency Power Packs 1
26 51 13.20 Lighting Fixtures 3

DIVISION 27 – 28
Not Used.

DIVISION 31 – 33
Not Used.

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PROJECT DIRECTORY
MARION COUNTY
BEHAVIORAL HEALTH CRISIS CENTER REMODEL

Owner:
Marion County
555 Court Street NE
Salem, Oregon 97301

Architect:
Carlson Veit Junge Architects PC
3095 River Road N
Salem, Oregon 97303
503 390-0281

Mechanical/Electrical Engineer:
Fluent Engineering
2110 State Street
Salem, OR 97301
503 226-2921

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PROJECT DESCRIPTION

In general, the project comprises a remodel of an existing 10,846 SF office building for the Health and Human Services department.

CONTRACT

In event work described herein is awarded, successful Bidder and Owner shall execute the following Contract:

Marion County standard construction contract.

WORK FURNISHED AND INSTALLED BY OWNER

Concurrently with Work of this Contract:

Telephone equipment
Computer equipment, unless otherwise noted
Systems Furniture
Furniture, unless otherwise noted
Appliances

PRODUCTS FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR, IF ANY

Delivery:

By Owner.

Unloading:

By Owner.

Owner's Duties:

Arrange for and deliver necessary shop drawings.
Deliver product to site in accordance with approved construction schedule.
Inspect deliveries jointly with Contractor.
Submit claims for transportation damage.
Arrange for replacement of damaged, defective, missing, or otherwise unacceptable Items.
Arrange for manufacturer's required warranties, bond, service, and inspections.

Contractor's Duties:

Designate required delivery date for each Owner-furnished product.
Review any shop drawings, samples, and product data, and notify Architect about any anticipated discrepancies or problems.
Promptly inspect delivered products, and report any damage, defective items, or missing items.
Handle at site, including uncrating and storing.
Protect products against damage and discoloration.
Install, connect, adjust, and where scheduled, finish products.
Clean, repair and touch-up, or replace when directed, products including those of other sections which have been soiled, discolored, or damaged by this work.

OWNER’S PROJECT REPRESENTATIVE

The Owner’s representative during the project will be:

Wesley Miller, Marion County Construction Project Coordinator
Phone: (503) 576-0595

Allow access by the Project Representative to the project at all times.
Coordinate scheduling, personnel access, and equipment access to the building with the Project Representative.
Owner’s Project Representative will provide contract administration services throughout project construction. All communications to the Owner shall be through the Owner’s Project Representative.

WORK SEQUENCE

Work sequence shall be the responsibility of the contractor. Coordinate with Owner prior to start of construction.

WORK HOURS

Contractor shall schedule work during regular business hours, 7:00 a.m. to 6:00 p.m., Monday through Friday.
Disruptive work that creates excessive noise, traffic, or odors shall be scheduled after hours or on Saturday or Sunday. Before hours, after hours, or weekend work shall be prearranged and scheduled

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with the Owner's Project Representative.
Contractor may be asked to cease daytime work and to reschedule if it is found to interfere with the Owner's operations.

CONTRACTOR USE OF PREMISES
See Contractor Staging and Parking Diagram for support areas. Do not use other areas around building without approval from Owner's Project Representative.
Contractor to provide site plan showing staging, storage, trailer locations, contractor parking, etc. for review by Owner's Project Representative.
Except as noted on Drawings, do not use Owner's parking lot, driveways, and walks without prior approval from Owner.
Provide a schedule/diagrams regarding the construction for review by Owner's Project Representative.

GRADE LINES AND LEVELS
Contractor shall verify all setbacks, grades, and levels; and stay within the limits thereof.

PROTECTION OF PUBLIC
Construction site is to be isolated from the public by temporary chain link fencing. Contractor to adjust fencing as needed throughout construction to keep site secure.
Provide barriers around equipment located on the ground.
Provide warning signs where necessary to alert pedestrians and vehicle operators to potential hazards.

PROTECTION OF PROPERTY
Protect existing building, building contents, trees, shrubs, planting beds, pavement and other exterior areas from damage.
Protect building occupants, pedestrians, building, and building contents from damage due to work of this project.
Replace damaged property, where directed, at no additional cost to Owner.
Owner shall deduct the value of any damage from amount owed Contractor, or at Owner's option, Contractor may pay for repair or replacement directly.

PROTECTING EXISTING UTILITIES
Drawings indicate approximate location of any known, concealed utility lines. Before starting work, Contractor shall determine exact location of any of these lines that could be damaged by contract work.
Contractor shall assume that other, unknown utility lines do exist, and Contractor shall proceed with caution when working in areas that could conceal unknown utilities. If such utility lines are encountered, immediately request disposition instructions from Architect.
If utility lines are damaged; remove, repair or replace lines as directed. Additional compensation and/or extensions of time, if any, caused by removing, repairing, or replacing lines will be determined in accordance with the General Conditions.

PROJECT COORDINATION
General Contractor is responsible for overall coordination of trades. Mechanical and electrical contractors are responsible for coordinating with each other and making provisions in their work for the other's trade.

CODES
All work shall be in compliance with current state and local codes. General Contractor shall make available to all Sub-contractors, all reports and requirements issued by the building permit or subsequent inspections by the building officials.

PERMITS AND FEES
The Owner will pay the plan review fee, general building permit fee and systems development charges.
The Contractor shall pay all other permit and use fees including, but not limited to: Specialty contractor fees and permit costs; public works fees and permits; plumbing, mechanical, electrical and related permits and fees; business license fees; permits and fees for work in public rights-of-way, temporary work, street closures, and utility taps. The Contractor shall be responsible for violations of law for any cause in connection with the completion of the work. The Contractor shall be responsible for obstruction or damage to streets, sidewalks, utilities and other public or private improvements done in connection with completion of the work. Conform to applicable state, city and local codes and ordinances.

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UNACCEPTABLE EXISTING CONDITIONS

Exposed to View:

Repair or replace as part of this work.

No additional payment by Owner will be made.

Concealed:

Repair or replace where necessary.

Upon notification from Contractor, Owner will issue change order authorizing Contractor to perform this work and contract sum will be adjusted accordingly.

END OF SECTION

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GENERAL

Include in contract sum all allowances itemized below to be expended in accordance with the General Conditions.

Designate in construction progress schedule delivery dates for products specified under each allowance.

Designate in schedule of values each allowance.

RELATED SECTIONS

Each specification referenced below.

PRODUCT ALLOWANCE

Include in the contract sum the following:

Allowance No. 1:

Provide 500 SF for damaged 12” x 12” adhesive applied ceiling tiles.

Allowance No. 2:

Remove 2,000 SF of damaged walls due to wallcovering removal and replace with new gyp board.

Allowances include:

- Product cost to Contractor, less any applicable trade discounts. Delivery to site.

In addition to allowance amount, include in contract sum Contractor's cost for the following:

- Handling at site; including unloading, uncrating, and storage.
- Protection against damage and discoloration.
- Labor for installation and finishing.
- Other expenses required to complete installation.
- Contractor's and Subcontractor's overhead and profit.

PRODUCT SELECTION UNDER ALLOWANCES

Architect's duties:

Consult with Contractor in consideration of products, and suppliers.

Make selection in consultation with Owner. Obtain Owner's written decision, designating:

- Product, model and finish.
- Accessories and attachments.
- Supplier.
- Contractor's cost delivered to site or installed, as applicable.
- Manufacturer's warranties.
- Prepare change order.

Contractor's Duties:

Assist Architect and Owner in determining qualified suppliers.

Obtain proposals from suppliers when requested by Architect.

Make appropriate recommendations for Architect's consideration.

Notify Architect promptly of:

- Any reasonable objection Contractor may have against product, supplier, or party under consideration.
- Any effect on construction schedule anticipated by selections under consideration.

CONTRACTOR'S RESPONSIBILITY FOR PURCHASE, DELIVERY, AND INSTALLATION

On notification of selection, execute purchase order agreement with designated Supplier.

Make delivery arrangements.

Upon delivery, promptly inspect products for damage and defects.

Submit claims for transportation damage.

Install products in compliance with respective specification section.

COST ADJUSTMENTS

Should net cost be more or less than allowance amount, contract sum will be adjusted accordingly by change order.

Change order amount will recognize any changes in handling costs at site, labor, overhead, profit, and other expenses caused by selection.

Submit any claims for anticipated additional costs at site, or other expenses caused by selection under allowance, prior to execution of work.

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Submit selection within 60 days after work completion.
Failure to submit claims within designated time will constitute waiver of claims for additional cost.
At contract closeout, reflect all approved contract sum changes in final statement of accounting.

END OF SECTION

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GENERAL

Bidders shall quote unit prices for additions or deductions for items of work as stated below. All unit prices quoted shall be for installed, completed work unless otherwise indicated, and shall include overhead, profit, taxes, permit costs and fees so that they are a complete price to the Owner.
These unit prices shall not apply to work which the Contractor may be required to perform in order to correct errors or damage resulting from the Contractor's negligence.
All unit prices shall be valid and in force up to the time of substantial completion.

COST ADJUSTMENTS

Unit prices accepted will be included in the contract sum stated in the agreement. Any additional unit prices accepted after execution of the agreement will be added or deleted from the contract by change order in accordance with the General Conditions before submittal of the Contractor's notice of substantial completion.

UNIT PRICE ITEMS

Item No. 1:
Price per square foot for removal and replacement of 12” x 12” adhesive applied ceiling tile.

Item No. 2:
Price per square foot for removal of plaster/gyp board finish and replacement with (1) layer gyp board.

END OF SECTION

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SECTION INCLUDES
Submission procedures.
Documentation of changes to contract sum/price and contract time.

REQUIREMENTS
Alternates quoted on Bid Form will be reviewed and accepted or rejected at Owner's option. Accepted alternates will be identified in the Owner-Contractor Agreement. Coordinate related work and modify surrounding work to integrate the work of each alternate.

ALTERNATE BIDS
Alternate No. 1 – Window Coverings.
Base Bid Item:
Existing window coverings at existing exterior windows to remain.
Alternate Item:
Remove existing window coverings at all exterior windows and provide new window blinds.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES

Contractor's requirements in the selection of products, manufacturers and procedures for consideration of proposal substitutions.

RELATED DOCUMENTS

“Marion County General Conditions for Public Improvement Contracts”

QUALIFICATIONS

Only approved substitutions may be used on contract work.

Each request for substitution approval shall include:

- Identity of product for which substitution is requested; include Specification page number.
- Identity of substitution; include product description, drawings, photographs, performance and test data, and any other information necessary for evaluation.
- Quality comparison of proposed substitution with specified product.
- Changes required in other work because of substitution.
- Effect on construction Progress Schedule.
- Cost comparison of proposed substitution with specified product.
- Any required license fees or royalties.
- Availability of maintenance service.
- Source of replacement materials.

SUBSTITUTIONS DURING BID PERIOD

No request for substitution approval will be considered unless written request has been electronically submitted with standard form bound herein in addition to substitution documentation noted above, and has been received by Architect by 5:00 PM at least 10 calendar days prior to bid opening day.

Request submitted after this date will not be individually acknowledged.

Architect will issue Addenda prior to bid opening listing all approved substitutions.

SUBSTITUTIONS AFTER CONTRACT AWARD

Refer to “Marion County General Conditions for Public Improvement Contracts” for additional information on substitutions after contract award.

END OF SECTION

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SUBSTITUTION REQUEST

TO:

PROJECT:

SPECIFIED ITEM:

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

PROPOSED SUBSTITUTION:

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

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

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

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

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

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

Submitted by:

Name (Printed or typed)	General Contractor (if after award of Contract)
Signature	For use by A/E ☐ Approved ☐ Approved as noted ☐ Not Approved ☐ Received too late
Firm Name	
Address	
City, State, Zip	By
Date	Date
Tel: Fax:	Remarks

July 1999

The Construction Specifications Institute
Northwest Region

Advancement of Construction Technology

_____
Owner (if after award of Contract)
Date _____

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SECTION INCLUDES

Pre-bid meeting, pre-construction meeting, pre-installation conferences, progress meetings, and Requests for Information.

PRE-BID MEETING

Attendees:

Owner, Architect, Bidders, Sub-bidders, and Suppliers.

A written list of attendees will be prepared (sign-in sheet).

Agenda:

Introduction of parties involved, review of scope of project, overview of project requirements, review of project schedule, review of project budget, and questions from Bidders.

A walk-through of the project site will be conducted.

Architect will record meeting minutes and distribute minutes and copy of sign-in sheet to Owner and Bidders. Copies will be sent to other attendees upon request.

PRE-CONSTRUCTION MEETING

Meeting Requirements:

Owner, Architect, Contractor schedule date and time for a Preconstruction Site Meeting as soon as possible after Contractor receives signed contract or Notice to Proceed.

Attendees:

Contractor, Subcontractors, Suppliers, and Consultants deemed necessary by Architect and Contractor.

Agenda:

Schedule Progress Meetings.

Discuss lines of communication and methods on how to reduce possible miscommunications between parties involved. Reach conclusions and abide by them. Maintain communication and cooperation.

Discuss waste management plan and indoor air quality management plan.

Discuss hazardous materials.

Review list of subcontractors and suppliers.

Discuss Construction Progress Schedule and agree on date of publication.

Discuss critical scheduling requirements.

Discuss Contractor requirements.

Discuss Design-Build requirements if applicable.

Discuss procedures for Contractor's RFIs. Requirements as follows:

- Contact Architect for items apparently requiring immediate attention.
- If Contractor requires additional information, clarification, unforeseen conditions are encountered or suggestions for betterment of project, document apparent item, provide a due date and indicate whether additional time/cost or savings are involved and submit RFI on form at end of this Section. Prepare each RFI for a single subject matter.
- Record each RFI in a Log, identifying each RFI by number, subject, date submitted, date of response and disposition.
- Contractor may prepare RFI by copying or scanning form at end of this Section. Number each RFI numerically and record in log. Architect answers RFIs in a timely manner by written response on submitted RFI. If Change Order is indicated change order request prepared and forwarded to Contractor.
- Design Clarification/Verification Request (DCVR) or other forms are unacceptable.

Review procedures for processing shop drawings, product data, samples, field decisions, and change orders.

Review procedures for maintaining project record documents, security, deliveries, safety, housekeeping, and first aid.

Discuss procedures of work forces and working relations with Owner's staff and others.

Review use of site for parking, staging, temporary buildings and construction activities.

Schedule future meeting dates and times.

PRE-INSTALLATION CONFERENCES

Meeting Requirements:

Conduct Pre-installation Conference before each activity that requires coordination with other construction activities.

See each Specification Sections to verify if a pre-installation conference is required.

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Attendees:
Architect, Contractor, Subcontractor(s) involved, manufacturer's representative if required by manufacturer and/or specifications. Code enforcement personnel if required by local codes.
Agenda:
Review progress of other activities and preparations for activity under consideration, including time schedules, manufacturer's preparation and installation recommendations, safety requirements, weather limitations, substrate acceptability, compatibility problems, and inspection and testing requirements.
Contractor conducts and records significant discussions, agreements and disagreements of each conference. It is recommended that this meeting be held before or after Progress Meeting.
Number and record meetings sequentially. Distribute meeting record to concerned parties including Architect and Owner within 72 hours after meeting.

PROGRESS MEETINGS
Meeting Requirements:
Contractor conducts Progress Meetings at weekly intervals.
Contractor prepares agenda and provides meeting minutes.
Weekly meetings, or as scheduled, conducted at jobsite.
Attendees:
Owner, Architect, Contractor, Consultants and Subcontractors deemed necessary by Architect and Contractor.
Agenda:
Review construction progress schedule.
Review last Meeting Minutes for accuracy. Correct items if needed.
Discuss old business and new business agenda items.
Review RFI log, ASI log, change order requests, and submittal log for current status.
Contractor distributes written minutes of each meeting to concerned parties, as determined, within 72 hours.

END OF SECTION

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REQUEST FOR INFORMATION

CARLSON VEIT JUNGE ARCHITECTS PC
3095 River Road North
Salem, Oregon 97303
503 390-0281
FAX 503 390-2459

RFI NO.: _____

DATE: _____

CONTRACTOR'S PROJECT NO.: _____

ARCHITECT'S PROJECT NO.: 01623

PROJECT: Marion County BHCC Remodel

OWNER: Marion County

TO: _____

INITIATED BY:_____

QUESTION:

Potential Cost Impact: _____

Potential Time Impact: _____

Response needed within _____ days

RESPONSE:

Signature:_____ Date: _____

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PART 1 - GENERAL

SECTION INCLUDES

Submit shop drawings, product data, and samples required by Contract Documents.

RELATED DOCUMENTS

"Marion County General Conditions for Public Improvement Contracts".

DEFINITIONS

Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

Action Submittals: Written and graphic information and physical samples that require the Architect's responsive action. Action submittals are those submittals indicated in individual specification sections as action submittals.

Informational Submittals: Written and graphic information and physical samples that do not require the Design Professional'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.

SPECIAL REQUIREMENTS

General:

Shop Drawings and Product Data shall be forwarded as electronic submittals in the form of PDF files. Electronic files may be forwarded by e-mail, or by interactive website services such as an FTP site, Smartsheet, or BlueBeam, established by the Contractor or the Contractors Project Information Management (PIM) software.

The electronic submittal process is not intended for color samples, color charts, or physical material samples.

Commissioning Authority will review submittals applicable to systems being commissioned for compliance with commissioning needs, concurrent with the Architect's review and approval.

Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.

Submittal Schedule:

Designate in Construction Schedule, or in separate coordinated schedule, submission dates and dates that reviewed Shop Drawings, Product Data and Samples will be needed.

Once the submittal schedule has been developed by the Contractor, the Owner's Project Representative will identify those submittals that will require Marion County review.

Shop Drawings:

Identify Shop Drawing details by reference to drawing sheet, detail, schedule, or room number shown on contract drawings.

If shop drawings are not submitted as three-dimensional, provide detailed two-dimensional drawings.

Paper Copies: Sheet Size 8 1/2 X 11 inch, or folded to that size to facilitate filing.

Product Data:

Clearly mark each copy to identify pertinent products.

Show performance characteristics and capacities.

Show dimensions and required clearance.

Show wiring and piping diagrams, and controls.

Manufacturer's standard schematic drawings and diagrams:

- Modify to delete information not applicable to work.
- Supplement standard information to provide information specifically applicable to work.

Samples:

Size and quantity: See respective specification sections.

Show full range of color, texture, and pattern.

Deliver to Architect's office, unless otherwise specified.

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Costs:
Cost of the project interactive website services shall be included in the Contractor's bid.
If using an FTP website or PIM software, Contractor shall provide training for Owner's representatives, Architect, and Architect's consultants, regarding use of website or PIM software.
Internet Service and Equipment Requirements:
- Email address and Internet access at Contractor's main office.
- Adobe Acrobat (www.adobe.com), Bluebeam PDF Revu (www.bluebeam.com), or other similar PDF review software for applying electronic stamps and comments. As an option, the project's interactive website provider shall provide free of charge to any party requesting it, a free downloadable PDF review software from their website.

CONTRACTOR'S RESPONSIBILITIES
Review Shop Drawings, Product Data, and Samples prior to submission.
Determine and verify:
- Field measurements.
- Field construction criteria.
- Catalog numbers and similar data.
- Conformance with specifications.

Comply with Contract Documents.
Coordinate each submittal with requirements of work.
Notify Architect in writing, at submission time, of any deviations in submittals from Contract Document requirements.
Contractor is responsible for providing submittals in one fully complete and vetted package. Failure to comply will cause the submittal to be returned to the Contractor for correction for proper submittal.
Perform no work or fabrication requiring submittal until Architect approves submittal.

SUBMISSION REQUIREMENTS
Make submittals promptly in accordance with approved Progress Schedule, and in such sequence as to cause no work delay.
Shop Drawings:
Submittal shall contain:
- Project title and names of Contractor, Supplier, and Manufacturer.
- Project identification complete with specification section number.
- Field measurements, clearly identified as such.
- Relation to critical features and adjacent work.
- Applicable standards, such as ASTM or Federal Specifications numbers.
- Identification of deviations from Contract Documents.
- Identification of resubmittal revisions.
- At least 6 X 8 inch space on each page for Contractor's and Architect's stamps.
- Contractor's stamp, signed and certifying that products, field measurements, field construction criteria, and information submitted has been reviewed and accepted by him as accurate and conforming with Contract Documents.

Product Data:
Submittal shall contain:
- Project title and names of Contractor, Supplier, and Manufacturer.
- Project identification complete with specification section number.
- Applicable standards, such as ASTM or Federal Specifications numbers.
- Identification of deviations from Contract Documents.
- Identification of resubmittal revisions.
- At least 6 X 8 inch space on the first page for Contractor's and Architect's stamps.

Contractor's stamp, signed and certifying that products and information submitted has been reviewed and accepted by him as accurate and conforming with Contract Documents.
Samples:
Submit number stated in respective specification section.
Submittal shall contain:
- Project title and names of Contractor, Supplier, and Manufacturer.
- Project identification complete with specification section number.
- Field measurements, clearly identified as such.
- Relation to critical features and adjacent work.

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Applicable standards, such as ASTM or Federal Specifications numbers.
Identification of deviations from Contract Documents.
Identification of resubmittal revisions.
At least 6 X 8 inch space on each page for Contractor's and Architect's stamps.
Contractor's stamp, signed and certifying that products, field measurements, field construction criteria, and information submitted has been reviewed and accepted by him as accurate and conforming with Contract Documents.

RESUBMISSION REQUIREMENTS
Make any corrections or changes in submittals required by Architect and resubmit until approved.
Contractor to be allowed a single original submittal review and a follow up submittal for corrections.
Beyond the two reviews, the Contractor may be penalized to pay for the Architect and Owner review time.
Shop Drawings and Product Data:
Revise initial drawings or data, and resubmit as specified for initial submittal.
Identify any changes made other than those requested by Architect.
Samples:
Submit new samples as required for initial submittal.

ARCHITECT'S RESPONSIBILITIES
Review submittals with reasonable promptness.
Affix signature, and indicate approval or requirements for resubmittal.
Return submittals to Contractor for distribution, or resubmission.

REQUIRED SUBMITTALS
Refer to individual sections in this Project Manual.

DEFERRED SUBMITTALS
As required in other specification sections, submit to the Authority Having Jurisdiction (AHJ) shop drawings and design professional’s engineering calculations as required by the AHJ for those products required to be bidder designed based on performance criteria noted.
Submit the number of paper copies required by the AHJ. Upon receiving approval by the AHJ, make submittal to the Architect for his review and approval. Obtain Architect’s approval before fabricating work.

SUBMITTAL ADMINISTRATIVE REQUIREMENTS
Architect's Digital Data Files: Electronic copies of CAD Drawings of the Contract Drawings may be provided by Architect for Contractor's use in preparing submittals, subject to execution of an AIA E201 – 2007 Digital Data Protocol Exhibit and the Architect’s Digital File Disclaimer/Waiver Form.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES

Removal of asbestos-bearing materials which may be encountered during the course of this Contract. Such materials may include pipe or duct insulation, asbestos-bearing plaster finishes, cement-asbestos board, and flooring materials. Verify which items to be demolished or removed, if any, contain asbestos-bearing materials prior to commencing demolition.

REFERENCES

Comply with the following requirements:
Worker's Compensation Department: OAR Chapter 437, Division 115.
Department of Environmental Quality: OAR Chapter 340, Division 25.
Environmental Protection Agency: Code of Federal Regulations Title 40, Part 61.
Occupational Safety and Health Administration: Code of Federal Regulations Title 29, Part 1910.
Other agencies regulating asbestos removal and disposal.

PERFORMANCE REQUIREMENTS

Furnish all labor, materials, services, insurance and equipment necessary for removal of all asbestos-bearing materials required to be removed under this Contract in accordance with guidelines or regulations of the public agencies listed below.

QUALITY ASSURANCE

Qualifications:

Employ only workmen experienced and qualified to perform work of the type required by this Section.

Notices:

Submit "Notice of Intent to Demolish" to Department of Environmental Quality, 895 Summer Street NE, Salem, Oregon. Forms are available from DEQ regional offices or local building departments.

COORDINATION

Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

ASBESTOS REMOVAL MATERIALS

Provide all necessary dustproof partitions or barricades, heavy plastic disposal bags, disposal clothing, hoods, shoe covers, NIOSH approved respiratory protective equipment, and all other necessary equipment, tools and materials to safely remove asbestos materials.

PART 3 - EXECUTION

EXAMINATION

Verify that areas within structure to be demolished are vacant and not in use.
Do not start work until conditions are satisfactory.

MATERIAL REMOVAL

General:

Post all areas in accordance with Federal and State requirements.
Barricade asbestos removal area to prevent workmen from other trades from entering work area without protective measures as specified herein. Protective equipment provided by each subcontractor working within the asbestos removal area.
Provide separate change areas and lunch areas.

BARRICADES

Tightly seal off work area using approved plastic sheeting.
Post warning signs on barricades.
Cover grates, registers, floors, doors, windows, and equipment with disposable polyethylene sheets securely taped into place.
Provide decontamination facility outside of removal area.
Dispose of barricade material similar to asbestos waste disposal after completion of asbestos removal

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work.

PERSONNEL PROTECTION
Comply with State and Federal regulations and guidelines.
Provide respiratory protection in accordance with ANSI Z88.2-1980 for all workmen. Supply each worker with a personal respirator. When not in use, store respirators in protective plastic bags. Clean and disinfect respirators daily.
Test respirators prior to entry into dust hazard area. Test for proper function and fit.
Wear disposable coveralls, hoods and shoe covers.
Change clothes at the end of each work shift. Place all contaminated clothing in disposal bags.
Do not remove respirators until all contaminated clothing has been removed and disposed of.
Thoroughly wash hands before eating.
Permit no smoking, eating, or drinking in dust hazard posted areas.

MONITORING
Provide monitoring as required by State and Federal Regulations.
Monitoring to be accomplished by trained personnel.

WASTE DISPOSAL
Properly bag and tag all waste materials including contaminated clothing, barricade material, drop cloths, and any other contaminated items.
Obtain a "waste dump permit" from approved landfill.
Give advance notice to landfill facility to assure immediate backfilling over bagged waste.

CLEANING AND REPAIRING
Allow no debris to accumulate in building, or on grounds.
Remove from site daily and dispose of as specified above.
Conform to cleaning requirements specified above.
Including work of other sections, clean, repair, and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.
Remove debris from project site upon work completion or sooner, if directed.

PROTECTION
Protect other work against damage and discoloration caused by work of this section.

END OF SECTION

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REFERENCED SPECIFICATIONS AND STANDARDS

For products or workmanship specified by Referenced Specification or Standard, comply with requirements of the Specification or Standard, except when more rigid requirements are specified or are required by governing codes.

Except where a specific date is specified, the date of Referenced Specification or Standard is that in effect as of the date of Owner-Contractor Agreement.

Obtain a copy of all Referenced Specifications and Standards, and maintain at jobsite during the specific work until Substantial Completion of the Project.

Wherever referenced Standard Specifications or Standards issued by manufacturers or other similar organizations contain provisions which conflict with the Contract Documents the Contract Documents shall govern.

REFERENCED REGULATORY AGENCIES

ADAAG	Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities Office on the Americans with Disabilities Act Civil Rights Division U.S. Department of Justice Washington, D.C. 20530 www.access-board.gov
AASHTO	American Association of State Highway and Transportation Officials 444 North Capital Street, NW Washington, D.C 20001 www.aashto.org
ANSI	American National Standards Institute 1430 Broadway New York, NY 10018 www.ansi.org
ASHRAE	American Society of Heating, Refrigeration and Air-Conditioning Engineers 1791 Tullie Circle NE Atlanta, GA 30329 www.ashrae.org
ASCE	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 www.asce.org
ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, PA 19103 www.astm.org
CS	Commercial Standards of the Commodities Division of the Department of Commerce Washington, D.C. 20006 www.doc.gov
EPA	Environmental Protection Agency Ariel Rios Building 1200 Pennsylvania Avenue, N.W. Washington, DC 20460 www.epa.gov
Fed. Spec.	Federal Specifications of the United States General Services Administration Specifications and Consumer Information Distribution Section (WF SIS)

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	Washington Navy Yard, Building 197 Washington, D. C. 20407 www.apps.fss.gsa.gov/pub/fedspecs/iindex.cfm
FMG	FM Global [formerly Factory Mutual (FM)] 1301 Atwood Avenue P.O. Box 7500 Johnston, RI 02919 www.fmglobal.com
IBC	International Building Code Published by International Code Council (see ICC below)
ICBO	International Conference of Building Officials 5360 Workman Mill Road Whittier, CA 90601-2298
ICC	International Code Council 5203 Leesburg Pike, Suite 708 Falls Church, VA 22041-3401 www.intlcode.org
IMC	International Mechanical Code Published by International Code Council (see ICC above)
LEED	Leadership in Energy and Environmental Design U.S. Green Building Council 1015 18th Street NW, Suite 805 Washington, D.C. 20036 www.usgbc.org
NEC	National Electric Code published by the National Fire Protection Association (See NFPA below)
NFPA	National Fire Protection Association International Battery March Park Quincy, MA 02269 www.nfpa.org
OSHA	Occupational and Safety Health Administration U.S. Department of Labor Occupational Safety & Health Administration 200 Constitution Avenue Washington, D.C. 20210 www.osha.gov
OSSC	2022 Oregon Structural Specialty Code (based on the 2021 International Building Code) Building Codes Division 1535 Edgewater Street NW Salem, OR 97310 www.oregonbcd.org
PS	Product Standards of the Commodities Division of the Department of Commerce Washington, D. C. www.doc.gov

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SMACNA Sheet Metal & Air Conditioning Contractors National Association
4201 Lafayette Center Drive
Chantilly, Virginia 20151-1219
www.smacna.org

UFAS Uniform Federal Accessibility Standards
United States Architectural and Transportation Barriers
Compliance Board
1111 Eighteenth Street NW, Suite 501
Washington, D.C. 20036-3894
www.access-board.gov

UL Underwriter's Laboratories
333 Pfingston Road
Northbrook, Illinois 60062
www.ul.com

USGBC U.S. Green Building Council
1015 18th Street NW, Suite 805
Washington, D.C. 20036
www.usgbc.org

TRADE ASSOCIATION REFERENCES
See specific Specification Sections.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES

Inspection and testing laboratory qualifications, duties, and responsibilities. Contractor's quality control requirements. Contractor's and Owner's responsibilities.

COSTS

Paid by Owner:

For Testing Laboratory Services specified in this section and as noted on Structural Drawings.

For special inspections of concrete, masonry, welding, and post-installed anchors specified in building code.

Paid by Contractor

For inspection and testing required by laws, ordinances, regulations, and orders of Public Authorities, but not specified in this section.

For re-inspections and retesting required because of defective work of ill-timed notices.

QUALIFICATIONS OF LABORATORY

Independent laboratory acceptable to Architect and Building Official.

Meet "Recommended Requirements for Independent Laboratory Qualification," latest edition, published by American Council of Independent Laboratories, 1050 17th Street NW, Suite 1000, Washington, D.C. 20038, (202) 887-5872.

Meet ASTM E-329 latest edition, "Standards of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as used in Construction."

LABORATORY'S DUTIES

Provide qualified personnel for specified inspections, sampling, and testing.

Ascertain and certify compliance with contract documents.

Promptly submit written inspection and test reports to Owner's Representative, Building Official, Contractor, and Architect.

Include the following on test reports:

- Date issued.
- Project title and locations.
- Testing laboratory name and address.
- Inspector's name.
- Date of inspection or sampling.
- Record of temperature and weather.
- Date of test.
- Identification of product tested.
- Test location in project.
- Type of inspection or test.
- Observations regarding compliance with contract documents.
- Laboratory is not authorized to:
- Release, revoke, alter, or enlarge on contract document requirements.
- Approve or accept any portion of work.
- Perform any duties for Contractor.

CONTRACTOR'S RESPONSIBILITIES

Cooperate with laboratory personnel, provide access to work and to manufacturer's operations.

Provide to laboratory, representative samples of materials to be tested, in required quantities.

Furnish casual labor and facilities:

- Provide access to work to be tested.
- To obtain and handle test samples at site.
- To facilitate inspections and tests.
- For laboratory's exclusive use for storage and curing of test samples until removed to laboratory.

Notify laboratory at least 24 hours in advance of operations to allow for personnel assignments and test scheduling.

Repair test holes to match original conditions.

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LIABILITY
Laboratory service is provided for Owner's self-assurance and in no way relieves Contractor's responsibility to comply with Contract Documents.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

SLAB MOISTURE
Testing Standard: ASTM F 1869-98 standard test method for measuring vapor emission rate at interior concrete slabs on grade requiring floor covering using anhydrous calcium chloride.
Testing Procedure: Sinak Dome Test vapor emission measuring system; Sinak Corporation, 861 Sixth Avenue, Suite 411, San Diego, CA 92101, phone 800-523-3147.

SLAB PH LEVEL
Method: ASTM F 710 “Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
Provide tests at area for each new flooring type.

CAST-IN-PLACE CONCRETE
Test Concrete Slump as follows:
Follow ASTM C-143 and C-172.
Prepare tests from same batch as that employed in preparing strength test specimens, unless otherwise directed.
If measured slump falls outside specified limits retest immediately from another portion of same load. In event of second failure concrete shall be considered as failing specification requirements.
Test Concrete Compressive Strength as follows:
Follow ASTM C-31, C-39, and C-172.
Prepare not less than 4 test cylinders for each 100 cubic yards or less for each strength of concrete cast in any one day.
Break 2 cylinders at 7 days of age, and unless otherwise directed break remainder at 28 days.
If any one set of two cylinders does not develop full design strength at 28 days of age, cores may be called for. All coring costs paid by Contractor.
If tests indicate concrete has failed to meet specifications, replace substandard material when directed by Architect.
Test Concrete Air Content as Follows:
Follow ASTM C-231.
Test each cylinder containing air entrainment.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES
Temporary utilities and miscellaneous temporary facilities required during construction.

JOB CONDITIONS
Establish and initiate use of each temporary facility at time first reasonably required for proper performance of the work. Terminate use and removal of temporary facilities at earliest reasonable time when no longer needed.
Comply with governing codes and regulations.
Pay required fees and easement assessments.
Enforce safe and sanitary practices.
Maintain clean facilities.
Prevent interference with Owner's normal use of his own facilities.
Prevent wasteful utility uses.
Should Owner occupy part of facility, Owner will pay his proportional utility cost.

PART 2 - PRODUCTS

MATERIALS AND EQUIPMENT
Materials and equipment may be new or used, but must be suitable and adequate in capacity for required usage.

PART 3 - EXECUTION

PROJECT SIGN
3/4 inch waterproof plywood, 4 x 8 feet size, framed with suitable moldings.
Provide immediately after contract is signed, in accordance with Architect's design.
Paint two coats prepared paint, color selected.
Employ professional sign supplier approved by Architect to letter names of:
- Project
- Owner
- Architect
- Consulting Engineers
- General Contractor

Secure signboard to nominal 4 x 4 inch wood posts set 4 feet into ground.
Place no other signs or advertisements on premises.

TELEPHONE
Provide wall-mounted directory at each instrument listing name and business phone number of at least the following:
- Each Contractor and Subcontractor
- Architect
- Architect's Consulting Engineers
- Testing laboratories
- Physicians
- Hospitals
- Ambulance
- Local Fire Department

ENVIRONMENTAL PROTECTION
General:
Establish procedures among subcontractors to prevent environmental harm (air pollution, water pollution, soil erosion, excessive noise, excessive odors and similar problems).
Comply with environmental regulations.
Complete construction operations by methods that minimize pollution and contamination.
Noise:
Avoid construction operations that produce harmful noise levels. Restrict use of noisy equipment and operations to hours that will have minimum effect on workers and neighboring buildings.

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Dust Control:
Provide dust-tight enclosures and/or sprinkle with water where necessary to control dust.
Do not use enough water to cause flooding, icing, or contaminated runoff.
Protect existing return air duct systems against demolition dust by providing filter media across duct openings. Replace dirty media with clean when necessary to protect systems.
Water Run-off Control:
Provide erosion control measures as required by Construction Documents. Provide additional measures if necessary to control erosion.
If high water table is encountered during construction, and water removal is necessary from excavations, lower water table by means of pumping, trenching below water table or other acceptable means to ensure drainage, proper soil compaction and placement of materials.
Dispose of excess water legally.
Where practical, direct excess water to storm water drainage system. Pre-treat water if necessary.
Conform to anti-pollution laws and regulations.

TEMPORARY WATER
Mechanical contractor shall provide and maintain water for the following purposes:
- Service standpipe equipped with sufficient 3/4 inch hydrants that any work Center can be reached with 100 ft. extension hose. Each Contractor shall provide his own extension hoses.
- Drinking water dispensed in single-service containers or sanitary fountains.
- Maintain cool as practicable, clean and fresh.

Maintain adequate volume.
Protect against freezing.
Water, in quantities judged reasonable by Architect, will be furnished without charge by Owner.
Ascertain where water service is available, provide required connections, and extend system to work area.

TEMPORARY TOILET FACILITIES
General Contractor shall provide at the rate of one fixture for each 40 workers.
Type: Comply with Building Code.
For enclosures accommodating more than one person, provide privacy screens for each toilet fixture.
If both men and women are working, provide separate facilities for each sex.
Maintain sufficient light and ventilation.
Maintain each toilet with toilet tissue on suitable dispenser.
Remove temporary toilets and use building fixtures as soon as feasible.
Disinfect premises after removal and restore to specified condition.
Do not use Owner's existing facilities.

TEMPORARY ENCLOSURES
Provide sufficient enclosure to prevent infiltration of rainwater, wind and other elements, and prevent undue heat loss from within enclosed area.

TEMPORARY BARRICADES
Provide all necessary to protect public against injury and protect project against damage and unauthorized intrusion.

TEMPORARY FIRE PROTECTION
Provide and maintain necessary facilities and equipment to safeguard project against fire damage.

TEMPORARY FENCING
Provide as shown on drawings to secure work area, 6 ft. high galvanized steel chain-link fencing.

TEMPORARY ELECTRICITY
Power:
Electrical Contractor shall provide and maintain structurally and electrically sound temporary power distribution system as follows:
- Sufficient 20 amp load centers that any work area can be reached with 100 foot extension cord.
- Each Contractor shall provide his own grounded, UL approved extension cords.
- Load centers shall include:

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Weatherproof distribution boxes.
Circuit breakers for each outlet.
Equipment grounding continuity for entire system.
Power at proper voltage for:
Temporary field offices.
Temporary storage and construction buildings.
Temporary lighting and power.
Temporary heating and ventilating.
Pumping.
Testing and checking equipment.
Owner's facilities continuous operation during electrical services change over.

General Contractor and Subcontractors shall provide their own power and distribution system for field welders and any other special power beyond that specified herein.

Lighting:

Provide and maintain temporary lighting as follows:

30 ft. candles measured 3 feet above floor in spaces during work. Energize permanent lighting fixtures prior to painting, except where fixtures are mounted on walls or ceilings to be painted. Maintain from 14 minutes prior to until 15 minutes past scheduled work hours. Maintain 5 ft candles measured 3 feet above floor as necessary to prevent damage or injury. Maintain when authorized Personnel are present. Provide light control switches at area entrances, or successive areas, so personnel access to project can be through lighted areas.

Wiring:

Prevent conflict with General Construction.
Maintain cords clear of walkways and other heavy traffic areas.

Power Source:

Contractor to utilize a temporary connection on the Owner’s power system. Power use will be tracked monthly and the Contractor will pay the power costs over the duration of the project.
Ascertain where electrical service is available, provide required connections, and extend system to work area.

TEMPORARY EXTERIOR ENCLOSURES

Provide temporary weather-tight closure of exterior openings to accommodate acceptable working conditions and protection of products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification Sections, and to prevent entry of unauthorized persons.
Provide access doors with self-closing hardware.
Provide temporary roofing as required.
After work is started, Contractor shall provide a watertight roof enclosure at the end of each day’s work.

TEMPORARY HEATING AND VENTILATING

Provide temporary heat and ventilation throughout enclosed construction areas to:
Facilitate work progress.
Protect work and products against dampness and cold.
Prevent moisture condensation on surfaces.
Provide suitable ambient temperatures and humidity levels for installation and curing of products.
Provide adequate ventilation to meet health regulations for safe working environment.

Mechanical Contractor shall expedite work so permanent facilities will be structurally, mechanically, and electrically sound throughout and ready to provide "temporary" service as soon as possible.
Operate no permanent heating, ventilating, or air conditioning equipment without Mechanical Engineer's authorization that equipment is properly installed, has clean air filters, and is otherwise properly prepared. Replace temporary air filters with new units and restore system to like-new condition immediately prior to turning project over to Owner.
Temporary portable heaters, as may be required, shall be provided by General Contractor.
Continue temporary heating and ventilation until Owner occupies or finally accepts project, which ever the sooner.
Maintain ventilated areas in clean condition to avoid undue circulation of dust and air-borne particles.
Minimum temperatures to be maintained:
Generally, 24 hours a day: 40^{o} minimum.
Temperatures required for work of various trades: See technical specific specification sections.

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Fuel costs for temporary heating shall be paid by General Contractor.

TEMPORARY VERTICAL TRANSPORTATION

General Contractor shall provide and pay costs for temporary stairs, ramps, personnel hoists, chutes, etc., required for execution of work of all trades. Subcontractors shall provide their own material hoists and scaffolds.

VEHICLE PARKING AND MATERIAL STORAGE

Coordinate with Owner's Representative.

Do not use existing paved streets or paved parking lots.

TEMPORARY EQUIPMENT

Thermometer:

Maintain one 10 inch minimum size outdoor thermometer. Mount at convenient location not in direct sunlight.

Temperature Range: Minus 20^{o}F to plus 110^{o}F.

FACILITIES REMOVAL

Remove temporary facilities, at project completion, or sooner, if directed.

Repair damage, if any, resulting from temporary facilities.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES

General requirements for transportation, handling, storage and protection of materials and equipment.
Contractor's options in selection of products, manufacturers and procedures.

PERFORMANCE REQUIREMENTS

Materials and Equipment incorporated into work shall:

- Conform to applicable specifications and standards.
- Comply with size, make, type, and quantity specified, unless otherwise approved in writing.

Manufactured and Fabricated Products:

- Manufactured like parts of duplicate units to standard sizes and gauges, to be interchangeable.
- Two or more items of same kind shall be identical, and by same manufacturer.
- Products shall be suitable for service conditions.
- Equipment shall comply with capacity, sizes, and dimensions shown or specified, unless otherwise approved in writing.

Do not use Materials or Equipment for any purpose other than that for which designed or specified.

CONTRACTOR'S OPTIONS

For products specified only by referenced standard, select any product meeting standard.
For products specified by naming several products, select any one complying with specifications.
For products specified by naming one or more products and "or accepted substitute," select any one specified product or submit request for substitution as required below.

INAPPROPRIATE PRODUCTS AND METHODS

If Contractor believes that any specified product, method, or system is inappropriate for use he shall, if possible, so notify Architect at least 5 working days prior to bid opening, and if not possible such notice shall be given before performing work in question.
If notice of objection is not received within the specified time limits, it will be assumed by the Owner that Contractor agrees that specified products, methods, and systems are not inappropriate for use on this project.

SALVAGE MATERIAL

All salvageable material will remain the property of the Owner, unless otherwise noted or released for the disposal by the Contractor.

NUMBER OF PRODUCTS REQUIRED

Wherever in Specifications a product is referred to in singular number, such reference shall include as many such products as are shown on Drawings or are required to complete the work.

PRODUCTS LIST

Before Contractor's first request for payment, submit to Architect complete list of major products proposed for use; include proprietary product names, Manufacturer's name, and installing Subcontractor's name.

MANUFACTURER'S INSTRUCTIONS

Perform work in accord with Manufacturer's instructions.
Do not omit preparatory or installation procedures required by Manufacturer, unless specifically modified or exempted by Contract Documents.
When Contract Documents require work to comply with Manufacturer's instructions, obtain and distribute such instructions to parties performing work including two copies to Architect. Maintain one set at job site during installation and until acceptance.
Handle, install, connect, clean, condition, and adjust products in strict accord with such instructions and in conformance with specified requirements.
Should job conditions or specified requirements conflict with Manufacturer's instructions, consult Architect for further instructions.
Do not proceed with work without clear instructions.

TRANSPORTATION AND HANDLING

Arrange product deliveries in accord with construction progress schedule; coordinate to avoid conflict with

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work and site conditions.
Deliver products undamaged, in Manufacturer's original containers or packaging, and with legible identifying labels intact.
Immediately upon delivery, inspect shipments to assure that products are properly protected and undamaged.

STORAGE AND PROTECTION
Follow Manufacturer's instructions.
Maintain product identity labels legible and intact.
Store products subject to weather-damage in weathertight enclosures.
Maintain storage room temperature and humidity within ranges required by Manufacturer's instructions.
Maintain reasonable protection against product theft and vandalism.
Exterior Storage:
Store fabricated products above ground, on blocking or skids; prevent product damage and discoloration.
Cover products subject to deterioration with impervious sheet coverings; provide adequate ventilation to prevent condensation.
Store loose granular materials in well-drained area on solid surface to prevent mixing with foreign matter.
Storage of Materials Off-site:
Not allowed unless previously approved by Marion County.
Inspection of Stored Products:
Arrange storage to permit easy access for inspection.
Make periodic inspections of stored products to assure that products are maintained as specified and are free from damage, discoloration, and deterioration.
Protection after Installation:
Provide substantial coverings as necessary to protect installed products against damage and discoloration. Remove covering when no longer needed.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES

Provide Field Engineering required for project, including the following:

- Layout survey work required for execution of project.
- Civil, structural, and other engineering necessary to execute Contractor's construction methods.

SUBMITTALS

Submit Engineer's names and addresses to Architect.

When requested, submit documentation to verify engineering accuracy to Architect.

Submit certificate signed by Surveyor certifying whether or not work layout conforms to Contract Documents.

QUALITY ASSURANCE

Engineer's Qualifications:

Land Surveyor: Oregon State Registered Land Surveyor.

Engineers: State-licensed in specific engineering to be performed.

Records:

Maintain complete and accurate log of control for survey work as it progresses.

PART 2 - PRODUCTS

EQUIPMENT

Maintain at project site the following:

- Complete transit or laser level
- Leveling rod
- Plumb bob
- 6 ft. and 10 ft. straight edges
- 100 ft. long measuring tape

PART 3 - EXECUTION

SURVEY REFERENCE POINTS

Existing Points: See Drawings.

Locate existing points prior to starting site work, and preserve during construction.

Make no changes to existing points without Architect's approval.

Notify Architect when any point is lost or destroyed, or requires relocation.

Employ Registered Surveyor to replace any lost, destroyed, or relocated points.

PROJECT LAYOUT

Establish at least two permanent bench marks on the site referenced to existing control points.

Record bench mark locations, with horizontal and vertical dimensions, on Project Record Drawings.

Using surveying instruments establish lines and levels for the following:

- Site improvements.
- Stakes for grading, fill, and topsoil placement.
- Utility slopes and invert elevations.
- Batter boards for structures.
- Building wall and column locations, floor elevations, and similar elements.

Periodically verify layout accuracy.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES

Procedures and limitations for cutting, removing, replacing or refinishing products or materials after initial installation of such products or materials.

EXTENT OF WORK

Perform all cutting, fitting, and patching, including attendant excavation and backfill, required to complete work or to:

- Make work fit properly together.
- Uncover work for installation of ill-timed work.
- Remove and replace defective work and work not conforming to Contract Documents.
- Remove samples of installed work for testing.
- Provide penetrations through non-structural surfaces for mechanical and electrical work.

SUBMITTALS

Submit written request for cutting approval to Architect well in advance of any cutting which affects:

- Work of Owner
- Structural value or integrity of any completed or existing work.
- Waterproof value or integrity of any weather-exposed or moisture-resistant work.
- Visual qualities of any sight-exposed work.

Request shall include:

- Project identification.
- Description of affected work.
- Necessity for cutting, alteration, or excavation.
- Effect on Owner's work.
- Effect on structural or weatherproof integrity on completed or existing work.
- Description of proposed work including:
  - Extent of cutting, patching, alteration, or excavation.
  - Trades who will execute work.
  - Products proposed for use.
  - Extent of required refinishing.
- Alternatives to cutting and patching.
- Cost proposal, when applicable.

Submit written notice to Architect designating date and time work will be performed.

PART 2 - PRODUCTS

MATERIALS

Products similar to those specified elsewhere in this Project Manual:

Follow those specifications.

Other Products:

Follow Architect's instructions.

PART 3 - EXECUTION

EXISTING CONDITIONS

Inspect existing conditions and identify work subject to damage or movement caused by proposed cutting and patching.

After uncovering work, inspect conditions affecting products installation or performance. Report unsatisfactory and questionable conditions to Architect in writing; do not proceed with work until Architect provides further instructions.

PREPARATION

Maintain adequate temporary support necessary to assure structural integrity of affected work.

Protect other portions of project work against damage and discoloration.

Protect work exposed by cutting against damage and discoloration.

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PERFORMANCE

Provide proper surfaces for repairs.

Employ original installer or qualified contractor to perform cutting and patching for:

- Weather-exposed or moisture-resistant surfaces.
- Sight-exposed finished surfaces.

Restore cut or removed work with new products to provide work complete in accordance with Contract Documents.

Fit work air-tight to pipes, sleeves, ducts, conduits, and other surface penetrations.

Where patching occurs refinish entire surface to provide even finish to match adjacent work as follows:

- Continuous Surfaces: Refinish to nearest intersection.
- Assemblies: Refinish entire unit.

CUTTING STRUCTURAL FRAMING

Not permitted at any location, unless shown on Drawings or otherwise approved.

Exposed Members:

Not permitted, unless shown on Drawings or otherwise approved.

Concealed Framing Members:

Verify with Structural Engineer.

CLEANING AND REPAIRING

Including work of this section, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section. Remove debris from project site upon work completion or sooner, if directed.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES

Special procedures for waste recycling, material and equipment recycling, and requirements for indoor air quality prior to building occupancy.

REGULATORY AGENCY REQUIREMENTS

Comply with governing codes, regulations, ordinances, and anti-pollution requirements.

Comply with Environmental Protection Agency standards for indoor air quality as they apply to this project.

Comply with State Department of Environmental Quality standards.

COORDINATION

Coordinate with other trades affecting or affected by Work of this section.

Cooperate to maintain continuous operation of Owner's activities.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

WASTE RECYCLING

Recycle waste materials resulting from construction operations to the greatest extent possible unless otherwise specified herein.

Deliver recyclable waste materials, or arrange for transportation to, a construction materials waste recycling company or enterprise.

Provide designated on-site containers for disposal of recyclable and salvageable materials.

Instruct employees and subcontractors on proper sorting and disposal of recyclable materials.

Periodically remove recyclable materials from site.

Dispose of at Contractor's expense at appropriate recycling centers.

Maintain recycling area clean and clearly marked in order to avoid contamination and co-mingling of materials.

Materials to be recycled include, but are not limited to, the following:

- Demolition lumber and wood waste
- Dimensional lumber waste
- Plywood, OSB and particle board
- Cardboard, paper and packaging
- Metals
- Paint
- Glass
- Plastics including foam plastic and film

AIR QUALITY

Minimize dust spread, both to the exterior of the building and within the building, to the greatest extend possible.

Protect existing return air duct systems against demolition dust by providing filter media across duct openings. Replace dirty media with clean when necessary to protect systems.

CLEANING AND REPAIRING

Allow no debris to accumulate in buildings, or on grounds, streets, or walks.

Clean, repair and touch-up, or replace when directed, adjacent property and surfaces which have been soiled, discolored, or damaged by Work of this Section.

END OF SECTION

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

PART 1 - GENERAL

SECTION INCLUDES
Cleaning and trash removal during work progress, and at work completion.

REGULATORY AGENCY REQUIREMENTS
Comply with governing codes, regulations, ordinances, and anti-pollution requirements.

PART 2 – PRODUCTS

CLEANING MATERIALS
Use only those which will not create hazards to health or property and which will not damage surfaces.
Use only those recommended by Manufacturer of surface to be cleaned.
Use only on surfaces recommended by cleaning material manufacturer.

PART 3 – EXECUTION

GENERAL
Follow cleaning material and surface manufacturer's instructions.

DURING CONSTRUCTION
Periodically clean to maintain work, site and adjacent properties free from accumulations of waste, rubbish, and windblown debris, resulting from construction operations.
Provide on-site containers for collection of waste, debris, and rubbish.
Periodically remove waste material, debris, and rubbish and legally dispose of away from project site.

DUST CONTROL
Clean interior surfaces prior to painting, and continue cleaning as needed until painting is complete.
Schedule cleaning so that resultant dust and contaminants will not fall on wet or newly coated surfaces.

FINAL CLEANING
Remove waste, debris, and surplus material from project site.
Clean grounds as follows:
- Paved Surfaces: Remove stains, spills, and foreign substances and sweep clean.
- Other Surfaces: Rake clean.

In addition to debris removal and cleaning specified in other sections, clean exposed-to-view interior and exterior surfaces.
Employ skilled workers to perform final cleaning.
Remove any temporary protection and labels not required to remain.
Remove grease, mastic, adhesive, dust, dirt, stains, fingerprints, labels, and other foreign matter from sight-exposed interior and exterior surfaces.
Wash and shine glazing, including mirrors.
Polish glossy surfaces to clear shine.
Vacuum carpet and similar soft materials.
Clean equipment surfaces; remove excess lubricants.
Clean and sanitize food service equipment and plumbing fixtures.
Ventilating system, if used during construction:
- Permanent Filters: Clean
- Disposable Filters: Replace
- Clean Ducts, Blowers, and Coils: Clean

Clean light fixtures and lamps.
Clean Owner provided furniture installed prior to turn-over of the building.
Remove waste, debris, and foreign matter from roofs and roof drainage system.
Maintain structure and components clean until substantial completion.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES

Contract condition requirements and specified administrative procedures in closing out work.

RELATED DOCUMENTS

“Marion County General Conditions for Public Improvement Contracts”

SUBSTANTIAL COMPLETION

When Contractor considers work substantially complete, as defined in General Conditions, he shall submit to the Architect:

- Written notice that work, or designated portion thereof, is substantially complete.
- List of items to be completed or corrected.

Architect will, as soon as possible thereafter, make inspection to determine completion status.

Should Architect determine that work is not substantially complete:

- Architect will promptly notify Contractor in writing, giving reasons therefore.
- Contractor shall remedy work deficiencies, and send second Notice of Substantial Completion to Architect.
- Architect will reinspect.

When Architect concurs that work is substantially complete, he will:

- Prepare Certificate of Substantial Completion using AIA Form G704, accompanied with Contractor's list of items to be completed or corrected.
- Submit Certificate to Owner and Contractor for their written acceptance of the responsibilities assigned to them in the Certificate.

FINAL INSPECTION

When Contractor considers work complete, he shall submit written certification that:

- Contract Documents have been reviewed.
- Contractor has inspected work for compliance with Contract Documents.
- Work has been completed in accordance with Contract Documents.
- Equipment and Systems have been tested in presence of Owner's Representative and are operational.
- Work is complete and ready for final inspection.

Architect will inspect work to verify completion status as soon as possible after receipt of Contractor's certification.

Should Architect consider work incomplete or defective:

- Architect will promptly notify Contractor in writing, listing incomplete or defective work.
- Contractor shall immediately remedy deficiencies, and send second written certification to Architect that work is complete.
- Architect will reinspect work.

When Architect finds work acceptable under Contract Documents, he shall request Contractor to make closeout submittals.

REINSPECTION FEES

Should Architect be required to make more than two final inspections due to Contractor's failure to correct specified deficiencies:

- Owner will compensate Architect for such additional services.
- Owner will deduct Architect's compensation amount from Contractor's final payment as follows:
  - Architect's time at $170.00 per hour.
  - Architect's employees time at currently published hourly rates.
  - Others at 1.10 times the direct cost incurred.
  - Charges will be made for necessary travel time, auto expense computed at the Architect’s currently published mileage rate, and all other expenses incurred in making inspections.

EVIDENCE OF PAYMENTS AND RELEASE OF LIENS

Contractor shall submit the following:

- Contractor's Affidavit of Payments of Debts and Claims, AIA Document G706.
- Contractor's Affidavit of Release of Liens, AIA Document G706A including the following:

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Consent of Contractor's Surety to Final Payment, AIA Document G707.
Contractor's Release of Waiver of Liens.
Separate releases or waivers of lien for Subcontractors, Suppliers, and others with lien rights against Owner's Property, together with list of those parties.

Duly sign and execute all submittals before delivery to Architect.

CONTRACTOR'S CLOSEOUT SUBMITTALS TO ARCHITECT

Extra Materials:

Verify and comply with each specification section for required extra stock of materials or product.
Certificate of domestic water disinfection.
Project Record Documents, see Section 01 78 39.
Owner's Operating and Maintenance Manual, see Section 01 78 23.

INSTRUCTION

Instruct Owner or Owner's personnel in operations of all systems and equipment in accordance with Section 01 78 23.

FINAL ADJUSTMENT OF ACCOUNTS

Submit final statement of accounting to Architect, including the following:

- Original contract sum.
- Additions and deductions resulting from:
  - Previous change orders.
  - Other adjustments.
  - Deductions for uncompleted work.
  - Deductions for reinspection payments.
- Total Contact Sum, as adjusted.
- Previous payments.
- Sum remaining due.

Architect will prepare and issue final Change Order, reflecting approved adjustments to Contract Sum not previously made by change orders.

FINAL APPLICATION FOR PAYMENT

Follow procedures specified in Supplementary Conditions, Section 00 7300.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES

Compile product data and related information appropriate for Owner's maintenance and operation of Products furnished under Contract.

Prepare as specified herein and in other specification sections.

Instruct Owner's personnel in maintenance of products and in operation of equipment and systems.

RELATED DOCUMENTS

“Marion County General Conditions for Public Improvement Contracts”

QUALITY ASSURANCE

Data preparation shall be done by personnel:

- Trained and experienced in maintenance and operation of described products.
- Completely familiar with requirements of this section.
- Sufficiently skilled as technical writer to communicate essential data.
- Sufficiently skilled as draftsman to competently prepare required drawings.

FORM OF SUBMITTALS

Printed Copies:

Prepare data in form of instructional manual for use by Owner's personnel.

Format:

- Size: 8 1/2 X 11 inches.
- Text: Manufacturer's printed data or neatly typed.
- Drawings:
  - Reinforce edges against tear-out.
  - Bind-in with text.
  - Fold larger drawings to match size of text pages.
- Provide fly-leaf for each separate product.
- Identify each fly-leaf with labeled tabs.
- Cover: Identify each volume with typed or printed title "Operating and Maintenance Instructions," and list:
  - Project title
  - Identity of general subject matter contained in manual.

Electronic Copy:

Prepare data in the form of PDF files. Electronic files must be separate for each Division.

Provide one copy to the Owner on flash drive.

PART 2 - PRODUCTS

BINDERS

Commercial quality, three-ring type with durable and cleanable plastic covers.

When multiple binders are used, correlate data into related consistent groupings.

MANUAL CONTENT, GENERAL

Neatly typewritten table of contents for each volume, arranged in systematic order.

List:

- Contractor, name of responsible principal, address, and telephone number.
- Each product including name, address, and telephone number of:
  - Subcontractor or installer
  - Recommended maintenance contractor
  - Local source for replacement parts
- Product name and other identifying symbols as set forth in Contract Documents.

Product Data:

- Include only those sheets which are pertinent to specific product.
- Annotate each sheet to:
  - Clearly identify product or part installed.
  - Clearly identify data applicable to installation.
  - Delete references to inapplicable data.

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Drawings:
- Supplement product data with drawings where necessary to clearly illustrate:
  - Relations of component parts
  - Control and flow diagrams
- Do not use Project Record Documents as maintenance drawings.

Written Text:
- Provide where necessary to supplement Product Data and Drawings.
- Organize in consistent format under separate headings for different procedures.
- Provide logical sequence of instructions for each procedure.

Warranties, Bonds, and Maintenance Contracts:
- Provide copy of each.
- Including the following:
  - Proper procedures in event of failure.
  - Instances which might affect validity or Warranties, Bonds, or Contract.

MANUAL FOR ARCHITECTURAL MATERIALS AND FINISHES

Include the following Manufacturer's data:
- Catalog number, size, composition.
- Color and texture designations.
- Required reordering information.
- Recommended cleaning materials and methods.
- Cautions against detrimental cleaning materials and methods.
- Recommended cleaning and maintenance schedule.

Submit specified information as called for in each specification section.

MANUAL FOR WEATHER PROTECTION MATERIALS

Include the following Manufacturer's data:
- Applicable manufacturing standards.
- Instructions for inspection, maintenance, and repair.

Submit specified information as called for in each specification section.

MANUAL FOR MECHANICAL EQUIPMENT AND SYSTEMS

Include the following Manufacturer's data:
- Description of unit and component parts including:
  - Function, normal operating characteristics, and limiting conditions.
  - Performance curves, engineering data and tests.
  - Complete nomenclature and commercial number of replaceable parts. Operating procedures including:
  - Start-up, break-in, routine and normal operating instructions.
  - Regulation, control, stopping, shut-down, and emergency instructions.
  - Summer and winter operating instructions.
  - Special operating instructions.
- Maintenance procedures including:
  - Routine operations.
  - Trouble-shooting guide.
  - Disassembly, repair, and reassembly.
  - Alignment, adjusting, and checking.
  - Servicing and lubricating schedule, including recommended Lubricants.
- Manufacturer's printed operating and maintenance instructions.
- Control Systems operation sequences.
- Parts list, illustrations, assembly drawings, and diagrams necessary for maintenance, including:
  - Life expectancy of parts subject to wear.
  - Items recommended to be stocked as spare parts.
- As-installed control system diagrams.
- Color-code legend, if any.
- Valve Tag Number Chart, with location and function of each valve.
- Submit specified information for the following:
  - Mechanical Equipment specified in Division 23.

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MANUAL FOR ELECTRICAL EQUIPMENT AND SYSTEMS
Include the following Manufacturer's data:
- Description of unit and component parts including:
  - Function, normal operating characteristics, and limiting conditions.
  - Performance curve, engineering data and tests.
  - Complete nomenclature and commercial number of replaceable parts.
- Panelboard circuit directories indicating:
  - Electrical service.
  - Controls.
  - Communications, if any.
  - As-installed wiring color-code legend, if any.
- Operating procedures, including:
  - Routine and normal operating instructions.
  - Sequences required.
  - Special operating instructions.
- Maintenance procedures, including:
  - Routine operations.
  - Trouble-shooting guide.
  - Disassembly, repair, and reassembly.
  - Adjustment and checking.
- Manufacturer's printed operating and maintenance instructions.
- Parts list, including current prices, and recommended spare parts to be maintained in storage.
- Submit specified information for the following:
- Electrical equipment specified in Divisions 23 and 26.

ADDITIONAL DATA
Prepare and include the following:
- Additional data when need become apparent during instruction of Owner's personnel.
- Additional data specified in other sections of Specifications to be included.

PART 3 - EXECUTION

SUBMITTAL SCHEDULE
Preliminary Draft:
Submit two copies of proposed format. Architect will review, and return one copy with comments.
Final Submittal:
Submit, in final form, one copy of complete data 15 days prior to final inspection.
Copy will be returned with comments.
Submit three paper copies and one electronic copy, in approved final form, within 10 days of final inspection.

INSTRUCTION OF OWNER'S PERSONNEL
Prior to final acceptance, instruct Owner's personnel in operation, adjustment, and maintenance of all products, equipment, and systems.
Operating and Maintenance Manual shall constitute basis of instruction.
Submit training materials and instruction schedule for Architect's review and acceptance at least 30 days prior to training session.
Training:
- Location: At project site.
- Review manual contents with Owner's personnel in detail to explain all aspects of operations and maintenance.

END OF SECTION

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REQUIREMENTS INCLUDED
Compile specified warranties and bonds.
Compile specified service and maintenance contracts.
Review submittals to verify compliance with Contract Documents.

RELATED DOCUMENTS
“Marion County General Conditions for Public Improvement Contracts”

SUBMITTAL REQUIREMENTS
Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective Manufacturers, Suppliers, and Subcontractors.
Number of original signed copies required: Provide 1 for each volume of Owner's maintenance manual as specified in Section 01 78 23.
Table of Contents: Neatly typed in orderly sequence.
Provide complete information for each item:
- Product or work item.
- Firm, with name of principal. address and telephone number.
- Beginning date of warranty, bond, or service and maintenance contract.
- Duration of warranty, bond, or service and maintenance contract.
- Provide the following information for Owner's personnel:
  - Procedure in case of failure or malfunction.
  - Instances which affect warranty or bond validity.
- Contractor, name of responsible principal, address, and telephone number.

SUBMITTAL FORM
Punch sheets for standard 3-ring binder.
Size: 8 1/2 x 11 inches.
Fold larger sheets to fit into Binder.
Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS".
List:
- Title of project.
- Name of Contractor.

Electronic Copy:
Prepare data in the form of PDF files.
Provide one copy to owner on flash drive.

SUBMITTAL TIME
See Section 01 78 23.

SUBMITTAL LOCATION
Bind into Owner's maintenance manuals specified in Section 01 78 23.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES

Procedures for Record Documents to be used throughout the execution of the work and at final completion of the work.

RELATED DOCUMENTS

“Marion County General Conditions for Public Improvement Contracts”

SUBMITTAL

At Contract close-out deliver Record Documents to Architect for Owner.
Provide two paper copies and one electronic copy of all documents.
Accompany submittal with transmittal letter in duplicate, containing:

- Project title.
- Date.
- Contractor's name and address.
- Title and number of each Record Document.
- Signature of Contractor or his authorized representative.

PART 2 - PRODUCTS

REQUIRED DOCUMENTS

Maintain at project site for Owner one record copy of:

- Contract Drawings and Specifications.
- Addenda.
- Change Orders and other Contract Modifications.
- Field Orders and other written instructions.
- Approved Shop Drawings, Product Data, and Samples.
- Field Test Reports.

REQUIRED DRAWINGS

Maintain one black-line or blue-line print of Contract Drawings as "work set", marking as required to record all Contract changes.
Prior to submittal, transfer recorded information to electronic format, such as PDF.
Contractor may retain "work-set" for his records.

PART 3 - EXECUTION

MAINTENANCE OF DOCUMENTS AND SAMPLES

Store in Contractor's field office apart from documents used for construction.
Provide files, shelving, and cabinets necessary to safely and securely store documents and samples.
Maintain documents clean, dry, legible, and in good order.
Do not use Record Documents for construction purposes.
Make documents available at all times for Architect's inspection.

RECORDING

Label each document "Project Record" in neat, large, printed letters.
Record information concurrently with construction progress.
Do not conceal any work until required information is recorded.
Drawings; legibly mark to record the following actual construction:

- Depths of foundation elements in relation to first floor elevation.
- Horizontal and vertical locations of underground utilities and Appurtenances, referenced to permanent surface improvements.
- Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure.
- Field changes of dimensions and details.
- Changes made by Change Order or Construction Change Directive.
- Details not shown on original Contract Drawings.

Specifications and Addenda: Legibly mark to record the following:

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Manufacturer, trade name, catalog number, and supplier of each product actually installed.
Changes made by Change Order or Construction Change Directive.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES
Interior demolition such as removing partitions, doors, equipment, fixtures and components, identify and cap utilities, clean up and preparation, temporary partitions.

SALVAGE
To Owner:
None.
To Contractor:
Items noted for reuse in new project.
All other salvage becomes property of Contractor. It may be re-used on work if Architect judges it equal to new products specified.
Remove other debris from site.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.
Cooperate to maintain continuous operation of Owner's activities.

PART 2 - PRODUCTS

PLYWOOD
Sound; thickness as required to satisfy installation and use conditions.

PLASTIC SHEETING
Clear or translucent polyethylene sheets, minimum 6 mil thickness.

FILTER MEDIA
Fiberglass, 8 inch minimum thickness, or accepted substitute.

WHEELING EQUIPMENT
Use only pneumatic-tired equipment.

PART 3 - EXECUTION

EXAMINATION
Verify that area to be demolished is vacant and not in use.
Do not start work until conditions are satisfactory.

PREPARATION
General:
Arrange for, and verify utility service termination including capping active lines.
Remove Salvage and store where directed.
Protect existing portions which are to remain against damage and discoloration.
Allow no leaks, even temporary, in existing building.
Barriers, Safety Guards, and Warning Lights:
Provide where necessary for public protection.
Utilities:
Keep active utilities intact and in continuous operation.
Party Walls:
Exercise extreme care not to damage party walls and adjacent construction.

DUST CURTAINS
Construct of plastic sheeting.
Provide where necessary or where directed to prevent dust-spread.
Install continuously from floor to ceiling.
Fasten to existing construction in such a manner to prevent sagging and accidental damage or removal.
Do not damage existing construction to remain.
Cover joints with tape.

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Provide temporary supports for sheeting as required.
Maintain dust-proof; remove only when no longer needed.
Provide access and egress curtains as required to maintain fire escape routes.

CLEANING AND REPAIRING
Allow no debris to accumulate in buildings, or on grounds, streets, or walks.
Haul away from site as soon as removed. Do not burn or bury materials on site.
Dispose of at Contractor's expense.
Clean, repair and touch-up, or replace when directed, adjacent property and surfaces which have been soiled, discolored, or damaged by work of this section.

PROTECTION
Protect work specified herein against damage and discoloration.
Protect other work against damage and discoloration caused by work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES
Reinforcing steel and required supports for cast-in-place concrete and reinforced masonry.

REFERENCES
"2014 Oregon Structural Specialty Code (OSSC) based on the International Building Code (IBC) 2012 Edition", published by the International Code Council (ICC).
"Manual of Standard Practice for Detailing Reinforced Concrete Structures Standard 315" (ACI Manual 315), published by American Concrete Institute, Box 19150, Redford Station, Detroit, Mich. 48219.
"Manual of Standard Practice" (CRSI Manual), published by Concrete Reinforcing Steel Institute, 180 N. LaSalle Street; Chicago, Ill. 60601.

SUBMITTALS
Submit in accordance with Section 01 33 00.
Shop Drawings:
Follow ACI Manual 315.

PRODUCT DELIVERY, HANDLING AND STORAGE
Protect against damage, rust, mud, grease, and oil.
Tag each piece or bundle; indicate size, grade, and location.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

BARS
ASTM A 615, #3 and smaller: Grade 40; #4 and larger: Grade 60.

SMOOTH WIRE REINFORCING
ASTM A 615, Grade 60.

TIE WIRE
Black, annealed steel 16 ga. minimum; Fed. Spec.QQ-W-461.

ACCESSORIES
General:
Conform to CRSI "Manual of Standard Practice.
Include all devices necessary for proper reinforcement placement, spacing, supporting, and fastening.
Fabricate from concrete ceramics, metal or plastic. Galvanize metal accessories in contact with finished concrete surfaces.
Slab-on-grade Bar Supports:
Precast concrete spacer blocks at bars placed over vapor retarders; wire chairs permitted only where vapor retarders are not scheduled.

FABRICATION
Follow CRSI "Manual of Standard Practice."

TOLERANCES
Fabrication;
Sheared length: Plus or minus 1 inch.
Stirrup, Spiral, and Tie dimensions: 1/2 inch plus or minus.
All other bend dimensions: Plus or minus 1 inch.

PART 3 - EXECUTION

EXISTING CONDITIONS
Verify that surfaces to receive reinforcement are accurately sized and located, square, plumb, rigid,

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secure, and otherwise accurately prepared.
Prior to starting work notify general contractor of defects requiring correction.

INSTALLATION
General:
Conform to Building Code and the following:
Bending:
Bend bars without heat.
Field bending partially embedded bars not permitted without Architect's approval.
Placing:
Secure against displacement.
Do not displace or damage vapor barrier.
Spacing:
Clear distance between parallel bars, including splices, unless otherwise permitted by Code, not less than:
- Nominal Bar diameter.
- 1-1/2 times maximum concrete aggregate size.
- 1 inch.

Splicing:
Do not weld or tackweld reinforcement splices.
Minimum Lap at Splices at Bar Reinforcement: 24 bar diameters.
Protective Concrete Covering:
At principal structural members cast directly against the ground, including footings: 3 inches minimum.
At principal structural members in direct contact with the ground after formwork removal: 2 inches minimum.
At walls not exposed directly to ground or weather: 3/4 inches minimum, or bar diameter, whichever the larger.
All other locations: 1-1/2 inches minimum, or bar diameter, whichever larger.

SPECIAL REINFORCEMENT, unless otherwise shown on Drawings
At Corners and Intersections:
Splice horizontal wall reinforcing with corner bars; same size and spacing. Extend beyond corner or intersection 40 bar diameters, minimum.

TOLERANCES
Placement:
Concrete cover: Plus or minus 1/4 inch.
Spacing between Bars: 1/4 inch.
Top Bars in Slabs and Beams:
- Members 8 inches deep or less: Plus or minus 1/4 inch.
- Members from 8 to 24 inches deep: Plus or minus 1/2 inch.
- Members more than 24 inches deep: Plus or minus 1 inch.

Stirrups and Transverse Bars: Space evenly within 2 inches of stated separation.
Bar relocation to avoid interference with other reinforcement, conduits, or embedded Items: 1 Bar diameter, unless otherwise approved by Architect.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.

CLEANING AND REPAIRING
Prior to concrete placement, remove loose flaky rust, mud, oil, and other bond-reducing coatings; conform to IBC, Chapter 19.
Remove debris from project site upon work completion or sooner, if directed, including work of other sections, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES
Cast-in-place or in-situ concrete for structural building frame, slabs on fill or grade, and other concrete components associated with the construction.

RELATED SECTIONS
03 11 00 Concrete Forming
03 20 00 Concrete Reinforcement
32 13 16 Decorative Concrete Paving
32 16 00 Concrete Curbs and Sidewalks

SUBMITTALS
Submit in accordance with 01 33 00.
Shop Drawings:
For any location where layout and detailing has been provided in the Contract Documents, submit Shop Drawings indicating understanding for architect's approval.
Product Data:
Design Mixes: Submit for each type and class of concrete specified.
Include prior laboratory test data and compressive strength results in accordance with ACI 301 and ASTM standards.
Indicate amounts of mixing water to be withheld for later addition at Project site.
Samples:
Pigment Color Selection: Submit manufacturer's complete sample chip set, including pigment number and required dosage rate for each color.
Verification Samples: Submit sample chips of specified colors indicating pigment numbers and required dosage rates, for subsequent comparison to installed concrete.

QUALITY ASSURANCE
Perform work in accordance with ACI 301.
Obtain materials from same source throughout the work.
Installer Qualifications:
A qualified installer with a minimum of 3 years of experience, who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician."
Manufacturer Qualifications:
A firm with a minimum of 3 years of experience in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94 M requirements for production facilities and equipment."
Pre-Installation Meeting:
Convene one week before starting work of this section to verify project requirements, coordinate with installers of other work, embedded items and penetrations required by other trades.
Establish condition and finish of concrete surfaces, including exposed form finish concrete.
Review construction joint layouts at walls and slabs.
Review control joint layouts at slabs.

SUSTAINABILITY REQUIREMENTS
Volatile Organic Compounds:
Comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA method 24):
Concrete Curing and Hardening Compounds: 60 g/L
Concrete Sealer: 10 g/L

PRODUCT DELIVERY, HANDLING, AND STORAGE
Protect against deterioration, foreign matter intrusion, contamination, and dampness.
Conform to ASTM C 94.

ENVIRONMENTAL REQUIREMENTS
Cold Weather:
Place no concrete on frozen subgrade.

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Remove ice and snow from reinforcing, forms, and embedded items.
Raise temperature of all surfaces in contact with concrete above freezing prior to concrete placement.
Minimum concrete temperature during placement: 65°F.
Minimum concrete temperature for 72 hours after placement: 55°F.
Maximum air temperature drop during first 24 hours after protection removal: 55°F.
Use of salts or chemical admixtures to prevent concrete freezing prohibited.
Do not permit temporary heaters to locally over-heat or over-dry concrete.
Assume responsibility, including costs, for testing suspected frozen concrete.
Remove and replace freeze-damaged concrete at contractor's expense.
Warm Weather:
When air temperature exceeds 90°F and when wind exceeds 20 mph place concrete in accordance with the following requirement:
Maximum concrete temperature at time of placement 75°F.
Mix concrete minimum possible time, and place as soon as possible thereafter.
Sprinkle forms, reinforcing, embedded items, and subgrade with cool water immediately prior to concrete placement.
Protect unstripped formwork and exposed concrete surfaces against excessive drying with water spray, or other approved method.
Assume responsibility, including costs, for testing suspected damaged concrete.
Remove and replace damaged concrete at contractor's expense.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

PORTLAND CEMENT
ASTM C 150, Type 1.
Use one brand only for exposed concrete.

AGGREGATE
Conform to ASTM C 33.
Maximum size: 1-1/2 inch, and not more than one-fifth of narrowest space between forms, one-third of slab depths, nor three-fourths of minimum clear space between reinforcing bars.
Use same source for course and fine aggregate used in exposed concrete.
Minimum 60% of surface of course aggregate to have crushed faces.

ENTRAINED AIR
ASTM C 260, non-toxic after 30 days, not containing chloride.
Provide in exterior curbs, walks, and flatwork that are subject to freezing while wet.

WATER REDUCING ADMIXTURES (PLASTICIZER)
ASTM C 494, Type A.
Provide at all concrete slabs on grade.
Provide with dosages high enough to reduce water by minimum 10% from the same mix without admixture.

CALCIUM CHLORIDE
Not approved for use.

BONDING AGENT
Euclid “Flex-Con”, W.R. Meadows “Interlock 1059”, Sika “Sika Bond”, Tammsweld, Larsen “Weld-Crete”, Nox-Crete “Vinl-hesive”, Dayton Superior J-40, or accepted substitute.

EXPANSION JOINT FILLER
W.R.Meadows Fibre Expansion Joint #320-F, 1/2 inch thick, conforming to ASTM D 1751.
Depth as required to bring top to within 1/4 inch of surface of slab.

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STANDARD GROUT

Parts by volume:

Cement	1
Lime	1/4
Fine Aggregate	3
Pea Gravel, as graded below	1 1/2

Sieve Size	% Passing
3/8	95-100
#3	45-75
#4	10-20
#8	0-5

Water: Minimum amount to produce required compressive strength at 28 days, and to provide pouring consistency without aggregate segregation.

Provide around pipes, conduit and ducts passing through floors and walls, and elsewhere necessary to prevent air and sound passage through walls and floors.

FLOOR FILLER

Dowman "Fix-All", or accepted substitute.

Provide over concrete floor slabs which are too rough or uneven to provide satisfactory base for resilient covering or carpeting.

CURING AND HARDENING COMPOUNDS

Interior Flatwork to receive Finish Covering:

Clear, colorless, with fugitive dye, approved by covering contractor; meet or exceed ASTM C 309, Type 1.

Interior Flatwork without Finish Covering:

Water-based chemical hardener; Dayton Superior "Day-Chem Hardener J-15", Tamms "Hornolith," Euclid "Surfhard", Sonneborn "Lapidolith," Nox-crete "Harbeton," or accepted substitute.

Do not apply curing compound to surfaces scheduled to receive ceramic or stone tile. Wet cure only.

CONCRETE SEALER

At interior flatwork without finish covering, provide topcoat sealer, Prosoco "Consolideck LS" or accepted substitute.

OTHER INGREDIENTS

Conform to Building Code.

CONCRETE MIX DESIGN

General:

Conform to ACI Code 318-02 and 201 OSSC Section 1905.

Selection of concrete proportions shall be based on required average compressive strength of concrete f'cr stated in table below unless concrete production facility has 15 or more test records meeting the requirements of ACI-11 5.3.1.

Documentation that proposed concrete proportions will produce an average compressive strength equal to or greater than required average compressive strength f'cr shall consist of more than 30 but not less than 10 consecutive test records which encompass a period of time not less than 45 days. Such records shall represent materials and conditions similar to those expected. When an acceptable record of field test results is not available, concrete proportions may be established based on trial mixtures meeting the requirements of ACI-11 5.3.3.2.

Concrete Strength and Minimum Cement Content:

Location	f'c	Max w/c ratio	Min. cement (sacks/cu. yd.)
Slabs-on-grade, Curbs	3500 psi	0.44	5.5
Footings, all other	3000 psi	0.46	5.0

Note: One sack of cement equals 94 lbs.

Engineer may order cement content for any class of concrete to be increased over the quantity specified if determined that such increase is necessary to attain required strength. Increased quantities of cement ordered to be furnished by contractor at no additional cost to owner.

Air Entrainment:

Footings: 2% to 4% of concrete volume.

Walls, Exterior Slabs: 4% to 6% of concrete volume.

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Concrete Slump:
Minimum: 2 inches.
Slabs-on-grade, Curbs: Maximum 4 inches, 7 inches maximum with plasticizers.
Footings: 6 inches.
Verify that design mix test results reflect the slumps to be used and adequate slump is produced to properly transport and place the mix.

PART 3 - EXECUTION

EXISTING CONDITIONS
Verify that formwork, reinforcement, and embedded items are accurately and securely placed, clean, water and frost-free, and ready to receive concrete.
Verify that vapor retarder is not punctured or otherwise damaged. Repair all damage.
Remove water from vapor retarder with portable high-speed air blowers just prior to slab-on-grade pour.
Prior to starting work notify General Contractor of defects requiring correction.
Do not start work until conditions are satisfactory.

SURFACE PREPARATION
Remove foreign matter from surfaces and areas to receive concrete.
If vapor retarder is wet, blow water off with power blower.
Sprinkle subgrades and other porous surfaces with water to eliminate suction.
Install slab-on-grade screeds without penetrating vapor retarder.

PLACING
Convey and place by methods which will prevent material separation and loss.
Deposit continuously, or in layers that will not form seams or weakened planes; where seams or weakened planes are unavoidable provide construction joints as specified hereunder.
Do not convey pneumatically placed concrete through aluminum pipe.
Do not retemper or use set concrete.
Maximum height of vertical drop without use of trunk, placement ports in sides of formwork, or other approved method is five (5) feet. When under-water concrete placement is approved, deposit fresh concrete into mass of previously placed concrete causing water to be displaced with minimum concrete surface disturbance.

COMPACTION
Employ mechanical high frequency vibrators to consolidate concrete around reinforcement, into corners and angles of forms, and to exclude rock pockets, air bubbles, and honey comb.
Hold vibrator in one spot no longer than 30 seconds; keep in constant motion, insert and withdraw at points approximately 18 inches on center.
Maintain vibrator in vertical position when penetrating concrete.
Transporting concrete with vibrator not permitted.
Maintain spare vibrator at jobsite during concrete placement.

CURING
Curing Period:
Not less than 7 days at 50^{o}F minimum.
Interior Flatwork:
Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
Avoid alternate wetting and drying and fluctuations of concrete temperature.
Curing compound prohibited at interior slabs-on-grade installed over vapor retarder.
Moist cure interior slabs-on-grade installed over vapor retarder only when weather conditions involve high temperatures, wind, or both. Moist cure for minimum 48 hours.
Cure concrete slabs scheduled to receive ceramic tile by keeping the surface continuously moist for minimum 48 hours. Do not use curing compounds.
Immediately prior to occupancy clean interior floors to remain exposed and treat with hardener.

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CONSTRUCTION JOINTS IN FLATWORK

General:

Form to true, straight lines, with slabs flush at joints.

Locate under walls wherever possible.

Spacing:

At Interior Flatwork:

Spacing shown on Drawings.

At Exterior Flatwork:

Maximum spacing, unless otherwise shown on Drawings:

At Walks and Drives: 15 ft. apart, both ways.

At Curbs: 30 ft. apart.

Fill alternate joints and joints where flatwork abuts vertical construction with expansion joint filler.

CRACK CONTROL JOINTS IN FLATWORK

General:

Form to true, straight lines, with slabs flush at joints.

Spacing:

At Interior Flatwork:

Maximum slab area without joints: 300 sq. ft.

Maximum spacing, unless otherwise shown on Drawings:

At uncovered Flatwork: 15 ft. apart, both ways.

At covered Flatwork: 15 ft. apart, both ways.

At Exterior Flatwork:

Maximum spacing, unless otherwise shown on Drawings:

At Walks and Drives: 15 ft. apart, both ways.

At Curbs: 15 ft. apart.

VOIDS AND GRAVEL POCKETS

Repair as directed wherever, in Architect's opinion, it is necessary.

CONCRETE SLAB FINISHES

General:

Screed all slabs, for whatever finish, to true levels or slopes.

Troweling:

At interior slabs-on-grade installed over vapor retarder: Provide single finish troweling.

Do not absorb wet spots with Neat cement or mixture of cement and sand.

Wait until surfaces are dry enough for proper troweling.

Chemical dryers not permitted.

Trowel floors level to true slopes.

Provide at all concrete slabs unless otherwise noted.

Slopes to Drains:

True to line, evenly graded, 1/8 inch per foot unless otherwise shown on Drawings.

STANDARD GROUT

Saturate concrete contact surfaces prior to grouting. Remove excess water.

Thoroughly compact grout free of air pockets. Do not vibrate.

Cure with moisture for 24 hours minimum.

Do not retemper set grout.

FLOOR FILLER

Prime floor with asphalt emulsion prior to filler application.

Mix filler with asphalt emulsion as required to improve bond.

TOLERANCES

Troweled Surfaces: True within 1/8 inch per 10 ft.

Non-Slip Surfaces: True within 1/4 inch per 10 ft.

All Other Surfaces: True within 1/4 inch per 2 ft.

FIELD QUALITY CONTROL

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Tests:

Average minimum test results for lab-cured concrete cylinders, compression:

Design Strength	Lab-Cured Value
3,000 psi	3,750 psi
3,500 psi	4,400 psi
4,000 psi	5,000 psi

If a test cylinder shows manifest evidence of damage, improper sampling, molding, or testing, it shall be discarded and the remaining cylinders strengths averaged.

During the progress of the work, if lab-cured values shown for each concrete design strength and quality as determined by compression test cylinders and tests fail to attain the requirements specified, suspend all concrete work until new mixes are designed and reviewed as outlined.

Concrete that has been placed and does not meet specified requirements will be reviewed by the Architect and Contractor.

Any field testing such as core drilling required to verify in-place concrete strengths shall be at the Contractor's expense.

Correct or remove defective work in a manner approved by the Architect with no additional cost to the Owner.

Inspection:

Notify Architect at least 24 hours before intended concrete placement.

Place no concrete until formwork and reinforcement have been inspected.

DEFECTIVE WORK

Remove and replace, when directed by Architect, loose topping, surfaces which show excessive cracks, any slabs which do not drain properly, and other defective concrete. On surfaces scheduled to receive floor or wall coverings remove, by grinding if necessary, defects of magnitude to show through covering. Remove honeycombed and other defective concrete down to sound concrete. If chipping is necessary, shape edges perpendicular to surface or slightly undercut.

Feathered edges not permitted.

CLEANING AND REPAIRING

Remove debris from project site upon work completion or sooner, if directed.

Including work of other sections, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.

PROTECTION

Protect work specified herein against damage and discoloration.

Protect other work against damage and discoloration caused by work of this section.

END OF SECTION

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PART 1 -GENERAL

SECTION INCLUDES
Treatment of wood products to increase their durability against decay or retard burning characteristics.

PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION
Deliver to General Contractor sufficient preservative solution for field-cut treatments.

REFERENCES
Pressure Treatments specified hereunder refer to quality mark designations of American Wood Protection Association, P.O. Box 361784, Birmingham, Alabama 35236-1784, and hereinafter referred to as AWPB. Specifications may be obtained from Association.

SUBMITTALS
Certification:
Indicate moisture content of treated wood, chemical used, and retention obtained.

DELIVERY, STORAGE, AND HANDLING
Protect against damage, moisture, and discoloration.

EXTRA MATERIAL
Deliver to General Contractor sufficient brush treatment material for field-cut treatments.

COORDINATION
Protect other work against damage or discoloration caused by work of this section.

PART 2 - PRODUCTS

PRESERVATIVE TREATMENT
General:
Provide AWPA, Standard P5, Use Standard UC4A, Copper Azole – (CA-C) treatment using CA-C dissolved in a solution of ethanolamine in water for wood preservative in the following locations:
In contact with masonry, concrete, roofing, and elsewhere shown on drawings.
Minimum Retention:
- Above Ground: 0.10 pcf CA-C.
- Ground or Fresh Water Contact: 0.21 pcf CA-C.
- Structural Posts and Poles (Sawn or Round): 0.31 pcf CA-C.

Furring Strips:
Provide AWPA, Standard P5, Use Standard UC4B, Copper Azole – (CA-C).

BRUSH TREATMENT MATERIAL
Material: Recommended by preservative treatment manufacturer for application to field cut treated lumber.
Treat any field cuts to pressure-treated wood.

FIRE RETARDANT TREATMENT
Treatment Chemical: Free of halogens, sulfates, and ammonium phosphate; Lonza “Dricon FR” or accepted substitute.
Manufacturing Standard: AWPA C-20 for lumber and C-27 for plywood.
Surface Burning Characteristics: Maximum smoke developed 450; flame spread 25 when tested per ASTM E-84, NFPA 255 or UL 723.
Wood Moisture Content: Kiln dry after treatment to maximum moisture content of 19% for lumber and 15% for plywood.

PART 3 - EXECUTION

EXAMINATION
Verify that material to receive treatment does not exceed moisture content specified for similar untreated wood.

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Prior to starting work notify General Contractor of conditions requiring correction.
Do not start work until conditions are satisfactory.

APPLICATION - PRESERVATIVE TREATED WOOD

General:

Follow referenced specifications.
Incise members prior to treatment.

Field Cuts and Brush Treatment:

Apply 2 liberal coats of brush treatment material to field cut surfaces.

INSTALLATION – FIRE RETARDANT TREATED WOOD

Do not rip or mill fire retardant treated wood. Only end cuts, drilling holes and joining cuts are permitted unless the material carries a UL approved milling treatment classification.
Install fire retardant treated wood with hot-dipped galvanized fasteners and hardware.
Provide at all structural wood, blocking, backing, bracing, other wood located in concealed spaces and elsewhere shown on Drawings.

PROTECTION

Protect other work against damage or discoloration caused by work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES

Construction of wood framework using lumber, plywood, and other sheathing materials. Miscellaneous blocking and curbing, concealed wood framing and furring. Includes rough hardware to join members and anchor framework.

QUALITY ASSURANCE

Framing Lumber:

Grade mark and trademark of association listed below and having jurisdiction must appear on each piece of material.

On members scheduled to receive transparent finish do not place grade mark stamp where exposed to view. In lieu thereof stamp where concealed, or submit Certificate of Inspection.

WWPA: Western Wood Products Assn., 522 SW Fifth Avenue, Portland, OR 97204-2122.

APA: American Plywood Assn., 1119 A Street; Tacoma, WA 98401.

DELIVERY, STORAGE, AND HANDLING

Protect against moisture, damage, and discoloration.

Do not store wood materials in wet or damp areas, or in contact with ground.

Avoid overloading floor and roof framing with stored materials.

COORDINATION

Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

FRAMING LUMBER

Material:

Douglas fir, surfaced 4 sides to standard nominal dimensions except where rough sawn stock or special shapes are indicated.

Grade:

Comply with current WWPA Standard Grading Rules as follows:

Framing Lumber: Standard and better.

Furring, Bracing and Blocking: Utility grade.

Maximum moisture content when delivered to project:

All wood materials: 19%.

PLYWOOD

US Product Standard 1-07, exterior type where exposed to moisture.

Each piece shall bear APA Grade mark.

Unless otherwise specified use Group 1 Douglas Fir; Grade "A" for exposed surfaces, "C" or better elsewhere.

PLYWOOD WALL SHEATHING

Grade: APA C-D with exterior glue, Exposure 1.

Thickness: 15/32 inch.

Span Rating: 24/0

Sheet Size: 48 X 96 inch size, unless otherwise indicated.

Surface Finish: Unsanded.

Edges: Square.

FASTENERS

Bolts: Fed. Spec. FF-B-575.

Nuts: Fed. Spec. FF-N-836.

Expansion Shields: Fed. Spec. FF-S-325.

Lag Screws and Lag Bolts: Fed. Spec. FF-B-561.

Wood Screws: Fed. Spec. FF-S-111.

Nails and Staples: Fed. Spec FF-N-105B.

Provide washers under bolt heads, lag heads, and nuts.

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Provide all necessary for installation of work specified herein.
Hot-dip galvanize steel fasteners exposed to moisture.

WOOD FURRING
Exterior locations: Preservative treated (SBX or DOT) meeting AWPA WC3B. Square edge stock, ½ inch x 3 inch behind exterior siding.
At other locations: square edge stock, thickness, size and spacing as required.

WOOD BLOCKING
Provide 2 inch nominal framing lumber behind cabinets, doors, windows, finish hardware including door stops, toilet room accessories, mirrors, miscellaneous specialties, building equipment, drapery track, and mechanical and electrical work. Verify exact location.

ADHESIVE
Glue conforming with APA Spec. AFG-01.
Approved manufacturers: Evans, Franklin, Georgia-Pacific, Glidden-Durkee, 3M, Weldwood, Willhold, Weyerhaeuser.

PART 3 - EXECUTION

EXAMINATION
Verify that surfaces to receive work specified herein are rigid, secure, accurately sized and located, and otherwise properly prepared.
Prior to starting work notify General Contractor of surfaces requiring correction.
Do not start work until conditions are satisfactory.

VERIFICATION OF CONDITIONS
Where necessary verify field measurements prior to fabrication.
If field measurements differ slightly from drawing dimensions, modify work as required for accurate fit. If measurements differ substantially, notify Architect prior to fabrication.

INSTALLATION - GENERAL
Install proprietary products in accordance with manufacturer's directions.
Use additional fasteners to those specified herein where necessary to insure rigidity and permanence.
Provide washers under nuts and heads when making bolted or lag screwed connections.
Drive nails perpendicular to grain in lieu of toe-nailing, where feasible.
Machine nailing or stapling with written approval only.
Provide for installation and support of plumbing, heating, ventilating, and electrical work.
Accurately, located, cut, fit, and install work secure rigid, to true lines, plumb, and level, unless otherwise indicated.

PLYWOOD WALL SHEATHING
Install continuous over 2 or more supports, end joints on supports.
Space adjacent panels 1/16 inch minimum.
Fasteners:
    Nails: 8d common galvanized nails spaced 6 inches on center at panel edges and 12 inches on center at intermediate supports.

AIR BARRIER INSTALLATION
Install air barrier prior to installation of doors and windows.
Install according to manufacturer's instructions and details on Drawings.
Wrap sheet edge minimum 12 inches around wall corners.
Extend continuous from sill plate to top plate.
Minimize sheet laps. Where sheet laps are necessary, lap minimum 8 inches.
Staple to wall sheathing at minimum 30 inches on center.
Smooth out all wrinkles downward.
Cut door and window openings with X-cut across opening. Pull sheet to wrap rough opening and staple to inside face of wall at opening jambs and sill. Lap sheet over window frame flange at opening heads.

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CLEANING AND REPAIRING

Including work of other sections, clean, repair and touch-up or replace when directed, products which have been soiled, discolored, or damaged by work of this section.

Leave surfaces ready for finishing specified in other sections.

Remove debris from project site upon work completion or sooner, if directed.

PROTECTION

Protect other work against damage or discoloration caused by work of this section.

NAILING SCHEDULE

Unless otherwise shown on drawings or in this specification, nailing shall be in accordance with the Building Code.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES
Fabrication and incorporation of site-built and site-finished wood moldings, trim and paneling.

SUBMITTALS
Product Data:
Submit manufacturer's product data listing volatile organic compound (VOC) content of adhesives and sealants.
Samples:
Provide three, 8.5x11, samples for stain color selection, as directed by Architect.

QUALITY STANDARDS
General:
Unless otherwise modified herein, materials and workmanship quality grades shall be determined by the Associations listed below.
Standards may be obtained from Association.
Plywood, Fir Lumber, and Workmanship:
Quality Standards of American Woodwork Institute, herein-after referred to as AWI, 5055 South Chesterfield Road; Arlington, VA 22206.

DELIVERY, STORAGE, AND HANDLING
Do not deliver products to jobsite until notified by General Contractor that project is conditioned and prepared to handle and store products without damage or discoloration.
Protect against damage and discoloration.

PROJECT CONDITIONS
Illumination:
Perform no work with less than 30 ft. candles of light measured 3 ft. above floor.
Temperature:
Maintain 50^{o}F minimum in interior spaces where finish carpentry materials are located.

PART 2 - PRODUCTS

MOISTURE CONTENT IN LUMBER
12% maximum.

INTERIOR TRIM
Wood Slat Ceilings and Trim to Receive Stain and/or Clear Finish:
Species: Ash, Hickory or Walnut.
Grain: Clear Vertical Grain.
AWI Grade: Premium.
Surface Texture: Smooth.
Stain: Custom color to be selected by Architect.
Minimum Lengths:
Opening Trim: 1 piece, single length.
Standing Trim: No less than full story height.
Running Trim: Joints no closer than 12 ft. apart.

FABRICATION
General:
Conform to AWI Premium Grade, unless specifically noted otherwise.
Assemble finish material at mill where feasible.
Use concealed fastening wherever possible.
Conceal end grain in exposed surfaces.
Kerf backs of flat grain members more than 5 inches wide or more than 1 inch nominal thickness.
Back-plow interior trim.
Machine sand finish carpentry not specified with rough surface.

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PART 3 - EXECUTION

EXAMINATION

Verify that surfaces to receive finish carpentry are straight, plumb, true, solid, rigid, and otherwise properly prepared.

Prior to starting work, notify General Contractor of defects requiring correction.

Do not start work until conditions are satisfactory.

FIELD MEASUREMENTS

Verify prior to fabrication.

If field measurements differ slightly from drawing dimensions, modify work as required for accurate fit. If measurements differ substantially, notify Architect prior to fabricating work.

INSTALLATION, GENERAL

Miter corners.

Accurately scribe filler strips, and trim strips to adjacent surface irregularities.

Ease sharp external corners prior to finishing.

TRIM INSTALLATION

Fit carefully at joints and against other members; all joints on bearings, secure with finish head self-drilling screws. Bevel-cut and glue end joints.

PRODUCT CLEANING AND REPAIRING

Including work of other sections, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.

Leave surfaces ready for finishing.

Remove debris from site upon work completion or sooner, if directed.

PROTECTION

Protect other surfaces against damage or discoloration caused by work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES

Shop fabricated institutional casework including base, full-height, and wall-mounted cabinets, countertops, wardrobes, and other similar units.

ALTERNATES

Refer to Section 01 23 00 for possible effect upon work of this section.

SYSTEM DESCRIPTION

Casework modules of reveal overlay design with continuous countertops.
Exposed cabinet exterior finished with high-pressure plastic laminate.
Exposed cabinet interior overlaid with low-pressure plastic laminate.
Edges of case bodies, doors, drawers, and shelves finished with color coordinated protective edge.
Hardware of institutional type and quality.

SUBMITTALS

Submit in accordance with Section 01 33 00.
Product Data:
Include manufacturer's descriptive literature for specialty items.
Identify each item as to location, material grade, workmanship grade, construction, finishes, and hardware.
Provide manufacturer’s product data for composite wood and agrifiber products (including but not limited to particleboard, wheatboard, strawboard, agriboard products, engineered wood components, solid-core wood doors, OSB, MDF, and plywood products) verifying that these products contain no urea-formaldehyde resins.
Provide product data for field-applied paints and coatings which have a potential impact on indoor air, including manufacturer’s MSDS sheets or other Product Data listing VOC content.
Provide product data for adhesives and sealants which have a potential impact on indoor air, including manufacturer’s MSDS sheets or other Product Data listing VOC content. Provide manufacturers’ documentation verifying all adhesives used to apply laminates, whether shop-applied or field-applied, contain no urea-formaldehyde.
Shop Drawings:
Show profiles, joint details, and other pertinent items.
Show connections to adjacent work, and complete assembly, whether or not manufacturer furnishes materials.

EMISSIONS STANDARDS

Conform to the following minimum standards for adhesive emissions:

Adhesive Type	VOC Limits	Standard
Adhesive Primer for Plastic:	550 g/L	SCAQMD Rule #1168
Contact Adhesive:	80 g/L	SCAQMD Rule #1168
Special Purpose Contact Adhesive:	250 g/L	SCAQMD Rule #1168
Wood Adhesive:	140 g/L	SCAQMD Rule #1168
Top & Trim Adhesive:	250 g/L	SCAQMD Rule #1168

Aerosol Adhesives: Green Seal Standard for Commercial Adhesive GS-36 requirements.
Submit manufacturer’s product data listing volatile organic compound (VOC) content of products specified herein.
Provide manufacturer’s documentation verifying that adhesives and sealants contain no urea-formaldehyde.

QUALITY STANDARDS

Except as herein modified, material and workmanship grades shall be determined by Quality Standards of Architectural Woodwork Institute, current edition, published by Architectural Woodwork Institute, 5055 S. Chesterfield Road; Arlington, VA 22206. Institute hereinafter referred to as "AWI".
Qualifications - General:
Work of this Section shall be provide by a 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-

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service performance.
Fabricator/installer qualifications:
Fabricator/installer shall have a minimum of ten (10) years experience in architectural casework manufacturing and have successfully performed a minimum of five (5) projects of similar size.

DELIVERY, STORAGE, AND HANDLING
Do not deliver products to job site until notified by General Contractor that project is conditioned and prepared to handle and store products without damage or discoloration.
Protect against damage and discoloration.

PROJECT CONDITIONS
Illumination:
Perform no work with less than 30 ft. candles of light measured 3 ft. above floor.
Temperature:
Maintain 50ºF minimum in interior spaces where casework and shelving are located and installed.

COORDINATION
Coordinate with other trades regarding work of this section.

PART 2 - PRODUCTS

LUMBER
Concealed: Poplar or Alder, vertical grain.
Exposed (if any): Douglas fir, hemlock or poplar, AWI Custom grade, vertical grain.

PLYWOOD
Type:
Douglas fir, US Product Standard PS 1-07, exterior type where exposed to moisture or around sinks.
Roseburg Forest Products ¾ inch thermally fused melamine sides, bottoms, shelving, interior doors and stretchers.
Melamine Color: White.
Face:
Rotary cut veneer, AWI Custom Grade.

PLASTIC LAMINATE (HPDL)
Manufacturing Standard: Conform to NEMA Standard LD-3.
Exposed Surfaces: NEMA GP28, 0.030 inch thickness, unless noted otherwise.
Post-Forming Grade: 0.042 inch material thickness for coved countertops and other forming.
Manufacturer, Color and Pattern: As noted on finish legend on sheet A-701.
Locations as noted on interior elevations.
Primer, Sealer and Adhesive: Water-resistant type made or recommended by plastic laminate manufacturer.

PVC EDGE BANDING
Impact resistant, machine applied with hot melt adhesive.
Standard 3mm thick at doors and drawer fronts and vertical case ends, 0.030 inch thick at bottoms, shelves, and sub-tops.
Color: To match plastic laminate, architect to approve prior to ordering.

HARDWARE
Hinges: Salice 200 Series.
Magnetic Catches: EPCO 1000LS, or accepted substitute.
Adjustable Shelf Hardware: Nickel plated steel brackets, 5mm diameter.
Door and Drawer Pulls: Wire type, 4 inches wide, brushed nickel finish.
Drawer Slides: Roller type, full extension, epoxy coated; Knape & Vogt 8400; Blum 430E series.
Casework Locks: Timberline Series. Keyed per room.
Door and Drawer Bumpers: Hemisphere 0.335 inch diameter by 0.085 inch height, clear finish.
All Other Hardware: Manufacturer's standard.

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FABRICATION

General:

Conform to AWI 400B standards for laminate clad cabinets, Premium Grade.
Construction: Overlay reveal, unless indicated otherwise.
Surfaces: Laminated plastic.
All shelves adjustable unless otherwise shown.
Verify dimension of sinks and other items to be built into cases and counters.
Assemble at factory where feasible.
Use concealed fastenings wherever possible.
Use screws and bolts in addition to adhesive where required for strength and rigidity.
Install finish hardware specified herein at factory.

Materials, unless specifically noted otherwise:

Bases: Exterior grade 3/4 inch plywood with thermally fused melamine.
Countertops: 3/4 inch plywood with 0.050 plastic laminate, backed with 0.020 balancing sheet.
Exposed materials: HPDL clad plywood.
Semi-exposed materials: LPDL clad plywood.
Concealed materials: Softwood.
Casework Bottoms, Ends, and Vertical Standards: 3/4 inch thick plywood with thermally fused melamine.
Back and Side Splash: 3/4 inch plywood with 0.050 plastic laminate.
Fixed Shelving at Breakroom 1142: 3/4 inch plywood with 0.050 plastic laminate. Overall thickness per drawings.
Fixed Shelving elsewhere: 3/4 inch plywood with 0.050 plastic laminate. Overall thickness per drawings.
Adjustable Shelving: 3/4 inch plywood with thermally fused melamine.
Adjustable Shelf Hardware: Provide bracket holes at 32 mm centers to within 6 inches of top and bottom of space where adjustable shelves are shown.
At Sink Cabinets: Hold shelves 3/4 inch back from rear face of door to provide space for ventilation.
Swinging Doors: 3/4 inch thick plywood with 0.050 plastic laminate.

Casework Backs:

- Concealed Base Cabinets: 1/4 inch prefinished hardboard.
- Exposed Backs: 3/4 inch plywood with 0.050 plastic laminate.
- Semi-exposed Backs: 3/4 inch plywood with thermally fused melamine.
- Upper Wall Cabinets: 3/4 inch plywood with thermally fused melamine.

Drawers:

- Exposed Fronts: 3/4 inch prefinished plywood with 0.050 plastic laminate.
- Semi-exposed Fronts: 3/4 inch prefinished plywood with thermally fused melamine.
- Sides: 1/2 inch thick plywood with thermally fused melamine.
- Backs: 1/2 inch thick plywood with thermally fused melamine.
- Bottoms: 1/2 inch plywood with thermally fused melamine.

Drawer Stops: Integral side type. Do not use drawer front as stop.
Edge Banding: Provide at exposed plywood and particle board edges in accordance with AWI Standards and as specified herein.

PART 3 - EXECUTION

EXAMINATION

Verify that surfaces to receive casework and shelving are straight, plumb, true, solid, rigid, and otherwise properly prepared.
Prior to starting work, notify General Contractor of defects requiring correction.
Do not start work until conditions are satisfactory.

FIELD MEASUREMENTS

Verify prior to fabricating casework and shelving.
If field measurements differ slightly from drawing dimensions modify Work as required for accurate fit. If measurements differ substantially, notify Architect prior to fabricating work.

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INSTALLATION

Casework to be installed factory-trained personnel.
Bases secured to floor and cases secured to each other and tight to adjacent walls.
Countertops fastened to cases and secure tight to walls.
Provide continuous bases under in-line base casework, unless otherwise indicated.
Secure casework in place plumb, square, true, level, and without distortion; level where necessary with concealed shims. Provide sealant at intersection of differing materials.

PLASTIC LAMINATE COUNTERTOPS

No "L" shaped pieces at countertop corners or longitudinal seams permitted; cross seams 12 ft. apart minimum and at least 24 inches away from any counter sinks.
Provide cut-outs for sinks and other openings; verify size and location

ADJUSTMENTS

Adjust moving parts to operate satisfactorily at time of final project acceptance and during warranty period.

CLEANING AND REPAIRING

Including Work of other Sections, clean, repair, and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this Section.
Remove debris from project site upon work completion or sooner, if directed.

PROTECTION

Protect other surfaces against damage or discoloration caused by Work of this Section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES

Non-structural plastic fabrications formed to various profiles for a variety of purposes.

SUBMITTALS

Provide in accordance with Section 01 33 00.

Product data:

Submit manufacturer's specifications and installation instructions for each type of product indicated.

Shop drawings:

Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices and other components.

Show full-size details, edge details, thermoforming requirements, attachments, etc.

Show locations and sizes of furring, blocking, including concealed blocking and reinforcement specified in other Sections.

Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, waste receptacle and other items installed in solid surface.

Samples:

For each type of product indicated submit minimum 6-inch by 6-inch sample in specified gloss.

Cut sample and seam together for representation of inconspicuous seam.

Indicate full range of color and pattern variation.

Approved samples will be retained as a standard for work.

Product certificates:

For each type of product, signed by product manufacturer.

Fabricator/installer qualifications: Provide copy of certification number.

Manufacturer certificates: Signed by manufacturers certifying that they comply with requirements.

Maintenance data:

Submit manufacturer's care and maintenance data, including repair and cleaning instructions.

Maintenance kit for finishes shall be submitted.

Include in project closeout documents.

QUALITY ASSURANCE

Qualifications - General:

Work of this Section shall be provide by a 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.

Fabricator/installer qualifications:

Work of this section shall be by a certified fabricator/installer, certified in writing by the manufacturer.

Applicable standards:

Standards of the following, as referenced herein:

American National Standards Institute (ANSI)

American Society for Testing and Materials (ASTM)

National Electrical Manufacturers Association (NEMA)

NSF International

Fire test response characteristics:

Provide with the following Class A (Class I) surface burning characteristics as determined by testing identical products per UL 723 (ASTM E84) or another testing and inspecting agency acceptable to authorities having jurisdiction:

Flame Spread Index: 25 or less.

Smoke Developed Index: 450 or less.

Mock-up:

Prior to fabrication of architectural millwork, erect sample unit to further verify selections made under sample submittals and to demonstrate the quality of materials and execution.

Build the mock-up to comply with the contract documents and install in a location as directed by the Architect.

Mockup locations:

1. Casework, including integral backsplash/side splash and sink at Office 1110.
2. Casework of one reception bay at Lobby 1101.

Notify the Architect one week in advance of the date of when the mock-up will be delivered.

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Should mock-up not be approved, re-fabricate and reinstall until approval is secured.
Remove rejected units from project site.
After approval, the mock-up may become a part of the project.
Approved mock-up shall serve as a standard for judging quality of all completed units of work.

DELIVERY, STORAGE, AND HANDLING
Protect against damage and discoloration.

ENVIRONMENTAL REQUIREMENTS
Illumination:
Perform no work with less than 30 ft. candles of light measured 3 ft. above floor.
Temperature:
Maintain 65ºF minimum in interior spaces where solid surfacing fabrications materials are located and installed.
Humidity:
35% minimum, 80% maximum.

WARRANTY
Provide manufacturer’s standard warranty against defects in materials.
Warranty shall provide material and labor to repair or replace defective materials.
Damage caused by physical or chemical abuse or damage from excessive heat will not be warranted.

COORDINATION
Coordinate with other trades regarding work of this section.

PART 2 - PRODUCTS

SOLID SURFACING - POLYMER (SS-1, SS-2)
Type: Solid polymer components, cast, nonporous, filled polymer, not coated, laminated or of composite construction with through body colors meeting ANSI Z124.3 or ANSI Z124.6, having minimum physical and performance properties specified.
Superficial damage to a depth of 0.010 inch (.25 mm) shall be repairable by sanding and/or polishing.
Thickness: 1/2 inch.
Edge Treatment: Eased edge.
Finish: Uniform, matte.
Manufacturer: Wilsonart, Corian surfaces from the DuPont company (basis of design).
Color: See finish schedule.
Backsplash and Sidesplash: Coved.

ACCESSORIES
Sink/lavatory mounting hardware: Manufacturer’s standard bowl clips, panel inserts and fasteners for attachment of undermount sinks/lavatories.
Joint Adhesive: Manufacturer’s standard one- or two-part adhesive kit to create inconspicuous, nonporous joints.
Sealant: Manufacturer’s standard mildew-resistant, FDA-compliant, NSF 51-compliant (food zone — any type), UL-listed silicone sealant in colors matching components.

FABRICATION
Solid Surfacing - Polymer:
Shop fabricate components to greatest extent practical to sizes and shapes indicated, in accordance with manufacturer's printed instructions and technical bulletins and approved shop drawings.
Fabricate backsplashes from solid surfacing material with radius cove where counter and backsplashes meet as indicated on Drawings. Refer to manufacturer’s installation instructions for integral splashes.
Form joints between components using manufacturer's standard joint adhesive with inconspicuous lines.
Reinforce with strip of solid polymer material, 2" wide.
Provide factory cutouts for plumbing fittings and bath accessories.
Thermoform corners and edges or other objects to shapes and sizes indicated, prior to seaming and joining. Cut components larger than finished dimensions and sand edges to remove nicks and scratches.
Heat entire component uniformly prior to forming.

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Ensure no blistering, whitening and cracking of components during forming.
Rout and finish component edges with clean, sharp returns.
Rout cutouts, radii and contours to template, smooth edges.
Repair or reject defective and inaccurate work.

PART 3 - EXECUTION

EXAMINATION

Verify that surfaces to receive solid surfacing are dry, clean, smooth, sound, well-fastened, free from conditions that would damage surfacing or impair adhesive-bond, and otherwise properly prepared.
Examine substrates and conditions, with fabricator present for compliance with requirements for installation tolerances and other conditions affecting performance of work.
Prior to starting work notify general contractor of defects requiring correction.
Do not start work until conditions are satisfactory.

INSTALLATION

General:

Install in accordance with manufacturer's instructions and approved Shop Drawings.
Install plumb, level and rigid, scribed to adjacent finishes.

Solid Surfacing - Polymer:

Install with largest size pieces available.
Install components plumb, level, rigid, scribed to adjacent finishes in accordance with reviewed Shop Drawings and Product installation details.
Fabricate field joints using manufacturer's recommended adhesive, with inconspicuous joints in finished work. Exposed joints/seams are not permitted. Keep components and hands clean when making joints.
Reinforce field joints as specified herein.
Cut and finish component edges with clean, sharp returns.
Route radii and contours to template.
Anchor securely to base component or other supports.
Align adjacent components and form seams to comply with manufacturer’s written recommendations using adhesive in color to match work.
Carefully dress joints smooth, remove surface scratches and clean entire surface.
Install countertops with no more than 1/8" sag, bow or other variation from a straight line.
Adhere undermount mount sinks/bowls to countertops using manufacturer's recommended adhesive and mounting hardware.
Seal between wall and components with joint sealant as specified herein and in Section 07 92 00, as applicable.
Provide coved backsplashes and sidesplashes at walls and adjacent millwork. Fabricate radius cove at intersection of counters with backsplashes to dimensions shown on reviewed Shop Drawings. Adhere to countertops using manufacturer’s standard color-coordinated joint adhesive.
Keep components and hands clean during installation. Remove adhesives, sealants and other stains.
Coordinate connections of plumbing fixtures with other trades.

CLEANING AND REPAIRING

Promptly remove any excess adhesive or sealant.
Remove any stains or markings from surfaces.
Repair minor imperfections and cracked seams and replace areas of severely damaged surfaces in accordance with manufacturer’s “Technical Bulletins”.
Including work of other sections, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.
Remove debris from project site upon work completion, or sooner, if directed.

PROTECTION

Protect other materials against damage and discoloration caused by work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES
Wallcoverings of prefinished panels over solid substrate for light, medium and heavy duty usage.

QUALITY ASSURANCE
Qualifications:
Workmen must have at least 2 years prior experience performing work of type specified herein, and be approved by covering manufacturer.
Regulatory Requirements:
Maximum ASTM E 84 Flame Spread Rating: Class C.
Maximum ASTM E 84 Smoke Developed Rating: 450.

DELIVERY, STORAGE, AND HANDLING
Store in clean and dry storage area.
Protect against damage and discoloration.
Protect from sunlight exposure.
Lay panels flat. Do not stand panels on edge.

ENVIRONMENTAL REQUIREMENTS
Install wall covering only when air temperature and humidity conditions approximate those that will exist when building is occupied.
Acclimate panels to installation environment minimum 24 hours prior to installation.
Do not install covering on surfaces which are colder than 65^{o}F.
Do not install covering under less than 30 ft. candles of light measured 3 ft. above floor.
Notify General Contractor, if necessary, to provide additional light.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

FIBERGLASS REINFORCED PANELS
Panel Type: Prefinished fiberglass reinforced plastic with embossed finish surface.
Material: Random chopped fiberglass reinforcement, modified polyester copolymer resin mix with inorganic fillers and pigments.
Panel Size: 48" X 96", or as required for installation.
Nominal Thickness: 0.09".
Color: See Finish Schedule
Manufacturer and Pattern: Crane Composites "Glasbord", or accepted substitute.
Location: As noted on drawings.

ACCESSORIES
Moldings: Manufacturer's standard one-piece extruded plastic, color to match panel color.
Fasteners: Insulating nylon drive rivets, length as required for installation, color to match panels color.
Adhesive: Waterproof type recommended by panel manufacturer.
Sealant: Silicone type as specific in Section 07 92 00, color to match panel color.

PART 3 - EXECUTION

EXAMINATION
Verify that surfaces to receive wall and ceiling covering are true, sound, clean, dry and dust-free, free from conditions that would damage covering or impair adhesive bond, and otherwise properly prepared.
Prior to starting work notify General Contractor about defects requiring correction,
Do not start work until conditions are satisfactory.

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PREPARATION

Before applying covering remove any finish hardware, electric cover plates, mechanical grilles and registers, etc. which would interfere with covering application.

Carefully store removed items and replace following covering application.

SURFACE PREPARATION

Follow manufacturer's directions.

INSTALLATION

Follow manufacturer's directions.

Take special care to insure complete adhesion at joints, edges, and corners.

Provide minimum 1/4" gap at ceiling joint and 1/8" gap between adjacent panels.

Pre-drill fastener holes oversized 1/8" to allow for panel expansion and contraction.

Apply adhesive to entire panel surface.

Set panels prior to "skinning" of adhesive.

Press panels firmly to substrate and install fasteners.

Provide single row of fasteners at top and bottom of panel as recommended by panel manufacturer for adhesive installation.

Install panels with moldings between adjacent panels, at wall corners, and exposed panel edges.

Apply sealant to molding channel prior to installing on panel. Apply sealant to opposite molding channel prior to installing adjacent panel.

Allow for specified gap between adjacent panels when installing moldings.

Remove excess sealant.

CLEANING AND REPAIRING

Remove adhesive and sealant from surfaces during application.

Replace defective and improperly applied material.

Leave surfaces clean and defect-free at time of final acceptance.

Remove debris from project site upon work completion or sooner, if directed.

Including work of other sections, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.

PROTECTION

Protect other work against damage and discoloration caused by work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES
Thermal insulation organic or inorganic applied to walls, roofs, perimeter of foundations, and other heated spaces.

DELIVERY, STORAGE, AND HANDLING
Deliver to project site in manufacturer's original unopened packages.
Label package wrappers with brand name, insulation type, and thermal rating.
Store materials off ground.
Protect against moisture and damage.
Do not use damaged or damp insulation.

ENVIRONMENTAL REQUIREMENTS
Do not install insulation when surfaces to receive insulation are wet.

SUSTAINABILITY REQUIREMENTS
Product Data:
Provide manufacturer’s product data verifying that fiberglass batt insulation contains no urea-formaldehyde.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

FLEXIBLE BATTS
Manufacturer:
Knauf “EcoBatt”, Certainteed Sustainable Insulation, Owens Corning “EcoTouch”, or accepted substitute.
Material:
Glass wool blankets, full-length, single-piece where practicable, conforming to ASTM C 665, Type I, Class A for unfaced batts.
Facings:
None, separate vapor retarder film as specified in Section 07 25 00.
Extent of Work:
Provide blanket insulation as follows: At exterior of all heated spaces in thickness and locations as shown on Drawings.

WIRE
Noncorrosive steel, 18 ga. minimum.

ADHESIVE
Manufactured or recommended by insulation manufacturer.

MECHANICAL FASTENERS
Type recommended by insulation manufacturer.
Long enough to penetrate substrate 1/2 inch, minimum.

PART 3 - EXECUTION

EXAMINATION
Verify that work of preceding trades is completed.
Verify that surfaces and spaces to receive insulation are accurately sized, located, dry, protected against inclement weather, clean, and otherwise properly prepared.
Prior to starting work notify General Contractor of defects requiring correction.
Do not start work until conditions are satisfactory.

PREPARATION
Remove, or protect against projections which may damage insulation or prevent proper installation.

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Remove bond-reducing coatings, and roughen surfaces, to receive insulation by adhesion as necessary for bond.
Prime surfaces to receive insulation by adhesion.

INSULATION INSTALLATION - GENERAL
Follow manufacturer's directions.
Fit insulation snugly between framing without forcing.
Permit no gaps for air passage.
Carefully cut and fit insulation around pipes, conduits, and other obstructions.
Where pipes, conduit, and other obstructions are located in space to receive insulation, place insulation between cold-in-winter surface and obstruction, compressing insulation where necessary.
Unless indicated otherwise, do not compress insulation more than 10%.

INSTALLATION - FLEXIBLE BATTS
Use full-length, single-piece batts where practicable.
Provide additional wire support as necessary to prevent insulation displacement or sagging.

INSPECTION
Notify Architect at least 24 hours prior to completing insulation work for inspection.

CLEANING AND REPAIRING
Including work of other sections, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.
Remove debris from project site upon work completion or sooner, if directed.

PROTECTION
Maintain the following minimum clearances between insulation and recessing lighting fixtures, metal chimneys, metal gas vents and similar high temperature equipment unless equipment is U.L. labeled for zero-clearance:
Side: 3 inches.
Top: 24 inches.
Protect other work against damage and discoloration caused by work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES

Elastic sheet vapor retarders for all exterior thermal insulation and air barrier installed as part of the exterior envelope construction.

SUBMITTALS

Submit in accordance with Section 01 33 00.

Product Data:

Manufacturer's data and details to include installation instructions.

Samples:

Two 8 1/2" x 11" samples of vapor retarder material.

QUALITY ASSURANCE

Subcontract the vapor retarder work of this section to the installer of associated work so there will be undivided responsibility for the related items of work.

Pre-Installation Conference

Convene at least one week before starting work of this section to verify project requirements, coordinate with installers of other work, establish condition and completeness of building substrate, and review manufacturer's installation instructions and warranty requirements. Meeting shall include review of integrated exterior mock-up to confirm installation procedures as required to provide a warrantable assembly. Establish requirements for other trades for patching and repairing any penetrations or damage to water-resistive barrier caused by those trades and material required for use for such repairs.

Representatives of the following shall attend:

- Owner's Project Representative
- Architect
- General Contractor
- Weather Barrier Installer
- Weather Barrier Manufacturer's Representative
- Representatives of other trades requiring coordination with weather barrier installation.

MOCK-UP

Provide water-resistive barriers with related materials as required to complete integrated exterior mock-ups as specified in Section 01 40 00 - Quality Requirements and other Sections. Build mock-up in size and location as directed by Architect.

1. Demonstrate complete installation of water-resistive barrier and treatment of internal and external corners, openings and sill flashings.
2. Establish requirements for patching and repairing any penetration or damage to water resistive barrier caused by Work of other Sections and material required for use for such repairs.
3. Obtain water-resistive barrier manufacturer's acceptance of barrier installation, including flashing installation.

PROJECT CONDITIONS

Proceed with vapor retarder work only after substrate work has been completed.

The contractor shall examine the substrate and the conditions under which the vapor retarder work is to be performed. Do not proceed with the work until satisfactory conditions have been corrected.

Environmental Requirements:

Proceed with vapor retarder work only when weather conditions will permit the materials to be applied in accordance with manufacturer's recommendations.

COORDINATION

Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

VAPOR RETARDERS

Sheet Barrier Below Grade:

Polyolefin geomembrane sheet, 15 mils thickness, maximum permeance = 0.01 perms as tested in accordance with ASTM E1745 Section 7.1 (7.1.1-7.1.5); Stego Industries "Stego Wrap", Fortifiber

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"Moistop Ultra 15", Raven Industries "Vapor Block 15", or accepted substitute.
Sheet Barrier Above Grade:
Translucent polyethylene film, 6 mil thickness, maximum permeance = 1.0.
Provide at all interior warm side wall locations.
Sheet Barrier Exposed in Attic Spaces:
Fire resistant type, foil-skrim-kraft facing composition, maximum flame spread rating 25, 0.02 perm rating.

FLEXIBLE FLASHING MEMBRANE
Membrane:
Self-adhering, rubberized SBS asphalt compound integrally laminated to cross-laminated polyethylene film, 40 mils thickness, 0.05 perms maximum vapor permeance; Henry Company "Blueskin SA", or accepted substitute.
Provide at window sills and other opening sills as detailed on Drawings.
Primer:
Quick-drying rubber based adhesive primer; Henry Company "Blueskin Adhesive", or accepted substitute.
Provide over substrate where Flexible air/vapor barrier membrane is applied.

WEATHER-RESISTIVE BARRIER (WRB)
Material: Self-adhered, vapor-permeable, water-resistive, air infiltration and moisture barrier with split-back poly-release film.
Fire Characteristics: Flame Spread Class A, tested in accordance with ASTM E 84.
Manufacturer and Model: Blueskin VP160 or accepted substitute.
Flexible Flashing: Adhesive-backed flexible membrane; Henry "Blueskin SA" specified above. Provide at door, window and other openings as detailed on Drawings.
Sealant: Moisture cured, medium modulus polymer modified sealing compound compatible with WRB and substrate; Henry "HE925 BES", or accepted substitute.
Adhesive: As recommended by WRB manufacturer.
Seam Tape: Adhesive-backed tape recommended by WRB manufacturer.
Through-Wall Flashing: Henry Blueskin TWF or accepted substitute.

ADHESIVE PRIMER
Low VOC, quick setting rubber based adhesive primer for primary self-adhering water resistive barrier membrane and SBS modified bitumen membranes at all temperatures; Henry Company "Blueskin® LVC Adhesive" or accepted substitute.

ACCESSORIES
Vapor Retarder Tape:
Sheet Barrier Below Grade: Polyethylene Tape as recommended by vapor retarder manufacturer.
Sheet Barrier Above Grade: Adhesive-backed polyethylene by Monsanto Plastics & Resins Co. or adhesive-backed polypropylene sheathing tape No. 8086 by 3M Contractor Products, or accepted substitute.
Sheet Barrier Exposed in Attic Spaces: Adhesive-backed, mylar-faced aluminum foil, 1-1/2 inches wide, 0.00 perm rating; Alumiseal Zero Perm.
Sealant:
Vapor Barrier Sealant: Elastic, polyurethane base, flexible sealant used to seal vapor retarder materials together or to other substrates as recommended by vapor retarder manufacturer.

PART 3 - EXECUTION

EXAMINATION
Verify that surfaces to receive work specified herein are rigid, secure, accurately sized and located, and otherwise properly prepared.
Prior to starting work notify General Contractor of surfaces requiring correction.
Do not start work until conditions are satisfactory.

PREPARATION
Clean substrate of projections and substances detrimental to the work; comply with recommendations of the vapor retarder manufacturer.
Remove ice, snow, grease, dust or other foreign material that may prevent bonding to substrate.

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Install cant strips, flashings and similar accessory items as shown, and as recommended by vapor retarder manufacturer. Prime substrate where recommended by the manufacturer.

INSTALLATION - VAPOR RETARDERS

Exterior Walls:

Locate over exterior wall insulation continuously from floor to underside of roof/attic insulation on the warm-in-winter side of wall.

Sequence of insulation and vapor retarder installation: Protect insulation at all times against migration of moisture vapor.

Immediately protect insulation with vapor retarder after insulation installation.

Apply sheets full height in one piece. Lap edges minimum 6"; seal with specified sealant or vapor retarder tape. Make all laps over framing members.

To avoid water vapor migration prior to installation of finish wall material, seal all edges and joints with specified sealant.

Carefully cut retarder around framing members, conduits, and other penetrations; seal edges by lapping a separate piece of vapor retarder material.

Concrete Floor Slabs:

Install underslab vapor retarder over smooth surface substrate, and without puncture under the entire area of floor slab or any accessory concrete on grade construction in accordance with manufacturer's instructions and ASTM E 1643.

Install with the longest dimension parallel with the direction of the concrete pour.

Lap edges minimum 6 inches and seal with vapor retarder tape.

Tape all seams with vapor retarder tape.

Seal all penetrations, including pipes and conduit per manufacturer's instructions. Install vapor retarder boots around all penetrations and seal with vapor retarder tape.

Do not penetrate vapor retarder with screed pins, stakes or other items. No penetration of the vapor retarder is allowed except for reinforcing steel and permanent utilities.

Sand or other granular fill prohibited above vapor retarder.

Coordinate sequence of installation, treatment of penetrations, and sealing of edges identical with that of exterior walls above.

Repair damaged areas, if any, by cutting patches of vapor retarder, overlapping damaged area 6 inches and taping all four sides with vapor retarder tape.

Penetrations:

Carefully seal all penetrations of vapor retarder by lapping additional piece of Vapor Retarder minimum 6" around all penetration edges. Carefully cut center "cut out" to fit the penetration. Seal all edges with specified sealant to ensure continuous vapor retarder performance.

INSTALLATION – ADHESIVE PRIMER

Apply adhesive primer according to manufacturer's recommendations where appropriate surface adhesion cannot be achieved.

Prime substrate with specified primer at a rate of 200-250 sq. ft. per gallon.

Apply adhesive primer on surface of WRB where subsequent WRB membrane will overlap such as selvage edge and end laps

INSTALLATION - FLEXIBLE FLASHING MEMBRANE

Install sill flashing stop.

Install flexible flashing membrane over window sill. Lap up vertical leg of flashing stop, down vertically below opening minimum 6 inches and up opening jambs minimum 6 inches. See detail on Drawings.

Fold side flaps of air infiltration retarder into opening, lapping over flexible flashing and staple in place.

Install window sill flashing and window.

Install 12 inch wide flexible flashing strips over window jamb flanges and air infiltration retarder. Adhere to window flange and air infiltration retarder.

Install window head flashing.

Install 12 inch wide flexible flashing strip over window head flashing and under air infiltration retarder, lapping side strips. Adhere to window head flashing and substrate. See detail on Drawings

INSTALLATION – WEATHER-RESISTIVE BARRIER (WRB)

Install in a consecutive weatherboard method starting at bottom of wall and working up. Maintain minimum 2" side laps and 3" end laps.

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Cut to manageable lengths, position membrane for alignment, remove protective poly-film and firmly apply pressure to assure adhesion.
Eliminate fishmouths, wrinkles and gaps.
Roll entire membrane surface (including seams) with a counter top or “J-roller” using minimum 5 lbs. pressure to ensure full contact and adhesion.
Seal membrane terminations, heads of mechanical fasteners, masonry tie fasteners, around penetrations, duct work, electrical and other apparatus extending through the WRB and around perimeter edge of membrane terminations at window and door frames with sealant recommended by WRB manufacturer.
Install WRB at rough openings and transitions according to manufacturer’s installation instructions and details.
Flash window and door openings according to manufacturer’s installation instructions and details shown on Drawings.
Use pre-cut rolls of flexible flashing membrane for sill pan flashings per manufacturer’s published window flashing guidelines.
Prime substrate before installation of flexible flashing membrane.
Mechanically fastened insulation clips, brick ties and other through penetrations through the membrane into solid backing and seal with sealant recommended by WRB manufacturer.
Inside and Outside Corners:
Seal inside and outside corners of sheathing boards with a strip of self-adhering vapor permeable membrane extending a minimum of 3 inches on either side of the corner detail.
At inside corners, pre-treat the corner with a continuous ½ inch bead of sealant.
Align and position self-adhering transition membrane, remove protective film and press firmly into place.
Ensure minimum 2 inches overlap at all side laps and minimum 3 inches overlap at all end laps of membrane.
Roll all laps and membrane with a counter top roller to ensure seal.
Transition Areas:
Tie-in to structural beams, columns, parapet curbs, foundation walls, roofing systems and at the interface of dissimilar materials with self-adhering water resistive air barrier transition membrane.
Align and position self-adhering transition membrane, remove protective film and press firmly into place.
Provide minimum 3 inch lap to all substrates.
Ensure minimum 2 inches overlap at all side laps and minimum 3 inches overlap at all end laps of membrane.
Roll all laps and membrane with a counter top roller to ensure seal.
Openings:
Install Flexible Flashing Membrane at opening sill as described above.
Pre-treat inside corners with a bead of termination sealant.
Wrap jamb of rough openings with self-adhering water resistive barrier transition membrane.
Extend self-adhering water resistive air barrier membrane into rough window openings sufficient to provide a connection to interior vapor retarder.
Align and position self-adhering transition membrane, remove protective film and press firmly into place.
Ensure minimum 2 inches overlap at all side laps and minimum 3 inches overlap at all end laps of membrane.
Roll all laps and membrane with a counter top roller to ensure seal.

PROTECTION
Protect other work against damage and discoloration caused by work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES

Fabrication and incorporation of site-built and site-finished fiber cement fascia, trim, and siding.

SUBMITTALS

Submit under provisions of Section 01300.

Product Data: Manufacturer's data sheets on each product to be used, including:

- Preparation instructions and recommendations.
- Storage and handling requirements and recommendations.
- Installation methods.

Shop Drawings: Provide detailed drawings of atypical non-standard applications of cementitious siding materials which are outside the scope of the standard details and specifications provided by the manufacturer.

Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

QUALITY ASSURANCE

Installer Qualifications: Minimum of 2 years experience with installation of similar products.

Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

Finish areas designated by Architect.

Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.

DELIVERY, STORAGE, AND HANDLING

Do not deliver products to jobsite until notified by General Contractor that project is conditioned and prepared to handle and store products without damage or discoloration.

Protect against damage and discoloration.

Store products in manufacturer's unopened packaging until ready for installation.

Store siding on edge or lay flat on a smooth level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.

Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

PROJECT CONDITIONS

Illumination:

Perform no work with less than 30 ft. candles of light measured 3 ft. above floor.

Temperature:

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.

WARRANTY

Product Warranty: Limited, non-pro-rated product warranty.

- Fiber cement lap siding for 30 years.
- Fiber cement vertical panels for 30 years.
- Fiber cement trim boards for 15 years.

Finish Warranty: Limited product warranty against manufacturing finish defects.

When used for its intended purpose, properly installed and maintained according to Hardie's published installation instructions, James Hardie's ColorPlus finish with ColorPlus Technology, for a period of 15 years from the date of purchase: will not peel; will not crack; and will not chip. Finish warranty includes the coverage for labor and material.

Workmanship Warranty: Application limited warranty for 2 years.

PART 2 - PRODUCTS

FIBER-CEMENT SIDING

Type:

Non-asbestos fiber-cement siding complying with ASTM C1186 Grade II, Type A, non-combustible when

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tested in accordance with ASTM test method E136.
Manufacturer: James Hardie Building Products Co., Allura.
Lap Siding:
Thickness: 5/16 inch.
Width: Match existing exposure.
Texture: Smooth.
Finish: Primed.
Trim:
Thickness: 1 inch.
Width: As shown on drawings.
Texture: Smooth.
Finish: Primed.

PART 3 - EXECUTION

EXAMINATION
Verify that surfaces to receive finish carpentry are straight, plumb, true, solid, rigid, and otherwise properly prepared.
Prior to starting work, notify General Contractor of defects requiring correction.
Do not start work until conditions are satisfactory.

PREPARATION
Clean surfaces thoroughly prior to installation.
Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
Install a water-resistive barrier is required in accordance with local building code requirements.
The water-resistive barrier must be appropriately installed with penetration and junction flashing in accordance with local building code requirements.

FIELD MEASUREMENTS
Verify prior to fabrication.
If field measurements differ slightly from drawing dimensions, modify work as required for accurate fit. If measurements differ substantially, notify Architect prior to fabricating work.

INSTALLATION, GENERAL
Miter corners.
Accurately scribe filler strips, and trim strips to adjacent surface irregularities.
Ease sharp external corners prior to finishing.

FIBER-CEMENT SIDING INSTALLATION
Lap Siding:
Install according to manufacturer’s directions.
Install over vertical furring strips.
Install ¼ inch thick starter strip at bottom course.
Apply siding units horizontally with 1 ¼ inch laps at the top.
Install first course overlapping starter strip.
Align vertical joints between units over framing members.
Blind nail with minimum 2 inch length hot-dipped galvanized or No. 8 X 1 ¼” screws.
Space fasteners 1 inch from top of unit.
Space fasteners minimum 3/8 inch and maximum ½ inch from unit end.
Drive fasteners tight, fit against trim with maximum 1/16 inch gap. Do not over-drive fasteners.
Maximum end gap 1/16 inch. Caulk joints with Urethane sealant.

INSTALLATION, TRIM BOARDS
Install materials in strict accordance with manufacturer's installation instructions. Install flashing around all wall openings.
Fasten through trim into structural framing or code complying sheathing. Fasteners must penetrate minimum 3/4 inch (19 mm) or full thickness of sheathing. Additional fasteners may be required to ensure adequate security.

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Place fasteners no closer than 3/4 inch (19 mm) and no further than 2 inches (51 mm) from side edge of trim board and no closer than 1 inch (25 mm) from end. Fasten maximum 16 inches (406 mm) on center.
Maintain clearance between trim and adjacent finished grade.
Trim inside corner with a single board trim both side of corner.
Outside Corner Board: Attach Trim on both sides of corner with 16 gage corrosion resistant finish nail 1/2 inch (13 mm) from edge spaced 16 inches (406 mm) apart, weather cut each end spaced minimum 12 inches (305 mm) apart.
Allow 1/8 inch gap between trim and siding.
Seal gap with high quality, paint-able caulk.
Shim frieze board as required to align with corner trim.
Fasten through overlapping boards. Do not nail between lap joints.
Overlay siding with single board of outside corner board then align second corner board to outside edge of first corner board. Do not fasten fiber cement boards to fiber cement boards.
Shim frieze board as required to align with corner trim.
Miter corners.
Accurately scribe filler strips, and trim strips to adjacent surface irregularities.
Ease sharp external corners prior to finishing.

PAINTING AND FINISHING included in this section:
Before installing, finish concealed ends of exterior trim.

PRODUCT CLEANING AND REPAIRING
Including work of other sections, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.
Leave surfaces ready for finishing.
Remove debris from site upon work completion or sooner, if directed.

PROTECTION
Protect other surfaces against damage or discoloration caused by work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES
Shop or field formed sheet metal products with waterproof joints; accessories and trim such as gutters, downspouts, copings, and metal or flexible flashings for roof or wall construction.

SUBMITTALS
Provide in accordance with Section 01 33 00.
Samples:
Submit two samples of pre-finished sheet metal in each color selected.
Shop Drawings:
Submit shop drawings showing profiles, dimensions, location and arrangement of joints, supports, types and locations of fasteners and other anchorage, sealant and accessories. Show details of weatherproofing at edges, terminations and penetrations.

SUSTAINABILITY REQUIREMENTS:
Provide manufacturer's product data listing recycled content.
Provide documentation of recycled content and value of recycled content as described in Section 01 81 13.

REFERENCES
Architectural Sheet Metal Manual, published by the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA), current edition.

DELIVERY, STORAGE, AND HANDLING
Protect against damage and discoloration.
Store off ground.

WARRANTY
Warrant work weathertight for 3 years, subject to General Condition terms.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

SHEET METAL
Pre-finished Sheet Steel:
Material: Sheet steel, 24 gauge thickness, unless otherwise shown on Drawings.
Exterior Finish: Baked on corrosion resistant primer and baked on Polyvinylidene Fluoride (PVDF) finish coat which includes 70% Kynar 500/Hylar 5000 resins.
Color: Selected by Architect.
Location: Where exposed and elsewhere shown on Drawings.
Aluminum Sheet:
Material: Alloy 5005-H32, conforming to ASTM B209/B209M, .050" minimum thickness unless otherwise shown on Drawings.
Finish: Anodized conforming to NAAMM AA-M12C22A44, Class 1, Architectural, 0.7 mils thick, Dark Bronze #40 aluminum color to match storefront windows.
Location: Exposed locations adjacent to aluminum windows, doors, louvers and other openings shown on Drawings.
Galvanized Sheet Steel:
Conform to ASTM A 525, coating designation: G-90; lock forming quality conforming to ASTM A 527.
Location: At locations not specified above or where shown on Drawings.
Stainless Steel:
Material: Alloy 316/316L molybdenum-bearing austenitic stainless steel.
Standards: ASTM UNS S31600. ASME S31603.
Exterior Finish: No. 4, smooth.
Color: Natural.
Location: Exterior flashing and elsewhere as shown on drawings.

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SCREWS
Pan head, self-tapping, sheet metal type; conforming to Fed. Spec. FF-S-107; #7 by one inch long minimum, cadmium plated, use stainless steel at stainless steel metal.

RIVETS
1/8 inch minimum diameter, length as recommended by rivet manufacturer for materials to be joined; cadmium plated.

EXPANSION ANCHORS
Type recommended by manufacturer for conditions of use.
1/4 inch diameter by 1 inch long, minimum.

SOLDER
ASTM B 32; 50% Tin and 50% Lead.

FLUX
Rosin, cut muriatic acid, or commercial preparation for material to be soldered.

SEALANT
Silicone type conforming to Fed. Spec. TT-S-001543; Dow, GE, or accepted substitute.

ASPHALT PLASTIC CEMENT
Fed. Spec. SS-C-153, Type 1.

PRIMER COATING AND UNDERCOATINGS
Galvanized iron primer as specified in Section 09 90 00.

ASPHALTIC COATING COMPOUND
Fed. Spec. TT-C-494, Type 11.

FABRICATION
General:
Form to details shown on Drawings or described herein. For work not described or detailed in the Drawings or Specifications, refer to SMACNA “Architectural Sheet Metal Manual”.
Form to shapes and dimensions shown with planes and lines in true alignment.
Unless otherwise shown on Drawings or specified fabricate with longest practicable lengths.
Hem exposed edges.
Angle bottom edge of vertical surfaces to form drip.
Cleats:
Same material and thickness as sheet metal.

PART 3 - EXECUTION

EXAMINATION
Verify that surfaces to receive sheet metal are smooth, clean, and otherwise properly prepared.
Verify that reglets and nailers to receive sheet metal are properly placed.
Prior to starting work notify General Contractor of defects that require correction.
Do not start work until conditions are satisfactory.

PREPARATION
Before fabricating sheet metal, verify shapes and dimensions of surfaces to be covered.
If field measurements differ slightly from Drawing dimensions modify work as required for accurate fit. If measurements differ substantially notify Architect prior to fabrication.

INSTALLATION, GENERAL
Install work watertight, without waves, warps, buckles, tool marks, fastening stresses, distortion, or defects which impair strength or mar appearance.
Install planes and lines to true alignment.
Allow for sheet metal expansion and contraction.

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SEAM INSTALLATION
Common Lock Seams:
3/4 inch finish width; 4-ply loose-locked.
Flat Lock Seams:
5/8 inch finish width; 4-ply flat-locked, malleted tight; sweat full with solder.
Drive Lock Seams:
Fold back abutting edges and cover joint with 1 1/8 inch wide loose drive cap.
Single Corner Seams:
3/4 inch finish width, 3-ply loose locked.
Double Corner Seams:
5/8 inch finish width; 4-ply loose locked.
Lap Seams:
3 inch finish width.
Solder-Lap Seams:
1 inch finish width; sweat full with solder.
Cover Plate Seams:
Space abutting sheets 1/2 inch; cover joint with 4 inch wide cover and back-up plates set in sealant.
Match plates to flashing profile.
Secure plates to substrate with screw installed through open space between flashing sheets.
S-Lock Seams:
Form 1 1/4 inch wide "S" shaped seam on one edge of flashing sheet for concealed fastening.

CLEAT INSTALLATION
Space 2 feet on center, unless continuous cleats or other spacings are specified hereunder.
Secure spaced cleats to substrate with 2 fasteners.
Secure continuous cleats to substrate with fasteners spaced at 12 inch maximum centers.
Cover fastener heads with cleat tabs.

SOLDERING
Clean and flux metals prior to soldering.
Sweat solder completely through seam widths.

SEALANT INSTALLATION
Apply 1/4 inch diameter bead, centered in full length of joint.

ASPHALT PLASTIC CEMENT INSTALLATION
Trowel apply 1/8 inch thick.

PAINTING
Apply primer coat to exposed sheet metal surfaces specified in Section 09 90 00 to receive finish paint; l 1/2 mil dry film thickness.
Protect galvanized steel against oxidation by back-painting with undercoating, 1 1/2 mil dry film thickness.
Protect contacting dissimilar metals against corrosion with asphaltic coating compound, 7 1/2 mil dry film thickness, applied to each contacting face.

CUSTOM FORMED METAL
At aluminum Windows, Louvers and Other Openings: Form to detail of anodized aluminum sheet. Color and finish to match adjacent frames.
At steel doors, Louvers and Other Openings: Form to detail of prefinished steel. Color and finish to match adjacent frames.
Elsewhere: Form to detail of pre-finished steel.

ROOF PENETRATIONS
General:
Form of 26 gage galvanized steel.
Base Flashing:
Extend flange onto roof 8 inches minimum in all directions away from penetration, and upward around penetration to position at least 2 inches above roof flood line.
At sheet metal roofing fold upper and side edges back flange 1/2 inch.

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Solder-lap joints.
Furnish to roofer for installation.
Counter Flashing:
Overlap base flashing at least 1 inch with storm collar sloped away from penetration.
Secure to penetration with solder.

EQUIPMENT SUPPORT FLASHING
Form of 18 gage galvanized steel.
Fully cap support.
Over lap base flashing 4 inches.
Solder-lap joints.
Provide sealant around penetrations, if any.

MISCELLANEOUS FLASHING
Provide flashing around doors, windows, louvers, and other openings in exterior walls where indicated or required to maintain building watertight.

CLEANING AND REPAIRING
As work progresses, neutralize excess flux with 5% to 10% washing soda solution, and thoroughly rinse.
Including work of other sections, clean, repair and touch-up, or replace when directed products which have been soiled, discolored, or damaged by work of this section.
Leave surfaces ready for finish painting specified in Section 09 90 00.
Remove debris from project site upon work completion or sooner, if directed.

PROTECTION
Protect other work against damage and discoloration caused by work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES

Elastomeric and non-elastomeric sealants, caulking compounds, compression seals, joint fillers and related accessories.

DELIVERY, STORAGE, AND HANDLING

Protect against damage.

Store products in original, tightly sealed containers, original labels thereon.

Do not exceed sealant shelf life.

SUBMITTALS

Submit in accordance with Section 01 33 00.

Manufacturer's Data:

Provide Manufacturer's installation instructions for each product used.

Provide Manufacturer's Literature and Data for primers and each type of sealant including compatibility when different sealants in contact with each other.

Sustainability Requirements:

Submit manufacturer's product data listing volatile organic compound (VOC) content of products specified herein.

Provide manufacturer's documentation verifying that sealants contain no urea-formaldehyde.

Samples:

Provide cured samples of exposed sealants for each color where required to match adjacent material.

ENVIRONMENTAL REQUIREMENTS

Perform no work when weather exceeds manufacturer's specified limits.

EMISSIONS STANDARDS

Conform to the following minimum standards for sealant emissions:

Sealant Type	VOC Limits	Standard
Architectural Sealants:	250 g/L	SCAQMD Rule #1168
Other Sealants:	420 g/L	SCAQMD Rule #1168

QUALITY ASSURANCE

Installer Qualifications:

Experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.

Source Limitations:

Obtain each type of joint sealant through one source from a single manufacturer.

Sealant Testing:

Product Testing: Obtain test results from a qualified testing agency based on testing current sealant formulations within a 12-month period.

Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021.

Test elastomeric joint sealants according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C920 for adhesion and cohesion under cyclic movement, adhesion-in peel, and indentation hardness.

Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.

Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to joint substrates in accordance with sealant manufacturer's recommendations:

- Locate test joints as directed by Architect.
- Conduct field tests for each application indicated below:
  - Each type of elastomeric sealant and joint substrate indicated.
  - Each type of non-elastomeric sealant and joint substrate indicated.
- Notify Architect seven days in advance of dates and times when test joints will be installed

Arrange for tests to take place with joint sealant manufacturer's technical representative present.

Mockups:

Provide a mock-up example of three stages of the assembly;

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The joint with all existing removed and cleaned prior to backer rod.
The joint with backer rod and all prep prior to sealant.
The finished joint with sealant applied.

The mock-up examples may be presented at one location or several at contractor's option.

Pre-Application Meeting:

Prior to sealant application, arrange meeting to clarify any questions about Specifications, details, and application requirements.

Representatives of the following shall attend:

Owner
Architect
General Contractor
Sealant Contractor with Supervisor
Sealant Manufacturer Representative

ENVIRONMENTAL REQUIREMENTS

Perform no work when weather exceeds manufacturer's specified limits.

WARRANTY

Caulking and sealing subject to 2 year weatherproof warranty called for in Supplementary Conditions, Section 00 73 00.

Prior to final project acceptance submit in accordance with Section 01 78 23, 2 copies of the Warranty for inclusion in Owner's Maintenance Manual:

COORDINATION

Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

SILICONE SEALANT

At Interior Air Seal of Doors/Windows:

One part, neutral cure silicone sealant.

Basis of Design: Dow Corning, Dow 758.

At other locations:

Dow Corning, DOWSIL 790, or accepted substitute, with mildew inhibitor, conforming to Fed. Spec. TT-S-001543.

Select proper type in accordance with manufacturer's recommendations.

URETHANE SEALANT

Vertical Joints:

ASTM C920, Type S, Grade NS, Class 50 for use NT.

Non-sag, one component type; BASF Building Systems, MasterSeal NP100.

Horizontal Joints:

ASTM C920, Type M, Grade P, Class 25 for use T and I.

Self-leveling, multicomponent type; BASF Building Systems, MasterSeal NP100.

FOAM AIR-INFILTRATION SEALANT

Grace Polycel One.

SEALANT COLORS

Urethane Sealant: Approximate color of adjacent surfaces, unless otherwise directed.

Silicone Sealant: Approximate color of adjacent surfaces, or clear if color not available.

Foam Sealant: Contractor's choice.

PRIMER AND SURFACE CONDITIONER

Made or recommended by manufacturer of compound or sealant.

BACKER ROD

Closed-cell polyethylene gasketing rod, Dow "Ethaform," or accepted substitute.

Diameter: 1/4 greater than width of joint where to be installed.

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PART 3 - EXECUTION

EXAMINATION

Inspect joints to be sealed and verify that joints are clean, dry, and free from dust, oil, grease, rust, lacquer, laitance, loose mortar, or other bond-reducing matter.
Allow concrete surfaces to dry at least 4 weeks before sealing.
Prior to starting work notify General Contractor of defects requiring correction.
Do not start work until conditions are satisfactory.

PREPARATION

General:

Remove dust, dirt and other foreign matter from joints to be sealed by brushing and air-blowing.

Priming:

Prime unpainted surfaces to receive sealant.
Apply with bristle brush. Do not flood surfaces.

BACKER INSTALLATION

Install backer rod behind sealant in accordance with manufacturer's directions.
Provide in as long continuous lengths as practicable.
Stretch taut and force into joints to uniform depth, approximately 1/2 Joint width but not to exceed 1/2 inch.
Replace any punctured backer rod.

FOAM SEALANT INSTALLATION

Follow sealant manufacturer's directions.
Inject sealant continuously until opening is filled.
If opening is not filled within sealant snap time or maximum of 3 minutes, stop application for at least 15 minutes before resuming work.
Trim cured foam flush with adjacent surface.

OTHER SEALANT INSTALLATION

Apply sealant in accordance with manufacturer's directions using gun-type dispenser.
Size gun nozzle to fit joint.
Seal joints before applying final paint coat.
Fill joints and voids solid; superficial pointing with skin bead not acceptable.
Install flush with adjacent surfaces.
Tool joints smooth within 10 minutes after installation.
Remove masking materials, if any, immediately after sealant installation.

APPLICATION

Caulk exterior and interior joints around window frames, door frames, and louver frames and other openings in exterior walls with urethane sealant.
Apply color-matched sand to joints in masonry.
Where subject to air infiltration, caulk spaces between wall framing members and windows, doors, and other openings in exterior walls with foam air-infiltration sealant.
Caulk space beneath exterior wall base plates with foam air infiltration sealant.
Caulk with silicone sealant where shown on Drawings.

CLEANING AND REPAIRING

Remove excess material as work progresses and leave surfaces neat, smooth, and clean.
Remove debris from project site upon work completion or sooner, if directed.
Including work of other sections, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.

PROTECTION

Protect other work against damage and discoloration caused by work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES
Shop fabricated metal doors, insulated or non-insulated, stock or custom sizes. Shop fabricated and assembled or field assembled steel frames of standard profiles and measurements.

REFERENCES
Except as modified herein, conform to requirements of "Recommended Specifications Standard Steel Doors and Frames," S.D.I. 100 (ANSI 250.8-2003), published by Steel Door Institute, 30200 Detroit Road, Westlake, Ohio 44145; 440-899-0010.
Conform to requirements of ANSI 250.4-2001, Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frame Anchors and Hardware Reinforcings; and ANSI 250.10-1998, Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames. Specifications may be obtained from Institute.

SUBMITTALS
Provide in accordance with Section 01 33 00.
Shop Drawings:
Show elevations, principal construction features, and dimensions of each door type and frame type, cut-outs, reinforcement, joints, welds, finish, anchoring and other pertinent details.
Locate and detail field splice joints for frames too large to ship in one piece.
Indicate instructions for making field splices.
Manufacturer's published details may be substituted for standard stock items, provided required information is included.
Certificates:
Furnish letter from manufacturer stating that the work delivered to project conforms to these Specifications.
Label on each unit, as defined in this section, may be substituted, at Contractor's option.

REGULATORY REQUIREMENTS
Fabricate doors and frames where scheduled to be fire-restrictive in accordance with Underwriters Laboratories requirements. Affix UL Acceptance Label on each piece.

QUALITY ASSURANCE
Manufacturer’s Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

DELIVERY, STORAGE, AND HANDLING
Protect against damage and discoloration.
Remove door wrappings upon jobsite delivery.
Store doors and frames upright in protected dry area, at least one inch above ground or floor, and with at least 1/4 inch between individual pieces.
Brace bottom ends of frame jambs against displacement.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

MATERIALS
General:
Steel, carbon, cold-rolled, commercial quality: ASTM A 366.
Steel sheet, zinc coated (galvanized) by the hot dip process, general requirements: ASTM A 525.
Steel, carbon, hot-rolled sheet and strip, commercial quality: ASTM A 569.
Sheet steel, cold-rolled, electrolytic zinc coated: ASTM A 591.
Supports and Anchors:
Fabricate of not less than 18 gage galvanized sheet steel.
Inserts, Bolts, and Fasteners:
General: Comply with ASTM A 153, class C or D as applicable.

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Items built into exterior walls: Galvanized.
Elsewhere: Manufacturer's standard units.
Glass and Glazing:
Provide glass and glazing materials which comply ANSI Z97.1 and with Section 08 80 00.

STANDARD STEEL DOORS
Type: Level II, Model 1, heavy duty 1-3/4 inch. Galvanized at exterior locations.
Style: Style F unless otherwise shown on Drawings, full flush hollow steel construction.
Construction: 18 gage.
Core: Solid foam core.

STANDARD STEEL FRAMES
Gauge Construction:
Exterior Frames: 16 gage, galvanized.
Interior Frames less than 40 inches wide: 18 gage.
Frame Type:
Construction: Full welded.
Frame Face: Standard 2" width.
Frame Depth:
    Interior: Finished wall thickness + 1 inch unless otherwise shown on Drawings.
    Exterior: 5 3/4 inches unless otherwise shown on Drawings.

ANCHORS
General:
Follow referenced specifications.
To Stud Walls:
Full frame width and depth, welded to frame.
Minimum quantity:
    Frames up to 7'-6" high: 3 per jamb.
    Frames 7'-6" to 8'-0" high & Bullet Resistant Steel Frames: 4 per jamb.

FABRICATION
General:
Fabricate steel door and frame units to be rigid, neat in appearance and free from defects, warp or buckle.
Clearly identify work that cannot be permanently factory-assembled before shipment, to assure proper assembly at project site.
Fill surface depressions with metallic paste filler and grind to smooth finish.
Touch up areas where galvanized coating has been removed.
Fabricate with 26 gage minimum dust cover boxes at hardware mortises.
Fabricate with the following clearances:
    Between doors and frames: 1/8 inch.
    Between door sills and thresholds: 1/4 inch.
    Between door sills and floor: 5/8 inch.
    Between meeting edges of pairs of doors: 1/8 inch.
Shop Finish:
Dress surface irregularities to smooth surface.
Chemically treat and clean exposed surfaces.
Manufacturer's standard, bonderized, and one coat baked-on rust inhibiting prime paint.
Doors:
Mechanically interlock longitudinal seams of honeycomb core type doors and panels. Leave seams invisible, or weld, fill and grind smooth.
Fabricate exterior doors with flush tops.
Provide astragals for double doors where removable center mullions are not provided. Provide in accordance with UL requirements for labeled doors and panels.
Frames:
Accurately form and cut mitered corners of welded type frames. Weld on inside surfaces. Grind welded joints to smooth uniform finish.
Accurately cope and securely weld butt joints of mullions and transoms of glazed lights. Grind welded

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joints to smooth uniform finish.
Reinforce frames wider than four feet with 12 gage formed steel channels welded in place, flush with top of frames.
At metal stud partitions, for exterior and interior doors as noted on Drawings: backplaster frames with rich, metal adhering, fast setting gypsum plaster.
Hardware reinforcement:
Make standard provision for hardware listed in Section 08 71 00, in accordance with ANSI/SDI 250.6-2003 “Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames”.
Reinforce for hardware listed in Hardware Schedule, Section 08 71 00.
Provide standard reinforcement for door closers whether or not closers are listed in Hardware Schedule, Section 08 71 00.

PART 3 - EXECUTION

EXAMINATION
Verify that openings to receive hollow steel doors and frames are accurately sized and located, square, plumb, and otherwise properly prepared.
Prior to starting work notify General Contractor of defects requiring correction.
Do not start work until conditions are satisfactory.

PREPARATION
Verify field dimensions prior to fabrication.
If minor differences exist between field measurements and drawing dimensions, modify work as required for accurate fit. Notify Architect about major differences prior to fabrication.

INSTALLATION
Follow referenced specifications and manufacturer's instructions.
Secure anchors to adjacent construction.
At metal stud partitions, for exterior and interior doors as noted on Drawings: backplaster frames with rich, metal adhering, fast setting gypsum plaster.
Set frames true with adjacent construction.
Accurately position work. Set doors flush with frame face.
Set doors plumb to hold any desired position.
Install glazed light frames with welded glass stops on security side.
Coordinate installation of glass and glazing in doors.

ADJUSTING
Adjust moving parts to operate satisfactorily at time of final project acceptance and during warranty period.

CLEANING AND REPAIRING
Including work of other sections, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.
Leave surfaces ready for finish painting specified in Section 09 90 00.
Remove debris from project site upon work completion or sooner, if directed.

PROTECTION
Protect other work against damage and discoloration caused by work of this section.
Protect contacting dissimilar materials against electrolytic corrosion.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES
Hollow and solid core wood doors, solid wood stiles and rails and/or plastic laminate face veneer.

REFERENCES
For Hardwood Veneer Faced Doors: National Woodwork Manufacturer's Association Industry Standards I.S.1-97.
Standard may be obtained from association at 400 W. Madison Street, Chicago, Ill. 60606.
For Softwood Doors: Fir and Hemlock Door Association, Industry Standard FHDA 5-75.
Standard may be obtained from Association at 1500 Yeon Building, Portland, Oregon 97204.

OPTIONS
Prefitting doors to frames and preparing for finish hardware specified in Section 08 71 00 may, at Contractor's option, be performed at mill.
Flush panel doors with openings therein, may, at Contractor's option, be fabricated with stile and rail cores.

SUBMITTALS
Submit in accordance with Section 01 33 00.
Shop Drawings:
Show elevations, principal construction features and dimensions of each door type.
Samples:
Submit two samples of door veneer, 12 x 12 inch size, illustrating wood grain, stain color, and sheen.

REGULATORY REQUIREMENTS
Fire Resistance Rating Certification Agency: Underwriter's Laboratories, Inc.

QUALITY ASSURANCE
Manufacturer’s Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

DELIVERY, STORAGE, AND HANDLING
Do not deliver to jobsite until notified by General Contractor that project is conditioned and prepared to handle and store products without damage or discoloration.
Protect against damage and discoloration.
Store flat on level, dry surface and in well ventilated space.
Cover for protection, but allow air circulation.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

CORE
Interior Flush Solid Core Doors:
Particle board type with 1 1/8 inch minimum width stiles.
All other doors:
Manufacturer's standard material.

FACE
At doors to be painted:
Hardboard facing for opaque finish
Construction Grade: Class 1 Tempered, S2S (smooth two sides), hardboard, 1/8” (3.2mm) thick

EDGE BAND
At wood doors:
1/2 inch thick, minimum.
Species: Manufacturer's standard hardwood, matched for color.

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ADHESIVE
Commercial Standards CS-171, Type I.

FACTORY FINISH
Finishing Standards: Conform to AWI/WDMA TR-6, Premium grade.
Type:
Base: S-W ProClassic® Waterborne Acrylic Semi-Gloss Enamel, B31-2100 Series
Top Coat: S-W ProClassic® Waterborne Acrylic Semi-Gloss Enamel, B31-2100 Series
(4.0 mils wet, 1.2 mils dry per coat)
.
Color: See Finish Schedule
Sheen: Semi-Gloss.
Edges: Finish vertical and horizontal door edges same as door face

FABRICATION
Conform to referenced standards "Premium" grade.
Prepare doors in accordance with "Standard Procedures and Recommendations for Factory Machining," published by National Woodwork Manufacturer's Association.
Install glass, if any, in other doors with manufacturer's standard wood stops to match Oregon Door WVF-8 Flush Square with Quirk profile.
Tolerances:
Thickness: 1/16 inch plus or minus.
Size: 1/8 inch plus or minus; 1/32 inch for prefit doors.
Squareness: 1/4 inch maximum difference between opposite diagonal measurements.
Warp: 1/4 inch maximum space measured from horizontal, vertical, or diagonal straight edge to point of maximum bow, cup or twist.

PART 3 - EXECUTION

EXAMINATION
Verify that door frames are correct type, accurately located and sized, square, plumb, true, and otherwise properly prepared.
Prior to starting work notify General Contractor about defects requiring correction.
Do not start work until conditions are satisfactory.

PREPARATION OF DOORS FOR HANGING
Seal job-cut surfaces with 2 coats waterproof sealer compatible with door finish.
Undercut doors as required for floor covering clearance.
Fit doors for width by planing; for height by sawing.

INSTALLATION
Position doors flush with frame face.
Set plumb so door will hold any desired position.
Install with the following clearances:
Between doors and frames: 1/8 inch.
Between door sills and thresholds: 1/4 inch.
Between meeting edges of pairs of doors: 1/8 inch.

ADJUSTMENTS
Adjust moving parts to operate satisfactorily at time of final project acceptance and during warranty period.

CLEANING AND REPAIRING
Including work of other sections, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.
Leave surfaces ready for finishing specified in Section 09 90 00.
Remove debris from project site upon work completion or sooner, if directed.

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PROTECTION

Protect other surfaces against damage or discoloration caused by work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES
Special doors operating in various methods and for various uses including hardware and controls.

SUBMITTALS
Provide in accordance with Section 01 33 00.
Shop Drawings:
Show elevations, principal construction features, and dimensions of each door type and frame type, cut-outs, reinforcement, joints, welds, finish, anchoring and other pertinent details.
Locate and detail field splice joints for frames too large to ship in one piece.
Indicate instructions for making field splices.
Manufacturer's published details may be substituted for standard stock items, provided required information is included.

REGULATORY REQUIREMENTS
Fabricate doors, where scheduled to be fire-resistive, in accordance with Underwriters Laboratories requirements. Affix U.L. Acceptance Label on each piece.

DELIVERY, STORAGE, AND HANDLING
Protect against damage and discoloration.

ENVIRONMENTAL REQUIREMENTS
Protect contacting dissimilar materials against electrolytic corrosion.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

CEILING ACCESS DOORS
Type: Flush, downward acting, 24 x 30 inch nominal size.
Manufacturer: Larsen's, Milcor Inc., Bilco, or accepted substitute.
Material: 14 gage door, 16 gage frame, prime coated steel.
Provide fire rated doors where required by Code.
Hardware: Concealed type hinges.
Number Required: Allow in Bid for all access doors, if any, indicated on Drawings.
Exact number will be determined by Architect as Work progresses.
Contract sum will be adjusted in accordance with General Conditions.
Locks: Cylinder lock, keyed to existing access door locks. Furnish with two keys per lock.

WALL ACCESS DOORS
Type: Flush, side hinged, size as shown on Drawings.
Manufacturer: J.L. Industries, Milcor Inc., Larsen's, or accepted substitute.
Material: 14 gauge door, 16 gauge frame, prime coated steel.
Finish: Manufacturer’s standard primer. Paint panel doors and frames to match color of adjacent material.
Size: As required for installation. Minimum size for access to plumbing valves 12” X 12”.
Provide appropriate U.L. fire-resistance rating where doors are located in fire walls.
Hardware: Concealed type hinges.
Number Required: Allow in Bid for all access doors, if any, indicated on Drawings or required under Divisions 22 and 23.
Exact number will be determined by Architect as Work progresses.
Contract sum will be adjusted in accordance with General Conditions.
Locks: Cylinder lock, keyed to existing access door locks. Furnish with two keys per lock.

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PART 3 - EXECUTION

EXISTING CONDITIONS

Verify that openings to receive doors are square, plumb, and accurately sized and located. Prior to starting work notify General Contractor of defects requiring corrections.

Do not start work until conditions are satisfactory.

INSTALLATION

Install access doors and hardware in accordance with manufacturer's directions and approved shop drawings.

Accurately locate and anchor members plumb, square, true, rigid, secure, and with proper clearances.

ADJUSTMENTS

Adjust moving parts to operate satisfactorily at time of project final acceptance and during warranty period.

PRODUCT CLEANING AND REPAIRING

Including work of other sections, clean, repair and touch-up, or replace when directed products which have been soiled, discolored, or damaged by work of this section.

Leave surfaces ready for painting specified in Section 09 90 00.

Remove debris from project site upon work completion or sooner, if directed.

PROTECTION

Protect other work against damage and discoloration caused by work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES

Entrance, transom and sidelight systems fabricated of formed or extruded metals and all glass systems.

SUBMITTALS

Provide in accordance with Section 01 33 00.

Shop Drawings:

Show elevations, principal construction features, and dimensions of each door type and frame type, cut-outs, reinforcement, joints, welds, finish, anchoring and other pertinent details.

Samples:

Submit finish color samples.

Submit frame sections, mullion section, corner section, glass, and anchor samples upon request.

Submit two samples 24 x 24 inches in size illustrating finished aluminum surface, glazing, infill panels, glazing materials.

LABORATORY TESTING AND PERFORMANCE REQUIREMENTS

Performance Requirements:

Provision for Thermal Movements: Design storefront framing systems to provide for thermal movement of all component materials resulting from expected surface temperatures range without causing buckling, stresses on glass, failure of joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance, or other detrimental effects. Operating windows and doors shall function normally over temperature range.

Test Procedures and Performance:

Air Infiltration Test:

Test unit in accordance with ASTM E 283 at a static air pressure difference of 6.24 psf (299 Pa).

Maximum air infiltration.06 cfm/SF (.30 l/s•m²) of unit.

Water Resistance Test:

Test unit in accordance with ASTM E 331.

No uncontrolled water leakage at a static test pressure of 10.0 psf (479 Pa).

Uniform Load Deflection Test:

Test in accordance with ASTM E 330.

Maximum deflection under design load L/175 of the clear span.

Uniform Load Structural Test:

Test in accordance with ASTM E 330 at a pressure 1.5 times the design wind pressure in 1.05.B.3.b with no glass breakage, permanent damage to fasteners, storefront parts, or any other damage that would cause the storefront to be defective.

Condensation Resistance Test (CRF):

Test unit in accordance with AAMA 1503.1.

Minimum condensation Resistance Factor (CRF) 66 (frame) and 69 (glass) when glazed with 1" (25 mm) insulated – 1/4" (6 mm) clear low emissivity, 1/2" (12 mm) air, 1/4" (6 mm) clear glass.

Thermal Transmittance Test (Conductive U-Value):

Test in accordance with AAMA 1503.1.

Maximum conductive thermal transmittance (U-Value) 0.44 BTU/hr•ft²•°F (2.49 W/m²•K) when glazed with 1" (25 mm) insulated – 1/4" (6 mm) clear low emissivity, 1/2" (12 mm) air, 1/4" (6 mm) clear glass.

Thermal Transmittance Test (Conductive U-Value):

Test in accordance with NFRC-102.

Maximum conductive thermal transmittance (U-Value) 0.41 BTU/hr•ft²•°F (2.32 W/m²•K) when glazed with 1" (25 mm) insulated – 1/4" (6 mm) clear low emissivity, 1/2" (12 mm) air, 1/4" (6 mm) clear glass.

Project Wind Loads:

Design wind pressure, both positive and negative as required by Building Code, calculated from ANSI A58.1, or as determined by boundary layer wind tunnel testing.

Use 20.0 psf (958 Pa) as minimum.

Provide test reports from AAMA accredited laboratories certifying performance.

Thermal Performance:

Comply with Energy Code.

Maximum Assembly U-value:

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Entrance Doors: 0.80.
Elsewhere: 0.45.
Maximum Assembly Solar Heat Gain Coefficient: 0.40.
Air Leakage:
Entrance Doors: 1.0 cubic feet per minute per square foot of door area when tested in accordance with ASTM E 283.
Elsewhere: Maximum 0.3 cubic feet per minute per square foot of fenestration area when tested in accordance with ASTM E 283.

QUALITY ASSURANCE
Source Limitations for Aluminum-Framed Systems:
Obtain from single source from single manufacturer.
Manufacturer Qualifications:
Company specializing in manufacturing aluminum glazing systems with minimum five (5) years of documented experience.
Installer Qualifications:
Company specializing in installation of aluminum glazing systems and approved by glazing system manufacturer.
Pre-Installation Meeting:
Convene one week before starting work of this section to verify project requirements, coordinate with installers of other work.
Representatives of the following shall attend:
Owner's Project Representative
Architect
Mechanical Engineer/Systems Engineer
General Contractor
Storefront Installer
Manufacturer's Representatives
Representatives of other trades requiring coordination with Storefront installation.

DELIVERY, STORAGE, AND HANDLING
Protect against damage and discoloration.
Store doors and frames upright in protected dry area, at least one inch above ground or floor, and with at least 1/4 inch between individual pieces.
Brace bottom ends of frame jambs against displacement.
Provide removable protective coating on exposed metalwork adjacent to plaster, gypsum board, or sprayed gypsum work. Maintain until project completion.

ENVIRONMENTAL REQUIREMENTS
Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.

WARRANTY
Total Storefront System:
Assume full responsibility and warrant for one year the satisfactory performance of the total storefront installation including insulated glazing units, anchorage and setting system, sealing, flashing, etc., as it relates to air, water, and structural adequacy as called for in the specifications and approved shop drawings. Correct any deficiencies due to such elements not meeting the specifications by the responsible contractor at their expense during the warranty period.
Material and Workmanship:
Per AAMA standard 601, provide written guarantee against defects in material and workmanship. Warranty period shall be for 3 years from the date of final shipment.
Glass:
Provide written warranty for insulated glass units that they will be free from obstruction of vision as a result of dust or film formation on the internal glass surfaces caused by failure of the hermetic seal due to defects in material and workmanship. Warranty period shall be for 10 (ten) years.

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PART 2 - PRODUCTS

MATERIALS

Aluminum:

Structural shapes, blocking, bracing, and other concealed members: 6061-T6.
Exposed Extrusions: 6063-T6.
Casting: 214-T6.
Sheetmetal: 5005-H32.
Special Finishes: Modify alloys and tempers specified above as necessary for proper application of special finishes specified hereunder.

Finish (unless modified hereunder):

Concealed Work: Mill Finish.
All other Work: AA-M12C22A44, Class 1, Dark Bronze #40.

Glass:

Refer to Section 08 80 00.

STEEL REINFORCEMENT

Conform to ASTM A 36.

FASTENERS

Type recommended by manufacturer for conditions of use.
Galvanically compatible with materials to be fastened.

CORROSION INSULATING COMPOUND

Asphaltic Coating Compound: Fed. Spec. TT-C-494, Type II.

FRAMES

Material: Extruded aluminum.
Size and Profile: 2 inches x 4½ inches, flush front glazing at exterior windows, center glazing at interior windows.
Wall Thickness: .125 inch.
Manufacturer: Kawneer, EFCO, Oldcastle or accepted substitute.
Model:
    Exterior insulated glazing: Kawneer “Trifab VG 451T - Front”.

SWING DOORS

Material: Extruded aluminum.
Rail Dimensions:
    Top Rail: 6 inches width.
    Side Rails: 5 inches width.
    Bottom Rail: 10 inches height.
Manufacturer: Kawneer “Insulpour 500T”, or accepted substitute.

GLASS STOPS

Square stops and non-stretch, high shore vinyl glazing beads reinforced with 60 pound test fiberglass cord core against both glass faces.

FINISH HARDWARE

Provide the following Hardware by door manufacturer:
    Threshold: Manufacturer's standard extruded aluminum type, dark bronze anodized finish.
    Weatherstripping: Manufacturer's standard flexible, non-porous polymeric strip. Provide for heads, jambs and sills of exterior doors. Sill weatherstrip adjustable for wear.
See Section 08 71 00 Finish Hardware for other hardware.

FABRICATION

General:

Provide concealed steel stiffeners where indicated or required to resist wind or other applied loads.
Fabricate connections as required for strength and rigidity using concealed mechanical fastenings wherever possible. Where not possible, welding may be used.

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Cut horizontal members between verticals.
Match exposed welds with adjacent material, free of porosity, cracks and blow-holes.
Select materials carefully for matching color and texture after finishing.
Fabricate flat surfaces smooth and true, free from waves, buckles, and seams.
Fabricate edges, corners, and angles clean, sharp, and square; joints precision fitted.
Allow for expansion and contraction.
Make exterior work permanently weathertight.
Clearances:
Fabricate with the following clearances:
    Between Doors and Frames: 1/8 inch.
    Between Door Sills and Thresholds: 1/4 inch.
    Between meeting edges of pairs of Doors: 1/8 inch.
Tolerances:
Member Alignment: True within 1/8 inch per 12 feet.
Openings: Accurately sized and located within 1/4 inch.
Squareness: 1/8 inch maximum difference between opposite diagonal measurements.

PART 3 - EXECUTION

EXAMINATION
Verify that openings to receive work of this section are plumb, rigid, accurately sized and located, and otherwise properly prepared.
Prior to starting work notify General Contractor of defects requiring correction.
Do not start work until conditions are satisfactory.

PREPARATION
Verify prior to fabrication.
If field measurements differ slightly from drawing dimensions modify work as required for accurate fit. If measurements differ substantially notify Architect prior to fabrication.

INSTALLATION
Follow manufacturer's directions and approved shop drawings.
Install plumb, square, true, rigid, secure, weathertight, and without glass-to-metal contact between panels and frames.

PAINTING
Coat contacting dissimilar materials with corrosion insulating paint, 7 1/2 mil dry film thickness, minimum, applied to each contacting face.
Touch-up any unfinished metal exposed by cutting. Match adjacent color.

CLEANING AND REPAIRING
Remove protective coatings.
Including work of other sections, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.
Final glass cleaning specified in Supplementary Conditions.
Remove debris from project site upon work completion or sooner, if directed.

PROTECTION
Protect other work against damage or discoloration caused by work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES

Operating hardware and accessories for doors and windows not specifically supplied as part of the manufactured item. Door hardware includes, but is not necessarily limited to mechanical door hardware, electromechanical door hardware, power supplies, back-ups and surge protection, automatic operators, and cylinders specified for doors in other sections.

CODES AND REFERENCES

Comply with the version year adopted by the Authority Having Jurisdiction.
ANSI A117.1 - Accessible and Usable Buildings and Facilities.
ICC/IBC - International Building Code.
NFPA 80 - Fire Doors and Windows.
NFPA 101 - Life Safety Code.
NFPA 105 - Installation of Smoke Door Assemblies.
UL/ULC and CSA C22.2 – Standards for Automatic Door Operators Used on Fire and Smoke Barrier Doors and Systems of Doors.
State Building Codes, Local Amendments.
Standards: All hardware specified herein shall comply with the following industry standards:
ANSI/BHMA Certified Product Standards - A156 Series
UL10C – Positive Pressure Fire Tests of Door Assemblies
Conform to Building Code requirements if more restrictive than those specified herein.
Notify Architect of difference prior to starting work.

SUBMITTALS

Provide in accordance with Section 01 33 00.
Product Data:
Submit three (3) copies of manufacturer's data for each item of finish hardware.
Submit manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
Hardware Schedule:
Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, and procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
Content: Include the following information:
Type, style, function, size, label, hand, and finish of each door hardware item.
Manufacturer of each item.
Fastenings and other pertinent information.
Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
Explanation of abbreviations, symbols, and codes contained in schedule.
Mounting locations for door hardware.
Door and frame sizes and materials.
Submittal Sequence: Submit three (3) copies of the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
Submit a keying schedule in accordance with the Owner's representative.
Shop Drawings:
Show details of electrified access control hardware indicating the following:
Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system

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electrified hardware. Differentiate between manufacturer-installed and field-installed wiring.
Include the following:
Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
Complete (risers, point-to-point) access control system block wiring diagrams.
Electrical Coordination: Coordinate with related Division 26 Electrical Sections the voltages and wiring details required at electrically controlled and operated hardware openings.

Keying Schedule:

Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.

Operating and Maintenance Manuals:

Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required by Section 01 78 23. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.

Warranties and Maintenance:

Special warranties and maintenance agreements specified in this Section.

QUALITY ASSURANCE

Hardware Supplier shall employ person qualified for membership in American Society of Hardware Consultants, who shall be available for consultation with Architect and Contractor during course of work.
Prior to final project acceptance supplier's representative shall make one field inspection and notify Architect if hardware installation complies with manufacturers instructions.
Prior to final project acceptance supplier's representative shall instruct Owner how to properly adjust and maintain hardware.

Manufacturers Qualifications:

Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

Installer Qualifications:

Approved by supplier.
Installers, trained by the primary product manufacturers, with a minimum 3 years documented experience installing both standard and electrified builders hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

Door Hardware Supplier Qualifications:

Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor in good standing by the manufacturers of the primary materials with a warehousing facility in Project's vicinity.
Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
Scheduling Responsibility: Preparation of door hardware and keying schedules.

Source Limitations:

Obtain each type and variety of Door Hardware specified in this Section from a single source, qualified supplier unless otherwise indicated.
Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

Regulatory Requirements:

Comply with NFPA 70, NFPA 80, NFPA 101 and ANSI A117.1 requirements and guidelines as directed in the model building code including, but not limited to, the following:
NFPA 70 "National Electrical Code", including electrical components, devices, and accessories listed and

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labeled as defined in Article 100 by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1 as follows:
- Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
- Door Closers: Comply with the following maximum opening-force requirements indicated:
- Interior Hinged Doors: 5 lbf applied perpendicular to door.
- Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.

NFPA 101: Comply with the following for means of egress doors:
- Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
- Thresholds: Not more than 1/2 inch high

Keying Conference:
Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
- Function of building, purpose of each area and degree of security required.
- Plans for existing and future key system expansion.
- Requirements for key control storage and software.
- Installation of permanent keys, cylinder cores and software.
- Address and requirements for delivery of keys.

Pre-Submittal Conference:
Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
Review sequence of operation narratives for each unique access controlled opening.
Review and finalize construction schedule and verify availability of materials.
Review the required inspecting, testing, commissioning, and demonstration procedures
At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

DELIVERY, STORAGE, AND HANDLING
Deliver to General Contractor for installation in original, unopened containers with legible labels intact.
Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
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.
Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".
Include complete set of specialized hardware maintenance and removal tools for Owner's use. Store where directed by Owner.
Protect against theft, damage, and discoloration

COORDINATION
Coordinate with other trades affecting or affected by work of this section.
Templates:
Furnish hardware templates for fabricators of doors, frames and other work to be factory prepared for hardware. Check shop drawings of such other work to confirm that adequate provisions will be made for installation of hardware.

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Door Hardware and Electrical Connections:
Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.
Door and Frame Preparation:
Related Division 08 Sections (Steel, Aluminum and Wood) doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

WARRANTY
General Warranty:
Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
Warranty Period:
Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
Structural failures including excessive deflection, cracking, or breakage.
Faulty operation of the hardware.
Deterioration of metals, metal finishes, and other materials beyond normal weathering.
Electrical component defects and failures within the systems operation.
Standard Warranty Period:
One year from date of Substantial Completion, unless otherwise indicated.
Special Warranty Periods:
Ten years for mortise locks and latches.
Five years for exit hardware.
Twenty five years for manual surface door closers.
Two years for electromechanical door hardware.

MAINTENANCE SERVICE
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 door hardware.
Continuing Service:
Beginning at Substantial Completion, and running concurrent with the specified warranty period, provide continuous (6) months full maintenance including repair and replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door opening operation. Provide parts and supplies as used in the manufacture and installation of original.

PART 2 - PRODUCTS

SCHEDULED DOOR HARDWARE
General:
Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
Designations:
Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
    Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
Substitutions:
Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

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MATERIALS
Recycled Content of Steel Products: Postconsumer recycled content plus one-half of pre-consumer recycled content not less than the following:
Mortise Locks: 57%
Exit Devices: 54%
Door Closers: 51%

BUTT HINGES
Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles as specified in the Door Hardware Sets.
Type: Mortise.
Sizes: Provide the following, unless otherwise scheduled, with hinge widths sized for door thickness and clearances required:
Widths up to 3'-0": 4-1/2" standard or heavy weight as specified.
Sizes from 3'-1" to 4'-0": 5" standard or heavy weight as specified.
Size Hinges to clear any projecting trim or other obstructions where necessary to obtain maximum possible door opening.
Quantity: Provide the following hinge quantity, unless otherwise scheduled:
Two Hinges: For doors with heights up to 60 inches.
Three Hinges: For doors with heights 61 to 90 inches.
Four Hinges: For doors with heights 91 to 120 inches.
For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
Hinge Options: Comply with the following where indicated in the Hardware Sets or on Drawings:
Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:
Out-swinging exterior doors.
Out-swinging access controlled doors.
Out-swinging lockable doors.
Provide non-rising loose pins at all other doors unless otherwise scheduled.
Acceptable Manufacturers:
Hager Companies (HA).
McKinney Products (MK).

BARN DOOR HARDWARE
Carrier Hardware Kit: Knape and Vogt: FR-BZTM-96 Flat RailTop Mount, black. RT-HKBZ-06
Salzburg Series, black.

POWER TRANSFER DEVICES
Electrified Quick Connect Transfer Hinges:
Provide electrified transfer hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.
Acceptable Manufacturers:
McKinney Products (MK) - QC (# wires) Option.
Electric Door Hardware Cords:
Provide electric transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

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Acceptable Manufacturers:
McKinney Products (MK) – QC-C Series.
Provide one each of the following tools as part of the base bid contract:
McKinney Products (MK) - Electrical Connecting Kit: QC-R001.
McKinney Products (MK) - Connector Hand Tool: QC-R003.

MECHANICAL LOCKS AND LATCHING DEVICES
Cylindrical Locksets:
Grade 1 (Heavy Duty), ANSI/BHMA A156.2, Series 4000, Operational Grade 1 certified bored locksets furnished in the functions as specified in the Hardware Sets.
Locksets to be manufactured with a corrosion resistant, stamped 12 gauge minimum formed steel case and be field-reversible for handing without disassembly of the lock body.
Lockset trim (including levers, escutcheons, roses) to be the product of a single manufacturer. Furnish with standard 2 3/4" backset, 3/4" throw anti-friction stainless steel latchbolt, and a full 1" throw stainless steel bolt for deadbolt functions.
Manufacturer: Sargent Manufacturing (SA) – 10X Series, no substitutions (facility standard).
Lock Trim Design: As specified in Hardware Sets.
Mortise Locksets:
Grade 1 (Heavy Duty), ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified mortise locksets furnished in the functions as specified in the Hardware Sets.
Locksets to be manufactured with a corrosion resistant, stamped 12 gauge minimum formed steel case and be field-reversible for handing without disassembly of the lock body.
Lockset trim (including levers, escutcheons, roses) to be the product of a single manufacturer. Furnish with standard 2 3/4" backset, 3/4" throw anti-friction stainless steel latchbolt, and a full 1" throw stainless steel bolt for deadbolt functions.
Manufacturer: Sargent Manufacturing (SA) – 8200 Series, no substitutions (facility standard).
Lock Trim Design: As specified in Hardware Sets.

LOCK AND LATCH STRIKES
Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
Standards: Comply with the following:
Strikes for Mortise Locks and Latches: BHMA A156.13.
Strikes for Bored Locks and Latches: BHMA A156.2.
Strikes for Auxiliary Deadlocks: BHMA A156.5.
Dustproof Strikes: BHMA A156.16.

PUSH PLATES AND PULL BARS
ANS/BHMA A156.6 certified door pushes and pulls of type and design specified below or in the Hardware Sets.
Coordinate and provide proper width and height as required where conflicting hardware dictates.
Push/Pull Plates:
Thickness: Minimum .050 inch thick.
Size: As indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
Door Pull and Push Bar: Design, size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
Acceptable Manufacturers:
Rockwood Manufacturing (RO).
Trimco (TC).

CYLINDERS AND KEYING
General:

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Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

Source Limitations:

Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.

Cylinders

Original manufacturer cylinders complying with the following:

- Mortise Type: Threaded cylinders with rings and straight- or clover-type cam.
- Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
- Bored-Lock Type: Cylinders with tailpieces to suit locks.
- Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
- Keyway: Manufacturer's Standard.

High Security Cylinders:

High security cylinder conforming to UL437, including both pick and drill resistance.

Pick resistance incorporates two or more independent locking mechanisms including a pin tumbler device with six top pin chambers, mushroom-shaped driver pins, and coded sidebar locking mechanism operated independently from the six top pin tumbler device.

Drill resistance incorporates cylinder housing with fixed case-hardened inserts protecting the pin tumbler shear line, cylinder plugs with case-hardened inserts protecting both the pin tumbler shear line and the side bar, mushroom-shaped stainless steel driver pins, and stainless steel sidepins.

Factory key cylinders.

Acceptable Manufacturers: Medeco (MC) – M3 Series.

Keying System:

All Keying shall be part of Contractor's scope. Contractor to subcontract with Owner's locksmith, Oregon Lock. Each type of lock and cylinders to be keyed by Owner's locksmith.

Conduct specified "Keying Conference" to define and document keying system instructions and requirements.

Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.

Incorporate decisions made in keying conference, and as follows:

- Master Key System: Cylinders are operated by a change key and a master key.
- Grand Master Key System: Cylinders are operated by a change key, a master key, and a grand master key.
- Great-Grand Master Key System: Cylinders are operated by a change key, a master key, a grand master key, and a great-grand master key.
- Existing System: Master key or grand master key locks to Owner's existing system.
- Keyed Alike: Key all cylinders to same change key.

Key Quantity:

Provide the following minimum number of keys:

- Top Master Key: One (1)
- Change Keys per Cylinder: Two (2)
- Master Keys (per Master Key Group): Two (2)
- Grand Master Keys (per Grand Master Key Group): Two (2)
- Construction Keys (where required): Ten (10)
- Construction Control Keys (where required): Two (2)
- Permanent Control Keys (where required): Two (2)

Construction Keying:

Provide construction master keyed cylinders or temporary keyed construction cores where specified.

Provide construction master keys in quantity as required by project Contractor. Replace construction cores with permanent cores.

Furnish permanent cores for installation as directed under specified "Keying Conference".

Key Registration List:

Provide keying transcript list to Owner's representative.

Key Control Software:

Provide one network version of "Key Wizard" branded key management software package that includes one year of technical support and upgrades to software at no charge. Provide factory key system formatted for importing into "Key Wizard" software.

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CONVENTIONAL EXIT DEVICES

General:

All exit devices specified herein shall meet or exceed the following criteria:

At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.

Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.

Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.

Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is not acceptable except in any case where the door light extends behind the device as in a full glass configuration.

Flush End Caps: Provide heavy weight impact resistant flush end caps made of architectural metal in the same finish as the devices as in the Hardware Sets. Plastic end caps will not be acceptable.

Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty trim with cold forged escutcheons, beveled edges, and four threaded studs for thru-bolts.

Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets. Provided free-wheeling type trim where indicated.

Where function of exit device requires a cylinder, provide an interchangeable core type keyed cylinder (Rim or Mortise) as specified in Hardware Sets.

Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.

Dummy Push Bar: Nonfunctioning push bar matching functional push bar.

Rail Sizing: Provide exit device rails factory sized for proper door width application.

Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

Conventional Push Rail Exit Devices (Heavy Duty):

Conform to ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets.

Mounting rails to be formed from smooth stainless steel, brass or bronze architectural materials no less than 0.072" thick, with push rails a minimum of 0.062" thickness.

Painted or aluminum metal rails are not acceptable.

Exit device latch to be investment cast stainless steel, pullman type, with deadlock feature.

Acceptable Manufacturers: Sargent Manufacturing (SA) - 80 Series, no substitutions (facility standard).

Tube Steel Removable Mullions:

Conform to ANSI/BHMA A156.3 removable steel mullions with malleable-iron top and bottom retainers and a primed paint finish.

Provide keyed removable feature, stabilizers, and mounting brackets as specified in the Hardware Sets.

At openings designed for severe wind load conditions due to hurricanes or tornadoes, provide manufacturers approved mullion and accessories to meet applicable state and local windstorm codes.

Acceptable Manufacturers:

Sargent Manufacturing (SA).

ELECTROMECHANICAL EXIT DEVICES

Electrified Conventional Push Rail Devices (Heavy Duty):

Subject to same compliance standards and requirements as mechanical exit devices, electrified devices to be of type and design as specified below.

Acceptable Manufacturers: Sargent Manufacturing (SA) - 80 Series, no substitutions (facility standard).

Electrified Options:

As indicated in hardware sets, provide electrified exit device options including: electric latch retraction (shall be motorized type that fully retracts the touchpad/push bar), electric dogging, outside door trim control, exit alarm, delayed egress, latchbolt monitoring, lock/unlock status monitoring, touchbar monitoring and request-to-exit signaling.

Unless otherwise indicated, provide electrified exit devices standard as fail secure.

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DOOR CLOSERS

General:

Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size.

Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.

Unless specified elsewhere, do not restrict door swing.

Fasteners: Concealed.

Standards:

Closers to comply with UL-10C and UBC 7-2 for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

Cycle Testing:

Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.

Size of Units:

Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.

Closer Arms:

Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

Where closers are indicated to have mechanical dead-stop, provide heavy duty arms and brackets with an integral positive stop.

Where closers are indicated to have mechanical hold open, provide heavy duty units with an additional built-in mechanical holder assembly designed to hold open against normal wind and traffic conditions. Holder to be manually selectable to on-off position.

Where closers are indicated to have a cushion-type stop, provide heavy duty arms and brackets with spring stop mechanism to cushion door when opened to maximum degree.

Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

Provide drop plates or other accessories as required for proper mounting.

Closer Accessories:

Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates, and through-bolt or security type fasteners as specified in the door Hardware Sets.

Door Closers, Surface Mounted (Heavy Duty):

Conform to ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force.

Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control.

Provide non-handed units standard.

Acceptable Manufacturers: Sargent Manufacturing (SA) - 351 Series, no substitution, (facility standard).

AUTOMATIC DOOR OPERATORS

Refer to section 08 71 13.

DOOR PROTECTIVE TRIM:

Metal Protection Plates:

ANSI/BHMA A156.6 certified metal protection plates (kick, armor, or mop), beveled on four edges (B4E), fabricated from the following:

- Stainless Steel: 300 series, 050-inch thick, with countersunk screw holes (CSK).
- Brass or Bronze: 050-inch thick, with countersunk screw holes (CSK).
- Laminate Plastic or Acrylic: 1/8-inch thick, with countersunk screw holes (CSK).

Door protective trim units to be of type and design as specified below or in the Hardware Sets.

Size: Not more than 2" less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side.

Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.

Fasteners:

Provide manufacturer's designated fastener type as specified in the Hardware Sets.

Acceptable Manufacturers:

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Rockwood Manufacturing (RO).
Trimco (TC).

DOOR STOPS AND HOLDERS
Door Stops and Bumpers:
ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers.
Provide wall bumpers with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets.
Do not mount floor stops where they will impede traffic.
Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
Acceptable Manufacturers:
    Rockwood Manufacturing (RO).
    Trimco (TC).

DOOR SILENCERS
At Metal Frames: Glynn Johnson #64, or accepted substitute.
Three silencers for single doors, 4 for pairs of doors.

ARCHITECTURAL SEALS
General:
Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets.
Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated.
At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
Sound-Rated Gasketing:
Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated, based on testing according to ASTM E 1408.
Replaceable Seal Strips:
Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
Acceptable Manufacturers: Pemko Manufacturing (PE).
Threshold:
Extruded aluminum, maximum 1/2 inch height, mill finish unless otherwise scheduled.

ELECTRONIC ACCESSORIES
Proximity Card Readers:
Card readers to support HID 125 kHz proximity technology or 13.56 MHz contactless smart cards as specified in the hardware sets.
Provide hard wired signal connection.
Card readers to meet the following minimum design and performance specifications:
    Reader power supply: 4-16 VDC.
    Reader to be suitable for outdoor use.
    Contactless smart card versions to be compatible with the following technologies: iCLASS, iCLASS Seos, iCLASS SE, ISO1443B UID, Mifare, Mifare Plus, Desfire SE, Desfire EV1, NFC
    Reader to come pre-paired with an Aperio hub and communicate with the hub via IEEE802.14.4 (2.4 GHz) wireless technology.
    Reader to have green LED status indicator.
    Reader type and model to meet the design and mounting applications needs of each entry point as indicated on the drawings.
    Acceptable Manufacturers: HID (HD) – Indala 603 Series.
Power Supplies:
Provide Nationally Recognized Testing Laboratory Listed 12VDC or 24VDC (field selectable) filtered and regulated power supplies.
Include battery backup option with integral battery charging capability in addition to operating the DC load in event of line voltage failure.
Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.
Acceptable Manufacturers: Securitron (SU) - BPS Series.

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FASTENERS
Provide required screws, bolts, and other fasteners.
Match hardware material and finish.
Use phillips head type where exposed to view.

KEYS
Material: Nickel-silver, or approved.
Keying Instructions: Masterkey and otherwise key locks as directed by Owner.
Number of keys required: Furnish 2 keys for each lock unless otherwise instructed.

FABRICATION
Make hardware for prefitted doors and frames to template. Send templates, together with hardware schedule, to door and frame manufacturer not later than two weeks after hardware schedule approval.
Lock and latch components shall be manufactured by only one manufacturer, and carry that manufacturer's warranty.
Fabricate joints with smooth, hair-line seams.
Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

FINISHES
Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
Finish unless otherwise scheduled: BHMA No. 626 (US26D) satin chrome except:
Door Closers: Spray painted to match hardware color.
Thresholds: As listed.
Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

EXAMINATION
Verify that surfaces to receive finish hardware are properly prepared, including necessary backing.
Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
Prior to starting work notify General Contractor of defects requiring correction.
Do not start work until conditions are satisfactory.

PREPARATION
Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
Wood Doors: Comply with ANSI/DHI A115-W series.
Provide solid blocking for all wall stops.
Fasteners: Use fastening devices as needed to securely anchor all hardware per manufacturer's templates. Self tapping sheet metal screws are not acceptable. Closers on wood doors shall be through bolted.

INSTALLATION
General:
Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
Accurately locate, fit, and install square, plumb, and secure in accordance with manufacturer's directions and templates.
Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of

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fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
After fitting mortised hardware to surfaces to be painted remove and store hardware in original package until painting completion, then permanently install.
Mounting Heights:
Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
Retrofitting:
Install door hardware to comply with manufacturer's published templates and written instructions.
Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections.
Do not install surface-mounted items until finishes have been completed on substrates involved.
Thresholds:
Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
Storage:
Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

FIELD QUALITY CONTROL
Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

ADJUSTING
Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit.
Replace units that cannot be adjusted to operate as intended.
Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
Adjust moving parts to operate satisfactorily at time of final project acceptance and during warranty period.

CLEANING AND REPAIRING
Including work of other sections, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.
Remove debris from project site upon work completion or sooner, if directed.
Clean operating items as necessary to restore proper finish and provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

DEMONSTRATION
Instruct Owner's personnel in proper adjustment and maintenance of hardware and hardware finishes.

PROTECTION
Protect other surfaces against damage and discoloration caused by work of this section.

HARDWARE SCHEDULE
The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule.
Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect

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with corrections made prior to the bidding process.
Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
Manufacturer's Abbreviations:

- MK - McKinney
- MR - Markar
- PE - Pemko
- RO - Rockwood
- SA - Sargent
- MC - Medeco
- GE - GE
- SU – Securitron
- NO – Norton
- RF - Rixon
- DT – Detex
- SC – Schlage
- AC – Accurate

Hardware Sets

Set: 1.0

Doors: 101A

2 Hinge, Full Mortise	T4A3386xNRP 5" x 4-1/2"	US32D	MK
1 Hinge, Full Mortise	T4A3786 NRP QC12 4-1/2" x 4-1/2"	US32D	MK
1 Exit Device, Fail Secure	55 56 8774 ETL	US32D	SA
1 Drop Plate	351D	US32D	SA
1 Kickplate	K1050 10X1.5LDW CSK BEV	US32D	RO
1 Threshold	2705DT		PE
1 Dust Proof Strike	570	US26D	RO
1 Gasketing	S773D		PE
1 Power Door Operator	See section 08 71 13		
1 Frame Harness	QC-C1500 (as required)		MK
1 Door Harness	QC-C__ (as required)		MK
1 Door Position Switch	1076-G		GE
1 Power Supply	AQL4-R8E1		SU
2 Battery Backup	B-24-5		SU
1 Card Reader	By Owner's contractor.		

Notes:

Latch retraction, locked and unlocked on schedule via EAC system.
Presenting valid credentials retracts exit device latches to allow entry, depressing opens door.
Free egress allowed at all times.
Access Control to be coordinated with Owner's contractor. Access Control components provided by Owner's contractor. GC to prep doors for wiring harness and DPS.

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Set: 2.0

Doors: 101B, 101C, 101D, 102A, 116A, 152A, B03A

3 Hinge, Full Mortise	T4A3786 (NRP)	US26D	MK	
1 Storeroom Lock	RGD-LC-10XG04-LL	US26D	SA	⚡
1 Medeco Cylinder X3	as required MK match existing	26	MC	
1 Door Closer	351 P10	689	SA	
1 Kick Plate	K1050 10X1.5LDW CSK BEV	US32D	RO	
1 Wall Stop	403	US26D	RO	
1 Gasketing	S773D		PE	
1 Electric Strike	HES 1500		SU	
1 Frame Harness	QC-C1500 (as required)		MK	⚡
1 Door Position Switch	1076-G		GE	
1 Card Reader	By Owner's contractor.			

Notes:
Presenting valid credentials retracts exit device latches to allow entry, depressing opens door.
Free egress allowed at all times.
Access Control to be coordinated with Owner's contractor. Access Control components provided by Owner's contractor. GC to prep doors for wiring harness and DPS.

Set: 3.0

Doors: 102B, 117B

3 Hinge, Full Mortise	T4A3786 (NRP)	US26D	MK	
1 Exit Lock	10XG15-3-LL	US26D	SA	⚡
1 Medeco Cylinder X3	as required MK match existing	26	MC	
1 Door Closer	351 P10	689	SA	
1 Kick Plate	K1050 10X1.5LDW CSK BEV	US32D	RO	
1 Wall Stop	403	US26D	RO	
1 Gasketing	S773D		PE	

Set: 4.0

Doors: 103A, 104A, 105A, 107A, 108A, 109A, 110A, 113A, 114A

1 Passage Latchset	10XU15-LL	US26D	SA

Reuse balance of existing hardware.

Set: 5.0

Doors: 106A, 129A, 132A, 133A, B01A, B02A

1 Storeroom Lock	RGD-LC-10XG04-LL	US26D	SA	⚡
1 Medeco Cylinder X3	as required MK match existing	26	MC	

Reuse balance of existing hardware.

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Set: 6.0

Doors: 118A, 121A, 130A, 136A

3 Hinge, Full Mortise	T4A3786 (NRP)	US26D	MK
1 Dormitory Lock	RGD-LC-10XG53-LL	US26D	SA
1 Medeco Cylinder X3	as required MK match existing	26	MC
1 Wall Stop	403	US26D	RO
1 Gasketing	S773D		PE

Set: 7.0

Doors: 115A, 147A, 148A

3 Hinge, Full Mortise	T4A3786 (NRP)	US26D	MK
1 Privacy Lock w/Occupancy Indicator	L/LV9492EL/EU w/ XL13-439	US26D	SC
1 Medeco Cylinder X3	as required MK match existing	26	MC
1 Door Closer	351 P10	689	SA
1 Kick Plate	K1050 10X1.5LDW CSK BEV	US32D	RO
1 Wall Stop	403	US26D	RO
1 Gasketing	S773D		PE
1 Electric Strike	HES 1500		SU
1 Frame Harness	QC-C1500 (as required)		MK
1 Door Position Switch	1076-G		GE
1 Card Reader	By Owner's contractor.		

Notes:
Presenting valid credentials retracts exit device latches to allow entry, depressing opens door.
Free egress allowed at all times.
Remote entry from Reception rooms.
Thumb turn latched will disable card reader/remote entry.
Emergency key will override thumb turn.
Access Control to be coordinated with Owner's contractor. Access Control components provided by Owner's contractor. GC to prep doors for wiring harness and DPS.

Set: 8.0

Doors: 116B

1 Power Door Operator	See section 08 71 13		
1 Electric Strike	HES 9600		SU
1 Frame Harness	QC-C1500 (as required)		MK
1 Door Position Switch	1076-G		GE
1 Card Reader	By Owner's contractor.		

Reuse balance of existing hardware.

Notes:
Presenting valid credentials retracts exit device latches to allow entry, depressing opens door.
Free egress allowed at all times.
See hardware set 1.0 for power supply.

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Access Control to be coordinated with Owner's contractor. Access Control components provided by Owner's contractor. GC to prep doors for wiring harness and DPS.

Set: 9.0

Doors: 150B, 156A

3 Hinge, Full Mortise	T4A3386xNRP 5" x 4-1/2"	US32D	MK
1 Storeroom Lock	RGD-LC-10XG04-LL	US26D	SA
1 Medeco Cylinder X3	as required MK match existing	26	MC
1 Door Closer	351 P10	689	SA
1 Kick Plate	K1050 10X1.5LDW CSK BEV	US32D	RO
1 Gasketing	S773D		PE
1 Threshold	2705DT		PE
1 Rain Guard	346D		PE
1 Sweep	315CN		PE
1 Electric Strike	HES 1500		SU
1 Frame Harness	QC-C1500 (as required)		MK
1 Door Position Switch	1076-G		GE
1 Card Reader	By Owner's contractor.		

Notes:
Presenting valid credentials retracts exit device latches to allow entry, depressing opens door.
Free egress allowed at all times.
Access Control to be coordinated with Owner's contractor. Access Control components provided by Owner's contractor. GC to prep doors for wiring harness and DPS.

Set: 9.1

Doors: 117A

3 Hinge, Full Mortise	T4A3386xNRP 5" x 4-1/2"	US32D	MK
1 Storeroom Lock	RGD-LC-10XG04-LL	US26D	SA
1 Medeco Cylinder X3	as required MK match existing	26	MC
1 Door Closer	351 P10	689	SA
1 Kick Plate	K1050 10X1.5LDW CSK BEV	US32D	RO
1 Rain Guard	346D		PE
1 Sweep	315CN		PE
1 Electric Strike	HES 1500		SU
1 Frame Harness	QC-C1500 (as required)		MK
1 Door Position Switch	1076-G		GE
1 Card Reader	By Owner's contractor.		

Notes:
Presenting valid credentials retracts exit device latches to allow entry, depressing opens door.
Free egress allowed at all times.
Threshold and weatherstripping by aluminum door and frame supplier.
Access Control to be coordinated with Owner's contractor. Access Control components provided by Owner's contractor. GC to prep doors for wiring harness and DPS.

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Set: 10.0

Doors: 120A, 123A, 123B

3 Hinge, Full Mortise	T4A3786 (NRP)	US26D	MK
1 Passage Latchset	10XU15-LL	US26D	SA
1 Wall Stop	403	US26D	RO
1 Kick Plate	K1050 10X1.5LDW CSK BEV	US32D	RO
1 Gasketing	S773D		PE

Set: 11.0

Doors: 128A, B05A

1	Privacy Lock w/Occupancy Indicator	ND40-RHO	626	SC
1	Gasketing	S773D		PE

Reuse balance of existing hardware.

Set: 12.0

Doors: 143A, 143B

1 Side Wall Track System	280C-SWTKIT/8		PE
1 Bottom Channel	94A		PE
1 Pull Plate	8302-8	630	IV

Set: 13.0

Doors: 145A

1 Storeroom Lock	RGD-LC-10XG04-LL	US26D	SA
1 Medeco Cylinder X3	as required MK match existing	26	MC
1 Door Closer	351 O	689	SA
1 Kick Plate	K1050 10X1.5LDW CSK BEV	US32D	RO
1 Wall Stop	403	US26D	RO
1 Gasketing	S773D		PE
1 Electric Strike	HES 1500		SU
1 Frame Harness	QC-C1500 (as required)		MK
1 Door Position Switch	1076-G		GE
1 Card Reader	By Owner’s contractor.		

Reuse balance of existing hardware.

Notes:
Presenting valid credentials retracts exit device latches to allow entry, depressing opens door.
Free egress allowed at all times.
Access Control to be coordinated with Owner’s contractor. Access Control components provided by Owner’s contractor. GC to prep doors for wiring harness and DPS.

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Set: 14.0
Doors: 146A

3 Hinge (heavy weight)	T4A3786 (NRP)	US26D	MK
1 Storeroom Lock	RGD-LC-10XG04-LL	US26D	SA
1 Medeco Cylinder X3	as required MK match existing	26	MC
1 Wall Stop	403	US26D	RO
3 Silencers	608		RO

Set: 15.0
Doors: 111A

3 Hinge, Full Mortise	T4A3786 (NRP)	US26D	MK
1 Passage Latchset	10XU15-LL	US26D	SA
1 Wall Stop	403	US26D	RO
1 Gasketing	S773D 17'		PE

Set: 16.0
Doors: 119A, 1222A, 124A, 125A, 126A, 127A, 131A, 134A, 135A, 137A, 138A, 139A, 140A, 141A, 142A, 144A, B04A

1 Dormitory Lock	RGD-LC-10XG53-LL	US26D	SA
1 Medeco Cylinder X3	as required MK match existing	26	MC
1 Wall Stop	403	US26D	RO

Reuse balance of existing hardware.

Set: 17.0
Doors: 152B

1 Mortise Lockset	SL-M915XE		AC
1 Medeco Cylinder X3	as required MK match existing	26	MC
1 Side Wall Track System	280C-SWTKIT/8		PE
1 Bottom Channel	94A		PE
1 Electric Strike	HES 1500		SU
1 Frame Harness	QC-C1500 (as required)		MK
1 Door Position Switch	1076-G		GE
1 Card Reader	By Owner's contractor.		

Presenting valid credentials retracts exit device latches to allow entry, depressing opens door. Free egress allowed at all times.
Access Control to be coordinated with Owner's contractor. Access Control components provided by Owner's contractor. GC to prep doors for wiring harness and DPS.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES
Automatic operating equipment, hardware, and accessories to operate entrance doors of the swing or horizontal sliding type not specifically supplied as part of a proprietary door or entrance assembly.

SUBMITTALS
Provide in accordance with Section 01 33 00.
Shop Drawings:
Submit showing layout, profiles, product components including anchorage, accessories, finish and glazing details.
Product Data:
Submit three (3) copies of manufacturer's data for each item of automatic operating equipment.
Templates:
Furnish hardware templates for fabricators of doors, frames and other work to be factory prepared for equipment hardware. Upon request, check shop drawings of other work so that adequate provisions will be made for installation of hardware.

INSTALLER'S QUALIFICATIONS
Factory trained, experienced to perform work of this section and approved by supplier.

SOURCE LIMITATIONS
Obtain automatic door operators through one source from a single manufacturer.

REGULATORY REQUIREMENTS
Conform to Building Code requirements if more restrictive than those specified herein.
Notify Architect of difference prior to starting work.
Conform to ADAAG requirements for accessibility.

DELIVERY, STORAGE, AND HANDLING
Deliver in original, unopened containers with legible labels intact.
Include complete set of specialized hardware maintenance and removal tools, if any, for Owner's use. Store tools where directed by Owner.
Protect against theft, damage, and discoloration.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

DOOR OPERATORS
Manufacturer and Model: Horton "HD-Swing S4100", or accepted substitute.
Regulatory Standard: Conform to ANSI A156.19.
Type: Extra heavy duty, surface mounted.
System Operation: Dual operation modes; push button automatic operation mode and manual "Push-N-Go" mode.
Electrical Requirements: 120V, 60 Hz, 1-phase, 10 amps for doors with operated pairs and 5 amps for single doors.
Adjustment: Door open time adjustable and opening angle adjustable 80° to 135°.
Fasteners: Concealed.
Warranty: Manufacturer's standard 1 year warranty.

ACTIVATING DEVICES
Type: Hard-wired, conforming to ANSI Safety Standard A117.1.
Push Plate: 4½" square stainless steel, wall mounted. Engrave plates with international symbol of accessibility and "Press To Open".

MATERIAL AND FINISHES
Extruded Aluminum: 1/8" thickness, ASTM B221, 6063-T5 alloy and temper, anodized.

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Finish: AA-M12C22A41, Class I, clear anodized color.

ACCESSORIES
C1633-3 decals on both sides of door panel per manufacturer's instructions.

FASTENERS
Provide required screws, bolts, and other fasteners.
Match hardware material and finish.
Use phillips head type where exposed to view.

FABRICATION
Components shall be manufactured by only one manufacturer, and carry that manufacturer's warranty.

PART 3 - EXECUTION

EXAMINATION
Verify that surfaces to receive automatic door equipment are properly prepared, including necessary backing.
Prior to staring work notify General Contractor of defects requiring correction.
Do not start work until conditions are satisfactory.

PREPARATION
Provide solid backing automatic door equipment mounting.
Fasteners: Use fastening devices as needed to securely anchor all equipment per manufacturer's templates.

INSTALLATION
Accurately locate, fit, and install square, plumb, and secure in accordance with manufacturer's directions and templates.
Separate aluminum materials and other corrodible surfaces from sources of corrosion or electrolytic action according to AAMA 101.
Install header and framing members in a bed of sealant or with joint filler gaskets. Coordinate installation with wall flashings and other components of construction.

ADJUSTING
Adjust moving parts to operate satisfactorily at time of final project acceptance and during warranty period.

CLEANING AND REPAIRING
Including work of other sections, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.
Remove temporary coverings and protection of adjacent work areas.
Remove debris from project site upon work completion or sooner if directed.
Clean product surfaces and lubricate operating equipment for optimum condition and safety.

DEMONSTRATION
Instruct Owner's personnel in proper adjustment and maintenance of equipment and equipment finishes.

PROTECTION
Protect other surfaces against damage and discoloration caused by work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES
Shop or site installed glass or plastic, and glazing methods.

REFERENCES
Glass Association of North America (GANA) formerly Flat Glass Marketing Association (FGMA): Glazing Manual.
IGMA Publication for Insulating Glass: SIGMA TM-3000, "Glazing Guidelines for Sealed Insulating Glass Units."
American National Standards Institute (ANSI): ANSI Z97.1.
Safe Glass Standard: CPSC 16 CFR 1201.
Federal Specifications:
DD-G-451D: Glass, Plate, Sheet Figured (Flat, for Glazing, Mirrors, and other uses).
DD-G-1403B: Glass, Plate (Float), Sheet, Figured, and Spandrel (Heat Strengthened and Fully Tempered).
DD-M-00411b & Am-1: Mirrors, Glass.

PERFORMANCE REQUIREMENTS
Watertight and airtight installation or each piece of glass is required unless otherwise shown. Each installation must withstand normal temperature changes, wind loading, and impact loading (for operating doors) without failure including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glazing materials and other defects in the work.
Comply with Building Code requirements for maximum allowable air infiltration.

SUBMITTALS
Submit in accordance with Section 01 33 00.
Product Data:
Provide structural, physical and environmental characteristics, size limitations, and special handling or installation requirements.
Provide data on glazing sealant. Identify colors available.
Samples:
Submit two samples, 12 X 12 inches in size, illustrating glass unit color and design.
Certificates:
Submit sealed glass unit manufacturer's certificate indicating units meet or exceed specified requirements.

ENVIRONMENTAL REQUIREMENTS
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.
Do not install liquid glazing sealants when ambient and substrate temperature conditions are outside limits permitted by glazing sealant manufacturer or below 40° F (4.4° C).
Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
For insulating-glass units that will be exposed to substantial altitude changes, comply with insulating-glass manufacturer's written recommendations for venting and sealing to avoid hermetic seal ruptures.

DELIVERY, STORAGE, AND HANDLING
Schedule glass delivery to coincide with glazing schedules.
Original labels, showing manufacturer, quality, and thickness required for each piece of glass except where label must be removed for glass-cutting.
Deliver other glazing materials in original containers, manufacturer's original legible labels thereon.
Protect against damage and discoloration.

WARRANTY
Manufacturer’s Special Warranty for Coated Glass Products:
Manufacturer’s standard form, made out to Owner and signed by coated glass manufacturer agreeing to

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replace coated glass units that deteriorate within specified warranty period.
Warranty Period: Ten (10) years from date of substantial completion. Glass manufacturer shall warrant that any glass that is not edge deleted will not develop loss of adhesion with insulating glass or structural glazing sealants for a period of ten (10) years.
Manufacturer's Special Warranty on Insulating Glass:
Manufacturer's standard form, made out to Owner and signed by insulating glass manufacturer agreeing to replace insulating glass units that deteriorate within the specified warranty period.
Warranty period: Ten (10) years from date of Substantial Completion.
Manufacturer's Special Warranty on Laminated Glass:
Manufacturer's standard form, made out to Owner as signed by laminated glass manufacturer agreeing to replace laminated glass units that deteriorate within the specified warranty period.
Warranty period: Five (5) years from date of Substantial Completion.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

MANUFACTURERS
Provide coated glass units that are the products of one of the following coated glass manufacturers:
- Guardian Industries, Inc.
- Vitro Architectural Glass, Inc.
- Viracon.

FABRICATORS
Provide insulating glass units fabricated by firm certified by coated glass manufacturer.

SOURCE LIMITATIONS
Provide coated glass through a single source from a single coated glass manufacturer.
Provide insulating glass units fabricated by a single firm.

PRODUCT REQUIREMENTS
In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
- Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
- Products: Subject to compliance with requirements, provide one of the products specified.
- Product: Subject to compliance with requirements, provide product specified.
- Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
- Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.
- Basis-of-Design Product: The design for each glazing product is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.

GLASS PRODUCTS
Glazing Publications:
Comply with published recommendations of glass product manufacturers and organizations listed in REFERENCES article above.
Safety Glazing Labeling:
Permanently mark glazing with certification label of the SGCC.
Insulating-Glass Certification Program:
Permanently marked with appropriate certification label of IGCC.
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.
Minimum Glass Thickness for Exterior Lites:

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6 mm. Glass thickness designations indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing project loads and in-service conditions. Provide glass lites in the thickness designations indicated for various size openings, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed requirements.
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.

ANNEALED FLOAT GLASS
Clear Float Glass: Manufacturing Standard: ASTM C1036 Type I, Class 1, Quality: q3 - Glazing Select.
Ultraclear Float Glass: ASTM C1036 Type I, Class 1, Quality: q3 - Glazing Select, and with visible light transmission of not less than 91 percent and solar heat gain coefficient of not less than 0.87.

FULLY TEMPERED FLOAT GLASS
Manufacturing Standard: ASTM C 1048, Type I, Class 1 (clear), Quality q3, Kind FT.
Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
Roll Wave Maximum Distortion Tolerance: .003 inch target with .005 inch maximum peak to valley measurement.
Bow and Warp Maximum Tolerance: 50 percent of the maximum allowed in ASTM C 1048.

HEAT-STRENGTHENED FLOAT GLASS
Manufacturing Standard: ASTM C 1048, Type I, Class 1 (clear), Quality q3, Kind HS.
Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
Roll Wave Maximum Distortion Tolerance: .003 inch target with .005 inch maximum peak to valley measurement.
Bow and Warp Maximum Tolerance: 50 percent of the maximum allowed in ASTM C 1048

INSULATING GLASS
Manufacturing Standard: ASTM E 2190.
Type: Hermetically sealed units with dehydrated air space, dual sealant, and argon gas fill.
Coatings: Comply with ASTM C1376.
Glass Layers: 2
Interspace Thickness: 1/2 inch.
Edge Sealant Material: Primary Seal: Polyisobutylene (PIB); Secondary Seal: Silicone.
Spacer Material: Aluminum.
Spacer Color: Black.
Edge Deletion: Delete low E prior to fabrication of insulating units according to coated glass manufacturer’s instructions.

INSULATING GLASS UNIT TYPES
General:
Type: Low-E-coated, clear (low-iron) insulating safety glass.
Overall Unit Thickness: 1 inch.
Minimum Thickness of Each Glass Lite: 6 mm.
Low-E Coating: Sputtered on third surface.
Interspace Content: Argon.
Winter Nighttime U-Factor, Visible Light Transmittance, and Solar Heat Gain Coefficient to match glazing systems below.
Insulated Glass Type G-1:
Exterior Face: ¼ inch clear float glass with low-e coating on surface #2, maximum emmisivity of 0.40, PPG Solarban 70XL.
Interior Face: ¼ inch clear float glass.

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LAMINATED SAFETY GLASS
Fabricated from two lites of Type I, Class I, quality q3 glass laminated together with a clear vinyl interlayer.
Glass: 1/8 inch thick each lite, ASTM C1036, ASTM C1072.
Laminate Interlayer: Saflex interlayer by Monsanto, or approved, in accordance with CPS 16 CFR 1201, Catagory II Safety Glazing Standard and UL 972 Burglary rating.
Thickness: .060 inches.

BULLET RESISTANT GLAZING
Type: Glass clad polycarbonate, UL 752 Level 2, complying with NIJ Standard 0108.01.
Thickness: Per manufacturer's requirements to comply with security level.
Manufacturer: Total Security Solutions "LTI-BR2", Consolidated Armor Products, or accepted substitute.
Voice Transmission: Provide manufacturer's standard electronic talk thru device.
Bottom Chanel: U-Channel specifically designed for securing transparencies tightly in place.
Secure unit in hollow metal frame with standard glazing gaskets and stops.

MIRROR GLASS
Type: Type I, Class 1, Quality q2.
Thickness: 3/16 inch thick for sizes less than 10 square feet and ¼ inch thick for sizes 10 square feet and larger.
Silvering: Silver coating with electrolytic copper plating conforming to Fed Spec. DD-M-411.
Coating Protection: Two coats clear varnish applied over copper backing and edges.
Bottom Channel:
"J" channel, extruded aluminum with clear anodized finish.
Manufacturer: U.S. Aluminum, model MM250.

GLAZING SEALANTS
Type: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 25, Use NT.
Manufacturer: Dow Corning Corporation; 799, GE Advanced Materials-Silicones; UltraGlaze SSG4000 or UltraGlaze SSG4000AC, Tremco Incorporated; Proglaze SSG or Tremsil 600.
Applications: General applications in glazing installation including perimeter; use non-staining formula at absorbent perimeter applications.

GLAZING GASKETS
Type: As specified below and recommended by manufacturer for conditions of use.
For Wood and Hollow Steel Work: Butyl tape.
For Aluminum Sections: Silicone conforming to ASTMC1115 or EPDM conforming to ASTM C864, extruded bead compatible with the silicone sealant or other recommended by Section manufacturer.
For Insulating Glass: Type compatible with edge sealant and recommended by insulating glass fabricator.

SETTING BLOCKS
Material: Neoprene rubber with 70-90 Shore "A" durometer hardness, and compatible with glazing compound and sealant.
Size: Fabricate wider than glass unit thickness and long enough to support glass without excessive pressure on glass edge.

PART 3 - EXECUTION

EXAMINATION
Verify that openings to be glazed are accurately sized and located, and free of fasteners and other projections which will interfere with glazing.
Verify that glazing surfaces are free of moisture, dirt, grease, oil or other deleterious substances.
Verify that steel or wood glazing rabbets and any contacting dissimilar materials are painted.
Prior to starting work notify General Contractor of defects requiring correction.
Do not start work until conditions are satisfactory.

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PREPARATION

Verify opening dimensions prior to fabrication; allow for glass-edge clearances.

If field measurements differ slightly from drawing dimensions modify work as required for accurate fit. If measurements differ substantially notify Architect prior to fabrication.

Prior to starting work, clean, dry, and remove protective coatings from glass and surfaces to be glazed.

INSTALLATION, GENERAL

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.

Allow for glass expansion and contraction.

Do not impact glass against framing.

Install setting blocks placed at sill quarter points unless identified other by submitted stamped structural calculations.

Install glass larger than 5 square feet with setting blocks placed at sill quarter points unless identified other by submitted stamped structural calculations.

Install glass surface waves running horizontal.

Shift glass with suction cups; do not use pry bar.

Clean inside faces of double glazed openings before setting glass in place.

INSULATING GLASS INSTALLATION

Remove identity labels immediately after installation; save for Architect's review.

Follow glazing specification for sealed insulating glass units, SIGMA No. 70-7-1.

MIRROR INSTALLATION

Install mirrors plumb, level, after finish painting is completed, and with open ventilation space behind.

Install with bottom "J" channel secured to wall framing with concealed fittings and tamperproof mountings and mastic adhesive elsewhere.

Provide mastic in coverage as recommended by manufacturer.

CLEANING AND REPAIRING

Remove excess glazing compound from glass and surrounding work.

Final glass cleaning specified in Section 01 74 23.

Remove debris from project site upon work completion or sooner, if directed.

Including work of other sections, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.

PROTECTION

Protect materials of other trades against damage or discoloration caused by work of this section.

Protect installed glazing against breakage and staining.

Cure glazing sealants in compliance with manufacturer's instructions and recommendations to obtain high early bond strength and surface durability.

Protect exterior glass from breakage immediately upon installation, by attachment of crossed streamers held away from glass.

Remove and replace glass which is broken, chipped, cracked, abraded, or damaged in other ways during the construction period, including pieces damaged through natural causes, accidents, and vandalism.

GLAZING SCHEDULE

See Window Schedule on Drawings.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES
Light gage metal framing, acoustical treatment, gypsum board with paper or vinyl facings, and finishing of board joints.

REFERENCES
Conform to Recommended Specifications for the Application and Finishing of Gypsum Board, GA-216-1989, and "Recommended Specification: Levels of Gypsum Board Finish" as modified and supplemented herein.
Recommended material and methods are mandatory; those proposed by Contractor as equal or equivalent must be accepted by Architect.
Referenced Specifications may be obtained from Gypsum Association, 810 1st Street NE, Suite 510, Washington D.C. 20002; 310 277-8686.

PERFORMANCE REQUIREMENTS
Maximum ceiling deflection: 1/360 of span.
Maximum deviation from true plane: 1/8 inch per 10 ft. and 1/16 inch in any running foot.

REGULATORY REQUIREMENTS
Where fire-rated ceilings are noted, construct to obtain specified rating as listed and rated by Underwriter's Laboratories (UL).

DELIVERY, STORAGE, AND HANDLING
Deliver products to site with manufacturer's original labels intact and legible.
Identify fire-rated materials with testing agency label.
Protect gypsum materials against damage and discoloration and metal materials against rust.
Do not stack gypsum board with long lengths overhanging shorter lengths.
Do not overload floor system with stockpiled materials.
Indicate adhesive "open time" on adhesive container label.

ENVIRONMENTAL CONDITIONS
Maintain between 55ºF and 75ºF for 24 hours before and during work, and for at least 24 hours after materials have dried.
Maintain at least 30 ft. candles of illumination measured 3 ft. above floor in work spaces during joint treatment.
Maintain sufficient ventilation for proper joint treatment drying.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

INTERIOR NON-BEARING STEEL STUDS
Material: Steel conforming to ASTM C 645.
Metal Finish: Galvanized in accordance with ASTM A 591.
Metal thickness:
- Adjacent to door jamb: 20 gage.
- 6” and wider studs: 20 gage.
- Elsewhere: 25 gage.

Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.
Accessories: Provide as required for complete installation.

DEFLECTION TRACK
Material: Steel conforming to ASTM C 645.
Metal Finish: Galvanized in accordance with ASTM A 591.
Type: Slotted deep leg.
Metal thickness: 25 gage minimum.

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FRAMING CHANNELS
Hot or cold rolled, galvanized steel conforming to MLA specification 12.
Type and size as required to support loads.

FURRING CHANNELS (Z-FURRING)
20 ga. Minimum, roll-formed, hot-dipped galvanized steel, zee-shaped, ASTM A 653/653M.

SHEET METAL BACKING
Provide 22 gauge sheet metal backing behind toilet room accessories, mirrors, marker boards, tack boards, miscellaneous specialties, building equipment, drapery track, and mechanical and electrical work. Verify exact location. Contractor's option to use fire retardant treated wood or metal backing, except at TV locations.

HANGER WIRE
9 ga. minimum galvanized steel wire; Fed. Spec. QQ-W-461.

TIE WIRE
Galvanized steel wire, Fed. Spec. QQ-W-461.

ATTACHING DEVICES
Hot-dipped galvanized steel wire or sheetmetal devices designed for attaching furring members to supports or each other.

GYPSUM BOARD
Manufacturing Standard: ASTM C 1396.
Edges: Tapered
Type and Thickness:
Interior stud walls and furred ceilings: Standard board, Type X, 5/8" thk., unless otherwise noted.
Exterior ceilings: Exterior gypsum soffit board, Type X, 5/8" thick.
Interior ceilings: Gypsum ceiling board, ½" thick.
Restrooms and "Wet" Walls: Water-resistant board, Type X, 5/8" thick.
Acoustic gypsum board: Type X, 5/8" thick, PABCO QuietRock EZ Snap.

BULLET RESISTANT PANELS
Manufacturing Standard: Conform to UL 752, Level 2.
Thickness: 3/8 inch.
Manufacturer: Total Security Solutions "BB-1", or accepted substitute.

FASTENERS
Screws:
Self-tapping, self-drilling, bugle head, ASTM C 626, Type S.
Length: 1 5/8 inches
Do not use nails.

METAL TRIM
Casing Bead:
US Gypsum No. 200-A, 200-B, or as noted in drawings, or accepted substitute.
Corner Bead:
US Gypsum No. 101, or accepted substitute.
Reveal Molding:
Extruded aluminum, Gordon 300 Series, Fry "Z" molding, or accepted substitute.

JOINT TAPE
ASTM C 475, perforated.

JOINT COMPOUND
ASTM C 475.

ACOUSTIC SEALANT

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Pecora BA 98, Tremco, Miracle 21, US Gypsum, or accepted substitute.
Provide at toilet room perimeter walls and at walls where acoustic insulation is noted on drawings.

ACOUSTIC INSULATION
Paperless, semi-rigid, spun mineral fiber mat, NOT fiberglass, minimum 2 inches thick, minimum 2.5 pcf density per ASTM C612, conforming to Federal Spec. Type 1 HH-I-521F, ASTM E136, ASTM E1050, and ASTM E90. Thermafiber SAFB (Sound Attenuation Fire Blankets), Roxul AFB.

WATER RESISTANT SEALANT
Silicone with mildew inhibitor conforming to Fed. Spec. TT-S-001543; GE, Dow, or accepted substitute.
Clear translucent color.

OTHER MATERIALS
Made or recommended by gypsum board manufacturer.
Provide all indicated or required for complete installation.

PART 3 - EXECUTION

EXAMINATION
Verify that surfaces to receive gypsum board are accurately located, plumb, square, true, secure, and otherwise properly prepared.
Prior to starting work notify General Contractor of defects requiring correction.
Do not start work until conditions are satisfactory.

STEEL STUD INSTALLATION
General:
Follow manufacturer's directions.
Install sealer gaskets to isolate the underside of wall bottom track and the top of foundation wall or slab at stud locations.
Install plumb, level, true, and in accurate locations indicated.
Isolate stud partitions from structure to prevent transfer of loads or movement into partitions.
Where stud partitions stop at or slightly above ceiling, brace partition to structure as required to stabilize partition.
Form corners and intersection with three studs.
Locate studs two inches from internal corners.
Frame for openings.
Provide partition-height stud adjacent to door frame jambs and secure to jambs.
Provide additional partition-height stud approximately 2 inches from each jamb-stud.
Provide reinforcing and blocking as required behind wall-mounted door stops, and to support wall-hung loads such as cabinets, railings, toilet room accessories, building equipment, etc. Verify exact locations.
Deflection Track:
Provide at all full height stud walls attached to overhead roof or floor framing.
Attach track to overhead structure.
Cut studs 1" to 1 1/2" short.
Install studs plumb.
Install screws through slot into stud snug-tight, approximately centered in length of slot to allow upward and downward track movement.
Do not attach gypsum board to track. Cut gypsum board approximately 1 inch short of full height.
Attach gypsum board to studs only.

SUSPENDED CEILING INSTALLATION
General:
Provide runner channels no more than 6 inches from walls and other ceiling interruptions.
Where mechanical and electrical equipment interfere with regular spacing of hangers provide additional hangers and channels, and make necessary adjustments in ceiling construction.
Hangers shall not be attached to or passed through ducts.
Provide framing around recessed light fixtures, expansion joints, and other ceiling openings.
Wire Tying:
Use double-strand 16 gage wire.

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Splicing: Double wrap tie.
Horizontal stiffeners to channel brackets: Figure-eight tie.
Framing members perpendicular to each other: Saddle tie.

GYPSUM BOARD INSTALLATION
Install board horizontally, and extend to within 1/4 inch of floor.
Loosely butt joints.
Place tapered edges together, except at angles.
Do not place butt ends against tapered edges.
Where possible apply boards without butt joints. Where butt joints are necessary, locate as far from ceiling centers as possible and stagger.
Support board ends and edges on framing members.
Maintain 3/8 inch minimum distance between fastener and board edge.
Dimple board surface 1/32 inch with fastener; do not fracture face paper.
Secure to framing as follows:
    Metal Wall Framing: Screw at 8 inches on center along board perimeter and 12 inches on center at intermediate supports.
    Metal Ceiling Framing: Screw at 8 inches on center along each support.
Provide gypsum board hood over top of any recessed lighting fixtures which penetrate fire-rated gypsum drywall ceilings. Maintain ceiling fire-resistance rating.
At stud walls constructed with deflection track, do not attach gypsum board to deflection track. Attach gypsum board to studs only. Allow for structure deflection without loading gypsum board panels.

JOINT, CORNER, AND EDGE TREATMENT
Application and finishing standard: ASTM C 840.
Fill joints and fastener holes in accordance with referenced standards.
Conform to GA 216, as follows:
    Elec 1128, Mech 1129, IT 1134: Level 3 finish.
    Elsewhere: Level 5, smooth finish.
Fill joints and fastener holes in accordance with referenced specifications.
Reinforce inside corners in accordance with manufacturer's directions.
Protect external corners and exposed edges with metal trim.
Provide control joints, unless otherwise shown on drawings, where and if framing changes direction, and at 30 ft. maximum spacings.

SEALANT INSTALLATION
Acoustic Sealant:
Provide sealant around electrical boxes, pipes, etc., located in or passing through sound walls.
Prior to installing gypsum board, provide acoustic sealant around sound wall perimeters in angle between wall, floor and ceiling; press board into sealant forming bond between framing member face and back side of board.
Provide in joints between sound wall perimeters and other adjacent materials.
Permit no voids for sound passage.
Water Resistant Sealant:
Provide at raw edges and around cutouts in water-resistant gypsum board.

ACOUSTIC INSULATION INSTALLATION
Install blankets in stud cavities. Friction fit securely between studs. Butt ends of blankets closely together and fill all voids. When installing in multiple layers, stagger joints. When installing in one thick layer, cut blankets vertically about 1 inch deep on a centerline between studs before gypsum board panel is installed.

REPAIRS
General:
After installation and before finishing, correct surface damage and defects.
Leave surfaces clean, smooth, and ready for finishing specified in Section 09 90 00.
Ridging:
Sand ridges smooth without cutting joint tape.

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Fill concave areas on both sides of ridge with compound and finish flush and smooth.
Cracks:
Fill with compound and finish flush and smooth.

CLEANING
Including work of other sections, clean, repair and touch-up, or replace when directed products which have been soiled, discolored, or damaged by work of this section.
Leave surface ready for finishing specified in other sections.
Remove debris from project site upon work completion or sooner, if directed.

PROTECTION
Protect other work against damage and discoloration caused by work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES
Commonly used acoustical ceiling systems, consisting of suspension system, grid, and acoustic tiles or boards.

REFERENCES
Acoustic Systems:
Type of acoustic materials, types of mounting, noise reduction coefficients, and methods of installation, hereinafter specified, refer to "Ceiling Systems Handbook," published by Ceilings and Interior Systems Construction Association (CISCA), 405 Illinois Avenue, Unit 2B, St. Charles, IL 60174; 630-584-1919.
Suspension Systems:
Suspension systems, hereinafter specified, refer to "Metal Suspension Systems for Acoustical Tile & Lay-in Panel Ceilings," ASTM C 635, and to "Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustic Tile and Lay-in Panels," ASTM C 636.

PERFORMANCE REQUIREMENTS
Suspension system components fully loaded; maximum deflection: 1/360 of span in accordance with ASTM C 635.
Finish surfaces level and true within 1/8 inch per 12 feet.
Fire Resistance Classification: ASTM E 119.
Flame Spread Classification: ASTM E 84.

SUBMITTALS
Product Data:
Submit manufacturer's specifications and installation instructions for acoustical materials, suspension system and accessory products required to provide a complete system.
Samples:
Submit samples of each acoustical material specified including representative grid and metal items. Samples shall show full range of texture and color to be expected in completed work.

DELIVERY, STORAGE, AND HANDLING
Deliver in original, unopened, protective packages with manufacturer's labels indicating brand name, pattern, size, thickness, and fire rating legible and intact.
Protect against damage and discoloration.
Store cartons open at each end to stabilize moisture content and temperature.

ENVIRONMENTAL REQUIREMENTS
Delay installation of acoustic units until work spaces are dry.
Maintain 65% - 75% humidity in work spaces 24 hours before, during, and 24 hours after installation.
Maintain uniform 55^{o}F - 70^{o}F temperature in work spaces 24 hours before, during, and after installation.

EXTRA MATERIALS
Submit one extra case of acoustic tile in unopened protective package. Store in Owner-approved location.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

ACOUSTIC TILE
Type: Mineral fiber tile, Square edge.
Manufacturers: Armstrong, or accepted substitute.
Model: 1943 Ultima High NRC Square Lay-in.
Size: 24 X 48 inch, 7/8 inch thick.
Texture: Fine.
Finish: Factory applied paint.

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Color: White
Noise Reduction Coefficient on specified mounting: 0.80 minimum.

METAL SUSPENSION SYSTEM
Type: Steel, heavy duty rating, exposed grid T-bar system.
Manufacturers: Donn, Armstrong, Chicago Metallic, or accepted substitute.
Finish: Manufacturer's standard enamel.
Color: Match Acoustic Tile.
Follow layout shown on Drawings.

STRUTS
ICBO listed, adjustable, heavy duty galvanized tubing with spring steel clip at upper end and bulb clip at bottom end; Donn, Roblin, or accepted substitute.

FASTENERS AND ACCESSORIES
General:
Type and sizes recommended by suspension system manufacturer.
Seismic Accessories:
Beam End Retaining Clip: Armstrong BERC or accepted substitute.
Main Runner Seismic Joint Clip: Armstrong MB with ES4 expansion sleeve, or accepted substitute.
Grid Intersection Seismic Joint Clip: Armstrong CT, or accepted substitute.

METAL EDGE TRIM
Corrosion-resistant steel, bonderized and enameled to match color of adjacent metal suspension system.

ACOUSTIC INSULATION
Paperless, semi-rigid, spun mineral fiber mat, 2 inches thick, standard density, conforming to Federal Spec. HH-I-521F, Type I, ASTM C 665 and ASTM E 84. USG Thermafiber Sound Attenuation Blankets, Roxul AFB, or accepted substitute.

PART 3 – EXECUTION

EXAMINATION
Verify that surfaces to receive directly-attached acoustical units are even, regular, true, level within 1/8 inch per 12 ft. dry and free from oil, or other bond-reducing substances.
Verify that surfaces provided by other trades are clean, dry, dust-free, smooth, level, within 1/8 inch in 12 ft. and otherwise properly prepared to receive acoustic treatment.
Prior to starting work notify General Contractor of defects requiring correction.
Do not start work until conditions are satisfactory.

FIELD MEASUREMENTS
Verify prior to fabrication.
If field measurements differ slightly from drawing dimensions, modify work as required for accurate fit. If measurements differ substantially notify Architect prior to fabrication.

INSTALLATION
General:
Follow standard specifications, manufacturer's directions and layout drawings, except as modified hereunder.
Metal Suspension System:
Where mechanical and electrical work interferes with regular spacing of hangers provide additional hangers and channels and make necessary adjustments in ceiling construction.
Do not attach or pass hangers through mechanical or electrical ductwork.
Provide framing around recessed light fixtures and other openings.
Maximum vertical hanger splay: 5 inches per 4 ft.
Acoustical Units:
Install units in level plane, in straight line courses, and with solid bearing on support members.
Minimum border unit width: 1/2 unit dimension, unless otherwise shown on Drawings.
Install pattern grain, if any, in one direction.

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Seal joints around pipes, ducts, and other penetrations with sealant specified in Section 07900.
Where tile abuts vertical surfaces trim joints with metal edge trim. Attach trim to vertical surface with mechanical fasteners.
Acoustic Insulation:
Provide between framing members butting joints tight with no voids.
Provide above ceilings at all family conference rooms, offices, restrooms, lunchroom, lactation room, and conference rooms.

CLEANING AND REPAIRING
Including work of other sections, clean, repair and touch-up, or replace when directed products which have been soiled, discolored, or damaged by work of this section.
Remove debris from project site upon work completion, or sooner, if directed.

PROTECTION
Protect other work against damage and discoloration caused by work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES

Interior restoration of existing acoustical ceiling tile.

REFERENCES

ASTM C 423 – Sound Absorption and Sound Absorption Coefficients by Reverberation Room Method.
ASTM C 523 – Light Reflectance of Acoustical Materials by the Integrating Sphere Reflectometer.
ASTM E 84 – Surface Burning Characteristics of Building Materials.
ASTM E 313 – Indexes of Whiteness and Yellowness of Near-White Opaque Materials.
ASTM E 795 – Mounting Test Specimens During Sound Absorption Tests.

SUBMITTALS

Provide in accordance with Section 01 33 00.

Product List:

Before ordering, submit complete and detailed list of materials, including label analysis proposed for use and application instructions.
Obtain Architect's acceptance before ordering.

Certification:

Provide certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).

Test Reports:

Submit manufacturer’s test reports from testing performed by an independent laboratory of tile coated with acoustical tile coating to include the following:

1. Sound absorption.
2. Flame spread.
3. Smoke developed.
4. Light reflectance.
5. Combustion toxicity.
6. Aging.

QUALITY ASSURANCE

Applicator Qualifications:

Experience in application of specified materials for a minimum of five years on projects of similar size and complexity.
Submit list of completed projects including name, location, material manufacturer, and area of ceiling tile restored

Pre-restoration Meeting:

Convene a pre-restoration meeting two weeks before start of work.
Attendees shall include Contractor, Architect, Owner’s Representative, applicator, and manufacturer’s representative. Review protection, surface prep, application, cleaning, and coordination with other work.

DELIVERY, STORAGE, AND HANDLING

Deliver in original, unopened containers.
Do not open containers or remove labels until Architect inspects.
Store in suitable location where directed by General Contractor.
Protect against freezing and contamination by foreign matter.
Minimum storage temperature of 55^{o}F.
Remove unacceptable materials from project site.

ENVIRONMENTAL REQUIREMENTS

Follow manufacturer's directions.
Minimum ambient air and surface temperature for 24 hours prior to and during application and until film is dry thereafter: 55^{o}F.
Comply with all ordinances and regulations regarding the prevention of environmental pollution and preservation of natural resources that might affect this project.
Do not work where dust or insects are present.
Do not work where inclement weather may damage surface.
Do not work with less than 30 foot candles of available light measured 3 ft. above floor.

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EXTRA STOCK
Leave, in previously unopened original containers, one gallon.
Label for positive identification.
Store on project premises where directed.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

MANUFACTURER
ProCoat Products, Inc., Phone: 781-767-2270, Website: www.procoat.com.

RESTORATION MATERIALS
ProCoustic Acoustical Tile and Ceiling Coating.
Material Properties:
Sound Absorption: Improve noise reduction coefficient of tile from 0.55 to 0.60. ASTM C 423 and E 795.
Fire Rating: Class A, flame spread reduced from 25 to 15, smoke developed reduced from 10 to 5. ASTM E 84.
Light Reflectance: Improved from 0.81 to 0.88. ASTMC 523.
Combustion Toxicity Test: Pass
Aging: Coated tile to have a higher whiteness index than new tile with manufacturer's standard coating. ASTM E 313.
Primary composition: Vinyl acrylic resin.
Pigment: Titanium dioxide, calcium carbonate, silicate wetting, and stabilizing agents.
Weight: 10.6 pounds per gallon.
Specific Gravity: 1.26.
Viscosity: 70 to 75 Krebs at 75^{o}F.
Solids: 40% +/- 1%.
Color: White.
Grid Cleaning Solution:
ProCoat Grid Cleaning Solution.
Chemically compatible with acoustic tile coating.
Film free to allow bond between tile coating and non porous surfaces.
Acoustical Tile Cleaner:
ProCoat Acoustical Tile and Ceiling Cleaner.
Chemically compatible with acoustic tile coating.
Odorless, biodegradable, and fabric safe.
Does not contain caustic bleaches.
Does not leave containments that could bleed through and discolor tile coating.

PART 3 - EXECUTION

EXAMINATION
Examine surfaces to receive coating for conditions that will adversely affect execution, permanence, and Work quality. Ceilings must be structurally sound.
Prior to starting work notify General Contractor about defects requiring correction.
Do not start work until conditions are satisfactory.

PREPARATION
Protection:
Cover or otherwise protect work of other trades. Cover walls, floors, equipment, furnishings, merchandise, and other surfaces to be protected against dry-fall spray dust with plastic sheets or drop cloths.
Mask light fixtures, sprinkle heads, smoke detectors, security lights, and other items against direct spray.
Surface Preparation:
General: Clean and prepare surfaces to be treated in accordance with manufacturer's instructions for each substrate condition specified.
Pretreat water stains with a primer/sealer. Pretreat tiles saturated with grease or nicotine with acoustic

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tile cleaner.

COATING APPLICATION
Follow manufacturer's directions.
Do not apply coating until moisture content of surface to be finished is within limitations recommended by manufacturer. Test with moisture meter.
Apply coating with spraying equipment as recommended by coating manufacturer.
Do not exceed coating manufacturer's application rate.
Follow coating manufacturer's recommended drying time between succeeding coats.

CLEANING
Remove spills, splatters, and stains from all surfaces including other work.
Remove debris from project site upon work completion or sooner, if directed.
Including work of other sections, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES

Sheet vinyl and resilient tile flooring. Preparation of substrate surfaces. Resilient bases and accessories.

SUBMITTALS

Provide in accordance with Section 01 33 00.

Samples:

Four full size samples of specified floor tile.
One 12 inch long sample of each edge strip.
One 12 inch wide sample of stair treads.

Maintenance Instructions:

In accordance with Section 01 33 00, submit manufacturer's recommended maintenance products and methods to General Contractor, for inclusion on Owner's maintenance manual.

Product Data:

Submit manufacturer's product data listing volatile organic compound (VOC) content of products specified herein.

Provide manufacturer's documentation verifying that adhesives and sealants contain no urea-formaldehyde.

EMISSIONS STANDARDS

Conform to the following minimum standards for sealant emissions:

Adhesive Type	VOC Limits	Standard
Rubber Floor Adhesives:	60 g/L	SCAQMD Rule #1168
LVT Adhesive:	50 g/L	SCAQMD Rule #1168
Cove Base Adhesive:	50 g/L	SCAQMD Rule #1168
Multi-Purpose Construction Adhesive:	70 g/L	SCAQMD Rule #1168

Aerosol Adhesives: Green Seal Standard for Commercial Adhesive GS-36 requirements.

Submit manufacturer's product data listing volatile organic compound (VOC) content of products specified herein.

Provide manufacturer's documentation verifying that adhesives and sealants contain no urea-formaldehyde.

QUALITY ASSURANCE

General:

Standards: Meet requirements of Resilient Floor Covering Institute.

Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.

Manufacturer Qualifications:

Installer Qualifications: Acceptable to manufacturer of resilient flooring or INSTALL (International Standards & Training Alliance) resilient certified for the requirements of the project with a minimum of 4 years' experience with resilient flooring of type equivalent to those specified.

1. It is recommended to have a minimum of one installer per working party with the ability to provide proof of current credentials at request.
2. Has obtained and maintained current credentials from manufacturer's training program.
3. Installers shall be able to exhibit proficient skills with flash cove detailing, both hot and cold-welding techniques, adhesives, specialty adhesive systems and seam cutting.
4. The installing parties shall provide a submittal of their skills in the form of mock-ups of the specified material. These mock-ups will be accepted as proof of their skills and benchmarking for the proposed project.

Installer Qualifications:

Company specializing in performing tile installation, with minimum 5 (five) years of documented experience.

Pre-Installation Meeting:

Convene one week before starting work of this section.

Mock-up:

Install at project site a mock-up of resilient flooring materials as listed below, minimum floor area size 9 sq. ft., encompassing all design elements, including heat welded seams, self-coving, and a corner. Use specified products, manufacturers and installation methods. Obtain acceptance of Owner and Architect

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of finish, color, texture, pattern and workmanship standards prior to proceeding with final installation.
Mock-ups required:
Rubber Tile
Luxury Vinyl Tile

DELIVERY, STORAGE AND HANDLING
Deliver in unopened packages, manufacturer's original labels thereon.
Matching coverings shall bear manufacturer's run number.
Do not remove labels or open packages until Architect inspects.
Protect against damage and discoloration.
Store in dry place.
Maintain storage place temperature above 70°F for immediate 48 hours prior to and during storage.

ENVIRONMENTAL REQUIREMENTS
Work Space Air and Surface Temperatures:
Not less than 70°F 48 hours before, during, and 48 hours after laying.
Not lower than 55°F thereafter.
Work Space Ventilation:
When using offensive odor adhesive provide sufficient ventilation to maintain healthy and pleasant environment for all trades.
Work Space Illumination:
Do not work under less than 30 foot candles measured 3 ft. above floor.

EXTRA STOCK
Provide one unopened case of each color and type of tile.
Store where directed.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

RUBBER TILE (RS-1)
Extent of work as noted on Drawings.
Manufacturing Standard: ASTM F1344 Standard Specification for Rubber Floor Tile Type IB and Grade 2
Composition: Homogeneous rubber compound with a vivid granular design
Manufacturer and type: Norament Pado, Article 3167
Color: As noted on Finish Schedule A-701.
Thickness: .14” gauge.
Cold Weld Color: 5105

RUBBER TILE COVE BASE ACCESSORIES
Cove Stick Fillet: Flexco, no. 195.
Cove Cap: Flexco, no. 197R.

LUXURY VINYL TILE (LVT-1)
Extent Of Work As Noted on Drawings.
Manufacturer: Patcraft
Manufacturing Standard: Class III printed vinyl plank.
Pattern/Style: 1466V Splitwood
Wear Layer: 20 Mil.
Thickness: 4.5 mm.
Size: 9” x 60”
Color: 00130 Raw Gold.

RUBBER BASE (RB-1)
Manufacturer: Nora.
Height: 4 inches.
Type: Coved.

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Provide with factory formed external corners, mitered internal corners and factory-formed end stops.
Color: See finish schedule on A-701.

RUBBER BASE (RB-2)
Manufacturer: ROPPE
Height: 4”
Type: Coved.
Provide with factory formed external corners, mitered internal corners and factory-formed end stops.
Color: See finish schedule on A-701.

EDGE STRIP
Manufacturer: Nora
Color: See finish schedule A-701.
One inch wide, 1/8 inch thick, rubber with beveled top.
Provide at exposed resilient flooring edges, if any.

PRIMER, SEALER, CRACK FILLER, AND ADHESIVE
Water-resistant type, made or approved by covering manufacturer.

CLEANER
Neutral type approved by covering manufacturer.

PART 3 - EXECUTION

EXAMINATION
Verify that surfaces to receive work specified herein are solid, dry, clean, level, and otherwise properly prepared.
Verify that walls to receive base extend to within 1/4 inch of floor.
Prior to starting work notify General Contractor of defects requiring correction.
Do not start work until conditions are satisfactory.

PREPARATION
Fill concrete slab cracks less than 1/16 inch wide and depressions less than 1/8 inch deep with crack filler. Notify General Contractor to correct wider cracks and deeper depressions.
Provide 1 coat of primer on sanded wood and other surfaces recommended by manufacturer.

AREAS TO BE COVERED
In Spaces Scheduled to have Floor Covering:
Also cover closet and alcove floors opening off spaces, if any, with same material.
Where Base is scheduled:
Provide around perimeter of room or space, unless otherwise indicated elsewhere.
Include casework, free-standing columns, pilasters and other projections, if any.
Miscellaneous:
Covering not required under permanently built-in casework and equipment, unless otherwise indicated elsewhere.

INSTALLATION
General:
Follow manufacturer's instructions and applicable sections of referenced specifications.
Luxury Vinyl Tile:
At least 24 hours before installing, remove tile from shipping cartons and back-stack.
Install tile in "ashlar pattern" – See attached Interface diagram for design intent.
Develop layout and Install tiles so that no tile is smaller than 5 or 6 inches.
Install floor tiles in strict compliance with manufacturer’s printed instructions.
Extend tile flooring into toed space, door reveals, into closets, and similar openings.
Rubber Tile Flooring:
Provide trained installers that have at least one of the following:
Approved by specified manufacturer (nora systems, Inc.) or INSTALL (International Standards & Training Alliance) certified for the requirements of the project.

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1. It is recommended to have a minimum of one installer per working party with the ability to provide proof of current credentials at request.
2. An effective installation manager to manage the project, installers, and ensure that all the required procedures are followed as detailed in the nora Installation Instructions (available at www.nora.com).
3. Follow all requirements in the appropriate nora Installation Instructions or nora nTx Installation Instructions.

Install with adhesive over entire floor area to be covered.
Install with all seams to be cold welded. Prepare cold-welded seams with special routing tool supplied for this purpose and heat weld with vinyl welding rod in seams.
Use methods and sequence of work in conformance with written instructions of the flooring manufacturer.
Finish all seams flush and free from voids, recesses, and raised areas.
Provide integral flash cove wall base, 6 inches high, where shown on the drawings, including cove fillet support strip and top edge cap trim. Construct flash cove base in accordance with the flooring manufacturer's instructions.
Edge Strip:
Provide wherever covering edges are exposed.

PATCHING
General:
Where alterations occur, and where indicated, patch existing covering to remain; match existing material, pattern, and color.
Join new covering neatly with existing covering in as good condition as found.
At Floor Tile:
Patch with full size tile only, unless otherwise approved.
Remove existing, less than full size tile, where required to install new full size tile.
Base:
Patch existing base with 4 ft. minimum length pieces.

CLEANING, REPAIRING, AND FINISHING
After covering and base have set sufficiently, wash with cleaner.
After rinsing and drying apply one coat of floor polish to covering. Machine-buff to smooth, dull gloss; hand-buff inaccessible areas.
Leave surfaces smooth and defect-free.
Remove debris from project site upon work completion or sooner, if directed.
Including work of other sections, clean, repair and touch-up, or replace when directed products which have been soiled, discolored, or damaged by work of this section.

PROTECTION
Protect other work against damage and discoloration caused by work of this section.
Rope off work areas and/or provide necessary coverings to protect work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES
Low pile carpet materials including cushions, if any, and accessories.

INSTALLER QUALIFICATIONS
To be eligible to perform work specified herein Contractor must be acceptable to carpet Manufacturer and have successfully completed 2 similar projects.

REGULATORY REQUIREMENTS
Comply with Department of Commerce Flammability Standard DOC FF 1-70.
Corridor and exit way carpet shall comply with National Bureau of Standards Radiant Panel Test 75-950.

QUALITY ASSURANCE
Testing: Owner will employ services of an independent testing laboratory for testing moisture content in concrete slabs in accordance with the requirements of ASTM F 1869-98 Standard Test method for measuring vapor emission rate of concrete subfloor using anhydrous calcium chloride.

SUBMITTALS
Certifications:
Provide in accordance with Section 01 33 00.
Product Data:
Submit manufacturer’s product data listing volatile organic compound (VOC) content of products specified herein.
Provide manufacturer’s documentation verifying that adhesives and sealants contain no urea-formaldehyde.
Lay-out diagram:
Provide to scale layout diagram showing all seam locations and direction of materials.
Samples:
Four full size samples of specified floor tile.

MAINTENANCE INSTRUCTIONS
Submit to General Contractor in accordance with Section 01 78 23 for inclusion in Owner's maintenance manual 1 copy of Manufacturer's recommendations for care, cleaning, and maintenance of installed carpet.
After installation thoroughly instruct Owner in care, cleaning, and maintenance of installed carpet.

PRODUCT DELIVERY
Deliver in original unbroken mill-wrapping, Manufacturer's register number labels thereon.
Do not deliver until installation is ready to start.
Do not remove labels or open packages until Architect reviews and accepts.

PRODUCT STORAGE AND HANDLING
Protect against damage and discoloration.
Do not store carpet rolls on end.

WORK SPACE ILLUMINATION
Perform no work under less than 30 ft. candles measured 3 ft. above floor.

MINIMUM AIR AND SURFACE TEMPERATURE
Perform no work when conditions exceed manufacturer's specified limits; 50^{o}F minimum.

EXTRA STOCK
Provide two unopened cases of each color and type of tile.
Leave with Owner excess pieces of usable carpet over 2 sq. ft., but not more than the equivalent of two cases.
Store where directed by Owner.

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COORDINATION
Coordinate with other trades affecting or affected by work of this section.

WARRANTY
Correct defects in materials or workmanship which appear during Warranty Period by repairing and/or replacing and/or re-stretching, if necessary, at no additional cost to Owner. Warrant for 5 years that carpet will maintain specified limits of static electricity generation. 10 year wear warranty against edge ravel and de-lamination.

PART 2 - PRODUCTS

CARPET TILE (CPT-1)
Extent of work as noted on Drawings.
Manufacturer: Interface
Model: Open Air 418
Color: 14752 107798 Oat
Minimum construction requirements:
- Type: Modular carpet tile 19.69 inch x 19.69 inch
- Construction: Tufted Textured Loop
- Gauge: 1/12
- Pile Height: 0.15 inch.
- Fiber System: 100% Recycled Content Nylon
- Dye Method: 100% Solution Dyed.
- Primary Backing: GlasBac
- Density: 7,650
- TARR Rating: Heavy

Electrostatic Propensity: 3.0kV (AATCC 134); Permanent Conductive Fiber.
Installation method: Monolithic

WALK-OFF Carpet Tile (WO)
Extent of work as noted on Drawings.
Manufacturer: Mannington
Model: Force
Color: Vector 14362
Minimum construction requirements:
- Construction: Textured Patterned Loop.
- Gauge: 1/12
- Pile Density: 7,005 oz/sq. yd.
- Tufted Weight: 36 oz/sq. yd.
- Yarn System: Type 6,6 Nylon.
- Backing: Synthetic.
- Secondary Backing: Infinity® 2 Modular.
- Dye Method: Solution
- Tile Size: 18” x 36”.
- TARR Rating: Severe

Electrostatic Propensity: 3.0kV (AATCC 134); Permanent Conductive Fiber.
Installation method: Brick Ashlar

CUSHION
Not required.

EDGE STRIP
Manufacturer: Johnsonite a Tarkett Company
One inch wide, thickness to match carpet height, with beveled top.
Locations: Provide at exposed carpet edges, if any, and as noted on Drawings.
Color: Selected by Architect.

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ADHESIVE
Full coat of non-flammable type recommended by carpet Manufacturer.
Adhesive for Carpet Tiles: Non-flammable type with anti-microbial protection, VOC content meeting requirements of CRI Green Label Indoor Air Quality Program; Provide Documentation.

FLOOR FILLER
W.W. Henry 547 Unipro™, DAP “Webcrete 98”, Maipei “PlaniPatch”, Ardex “Featherfinish” or similar accepted substitute.
Provide over concrete floor slabs which are too rough or uneven to provide satisfactory base for carpeting.

CONCRETE SEALER
Type recommended by carpet Manufacturer.

SEAM CEMENT
Non-flammable type recommended by carpet Manufacturer.

PART 3 - EXECUTION

EXAMINATION
Verify that subfloor is clean, dry, level, and solid, with no projections or holes that will damage carpet system; that work spaces have specified illumination, humidity, and temperature; and that surfaces are otherwise properly prepared.
Prior to starting work notify General Contractor of defects requiring correction.
Do not start work until conditions are satisfactory.

PREPARATION
Fill cracks less than 1/16 inch wide and depressions less than 1/8 inch deep with filler.
Notify General Contractor to correct wider cracks and deeper depressions.

EDGE STRIP INSTALLATION
Follow Manufacturer's directions.
Provide edge stripping at exposed carpet edges.
Where carpet terminates at door openings, center edge strip under door.

ADHESIVE APPLICATION
Follow Manufacturer's directions.
Apply uniformly.
Apply only to area that can be covered by carpet within adhesive working-time.
Promptly remove spillages.

CARPET TILE
Provide Interface direct glue-down carpet adhesive per manufacturers installation graphic.
Follow Manufacturers direction for installation.
Do not force the tile together. Compression must be avoided.
See sheet A-701 for installation pattern and direction.
Roll tiles only after 24 hours to re-adhere any tiles that may be lifting.

WALK-OFF MAT INSTALLATION
Provide Mannigton Contract glue-down Installation System per manufacturer’s installation graphic.
Follow Manufacturers direction for installation.
Do not force the tile together. Compression must be avoided.
See sheet A-701 for installation pattern and direction.
Roll tiles only after 24 hours to re-adhere any tiles that may be lifting.

CLEANING AND REPAIRING
After all trades have completed with work, vacuum clean carpet.
Remove debris from project site upon work completion or sooner, if directed.

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Including work of other sections, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.

PROTECTION

Protect work specified herein, and work of other trades, against damage and discoloration caused by work of this section.

Provide necessary coverings and barricades to protect completed work.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES

Exterior and interior painting with transparent or opaque finishes. Includes stains, varnishes, lacquers, fillers, and preparation of surfaces.

SUBMITTALS

Provide in accordance with Section 01 33 00.

Product List:

Before ordering, submit complete and detailed list of materials proposed for use.
Obtain Architect's acceptance before ordering.
Provide product data for field-applied interior paints and coatings which have a potential impact on indoor air quality, including manufacturer's MSDS sheets or other Product Data listing VOC content as noted below.
Provide product data for exterior field-applied paints and coatings, which have a potential impact on ambient air quality, including manufacturer's MSDS sheets or other manufacturer's Product Data listing VOC content as noted below.

Color Samples:

One Sample of each required finish, color, and sheen. Sample size 8 1/2 X 11 inches, minimum.
Use suitable substrate for each sample, such as stiff paper for paint and specified wood for stains.
Obtain Architect's acceptance before proceeding with work.

QUALITY ASSURANCE

Each product container shall bear manufacturer's legible label indicating the following:

- Manufacturer's Name
- Type of Material
- Manufacturer's Product Number
- Manufacturer's Batch Number
- Color
- Instructions for reducing, where applicable.

DELIVERY, STORAGE, AND HANDLING

Deliver in original, unopened containers.
Do not open containers or remove labels until Architect inspects.
Store in suitable location where directed by General Contractor.
Protect against contamination by foreign matter.
Remove unacceptable materials from project site.

ENVIRONMENTAL REQUIREMENTS

Follow manufacturer's directions.
Minimum ambient air and surface temperature for 24 hours prior to and during application and until film is dry hard thereafter: 40°F.
Do not work where dust or insects are present.
Do not work where inclement weather may damage surface.
Do not work with less than 30 foot candles of available light measured 3 ft. above floor.

EMISSIONS STANDARDS

Conform to the following minimum standards for coating emissions:

Coating Type	VOC Limits	Standard
Architectural Flat Paints – Interior	50 g/L	Green Seal GS-11
Architectural Non-Flat Paints - Interior	150 g/L	Green Seal GS-11
Primer or Undercoat	150 g/L	Green Seal GS-11
Anti-Corrosive Coating	250 g/L	Green Seal GS-11
Clear Wood Finishes - General	350	SCAQMD Rule 1113
Clear Wood Finishes – Varnish	350	SCAQMD Rule 1113
Clear Wood Finishes – Sanding Sealer	275	SCAQMD Rule 1113
Clear Wood Finishes – Lacquer	550	SCAQMD Rule 1113
Clear Wood Finishes – Pigmented Lacquer	550	SCAQMD Rule 1113
Stains – Interior	250	SCAQMD Rule 1113

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EXTRA STOCK
Leave, in previously unopened original containers, one gallon of each top coat.
Label for positive identification.
Store on project premises where directed.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

GENERAL
Products for each general purpose shall be of same manufacturer.
Do not use products of different manufacturers over one another, except for shop prime coats specified in other sections of these Specifications.

MATERIALS
Select from the following Approved Products Table unless otherwise specified herein.
All listed products will not necessarily be employed on this project. Consult painting schedule for required materials.
Product numbers are given to establish desired quality and do not indicate color.

COLORS
As selected by Architect.
Color Quantity:
- Interior Walls: Maximum 12 colors.
- Exterior Walls, Trim and Galvanized Metal: Maximum 3 colors.

Interior Colors: Noted on Drawings.
Exterior Colors: Colors to be selected by Architect.

MIXING AND TINTING
Deliver paints and enamels ready-mixed to jobsite.
Job-mix and job-tint only when acceptable to Architect.
Mix only in clean, rust-resistant containers.
Use tinting colors recommended by manufacturer for specific type of surface.
Factory-add fungicidal agent to all exterior coatings and to interior coatings applied in any high humidity spaces.

PART 3 - EXECUTION

EXAMINATION
Examine surfaces to receive coating for conditions that will adversely affect execution, permanence, and Work quality.
Verify that General Contractor has removed door hardware.
Prior to starting work notify General Contractor about defects requiring correction.
Do not start work until conditions are satisfactory.

PREPARATION
Protection:
Cover or otherwise protect work of other trades, including walls and floors of paint storage and mixing rooms.
Remove finish hardware, accessories, plates, lighting fixtures, and similar items. Obtain Architect's approval for protection in lieu of removal.
Post signs and install barricades as required to protect work of this section against damage or discoloration.
Take extraordinary care to prevent fire. Open cans of paint and varnish only when needed.
Keep rubbing cloths and oily rags submersed in water.
Surface Preparation:
General: Remove any loose material, dirt, or dust.
Galvanized Metal: Thoroughly clean with surface conditioner in accordance with manufacturer's

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instructions.
Etch metal with metal conditioner or in accordance with Steel Structures Painting Council Specification 7.
Non-Galvanized Steel: Remove any rust and scale.
Wood Doors: Lightly hand block-sand faces and edges with 180 grit sandpaper to remove any raised grain.
Preparation at Existing Doors: remove all surface contamination by washing with an appropriate cleaner, rinse thoroughly and allow to dry. Existing peeled or chipped paint should be scraped and sanded to a sound surface. Glossy surfaces should be sanded dull. Stains from water, smoke, ink, pencil, grease, etc. Should be sealed with the appropriate primer/sealer. Recognize that any surface preparation short of total removal of the old coating may compromise the service length of the system.
Fill any Voids. At natural finish, color filler to match wood.
Other Wood: Clean soiled surfaces with alcohol or approved.
Hand block-sand with 180 grit sandpaper to remove any raised grain.
At opaque coating seal knots, pitch, and resinous sapwood before prime coat application.
Fill voids, cracks, and other defects. At natural finish, color filler to match wood.
Remove gloss by washing and sanding; touch-up bare spots with proper type primer.

COATING APPLICATION
General:
Follow manufacturer's directions.
Do not apply initial coating until moisture content of surface to be finished is within limitations recommended by paint manufacturer. Test with moisture meter.
Apply coating with suitable brushes, rollers, or spraying equipment as recommended by coating manufacturer.
Do not exceed coating manufacturer's application rate.
Follow coating manufacturer's recommended drying time between succeeding coats.
Apply finish coats smooth, free of brush marks, streaks, laps, coating pile-up, and skips.
Keep brushes, rollers, and spraying equipment clean, dry, free from contaminates, and suitable for finish required.
Leave moldings and ornaments clean and true to detail without excessive coating build-up in corners and depressions.
Where paint abuts other materials or colors, cut paint edges clean and sharp and with no overlap.
Finish door tops, bottoms and edges as specified below: Remove doors from frames, if necessary.
Painted Work:
Flat Metalwork except Doors: Apply paint with brush, roller or airless spray equipment.
Doors: Apply paint with roller or airless spray equipment only, do not apply with brush.
Face runs not permitted.
Stained and Natural Work:
Adjust finishes where necessary to obtain similar appearance between different adjacent materials.

FIELD QUALITY CONTROL
For each required color scheme, request Architect to inspect first finished room, space, or item for color, texture, and workmanship.
Dry paint film thicknesses will be measured upon painting completion using Tooke Paint Inspection Gage IV, a precision instrument designed for measuring and evaluating paint coatings. Re-coat any Work measuring less than specified thickness.

FIELD SAMPLE
Before proceeding with painting, apply where directed at least 30 sq. ft. of each specified coating on actual wall and ceiling surfaces, and at least one sample door, door frame, and cabinet. Simulate building's design lighting during Architect's review.
Accepted sample represents minimum standards for subsequent work.
Accept samples in like-new condition may be used in contract work.
Touch-up test surfaces, which will measure approximately 1 sq. inch per Test.

CLEANING
Remove spills, splatters, and stains from all surfaces including other work and those in paint storage and mixing rooms.
Unless otherwise approved, refinish entire wall or surface where portion of finish has been damaged or is

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otherwise unacceptable.
Remove debris from project site upon work completion or sooner, if directed.
Including work of other sections, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.

PAINTING SCHEDULE

General:

Prime coats specified below may be omitted where factory-applied shop coats are specified in other Sections.
Prime coats specified may be omitted from existing finished surfaces, provided existing coating is sound.
Number of coats hereunder specified is minimum. Finished work shall be even, uniform color, and free from cloudy and mottled surfaces. Apply additional coats where necessary for any deep tone colors.
Minimum coating thicknesses specified below include prime coat and finishing coats combined.

Surfaces not coated, unless otherwise shown on Drawings:

Items having complete factory finish.
Rubber.
Non-ferrous metal.
Elastomeric sealants.
Tempered hardboard.
Acoustic tile.
Glass.
Flooring.
Fire-resistance rating labels and instructional labels.
Portions of buildings where no alterations occur, except as noted on Finish Schedule on Drawings.

Exterior Galvanized Steel, Ferrous and Non-Ferrous Metal:

Paint System – 2: Epoxy Enamel
- One coat water base primer, 1.6 mils.
- Two coats semi-gloss water-based catalyzed epoxy enamel, 6.0 mils.
- Total minimum dry thickness: 7.6 mils.

Exterior Fiber Cement Siding:

Paint System 8: Latex Enamel.
- One coat exterior water base primer, 1.4 mils.
- Two coats satin exterior latex enamel, 2.6 mils.
- Total minimum dry thickness: 4.0 mils.

Exterior Gypsum Board Soffits:

Paint System - 16: Epoxy Enamel
- One coat water base primer, 1.6 mils.
- Two coats eggshell gloss water-based catalyzed epoxy enamel, 6.0 mils.
- Total minimum dry thickness: 7.6 mils.

Interior Gypsum Board Ceilings:

Paint System - 14: Latex Enamel
- One coat wallboard primer, 1.6 mils.
- Two coats flat latex enamel, 2.6 mils.
- Total minimum dry thickness: 4.2 mils.

Interior Gypsum Board:

Paint System - 15: Latex Enamel
- One coat wallboard primer, 1.6 mils.
- Two coats eggshell gloss latex enamel, 2.6 mils.
- Total minimum dry thickness: 4.2 mils.

Interior Gypsum Board in Wet Areas:

Paint System - 16: Epoxy Enamel
- One coat water base primer, 1.6 mils.
- Two coats eggshell gloss water-based catalyzed epoxy enamel, 6.0 mils.
- Total minimum dry thickness: 7.6 mils.

Interior Ferrous and Non-ferrous Metal:

Paint System – 18: Latex Enamel
- One coat metal primer, 2.5 mils.
- Two coats semi-gloss latex enamel, 2.6 mils.
- Total minimum dry thickness: 5.1 mils.

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Interior Woodwork:

Paint System - 20: Stain and Clear Coating
- One coat clear prestain
- One coat penetrating water-base stain.
- One coat sanding sealer
- Two coats satin gloss urethane coating.

Paint System - 22: Latex Enamel
- One coat enamel undercoat, 1.9 mils.
- Two coats semi-gloss latex enamel, 2.6 mils.
- Total minimum dry thickness: 4.5 mils.

Exposed Mechanical and Electrical Work except in Mechanical or Electrical Equipment Rooms:

Paint System -25: Exterior metal work including that on roof:
- Prepare and paint as specified for other exterior metal of same kind.

Paint System - 26: Interior metal work:
- Prepare and paint as specified for other interior metal of same kind.

Paint System - 27: Electrical conduit, panel boards, and service boxes:
- Prepare and paint as specified for other interior metal of same kind.

END OF SECTION

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APPROVED PRODUCTS TABLE

Manufacturers ►| Products ▼|	Benjamin Moore	Miller	PPG	Rodda Cloverdale	Sherwin Williams	Other
Concrete Block Filler – water base	571	481-0-11	6-7	501901	B25W25	
Masonry Primer Sealer – water base	609	620-0-XX	4-808	501601	A24W300	
Wood Primer Sealer – water base	027	270-0-11	17-921X1	501601	B42W08041	
Galvanized Iron Primer – water base	HP04	310-2-10	4020PF	501601	B66W1	
Ferrous Metal Primer – water base	HP04	310-2-10	4020PF	70323	B66W1	
Heavy-bodied Stain – water base	610	Storm 412XX	FLD 820	70303	A15W00053	Olympic, Cabot,
Exterior Satin Enamel – water base	448	320-4-00	6-2045XI	532201	A82W00107	
Exterior Semi-gloss Enamel – water base	449	320-5-XX	PP919	542001	A08W00116	
Elastomeric Coating – water base	359	550-2-XX	4-110XI	511301	A5-600	
Epoxy Enamel Semi-gloss – water base	V341	183-5-10	16-510	70503	B70/B60V25	
Enamel Undercoat – water base	027	270-0-11	17-921X1	502001	B28W02600	
Wallboard Primer – water base	534	220-0-11	6-2	503601	B28W02600	
Interior Eggshell Enamel – water base	537	120-3-XX	6-4310XI	523601	B20-2600	
Interior Satin Enamel – water base	538	120-4-00	6-4410XI	533001	A87W011XX	
Interior Semi-gloss Enamel – water base	539	120-5-73	4216 HP	543601	B31W046XX	
Dry Fall – water base	395	181-1-11	6-725XI	513801	B42W1	
Interior Stain – water base	1WB1300	700	DFT300	06680	618074444	Varathane
Urethane Varnish Gloss – water base	422		DFT157	59324	A68V00091	
Urethane Varnish Satin – water base	423		DFT159	59314	A68F00090	
Traffic Paint – White	TP-22XX	8001	11-53	57341A	TM2152	
Traffic Paint – Yellow	TP-32XX	8013	11-54	57342A	TM2153	

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PART 1 - GENERAL

SECTION INCLUDES
Writing and marker board surfaces manufactured of various materials; mounting surfaces including framing systems and accessories.

SUBMITTALS
Provide in accordance with Section 01 33 00.
Shop Drawings:
Show dimensions, full size sections, metal thickness, construction details, required clearance, anchor location, and installation details.
Manufacturer's Instructions:
One copy of manufacturer's cleaning and maintenance instruction for inclusion in Owner's Maintenance Manual.
Install one permanent Chalkboard Maintenance Instructions Plate where directed in each room where boards are installed. Plate shall include instructions for proper board care.

QUALITY ASSURANCE
Manufacturer’s Qualifications: Company specializing in manufacturing the products specified in this section with a minimum of five years of documented experience.

DELIVERY, STORAGE, AND HANDLING
Deliver in protective containers with manufacturer's original, legible label intact.
Store in clean, dry area.
Protect against damage and discoloration.
Store rolled material on end, and sheet material flat.
Provide support necessary to retain original shape.
Maintain storage area temperature above 55^{o}F.

ENVIRONMENTAL REQUIREMENTS
Maintain installation area temperature greater than 55^{o}F for 24 hours prior to, during, and continuously after installation.
When using offensive smelling adhesives provide adequate ventilation to maintain healthy and pleasant working environment for workmen of all trades.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

DRY MARKER BOARDS
Manufacturer and Model:
Claridge LCSII, or accepted substitute.
Board:
Type: Porcelain enamel on steel. Base sheets coated on both sides.
Thickness: 23 gage minimum base metal, .0025 inch minimum porcelain writing surface.
Sizes: As noted on Drawings.
Color: #75 Low Gloss White.
Metal Trim:
Frame: Extruded aluminum, 1/16 inch minimum thickness, 4 ft. minimum length, satin mechanical finish with Class III clear architectural anodic coating AA-M31A31.
Chalk Trough: Manufacturer’s standard type with end closures. Provide full length across bottom of marker boards.
Map Rail: Manufacturer’s standard type with cork inserts. Provide full length across top of each marker board unit.

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Mounting:
Steel mounting clips at top, angle clips at bottom mounted 24" on center.
Backing For Boards:
7/16 inch particle board, 42 pcf maximum density, "Duraflake", "Timblend", "Versabord" or accepted substitute.

BACKING FOR BOARDS
Provide all necessary.
Sheet metal backing as described in section 09 29 00.
Accessories are located on Drawings for Contractor's convenience.
Verify location, type, and quantity with Owner prior to proceeding with work.

TACKABLE PANEL
Manufacturer and Model: MDC "Zintra", Acoustic Panels.
Material: 100% Polyester
Features: Sounds absorbing, tackable surface.
Thickness: 1/2 inch.
Panel Dimensions: As shown on Drawings.
Color: To be selected by Architect.
Flammability: ASTM E84, Class A.
Extruded Trim: 1 inch by ½ inch extruded aluminum, clear anodized finish.
Installation: Silicone based construction adhesive or Z-clips.

FABRICATION
Fabricate panels to sizes and configurations shown on Drawings.
Fabricate panels to exact sizes required to fit wall surfaces based on field measurements of completed substrates.

PART 3 - EXECUTION

EXAMINATION
Do not proceed with work until surfaces to receive boards are smooth, true, clean, sound, dry, backing is in place, and otherwise properly prepared.
Prior to starting work notify General Contractor of defects requiring correction.
Do not start work until conditions are satisfactory.
Verify prior to fabrication.
If field measurements differ slightly from drawing dimensions modify work as required for accurate fit. If measurements differ substantially notify Architect prior to fabrication.

PREPARATION
Remove substrate surface imperfections that will interfere with board installation or mar board appearance.
Roughen smooth surfaces before applying adhesive.
Prime substrate surfaces prior to applying adhesive when recommended by manufacturer.

INSTALLATION
General:
Follow manufacturer's directions.
Keep perimeter lines straight, plumb, level, and true to wall plane.
Install boards without horizontal joints, unless otherwise shown on Drawings.
Install boards without vertical joints if possible; where joints are mandatory space no closer than 8 feet on center unless otherwise approved or shown on Drawings.
Fabricate board joints straight and balance symmetrically, unless otherwise shown on Drawings.
Fit butt joints tight and in same plane on both side of joints.
Metal Trim:
Provide metal trim around board perimeter.
Secure as recommended by manufacturer, unless otherwise approved.

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Fit with precise hairline joints with no rough edges.
Locate joints no closer than 4 ft. on center unless otherwise approved.
Tackable Panel Extruded Trim:
Provide metal trim around board perimeter.
Secure as recommended by manufacturer, unless otherwise approved.
Orient trim so that the ½ inch leg sits along the edge of the tackable panel. The 1 inch leg shall be concealed behind the panel.
Fit with precise hairline joints with no rough edges.

CLEANING AND REPAIRING
Remove debris from project site upon work completion or sooner, if directed.
Including work of other sections, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.

PROTECTION
Protect other work against damage and discoloration caused by work of this section.
Provide temporary protective cover. Remove at substantial completion.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES
Directories, directional items, letters, signs, and plaques of various materials used in establishing identity or communication.

SUBMITTALS
Provide in accordance with Section 01 33 00.
Shop Drawings:
Prior to starting work submit the following for review and acceptance:
- Layout templates
- Color samples
- One completed sign
- Jobsite layout and mounting of each sign type.

DELIVERY, STORAGE, AND HANDLING
Protect against damage and discoloration.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

PLASTIC SIGNS
General:
Type: Injection-molded plastic, exposed edges beveled, single faced.
Thickness: 1/8 inch minimum.
Colors: To be selected by Architect.
Size: See detail 2/A-505.
Accessories: At signs located on glazing, provide blank back plates to match size and shape of sign.
Manufacturer: Innerface Sign Systems, ASI Sign Systems, Architectural Metalcrafters, Meyer Architectural Signs & Graphics, Best Sign Systems, Gemini Incorporated, Martin Bros, Mohawk Sign Systems.
Extent of Work: Provide signs next to each new interior door in Door Schedule.
Provide room names and numbers as directed by owner.
Provide the following sign types and the following doors.

'Type A' – 152B, B01A, B02A, B03A

'Type B' – 102A, 102B, 106A, 118A, 129A, 132A, 133A, 145A, 146A, B04A

'Type C' – All other interior doors

'Type D1' – 128A, B05A

'Type D2' – 115A, 147A, 148A

'Type E' – 101A, 101B, 101C, 101D, 116A, 116B, 117A, 117B, 150B, 152A, 156A

'Type F' – 101A, 101B, 101C, 101D, 116A, 116B, 117A, 117B, 150B, 152A, 156A

PART 3 - EXECUTION

EXAMINATION
Verify that backing and surfaces to receive signs are complete, clean, dry, secure, and otherwise properly prepared.
Prior to starting work notify General Contractor about defects requiring corrections.
Do not start work until conditions are satisfactory.

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FIELD MEASUREMENTS
Verify prior to fabrication.
If field measurements differ slightly from Drawing dimensions modify work as required for accurate fit. If measurements differ substantially notify Architect prior to fabrication.

INSTALLATION
Install plumb, level, square, true, and secure.
Attach to wall at latch side of doors unless otherwise noted on Drawings.
Install with double-stick adhesive tape.
Mount signs at maximum 60 inches above floor to centerline of sign. All signs mounted at uniform height.

CLEANING AND REPAIRING
Remove debris from project site upon work completion of sooner, if directed.
Including work of other sections, clean, repair and touch-up, or replace when directed products which have been soiled, discolored, or damaged by work of this section.

PROTECTION
Protect other work against damage and discoloration caused by work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES
Prefabricated items for use in conjunction with toilets and baths.

DELIVERY, STORAGE, AND HANDLING
Protect against damage and discoloration.
Do not remove protective covers until final project clean-up.
Deliver keys to Architect.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

GRAB BARS
Material: Satin finish stainless steel.
Mounting: 1 1/2 inch clearance between bar and wall; mount as shown on Drawings.
Manufacturer: Bobrick B-5806 series, or accepted substitute.
Provide in toilet compartments intended for handicapped users as shown on the Drawings.

SANITARY NAPKIN RECEPTACLE
Type: Surface mounted with hinged top cover and bottom trap door.
Material: Stainless steel.
Manufacturer: Bobrick B-270, or accepted substitute.
Provide one in each each toilet room.

TOILET SEAT COVER DISPENSER
Type: Surface-mounted.
Material: Stainless steel with satin finish.
Manufacturer: Bobrick B-221.
Provide one in each toilet compartment and each toilet room where shown on Drawings.

COAT HOOKS
Type: Single robe hook, concealed mounting.
Material: Satin finish stainless steel.
Mounting: Unless otherwise shown on Drawings, mount 4 ft. above floor.
Manufacturer: Bobrick B-6707, or accepted substitute.

BABY CHANGING STATION
Type: Wall mounted, horizontal, fold-down, ADA compliant.
Construction: Blow-molded high density polyethylene with Microban antimicrobial additive, continuous steel hinge, 11 gage steel mounting plates and mounting hardware, pneumatic cylinder controlled opening and closing, with built-in dispenser for sanitary liners.
Accessories: Nylon safety straps and bag hooks, safety messages in six languages and Braille.
Manufacturing and Safety Standards: Conform to ASTM F 2285-04, ANSI S117.1 and ANSI Z535.4.
Manufacturer and Model: Koala Kare Products KB200-01SS, Grey color, with recessed sanitary liner dispenser KB134-SSLD.

OWNER-PROVIDED PRODUCTS
The owner will provide the following Toilet Accessories to the Contractor for installation:
- Soap dispensers: Surface mount.
- Paper towel dispensers: Surface mount hands-free type.
- Toilet paper dispensers: Surface mount double roll type.
- Trash receptacles: Surface mount.

BLOCKING AND BACKING
Provide all necessary.
Accessories are located on Drawings for Contractor's convenience.

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Verify location, type, and quantity with Owner prior to proceeding with work.

FABRICATION
Fabricate units with welded corners, one piece seamless exposed flanges, and without open miters.
Except at coin boxes, key locked units alike.

PART 3 - EXECUTION

EXAMINATION
General:
Do not proceed until surfaces to receive accessories are smooth, clean, dry, square, sound, accurately sized and located, and otherwise properly prepared.
Prior to starting work notify General Contractor of defects requiring correction.
Verification of Conditions:
Verify type of wall construction prior to ordering. Provide all required fasteners, clamps, adapters, etc., necessary for conditions encountered.

INSTALLATION
Install accessories in accordance with manufacturer's directions where indicated, or directed.
Mount plumb, level, true, and secure with non-corrosive Fasteners.

ADJUSTMENTS
Adjust moving parts to operate satisfactorily at time of final project acceptance and during warranty period.

CLEANING AND REPAIRING
Remove debris from project site upon work completion or sooner, if directed.
Including work of other sections, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.

PROTECTION
Protect other work against damage and discoloration caused by work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES
Shop fabricated, field installed wood and wood composite lockers, related components and accessories.

SUBMITTALS
Submit in accordance with Section 01 33 00.
Shop Drawings:
Show dimensions, details of construction, joining of equipment to adjacent construction, finish, and other pertinent items.
Product Data:
Manufacturer's descriptive data of all materials and products construction, overall dimensions for installation of lockers, accessories, and trim.
Samples:
Submit three color samples of laminate specified.

PRODUCT DELIVERY, STORAGE, AND HANDLING
Deliver in Manufacturer's protective container with legible identifying label intact.
Store flat and above ground.
Protect against moisture, damage, and discoloration.

WARRANTY
All parts and hardware shall be WIG compliant, structurally sound and free from defects in material and workmanship under normal use and service for a period of three (3) years.
All lock parts to be warrantied for a period of one (1) year.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

EQUIPMENT SIZE
Dimensions of lockers listed are nominal, are for each unit, and are exclusive of legs or base and sloping tops, if any.

WOOD LOCKERS
Manufacturer and Model:
Ideal Products Inc. 2000 Series, or accepted substitute.
Type and Size:
Standard Two Tier, 18 inch depth X 12 inch width X 72 inch height, style “B”.
Door and Panel Material:
Vertical grade high pressure plastic laminate applied to both sides 11/16” 48 lb. industrial grade particle board core. Door edges radiused and finished with manufacturer’s standard T-molding.
Interior Material:
48 lb. industrial grade particle board core, ANSI A208.1, grade 1-M-2, 45. , manufacturer’s standard color.
Interior vertical surfaces of sides and back panel are finished with 6 mil frosty white vinyl.
Interior horizontal surfaces of shelves, tops and bottoms are finished with white thermal-fused melamine.
Finish:
Plastic laminate, color and pattern selected by Architect.

HARDWARE
Provide with Manufacturer's standard hardware and accessories, unless modified herein.
Hinges, heavy duty: fully concealed, nickel plated, self-closing, 120 degree opening (3 per door > 42”).
Locks, heavy duty: Padlock hasps, surface mounted through-bolted, case harden and cadmium plated steel.
Clothes Hooks, aluminum or brass finished: Ceiling mounted double prong.

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NUMBER PLATES
Provide non-corrosive number plate on each locker.
1¼" diameter, ¼" numerals recessed flush in door, satin chrome, satin brass and black.
Schedule of numbers furnished by Owner.

FABRICATION
Lockers shall be fabricated using blunt joint and t-head 2" galvanized nail and screw construction.
Fabricated lockers square, rigid and without warp.
Machine all parts and attachment holes accurately and chip free.
Fabricate corners, fillers, scribes, tops as required for installation.

PART 3 - EXECUTION

EXISTING CONDITIONS
Verify that surfaces to receive work of this section are solid, true, square, plumb, accurately sized and located, and otherwise properly prepared.
Prior to starting work notify General Contractor of defects requiring corrections.
Do not start work until conditions are satisfactory.

INSTALLATION
Assemble lockers plumb and true; fasten securely together and to adjacent construction.
Install lockers at the locations shown in accordance with manufacturer's instructions for plumb, level, rigid and flush installation.
Option to install on standard prefabricated bases as supplied by manufacturer allowing for 2" toe kick.
Fasten locker frames to each other with chromium plated t-nuts and hex head screws through holes per drilled at factory.
Secure banks of lockers every 4 feet to walls or wall studs for earthquake resistance with straps as supplied by manufacturer.
Install end and corner fillers and caps, cut to size in field per plans.
Install end panels, sloped tops, finished tops.
Install number discs, clean lockers, remove all related trash and debris from jobsite.

ADJUSTMENTS
Adjust moving parts to operate satisfactorily at time of final project acceptance and during warranty period.

PRODUCT CLEANING AND REPAIRING
Including work of other sections, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.
Remove debris from project site upon work completion or sooner, if directed.

PROTECTION
Protect other work against damage and discoloration caused by work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES
Collection of small specialty items not found in independent sections.

SUBMITTALS
Submit in accordance with Section 01 33 00.
Shop Drawings:
Show layout, dimensions, details of construction, methods of joining to other work, required clearances, finishes, accessories, and other pertinent items.
Manufacturer's printed data or samples may be substituted, provided required information is included.
Approved samples in like-new condition may be used on contract work.
Product Data:
Provide manufacturer’s data for products specified herein. Include information on mounting, operation, finishes, and sizes.

DELIVERY, STORAGE, AND HANDLING
Protect against damage and discoloration.
Deliver in manufacturer's original, unopened, protective wrapping with original, legible label intact.

COORDINATION
Coordinate with other trades affecting or affected by work of this section.

PART 2 - PRODUCTS

KEYWATCHER SYSTEM
Manufacturer and Model: Morse Watchmans, Keywatcher Touch.
Type: Single module, 16 keys total.
Mount: Wall, surface mount.
Operation: Card reader access, coordinate power/data so that it is behind the unit.
Case Color: Gray/silver.
Location: See Drawings.

SPEAK-THRU DEVICE
Type: No-draft speak thru with theft proof locking device.
Size: Approximately 5 inches.
Finish: Satin anodized aluminum.
Manufacturer and Model: CRL #834A.

FIRE EXTINGUISHER CABINETS (FEC)
Type: Semi-recessed, aluminum, trimmed.
Door: Clear acrylic plastic slim window.
Cylinder Lock: Not required.
Brackets: Provide with manufacturer's standard brackets to support extinguisher.
Painting: Paint cabinet interior with black enamel.
Manufacturer and Type: J. L. Industries Academy Series or accepted substitute.
Provide where “FEC” is noted on Drawings.

FIRE EXTINGUISHERS (FE)
Type: OSHA Approved, red, multi-purpose dry chemical.
Rating: UL rated 2A-10B:C, 5 lb capacity.
Fill and service extinguishers prior to substantial completion of project.
Install in fire extinguisher cabinets where “FEC” is noted on Drawings.
Install on manufacturer’s standard wall bracket where “FE” is noted on Drawings.

FIRE EXTINGUISHER SIGNS
Type: 3D Tent Style, 5” x 6”.
Manufacturer and Type: J. L. Industries 24S or accepted substitute.
Provide at each fire extinguisher is noted on Drawings, mount bottom of sign at 84” above finish floor.

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CORNER GUARDS
Size: 1½" X 1½" wings or 2" x wall width, 48 inches length.
Material: 16 gage, type 304 stainless steel, No. 4 finish.
Mounting: Cement-on type.
Manufacturer: IPC Door and Wall "181124C-304" Protection, Babcock-Davis "CG-SS304", Korogard Wall Protection Systems "GS20", or accepted substitute.
Location: Provide at all 90-degree interior corners and wall end caps, existing and new, throughout the entire building.

JANITOR'S MOP HANDLE HOLDERS
Material: Type 30 Stainless steel.
Size: 24 inches long with 3 holders.
Manufacturer: Bobrick B-223 X 24, or accepted substitute.
Quantity Required: 1

SHOP PAINTING
Factory-apply one coat rust-preventative metal primer to ferrous metal surfaces after fabrication, but before installation, unless hereunder specified otherwise.
Substitute complete factory-finish where so specified herein.

BLOCKING AND BACKING
Provide where necessary.
Specialties are shown on Drawings for Contractor's convenience; verify location, type and extent of Work before installing blocking and backing.

PART 3 - EXECUTION

EXAMINATION
Verify that surfaces to receive specialties are properly prepared, sized, and located.
Prior to starting work notify General Contractor of defects requiring correction.
Do not start work until conditions are satisfactory.

INSTALLATION
General:
Follow manufacturer's instructions and approved shop drawings.
Secure plumb, level, square, straight, and true as applicable.
Fire Extinguishers:
Mount in cabinet where "FEC" is noted on Drawings. Mount on bracket on wall where "FE" is shown on Drawings unless otherwise directed by building official.

ADJUSTMENTS
Adjust moving parts to operate satisfactorily at time of final project acceptance and during warranty period.

CLEANING AND REPAIRING
Remove debris from project site upon work completion or sooner, if directed.
Including work of other sections, clean, repair and touch-up, or replace when directed products which have been soiled, discolored, or damaged by work of this section.
Leave installation clean and defect-free.

PROTECTION
Protect other work against damage and discoloration caused by work of this section.

END OF SECTION

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PART 1 - GENERAL

SECTION INCLUDES
Furnishing and installing window blinds and hardware.

ALTERNATES
Refer to Section 01 23 00 for possible effect upon work of this section.

SUBMITTALS
Submit in accordance with Section 01 33 00.
Product Data:
For each product specified.
Shop Drawings:
Show mounting details with appropriate fasteners for specific project substrates.

PRODUCT DELIVERY, STORAGE, AND HANDLING
Deliver in Manufacturer's protective container with legible identifying labels intact.
Store flat and above ground.
Protect against moisture, damage, and discoloration.

COORDINATION
Coordinate with other Trades affecting or affected by Work of this Section.

PART 2 - PRODUCTS

WINDOW BLINDS
Type: Horizontal, spring tempered, bounce back, solid aluminum slats window covering with valance free exposed headrail.
Manufacturer: SWF Contract, Hunter-Douglas.
Model: SWF Contract, Bali Classics; Hunter-Douglas, CE81.
Slats: Nominally 1" wide, .008" thickness with minimum 90% recycled content.
Mounting and Controls: Inside frame where possible. Tilt left/Lift right. Provide longer extensions at all glazing 7'-0" AFF, such as transoms above doors, verify in field.
Included Options: Heavy duty cord, cordlock, cradles.
Color: Selected by Architect from manufacturer's standard.
Extent of Work: Selected windows as shown on Drawings.

PART 3 - EXECUTION

EXAMINATION
Verify that surfaces to receive work of this section are solid, true, square, plumb, accurately sized and located, and otherwise properly prepared.
Prior to starting work notify General Contractor of defects requiring corrections.
Do not start work until conditions are satisfactory.

ADJUSTMENTS
Adjust moving parts to operate satisfactorily at time of final project acceptance and during warranty period.

PRODUCT CLEANING AND REPAIRING
Including work of other sections, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.
Remove debris from project site upon work completion or sooner, if directed.

PROTECTION
Protect other Work against damage and discoloration caused by work of this section.

END OF SECTION

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MECHANICAL ENGINEER'S SEAL

The undersigned hereby certifies that the Plumbing Technical Specifications in this project manual were prepared by me or under my direct supervision.

Jeremy Wenger
Fluent Engineering, Inc.



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PART 1 - GENERAL

SUMMARY

Products under this contract must meet minimum specification requirements in detail without exception unless specifically noted and approved as provided in these Specifications. Equipment submitted for review must clearly state on cover sheet any differences from specified product. Equipment substitution or submittal review does not relieve Contractor from meeting all requirements of specified item.

RELATED WORK

CAST-IN-PLACE CONCRETE: Concrete and Grout

CONTRACT DOCUMENTS

The Contract Documents are inclusive. All requirements of all Contract Documents shall be binding as if repeated herein and with this Division as required by any other Division or Contract Document. Applicable provisions of Division 1 govern work under this section. This Division does not express or imply separation of the Contract Documents and shall not be considered as separation of the Work. See Advertisement for Bids, Instructions to Bidders, Supplemental Instructions to Bidders, General Conditions, Supplemental General Conditions, Drawings and Specifications, and modifications incorporated in the documents before execution of the Agreement.

Conflicts:

If any conflicts exist the more stringent Contract Document is required.

DEFINITIONS

Definitions herein are intended as advisory and shall not limit requirements within the Contract Documents. Where a conflict of definitions exists, the more stringent standard shall be used. Where a term is defined on a Drawing the Drawing definition shall be used for that drawing. Not all definitions are included. Trade standard terms are not defined.

SCOPE OF WORK

General:

Provide complete and functional plumbing systems as specified, as shown on Drawings, as required, and as intended.

Omissions:

Contractor shall be responsible for additional labor, or additional material necessary for the proper execution of the Work. Omissions of expressed reference to any item shall not relieve the responsibility to conform to the Contract Documents.

Scope of Plumbing Work:

All materials and workmanship shall be furnished for complete, tested, and operating plumbing systems as shown on the drawings and specified herein. Plumbing work is to include the water and sanitary service. Complete to the point of connection with the serving utility(ies). Any changes of or work required by the serving utility(ies), are part of this work and shall be fully included in the bid price.

CODES

Comply with the requirements of local, federal, Oregon Administrative Code, and Oregon Plumbing Specialty Code.

SUBMITTALS

Reference: Division 1, General Conditions, Submittals.

Shop Drawings and Submittals:

Bound, labeled, contain the project manual cover page and a material index list page showing item designation, manufacturer and additional items supplied with the installation. Submit for all equipment and systems as indicated in the respective specification sections, marking each submittal with that specification section number. Mark general catalog sheets and drawings to indicate specific items being submitted and proper identification of equipment by name and/or number, as indicated in the contract documents. Include wiring diagrams of electrically powered equipment.

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Engineer Review:
Allow not less than 20 Days.
Submit:
Not less than Fixtures, Stops, and Piping catalog information.

CONFORMANCE WITH REQUIREMENTS
General:
All work shall conform to the reasonable requirements of the project within the scope of the project and authorizations. All work shall conform to the methods and requirements of Code at the location of the Work.
Access and inspection:
All portions of the Work shall be accessible to inspections and review at all reasonable times during construction. Contractor is responsible for providing access for review and inspection of the Work. Contractor shall secure written inspection reports prior to concealing Work. Contractor is responsible for damages to properly review the Work due to lack of at least 7 Days advance written notification to the Architect, and Engineer that Work is ready for inspection.
Accounting:
Provide general accounting information as to labor and equipment costs to assist in determination of modifications to the Contract. Provide accounting breakdown when required for securing Owner financing, or for analysis of equipment costs or equipment payback periods, as well as information for Owner's incentives.

COORDINATION OF TRADES
Check all other trade drawings to avert potential installation conflicts. Should major changes from the Drawings be required to resolve potential conflicts, notify the Architect and secure written approval and agreement on necessary adjustments prior to start of installation. Check all equipment locations and connections on the site for coordination with other Divisions' equipment and connections and structure and the like. Contractor is responsible for scheduling trades to properly execute all the Work as intended.

STANDARD OF CARE AND QUALIFICATIONS
General:
Contractor shall be experienced and knowledgeable to Provide Work. Owner is not responsible for improper operation, incompliance, or installation due to Contractor's lack of knowledge or experience. Upon request, and where requested herein the Contractor shall supply qualifications and experience. Drawings are presented with industry terms, statements, and trade practices and it is the responsibility of the Contractor to be familiar. Provide written notification prior to Bid to the Architect if any representation is not understood, or outside standard practice.
Like Materials and Quality Control: All systems provided shall be new and of like materials provided through manufacturer. Items of the same by different manufacturers will be rejected. Equipment shall conform to all applicable Code and applicable listing criteria as of the date of the Contract Documents. Equipment determined to be manufactured under any other listing or Code prior to the date of the Contract is not acceptable, even if the equipment is new or has not been used. All equipment provided to project shall be listed by an approved listing organization.

EXAMINATION OF SITE
Examine Site of Work prior to making Bid. Ascertain all related physical conditions. Verify at the Site of Work prior to Bid scale dimensions shown due to exact locations, distances, and levels will be governed by actual field conditions. Owner will not be responsible for any loss or costs that may be incurred due to a Bidder's failure to fully inform themselves prior to Bid in regard to conditions pertaining to the Work and nature of the Work.

MINOR DEVIATIONS
Make minor changes in equipment locations and equipment connections as directed or required without extra cost.

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RECORD DRAWINGS
Maintain a marked set of prints at job site at all times. Show all changes from the original drawing set whether visible or concealed. Include all addendums, field orders, change orders, clarifications, request for information drawn responses, and deviations. Dimension accurately from building lines, floor, or curb elevations. Show exact location, elevation, and size of conduit/raceway, access panels and doors, equipment, and all other information pertinent to the Work. At project completion, submit marked set to Architect for review.

WARRANTY
Warrant Work, materials, and equipment for not less than one year.

CONTINUITY OF EXISTING SERVICES
Do not interrupt or change existing services without prior written approval from the Owner's Project Representative. When interruption is required, coordinate scheduling of down-time with the Owner to minimize disruption to his activities. Unless specifically stated, all work involved in interrupting or changing existing services is to be done during non-working hours.

CERTIFICATES AND INSPECTIONS
Reference:
Division 1, General Conditions, Permits, Regulations, Utilities, and Taxes.
Inspections:
Obtain and pay for all required installation inspections except those provided by the Architect. Deliver the originals of inspection certificates and test records to the Owner's Project Representative. Include copies of the certificates and test records in the Operating and Maintenance Instructions.

PROTECTION OF FINISHED SURFACES
Refer to Division 1, General Requirements, Protection of Finished Surfaces.

SLEEVES AND OPENINGS
Refer to Division 1, General Requirements, Sleeves and Openings.

SEALING AND FIRESTOPPING
Sealing and firestopping of sleeves/openings between piping, etc. and the sleeve or structural opening shall be the responsibility of the contractor whose work penetrates the opening. The contractor responsible shall hire individuals skilled in such work to do the sealing and fireproofing. Provide all fire stopping of fire rated penetrations and sealing of smoke rated penetrations in compliance with Specifications Fire Stopping.

OPERATION AND MAINTENANCE DATA
All operations and maintenance data shall comply with the submission and content requirements specified under section GENERAL REQUIREMENTS.
In addition to the general content specified under GENERAL REQUIREMENTS supply the following additional documentation:
Records of tests performed to certify compliance with system requirements.
Manufacturer's wiring diagrams for electrically powered equipment.
Certificates of inspection by regulatory agencies.
Valve schedules.
Lubrication instructions, including list/ frequency of lubrication.
Parts lists for fixtures, equipment, valves and specialties.
Manufacturers installation, operation and maintenance recommendations for fixtures, equipment, valves and specialties.
Additional information as indicated in the technical specification sections.

PART 2 - PRODUCTS

IDENTIFICATION

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Adhesive labels: Pressure-sensitive, adhesive backed, vinyl pipe markers with applicable labeling, ¾" min. size for lettering and surrounding tape on both ends.

CONTRACT DOCUMENTS

END OF SECTION

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PART 1 - GENERAL

SUMMARY

This Section includes requirements for selective demolition and removal of plumbing, sprinkler systems and related mechanical components and incidentals required to complete work described in this Section ready for new construction.

RELATED REQUIREMENTS

Section 01 74 19 - Construction Waste Management and Disposal.

DEFINITIONS

Demolish:

Detach items from existing construction and legally dispose of items off site, unless indicated as removed and salvaged, or removed and reinstalled.

Remove:

Planned deconstruction and disassembly of items from existing construction including removal of conduit, junction boxes, cabling and wiring from electrical component to panel taking care not to damage adjacent assemblies designated to remain; legally dispose of items off site, unless indicated as removed and salvaged, or removed and reinstalled.

Remove and Salvage:

Detach items from existing construction and deliver them to Owner ready for reuse.

Remove and Reinstall:

Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

Existing to Remain:

Existing items of construction that are not removed and that are not otherwise indicated as being removed and salvaged, or removed and reinstalled.

Hazardous Substances:

Dangerous substances, dangerous goods, hazardous commodities and hazardous products may include asbestos, mercury and lead, PCB's, poisons, corrosive agents, flammable substances, radioactive substances, or other material that can endanger human health or wellbeing or environment if handled improperly as defined by the Federal Hazardous Products Act (RSC 1985) including latest amendments.

ADMINISTRATIVE REQUIREMENTS

Coordination:

Coordinate work of this Section to avoid interference with work by other Sections.

Account for Owner's continued occupancy requirements during selective demolition and schedule staged occupancy and worksite activities.

SITE CONDITIONS

Condition of materials identified as being salvaged or demolished are based on their observed condition on date that tender is accepted.

SALVAGE AND DEBRIS MATERIALS

Demolished items become Contractor's property and will be removed from Project site; except for items indicated as being reused, salvaged, or otherwise indicated to remain Owner’s property.

Carefully remove materials and items designated for salvage and store in a manner to prevent damage or devaluation of materials.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

EXAMINATION

Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

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Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of conditions as satisfactory.

PREPARATION

Protect systems and components indicated to remain in place during selective demolition operations and as follows:

Prevent movement and install bracing to prevent settlement or damage of adjacent services and parts of existing buildings scheduled to remain.

Notify Owner and cease operations where safety of buildings being demolished, adjacent structures or services appears to be endangered and await additional instructions before resuming demolition work specified in this Section.

Prevent debris from blocking drainage inlets.

Protect plumbing and sprinkler systems that must remain in operation.

Ensure hazardous materials are removed or abated prior to commencing demolition.

For components intended for relocation and reuse, remove, store, protect, clean and reinstall and connect to Plumbing systems, and recommission.

Sequence demolition work so that interference with the use of the building by the Owner and users is minimized and as follows:

Prevent debris from endangering the safe access to and egress from occupied buildings.

Notify Owner and cease operations where safety of occupants appears to be endangered and await additional instructions before resuming demolition work specified in this Section.

DEMOLITION, REMOVAL, AND DISPOSITION

Disconnect and cap gas supply and electrical services in accordance with requirements of local Authority Having Jurisdiction.

Do not disrupt active or energized utilities without approval of the Owner.

Erect and maintain dust proof and weather tight partitions to prevent the spread of dust and fumes to occupied building areas; remove partitions when complete.

Demolish parts of existing building to accommodate new construction and remedial work as indicated.

At end of each work day, leave worksite in safe condition.

Perform demolition work in a neat and workmanlike manner:

Remove any tools or equipment after completion of work, and leave site clean and ready for subsequent renovation work.

Repair and restore damages caused as a result of work of this Section to match existing materials and finishes.

Conduct demolition of plumbing and sprinkler systems in accordance with local Authority Having Jurisdiction (AHJ).

Saw-cut concrete as shown or required.

Piping, and Equipment to Be Removed:

Remove all piping, and equipment as indicated on the Drawings.

Piping Removed:

Drawings do not show all existing piping which is to be removed. Unless indicated otherwise, where existing equipment has been removed, or its use replaced by new equipment, remove connecting piping back to the branch in the main so that there will be no dead ends or unused pipe lines at completion.

Control Wiring and Tubing to be Removed:

Remove all control wiring and tubing as indicated. Drawings do not show all existing control wiring and tubing which is to be removed. Unless indicated otherwise, where existing equipment has been removed, or its use replaced by new equipment, remove connecting piping and ductwork back to the branch in the main so that there will be no dead ends or unused pipe lines in mechanical spaces at completion.

Materials to Owner:

All items or materials removed from the project shall be made available for the Owner's inspection. The Owner retains the option to claim any item or material. The Contractor shall deliver any claimed item or material in good condition to the place designated by the Owner. All items not claimed become the property of the Contractor and shall be removed from the site by the Contractor.

Protect any active piping and/or wiring encountered that are not designated for removal; remove, plug or cap utilities to be abandoned in accord with code and regulatory requirements. Notify the Architect of

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utilities encountered whose service is not known.

Debris Removal:

Existing materials removed and not reinstalled or turned over to the Owner shall be immediately removed from the site and disposed of by the Contractor.

Repairs:

Any portion of the facility damaged, cut back or made inoperable by this Contractor shall be repaired with similar materials as the existing structure and/or damaged item as instructed by the Architect.

CLOSEOUT ACTIVITIES

Arrange for legal disposal and remove demolished materials to accredited landfill site or alternative disposal site (recycle center).

END OF SECTION

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PART 1 - GENERAL

SCOPE OF WORK
This section includes valve specifications for all Plumbing systems except where indicated under Related Work. Included are the following topics:

RELATED WORK
Work indicated herein shall include requirements bound by entire Specification, and Project Documents. Related work referenced is as a courtesy only not intended as a complete related work requirement.
Section 22 11 16 - Domestic Water Piping.
Section 22 13 16 - Sanitary Waste and Vent Piping.

REFERENCE
Division 1.

QUALITY ASSURANCE
Substitution of Materials:
Refer to Section 01 60 00, Product Requirements, Equals and Substitutions.

SUBMITTALS
Schedule of all valves indicating type of service, dimensions, materials of construction, and pressure/temperature ratings for all valves to be used on the project. Temperature ratings specified are for continuous operation.

OPERATION AND MAINTENANCE DATA
All operations and maintenance data shall comply with the submission and content requirements specified under section 01 78 00 Closeout Submittals.

DESIGN CRITERIA
ANSI Z21.22 - Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems.
Where valve types (ball, butterfly, etc.) are specified for individual plumbing services (i.e. domestic water, gas, etc.), each valve type shall be of the same manufacturer unless prior written approval is obtained from the Owner.
Valves to be line size unless specifically noted otherwise.

PART 2 - PRODUCTS

WATER SYSTEM VALVES
All water system valves to be rated at not less than 125 psi water working pressure at 240 deg. F unless noted otherwise.
Ball valves 3" and smaller:
Two- or three-piece bronze body; sweat ends, chrome plated bronze ball; glass filled Teflon seat; Teflon packing and threaded packing nut; blowout-proof stem; 600 psig WOG. Provide valve stem extensions for valves installed in all piping with insulation. Apollo 70-200, Jomar T/S 100, Hammond 8511, Milwaukee BA150, Nibco S580-70, Watts B-6001.

SPECIALTY VALVES AND VALVE ACCESSORIES
Safety relief valves:
Bronze body, temperature and pressure actuated, stainless steel stem and spring, thermostat with non-metallic coating, test lever, suitable for 125 psig water working pressure at 240 deg. F, sized for full BTUH input and operating pressure of equipment, with valve capacity on metal label. For equipment less than or equal to 200,000 BTUH input, provide AGA, UL, or ASME listed and labeled valve.

PART 3 - EXECUTION

GENERAL

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Properly align piping before installation of valves. Install and test valves in strict accordance with valve manufacturer's installation recommendations. Do not support weight of piping system on valve ends. Mount valves in locations which allow access for operation, servicing, and replacement.
Provide valve handle extensions for all valves installed in insulated piping.
Install all valves with the stem in the upright or horizontal position. If possible, install butterfly valves with the stem in the horizontal position. Valves installed with the stems down will not be accepted.
Prior to flushing of piping systems, place all valves in the full-open position.

SHUT-OFF VALVES
Install shut-off valves at each piece of equipment, at each branch take-off from mains for isolation or repair and elsewhere as indicated.

SAFETY RELIEF VALVES
Install relief valves on all pressure vessels and elsewhere as indicated. Inlet and outlet piping connecting to valves must be the same size as valve connections or larger. Pipe discharge to drain where indicated or to floor.

END OF SECTION

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PART 1 - GENERAL

CONTRACT CONDITIONS
Work of this Section is bound by the Contract Conditions and Division 1, bound herewith, in addition to this Specification and accompanying Drawings.

SECTION INCLUDES
Specifications for supports of all plumbing equipment and materials as well as piping system anchors. Included are the following topics:

RELATED WORK
Division 7 - Thermal and Moisture Protection
Division 3 - Concrete

REFERENCE STANDARDS
MSS SP-58 Pipe Hangers & Supports-Materials, Design, Manufacture and Installation
MSS SP-69 Pipe Hangers & Supports-Selection and Application

REFERENCE
Applicable provisions of Division 1 govern work under this section.

QUALITY ASSURANCE
Substitution of Materials:
Refer to Section 01 60 00 Product Requirements.

DESCRIPTION
Provide all supporting devices as required for the installation of mechanical equipment and materials. All supports and installation procedures are to conform to the latest requirements of the ANSI Code for building piping.
Do not hang any mechanical item directly from a roof deck or run piping so it rests on the bottom chord of any truss or joist.
Fasteners depending on soft lead for holding power or requiring powder actuation will not be accepted.
Support apparatus and material under all conditions of operation, variations in installed and operating weight of equipment and piping, to prevent excess stress, and allow for proper expansion and contraction.
Protect insulation at all hanger points.

DESIGN CRITERIA
Materials and application of pipe hangers and supports shall be in accordance with MSS Standard Practice SP-58 and SP-69 unless noted otherwise.

PART 2 - PRODUCTS

MANUFACTURERS
Anvil, B-Line, Unistrut, or approved equal.

STRUCTURAL SUPPORTS
Provide all supporting steel required for the installation of mechanical equipment and materials, including angles, channels, beams, etc. to suspended or floor supported tanks and equipment. All of this steel may not be specifically indicated on the drawings.

PIPE HANGERS AND SUPPORTS
Wall/Vertical Support
Metal C-Channel type with Stainless steel strapping.
Rubber Sleeve around pipe strap.
Unistrut, B-line, Anvil, approved.

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Horizontal Support
Multiple Runs:
Rack with 25 percent spare capacity. Maximum width per manufacturer's recommendations.
PSupport PEX piping in accord with manufacturer guidelines
Pipe Supports:
All supports, fasteners, clamps, etc. directly connected to copper piping shall be copper plated. Where dissimilar materials are used, provide isolation collar between supports/clamps/fasteners and copper piping. Cushmen type or approved.
Single Hanger- Rod type required.
PVC Coated in Exterior, Crawl, Attic, and wet locations.
Strapping:
Nylon permitted for crawl spaces, and attics locations only when mechanically secured to structure. 300-lb tensile rated stainless-steel straps required for PEX piping when 23 ga. or heavier steel channel is used to support pipe.

PIPE HANGER RODS
Steel Hangar Rods:
Threaded both ends, threaded one end, or continuous threaded, complete with adjusting and lock nuts.
Size rods for individual hangers and trapeze support as indicated in the following schedule.
Redundancy cable shall be included for each rod hanger.
Total weight of equipment, including valves, fittings, pipe, pipe content, and insulation, are not to exceed the limits indicated.

Maximum Load (Lbs.) (650°F Maximum Temp.)	Rod Diameter (inches)
610	3/8
1,130	1/2
1,810	5/8
2,710	3/4
3,770	7/8
4,960	1
8,000	1-1/4

ANCHORS
Use welding steel shapes, plates, and bars to secure piping to the structure.
Nylon Strapping used in permitted locations only shall be mechanically held to the structure.
No Anchors shall come in-contact with metal piping unless dielectrically isolated as indicated herein.

NOT PERMITTED FOR ANY SUPPORTING MEANS
Metal Plumbers Tape
Staples
“Zip ties”/wire ties
Wood Blocks/Wood Anchors/Wood Roof Pipe supports

PART 3 - EXECUTION

INSTALLATION
Size, apply, and install supports and anchors in compliance with manufacturer’s recommendations.
Install supports to provide for free expansion of the piping system. Support all piping from the structure using concrete inserts, ceiling plates, wall brackets, or floor stands. Fasten ceiling plates and wall brackets securely to the structure and test to demonstrate the adequacy of the fastening.
Coordinate hanger and support installation to properly group piping of all trades.
Where piping can be conveniently grouped to allow the use of trapeze type supports, use standard structural shapes or continuous insert channels for the supporting steel. Where continuous insert channels are used, pipe supporting devices made specifically for use with the channels may be substituted for the specified supporting devices provided that similar types are used and all data is submitted for prior approval.

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Size and install hangers and supports, except for riser clamps, for installation on the exterior of piping insulation. Where a vapor barrier is not required, hangers may be installed either on the exterior of pipe insulation or directly on piping.
Dielectrically isolate dissimilar materials from metal pipes and metal supports with rubberized isolation sleeves, and blocks as indicated herein.

HANGER AND SUPPORT SPACING

Install hangers to provide minimum ½-inch space between finished covering and adjacent work.
Place a hanger within 12 inches of each horizontal elbow, valve, strainer, or similar piping specialty item.
Use hangers with 1-1/2-inch minimum vertical adjustment.
Where several pipes can be installed in parallel and at the same elevation, provide multiple or trapeze hangers.
Support riser piping independently of connected horizontal piping.
Adjust hangers to obtain the slope specified in the piping section of these specifications.
Space hangers for pipe as follows:

Pipe Material	Pipe Size	Max. Horiz. Spacing	Max. Vert. Spacing
Cast Iron	2" and larger	5'-0"	15'-0"
Copper	1/2" through 3/4"	5'-0"	10'-0"
Copper	1" through 1-1/4"	6'-0"	10'-0"
Copper	1-1/2" through 2-1/2"	8'-0"	10'-0"
Ductile Iron	All	10'-0"	20'-0"
Steel	1/2" through 1-1/4"	7'-0"	15'-0"
Steel	1-1/2" through 6"	10'-0"	15'-0"
Plastic	Drain and Vent	4'-0"	10'-0"
Plastic*	1" or less	32"	4'-0"
Plastic	1-1/4" and over	4'-0"	6'-0"

* Max horizontal spacing for bare pipe only without rigid channel support

CONCRETE INSERTS

Select size based on the manufacturer's stated load capacity and weight of material that will be supported.

ANCHORS

Install where indicated on the drawings and details. Where not specifically indicated, install anchors at ends of principal pipe runs and at intermediate points in pipe runs between expansion loops. Make provisions for preset of anchors as required accommodating both expansion and contraction of piping.

END OF SECTION

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PART 1 - GENERAL

CONTRACT CONDITIONS
Work of this Section is bound by the Contract Conditions and Division 1, bound herewith, in addition to this Specification and accompanying Drawings.

RELATED DOCUMENTS
See Section 22 00 00, “General Plumbing Provisions” for additional requirements for this section.

REFERENCE REQUIREMENTS
Unless otherwise required by this specification, conform to the requirements of ASME/ANSI A13.1. Where label backgrounds and lettering colors are not specifically called out in these Contract Documents, conform to requirements of ASME/ANSI A13.1.
Unless specified otherwise, all piping systems and equipment shown on Contract Documents shall be labeled to comply with ASME/ANSI A13.1.

SUMMARY
Section Includes:
Equipment labels.
Pipe labels.

SUBMITTALS
Product Data:
For each type of product indicated.
Samples:
For color, letter style, and graphic representation required for each identification material and device.
Chain hung phenolic sign example shall be submitted.
Equipment Label Schedule:
Include a listing of all equipment to be labeled with the proposed content for each label.

COORDINATION
Finished Surfaces:
Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
Access Panel Locations:
Coordinate installation of identifying devices with locations of access panels and doors.
Scheduling:
Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

ON-PIPE LABELS
General Requirements for Manufactured Pipe Labels:
Preprinted, color-coded, with lettering indicating service, and showing flow direction.
Self-Adhesive Pipe Labels:
Printed plastic with contact-type, permanent-adhesive backing.
Pipe Label Contents:
Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.
Flow-Direction Arrows:
Integral with piping system service lettering to accommodate both directions or as separate unit on each pipe label to indicate flow direction printed on display side only.
Lettering Size:
At least 1.50 inches-high.

PART 3 - EXECUTION

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PREPARATION

Cleaning:

Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulates.

ON-PIPE LABEL INSTALLATION

On-Pipe Labels:

Locate pipe labels where piping is exposed or in attic as follows:

Near each valve and control device.

Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.

Near penetrations through walls, floors, ceilings, and inaccessible enclosures.

Spaced at maximum intervals of 30.00 feet along each run. Reduce intervals to 10.00 feet in areas of congested piping and equipment.

Pipe Label Color Schedule:

Domestic Cold Water Piping:

Background Color: Green.

Letter Color: White.

Domestic Hot Water:

Background Color: Green.

Letter Color: White.

Domestic Hot Water Return:

Background Color: Green.

Letter Color: White.

Natural Gas:

Background Color: Yellow.

Letter Color: Black.

END OF SECTION

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PART 1 - GENERAL

CONTRACT CONDITIONS

Work of this Section is bound by the Contract Conditions and Division 1, bound herewith, in addition to this Specification and accompanying Drawings.

Comply with all other Division 22 Sections as applicable. Refer to other divisions for coordination of work with other portions of Work.

RELATED DOCUMENTS

Other Requirements:

See Section 22 00 00, “General Plumbing Provisions” for additional requirements for this section.

SUMMARY

Section includes insulating the following plumbing piping services:

Domestic cold water piping.

Domestic hot water piping.

Domestic recirculating hot water piping.

Vent, and Sanitary piping insulation to the extent required for ADA (under-sink guards), and penetrations.

SUBMITTALS

Product Data:

For each type of product indicated. Include thermal conductivity, water vapor permeance thickness, and jackets (both factory- and field-applied, if any).

Qualification Data:

For qualified Installer.

Material Test Reports:

From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.

Field Quality Control Reports:

Provide.

QUALITY ASSURANCE

Surface-Burning Characteristics / Fire Rating- Provide as required per Construction Type:

For insulation and related materials, as determined by testing identical products according to ASTM E 84, and UL72. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.

Comply with the following applicable standards and other requirements specified for miscellaneous components:

Supply and Drain Protective Shielding Guards: ICC A117.1.

DELIVERY, STORAGE, AND HANDLING

Packaging:

Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

COORDINATION

Supports, Hangers, and Insulation Shields:

Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 22 05 29 “Hangers and Supports for Plumbing Piping and Equipment.”

Clearance Requirements:

Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

SCHEDULING

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Insulation:
Schedule insulation application after pressure testing systems. Insulation application may begin on segments that have satisfactory test results.
Plastic Materials:
Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

INSULATION MATERIALS
General:
Comply with requirements in “Piping Insulation Schedule, General” and “Indoor Piping Insulation Schedule” Specifications for where insulating materials shall be applied.
Hazardous Materials:
Products shall not contain asbestos, lead, mercury, or mercury compounds.
Contact with Stainless Steel:
Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
Foam Insulation:
Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process. Closed cell type only.
Flexible Elastomeric Insulation:
Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials.
Manufacturers:
Subject to compliance with requirements, provide products by one of the following or approved:
Aeroflex USA, Inc.; Aerocel.
Armacell LLC; AP Armaflex.
K-Flex USA; Insul-Lock, Insul-Tube, and K-FLEX LS.
Fiberglass Insulation:
Conform to ASTM C547. Ensure the apparent thermal conductivity does not exceed 0.54 Btu-inch per hour per square foot per deg. F at 200 deg. F mean.

INSULATING CEMENTS
General Purpose Insulating Cement
Provide general purpose insulating cement, [diatomaceous silica] [mineral fiber], conforming to ASTM C195. Ensure composite is rated for 1800 deg. F service, with a thermal-conductivity maximum of 0.85 Btu per inch per hour per square foot for each deg. F temperature differential at 200 deg. F mean temperature for a 1-inch thickness.

ADHESIVES
Compatibility:
Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.
Flexible Elastomeric and Polyolefin Adhesive: Comply with MIL-A-24179A, Type II, Class I.
Manufacturers:
Subject to compliance with requirements, provide products by one of the following or approved:
Aeroflex USA, Inc.; Aeroseal (VOC: 417 g/L).
Armacell LLC; Armaflex 520 Adhesive (VOC: 430 g/L).
Foster, H. B. Fuller Construction Products; 85-75 (VOC 7 g/L).
Childers, H.B. Fuller Construction Products; CP-82 (3 g/L, less exempt)
K-Flex USA; R-373 Contact Adhesive (VOC: 593 g/L).
For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
PVC Jacket Adhesive:
Compatible with PVC jacket.

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Manufacturers:
Subject to compliance with requirements, provide products by one of the following or approved:
Dow Corning Corporation; 739, Dow Silicone.
Johns Manville; Zeston Perma-Weld, CEEL-TITE Solvent Welding Adhesive.
P.I.C. Plastics, Inc.; Welding Adhesive.
Speedline Corporation; Polyco VP Adhesive.
For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

LAGGING COATINGS/ADHESIVES
Description:
Comply with MIL-A-3316C, Class I, Grade A, and shall be compatible with insulation materials, jackets, and substrates.
For indoor applications, use lagging adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
Products:
Subject to compliance with requirements, provide one of the following:
Foster, H.B. Fuller Construction Products 30-36, (VOC 15 g/L).
Childers, H.B. Fuller Construction Products; CP-50 AHV2, (VOC: 46 g/L).
Vimasco Corp., 713 and 714, (VOC: 57.5 / 26 g/L).

SEALANTS
ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:
Manufacturers:
Subject to compliance with requirements, provide products by one of the following or approved:
Childers, H. B. Fuller Construction Products, CP-76/CP-70 (VOC 356/85g/L).
Foster, H.B. Fuller Construction Products, 95-44/30-45 (VOC 384/87 g/L).
Materials shall be compatible with insulation materials, jackets, and substrates.
Fire- and water-resistant, flexible, elastomeric sealant.
Service Temperature Range: Minus 40 to plus 250 deg. F.
Color:
White.
For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

FACTORY-APPLIED JACKETS
Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
ASJ:
White, Kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
ASJ-SSL:
ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.
FSK Jacket:
Aluminum-foil, fiberglass-reinforced scrim with Kraft-paper backing; complying with ASTM C 1136, Type II.

TAPES
ASJ Tape:
White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.
Manufacturers:
Subject to compliance with requirements, provide products by one of the following or approved:
ABI, Ideal Tape Division; 428 AWF ASJ.
Avery Dennison Corporation, Specialty Tapes Division; Fasson 0836.
Compac Corporation; 104 and 105.

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Venture Tape; 1540 CW Plus, 1542 CW Plus, and 1542 CW Plus/SQ.
Width: 3.00 inches.
Thickness: 11.5 mils.
Adhesion: 90 ounces force/inch in width.
Elongation: 2 percent.
Tensile Strength: 40 lbf/inch in width.
ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.
PVC Tape:
White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive; suitable for indoor and outdoor applications.
Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved:
ABI, Ideal Tape Division; 370 White PVC tape.
Compac Corporation; 130.
Venture Tape; 1506 CW NS.
Width: 2.00 inches.
Thickness: 6 mils.
Adhesion: 64 ounces force/inch in width.
Elongation: 500 percent.
Tensile Strength: 18 lbf/inch in width.

SECUREMENTS
Staples: Outward-clinching insulation staples, nominal 0.75-inch-wide, stainless steel or Monel.
Wire: 0.062-inch soft-annealed, stainless steel.
Manufacturers:
Subject to compliance with requirements, provide products by one of the following or approved:
C & F Wire.

PROTECTIVE SHIELDING GUARDS
Protective Shielding Pipe Covers:
Manufacturers:
Subject to compliance with requirements, provide products by one of the following or approved:
Engineered Brass Company.
Insul-Tect Products Co.; a subsidiary of MVG Molded Products.
McGuire Manufacturing.
Plumberex.
Truebro; a brand of IPS Corporation.
Zurn Industries, LLC; Tubular Brass Plumbing Products Operation.
Description:
Manufactured plastic wraps for covering plumbing fixture hot and cold water supplies and trap and drain piping. Comply with Americans with Disabilities Act (ADA) requirements.
Protective Shielding Piping Enclosures:
Manufacturers:
Subject to compliance with requirements, provide products by one of the following or approved:
Truebro; a brand of IPS Corporation.
Zurn Industries, LLC; Tubular Brass Plumbing Products Operation.
Description:
Manufactured plastic enclosure for covering plumbing fixture hot- and cold water supplies and trap and drain piping. Comply with ADA requirements.
Fire Rating:
Fire Rated, flame and smoke standards per Code and not less than ASTM E84, and UL 723

PART 3 - EXECUTION

EXAMINATION
Installation Requirements:
Examine substrates and conditions for compliance with requirements for installation tolerances and other

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conditions affecting performance of insulation application.
Verify that systems to be insulated have been tested and are free of defects.
Verify that surfaces to be insulated are clean and dry.
Corrections:
Proceed with installation only after unsatisfactory conditions have been corrected.

PREPARATION
Surface Preparation:
Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

GENERAL INSTALLATION REQUIREMENTS
General: Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.
Insulation System Schedules:
Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.
Compatibility:
Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
Longitudinal Seams:
Install insulation with longitudinal seams at top and bottom of horizontal runs.
Welding Limitations:
Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.
Protection:
Keep insulation materials dry during application and finishing.
Insulation Seams:
Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
Insulation Joints:
Install insulation with least number of joints practical.
Vapor Barrier Requirements:
Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor barrier mastic.
Install insulation continuously through hangers and around anchor attachments.
For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.
Coverage:
Apply adhesives, mastics, and sealants at manufacturer’s recommended coverage rate and wet and dry film thicknesses.
Install insulation with factory-applied jackets as follows:
Draw jacket tight and smooth.
Cover circumferential joints with 3.00-inch-wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4.00 inches o.c.
Overlap jacket longitudinal seams at least 1.50 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4.00 inches o.c.
For below-ambient services, apply vapor-barrier mastic over staples.
Cover joints and seams with tape, according to insulation material manufacturer’s written instructions, to maintain vapor seal.

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Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.
Avoid Compressing Insulation: Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
Operating Conditions:
Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
Damaged Insulation:
Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4.00 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.
For above-ambient services, do not install insulation to the following:
Vibration-control devices.
Testing agency labels and stamps.
Nameplates and data plates.
Cleanouts.

PENETRATIONS
Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated):
Install insulation continuously through walls and partitions.
Insulation Installation at Fire-Rated Wall and Partition Penetrations:
Install insulation continuously through penetrations of fire-rated walls and partitions.
Comply with requirements in Section 07 84 00 “Firestopping” for fire-stopping and fire-resistive joint sealers.
Concrete penetrations shall be rubber-wrapped and isolated.

GENERAL PIPE INSULATION INSTALLATION
General: Requirements in this specification generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation specifications.
Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:
Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.
Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.

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For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.
Stencil or label the outside insulation jacket of each union with the word “union.” Match size and color of pipe labels.
Piping Accessories:
Insulate instrument connections for thermometers, pressure gauges, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION
Longitudinal Seams:
Seal longitudinal seams and end joints with manufacturers recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
Insulation Installation on Pipe Flanges:
Install pipe insulation to outer diameter of pipe flange.
Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of same thickness as pipe insulation.
Secure insulation to flanges and seal seams with manufacturer’s recommended adhesive to eliminate openings in insulation that allow passage of air to surface while being insulated.
Additionally, tape around not less than every 4-feet, and at each termination of installation location.
Continuous spiral wrap along entire length is also a permitted means of additional taping required.
Insulation Installation on Pipe Fittings and Elbows:
Install mitered sections of pipe insulation.
Secure insulation materials and seal seams with manufacturer’s recommended adhesive to eliminate openings in insulation that allow passage of air to surface while being insulated.
Insulation Installation on Valves and Pipe Specialties:
Install preformed valve covers manufactured of same material as pipe insulation when available.
When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
Install insulation to flanges as specified for flange insulation application.
Secure insulation to valves and specialties and seal seams with manufacturer’s recommended adhesive to eliminate openings in insulation that allow passage of air to surface while being insulated.

FIELD QUALITY CONTROL
Tests and Inspections:
Provide.
Corrections:
All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements. Defective work shall be replaced with non-defective as specified.

PIPING INSULATION SCHEDULE, GENERAL
Materials and Thicknesses:
Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor’s option.
Items Not Insulated:
Unless otherwise indicated, do not install insulation on the following:
Drainage piping located in crawl spaces.
Underground piping.
Chrome-plated pipes and fittings unless there is a potential for personnel injury, or required by ADA.

INDOOR PIPING INSULATION SCHEDULE

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Domestic Cold Water:
NPS 1 and Smaller: Insulation shall not be less than the following:
Glass Fiber: 1.00 inch thick.
Flexible Elastomeric: 1.00 inch thick.
NPS 1-1/4 and Larger: Insulation shall not be less than the following:
Glass Fiber: 1.00 inch thick.
Flexible Elastomeric: 1.00 inch thick.
Domestic Hot Water & Hot Water Return:
NPS 1-1/4 and Smaller:
Insulation shall not be less than the following:
Glass Fiber: 1.00 inch thick.
Flexible Elastomeric: 1.00 inch thick.
NPS 1-1/2 and Larger:
Insulation shall not be less than the following:
Glass Fiber: 1.50 inches thick.
Flexible Elastomeric: 1.50 inches thick.

ADA
Provide insulated protective covers, where required by ADA. Insulation shall meet requirements herein for protection and thermal conductivity as well as listed for use as a personal protective shield for ADA. Use only where personal injury hazard exists.

END OF SECTION

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PART 1 - GENERAL

CONTRACT CONDITIONS

Work of this section is bound by the Contract Condition and Division 1, bound herewith, in addition to this specification and accompanying drawings.

Comply with all other Division 22 Sections as applicable. Refer to other divisions for coordination of work with other portions of Work.

RELATED WORK

22 05 29 - Hangers and Supports for Plumbing Piping and Equipment

REFERENCE STANDARDS

ANSI B16.5 Pipe Flanges and Flanged Fittings
ANSI B16.22 Wrought Copper and Wrought Copper Alloy Solder Joint Pressure Fittings
ANSI B16.29 Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings – DWV
ANSI/NSF Standard 14 Plastics Piping System Components and Related Materials
ANSI/NSF Standard 61 Drinking Water System Components – Health Effects
ASTM B32 Solder Metal
ASTM B88 Seamless Copper Water Tube
ASTM B813 Liquid and Paste Fluxes for Soldering Applications of Copper and Copper Alloy Tube
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials
ASTM E814 Standard Test Method for Fire Tests of Through-Penetration Fire Stops
ASTM F876 Standard Specification for Cross-linked Polyethylene (PEX) Tubing
ASTM F877 Standard Specification for Cross-linked Polyethylene (PEX) Plastic Hot- and Cold-Water Distribution Systems
ASTM F1960 Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) Tubing
AWS A5.8 Brazing Filler Metal
AWWA C651 Disinfecting Water Mains

QUALITY ASSURANCE

Substitution of Materials:

Refer to Division 1 Project requirements. No PEX Piping substitutions permitted.

Order copper, and PEX pipe with each length marked with the name or trademark of the manufacturer and type of pipe; with each shipping unit marked with the purchase order number, metal or alloy designation, temper, size, and name of supplier.

Any installed material not meeting the specification requirements must be replaced with material that meets these specifications without additional cost to the Owner.

PEX Piping:

Test Reports:

Upon request, submit test reports from recognized testing laboratories.

Certificates:

Submit manufacturer’s certificate that products comply with specified requirements.

DELIVERY, STORAGE, AND HANDLING

Promptly inspect shipments to ensure that the material is undamaged and complies with specifications.

Cover pipe to prevent corrosion or deterioration while allowing sufficient ventilation to avoid condensation.

Do not store materials directly on grade. Protect pipe, tube, and fitting ends so they are not damaged.

Where end caps are provided or specified, take precautions so the caps remain in place. Protect fittings, flanges, and unions by storage inside or by durable, waterproof, above ground packaging.

Storage and protection methods shall allow inspection to verify products.

PEX Piping:

General:

Comply with Division 1 Product Requirement Section.

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Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.
Comply with manufacturer's PEX design manual for recommended practices.
Delivery:
Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
Storage and Protection:
Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.
Store PEX tubing in cartons or under cover to avoid dirt or foreign material from being introduced into the tubing.
Do not expose PEX tubing to direct sunlight for more than 30 days. If construction delays are encountered, provide cover to portions of tubing exposed to direct sunlight.

DESIGN CRITERIA
Not smaller than ½ inch size.
Use only new material, free of defects, rust and scale, and meeting the latest revision of ASTM, AWWA or CISPI specifications as listed herein.
Construct piping for the highest pressures and temperatures in the respective system and add 25% more.
Non-metallic piping will be acceptable only for the services indicated.
Where ASTM B88, type L H (drawn) temper copper tubing is specified, ASTM B88, type K H (drawn) temper copper tubing may be used at Contractor's option.
Contractor is required to meet application criteria and requirements where stated other may be used at Contractor's option herein.
Standard grade hydrostatic pressure ratings from Plastics Pipe Institute (PPI) in accordance with TR-3 as listed in TR-4. The following three standard-grade hydrostatic ratings are required for PEX piping:
200°F (93°C) at 80 psi (551 kPa)
180°F (82°C) at 100 psi (689 kPa)
73.4°F (23°C) at 160 psi (1,102 kPa)
Certification of flame spread/smoke development rating of 25/50 in accordance with ASTM E84 provided the PEX installation meets one of the following requirements:
Tubing spacing is a minimum of 18 inches apart for the following sizes.
½ inch
⅝ inch
¾ inch
PEX Tubing is wrapped with acceptable fire rated insulation with a flame spread of not more than 20 and a smoke-developed rating of not more than 30 and a nominal density of 4.0 to 4.5 pcf. Tubing can run with three tubes separated by zero inches and then 18 inches between the next group of three tubes for the following sizes.
½ inch
⅝ inch
¾ inch
1 inch
1¼ inch
1½ inch
2 inch or greater

WARRANTY
Provide 25-year manufacturer warranty.

PART 2 - PRODUCTS

DOMESTIC WATER
Above Ground:
PEX-a as specified herein.
Type L copper water tube, H (drawn) temper, ASTM B88; wrought copper pressure fittings, ANSI B16.22; lead free (<0.2%) solder, ASTM B32; flux, ASTM B813; copper phosphorous brazing alloy, AWS A5.8

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BCuP. Mechanically formed brazed tee connections may be used in lieu of specified tee fittings for branch takeoffs up to one-half (1/2) the diameter of the main.

STUBBING TO VISIBLE SPACE
For PEX installations, provide copper where stubbing to interior side of wall to stop. Provide 100% fully backed, braced, bracketed copper extending into visible space (stub out in copper). Transition to from copper to PEX behind wall. Copper shall be fully braced and bracketed to prevent damage of PEX or copper.

FREEZE PROTECTION
Provide where installed in attics, crawl spaces, or other above grade unheated spaces.
Electrical heating tape with integrated thermostat mounted against pipe, with an activation temperature not less than 37 deg. F.
Connect via Ground Fault Circuit Interrupter Breaker.
Do not exceed 10 Amps. total load/length per circuit.
UL Listed.
Manufacturers
Heat Trace Cable (Freeze Protection):
Chromalox
Technitrace
Raychem.
Other Manufacturers:
Submit substitution request.
General:
Furnish and install a complete UL listed system of heaters, controllers, and components listed specifically for maintaining a 40 deg. F water temperature over the entire system.
IEEE 515.1 listed for use as trace heating for commercial applications.
Self-Regulating Heating Cable
Two 16 AWG nickel-coated copper bus wires embedded in a radiation cross-linked self-regulating polymer core.
Automatically adjusts power output to compensate for temperature changes.
Tinned copper braid.
Fluoropolymer dielectric outer jacket.
Voltage: 120V
Single Circuit System:
Controller:
Raychem C910
Adjustable temperature control:
105 deg. F – 140 deg. F
BMS interface
Enclosure:
NEMA 4X
Voltage:
120V
Pipe temperature sensor:
RTD type.

AMERICAN MANUFACTURED:
ALL Domestic Water tubing, piping, and fittings are to be U.S. Manufactured. The contractor shall furnish proof of manufacture’s location(s) to the Owner upon request.
PEX HOT AND COLD POTABLE WATER DISTRIBUTION PIPING
Manufacturer: Uponor, or approved.
Materials:
Tubing material:
Crosslinked polyethylene (PEX) manufactured by PEX-a or Engel method.
Type:
Uponor AQUAPEX, or approved.

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Material Standard:
Manufactured in accordance with ASTM F876 and ASTM F877 and tested for compliance by an independent third-party agency.
Standard grade hydrostatic design and pressure ratings from PPI.
Fire-rated assembly listings in accordance with ANSI/UL 263.
UL Design No. L557 — 1-hour wood frame floor/ceiling assemblies
UL Design No. K913 — 2-hour concrete floor/ceiling assemblies
UL Design No. U372 — 1-hour wood stud/gypsum wallboard wall assemblies
UL Design No. V444 — 1-hour steel stud/gypsum wallboard wall assemblies
Minimum Bend Radius (cold bending): No less than six times the outside diameter. Use a bend support as supplied by the PEX tubing manufacturer for tubing with a bend radius less than stated.
Nominal Inside Diameter: Provide tubing with nominal inside diameter, in accordance with ASTM F876 as indicated.
½ inch [12.7mm] (No Smaller Permitted)
¾ inch [19.05mm]
1 inch [25.4mm]
1¼ inch [31.75mm]
1½ inch [38.1mm]
2 inch [50.8mm]
or greater
Colors:
Hot - Red
Cold: Piping <2” Nominal Diameter - Blue
Cold: 2” and larger – Blue or White
Fittings
Material: Fitting assembly is manufactured from material listed in paragraph 5.1 of ASTM F1960.
Material Standard: Comply with ASTM F1960.
Type: PEX-a cold expansion fitting.
Assembly consists of the appropriate ProPEX insert with a corresponding ProPEX Ring.
Manifolds
Material: Type L copper body with UNS 3600 series brass ProPEX outlet connections.
Engineered Plastic (EP) body with ProPEX outlet connections.
Manifold Type:
Uponor ProPEX 1" Copper Manifold, or approved.
Uponor engineered plastic (EP) Manifold, or approved.
Manifolds manufactured with the appropriate-sized ProPEX fittings on the manifold supply inlets.
Manifold shall remain accessible and include an access panel.
Accessories:
Angle stops and straight stops that are compatible with PEX tubing are supplied by the PEX tubing manufacturer.
¼ turn type Stops only.
Bend supports designed for maintaining tight radius bends are supplied by the PEX tubing manufacturer.
ProPEX expander tool to install the ASTM F1960 compatible fittings are supplied by the PEX tubing manufacturer.
The tubing manufacturer provides clips and/or PEX rails for supporting tubing runs.
Horizontal tubing hangers and riser clamps are epoxy-coated material.

DIELECTRIC UNIONS AND FLANGES
Watts Regulator Company, Lochinvar, Wilkins, EPCO Sales, or approved dielectric unions 2" and smaller; with iron female pipe thread to copper solder joint or brass female pipe thread end connections, non-asbestos gaskets, having a pressure rating of not less than 175 psig at 180 deg.

UNIONS AND FLANGES
Unions, flanges and gasket materials to have a pressure rating of not less than 150 psig at 180 deg.
Gasket material for flanges and flanged fittings shall be Teflon type. Treated paper gaskets are not acceptable.
2" and Smaller Copper:

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ANSI B16.18 cast bronze union coupling or ANSI B15.24 Class 150 cast bronze flanges.

PREPARATION
Cut pipe ends square. Ream ends of piping to remove burrs. Clean scale and dirt from interior and exterior of each section of pipe and fitting prior to assembly.

PART 3 - EXECUTION

EXAMINATION
Site Verification of Conditions:
Verify that site conditions are acceptable for installation of the PEX potable water system.
Do not proceed with installation of the PEX potable water system until unacceptable conditions are corrected.

ERECTION
Install piping parallel to building walls and ceilings and at heights which do not obstruct any portion of a window, doorway, stairway, or passageway. Where interferences develop in the field, offset or reroute piping as required to clear such interferences. Coordinate locations of plumbing piping with piping, ductwork, conduit and equipment of other trades to allow sufficient clearances. In all cases, consult drawings for exact location of pipe spaces, ceiling heights, door and window openings, or other architectural details before installing piping.
Where copper piping is embedded in masonry or concrete, provide protective sleeve covering of elastomeric pipe insulation.
Install underground warning tape 6"-12" below finished grade above exterior below ground piping. Where existing underground warning tape is encountered, repair and replace.
Maintain piping in clean condition internally during construction.
Provide clearance for installation of insulation, access to valves and piping specialties.
Provide anchors, expansion joints, swing joints and/or expansion loops so that piping may expand and contract without damage to itself, equipment, or building.
Do not route piping through transformer vaults or above transformers, panelboards, or switchboards, including the required service space for this equipment, unless the piping is serving this equipment
Install valves and piping specialties, including items furnished by others, as specified and/or detailed.
Provide access to valves and specialties for maintenance. Make connections to equipment, fixtures and systems installed by others where same requires the piping services indicated in this section.

COPPER PIPE JOINTS
Remove slivers and burrs remaining from the cutting operation by reaming and filing both pipe surfaces. Clean fitting and tube with metal brush, emery cloth, or sandpaper. Remove residue from the cleaning operation, apply flux, and assemble joint to socket stop. Apply flame to fitting until solder melts when placed at joint. Remove flame and feed solder into joint until full penetration of cup and ring of solder appears. Wipe excess solder and flux from joint. No lead.

THREADED PIPE JOINTS
Use a thread lubricant or Teflon tape when making joints; no hard setting pipe thread cement or caulking will be allowed.

MECHANICALLY FORMED TEE FITTINGS
Form mechanically extracted collars in a continuous operation, consisting of drilling a pilot hole and drawing out the tube surface to form a collar having a height of not less than three times the thickness of the tube wall. Use an adjustable collaring device. Notch and dimple the branch tube. Braze the joint with neutral flame oxy-acetylene torch, applying heat properly so that pipe and tee do not distort; remove distorted connections.

DOMESTIC WATER
Maintain piping system in clean condition during installation. Remove dirt and debris from assembly of piping as work progresses. Cap open pipe ends where left unattended or subject to contamination.

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Install exterior water piping below predicted frost level in accordance with code, but in no case less than 18” bury depth to top of pipe.
Install interior water piping with drain valves where indicated and at low points of system to allow complete drainage. Install shutoff valves where indicated and at the base of risers to allow isolation of portions of system for repair. Do not install water piping within exterior walls.
Prior to use, and after leak testing, isolate and fill system with potable water. Allow to stand 24 hours. Flush each outlet proceeding from the service entrance to the furthest outlet for minimum of 5 minutes and until water appears clear. Fill system with a solution of water and chlorine containing at least 50 parts per million of chlorine and shall stand for 24 hours. Flush system with potable water until chlorine concentration is no higher than source water level.
Provide Lab testing if required by AHJ: Wait 24 hours after final flushing. Take samples of water for lab testing. The number and location of samples shall be representative of the system size and configuration and are subject to approval by the Owner, and AHJ. Test shall show the absence of coliform bacteria and/or any other contaminant absence/level required by AHJ. If test fails, repeat disinfection and testing procedures until no coliform bacteria are detected and any other substance is at required level(s). Submit test report indicating date and time of test along with test results. Submit/Share/Provide test(s) results with Owner.

DIELECTRIC UNIONS AND FLANGES
Install dielectric unions or flanges at each point where a copper-to-steel pipe connection is required in domestic water systems.

UNIONS AND FLANGES
Install a union or flange at each connection to each piece of equipment and at other items which may require removal for maintenance, repair, or replacement. Where a valve is located at a piece of equipment, locate the flange or union connection on the equipment side of the valve. Concealed unions or flanges are not acceptable.

PEX PIPING INSTALLATION
Uponor AQUAPEX or approved Tubing.
Install Uponor AQUAPEX tubing in accordance with the tubing manufacturer's recommendations and as indicated in the installation handbook.
Expansion method is preferred.
If Contractor does not have tools for expansion method, “shark-bite” method is permitted.
Gluing/Glue method, is not permitted.
Do not install PEX tubing within 6 inches [152 mm] of gas appliance vents or within 12 inches [305 mm] of any recessed light fixtures.
Do not solder within 18 inches [457 mm] of PEX tubing in the same waterline. Make sweat connections prior to making PEX connections.
Do not expose PEX tubing to direct sunlight for more than 30 days.
Ensure no glues, solvents, sealants, or liquid chemicals come in contact with the tubing that is not permitted by the tubing manufacturer. Gluing tubing is not permitted.
Use grommets or sleeves at the penetration for PEX tubing passing through metal studs.
Protect PEX tubing with sleeves where abrasion may occur.
Use strike protectors where PEX tubing penetrates a stud or joist and has the potential for being struck with a screw or nail.
Use tubing manufacturer-supplied bend supports where bends are less than six times the outside tubing diameter.
Minimum horizontal supports are installed not less than 32 inches between hangers in accordance with model plumbing codes and the installation handbook.
PEX riser installations require epoxy-coated riser clamps installed at the base of the ceiling per floor.
A mid-story support is required for riser applications.
Pressurize Uponor AQUAPEX tubing with air in accordance with applicable codes or in the absence of applicable codes to a pressure of 150 psi.

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Comply with safety precautions when pressure testing, including use of compressed air, where applicable. Do not use water to pressurize the system if ambient air temperature has the possibility of dropping below 32 deg. F (0 deg. C).
Through-penetration Firestop.
Ensure compliance of one- and two-hour rated through penetration assemblies in accordance with ASTM E814.
A list of firestop manufacturers that list PEX tubing with their firestop systems is available from the PEX tubing manufacturer.

PEX PIPING CLEANING
Remove temporary coverings and protection of adjacent work areas.
Repair or replace damaged installed products.
Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance.
Remove construction debris from project site and legally dispose of debris.

PEX PIPING PROTECTION
Protect installed work from damage due to subsequent construction activity on the site.

FREEZE PROTECTION
GENERAL
Inspect surfaces and substrates of electric heating cables for compliance with requirements of this specification. Ensure surfaces and pipes in contact with electric heating cables are free of burrs and sharp protrusions.
Notify EOR if the existing substrate conditions are unsuitable for application of heating cables in accordance with manufacturer's recommendations.
If the installation of the heat tracing is unsatisfactory, then the Contractor shall correct the installation at no additional cost or time to the Owner.
INSTALLATION
Location: Provide heat trace on piping in unheated spaces as shown or required to prevent freezing.
Install heat trace cable on pipes indicated to maintain a minimum of 35 deg. F in an ambient temperature of 0 deg. F. Lay cable parallel on pipe or spiral wrap to maintain adequate temperature as required by pipe size and thermal properties of the pipe insulation to be applied.
Attach heat trace cable to metal pipe with GT-66 glass tape at increments not exceeding 1-foot.
Attach heat trace cable to plastic pipe with AT-180 aluminum tape at increments not exceeding 1-foot.
Install thermostat capillary and bulb to pipe with polyester tape assuring a firm bulb contact with pipe. Bulb not in contact with heat cable.
Install ambient sensing thermostat at accessible location adjacent to pipe.
Install line sensing thermostat on piping, interior to insulation.
Installer responsible for affixing an Electric Traced label to the outside of the pipe's thermal insulation on alternating sides at intervals of five to fifteen feet immediately after the piping has been insulated.
Coordinate installation with work under Division 26, Electrical for adequate electrical service to each thermostat.

PIPING SYSTEM LEAK TESTS
Do not test with any fixtures installed, rough-in only. Remove components from system which are specified as rated for test pressure. Test piping in sections or entire system as required by sequence of construction, and AHJ. Do not insulate or conceal pipe until it has been successfully tested.
If required for the additional pressure load under test, provide temporary restraints at fittings or expansion joints. Backfill underground water mains prior to testing with the exception of thrust restrained valves which may be exposed to isolate potential leaks.
For hydrostatic tests, use clean water and remove air from the piping being tested by means of air vents or loosening of flanges/unions. Measure and record test pressure at the high point in the system.
Inspect system for leaks. Where leaks occur, repair the area with new materials and repeat the test; caulking will not be acceptable.
Entire test shall be witnessed as required by the Owner's Representative.

Test

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System	Medium	Pressure	Duration
Below Ground Domestic Water	Water	150 psig	2 hr
Above Ground Domestic Water	Water	150 psig	8 hr

Durations of leak test shall be longer if required by AHJ.

END OF SECTION

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

PART 1 - GENERAL

CONTRACT CONDITIONS

Work of this Section is bound by the Contract Conditions and Division 1, bound herewith, in addition to this Specification and accompanying Drawings.

SUBMITTALS

Product Data:

For each type of product.

Field Quality Control Reports:

Provide.

Operation and Maintenance Data:

For domestic water piping specialties to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

GENERAL REQUIREMENTS FOR PIPING SPECIALTIES

Potable Water Piping and Components:

Potable-water piping and components shall comply with NSF 61.

PERFORMANCE REQUIREMENTS

Minimum Working Pressure for Domestic Water Piping Specialties:

125 psig unless otherwise indicated.

VACUUM BREAKERS

Pipe-Applied, Atmospheric-Type Vacuum Breakers:

Manufacturers:

Subject to compliance with requirements, provide products by one of the following, or approved:

FEBCO.

Watts.

Zurn.

Apollo.

Standard:

ASSE 1001.

Size:

NPS 1/4 to NPS 3, as required to match connected piping.

Body:

Bronze.

Inlet and Outlet Connections:

Threaded.

Finish:

Chrome plated.

Hose-Connection Vacuum Breakers:

Manufacturers:

Subject to compliance with requirements, provide products by one of the following, or approved:

MIFAB.

Watts.

Woodford.

Apollo.

Standard:

ASSE 1011.

Body:

Bronze, non-removable, with manual drain.

Outlet Connection:

Garden-hose threaded complying with ASME B1.20.7.

Finish:

Contractor’s option

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AIR VENTS
Automatic Air Vents
Manufacturers:
Caleffi Plumbvent, or approved.
Pressure Rating:
150 psig minimum.
Standards:
NSF/ANSI 372

BALANCING VALVES
Automatic Balancing Valves
Application:
Hot Water Recirculation
Manufacturers:
Caleffi
Kemper
CircuitSolver
Standard:
NSF/ANSI 61, NSF/ANSI 372, APMO/IGC 302
Adjustable Return Temperature
Return Temperature Setting:
120-122 deg. F
Provide line sized, ball shutoff valves on each side of the balancing valve.
Provide disinfection bypass.

STRAINERS FOR DOMESTIC WATER PIPING
Y-Pattern Strainers:
Pressure Rating:
125 psig minimum unless otherwise indicated.
Body:
Bronze for NPS 2 and smaller; cast iron with interior lining that complies with AWWA C550 or that is FDA approved, epoxy coated.
End Connections:
Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.
Screen:
Stainless steel with round perforations unless otherwise indicated.
Perforation Size:
Strainers NPS 2 and Smaller: 0.020 inch.
Drain:
Factory-installed, hose-end drain valve.

DRAIN VALVES
Ball-Valve-Type, Hose-End Drain Valves:
Standard:
MSS SP-110 for standard-port, two-piece ball valves.
Pressure Rating:
400-psig minimum CWP.
Size:
NPS 3/4.
Body:
Copper alloy.
Ball:
Chrome-plated brass.
Seats and Seals: Replaceable.
Handle:
Vinyl-covered steel.
Outlet:

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Threaded, short nipple with garden-hose thread complying with ASME B1.20.7 and cap with brass chain.

WATER-HAMMER ARRESTERS

Water-Hammer Arresters:

Manufacturers:

Subject to compliance with requirements, provide products by one of the following, or approved:

AMTROL.

Josam.

Precision Plumbing Products.

Sioux Chief Manufacturing Company.

Smith, Jay R.

Watts.

Zurn.

Standard:

ASSE 1010 or PDI-WH 201.

Type:

Metal bellows.

Size:

ASSE 1010, Sizes AA and A through F, or PDI-WH 201, Sizes A through F.

TRAP-SEAL PRIMER DEVICE

Supply-Type, Trap-Seal Primer Device:

Manufacturers:

Subject to compliance with requirements, provide products by one of the following, or approved:

MIFAB.

Precision Plumbing Products.

Sioux Chief Manufacturing Company.

Smith, Jay R.

Watts.

Standard:

ASSE 1018.

Pressure Rating:

125 psig minimum.

Body:

Bronze.

Inlet and Outlet Connections:

NPS 1/2 threaded, union, or solder joint.

Gravity Drain Outlet Connection: NPS 1/2 threaded or solder joint.

Finish:

Chrome plated, or rough bronze for units used with pipe or tube that is not chrome finished.

SPECIALTY VALVES

Section 22 05 23:

Comply with requirements for general-duty metal valves in Section 22 05 23 “General-Duty Valves for Plumbing Piping.”

EXPANSION TANKS

Sized as Required by System

Pressure regulated per nominal system design.

Maintains positive gauge pressure in all parts of system.

Prevent cavitation and boiling in all parts of the system through sufficient pressures.

MIXING VALVES

Master Mixing Value - Digital

Manufacturers:

Watts, Leonard, or approved.

Standards:

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ASSE 1017
Minimum Flow Rate 0.5 GPM or lower
Accuracy: +/- 3 deg. F or better
Rated 150 psig or greater
Temperature Deg. F markings on adjustment
Voltage:
115-230 VAC, 60 hz
Features:
Digital display, sanitation mode, complies with low-lead requirements.
Standard Point-of-Use Mixing Valves Sized as Required
Manufacturers:
Watts Hydroguard, Caleffi SinkMixer, or approved.
Standards:
ASSE 1017, ASSE 1070, ASSE 1071
Adjustable, not less than 80 and not higher than 180
Rated 125 psig or greater
Temperature Deg. F markings on adjustment

PART 3 - EXECUTION

INSTALLATION
Comply with manufacturer requirements for installations. Locate and install equipment such that access can be maintained for proper maintenance.
Balancing Valves:
On multiple-branch circuits, install balancing valves in locations where they can easily be adjusted and after the last hot water fixture before returning to the hot water recirculation pump.
Strainers: Install Y-pattern strainers for water on supply side of each pump.
Air Vents:
Install automatic air vents at high points of water piping.
Trap Seal Primer Piping: Install trap-seal primer systems with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust system for proper flow.
Expansion Tank:
Provide, locate adjacent to each Hot Water Heater larger than 10 gallons.

CONNECTIONS
Grounding:
Comply with requirements for ground equipment in Section 26 05 26 “Grounding and Bonding for Electrical Systems.”
Fire Retardant Treated Wood Blocking:
Fire-retardant-treated-wood blocking is specified in Section 26 05 19 “Low-Voltage Electrical Power Conductors and Cables” for electrical connections.

LABELING AND IDENTIFYING
Equipment Nameplates and Signs:
Install engraved plastic-laminate equipment nameplate or sign on or near each of the following:
Calibrated balancing valves.
Supply-type, trap-seal primer valves.
Additional Signage Requirements:
Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit.
Nameplates and signs are specified in Section 22 05 53 “Identification for Plumbing Piping and Equipment.”

FIELD QUALITY CONTROL
Defective Piping Specialties:

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Domestic water piping specialties will be considered defective if they do not pass tests and inspections.
Reports:
Prepare test and inspection reports.

FREEZE PROTECTION
Provide Freeze Protection where installed in attics, in crawl spaces, and other above-ground unheated spaces. See Specification Section 22 11 16 Domestic Water Piping for Freeze Protection Requirements

ADJUSTING
Flow Setpoints:
Set field-adjustable flow setpoints of balancing valves.
Mixing Valves:
Set field-adjustable set point per AHJ requirements.

END OF SECTION

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PART 1 - GENERAL

CONTRACT CONDITIONS

Work of this Section is bound by the Contract Conditions and Division 1, bound herewith, in addition to this Specification and accompanying Drawings.

RELATED DOCUMENTS

General:

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

Other Requirements:

See Section 22 00 00 “General Plumbing Provisions” for additional requirements for this section.

SUMMARY

Section Includes:

Hot water recirculation pumps

DEFINITIONS

Low Voltage:

As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote control, signaling power-limited circuits.

SUBMITTALS

Product Data:

For each type of product indicated. Include materials of construction, rated capacities, certified performance curves with operating points plotted on curves, operating characteristics, electrical characteristics, and furnished specialties and accessories.

Operation and Maintenance Data:

For domestic water pumps to include in operation and maintenance manuals.

QUALITY ASSURANCE

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.

UL Compliance:

Comply with UL 778 for motor-operated water pumps.

DELIVERY, STORAGE, AND HANDLING

Flanges:

Retain shipping flange protective covers and protective coatings during storage.

PART 2 - PRODUCTS

HOT WATER RECIRCULATION PUMP

Manufacturers:

Subject to compliance with requirements, provide products by one of the following, or approved:

Armstrong.

Bell & Gossett.

Aurora Pump.

TACO.

Grundfos

Description:

Factory-assembled and -tested, in-line, single-stage, close-coupled, over hung impeller centrifugal pumps designed for installation with pump and motor shaft mounted horizontal.

Vibration Isolation:

Required, spring and rubber mounted. Installations without vibration isolation will be rejected.

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Bypass Valve:
Provide bypass to isolate and remove from plumbing circuit while maintaining operation of system.
Capacities, Quantities, and Characteristics: See Drawings.
CONTROL(S)- Not less than the following, each:
Pressure Switches:
Power Requirement: 120 V AC or as otherwise shown.
Thermostat(s):
Electric; adjustable for control of hot-water circulation pump.
Type: Water-immersion temperature sensor, for installation in piping.
Range: 100 to 240 deg. F.
Operation of Pump: On or off.
Power Requirement: 120V AC or as otherwise shown.
Settings: Start pump at 115 deg. F and stop pump at 125 deg. F.
Timer(s): Electric, for control of hot-water circulation pump.
Type: Programmable, seven-day clock with manual override on-off switch.
Accessories:
Automatic Air Vent
Manufacturers: Caleffi, Watts, Bell and Gosset, Taco, Or Approved
Certifications:
NSF/ANSI 372
Max Pressure:
150 psi
Max Working Temperature:
240 deg. F
Low Lead
Application:
Install at recirculation pump inlet.

PART 3 - EXECUTION

EXAMINATION
Rough In:
Examine roughing-in of domestic-water-piping system to verify actual locations of connections before pump installation.

PUMP INSTALLATION
Install equipment in accordance with manufacturer's instructions.
The contractor shall align the pump and motor shafts to within the manufacturer's recommended tolerances prior to system start-up.
Power wiring, as required, shall be the responsibility of the electrical contractor. All wiring shall be performed per manufacturer's instructions and applicable state, federal and local codes.
Control wiring for remote mounted switches and sensor / transmitters shall be the responsibility of the controls contractor. All wiring shall be performed per manufacturer's instructions and applicable state, federal, and local codes.
Vibration Isolation is essential and required. Provide. Installations without vibration isolation will be rejected. Isolation shall prevent any vibration for entering or being heard from any unit, or other areas.

CONNECTIONS
Section 22 11 16:
Comply with requirements for piping specified in Section 22 11 16 “Domestic Water Piping.” Drawings indicate general arrangement of piping, fittings, and specialties.
Service and Maintenance:
Install piping adjacent to pumps to allow service and maintenance. Provide bypass valves and piping to isolate.
Pump Piping:
Connect domestic water piping to pumps. Install suction and discharge piping equal to or greater than

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size of pump nozzles or pump station headers.
Hot Water Circulation Pump Connections:
Install shutoff valve and strainer on suction side of each pump, and check, shutoff, and throttling valves on discharge side of each pump. Install valves same size as connected piping. Comply with requirements for valves specified in Section 22 05 23 “General-Duty Valves for Plumbing Piping” and comply with requirements for strainers specified in Section 22 11 19 “Domestic Water Piping Specialties.”
Pump Control:
Connect thermostats and timers to pumps that they control.

IDENTIFICATION
Section 22 05 53:
Comply with requirements for identification specified in Section 22 05 53 “Identification for Plumbing Piping and Equipment” for identification of pumps.

HOT WATER CIRCULATION PUMP STARTUP SERVICE
Startup Service:
Perform startup service.
Complete installation and startup checks according to manufacturer’s written instructions.
Check piping connections for tightness.
Clean strainers on suction piping.
Set thermostats and timers for automatic starting and stopping operation of pumps.
Perform the following startup checks for each pump before starting:
Verify that pump is free to rotate by hand and that pump for handling hot liquid is free to rotate with pump hot and cold. If pump is bound or drags, do not operate until cause of trouble is determined and corrected.
Verify that pump is rotating in the correct direction.
Start motor.
Adjust temperature settings on thermostats per herein.
Adjust timer settings per Owner.

END OF SECTION

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PART 1 - GENERAL

CONTRACT CONDITIONS

Work of this Section is bound by the Contract Conditions and Division 1, bound herewith, in addition to this Specification and accompanying Drawings.

RELATED WORK

Section 22 05 00 - Common Work Results for Plumbing
Section 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment
Section 22 11 19 - Domestic Water Piping Specialties

REFERENCE

Applicable provisions of Division 1 govern work under this section.

REFERENCE STANDARDS

ASTM D1785 Poly Vinyl Chloride (PVC) Plastic Pipe
ASTM D2241 Poly Vinyl Chloride (PVC) Pressure-Rated Pipe (SDR Series)
ASTM D2466 Poly Vinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 40
ASTM D2564 Solvent Cements for Poly Vinyl Chloride (PVC) Plastic Pipe and Fittings
ASTM D2665 Poly Vinyl Chloride (PVC) Plastic Drain, Waste and Vent Pipe and Fittings
ASTM D2729 Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings
ASTM D2855 Making Solvent Cemented Joints with Poly Vinyl Chloride (PVC) Pipe and Fittings
ASTM D3034 Type PSM Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings
ASTM D3212 Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM D3311 Drain, Waste and Vent (DWV) Plastic Fitting Patterns

QUALITY ASSURANCE

Substitution of Materials:

Refer to Section 01 60 00 Project requirements.
Order all DWV pipe with each length marked with the name or trademark of the manufacturer and type of pipe; with each shipping unit marked with the purchase order number, metal or alloy designation, temper, size, and name of supplier.
Any installed material not meeting the specification requirements must be replaced with material that meets these specifications without additional cost to the Owner.

DELIVERY, STORAGE, AND HANDLING

Promptly inspect shipments to ensure that the material is undamaged and complies with specifications.
Cover pipe to prevent corrosion or deterioration while allowing sufficient ventilation to avoid condensation.
Do not store materials directly on grade. Protect pipe, tube, and fitting ends so they are not damaged.
Where end caps are provided or specified, take precautions so the caps remain in place. Protect fittings, flanges, and unions by storage inside or by durable, waterproof, above ground packaging.
Storage and protection methods must allow inspection to verify products.

DESIGN CRITERIA

Use only new material, free of defects, rust and scale, and meeting the latest revision of ASTM, specifications as listed in this specification.
Construct all piping for the highest pressures and temperatures in the respective system.
Contractor is required to meet application criteria and requirements where stated other may be used at Contractor’s option herein.
Conceal work.

PART 2 - PRODUCTS

SANITARY WASTE AND VENT

Interior Above Ground

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PVC plastic pipe, Schedule 40 or 80 as required by AHJ, Class 12454-B (PVC 1120), ASTM D1785; PVC plastic drain, waste and vent pipe and fittings, ASTM D2665; socket fitting patterns, ASTM D3311; primer, ASTM F656; solvent cement, ASTM D2564. Color: White
ABS Plastic, Schedule 40 or 80 as required by AHJ; ABS plastic drain, waste and vent pipe and fittings. ASTM listed with socket fitting patterns. ASTM approved primer, and solvent. Color: Black
Below Grade, Inside of Building Envelope
PVC plastic pipe, Schedule 40 or 80 as required by AHJ, Class 12454-B (PVC 1120), ASTM D1785; PVC plastic drain, waste and vent pipe and fittings, ASTM D2665; socket fitting patterns, ASTM D3311; primer, ASTM F656; solvent cement, ASTM D2564. Color: White

PART 3 - EXECUTION

GENERAL
Install pipe and fittings in accordance with reference standards, manufacturer's recommendations and recognized industry practices.

PREPARATION
Cut pipe ends even. Ream ends of piping to remove burrs. Clean scale and dirt from interior and exterior of each section of pipe and fitting prior to assembly.

ERECTION
Install all piping parallel to building walls and ceilings and at heights which do not obstruct any portion of a window, doorway, stairway, or passageway. Where interferences develop in the field, offset or reroute piping as required to clear such interferences. Coordinate locations of plumbing piping with piping, ductwork, conduit and equipment of other trades to allow sufficient clearances. In all cases, consult drawings for exact location of pipe spaces, ceiling heights, door and window openings, or other architectural details before installing piping.
Install underground warning tape with integrated tracer wire 6"-12" below finished grade above all exterior below ground piping. Where existing underground warning tape is encountered, repair and replace.
Maintain piping in clean condition internally during construction.
Provide clearance for installation of insulation, access to valves and piping specialties.
Provide anchors, expansion joints, swing joints and/or expansion loops so that piping may expand and contract without damage to itself, equipment, or building.
Do not route piping through transformer vaults or above transformers, panelboards, or switchboards, including the required service space for this equipment, unless the piping is serving this equipment.
Install all valves and piping specialties, including items furnished by others, as specified and/or detailed.
Provide access to valves and specialties for maintenance. Make connections to all equipment, fixtures and systems installed by others where same requires the piping services indicated in this section.

THREADED PIPE JOINTS
Use a thread lubricant or Teflon tape when making joints; no hard setting pipe thread cement or caulking will be allowed.

SOLVENT WELDED PIPE JOINTS
Install in accordance with ASTM D2855 "Making Solvent Cemented Joints With PVC Pipe and Fittings".
Saw cut piping square and smooth. Tube cutters may be used if they are fitted with wheels designed for use with PVC/CPVC pipe that do not leave a raised bead on pipe exterior. Support and restrain pipe during cutting to prevent nicks and scratches. Bevel ends 10-15 deg. and deburr interior. Remove dust, drips, moisture, grease and other superfluous materials from pipe interior and exterior. Check dry fit of pipe and fittings. Reject materials which are out of round or do not fit within close tolerance. Use heavy body solvent cement for large diameter fittings.
Maintain pipe, fittings, primer and cement between 40 and 100 deg. during application and curing. Apply primer and solvent using separate daubers (3" and smaller piping only) or clean natural bristle brushes about 1/2 the size of the pipe diameter. Apply primer to the fitting socket and pipe surface with a scrubbing motion. Check for penetration and reapply as needed to dissolve surface to a depth of 4-5 thousandths. Apply solvent cement to the fitting socket and pipe in an amount greater than needed to fill

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any gap. While both surfaces are wet, insert pipe into socket fitting with a quarter turn to the bottom of the socket. Solvent cement application and insertion must be completed in less than 1 minute. Minimum of 2 installers is required on piping 4" and larger. Hold joint for 30 seconds or until set. Reference manufacturer's recommendations for initial set time before handling and for full curing time before pressure testing. Cold weather solvent/cement may be utilized only under unusual circumstances and when specifically approved by the Owner Representative.

MECHANICAL HUBLESS PIPE CONNECTIONS

For above-ground installation only, and where permitted. Below ground requires sealant.
Place the gasket on the end of one pipe or fitting and the clamp assembly on the end of the other pipe or fitting. Firmly seat the pipe or fitting ends against the integrally molded shoulder inside the neoprene gasket. Slide the clamp assembly into position over the gasket. Tighten fasteners to manufacturer's recommended torque.

SANITARY WASTE AND VENT

Verify invert elevations and building elevations prior to installation. Install exterior piping pitched to drain at indicated elevations and slope. Install interior piping pitched to drain at minimum slope of 1/4 inch per foot where possible and in no case less than Code per foot for piping 3" and larger.
Install exterior piping below predicted frost level and not less than 24" bury depth to top of pipe wherever possible. Where piping is located above predicted frost level, provide frost protection.
Flush piping inlets (floor drains, fixtures, etc.) with high flow of water at completion of project to demonstrate full flow capacity. Remove blockages and make necessary repairs where flow is found to be impeded.
Excessive roof penetrations will not be permitted. Excessive is defined by Owner. To the extent possible, gang vent piping that is less than 2-inches together for a single roof penetration. Visible from ground roof penetrations shall occur not less than 4-feet from gutter side of roof. Where non-visible from ground roofs are provided, no vent penetration shall be visible from the ground. Provide at locations shown when shown on Architectural drawings/elevations. Contractor is advised to obtain approval from Owner for each vent location as not to deem any vents as excessive. Where one or more visible roof breakups are visible, line-up vents in parallel or perpendicular to other visible roof breaks for a neat and professional installation. Breaks include and are not limited to: attic vents, mechanical equipment, other penetrations, eves, peaks, valleys, etc.

PIPING SYSTEM LEAK TESTS

Isolate or remove components from system which are not rated for test pressure. Perform final testing for medical and lab gas with all system components in place. Test piping in sections or entire system as required by sequence of construction. Do not insulate or conceal pipe until it has been successfully tested.
If required for the additional pressure load under test, provide temporary restraints at fittings or expansion joints. Backfill underground water mains prior to testing with the exception of thrust restrained valves which may be exposed to isolate potential leaks.
For hydrostatic tests, use clean water and remove all air from the piping being tested by means of air vents or loosening of flanges/unions. Measure and record test pressure at the high point in the system. Inspect system for leaks. Where leaks occur, repair the area with new materials and repeat the test; caulking will not be acceptable.

Test System	Medium	Pressure	Duration
Sanitary Waste and Vent	Water	10' water	2 hr

END OF SECTION

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PART 1 - GENERAL

CONTRACT CONDITIONS
Work of this Section is bound by the Contract Conditions and Division 1, bound herewith, in addition to this Specification and accompanying Drawings.

RELATED DOCUMENTS
Other Requirements: See Section 22 00 00, “General Plumbing Provisions” for additional requirements for this section.

SUMMARY
Section Includes:
Commercial, gas-fired, high-efficiency, storage, domestic water heaters.
Domestic water heater accessories.
Commercial, atmospheric, gas-fired, storage water heaters.

PERFORMANCE REQUIREMENTS
Seismic Performance:
Commercial domestic water heaters shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
The term “withstand” means, the unit will remain in place without separation of any parts from the device when subjected to the seismic forces at area installed.

DEFINITIONS
HI-1.1-1.2:
ANSI/HI 1.1-1.2 - Centrifugal Pumps - Definitions
HI-1.3:
Rotodynamic (Centrifugal) Pump Applications (ANSI/HI 1.3)

QUALITY ASSURANCE
Electrical Components, Devices, and Accessories:
Listed and labeled as defined in NFPA 70, by an Oregon certified testing agency, and marked for intended location and application.
ASHRAE/IESNA Compliance:
Fabricate and label fuel-fired, domestic water heaters to comply with ASHRAE/IESNA 90.1.
ASME Compliance:
Where ASME-code construction is indicated, fabricate and label commercial, domestic water heater storage tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.
Where ASME-code construction is indicated, fabricate and label commercial, finned-tube, domestic water heaters to comply with ASME Boiler and Pressure Vessel Code: Section IV.
NSF Compliance: Fabricate and label equipment components that will be in contact with potable water to comply with NSF 61, “Drinking Water System Components - Health Effects.

SUBMITTALS
Product Data:
For each type and size of domestic water heater indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
Product Certificates:
For each type of commercial, gas-fired domestic water heater, from manufacturer.
Source Quality Control Reports:
Provide.
Field Quality Control Reports:
Provide.
Warranty:
Sample of special warranty.
Operation and Maintenance Data:

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For fuel-fired, domestic water heaters to include in emergency, operation, and maintenance manuals.

WARRANTY

Special Warranty:

Manufacturer's standard form in which manufacturer agrees to repair or replace components of fuel-fired, domestic water heaters that fail in materials or workmanship within specified warranty period.

Failures include, but are not limited to, the following:

Structural failures including storage tank and supports.

Faulty operation of controls.

Deterioration of metals, metal finishes, and other materials beyond normal use.

Warranty Periods:

From date of Substantial Completion.

Commercial, Gas-Fired, Storage, Domestic Water Heaters:

Storage Tank: 5 years.

Controls and Other Components:

1 year.

PART 2 - PRODUCTS

COMMERCIAL, GAS-FIRED, STORAGE, DOMESTIC WATER HEATERS

Commercial, Atmospheric, Gas-Fired, Storage Domestic Water Heaters

Manufacturers Subject to compliance with requirements, provide products by the following:

See plumbing fixture schedule or approved.

Standard:

ANSI Z21.10.3/CSA 4.3.

Storage-Tank Construction:

ASME-code steel with 150-psig working-pressure rating.

Tappings:

Factory fabricated of materials compatible with tank. Attach tappings to tank before testing.

NPS 2 and Smaller: Threaded ends according to ASME B1.20.1.

Interior Finish:

Comply with NSF 61 barrier materials for potable-water tank linings, including extending finish into and through tank fittings and outlets.

Lining:

Glass complying with NSF 61 barrier materials for potable-water tank linings, including extending lining into and through tank fittings and outlets.

Factory-Installed Storage-Tank Appurtenances:

Anode Rod: Replaceable magnesium or non-sacrificial electrically powered rods.

Dip Tube: Required unless cold-water inlet is near bottom of tank.

Drain Valve: Corrosion-resistant metal complying with ASSE 1005.

Insulation: Comply with ASHRAE/IESNA 90.1. Surround entire storage tank except connections and controls.

Jacket: Steel with enameled finish.

Burner: For use with atmospheric, gas-fired, domestic water heaters and natural gas fuel.

Automatic Ignition: ANSI Z21.20/CSA C22.2 No. 199, electric, automatic, gas-ignition system.

Temperature Control: Adjustable thermostat.

Safety Controls: Automatic, high-temperature-limit and low water cutoff devices or systems.

Combination Temperature-and-Pressure Relief Valves:

ANSI Z21.22/CSA 4.4-M. Include one or more relief valves with total relieving capacity at least as great as heat input, and include pressure setting less than domestic water heater working-pressure rating. Submit rating selected separately. Select one relief valve with sensing element that extends into storage tank.

Capacity and characteristics:

See Drawings.

DOMESTIC WATER HEATER ACCESSORIES

Domestic Water Expansion Tanks:

Basis of Design:

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See plumbing fixture schedule or approved.
Description:
Steel, pressure-rated tank constructed with welded joints and factory installed butyl-rubber diaphragm. Include air pre-charge to minimum system-operating pressure at tank.
Construction:
Tappings:
Factory-fabricated steel, welded to tank before testing and labeling. Include ASME B1.20.1 pipe thread.
Interior Finish: Comply with NSF 61 barrier materials for potable-water tank linings, including extending finish into and through tank fittings and outlets.
Air-Charging Valve:
Factory installed.
Capacity and Characteristics:
See schedule on Drawings.
ASME Requirements:
Unless otherwise scheduled on Drawings, the following minimum requirements shall apply to all unfired pressure vessel tanks on project:
Unfired pressure vessels having a volume of 1.50 cubic feet (11.25 gallons) or more shall be ASME labeled.
The above requirements shall be superseded by the code requirements of the local jurisdiction or authority having jurisdiction. Contractor shall comply with most stringent requirement.
Gas Shutoff Valves:
ANSI Z21.15/CSA 9.1-M manually operated. Furnish for installation in piping.
Gas Pressure Regulators:
ANSI Z21.18/CSA 6.3, appliance type. Include 1/2-psig pressure rating as required to match gas supply.
Automatic Gas Valves:
ANSI Z21.21/CSA 6.5, appliance, electrically operated, on-off automatic valve.
Combination Temperature-and-Pressure Relief Valves:
Include relieving capacity at least as great as heat input, and include pressure setting less than domestic water heater working pressure rating. Select relief valves with sensing element that extends into storage tank.
Gas-Fired, Domestic water Heaters:
ANSI Z21.22/CSA 4.4-M.
Pressure Relief Valves:
Include pressure setting less than domestic water heater working pressure rating.
Gas-Fired, Domestic water Heaters:
ANSI Z21.22/CSA 4.4-M.
Vacuum Relief Valves:
ANSI Z21.22/CSA 4.4-M.
Thermometers: Thermometers shall be rigid stem or remote sensing, scale or dial type with an aluminum, black metal, stainless steel, or chromium plated brass case. The thermometer shall be back connected, red liquid (alcohol or organic-based) fill, vapor, bi-metal or gas actuated, with 9 inches high scale dial or circular dial 2 to 5 inches in diameter graduated from 40 to 212 deg. F, with two-deg. graduations guaranteed accurate within one scale division. The socket shall be separable, double-seat, micrometer-fittings, with extension neck not less than 2-1/2 inches to clear tank or pipe covering. The thermometer shall be suitable for 3/4 inch pipe threads. Thermometers may be console-mounted with sensor installed in separate thermometer well.

SOURCE QUALITY CONTROL
Factory Tests:
Test and inspect assembled domestic water heaters specified to be ASME-code construction, according to ASME Boiler and Pressure Vessel Code.
Hydrostatic Test:
Hydrostatically test commercial domestic water heaters to minimum of one and one-half times pressure rating before shipment.
Test and Inspection Reports:
Prepare test and inspection reports.

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WATER HEATER SEISMIC STRAP

Water Heater and Tank Seismic Restraints: For water heaters and tanks, Watts “Spacemaker,” Holdrite “Quickstrap,” or approved.

PART 3 - EXECUTION

DOMESTIC WATER HEATER INSTALLATION

Commercial, Domestic Water Heater Mounting: Install commercial domestic water heaters on concrete base. Comply with requirements for concrete base specified in Section 03 30 00 “Castin- Place Concrete.”

Exception:

Omit concrete bases for commercial domestic water heaters if installation on stand, bracket, suspended platform, or directly on floor is indicated.

Maintain manufacturer’s recommended clearances.

Arrange units so controls and devices that require servicing are accessible.

Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18.00-inch centers around the full perimeter of concrete base.

For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.

Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

Install anchor bolts to elevations required for proper attachment to supported equipment.

Anchor domestic water heaters to substrate.

Gas Fired Domestic Water Heaters:

Install gas-fired, domestic water heaters according to NFPA 54.

Install gas shutoff valves on gas supply piping to gas-fired, domestic water heaters without shutoff valves.

Install gas pressure regulators on gas supplies to gas-fired, domestic water heaters without gas pressure regulators if gas pressure regulators are required to reduce gas pressure at burner.

Install automatic gas valves on gas supplies to gas-fired, domestic water heaters required for operation of safety control.

Comply with requirements for gas shutoff valves, gas pressure regulators, and automatic gas valves specified in Section 23 11 23 “Natural-Gas Piping.”

Temperature Relief Valves:

Install combination temperature-and-pressure relief valves in top portion of storage tanks. Use relief valves with sensing elements that extend into tanks. Extend commercial-water-heater relief-valve outlet, with drain piping same as domestic water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.

Combination Temperature Pressure Relief Valves:

Install combination temperature-and pressure relief valves in water piping for domestic water heaters without storage. Extend commercial-water-heater relief-valve outlet, with drain piping same as domestic water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.

Drain Piping:

Install water-heater drain piping as indirect waste to spill by positive air gap into open drains or over floor drains. Install hose-end drain valves at low points in water piping for domestic water heaters that do not have tank drains. Comply with requirements for hose-end drain valves specified in Section 22 11 19 “Domestic Water Piping Specialties.”

Thermometers:

Install thermometer on outlet and inlet piping of domestic water heaters.

Filling:

Fill domestic water heaters with water, include in sanitation process.

CONNECTIONS

Domestic Water Piping: Comply with requirements for domestic water piping specified in Section 22 11 16 “Domestic Water Piping.”

Gas Piping:

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Comply with requirements for gas piping specified in Section 23 11 23 “Natural-Gas Piping.”
Service and Maintenance:
Where installing piping adjacent to fuel-fired, domestic water heaters, allow space for service and maintenance of water heaters. Arrange piping for easy removal of domestic water heaters.

IDENTIFICATION
System Components:
Identify system components. Comply with requirements for identification specified in Section 22 05 53 “Identification for Plumbing Piping and Equipment.”

FIELD QUALITY CONTROL
Tests and Inspections:
Manufacturer’s Field Service:
Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
Leak Test:
After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist. Replace unit if tank or internal leak occurs.
Operational Test:
After NG and electrical circuitry has been energized, start units to confirm proper operation.
Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
Defective Units:
Domestic water heaters will be considered defective if they do not pass tests and inspections. Comply with requirements in Section 01 41 00 “Special Inspection and Testing Laboratory Services” for retesting and re-inspecting requirements and Section 01 60 00 “Execution” for requirements for correcting the Work.
Reports: Prepare test and inspection reports.

END OF SECTION

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PART 1 - GENERAL

CONTRACT CONDITIONS
Work of this Section is bound by the Contract Conditions and Division 1, bound herewith, in addition to this Specification and accompanying Drawings.

RELATED WORK
Section 22 00 00 – General Plumbing Provisions
Section 22 11 16 – Domestic Water Piping
Section 22 13 16 – Sanitary Waste and Vent Piping
Section 22 05 29 – Hangers and Supports for Plumbing Piping and Equipment

QUALITY ASSURANCE
Substitution of Materials: Section 01 60 00 Product Requirements.

SHOP DRAWINGS
Include data concerning sizes, utility sizes, rough in-dimensions, capacities, materials of construction, ratings, weights, trim, finishes, manufacturer's installation requirements, manufacturer's performance limitations, and appropriate identification.

OPERATION AND MAINTENANCE DATA
All operations and maintenance data shall comply with the submission and content requirements specified under section 01 78 00 Closeout Submittals.

DESIGN CRITERIA
ANSI A112.6.1M-88 - Supports for Off-the Floor Plumbing Fixtures for Public Use.
ANSI A112.18.1-94 - Finished and Rough Brass Plumbing Fixture Fittings.
ANSI A112.19.1-90 - Enameled Cast Iron Plumbing Fixtures.
ANSI A112.19.2M-82 - Vitreous China Plumbing Fixtures.
ANSI A112.19.5-79(R1990) - Trim for Water Closet Bowls, Tanks and Urinals.

PART 2 - PRODUCTS

PIPING
Piping, fittings, and related items as specified in related Sections 22 11 16 Domestic Water Piping.

PLUMBING MATERIALS
Water Hammer Arrester:
As specified in Domestic Water Piping Specialties 22 11 19
Traps:
Except chrome plated fixture traps. Recessed drainage pattern for threaded pipe and same grade as pipe for cast iron pipe; with cleanout plugs in trap body in all above grade locations.
Secondary piping supports: Install manufactured secondary piping supports for support and positioning of fixture rough-in piping from framing members. Hubbard, Sioux Chief, or approved.

PLUMBING TRIM
Stops:
Furnish stop valves for all fixtures. ¼ turn handle style, in wall, angle or straight through pattern to fit installation. Stops to be all brass with ¼ turn brass stem and replaceable washer, no plastic. Compression nuts to be high copper content brass. Finish to be copper nickel chrome plate. Product to carry manufacturer’s name. Risers to be chrome plated copper. Provide chrome plated shallow escutcheons. McGuire, Chicago, Brasskraft, Keeney, Zurn, or approved.
Fixture Traps:
Exposed fixture tail pieces, traps, and wastes shall be smooth tubular plastic unless plastic not permitted, use non-combustible iron.
Provide compliant fixture piping ADA protector kit on all exposed accessible fixture traps and water

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supplies. Provide fire rated where required.
Supplies: Braided Stainless Steel, flexible. Stainless steel connectors, 200 psig rated, with burst pressure at 2000 psi at 70-deg. F. Integrated EPDM rubber washers, Ferguson ProFlo, or approved.

PLUMBING FIXTURES- UNITS- See Drawings for Schedule(s), Locations, and Additional Requirements
General:
Install equipment in accordance with manufacturer's instructions including providing any necessary mounted hardware, caulking, sealants, appurtenances, connecting piping, p-traps, and any other accessory equipment.
Lavatory (public use):
Model: See fixture schedule or approved.
Color/Finish: White, Porcelain
Features: Metering faucet, 4-inch fixed centers, integral cast spout.
Faucet Style: Per fixture schedule or approved.
Faucet GPM: 0.5 GPM @ 60 psi, 0.20 max gallons per cycle.
Faucet Finish: Chrome
Provide grid drain and tailpiece to match faucet finish.
Provide lavatory support with concealed arms for narrow wall installation.
Lavatory (employee use):
Model: See fixture schedule or approved.
Color/Finish: White, Porcelain
Features: Sensor faucet, battery powered, above deck mixing valve.
Faucet Style: Per fixture schedule or approved.
Faucet GPM: 0.5 GPM @ 60 psi
Faucet Finish: Chrome
Provide pop up drain and tailpiece to match faucet finish.
Provide lavatory support with concealed arms for narrow wall installation.
Water Closet Assembly – Flush Tank
Model: See fixture schedule or approved.
Bowl: ADA Compliant, elongated flush tank toilet made from vitreous China.
Mounting: Floor Mount, 17 5/8" from floor.
Seat: Provide from same manufacturer as bowl. Open Front.
Waste Outlet Seal: Wax
Bolts: Provide compatible mounting hardware
Color/Finish: White Vitreous China Tank/Bowls, White Solid Polypropylene Seats
Features: 1.28 gpf, ADA, quiet operation, manual flush
Water Supply Outlet Boxes
Model: See fixture schedule or approved.
Color/Finish: Plastic
Features: ¼-Turn stop valves, waste and supplies integrated, hammer arrestors integrated.
Provided fire rated model when used in rated walls.
FCO Floor Cleanout in Finished Areas
Model, or approved: J R. Smith Mfg Co 4021S, Watts CO-200-R, Sioux Chief 834
Features: Gasket Seal, bronze plug with round adjustable scoriated secured Nickel-Bronze top
Break Room Sink
Model: See fixture schedule or approved.
Color/Finish: Stainless Steel
Description: 23.5-inch by 18.25-inch by 4.875-inch single compartment 18 ga., type 304 stainless steel, undermount sink, nickel plated brass grid strainer.
Faucet Style: Chicago 786 Series faucet with polished chrome plated solid brass body construction, GN2A gooseneck spout and indexed wrist blade handles, 1.5 GPM pressure compensating laminar flow outlet, vandal resistant complete.
Faucet GPM: 1.5 GPM @ 60 psi
Faucet Finish: Polished Chrome
Janitor Sink Basin
Model, or approved: See fixture schedule or approved.
Color/Finish: Enameled Cast Iron

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Features: 28-Inch by 28-Inch by 8 Inch Deep, and 3-Inch body strainer outlet and grid drain
Accessories: Provide 18 gauge type 302 No.4 finish stainless steel splash on the two walls.
Janitor Sink Basin Faucet
Model, or approved: See fixture schedule or approved.
Faucet Style: Manual sink faucet with 8-inch centers, color-coded index on handles, vandal proof 2-3/8”
Faucet Finish: Cast Brass with total lead content less than 0.25%, chrome plated finish.
level handle.
Features: bucket hook, vacuum breaker and integral stops in shanks, ceramic, quarter turn cartridge with integrated check valve.
Electric Water Cooler
Elkay LZ8WSSSMC hung water cooler bottle filling station
Surface mounted
Bottle Filler: Sensor activated 20 second automatic shut-off, 1.1 GPM
Water Chiller: 8 GPH, 50 deg. F water at 90 deg. F ambient and 80 deg. F inlet water 55 temperature.
120V, single phase, 5 FLA
3000-gallon water filter

PART 3 - EXECUTION

INSTALLATION
Install plumbing fixtures in accordance with manufacturer’s instructions. Set level and plumb. Secure in place to counters, floors and walls providing solid bearing and secure mounting. Bolt fixture carriers to floor and wall. Secure rough-in fixture piping to prevent movement of exposed piping.
Install each fixture with trap easily removable for servicing and cleaning. Install fixture stops in readily accessible location for servicing.
Provide barrier free fixtures in compliance with local code, and Federal ADA Accessibility Guidelines.
Install barrier free lavatory traps parallel and adjacent to wall and supplies and stops elevated to 27" above floor to avoid contact by wheelchair users.
Provide ADA protection wraps/shields guards around exposed piping/stops/supplies at every sink. See Piping Insulation Specification.
Each fixture shall have a stop valve installation to control the fixture. Stop valves shall be heavy duty type, 1/4 turn, with brass stems and screwed or sweat inlet connections. Compression type inlets are not acceptable.
Cover pipe penetrations with escutcheons. Exposed traps, stops, piping, and escutcheons to be chrome plated brass, same items in concealed locations may be of rough brass finish.
Set floor mounted water closets; counter mounted lavs and sinks; lav and sink faucets and drains with full setting bed of flexible non-staining plumber's putty. Cover exposed water closet bolts with bolt covers.
Provide transition piece for showers matching floor height. No shower-to-floor lip permitted, provide minimum transition difference possible.
Seal openings between walls, floors and fixtures with mildew-resistant silicone sealant same color as fixture. Fixtures in contact with finished walls and floors shall be caulked with waterproof, non-hardening sealant which will not crack, shrink or change color with age. Color to match fixture.
Test fixtures to demonstrate proper operation. Replace malfunctioning units or components. Adjust valves for intended water flow rate to fixtures without splashing, noise or overflow. Adjust shower valve temperature limit stops to 110 deg. maximum outlet temperature.
Protect fixtures during construction. At completion clean plumbing fixtures and trim using manufacturer's recommended cleaning methods and materials.
Provide non-freezing type hose bibb where installed at/through crawl spaces, attics, or penetrating other non-heated areas.
Lavatories with Hard-Wired Electronic Sensors:
Install sensors, wiring and piping as recommended by manufacturer. Provide vandal-proof screws on wiring boxes for lavatories and sensor boxes.
Mount lavatory wiring box on bottom of countertop for total concealment. Coordinate with Division 26 for plug-in transformer and receptacle locations.

END OF SECTION

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MECHANICAL ENGINEER'S SEAL

The undersigned hereby certifies that the Mechanical Technical Specifications in this project manual were prepared by me or under my direct supervision.

Jeremy Wenger
Fluent Engineering, Inc.



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PART 1 - GENERAL

CONTRACT DOCUMENTS

The Contract Documents are inclusive. All requirements of all Contract Documents shall be binding as if repeated herein and within this Division as required by any other Division or Contract Document. Applicable provisions of Division 1 govern work under this section. This Division does not express or imply separation of the Contract Documents and shall not be considered as separation of the Work. See Advertisement For Bids, Instructions to Bidders, Supplemental Instructions to Bidders, General Conditions, Supplemental General Conditions, Drawings and Specifications, and modifications incorporated in the documents before execution of the Agreement.

Conflicts: If any conflicts exist, the more stringent Contract Document is required.

SUMMARY

Products under this contract must meet minimum specifications requirements in detail without exception unless specifically noted and approved as provided in these Specifications. Equipment submitted for review must clearly state on cover sheet any differences from specified product. Equipment substitution or submittal review does not relieve Contractor from meeting all requirements of specified item.

DEFINITIONS

Definitions herein are intended as advisory and shall not limit requirements within the Contract Documents. Where a conflict of definitions exists, the more stringent standard shall be used.

Where a term is defined on a Drawing the Drawing definition shall be used for that drawing. Not all definitions are included. Trade standard terms are not defined.

SCOPE OF WORK

General:

Provide complete and functional mechanical systems as specified, as shown on Drawings, as required, and as intended.

Omissions:

Contractor shall be responsible for additional labor, or additional material necessary for the proper execution of the Work. Omissions of expressed reference to any item shall not relieve the responsibly to conform to the Contract Documents.

Scope of Mechanical Work:

All materials and workmanship shall be furnished for complete, tested, and operating mechanical systems as shown on the drawings and specified herein.

Mechanical work is to include the fuel utility service. Complete to the point of connection with the serving utility(ies). Any changes of or work required by the serving utility(ies), are part of this work and shall be fully included in the bid price.

CONFORMANCE WITH REQUIREMENTS

General:

All Work shall conform to the reasonable requirements of the project within the scope of the project and authorizations. All work shall conform to the methods and requirements of Code at the location of the Work.

Access and inspection:

All portions of the Work shall be accessible to inspections and review at all reasonable times during construction. Contractor is responsible for providing access for review and inspection of the Work. Contractor shall secure written inspection reports prior to concealing Work. Contractor is responsible for damages to properly review the Work due to lack of at least 7 Days advance written notification to the Architect, and Engineer that Work is ready for inspection.

Accounting:

Provide general accounting information as to labor and equipment costs to assist in determination of modifications to the Contract. Provide accounting breakdown when required for securing Owner financing, or for analysis of equipment costs or equipment payback periods, as well as information for Owner incentives.

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COORDINATION OF TRADES

Check all other trade drawings to avert potential installation conflicts. Should major changes from the Drawings be required to resolve potential conflicts, notify the Architect and secure written approval and agreement on necessary adjustments prior to start of installation. Check all equipment locations and connections on the site for coordination with other Divisions equipment and connections and structure and the like. Contractor is responsible for scheduling trades to properly execute all the Work as intended.

STANDARD OF CARE AND QUALIFICATIONS

General:

Contractor shall be experienced and knowledgeable to Provide Work. Owner is not responsible for improper operation, incompliance, or installation due to Contractor's lack of knowledge or experience. Upon request, and where requested herein the Contractor shall supply qualifications and experience. Drawings are presented with industry terms, statements, and trade practices and it is the responsibility of the Contractor to be familiar. Provide written notification prior to Bid to the Architect if any representation is not understood, or outside standard practice.

Like Materials and Quality Control:

All systems provided shall be new and of like materials provided through manufacturer authorized distributors. Provide equipment of same system and type by same manufacturer. Items of the same by different manufacturers will be rejected. Equipment shall conform to all applicable Code and applicable listing criteria as of the date of the Contract Documents. Equipment determined to be manufactured under any other listing or Code prior to the date of the Contract is not acceptable, even if the equipment is new or has not been used. All equipment provided to project shall be listed by an approved listing organization.

EXAMINATION OF SITE

Examine Site of Work prior to making Bid. Ascertain all related physical conditions. Verify at the Site of Work prior to Bid scale dimensions shown due to exact locations, distances, and levels will be governed by actual field conditions. Owner will not be responsible for any loss or costs that may be incurred due to a Bidder's failure to fully inform themselves prior to Bid in regard to conditions pertaining to the Work and nature of the Work.

MINOR DEVIATIONS

Make minor changes in equipment locations and equipment connections as directed or required without extra cost.

RECORD DRAWINGS

Maintain a marked set of prints at job site at all times. Show all changes from the original drawing set whether visible or concealed. Include all addendums, field orders, change orders, clarifications, request for information drawn responses, and deviations. Dimension accurately from building lines, floor, or curb elevations. Show exact location, elevation, and size of conduit/raceway, access panels and doors, equipment, and all other information pertinent to the Work. At project completion, submit marked set to Architect for review.

WARRANTY

Warrant Work, materials, and equipment for not less than one year.

CONTINUITY OF EXISTING SERVICES

Do not interrupt or change existing services without prior written approval from the Owner's Project Representative. When interruption is required, coordinate scheduling of down-time with the Owner to minimize disruption to his activities. Unless specifically stated, all work involved in interrupting or changing existing services is to be done during non-working hours.

CODES

Comply with requirements of local, federal, Oregon Administrative Code, and Oregon Mechanical Specialty Code.

CERTIFICATES AND INSPECTIONS

Refer also to Division 1, General Conditions, Permits, Regulations, Utilities and Taxes.

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Obtain and pay for all required installation inspections except those provided by the Architect. Deliver the originals of inspection certificates and test records to the Owner's Project Representative. Include copies of the certificates and test records in the Operating and Maintenance Instructions.

SEISMIC DESIGN CRITERIA

Seismic restraints and bracing:

Sized to accommodate dynamic loads as specified in the Oregon Structural Specialty Code based on the seismic criteria identified in the project general structural notes. Rigidity of bracing and/or the attachment shall be considered in determining the dynamic loads.

Vibration Isolation: Mechanical equipment shall be isolated from the building structure. Refer to individual equipment specifications for isolators, unless specifically specified herein.

Equipment Seismic Restraint: Provide seismic restraint bracing for mechanical equipment which has vibration isolators. Mechanical equipment, with or without vibration isolators, shall be anchored to the supporting floor, platform, or roof structure. Anchoring devices or equipment shall comply with the Seismic Criteria listed above.

SUBMITTALS

Refer to Division 1, General Conditions, Submittals.

Shop drawings and Submittals:

Bound, labeled, contain the project manual cover page and a material index list page showing item designation, manufacturer and additional items supplied with the installation. Submit for all equipment and systems as indicated in the respective specification sections, marking each submittal with that specification section number. Mark general catalog sheets and drawings to indicate specific items being submitted and proper identification of equipment by name and/or number, as indicated in the contract documents. Include wiring diagrams, and mechanical nameplate, and electrical nameplate ratings of electrically powered equipment.

Engineer’s Review:

Allow not less than 20 Days review.

Submit: Not less than Air Distribution, and Product catalog information. See individual sections for specific submittal requirements for each product.

OPERATION AND MAINTENANCE DATA

All operations and maintenance data shall comply with the submission and content requirements specified under section GENERAL REQUIREMENTS.

An Operating Manual and a Maintenance Manual shall be provided to the building owner or the building owner’s designated representative within 90 days after the date of system acceptance. Manuals shall be in accord with industry accepted requirements and local Code requirements.

In addition to the general content specified under GENERAL REQUIREMENTS supply the following additional documentation:

Records of tests performed to certify compliance with system requirements.

Manufacturer's wiring diagrams for electrically powered equipment.

Certificates of inspection by regulatory agencies.

Mechanical schedules.

Parts lists for fixtures, equipment, valves and specialties.

Manufacturers installation, operation and maintenance recommendations for, equipment, thermostat, and control systems.

Additional information as indicated in the technical specification sections.

PART 2 - PRODUCTS

IDENTIFICATION

Adhesive Labels:

Pressure-sensitive, adhesive backed, vinyl markers with applicable labeling, ¾” min. size for lettering and surrounding tape on both ends. With flow arrows on piping. Conforming to ANSI and NFPA standards. Seton Opti-Code, MSI, Brady, or approved equal.

NON-RATED PENETRATIONS

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At pipe penetrations of non-rated interior partitions, floors and exterior walls, use urethane caulk in annular space around penetration. For non-rated drywall, plaster or wood partitions where sleeve is not required use urethane caulk in annular space between pipe insulation and wall material

SEISMIC RESTRAINTS AND SUPPORTS

Seismic Cable Restraint:

Slack cables rigidly attached to suspended equipment. Attachment to structure shall include an interlocking steel element with a minimum ¼" thick neoprene pad between the interlocking steel members. Cables shall be slack during normal operation of equipment and shall not compromise the efficiency of the vibration isolation hangers.

Manufacturers:

Mason cable assemblies Type SCB, or approved.

Channel Support Systems:

Galvanized steel. Size as indicated on drawing details or required, 12 gauge minimum. Provide complete with necessary appurtenances; including, but not limited to, threaded rod supports, closure strips, hanger supports, joiners, swivel covers, etc.

Manufacturers:

Super Strut, Unistrut, or approved. Similar to Unistrut P1000.

Vibration Isolator Pad (Neoprene waffle pad):

One or two layers equal to ¾" minimum thick neoprene ribbed or waffled pad. Bonded to galvanized steel load distribution plate.

Manufacturer:

Mason type Super W, Kinetics, Amber Booth, or approved.

PART 3 - EXECUTION

IDENTIFICATION

Identify equipment in mechanical equipment rooms by stenciling equipment number and service with one coat of black enamel against a light background or white enamel against a dark background. Use a primer where necessary for proper paint adhesion.

Identify interior piping not less than once every 30 feet, not less than once in each room, adjacent to each access door or panel, and on both side of the partition where accessible piping passes through walls or floors. Place flow directional arrows at each pipe identification location. Use one coat of black enamel against a light background or white enamel against a dark background.

PROTECTION OF FINISHED SURFACES

Refer to Division 1, General Requirements, Protection of Finished Surfaces.

BUILDING ACCESS

Arrange for the necessary openings in the building to allow for admittance or removal of all apparatus. When the building access was not previously arranged and must be provided by this contractor, restore any opening to its original condition after the apparatus has been brought into the building.

EQUIPMENT ACCESS

Install all piping, conduit and accessories to permit access to equipment for maintenance and service. Coordinate the exact location of wall and ceiling access panels and doors with the General Prime Contractor, making sure that access is available for all equipment and specialties. Access doors in general construction are to be furnished by the Mechanical Contractor and installed by the General Prime Contractor.

DEMOLITION

Perform all demolition as indicated on the drawings and required to accomplish new Work. Where demolition work is to be performed adjacent to existing work that remains in an occupied area, construct temporary dust partition to minimize the amount of contamination of the occupied space. Where pipe is removed and not reconnected with new work, cap ends of existing services as if they were new work. Coordinate work with the Owner to minimize disruption to the existing building occupants.

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All ducts, fixtures, equipment, wiring and associated conduit, insulation and similar items demolished, abandoned, or deactivated are to be removed from the site by the Contractor except as specifically noted otherwise. All designated equipment is to be turned over to the user agency for their use at a place and time so designated. Maintain the condition of material and/or equipment that is indicated to be reused equal to that existing before work began.

SLEEVES AND OPENINGS

Refer to Division 1, General Requirements, Sleeves and Openings. Pipe penetrations in new poured concrete horizontal construction requiring F and T rating: Form opening using hole form or core drill opening. Alternatively provide cast in place fire stopping devices/sleeves.

Pipe penetrations in new poured concrete horizontal construction requiring F rating but no T rating: Same as pipe penetrations in new poured concrete construction requiring F and T ratings except that schedule 40 steel sleeves may also be used.

Pipe penetrations in new poured concrete horizontal construction that do not require F or T ratings:

Provide schedule 40 steel pipe sleeve, form opening using hole form or core drill opening.

Pipe penetrations in existing concrete floors:

Core drill openings.

SEALING AND FIRESTOPPING

Sealing and firestopping of sleeves/openings between piping, etc. and the sleeve or structural opening shall be the responsibility of the contractor whose work penetrates the opening. The contractor responsible shall hire individuals skilled in such work to do the sealing and fireproofing. Provide all fire stopping of fire rated penetrations and sealing of smoke rated penetrations in compliance with Specifications Fire Stopping.

MECHANICAL JOINT PIPE CONNECTIONS

Comply with AWWA C600/C605 installation requirements. Clean pipe end and socket. Clean and lubricate pipe end, socket and gasket with soapy water or gasket lubricant. Place gland and gasket, properly oriented, on pipe end. Insert pipe end fully into socket and press gasket evenly into recess keeping joint straight. Press gland evenly against gasket, insert bolts and hand tighten nuts. Make joint deflection prior to tightening bolts. Evenly tighten bolts in sequence to recommended torque.

SEISMIC RESTRAINTS

Verify that restraints, bracing and anchors are attached to structural members capable of withstanding the required forces.

END OF SECTION

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PART 1 GENERAL

SUMMARY

This Section includes requirements for selective demolition and removal of heating, ventilation and air conditioning systems, controls and automated automation components, and related mechanical components and incidentals required to complete work described in this Section.

RELATED REQUIREMENTS

Section 01 74 19 - Construction Waste Management and Disposal

DEFINITIONS

Demolish:

Detach items from existing construction and legally dispose of items off site, unless indicated as removed and salvaged, or removed and reinstalled.

Remove:

Planned deconstruction and disassembly of items from existing construction including removal of conduit, junction boxes, cabling and wiring from electrical component to panel taking care not to damage adjacent assemblies designated to remain; legally dispose of items off site, unless indicated as removed and salvaged, or removed and reinstalled.

Remove and Salvage:

Detach items from existing construction and deliver them to Owner ready for reuse.

Remove and Reinstall:

Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

Existing to Remain:

Existing items of construction that are not removed and that are not otherwise indicated as being removed and salvaged, or removed and reinstalled.

Hazardous Substances:

Dangerous substances, dangerous goods, hazardous commodities and hazardous products may include asbestos, mercury and lead, PCB's, poisons, corrosive agents, flammable substances, radioactive substances, or other material that can endanger human health or wellbeing or environment if handled improperly as defined by the Federal Hazardous Products Act (RSC 1985) including latest amendments.

ADMINISTRATIVE REQUIREMENTS

Coordination:

Coordinate work of this Section to avoid interference with work by other Sections.

Account for Owner's continued occupancy requirements during selective demolition and schedule staged occupancy and worksite activities.

SITE CONDITIONS

Condition of materials identified as being salvaged or demolished are based on their observed condition on date that tender is accepted.

SALVAGE AND DEBRIS MATERIALS

Demolished items become Contractor's property and will be removed from Project site; except for items indicated as being reused, salvaged, or otherwise indicated to remain Owner’s property.

Carefully remove materials and items designated for salvage and store in a manner to prevent damage or devaluation of materials

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

EXAMINATION

Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

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Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of conditions as satisfactory.

PREPARATION

Protect systems and components indicated to remain in place during selective demolition operations and as follows:
Prevent movement and install bracing to prevent settlement or damage of adjacent services and parts of existing buildings scheduled to remain.
Notify Owner and cease operations where safety of buildings being demolished, adjacent structures or services appears to be endangered and await additional instructions before resuming demolition work specified in this Section.
Prevent debris from blocking drainage inlets.
Protect mechanical systems that must remain in operation.
Ensure hazardous materials are removed or abated prior to commencing demolition.
For components intended for relocation and reuse, remove, store, protect, clean and reinstall and connect to HVAC systems, and recommission.
Sequence demolition work so that interference with the use of the building by the Owner and users is minimized and as follows:
Prevent debris from endangering the safe access to and egress from occupied buildings.
Notify Owner and cease operations where safety of occupants appears to be endangered and await additional instructions before resuming demolition work specified in this Section.

DEMOLITION, REMOVAL, AND DISPOSITION

Disconnect and electrical services in accordance with requirements of local Authority Having Jurisdiction.
Do not disrupt active or energized utilities without approval of the Owner.
Erect and maintain dust proof and weather tight partitions to prevent the spread of dust and fumes to occupied building areas; remove partitions when complete.
Demolish parts of existing building to accommodate new construction and remedial work as indicated.
At end of each work day, leave worksite in safe condition.
Perform demolition work in a neat and workmanlike manner:
Remove any tools or equipment after completion of work, and leave site clean and ready for subsequent renovation work.
Repair and restore damages caused as a result of work of this Section to match existing materials and finishes.
Conduct demolition of HVAC systems in accordance with local Authority Having Jurisdiction (AHJ).
Saw-cut concrete as shown or required.
Piping, Ductwork, and Equipment to be Removed: Remove all piping, ductwork, and equipment as indicated on the Drawings.
Ductwork and Piping Removed: Drawings do not show all existing ductwork or piping which is to be removed. Unless indicated otherwise, where existing equipment has been removed, or its use replaced by new equipment, remove connecting piping back to the branch in the main so that there will be no dead ends or unused pipe lines at completion.
Control Wiring and Tubing to be Removed: Remove control wiring and tubing as indicated. Drawings do not show all existing control wiring and tubing which is to be removed. Unless indicated otherwise, where existing equipment has been removed, or its use replaced by new equipment, remove connecting piping and ductwork back to the branch in the main so that there will be no dead ends or unused pipe lines in mechanical spaces at completion.
Materials to Owner: All items or materials removed from the project shall be made available for the Owner's inspection. The Owner retains the option to claim any item or material. The Contractor shall deliver any claimed item or material in good condition to the place designated by the Owner. All items not claimed become the property of the Contractor and shall be removed from the site by the Contractor.
Protect any active piping and/or wiring encountered that are not designated for removal; remove, plug, or cap utilities to be abandoned in accord with code and regulatory requirements. Notify the Architect of utilities encountered whose service is not known.
Debris Removal: Existing materials removed and not reinstalled or turned over to the Owner shall be immediately removed from the site and disposed of by the Contractor.
Repairs: Any portion of the facility damaged, cut back or made inoperable by this Contractor shall be

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repaired with similar materials as the existing structure and/or damaged item as instructed by the Architect.

CLOSEOUT ACTIVITIES

Arrange for legal disposal and remove demolished materials to accredited landfill site or alternative disposal site (recycle center).

END OF SECTION

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PART 1 - GENERAL

SUMMARY

Testing, adjusting, and balancing of air systems. Measurement of final operating conditions of HVAC equipment.

SCOPE OF WORK

Testing, adjusting, and Balancing (TAB) of the HVAC systems and related ancillary equipment will be performed by a certified third party independent of the Contractor who specializes in testing, adjusting, and balancing of heating, ventilating, air moving equipment and hydronic systems and has a minimum of 5 years' experience in this specialty.

Make changes or replacements to the sheaves, belts, dampers, valves, etc. required for the correct balance as advised the TAB Firm, at no additional cost to the Owner.

The Drawings and Specifications indicate valves, dampers, and miscellaneous adjustment devices for the purpose of adjustment to obtain optimum operating conditions, and it will be the responsibility of the Contractor to install these devices in a manner that will leave them accessible and readily adjustable. Should any such device not be readily accessible, provide access as requested by the TAB Firm. Correct equipment malfunction encountered during the balancing process.

ADMINISTRATIVE REQUIREMENTS

Scheduling:

Contractor to schedule this work in cooperation with other Sections involved and to comply with completion date for test, balance, and adjust air duct systems as described in Contract Documents.

Contact Testing Agency and coordinate date(s) for test and balance work when following is completed:

HVAC and exhaust systems including installation of specialties, devices, and new filters.

Proper function of control system components including electrical interlocks, damper sequences, air and water reset, and fire and freeze stats have been verified.

Automatic temperature controls have been calibrated and set for design operating conditions.

Verification of proper thermostat calibration and setting of control components such as static pressure controllers and other devices that may need set points changed during process of balancing system.

If, in opinion of Testing Agency, systems are not ready for test and balance, reschedule as required.

Accomplish testing, adjusting, and balancing work in a timely manner that allows partial occupancy of building.

SUBMITTALS

Submit final report containing all data required herein on Contractor forms approved by the Engineer.

Provide reduced blueprint relating all reference points in report to contract drawings by room number and points per room.

Provide cover sheet containing:

Project name and location.

Engineer.

Mechanical Contractor.

Balancing Firm.

Provide Table of Contents.

Bind report in 3 ring binder properly indexed.

Submit three copies.

QUALITY ASSURANCE

Work of this Section shall be done in accordance with the latest edition of the NEBB Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems and ASHRAE HVAC Applications Chapter 37.

Measuring instruments shall be maintained and calibrated in accordance with NEBB standards.

Technicians on this project must have satisfactorily completed work on a minimum of (3) three projects of at least this size, and of similar complexity.

Submit Qualifications of project staff to Architect upon request.

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REQUIREMENTS
Accomplish testing, adjusting, and balancing work in a timely manner that allows partial occupancy of building.

PART 2 - PRODUCTS

PATCHING MATERIALS
Ductwork and Housings:
Use plastic plugs with retainers to patch drilled holes.

INSTRUMENTS
Utilize test instruments and equipment as recommended in the following:
NEBB's Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems.
AABC's Manual MN-1, "AABC National Standards."

PART 3 - EXECUTION

GENERAL
Check the following and report to Contractor for necessary corrections:
Noise and vibration.
Perform TAB work with doors, closed windows, and ceilings installed, etc., to obtain simulated or project operating conditions. Do not proceed until systems scheduled for testing, adjusting, and balancing are clean and free from debris, dirt, and discarded building materials.
Verify the following:
Equipment is operable and normal condition.
Temperature control systems are installed complete and operable.
Final filters are clean and in place.
Duct systems are clean of debris.
Fan rotation is correct.
Dampers are in place and open.
Access doors are closed.
Air outlets are installed and connected.
Any conditions affecting system operation, such as open doors, adjacent pressurized areas, and the like, are in final operating conditions prior to testing and balancing.
Report any defects or deficiencies noted during performance of services to Architect. Promptly report abnormal conditions in Mechanical Systems or conditions which prevent system balance.

ADJUSTMENT & BALANCING
Mechanical Equipment:
Provide unit designation and area served.
Provide electric heater wattage, number of stages, and voltage.
Provide motor nameplate data including manufacturer, frame, HP, volts, phase, FLA, RPM.
Provide fan nameplate data including manufacturer, model, size, type, and serial number.
Provide sheave data if applicable.
Provide belt manufacturer, size, and model number.
List designs data including CFM/TSP, SP, HP, RPM.
List actual test data including FLA, fan rpm, TSP, outside air CFM, Heating and Cooling BTU’s.
System Supply, Return, Exhaust outlets:
Measure with Diffuser Hood.
List required design cfm, velocity.
List initial velocities and cfm at all inlets/outlets.
Adjust and list until volumes are within 10% of the design cfm as follows:

Fans	-5% to +10%
Supply grilles, resisters, diffusers	-5% to +10%
Return/exhaust grilles, registers	-15% to +10%

Ensure recorded data represents actual measured or observed conditions.
Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.

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After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.
At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by the Owner.
Program Thermostats based on Owner's operating schedule.

END OF SECTION

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PART 1 - GENERAL

SUMMARY

Ductwork Insulation - Materials and installation of duct insulation including the following applications:
Air conditioning and heating ductwork.
Outside air ductwork.
Equipment related to air handling systems.
Exterior louver blank-off areas.

QUALITY ASSURANCE

Qualification of Workers:

Use proficient journeyman insulators and supervisors in the execution of this portion of the work to ensure proper and adequate installation of insulation throughout. A firm with at least 5 years successful installation experience on projects with installations similar to that required for this project.

Compliance with Specifications:

Whenever required during progress of the work, furnish proof acceptable to the Owner that items installed are equal to or exceed requirements specified for this work. In the event such proof is not available, or is not acceptable to the Owner, the Owner may require the Contractor to remove the item or items and replace with material meeting the specified requirements and to repair damage caused in the removal and replacement, at no additional cost to the Owner. Install per manufacturer's written instructions. As a minimum, comply with appropriate state energy code and other applicable codes.

SUBMITTALS

Product Data:

Submit manufacturer's technical data and installation instructions for each type of insulation, jacket, glue, paint, fitting cover, and accessory. Submit schedule showing manufacturer's product number, thickness, and furnished accessories for each piping, equipment and duct system requiring insulation. All products utilized shall only be used as recommended by the product’s manufacturer, or as otherwise approved.

PRODUCT HANDLING

Protection:

Use all means necessary to protect insulation materials before, during, and after installation.

Replacements:

In the event of damage, immediately make repairs and replacements necessary.

FIRE HAZARD CLASSIFICATION

Maximum fire hazard classification of the composite insulation construction as installed to be not more than a flame spread of 25, fuel contributed of 50 and smoke developed of 50 as tested by ASTM E84 (NFPA 255) method.

Pipe insulation to comply with testing requirements of UL "Pipe and Equipment Coverings R5583 400 8.15."

Duct insulation to comply with ASTM E84 testing and bear the UL label.

LINING MATERIALS

Materials to be mold-, humidity-, and erosion-resistant surface that meets the requirements of UL 181.

PART 2 – PRODUCTS

MANUFACTURERS

Ductwork:

Armacell LLC Armaflex, Certainteed, Johns Manville, Knauf, Owens-Corning, PPG, or approved.

TYPE 10, FLEXIBLE FIBERGLASS BLANKET

ASTM C553, Type 1, Class B-2; flexible blanket.

'K' Value: 0.27 at 75F installed.

Density: 0.75 lb./cu.ft.

Vapor Barrier Jacket: FSK aluminum foil reinforced with fiberglass yarn and laminated to fire resistant

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Kraft, secured with UL listed pressure sensitive tape or outward clinched expanded staples and vapor barrier mastic as needed.

TYPE 11, DUCT LINER
ASTM C1071; flexible blanket.
'K' Value: ASTM C518, 0.25 at 75F.
Noise Reduction Coefficient: 0.65 or higher based on "Type A mounting."
Maximum Velocity on Mat or Coated Air Side: 5,000 FPM
Adhesive: UL listed waterproof type ASTM C 916.
Fasteners: Duct liner galvanized steel pins, welded or mechanically fastened and conform to Mechanical Fastener Standard from SMACNA.
Internal Duct Lining shall be 1” unless otherwise called out, 1.5 lb/ft3 minimum density and shall meet the requirements of NFPA 90-A and 90-B.
Mold-, Humidity-, and Erosion-Resistant Surfaces: UL 181.

DUCT WRAP
Weather-proofing cladding, self-adhesive, self-healing, rubberized bituminous membrane with UV-resistant aluminum foil/polymer outer covering, which meets, or exceeds Energy Star requirements. Polyguard Alumaguard All-Weather, or Approved.

ACCESSORIES
Equipment Insulation Jacketing:
Pre-sized glass cloth, not less than 7.8 ounces/sq.yd., except as otherwise indicated. Coat with gypsum-based cement.
Equipment Insulation Compounds:
Provide adhesives, cement, sealers, mastics, and protective finishes as recommended by insulation manufacturer for applications indicated.
General:
Provide staples, bands, wire, wire netting, tape corner angles, anchors, stud pins, and metal covers as recommended by insulation manufacturer for applications indicated. Accessories, i.e., adhesives, mastics, cements, and tape to have the same flame and smoke component ratings as the insulation materials with which they are used. Shipping cartons to bear a label indicating that flame and smoke ratings do not exceed those listed above. Provide permanent treatment of jackets or facings to impart flame and smoke safety. Provide non-water-soluble treatments.
Pins:
Weld Pins: Type: Retainer disk attached to pin, for resistance welding to duct surface after liner is in place.
Retainer Disk: Not less than 0.75 square inches.
Pin: 0.1 inch shorter than liner thickness. Pins shall not protrude into airstream.
Manufacturer:
Similar to Duro Dyne "CP Series Clip Pins."
Stick Pins:
Type: Perforated base with protruding pin, for gluing to duct surface prior to application of liner.
Pin: 0.25 inches longer than liner thickness.
Self-locking Washer: Attaches to pin after application of liner.
Manufacturer:
Similar to Gemco series PH.

PART 3 - EXECUTION

VERIFICATION OF CONDITIONS
Do not apply insulation until the duct has been inspected.
Examine areas and conditions under which duct insulation will be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

PREPARATION
Clean and dry surfaces to be insulated.

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INSTALLATION

Insulation:

Continuous through walls, floors, and partitions except where noted otherwise.

Ductwork:

Install insulation in conformance with the manufacturer's recommendations to completely cover the duct. Butt insulation joints firmly together and install jackets and tapes smoothly and securely. Apply duct insulation continuously through sleeves and prepared openings, except as otherwise specified. Apply vapor barrier materials to form a complete unbroken vapor seal over the insulation. Coat staples and seals with vapor barrier coating. Cover breaks in the jacket material with patches of the same material as the vapor barrier. Extend the patches not less than 2 inches beyond the break or penetration in all directions and secure with adhesive and staples. Seal staples and joints with brush coat of vapor barrier coating. Fill jacket penetrations, i.e., hangers, thermometers and damper operating rods, and other voids in the insulation with vapor barrier coating. Seal the penetration with a brush coat of vapor barrier coating. Seal and flash insulation terminations and pin punctures with a reinforced vapor barrier coating. Do not conceal duct access doors with insulation. Install insulation terminations at access doors in accordance with the above.

Duct Liners:

Install mat finish surface on air stream side. Secure insulation to cleaned sheet metal duct with a continuous 100 percent coat of adhesive. For widths over 20 inches, additionally secure the liner with mechanical fasteners 15 inches on center. Accurately cut liner and thoroughly coat ends with adhesive. Butt joints tightly. Top and bottom sections of insulation overlap sides. Keep duct liner clean and free from dust. At completion of project, vacuum duct liner if it is dirty or dusty. Cut studs off near washers. Do not use small pieces. If insulation is installed without horizontal, longitudinal, and end joints butted together, installation will be rejected and work removed and replaced with work that conforms to this Specification.

Duct Wrap:

Cover supply air ducts except ducts internally lined. Wrap tightly with circumferential joints butted and longitudinal joints overlapped minimum of 2 inches. Adhere insulation with 4-inch strips of insulating bending adhesive at 8 inches on center. On ducts over 24 inches wide, additionally secure insulation with suitable mechanical fasteners at 18 inches on center. Circumferential and longitudinal joints stapled with flare staples 6 inches on center and covered with 3-inch-wide, foil reinforced tape.

PROTECTION AND REPLACEMENT

Protect installed insulation during construction. Replace damaged insulation which cannot be repaired satisfactorily, including units with vapor barrier damage and moisture saturated units.

Item	System Insulation Type	Duct Size	Minimum R-Value
Ductwork located within conditioned space	None	All	N/A
Supply ductwork on outlet of each fan coil	10	All connected to FC outlet, except flexible.	R=5
Supply and Return ductwork (where duct is outside the building thermal shell, including outdoors and attic space).	10, 11	All	R=8
Outside air ductwork (all duct carrying unconditioned outside air to mechanical equipment)	10, 11	All	R=8

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Where shown on Drawings	10, 11	As Shown	R=8

DUCT INSULATION SCHEDULE

Note:

Insulation thickness is a minimum. Provide code required additional thickness to meet R-Value per Code. Flexible, return, and supply air ductwork not indicated above does not require additional insulation.

FIBERGLASS BLANKET INSULATION WITH VAPOR BARRIER

Fully wrap duct, with facing to the outside.
Overlap vapor barrier facing 2 inches minimum at seams and joints.
Secure insulation with tie wires.
Seal all seams, joints, and penetrations with foil faced pressure sensitive tape of same material as insulation facing, to provide a continuous vapor barrier.
On ducts 24 inches or more in width, secure insulation on underside of ducts with stick pins 18 inches maximum on center. Cut pins off flush with washer and seal with vapor barrier tape.

DUCT LINER

Apply 100% coverage of approved adhesive to inside of duct.
Cover interior of duct with liner, with mat coating of liner toward the airstream.
Seams and joints shall be neatly butted, with edges coated with adhesive.
Coat leading edges with adhesive or provide liner with factory applied edge coating. For duct velocities above 2000 fpm, provide metal nosing around leading edges.
Install weld pins, spaced according to liner manufacturer's instructions, not greater than 18 inches on center or greater than 3 inches from any edge.
Weld pins shall be resistance welded to duct with a machine similar to Duro Dyne "Pinspotter."

DUCT WRAP

Duct exposed to weather (outside the building envelope) shall be wrapped in weather-proofing Duct Wrap to protect against UV damage and heat loss/gain.

APPLICATION TO DUCT SYSTEMS

Supply Air Ducts and Outside Air Ducts, Except Ducts with Duct Liner:

Insulation Type:
Fiberglass Blanket with Vapor Barrier.
Supply Duct Insulation Thickness: 1.5 inches.
Outside Air Duct Insulation Thickness: 1 inch.
Supply Air Ducts and Outside Air Ducts, with Duct Liner:
Includes ducts indicated on Drawings to have liner.
Insulation Type: Duct Liner.
Insulation Thickness: 1 inch.

Return and Exhaust Air Ducts, with Duct Liner:

Includes ducts indicated on Drawings to have liner.
Insulation Type: Duct Liner.
Insulation Thickness: 1 inch.

Supply and Return Plenums:

Includes plenums connected to, but not part of, air handling equipment.
Insulation Type: Duct Liner.
Insulation Thickness: 2 inches.

END OF SECTION

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PART 1 - GENERAL

SUMMARY

Section Includes:
Pipes, tubes, and fittings.
Piping specialties.
Piping and tubing joining materials.
Valves.
Pressure regulators.

PERFORMANCE REQUIREMENTS

Minimum Operating-Pressure Ratings:
Piping and Valves: 100 psig minimum unless otherwise indicated.
Service Regulators: 65 psig minimum unless otherwise indicated.
Natural-Gas System Pressures within Buildings: Two pressure ranges. Primary pressure is more than 0.5 psig but not more than 2 psig, and is reduced to secondary pressure of 0.5 psig or less.
Delegated Design: Design restraints and anchors for natural-gas piping and equipment, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

SUBMITTALS

Product Data: For each type of product indicated.
Shop Drawings: For facility natural-gas piping layout. Include plans, piping layout and elevations, sections, and details for fabrication of pipe anchors, hangers, supports for multiple pipes, alignment guides, expansion joints and loops, and attachments of the same to building structure. Detail location of anchors, alignment guides, and expansion joints and loops.
Delegated-Design Submittal: For natural-gas piping and equipment indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
Detail fabrication and assembly of seismic restraints.
Design Calculations: Calculate requirements for selecting seismic restraints.
Welding certificates.
Field quality-control reports.
Operation and maintenance data.

QUALITY ASSURANCE

Steel Support Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.
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.

PART 2 - PRODUCTS

PIPES, TUBES, AND FITTINGS

Steel Pipe: ASTM A 53/A 53M, black steel, Schedule 40, Type E or S, Grade B.
Malleable-Iron Threaded Fittings: ASME B16.3, Class 150, standard pattern.
Wrought-Steel Welding Fittings: ASTM A 234/A 234M for butt welding and socket welding.
Unions: ASME B16.39, Class 150, malleable iron with brass-to-iron seat, ground joint, and threaded ends.
Protective Coating for Underground Piping: Factory-applied, three-layer coating of epoxy, adhesive, and PE.
Joint Cover Kits: Epoxy paint, adhesive, and heat-shrink PE sleeves.
Corrugated, Stainless-Steel Tubing: Comply with ANSI/IAS LC 1.

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Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
OmegaFlex, Inc.
Parker Hannifin Corporation; Parflex Division.
Titeflex.
Tru-Flex Metal Hose Corp.
Tubing: ASTM A 240/A 240M, corrugated, Series 300 stainless steel.
Coating: PE with flame retardant.
Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
Flame-Spread Index: 25 or less.
Smoke-Developed Index: 50 or less.
Fittings: Copper-alloy mechanical fittings with ends made to fit and listed for use with corrugated stainless-steel tubing and capable of metal-to-metal seal without gaskets. Include brazing socket or threaded ends complying with ASME B1.20.1.
Striker Plates: Steel, designed to protect tubing from penetrations.
Manifolds: Malleable iron or steel with factory-applied protective coating. Threaded connections shall comply with ASME B1.20.1 for pipe inlet and corrugated tubing outlets.
Operating-Pressure Rating: 5 psig.
Annealed-Temper Copper Tube: Comply with ASTM B 88, Type K ASTM B 837, Type G.
Copper Fittings: ASME B16.22, wrought copper, and streamlined pattern.
Flare Fittings: Comply with ASME B16.26 and SAE J513.
Copper fittings with long nuts.
Metal-to-metal compression seal without gasket.
Dryseal threads complying with ASME B1.20.3.
Protective Coating for Underground Tubing: Factory-applied, extruded PE a minimum of 0.022 inch thick.
PE Pipe: ASTM D 2513, SDR 11.
PE Fittings: ASTM D 2683, socket-fusion type or ASTM D 3261, butt-fusion type with dimensions matching PE pipe.
PE Transition Fittings: Factory-fabricated fittings with PE pipe complying with ASTM D 2513, SDR 11; and steel pipe complying with ASTM A 53/A 53M, black steel, Schedule 40, Type E or S, Grade B.
Anodeless Service-Line Risers: Factory fabricated and leak tested.
Underground Portion: PE pipe complying with ASTM D 2513, SDR 11 inlet.
Casing: Steel pipe complying with ASTM A 53/A 53M, Schedule 40, black steel, Type E or S, Grade B, with corrosion-protective coating covering. Vent casing aboveground.
Aboveground Portion: PE transition fitting.
Outlet shall be threaded or suitable for welded connection.
Tracer wire connection.
Ultraviolet shield.
Stake supports with factory finish to match steel pipe casing or carrier pipe.
Transition Service-Line Risers: Factory fabricated and leak tested.
Underground Portion: PE pipe complying with ASTM D 2513, SDR 11 inlet connected to steel pipe complying with ASTM A 53/A 53M, Schedule 40, Type E or S, Grade B, with corrosion-protective coating for aboveground outlet.
Outlet shall be threaded or suitable for welded connection.
Bridging sleeve over mechanical coupling.
Factory-connected anode.
Tracer wire connection.
Ultraviolet shield.
Stake supports with factory finish to match steel pipe casing or carrier pipe.

PIPING SPECIALTIES

Appliance Flexible Connectors:
Indoor, Fixed-Appliance Flexible Connectors: Comply with ANSI Z21.24.
Indoor, Movable-Appliance Flexible Connectors: Comply with ANSI Z21.69.
Outdoor, Appliance Flexible Connectors: Comply with ANSI Z21.75.

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Corrugated stainless-steel tubing with polymer coating.
Operating-Pressure Rating: 0.5 psig.
End Fittings: Zinc-coated steel.
Threaded Ends: Comply with ASME B1.20.1.
Maximum Length: 72 inches
Quick-Disconnect Devices: Comply with ANSI Z21.41.
Copper-alloy convenience outlet and matching plug connector.
Nitrile seals.
Hand operated with automatic shutoff when disconnected.
For indoor or outdoor applications.
Adjustable, retractable restraining cable.
Y-Pattern Strainers:
Body: ASTM A 126, Class B, cast iron with bolted cover and bottom drain connection.
End Connections: Threaded ends for NPS 2 and smaller.
Strainer Screen: 40-mesh startup strainer, and perforated stainless-steel basket with 50 percent free area.
CWP Rating: 125 psig.
Weatherproof Vent Cap: Cast- or malleable-iron increaser fitting with corrosion-resistant wire screen, with free area at least equal to cross-sectional area of connecting pipe and threaded-end connection.

JOINING MATERIALS

Joint Compound and Tape: Suitable for natural gas.
Welding Filler Metals: Comply with AWS D10.12/D10.12M for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
Brazing Filler Metals: Alloy with melting point greater than 1000 deg. F complying with AWS A5.8/A5.8M.
Brazing alloys containing more than 0.05 percent phosphorus are prohibited.

MANUAL GAS SHUTOFF VALVES

See "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles for where each valve type is applied in various services.
General Requirements for Metallic Valves, NPS 2 and Smaller: Comply with ASME B16.33.
CWP Rating: 125 psig.
Threaded Ends: Comply with ASME B1.20.1.
Dryseal Threads on Flare Ends: Comply with ASME B1.20.3.
Tamperproof Feature: Locking feature for valves indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
Listing: Listed and labeled by an NRTL acceptable to authorities having jurisdiction for valves 1 inch and smaller.
Service Mark: Valves 1-1/4 inches to NPS 2 shall have initials "WOG" permanently marked on valve body.
One-Piece, Bronze Ball Valve with Bronze Trim: MSS SP-110.
Manufacturers: Subject to compliance with requirements, provide products by one of the following:
BrassCraft Manufacturing Company; a Masco company.
Conbraco Industries, Inc.; Apollo Div.
Lyall, R. W. & Company, Inc.
Body: Bronze, complying with ASTM B 584.
Ball: Chrome-plated brass.
Stem: Bronze; blowout proof.
Seats: Reinforced TFE; blowout proof.
Packing: Separate packnut with adjustable-stem packing threaded ends.
Ends: Threaded, flared, or socket as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
CWP Rating: 600 psig.
Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
Service: Suitable for natural-gas service with "WOG" indicated on valve body.

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Two-Piece, Full-Port, Bronze Ball Valves with Bronze Trim: MSS SP-110.
Manufacturers: Subject to compliance with requirements, provide products by one of the following:
BrassCraft Manufacturing Company; a Masco company.
Conbraco Industries, Inc.; Apollo Div.
Lyall, R. W. & Company, Inc.
Body: Bronze, complying with ASTM B 584.
Ball: Chrome-plated bronze.
Stem: Bronze; blowout proof.
Seats: Reinforced TFE; blowout proof.
Packing: Threaded-body packnut design with adjustable-stem packing.
Ends: Threaded, flared, or socket as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
CWP Rating: 600 psig.
Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
Service: Suitable for natural-gas service with "WOG" indicated on valve body.
Two-Piece, Regular-Port Bronze Ball Valves with Bronze Trim: MSS SP-110.
Manufacturers: Subject to compliance with requirements, provide products by one of the following:
BrassCraft Manufacturing Company; a Masco company.
Conbraco Industries, Inc.; Apollo Div.
Lyall, R. W. & Company, Inc.
Body: Bronze, complying with ASTM B 584.
Ball: Chrome-plated bronze.
Stem: Bronze; blowout proof.
Seats: Reinforced TFE.
Packing: Threaded-body packnut design with adjustable-stem packing.
Ends: Threaded, flared, or socket as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
CWP Rating: 600 psig.
Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
Service: Suitable for natural-gas service with "WOG" indicated on valve body.
Bronze Plug Valves: MSS SP-78.
Manufacturers: Subject to compliance with requirements, provide products by one of the following:
Lee Brass Company.
McDonald, A. Y. Mfg. Co.
Body: Bronze, complying with ASTM B 584.
Plug: Bronze.
Ends: Threaded, socket, as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
Operator: Square head or lug type with tamperproof feature where indicated.
Pressure Class: 125 psig.
Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
Service: Suitable for natural-gas service with "WOG" indicated on valve body.
PE Ball Valves: Comply with ASME B16.40.
Manufacturers: Subject to compliance with requirements, provide products by one of the following:
Kerotest Manufacturing Corp.
Lyall, R. W. & Company, Inc.
Perfection Corporation; a subsidiary of American Meter Company.
Body: PE.
Ball: PE.
Stem: Acetal.
Seats and Seals: Nitrile.
Ends: Plain or fusible to match piping.
CWP Rating: 80 psig.

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Operating Temperature: Minus 20 to plus 140 deg F.
Operator: Nut or flat head for key operation.
Include plastic valve extension.
Include tamperproof locking feature for valves where indicated on Drawings.
Valve Boxes:
Cast-iron, two-section box.
Top section with cover with "GAS" lettering.
Bottom section with base to fit over valve and barrel a minimum of 5 inches in diameter.
Adjustable cast-iron extensions of length required for depth of bury.
Include tee-handle, steel operating wrench with socket end fitting valve nut or flat head, and with stem of length required to operate valve.
PRESSURE REGULATORS
General Requirements:
Single stage and suitable for natural gas.
Steel jacket and corrosion-resistant components.
Elevation compensator.
End Connections: Threaded for regulators NPS 2 and smaller.
Line Pressure Regulators: Comply with ANSI Z21.80.
Manufacturers: Subject to compliance with requirements, provide products by one of the following:
Actaris.
American Meter Company.
Eclipse Combustion, Inc.
Fisher Control Valves and Regulators; Division of Emerson Process Management.
Invensys.
Maxitrol Company.
Richards Industries; Jordan Valve Div.
Body and Diaphragm Case: Cast iron or die-cast aluminum.
Springs: Zinc-plated steel; interchangeable.
Diaphragm Plate: Zinc-plated steel.
Seat Disc: Nitrile rubber resistant to gas impurities, abrasion, and deformation at the valve port.
Orifice: Aluminum; interchangeable.
Seal Plug: Ultraviolet-stabilized, mineral-filled nylon.
Single-port, self-contained regulator with orifice no larger than required at maximum pressure inlet, and no pressure sensing piping external to the regulator.
Pressure regulator shall maintain discharge pressure setting downstream, and not exceed 150 percent of design discharge pressure at shutoff.
Overpressure Protection Device: Factory mounted on pressure regulator.
Atmospheric Vent: Factory- or field-installed, stainless-steel screen in opening if not connected to vent piping.
Maximum Inlet Pressure: 2 psig.
Appliance Pressure Regulators: Comply with ANSI Z21.18.
Manufacturers: Subject to compliance with requirements, provide products by one of the following:
Canadian Meter Company Inc.
Eaton Corporation; Controls Div.
Harper Wyman Co.
Maxitrol Company.
SCP, Inc.
Body and Diaphragm Case: Die-cast aluminum.
Springs: Zinc-plated steel; interchangeable.
Diaphragm Plate: Zinc-plated steel.
Seat Disc: Nitrile rubber.
Seal Plug: Ultraviolet-stabilized, mineral-filled nylon.
Factory-Applied Finish: Minimum three-layer polyester and polyurethane paint finish.
Regulator may include vent limiting device, instead of vent connection, if approved by authorities having jurisdiction.
Maximum Inlet Pressure: 1 psig.

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DIELECTRIC UNIONS

Manufacturers: Subject to compliance with requirements, provide products by one of the following:
Capitol Manufacturing Company.
Central Plastics Company.
Watts Regulator Co.; Division of Watts Water Technologies, Inc.
Wilkins; Zurn Plumbing Products Group.
Minimum Operating-Pressure Rating: 150 psig.
Combination fitting of copper alloy and ferrous materials
Insulating materials suitable for natural gas.
Combination fitting of copper alloy and ferrous materials with threaded, brazed-joint, plain, or welded end connections that match piping system materials.

SLEEVES

Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.
Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

MECHANICAL SLEEVE SEALS

Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.
Manufacturers: Subject to compliance with requirements, provide products by one of the following:
Advance Products & Systems, Inc.
Calpico Inc.
Metraflex Company (The).
Pipeline Seal and Insulator, Inc.
Sealing Elements: EPDM or NBR interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe and sleeve.
Pressure Plates: Carbon steel.
Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one nut and bolt for each sealing element.

LABELING AND IDENTIFYING

Detectable Warning Tape: Acid- and alkali-resistant, PE film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored yellow.

PART 3 - EXECUTION

OUTDOOR PIPING INSTALLATION

Comply with NFPA 54 and the International Fuel Gas Code for installation and purging of natural-gas piping.
Install underground, natural-gas piping buried at least 36 inches below finished grade. Comply with requirements in Division 31 Section "Earth Moving" for excavating, trenching, and backfilling.
If natural-gas piping is installed less than 36 inches below finished grade, install it in containment conduit.
Install underground, PE, natural-gas piping according to ASTM D 2774.
Steel Piping with Protective Coating:
Apply joint cover kits to pipe after joining to cover, seal, and protect joints.
Repair damage to PE coating on pipe as recommended in writing by protective coating manufacturer.
Replace pipe having damaged PE coating with new pipe.
Copper Tubing with Protective Coating:
Apply joint cover kits over tubing to cover, seal, and protect joints.
Repair damage to PE coating on pipe as recommended in writing by protective coating manufacturer.
Install fittings for changes in direction and branch connections.

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Exterior-Wall Pipe Penetrations: Seal penetrations using steel or cast-iron pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
Install pressure gage downstream from each service regulator. Pressure gages are specified in Division 23 Section "Meters and Gages for HVAC Piping."

INDOOR PIPING INSTALLATION

Comply with NFPA 54 and the International Fuel Gas Code for installation and purging of natural-gas piping.
Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
Arrange for pipe spaces, chases, slots, sleeves, and openings in building structure during progress of construction, to allow for mechanical installations.
Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
Locate valves for easy access.
Install natural-gas piping at uniform grade of 2 percent down toward drip and sediment traps.
Install piping free of sags and bends.
Install fittings for changes in direction and branch connections.
Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements in Division 07 Section "Penetration Firestopping."
Verify final equipment locations for roughing-in.
Comply with requirements in Sections specifying gas-fired appliances and equipment for roughing-in requirements.
Drips and Sediment Traps: Install drips at points where condensate may collect, including service-meter outlets. Locate where accessible to permit cleaning and emptying. Do not install where condensate is subject to freezing.
Construct drips and sediment traps using tee fitting with bottom outlet plugged or capped. Use nipple a minimum length of 3 pipe diameters, but not less than 3 inches long and same size as connected pipe. Install with space below bottom of drip to remove plug or cap.
Extend relief vent connections for service regulators, line regulators, and overpressure protection devices to outdoors and terminate with weatherproof vent cap.
Conceal pipe installations in walls, pipe spaces, utility spaces, above ceilings, below grade or floors, and in floor channels unless indicated to be exposed to view.
Use eccentric reducer fittings to make reductions in pipe sizes. Install fittings with level side down.
Connect branch piping from top or side of horizontal piping.
Install unions in pipes NPS 2 and smaller, adjacent to each valve, at final connection to each piece of equipment.
Do not use natural-gas piping as grounding electrode.
Install strainer on inlet of each line-pressure regulator and automatic or electrically operated valve.
Install pressure gage downstream from each line regulator. Pressure gages are specified in Division 23 Section "Meters and Gages for HVAC Piping."

VALVE INSTALLATION

Install manual gas shutoff valve for each gas appliance ahead of corrugated stainless-steel tubing or copper connector.

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Install underground valves with valve boxes.
Install regulators and overpressure protection devices with maintenance access space adequate for servicing and testing.
Install earthquake valves aboveground outside buildings according to listing.
Install anode for metallic valves in underground PE piping.

PIPING JOINT CONSTRUCTION

Ream ends of pipes and tubes and remove burrs.
Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
Threaded Joints:
Thread pipe with tapered pipe threads complying with ASME B1.20.1.
Cut threads full and clean using sharp dies.
Ream threaded pipe ends to remove burrs and restore full inside diameter of pipe.
Apply appropriate tape or thread compound to external pipe threads unless dryseal threading is specified.
Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
Welded Joints:
Construct joints according to AWS D10.12/D10.12M, using qualified processes and welding operators.
Bevel plain ends of steel pipe.
Patch factory-applied protective coating as recommended by manufacturer at field welds and where damage to coating occurs during construction.
Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter.
Flared Joints: Cut tubing with roll cutting tool. Flare tube end with tool to result in flare dimensions complying with SAE J513. Tighten finger tight, then use wrench. Do not overtighten.
PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.
Plain-End Pipe and Fittings: Use butt fusion.
Plain-End Pipe and Socket Fittings: Use socket fusion.

HANGER AND SUPPORT INSTALLATION

Install hangers for horizontal steel piping with the following maximum spacing and minimum rod sizes:
NPS 1 and Smaller: Maximum span, 96 inches; minimum rod size, 3/8 inch.
NPS 1-1/4: Maximum span, 108 inches; minimum rod size, 3/8 inch.
NPS 1-1/2 and NPS 2: Maximum span, 108 inches; minimum rod size, 3/8 inch.
Install hangers for horizontal, corrugated stainless-steel tubing with the following maximum spacing and minimum rod sizes:
NPS 3/8: Maximum span, 48 inches; minimum rod size, 3/8 inch.
NPS 1/2: Maximum span, 72 inches; minimum rod size, 3/8 inch.
NPS 3/4 and Larger: Maximum span, 96 inches; minimum rod size, 3/8 inch.

CONNECTIONS

Connect to utility's gas main according to utility's procedures and requirements.
Install natural-gas piping electrically continuous, and bonded to gas appliance equipment grounding conductor of the circuit powering the appliance according to NFPA 70.
Install piping adjacent to appliances to allow service and maintenance of appliances.
Connect piping to appliances using manual gas shutoff valves and unions. Install valve within 72 inches of each gas-fired appliance and equipment. Install union between valve and appliances or equipment.
Sediment Traps: Install tee fitting with capped nipple in bottom to form drip, as close as practical to inlet of each appliance.

LABELING AND IDENTIFYING

Comply with requirements in Division 23 Section "Identification for HVAC Piping and Equipment" for piping and valve identification. Install detectable warning tape directly above gas piping, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

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FIELD QUALITY CONTROL

Test, inspect, and purge natural gas according to NFPA 54 and the International Fuel Gas Code and authorities having jurisdiction.
Natural-gas piping will be considered defective if it does not pass tests and inspections.
Prepare test and inspection reports.

OUTDOOR PIPING SCHEDULE

Underground natural-gas piping shall be one of the following:
PE pipe and fittings joined by heat fusion; service-line risers with tracer wire terminated in an accessible location.
Steel pipe with wrought-steel fittings and welded joints. Coat pipe and fittings with protective coating for steel piping.
Annealed-temper copper tube with wrought-copper fittings and brazed joints. Coat pipe and fittings with protective coating for copper tubing.
Aboveground natural-gas piping shall be one of the following:
Steel pipe with malleable-iron fittings and threaded joints.
Steel pipe with wrought-steel fittings and welded joints.
Annealed-temper copper tube with wrought-copper fittings and brazed joints.
Branch Piping in Cast-in-Place Concrete to Single Appliance: Annealed-temper copper tube with wrought-copper fittings and brazed or flared joints. Install piping embedded in concrete with no joints in concrete.
Containment Conduit: Steel pipe with wrought-steel fittings and welded joints. Coat pipe and fittings with protective coating for steel piping.

INDOOR PIPING SCHEDULE

Aboveground, branch piping NPS 1 and smaller shall be one of the following:
Corrugated stainless-steel tubing with mechanical fittings having socket or threaded ends to match adjacent piping.
Annealed-temper copper tube with wrought-copper fittings and brazed or flared joints.
Steel pipe with malleable-iron fittings and threaded joints.
Aboveground, distribution piping shall be one of the following:
Steel pipe with malleable-iron fittings and threaded joints.
Steel pipe with wrought-steel fittings and welded joints.
Underground, below building, piping shall be one of the following:
Steel pipe with malleable-iron fittings and threaded joints.
Steel pipe with wrought-steel fittings and welded joints.
Containment Conduit: Steel pipe with wrought-steel fittings and welded joints. Coat pipe and fittings with protective coating for steel piping.
Containment Conduit Vent Piping: Steel pipe with malleable-iron fittings and threaded or wrought-steel fittings with welded joints. Coat underground pipe and fittings with protective coating for steel piping.

UNDERGROUND MANUAL GAS SHUTOFF VALVE SCHEDULE

Connections to Existing Gas Piping: Use valve and fitting assemblies made for tapping utility's gas mains and listed by an NRTL.
Underground: PE or Bronze plug valves

ABOVEGROUND MANUAL GAS SHUTOFF VALVE SCHEDULE

Valves for pipe sizes NPS 2 and smaller at service meter shall be one of the following:
One-piece, bronze ball valve with bronze trim.
Two-piece, full-port, bronze ball valves with bronze trim.
Bronze plug valve.
Distribution piping valves for pipe sizes NPS 2 and smaller shall be one of the following:
One-piece, bronze ball valve with bronze trim.
Two-piece, full-port, bronze ball valves with bronze trim.
Bronze plug valve.

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Valves in branch piping for single appliance shall be one of the following:
One-piece, bronze ball valve with bronze trim.
Two-piece, full-port, bronze ball valves with bronze trim.
Bronze plug valve.

END OF SECTION

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PART 1 – GENERAL

CONTRACT CONDITIONS
Work of this Section is bound by the Contract Conditions and Division 1, bound herewith, in addition to this Specification and accompanying Drawings.

RELATED WORK
Section 23 07 13 Duct Insulation

REFERENCE STANDARDS
ANSI B16.22 Wrought Copper and Wrought Copper Alloy Solder Joint Pressure Fittings
ASTM B88 Seamless Copper Water Tube
ASTM B280 Seamless Copper Tube for Air Conditioning and Refrigeration Field Service
ASHRAE 15 Safety Code for Mechanical Refrigeration

SHOP DRAWINGS
Refer to Division 1, General Conditions, Submittals.
Contractor shall submit schedule indicating the ASTM specification number of the pipe being proposed along with its type and grade and sufficient information to indicate the type and rating of fittings for each service.

COPPER TUBE
Statement from manufacturer on his letterhead that the pipe furnished meets the ASTM specification contained in this section.

QUALITY ASSURANCE
Order all copper refrigeration tube with each shipping unit marked with the purchase order number, metal or alloy designation, temper, size, and name of supplier; with soft straight lengths or coils identified with a tag indicating that the product was manufactured in accordance with ASTM B280; and with each hard temper straight length identified throughout its length by a blue colored marking not less than 3/16 inch in height and a legend at intervals of not greater than three feet that includes the designation "ACR" and pipe outside diameter.
Any installed material not meeting the specification requirements must be replaced with material that meets these specifications without additional cost to the Owner.

DELIVERY, STORAGE, AND HANDLING
Promptly inspect shipments to ensure that the material is undamaged and complies with specifications. Cover pipe to eliminate rust and corrosion while allowing sufficient ventilation to avoid condensation. Do not store materials directly on grade. Protect pipe, tube, and fitting ends so they are not damaged. Where end caps are provided or specified, take precautions so the caps remain in place. If end caps are not present on tube bearing the "ACR" designation, clean and re-cap in accordance with ASTM B280. Protect fittings, flanges, and unions by storage inside or by durable, waterproof, above ground packaging. Offsite storage agreements will not relieve the contractor from using proper storage techniques. Storage and protection methods must allow inspection to verify products.

DESIGN CRITERIA
Use only new material, free of defects and scale, and meeting the latest revision of ASTM specifications as listed in this specification.
Where ASTM B88, type L hard temper copper tubing is specified, ASTM B88, type K hard temper copper tubing may be substituted at Contractor's option.

PART 2 - PRODUCTS

REFRIGERANT PIPING
ASTM B88 type L hard drawn copper tube, cleaned and capped in accordance with ASTM B280, and marked "ACR", with ANSI B16.22 wrought copper or forged brass solder-type fittings.

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REFRIGERANT PIPING ACCESSORIES

Provide all refrigerant piping specialties with a maximum working pressure of full vacuum to 450 psig and a maximum working temperature of 225 deg. F. For systems using R-410A, provide all refrigerant piping specialties with a maximum working pressure of full vacuum to 850 psig and a maximum working temperature of 225 deg. F.

Flexible pipe connectors:

Double braided bronze hose flexible pipe connectors with solder end connections.

Filter Dryers: For circuits 15 tons and over provide angle pattern filter dryers with replaceable core. For circuits below 15 tons provide straight pattern filter dryers without replaceable core.

Sight Glasses:

Two-piece brass construction with solder end connections. Include color indicator for sensing moisture.

Solenoid Valves: Two-way normally closed with two-piece brass body, full port, stainless steel plug, stainless steel spring, Teflon diaphragm and solder end connections. Provide replaceable coil assembly.

Hot Gas Bypass Valves: Provide with integral solenoid valve, external equalizer connection and adjustable pilot assembly.

Thermostatic Expansion Valves:

Brass body, bronze disc, neoprene seat, bronze bonnet, stainless steel spring and solder end connections.

Charging Valves:

Provide ¼" SAE brass male flare access ports with finger tight, quick seal caps. Provide 2-inch long copper extension sections.

Check valves:

Spring loaded type with bronze body, bronze disc, neoprene seat, bronze bonnet, stainless steel spring and solder end connections.

PART 3 - EXECUTION

PREPARATION

Remove all foreign material from interior and exterior of pipe and fittings.

ERECTION

Install all piping parallel to building walls and ceilings and at heights which do not obstruct any portion of a window, doorway, stairway, or passageway. Where interferences develop in the field, offset or reroute piping as required to clear such interferences. In all cases, consult drawings for exact location of pipe spaces, ceiling heights, door and window openings, or other architectural details before installing piping.

Do not route piping through transformer vaults or above transformers, panelboards, or switchboards, including the required service space for this equipment, unless the piping is serving this equipment

Install all valves and piping specialties, including items furnished by others, as specified and/or detailed.

Make connections to all equipment installed by others where that equipment requires the piping services indicated in this section.

REFRIGERANT PIPING

Refrigeration piping to be installed by Contractor(s) who are experienced in installation of such piping and in accordance with the requirements of similar installations.

All solder joints to be ASTM Grade 4 or 5 and have a melting point of approximately 1250 deg. F. Solder impurities shall not exceed 0.15%. Tubing to be new and delivered to the job site with the original mill end caps in place. Clean and polish all joints before soldering. Avoid prolonged heating and burning during soldering. Purge all lines with nitrogen during soldering. Provide manual shut-off and check valves as required.

No refrigerant is to be vented directly to the atmosphere except that which may escape through leaks in the system during leak testing. During evacuation procedures, use equipment designed to recover and allow recycling of the refrigerant.

Leak test the system by charging the system to a pressure of 10 psig with an HFC refrigerant, with the compressor suction and discharge valves closed and with all other system valves open. Increase pressure to 300 psig with dry nitrogen. Rap all joints with a mallet and check for leaks with an electric leak detector having a certified sensitivity of at least one ounce per year. Seal any leaks that may be found

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and retest.
After completion of the leak test, evacuate the system with a vacuum pump to an absolute pressure not exceeding 1500 microns while the system ambient temperature is above 60 deg. F. Break the vacuum to 2 psig with the refrigerant to be used in the system. Repeat the evacuation process, again breaking the vacuum with refrigerant. Install a drier of the required size in the liquid line, open the compressor suction and discharge valves, and evacuate to an absolute pressure not exceeding 500 microns. Leave the vacuum pump running for not less than two hours without interruption. Raise the system pressure to 2 psig with refrigerant and remove the vacuum pump.
Charge refrigerant directly from original drums through a combination filter-drier. Each drier may be used for a maximum of three cylinders of refrigerant and then must be replaced with a fresh drier. Charge the system by means of a charging fitting in the liquid line. Weigh the refrigerant drum before charging so that an accurate record can be kept of the weight of refrigerant put in the system. If refrigerant is added to the system through the suction side of the compressor, charge in vapor form only.
Protect refrigeration piping from damage and do not install in areas where subject to damage. Support piping with approved means.

Insulate refrigeration piping to meet ASHRAE 90.1 requirements using flexible elastomeric insulation as specified in 22 07 19. Insulation located outdoors shall require PVC jackets and wall penetrations shall be sealed with an approved wall seal outlet, such as Airex Titan, Rectorseal, or approved.

REFRIGERANT PIPING ACCESSORIES
Install accessories in accordance with the manufacturer’s written instructions and recommendations.

END OF SECTION

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PART 1 - GENERAL

SUMMARY

Materials, installation and testing of HVAC ductwork and accessories, including the following:
Heating and air conditioning supply and return systems.
Outside air systems.
Ductwork hangers.

QUALITY ASSURANCE

Unless otherwise noted, where the Specification refers to SMACNA in reference to sheet metal or flexible ductwork, this refers to HVAC Duct Construction Standards, Metal and Flexible, latest edition, as published by SMACNA.
Unless otherwise noted, where the Specification refers to TIMA in reference to fiberglass ductwork, this refers to Fibrous Glass Duct Construction Standards, latest edition, as published by TIMA.
Provide duct systems per OMSC, latest edition, and referenced standards.
Have available at the project field office a copy of the referenced standards.

SUBMITTALS

Provide shop drawings for fabricated ducts, fittings, duct materials, and flues.

AIR DISTRIBUTION DUCT SYSTEMS

General:

Ductwork, including collars, register boxes, as well as dampers and any other miscellaneous items not specifically mentioned but necessary for a complete installation. Apply the latest standards of SMACNA and ASHRAE with respect to sheet-metal gauge and general construction for round and rectangular ducts.

DELIVERY, STORAGE, AND HANDLING

Comply with manufacturer's rigging and installation instructions for unloading and installing HVAC equipment.
Protect accessories from damage during shipping, storage and handling.

GUARANTY

General:

Provide written guaranty on HVAC work, agreeing to replace/repair inadequate and defective materials and quality of work, including leakage, breakage, improper assembly and failure to perform as required for a period of 1 year from date of Owner's acceptance. Include separate product warranties as indicated (if any) for specific parts or products in the work. Provide guaranty signed by both the installer and Contractor.
Include manufacturer's standard product warranty, covering HVAC equipment operation under normal conditions and use, where installed, operated and maintained in accordance with manufacturer's instructions. Provide product warranty period terminating 12 months after final acceptance by Owner of the project.

PART 2 - PRODUCTS

GALVANIZED SHEET-METAL DUCTWORK

General:

OMSC Duct Construction Standards, latest edition, or latest edition of ASHRAE Guide Table. 1-1/2-ounce galvanizing per square foot, both sides.

SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

General Fabrication Requirements:

Comply with SMACNA’s “HVAC Duct Construction Standards - Metal and Flexible” based on indicated static pressure class unless otherwise indicated.
Transverse Joints:
Select joint types and fabricate according to SMACNA’s “HVAC Duct Construction Standards - Metal and

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Flexible," Figure 2-1," Rectangular Duct/Transverse Joints," for static pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

Longitudinal Seams:

Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2," Rectangular Duct/Longitudinal Seams," for static pressure class, applicable sealing requirements, materials involved, duct support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible." Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4," Fittings and Other Construction," for static pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

SINGLE-WALL ROUND DUCTS AND FITTINGS

General Fabrication Requirements:

Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static pressure class unless otherwise indicated.

Transverse Joints:

Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1," Round Duct Transverse Joints," for static pressure class, applicable sealing requirements, materials involved, duct support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

Transverse Joints in Ducts Larger than 48.00 inches in Diameter: Flanged.

Longitudinal Seams:

Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2," Round Duct Longitudinal Seams," for static pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

Fabricate round ducts larger than 90.00 inches in diameter with butt-welded longitudinal seams.

Fabricate flat-oval ducts larger than 72.00 inches in width (major dimension) with butt welded longitudinal seams.

Tees and Laterals:

Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees," for static pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

SHEET METAL MATERIALS

General Material Requirements:

Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

Galvanized Sheet Steel:

Comply with ASTM A 653/A 653M.

Galvanized Coating Designation:

G90.

Finishes for Surfaces Exposed to View: Mill phosphatized.

Aluminum Sheets:

Comply with ASTM B 209 Alloy 3003, H14 temper; with mill finish for concealed ducts, and standard, one-side bright finish for duct surfaces exposed to view.

Factory- or Shop-Applied Antimicrobial Coating:

Apply to the surface of sheet metal that will form the interior surface of the duct. An untreated clear coating shall be applied to the exterior surface.

Antimicrobial compound shall be tested for efficacy by an NRTL and registered by the EPA for use in HVAC systems.

Coating containing the antimicrobial compound shall have a hardness of 2H, minimum, when tested according to ASTM D 3363.

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Surface-Burning Characteristics:
Maximum flame-spread index of 25 and maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.
Shop-Applied Coating Color: White.
Antimicrobial coating on sheet metal is not required for duct containing liner treated with antimicrobial coating.
Reinforcement Shapes and Plates: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
Where black and galvanized steel shapes and plates are used to reinforce aluminum ducts, isolate the different metals with butyl rubber, neoprene, or EPDM gasket materials.
Tie Rods:
Galvanized steel, 0.25-inch minimum diameter for lengths 36.00 inches or less; 0.375-inch minimum diameter for lengths longer than 36.00 inches.

FLEXIBLE DUCTS
General:
Comply with OMSC, latest edition, Class 0 or Class 1.
Standard factory fabricated product, construct an inner wall of impervious vinyl or chlorinated polyethylene, permanently bonded to a vinyl or zinc-coated spring steel helix. Cover the assembly with fiberglass blanket insulation covered by an outer wall of vinyl or fiberglass-reinforced metalized vapor barrier. UL 181 listed Class 1 flexible air duct material. Overall thermal transmission no more than 0.25 (BTU/in)/(hr/sq.ft./deg. F) at 75F differential, per ASTM C335. Vapor transmission value no more than 0.10 perm, per ASTM E96.
Minimum pressure ratings of 4-inch w.g. positive pressure and 1-inch w.g. negative pressure.
Air friction correction factor of 1.3 maximum at 1000 FPM. Working air velocity of at least 2000 FPM.
Flame spread rating no more than 25. Smoke development rating no more than 50 as tested per ASTM E84. Must have cataloged data on insertion loss characteristics, minimum attenuation of 29 DB for 10-foot straight length at 8-inch diameter and 500 Hz.
Manufacturers:
J. P. Lamborn Co., Norflex, Clevaflex, Genflex, Atco, Flexmaster, Thermaflex, or approved.

FACTORY FABRICATED METAL ROUND AND FLAT OVAL DUCTWORK
General:
Provide per OMSC Duct Construction Standards, latest edition, and ASTM A527 Class 0. Round sheet metal, spiral lock seam type. Fittings: Same construction as the duct. Tap in fittings not allowed. Duct sealer: Specifically formulated for sealing field joints for round spiral lock-seam duct systems.

DAMPERS
Splitter Dampers (SD):
Provide where required; constructed of galvanized sheets not lighter than 18 gauge, reinforced to prevent vibration, equipped at both ends with brass bearing mounts and of sufficient length to provide complete shutoff branch duct.
Extractors (EX):
Provide behind sidewall grilles by same manufacturer as the supply grilles. Each unit to be the same size as the grille face.
Register Dampers:
Dampers utilized with grilles. Opposed blade dampers utilizing a side operated worm drive which provides external duct operation. Slot the end of the shaft to receive a screwdriver. Factory assembled side operator. Construct of the same material as the grille.
Manufacturers:
Same as grilles and diffusers. Provide Young Regulator 443 or 443B raised platform for insulated duct.

MANUAL VOLUME DAMPERS
Volume Dampers, up to 10" width:
Blade: Minimum 22 ga. galvanized steel.
Regulator: Quadrant type, 1/4" diameter shaft, wingnut, indicator dial marked "open" and "shut".
Bearings: 1/4" diameter shaft, spring lock on tail bearing.

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Regulator/Bearing Set Manufacturer: Duro Dyne KS 145 or approved.
Volume Dampers, 11" to 20" width:
Blade:
Minimum 18 ga. galvanized steel. Use multiple blades for height over 12".
Regulator: Quadrant type, 3/8" diameter shaft, wingnut, indicator dial marked "open" and "shut".
Bearings: 3/8" diameter shafts, spring lock on tail bearing.
Regulator/Bearing Set Manufacturer: Duro Dyne KSR 195 or approved.
Volume Dampers, 21" to 30" width:
Blade: Minimum 16 ga. galvanized steel. Use multiple blades for height over 12".
Regulator: Quadrant type, 1/2" diameter shaft, wingnut, indicator dial marked "open" and "shut".
Bearings: 112" diameter shafts.
Regulator/Bearing Set Manufacturer: Duro Dyne KS 12 or approved.

CONTROL DAMPERS:
Standard Control Dampers:
Frame: 16 gage min. galvanized steel.
Blades: 16 gage galvanized steel, Opposed action.
Blade Seals: TPE
Bearings: Synthetic.
Electric Actuator: Belimo or approved equal.
Control performance: Rated for 2000 - 3000 fpm velocity, and 2.5” – 5.0” w.g. pressure differential
Leakage: Maximum 4 cfm/sf at 1” w.g. per ASHRAE 90.1
Manufacturer: Greenheck, Pottorff, Ruskin, Air Balance, Cesco, Prefco, Safe Air, Nailor 1120, or approved. Similar to Greenheck VCD-23.

TURN VANES
Turn Vanes:
Type: Non-adjustable, 90 deg. air turn
Side Rails: Minimum 24 gage galvanized steel.
Vane Spacing: 2 1/8 inches on center.
Manufacturer: Aero/Dyne Co., Duro Dyne, or approved. Similar to Aero/Dyne Model H E P.

BACKDRAFT DAMPERS
Counter Balanced Backdraft Dampers:
Type: Designed for gravity relief at low pressure differentials and low velocity air flow.
Frame: Steel or aluminum channel.
Blades: 0.070" thick aluminum with felt or vinyl edges.
Counterbalance Weights: Adjustable, to operate damper in range of 0.01 to 0.05 w.g.
Manufacturer: Nailor, Ruskin, Cesco, Dowco, Greenheck, or approved. Similar to Ruskin Type CBD 4.

FLEXIBLE DUCT CONNECTORS
Flexible Duct Connectors:
Assembly: Two 3" wide strips of metal connected to 3" wide strip of fabric with continuous crimped seams.
Metal Strips: 24 gage galvanized steel.
Fabric Strip:
Indoor:
Glass fabric with black DuPont Neoprene coating, flame resistant, approximately 30 ounces per yard.
Outdoor:
Glass fabric with white DuPont Hypalon coating, flame resistant, UV resistant, approximately 26 ounces per yard.
Manufacturer: Ventfabrics, Duro Dyne or approved. Similar to Duro Dyne "Metal Fab".

TWIST LOCK FITTINGS
Twist Lock Fittings:
Type: Straight neck "spin in" for round take off from rectangular duct where shown on drawings. No scoop or damper.
Damper: None. Volume dampers shall be separate from twist lock fitting. Refer to volume damper specification in this Section.

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Manufacturer: Genflex, Flexmasterwest, Gensco, Western Stats, or approved. Similar to Flexmaster FL.

DUCT ACCESS DOORS

Duct Access Doors, Rectangular Ducts:

Frame: Minimum 24 ga. galv. steel, with gasket and knock over tabs.
Door: Galv. steel of thickness equal or greater than that of the duct, double panel with 1" insulation, continuous steel hinge, cam lock, and gasket.
Size: As required for easy access to fire damper.
Manufacturer: Ruskin, Air Balance, Safe Air, Cesco, or approved. Similar to Air Balance model FSA100.

TAPE AND ADHESIVE DUCT SEALER, INDOORS

U.L. Classification: Flame spread rating not to exceed 25, smoke developed rating not to exceed 50, when applied in a 2-inch wide strip at a thickness of 0.0032 inch.
Application Temperature Limits: 30 to 110 deg. F.
Manufacturer:
Hardcast Inc. DT tape with FTA 20 adhesive
United McGill MDT6 300 tape with MTA 20 adhesive

SHEET-METAL DUCT SEALER

Hardcast "Duct-Seal 321" or United McGill. Indoor/outdoor, low VOC (<20 GPL), water based with fiber reinforcement.

PART 3 - EXECUTION

INSTALLATION

The duct layout shown on the Contract Drawings is diagrammatic in nature. Coordinate the ductwork routing and layout, and make alterations to the ductwork routing and layout as required to eliminate physical interferences. Where deviations in the ductwork routing as shown in the Contract Drawings are required, such alterations not to compromise the air flow, pressure drop, and sound characteristics of the duct fitting or run as shown on the Contract Drawings. Make such determination by Project Manager. In the event Project Manager determines that the installed ductwork is inconsistent with the above mentioned criteria, remove and replace at no additional cost to the Owner.
Install ductwork in the location and manner shown and detailed. Review deviations required by job conditions with Project Manager prior to any fabrication. Provide fittings construction per SMACNA.
Connect duct assemblies such as ductwork, etc., and operating machines or mechanisms such as fans, air conditioners, etc., with flexible connections.
Fabricate radius elbows with centerline radius not less than 1-1/2 duct diameters.
Do not install duct size transition pitch angles which exceed 30 degrees for reductions in duct size in the direction of airflow, and 15 degrees for expansions in duct size in the direction of airflow.
Install single thickness turning vanes in square throat rectangular elbows and in tees. Provide 3/4-inch trailing edge on turning vanes, turned slightly past parallel to the duct.
Duct sizes indicated are free inside dimensions including where internal lining is shown.
Provide galvanized sheet-metal duct material for ducts unless otherwise indicated or specified.
Provide temporary closures of open ducts during construction to prevent dust and debris from entering the system.

Flexible Duct:

Install flexible duct with bend radius equal to 1.5 times the diameter. Minimum length 2 feet. Maximum length 5 feet, unless noted otherwise.
Provide round neck grilles/diffusers or square-to-round transitions. No flex duct connections directly to square neck allowed.
Flex duct allowed only for vertical drops to diffusers. Maximum offset angle from vertical: 30 degrees.
Approved for use on supply ducts only; not allowed for return or exhaust.
Flex duct allowed in concealed spaces above lay-in ceilings only.
Fabricate ductwork and sheet metal work of prime grade, lock forming quality steel in accordance with the current issues of the ASHRAE "Guide" and SMACNA standards and installed in strict conformance with SMACNA standards.
Submit shop drawings for approval for ductwork. Ductwork to be sheet metal unless specifically

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authorized.
Construct ductwork upstream of VAV boxes for 2-inch pressure class; downstream duct 1-inch pressure class. Other duct 2-inch pressure class.
Round spiral duct and fittings or where required due to available clearances, use flat oval ductwork and fittings upstream of terminal units manufactured by United Sheet Metal, Rolok or approved in accordance with ASTM A527.
Seal joints and seams in supply, exhaust, and return air ductwork and plenums.
Fabricate ductwork and plenums with a smooth inside surface and support and brace to prevent sagging and vibration at any time. Provide galvanized steel angles for reinforcing and bracing.
Joints:
Carefully cut and trim joints and seams in fabricated ducts and fitting to form a closed joint with no portion of the duct or fitting protruding into the air stream.
Seal joints in sheet-metal ducts in concealed locations (such as enclosed ceiling spaces) with Hardcast joint sealant system applied in accordance with manufacturer's recommendations, or use Ductmate-type joints.
Seal joints in sheet-metal ducts in exposed locations with sealant system applied in accordance with manufacturer's recommendations. Wipe off excess sealer on duct to give a clean finish, or use Ductmate-type joints.
To connect sheet-metal ductwork to fiberglass ductboard, use Hardcast only.
Standard gray duct tape not allowed.
Fasteners such as sheet-metal screws, machine screws or rivets shall be of a corrosion resistant type.
Black oxide is not an approved corrosion resistant coating.
Crimp flat duct surfaces diagonally or beaded regardless of size, unless acoustically lined.
Fabricate duct size transitions with a slope of not more than 1 foot to 5 feet where possible, but in no case more than 1 foot in 3 feet.
Fabricate duct turns with the inside (smallest) radius at least equal to the duct width. Where necessary, square elbows may be used, with maximum available inside radius and with fixed single thickness curved vanes, with trailing edge extended 3/4 inch.
Provide flexible connectors at connections to equipment, in ducts crossing building expansion joints and may be used at connections of dissimilar metals. Flexible Connections: Minimum 16 ounce airtight "Ventglass" noncombustible fabric with fire retardant neoprene coating on outside, fastened with bolted galvanized steel bands. Maintain a minimum 1-inch space between the connecting surfaces.
Duct Hangers and Supports:
Hang rectangular sheet-metal ducts with a cross sectional area of less than 7 sq.ft. with galvanized strips of No. 16 USS gauge steel 1-inch wide, and larger ducts with steel angles and adjustable hanger rods similar to piping hangers. Support at 8 feet on center, as detailed.
Anchor ducts securely to building in such a manner as to prevent transmission of vibration to structure.
Do not connect duct hanger straps to roof deck. Do not support ducts from other ducts or piping.
For round sheet-metal ducts, provide duct support in accordance with SMACNA Guidelines. Verify type of building construction.
Attach strap hangers installed flush with end of sheet-metal duct run to duct with sheet-metal screws.
Do not install duct stiffeners on interior (air side) of unlined ductwork; install on exterior only or on interior of ductwork with duct liner.
Seismic Restraint: Brace ductwork against lateral movement as detailed in document "Seismic Restraint Manual Guidelines for Mechanical Systems" as published by SMACNA.
Ductwork not to be supported from the roof deck. Hang ducts from beams, joists or supplementary structural members provided by Contractor. Do not hang ductwork from joist bridging or from other ducts.
Although not necessarily indicated on the Drawings, provide turning vanes at mitered elbows, opposed blade balancing dampers with locking quadrants at branch ducts, volume extractors and any other applicable devices necessary for minimum duct resistance and proper system air balancing. Sufficiently stiffen dampers to prevent noise or vibration and in no case be lighter than 20 gage steel. Provide with accessibly located adjuster, manufactured by Young Regulator Co., Parker Kalon Corporation, or approved.
Construct exterior ductwork or ductwork which is otherwise exposed to weather watertight.
Duct sizes indicated are the free inside dimensions. Construct sheet-metal ducts as required to accommodate interior insulation or lining where shown.
Locate access doors in ductwork as required for service of fire dampers, automatic dampers and other items requiring maintenance or inspection.

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Paint inside surface of bare ductwork which is visible through face of grilles with flat black paint for ceilings 12 feet and lower.

GRILLE AND EXPOSED DUCT CLEANING

After completion of ductwork installation, operate each fan system (excluding exhaust fans) for a minimum of 30 minutes prior to installation of ceiling grilles and diffusers. After grilles and diffusers are installed, clean out accumulation of particles from grilles and diffusers prior to acceptance.

Clean exterior surface of ducts exposed to public view of chalk, pencil and pen marks, labels, sizing tags, dirt, dust, etc., so that upon completion of installation, ducts are left in clean and unblemished manufactured condition.

Exposed duct and grilles shall remain free of dust entrained streaks due to leakage at joints and grille connections during warranty period. Clean leaks, seal and refinish to match existing if visible streaks develop.

CONNECTIONS

Flexible Connectors:

Make connections to equipment with flexible connectors complying with Section 23 33 00 “Air Duct Accessories.”

SMACNA Requirements: Comply with SMACNA’s “HVAC Duct Construction Standards – Metal and Flexible” for branch, outlet and inlet, and terminal unit connections.

PAINTING

Line of Sight:

Paint interior of metal ducts that are visible through registers and grilles and that do not have duct liner. Apply one coat of flat, black, latex paint over a compatible galvanized steel primer. Paint materials and application requirements are specified in Section 09 91 13 “Exterior Painting” and Section 09 91 23 “Interior Painting.”

FIELD QUALITY CONTROL

General:

Perform tests and inspections.

START UP

Air Balance:

Comply with requirements in Section 23 05 93 “Testing, Adjusting, and Balancing for HVAC.”

OPTIONAL DUCT JOINT SYSTEM

General:

Fasten Ductmate angles to duct walls using self-drilling screws, rivets, or spot welding. Fastener spacing shall be as recommended by manufacturer for size of duct and pressure class. Seat raw duct ends in integral mastic seal. A continuous strip of DM440 Butyl Gasket Tape, size 0.25-inch by 0.75-inch, shall be provided between mating flanges of companion angles at each transverse joint, and joint shall be made up using 0.375-inch-diameter by 1.00-inch-long zinc-plated bolts and nuts. Drive-on or snap-on cleats shall be used at spacings as recommended by manufacturer.

EXPOSED DUCTWORK

Requirements:

In addition to requirements of SMACNA and ACGIH, seal seams and joints of exposed supply, exhaust, return, and outside air ductwork in finished rooms airtight with caulk. Clean exposed surfaces. Prepare for painting.

Ductwork Exposed to Weather:

Ductwork exposed to weather (outside building envelope) shall be constructed two gauges heavier than required by SMACNA standards for pressure classification being used. Ductwork shall be constructed (sloped) to prevent ponding of water on top surface of duct. Seal joints and seams watertight.

Duct Sealer:

Where duct joints have been sealed with a fluid applied sealer (solvent or water based) and ductwork is to remain exposed in occupied area (no ceilings), make joints smooth, ready for painting.

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COMMISSIONING

Verify that installation is as indicated and specified.
Complete manufacturer's installation and startup checks and perform the following:
Inspect for visible damage to casing or components.
Verify clearances have been provided for servicing.
Verify that labels are clearly visible.
Verify that controls are connected and operable.
Remove shipping bolts, blocks, and tie-down straps.
Verify that filters are installed.
Adjust vibration isolators.
Lubricate fan bearings.
Check fan-wheel rotation for correct direction without vibration and binding.
Adjust fan belts for proper alignment and tension.
Check dampers for free movement and proper operation.
Provide cooperation and assistance to the control contractor and engineer for testing of fan speed control, heating, cooling, damper operation, and normal and emergency shutdown.
After startup, test and balance, and performance testing; change filters, vacuum coils, lubricate bearings, and adjust belt tension.

END OF SECTION

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PART 1 - GENERAL

RELATED DOCUMENTS

General:

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

Other Requirements:

See Section 23 00 00, “General Mechanical Provisions” for additional requirements for this Section.

SUMMARY

Section Includes:

Rectangular and square ceiling diffusers.

Fixed face registers and grilles.

Louvers.

SUBMITTALS

Product Data:

For each type of product indicated, include the following:

Data Sheet: Indicate materials of construction, color, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.

Air Device Schedule: Indicate drawing designation, room location, quantity, model number, size, and accessories furnished.

Coordination Drawings:

Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

Ceiling suspension assembly members.

Method of attaching hangers to building structure.

Size and location of initial access modules for acoustical tile.

Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.

Duct access panels.

Source Quality Control Reports: Provide.

PART 2 - PRODUCTS

GENERAL

Style, Color, and the like shall be reviewed, and accepted by Architect, and Engineer.

CEILING DIFFUSERS (SA, RA, EX AND TG)

Rectangular and Square Ceiling Diffusers

Manufacturers:

Subject to compliance with requirements, provide products by one of the following:

Price, Titus, or approved.

Material:

See Air Device Schedule on Drawings.

Finish:

See Air Device Schedule on Drawings.

Face Size:

See Air Device Schedule on Drawings.

Face Style:

See Air Device Schedule on Drawings.

Mounting:

See Air Device Schedule on Drawings.

Pattern:

Adjustable.

REGISTERS AND GRILLES

Fixed Face Grille (RG)

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Manufacturers:
Subject to compliance with requirements, provide products by one of the following:
Price, Titus, or approved.
Material:
Steel or Aluminum.
Finish:
See Air Device Schedule on Drawings.
Face Arrangement:
See Air Device Schedule on Drawings.
Core Construction:
Integral.
Frame:
1.25 inches wide.
Mounting:
Countersunk screw.

SOURCE QUALITY CONTROL
Verification of Performance:
Rate diffusers, registers, and grilles according to ASHRAE 70, “Method of Testing for Rating the Performance of Air Outlets and Inlets.”

PART 3 - EXECUTION

EXAMINATION
Installation Requirements:
Examine areas where diffusers, registers, and grilles are to be installed for compliance with requirements for installation tolerances and other conditions affecting performance of equipment.
Unsatisfactory Conditions:
Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION
Appearance:
Install diffusers, registers, and grilles level and plumb. Exact location per Architect.
Ceiling-Mounted Outlets and Inlets:
Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practical. For units installed in lay-in ceiling panels, locate units in the center of panel. Where architectural features or other items conflict with installation, notify Owner’s Representative for a determination of final location.
Connections and Service:
Install diffusers, registers, and grilles with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.
Mounting Frames:
Select frame style for type of construction and module of ceiling or wall in which they are mounted.
Special Hangers:
Grilles, registers, or diffusers weighing over 20 pounds are to be hung independently of ceiling system; in T-bar ceilings, they are to be clipped to T-bars. Return/exhaust terminals that lay into T-bar ceilings shall also be clipped to T-bars to prevent rattling.
Installation Requirements:
Collar:
Where manufacturer provides grilles, registers, or diffusers with less than a 2.00-inch collar for connection of ductwork, provide a 2.00-inch sheet metal collar riveted and sealed to manufacturer’s collar.
Equalizer Grid:
Provide equalizer grids in ceiling diffusers.
Ceiling Diffuser Supply Plenum:
Ceiling diffuser supply plenum shall be used at ceiling supply air terminal locations where a hard duct radius elbow cannot be used due to space constraints. In no case shall flexible duct be connected directly

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to a ceiling diffuser without a hard duct radius elbow or a ceiling diffuser supply plenum. Back of ceiling diffuser and ceiling diffuser supply plenum, or radius elbow, shall be insulated with faced fiberglass blanket insulation in same manner as supply ductwork.

Location:

Approximate location of air terminals is indicated on Drawings. Precise location of these air terminals is indicated on Architectural Ceiling Plans and interior elevations. Bring conflicts between Drawings to immediate attention of Owner's Representative prior to Shop Drawing submittal.

Painting:

Where diffusers, registers, and grilles cannot be provided to avoid seeing inside duct, paint inside of duct with flat black paint to reduce visibility. Per Architect.

ADJUSTING

Prior to Balancing:

After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION

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PART 1 - GENERAL

CONTRACT CONDITIONS
Work of this Section is bound by the Contract Conditions and Division 1, bound herewith, in addition to this Specification and accompanying Drawings

SUMMARY
Related Documents:
Drawings and general provisions of the Subcontract apply to this Section.
Review these documents for coordination with additional requirements and information that apply to work under this Section.
Related Sections:
Division 01 Section "General Requirements."
Division 01 Section "Special Procedures."
Division 07 Section "Sheet Metal Flashing and Trim".
Division 23 Section "Common Results for HVAC".

REFERENCES
Air Conditioning and Refrigeration Institute ARI 210 Unitary Air Conditioning Equipment.

SUBMITTALS
Submit under provisions of Division 23 Section "Common Results for HVAC, Review of Materials and Division 01 Section "General Requirements."
Submit manufacturer’s installation instructions.
Submit manufacturer’s descriptive literature, operating instructions, and maintenance and repair data.

QUALITY ASSURANCE
Test and rate cooling system in accordance with ARI 210.
ASHRAE Compliance:
Applicable requirements in ASHRAE 62.1-2022, Section 4 - "Outdoor Air Quality," Section 5 - "Systems and Equipment," Section 6 - "Ventilation Rate Procedures," and Section 7 - "Construction and Startup."
ASHRAE/IESNA Compliance:
Applicable requirements in ASHRAE/IESNA 90.1-2022.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS
Amana, Friedrich, or approved.

TYPE
Provide packaged, self-contained, through-the-wall, air-cooled heat pump units, with wall sleeve, room cabinet, electric cooling, heat pump and electric heating, and built-in temperature controls.

PERFORMANCE
See Drawings.
Unit Energy Efficiency Ratio (EER) based on the type and size of the unit shall meet OR and Local Energy Code and is specified on Drawings.

CAPACITIES AND CHARACTERISTICS
See Drawings.

WALL SLEEVES AND LOUVERS
Wall Sleeves:
16-ga. (.61 mm) galvanized sheet steel, finished with protective mastic coating.
Louvers:
Extruded aluminum, anodized, Color per Architect]

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CHASSIS

Incorporate electric heating coil, direct-expansion cooling/heating heat pump coil, compressor, centrifugal-evaporator fan(s), air-cooled condenser fan and coil, permanent filters, ventilation duct, dampers, and controls into removable unit chassis.

Filters:

Washable. Comply with ASHRAE 62.1-2022 for drain pan construction and connections.

CONTROLS

Supply units with built-in “HEAT-COOL-OFF” switch.

Provide two-speed evaporator fan motor with built-in fan switch. Program for AUTO fan operation (not continuous).

Provide units with low-ambient lockout control to prevent compressor operation below [35] deg. F.

Control Module:

Unit-mounted digital panel with touchpad temperature control and with touchpad for heating, cooling, and fan operation. Include the following features:

PART 3 - EXECUTION

INSTALLATION

Coordinate installation of units with architectural, mechanical, and electrical work.

Supply units fully charged with refrigerant and filled with oil in factory.

END OF SECTION

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PART 1 - GENERAL

PRODUCT SPECIFICATION

This section includes air-to-air energy recovery ventilators (ERV) for indoor installation and electric duct heaters.

The ERV shall be a packaged unit and shall transfer both sensible and latent energy using static plate core technology.

SUBMITTALS

Product data: For each type or model of ERV, include the following:

Dimensioned drawings showing front, side and plan views, to include location of attached ductwork and service clearance requirements.

Estimated gross weight of each installed unit.

Filter types, quantities, and sizes

Installation, Operating and Maintenance manual (IOM) for each model.

QUALITY ASSURANCE

Source Limitations: Obtain air-to-air ERV with all appurtenant components or accessories from a single manufacturer. ERV manufacturer shall have a minimum of 10 years' experience manufacturing ERVs.

For the actual fabrication, installation, and testing of work under this section, use only thoroughly trained and experienced workers completely familiar with the items required and with the manufacturer's current recommended methods of installation.

The ERV core shall be warranted to be free of manufacturing defects and to retain its functional characteristics, under circumstances of normal use, for a period of ten (10) years from the date of purchase. The balance-of-unit shall be warranted to be free of manufacturing defects and to retain its functional characteristics, under circumstances of normal use, for a period of five (5) years from the date of purchase.

Manufacturer shall be able to provide evidence of independent testing of the core by Underwriters Laboratory (UL), verifying a maximum flame spread index (FSI) of 25 and a maximum smoke developed index (SDI) of 50 thereby meeting NFPA90A and NFPA 90B requirements for materials in a compartment handling air intended for circulation through a duct system. The method of test shall be UL Standard 723.

Certifications:

Unit shall be listed under UL 1812 Standard for Ducted Air to Air Heat Exchangers. The unit must pass commercial flammability requirements and shall not be labeled "For Residential Use Only."

COORDINATION

Coordinate size and location of all building penetrations required for installation of each ERV and associated electrical systems.

Coordinate sequencing of construction for associated plumbing, HVAC, electrical supply.

PART 2 - PRODUCTS

INDOOR ENERGY RECOVERY VENTILATORS

Manufacturers

Renewaire or approved.

General:

Air-to-air ERV shall be fully assembled at the factory and consist of a fixed-plate cross-flow heat exchanger with no moving parts, an insulated single wall G90 galvanized painted 22-gauge steel cabinet, filter assemblies for both intake and exhaust air, enthalpy core, supply air blower assembly, exhaust air blower assembly and electrical control box with all specified components and internal accessories factory installed and tested and prepared for single-point high voltage connection. Entire unit with the exception of field-installed components shall be assembled and test operated at the factory.

The ERV shall use an integral mounting flange and hanging bar system to mount the unit per manufacturer's installation manuals to a structurally suitable surface. The units may be mounted in any orientation.

The ERV shall have pressure taps on the unit door and onboard adjustable airflow controls for easy airflow balancing of unit.

The onboard airflow setting controls shall be factory installed and tested.

The ERV onboard control center shall have the ability to set the high and low airflow for the supply and exhaust fans independently of each airstream.

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The onboard control shall have the capability to set the high and low airflow setting for the supply and exhaust fan using easy to use adjustable airflow dials that are clearly labeled outdoor air or return air and high or low for airflow setting.
The adjustable airflow setting dial shall have the capability to vary the desired airflow in infinite increments for the supply and exhaust airflows.
ERV shall have the capability to provide listed on the equipment schedule.

The ERV shall be capable of transferring both sensible and latent energy between airstreams. Latent energy transfer shall be accomplished by direct water vapor transfer from one airstream to the other, without exposing transfer media in succeeding cycles directly to the exhaust air and then to the fresh air.
Unit shall have the capacity to operate continuously without the need for bypass, recirculation, pre-heaters, or defrost cycles under normal operating conditions.
Water vapor transfer shall be through molecular transport by hydroscopic resin and shall not be accomplished by “porous plate” mechanisms. Exhaust and fresh airstreams shall travel at all times in separate passages, and airstreams shall not mix. No metal separators or metal core material shall be acceptable.
Airflow through the ERV core shall be laminar over the product’s entire operating airflow range, avoiding deposition of particulates on the interior of the energy exchange plate material.

Power rating of the unit shall be 120 volts and 60 Hz.

Cabinet
Materials: Formed single wall insulated metal cabinet, fabricated to permit access to internal components for maintenance.
The energy recovery component shall be of fixed-plate cross-flow construction, with no moving parts.
Enthalpy core: Energy recovery core shall be of the total enthalpy type, capable of transferring both sensible and latent energy between airstreams. Latent energy transfer shall be accomplished by direct water vapor transfer from one airstream to the other, without exposing transfer media in succeeding cycles directly to the exhaust air and then to the fresh air. No condensate drains shall be allowed. The energy recovery core shall be designed and constructed to permit cleaning and removal for servicing.
Outside casing: Shall be constructed of smooth pre-painted or powder coated white 22-ga. steel, with lapped corners and zinc-plated screw fasteners.
Case walls and doors shall be fully insulated with 1", expanded polystyrene foam insulation faced with a cleanable foil face on all exposed surfaces.
Access door shall provide easy access to blowers, ERV cores, and filters. Access door shall be hinged with airtight closed cell foam gaskets. Doors shall have an airtight compression seal using closed cell foam gaskets.
The ERV shall have locking door hinges so that the ERV can be installed in multiple orientations.
Door pressure taps, with captive plugs, shall be provided for cross-core pressure measurement allowing for accurate airflow measurement.
No condensate drain pans or drains shall be allowed and unit shall be capable of operating in both winter and summer conditions without generating condensate.
Passive Frost Control: The ERV core shall perform without condensing or frosting under normal operating conditions (defined as outside temperatures above -10ºF and inside relative humidity below 40%). Occasional more extreme conditions shall not affect the usual function, performance or durability of the core. No condensate drains will be allowed.
Blower section
The impeller type shall be backward-curved.
Blower assemblies: Shall be statically and dynamically balanced and designed for continuous operation at maximum rated fan speed and horsepower.
Motors
The supply and exhaust fans shall be electronically commutated (EC) motors with multispeed capability as standard offering.

Unit Controls
Unit shall have the capacity to operate continuously without the need for bypass, recirculation, pre-heaters, or defrost cycles under normal operating conditions.
The unit shall be capable of operating continuously or intermittently at the low airflow setting with the ability to go temporarily to the high airflow boost mode.
The unit shall have an internal 24VAC transformer and relay.

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Filter section
The ERV cores shall be protected by a MERV 8 rated, spun polyester, disposable filter in both airstreams. ERV shall have the capability to incorporate an optional 1" thick MERV 13 disposable pleated filter located in the outdoor air airstream.
All filters shall be accessible from the exterior of the unit.

ELECTRIC DUCT HEATERS
Manufacturers:
Renewaire, Indeeco, Price, or approved.
General:
Duct heaters shall be open coil heaters.
Voltage, size, wattage, control type and control voltage shall be as scheduled on the drawings.
Heaters shall be UL listed for zero clearance and meet all applicable requirements of the NEC.
Electric duct heaters shall be independently powered.
Type: Heaters shall be of the slip-in mount type for duct mounting.
Heating Elements: Open coil of resistance wire supported and insulated by floating ceramic bushings.
Heating element support structure shall consist of galvanized steel wire formed and constructed to support ceramic bushings through which the heating element passes.
All heating elements shall be made of nickel/chromium resistance wire with ends terminated by means of staking and Heliarc welding to machine screws.
Coil Layout: Horizontal (air flow vertical).
Control Box: Control cabinet shall have a solid cover also of heavy gauge galvanized steel and held in place with hinges and interlocking disconnect switch.
Built-in components shall include disconnecting break magnetic contactors, transformer with primary fusing, pressure-type airflow switch set at 0.05" + 0.02" WC all as required by UL, branch circuit fuses per NEC, interlocking disconnect switch and a single terminal block to accept the number, type and size of conductors as required.
Over-Temperature Protection:
Serviceable through electric duct heater without removing heater from duct or unit.
Disk-type, automatic reset, thermal-cutout safety devices for primary over-temperature protection.
Secondary over-temperature protection by built in disc type manually resettable thermal cutouts. These devices must function independently of one another and are not acceptable if series connected in the control circuit wiring.
All duct heaters will require either a fan interlock circuit or an airflow switch. The airflow switch shall be diaphragm operated differential pressure switch to prevent duct heater from operating when there is no air flow.
A disconnecting magnetic control circuit is required.
All wiring, component sizing, component spacing and protective devices within the control cabinet shall be factory installed and comply with NEC and UL standards.
Control Panel: Mounted on unit, with means of a safety disconnect and overcurrent protection. Include the following controls:
Silicon Controlled Rectifier (SCR) that shall be capable of accepting 0-10Vdc or 4-20mA as control signal.
A wiring diagram depicting layout and connections of electrical components within the control cabinet shall be affixed to the inside of the control cabinet cover.
A rating plate label shall be affixed to the exterior of the control cabinet cover which states model number, serial number, volts, amps, phase, frequency, control volts, volt-amps and minimum airflow requirements.

PART 3 – EXECUTION

EXAMINATION
Prior to start of installation, examine area and conditions to verify correct location for compliance with installation tolerances and other conditions affecting unit performance. See unit IOM.
Examine roughing-in of plumbing, electrical, and HVAC services to verify actual location and compliance with unit requirements. See unit IOM.
Proceed with installation only after all unsatisfactory conditions have been corrected.

INSTALLATION
Energy Recover Ventilator:

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Installation shall be accomplished in accordance with these written specifications, project drawings, manufacturer's installation instructions as documented in manufacturer's IOM, best practices, and all applicable building codes.
Install unit with clearances for service and maintenance.
Locate, orient, and connect ductwork per AMCA, ASHRAE, and SMACNA guidelines. Provide service clearances as indicated on the plans. Locate units distant from sound critical occupancies.
Use factory supplied mounting flange to mount the unit per manufacturer's installation manuals to a structurally suitable surface. The units may be mounted in any orientation.
Provide flexible duct connections at unit duct flanges.
To control sound radiated from the unit:
Provide acoustic treatment in mechanical room walls and ceilings.
To control sound associated with the two blower outlets:
Utilize insulated, flexible duct.
Duct Heater:
Locate, orient, and connect ductwork per AMCA, ASHRAE, and SMACNA guidelines. Provide service clearances as indicated on the plans. Locate units distant from sound critical occupancies.
Provide a structurally suitable support as necessary for all units. Installation shall meet or exceed all applicable federal, state, and local requirements, referenced standards and conform to codes and ordinances of authorities having jurisdiction.
Perform all work required to provide and install the following electric duct heaters indicated by the contract documents with supplementary items necessary for proper installation.
All installation shall be in accordance with manufacturer's published recommendations.
Inspect areas and conditions under which heater units are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to installer.
Do not operate electric heaters for any purpose until ductwork is clean of any possible debris.
Maintain minimum working clearances around the heater electrical panel in accordance with NEC Article 110.
Install duct heaters in metal ducts and casings constructed according to SMACNA "HVAC Duct Construction Standards".
If applicable, anchor duct heaters in position using suitable supports.
Connect duct heaters and components to wiring systems and to ground as indicated and instructed by manufacturer. Tighten connectors and terminals, including screws and bolts, according to equipment manufacturer's published torque-tightening values for equipment connectors. Where manufacturer's torque requirements are not indicated, tighten connectors and terminals according to tightening torques specified in UL 486A.
After construction is completed, including painting, clean unit's exposed surfaces and vacuum clean electric duct heaters and inside of cabinets.
Touch up scratches and marks from handling and placement of equipment with masking enamel to match manufacturer's color. Refer to Division 09 for site-applied finishes.

CONNECTIONS
In all cases, industry best practices shall be incorporated. Connections are to be made subject to the installation requirements shown above.
Duct installation and connection requirements are specified in Division 23 of this document.
Electrical installation requirements are specified in Division 26 of this document.
All ductwork shall be designed, constructed, supported, and sealed in accordance with SMACNA HVAC Duct Construction Standards and pressure classifications.
At a minimum all duct runs to the outdoors shall be thermally insulated at levels appropriate to the local climate. A continuous vapor barrier shall also be provided on both sides of the insulation.

FIELD QUALITY CONTROL
Contractor to inspect field assembled components and equipment installation, to include electrical and piping connections. Report results to Architect/Engineer in writing. Inspection must include a complete start-up checklist to include (as a minimum) the following: Completed start-up checklists as found in manufacturer's IOM.

START-UP SERVICE

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Contractor to perform startup service. Refer to Division 23 “Testing, Adjusting, and Balancing” and comply with provisions therein. Refer to the manufacturer’s installation, operation and maintenance IOM manual for startup procedure.
Testing and balancing may not begin until 100% of the installation is complete and fully functional. Refer to the manufacturer’s installation, operation and maintenance IOM manual for a table and formula to correlate cross-core pressure measurements into an airflow through the core.
Follow National Environmental Balancing Bureau (NEBB) air test and balance procedures specific to energy recovery devices. Provide balancing reports to owner's representatives.

DEMONSTRATION AND TRAINING
Contractor to train owners or owner’s maintenance personnel to adjust, operate and maintain the ERV.
Refer to Division 01 Section Closeout Procedures and Demonstration and Training.

END OF SECTION

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PART 1 - GENERAL

RELATED DOCUMENTS
General:
Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section.
Other Requirements:
See Section 23 00 00, “General Mechanical Provisions” for additional requirements for this Section.

SUMMARY
General:
Section includes split-system air conditioning units consisting of separate evaporator fan and compressor-condenser components.

SUBMITTALS
Product Data:
For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories. Include performance data in terms of capacities, outlet velocities, static pressures, sound power characteristics, motor requirements, and electrical characteristics.
Field Quality Control Reports: Provide.
Warranty:
Sample of special warranty.
Operation and Maintenance Data:
For split-system air conditioning units to include in emergency, operation, and maintenance manuals.

QUALITY ASSURANCE
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.
ASHRAE Compliance:
Fabricate and label refrigeration system to comply with ASHRAE 15, “Safety Standard for Refrigeration Systems.”
ASHRAE/IESNA Compliance:
Applicable requirements in ASHRAE/IESNA 90.1.

COORDINATION
Roof Mounted Equipment:
Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided. Mount as shown on Drawings. Do not mount on roof without written approval from Architect.

WARRANTY
Special Warranty:
Manufacturer’s standard form in which manufacturer agrees to repair or replace components of split-system air-conditioning units that fails in materials or workmanship within specified warranty period.
Warranty Period: 1 year from Substantial Completion.

PART 2 - PRODUCTS

MANUFACTURERS
Manufacturers:
Subject to compliance with requirements, provide products by one of the following:
Mitsubishi, LG, Daikin, or approved.

INDOOR UNITS (5 TONS OR LESS)
Wall-Mounted, Evaporator-Fan Components:
Cabinet:

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Manufacturer's standard cabinet with removable panels on front, and discharge drain pans with drain connection.
Refrigerant Coil:
Copper tube, with mechanically bonded aluminum fins and thermal expansion valve. Comply with ARI 210/240.
Fan: Direct drive, centrifugal.
Fan Motors:
Comply with NEMA designation, temperature rating, service factor, enclosure type, and premium efficiency requirements.
Multi-tapped, multispeed with internal thermal protection and permanent lubrication.
Controllers, Electrical Devices, and Wiring: Comply with requirements for electrical devices and connections specified in electrical Sections.
Mount unit-mounted disconnect switches on interior of unit.
Condensate Drain Pans:
Fabricated to collect condensate from cooling coils (including coil piping connections, coil headers, and return bends), and to direct water toward drain connection.
Drain Connection:
Located at lowest point of pan and sized to prevent overflow. Terminate with threaded nipple on one end of pan or provide integral condensate pump with discharge to drain connection.
Air Filtration Section:
Provide manufacturer's standard washable and reusable filter media.

OUTDOOR UNITS (5 TONS OR LESS)
Air-Cooled, Compressor-Condenser Components:
Casing:
Manufacturer's standard casing, with removable panels for access to controls, weep holes for water drainage, and mounting holes in base.
Compressor:
Hermetically sealed. Compressor motor shall have thermal- and current sensitive overload devices, start capacitor, relay, and contactor.
Compressor Type:
Inverter.
Refrigerant Charge:
R-410A.
Refrigerant Coil:
Copper tube, with mechanically bonded aluminum fins.
Fan:
Propeller type directly connected to motor.
Motor:
Permanently lubricated, with integral thermal-overload protection.
Low Ambient Kit:
Permits operation down to 45 deg. F.
Mounting Base:
Polyethylene.

ACCESSORIES
Wall-Mounted Controller-Thermostat:
Low voltage wired with sub-base to control compressor and evaporator fan.
Compressor time delay.
24-hour time control of system stop and start.
Liquid-crystal display indicating temperature, setpoint temperature, time setting, operating mode, and fan speed.
Fan-speed selection including auto setting.
Wall mounted remote control is acceptable.
Refrigerant Line Kits:
Soft-annealed copper suction and liquid lines factory cleaned, dried, pressurized, and sealed; factory-insulated suction line with flared fittings at both ends.
Drain Hose:

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For condensate.

CAPACITIES AND CHARACTERISTICS
Cooling Capacity:
Total:
See Equipment Schedule on Drawings.
Sensible:
See Equipment Schedule on Drawings.
Entering-Air Temperature:
See Equipment Schedule on Drawings.
Leaving-Air Temperature:
See Equipment Schedule on Drawings.
Indoor Unit (HPI-X):
See Equipment Schedule on Drawings.
Outdoor Unit (HPO-X):
See Equipment Schedule on Drawings.

PART 3 - EXECUTION

INSTALLATION
Unit Installation:
Install units level and plumb.
Structural Attachments:
Install evaporator-fan components using manufacturer's standard mounting devices securely fastened to building structure.
Ground Mounted Equipment:
Install ground-mounted, compressor-condenser components on 4.00-inch-thick, reinforced concrete base that is 4.00 inches larger, on each side, than unit. Concrete, reinforcement, and formwork are specified in Section 03 30 00 "Cast-in-Place Concrete." Coordinate anchor installation with concrete base.
Ground Mounted Equipment Base:
Install ground-mounted, compressor-condenser components on polyethylene mounting base.
Wall Mounted Equipment:
Mount condensing units on pre-manufactured wall-brackets supplied by the same distributer as the condensing unit. Provide hardware as required by the bracket manufacturer for the wall type used.
Roof Mounted Equipment:
Install roof mounted equipment on 12-inch tall, premanufactured heat pump stand such as Diversitech QST3000-12 or approved stands.
Seismic Restraints:
Install seismic restraints as required.
Refrigerant Tubing:
Install and connect pre-charged refrigerant tubing to component's quick connect fittings. Install tubing to allow access to unit.

CONNECTIONS
General:
Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
Service and Maintenance:
Where piping is installed adjacent to unit, allow space for service and maintenance of unit.

FIELD QUALITY CONTROL
Tests and Inspections:
Leak Test:
After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
Operational Test:
After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.

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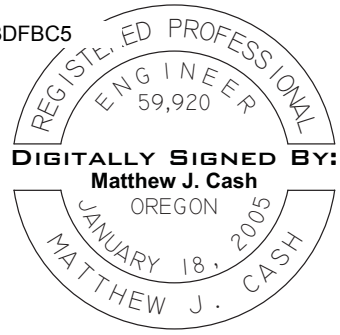
Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
Corrections:
Remove and replace malfunctioning units and retest as specified above.
Test and Inspection Reports:
Provide.

STARTUP SERVICE
Startup Service: Perform startup service.
Complete installation and startup checks according to manufacturer's written instructions.

DEMONSTRATION
Training:
Train Owner's maintenance personnel to adjust, operate, and maintain units.

END OF SECTION

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EXPIRES: 12/31/2025

THIS STAMP, ON THIS PROJECT APPLIES ONLY TO SECTIONS AUTHORED BY:

MATTHEW J. CASH, PE
FLUENT ENGINEERING, INC.
2110 STATE STREET
SALEM, OR 97301
503-447-5030

26 00 01 General Electrical Provisions

26 00 20 Electrical Demolition

DEQ FACT SHEET

26 00 26 Submittals and Shop Drawings

26 05 19 Building Wire and Cables

26 05 26 Grounding

26 05 29 Supporting Devices

26 05 33 Raceways and Fittings

26 05 33.16 Outlet, Junction, and Pull Boxes

26 05 53 Electrical Identification

26 05 60 Overcurrent Protective Devices

26 05 83 Wire Connections

26 24 17 Panelboards

26 24 18 SPD (Surge Protection) Equipment

26 27 26 Wiring Devices

26 29 12 Disconnects and Manual Starters

26 33 13 Emergency Power Packs

26 51 13.20 Lighting Fixtures

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PART 1 - GENERAL

Products under this contract must meet minimum specifications requirements in detail without exception unless specifically noted and approved as provided in these Specifications. Equipment submitted for review must clearly state on cover sheet any differences from specified product. Equipment substitution or submittal review does not relieve Contractor from meeting all requirements of specified item.

DEFINITIONS

Definitions herein are intended as advisory and shall not limit requirements within the Contract Documents. Where a conflict of definitions exists, the more stringent standard shall be used. Where a term is defined on a Drawing the Drawing definition shall be used for that drawing. Not all definitions are included. Trade standard terms are not defined.

CONTRACT DOCUMENTS

The Contract Documents are inclusive. All requirements of all Contract Documents shall be binding as if repeated herein and within this Division as required by any other Division or Contract Document.
This Division does not express or imply separation of the Contract Documents and shall not be considered as separation of the Work.
See Advertisement For Bids, Instructions to Bidders, Supplemental Instructions to Bidders, General Conditions, Supplemental General Conditions, Drawings and Specifications, and modifications incorporated in the documents before execution of the Agreement.
Conflicts: If any conflicts exist the more stringent is required.

SCOPE OF WORK

General:

Provide complete and functional electrical systems as specified, as shown on Drawings, as required, and as intended. Work generally includes, inspections, electrical distribution, lighting, devices, wiring systems, raceways, and control systems.

Omissions:

Contractor shall be responsible for additional labor, or additional material necessary for the proper execution of the Work. Omissions of expressed reference to any item shall not relieve the responsibly to conform to the Contract Documents

SCOPE OF ELECTRICAL WORK

All materials and workmanship shall be furnished for complete, tested, and operating electrical systems as shown on the drawings and specified herein.
Electrical work is to include the electrical service. Complete to the point of connection with the serving utility. Any changes of or work required by the serving utility, are part of this work and shall be fully included in the bid price.
Work is also to include main distribution panel, feeder system and branch circuit panels. Complete branch circuit wiring. Light fixtures, wall switches, receptacles and similar items, and wiring and connection to all mechanical equipment as required.
Provide Power Connections to Equipment provided by others, specified not shown, and/or part of a complete and operable system. This equipment may, or may not be shown, and generally includes, and is not limited to:
Lighting Control Panels, Lighting Controller Equipment, Lighting Controls.
Building Management Control System, HVAC Controls, and the like.
Automatic Door Operators, ADA Doors, Sliding Automatic Doors, and the like.
Unitary, generally self-contained access controls.
Domestic Water circulation pump(s).
Plumbing fixtures with automatic sink/flush valves, and the like.
Automatic plumbing electronic trap primers.
Control Connections to unitary Equipment provided by others, specified, not shown, and/or part of a complete and operable system. This equipment may, or may not be shown, and generally includes, and is not limited to, control wiring for:
Automatic Door Operators, ADA Doors, Sliding Automatic Doors, and the like.

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Unitary, generally self-contained access controls
Automatic plumbing fixtures, and trap primer systems.
The lists above are intended to indicate equipment that is generally shown/specified elsewhere. Where specified, and/or shown otherwise, and/or specified by electrical follow additional power, and control requirements as indicated.

CONFORMANCE WITH REQUIREMENTS

General:

All Work shall conform to the reasonable requirements of the project within the scope of the project and authorizations. All work shall conform to the methods and requirements of Code at the location of the Work.

Access and inspection:

All portions of the Work shall be accessible to inspections and review at all reasonable times during construction. Contractor is responsible for providing access for review and inspection of the Work. Contractor shall secure written inspection reports prior to concealing Work. Contractor is responsible for damages to properly review the Work due to lack of at least 7 Days advance written notification to the Architect, and Engineer that Work is ready for inspection.
Plenums: Provide raceway where conductors, and/or cables are routed through plenums. If specifically noted, or specified raceway is not required, plenum routes may utilize conductors/cables rated for use in plenums, and shall be marked as such per NEC. Supporting devices utilized shall also be rated for use in plenums.

Accounting:

Provide general accounting information as to labor and equipment costs to assist in determination of modifications to the Contract. Provide accounting breakdown when required for securing Owner financing, or for analysis of equipment costs or equipment payback periods, as well as information for Owner incentives.

COORDINATION OF TRADES

Check all other trade drawings to avert potential installation conflicts. Should major changes from the Drawings be required to resolve potential conflicts, notify the Architect and secure written approval and agreement on necessary adjustments prior to start of installation.
Check all equipment locations and connections on the site for coordination with other Divisions equipment and connections and structure and the like.
Contractor is responsible for scheduling trades to properly execute all the Work as intended.

STANDARD OF CARE AND QUALIFICATIONS

General:

Contractor shall be experienced and knowledgeable to Provide Work. Owner is not responsible for improper operation, incompliance, or installation due to Contractor’s lack of knowledge or experience. Upon request, and where requested herein the Contractor shall supply qualifications and experience. Drawings are presented with industry terms, statements, and trade practices and it is the responsibility of the Contractor to be familiar. Provide written notification prior to Bid to the Architect if any representation is not understood, or outside standard practice.

Like Materials and Quality Control:

All systems provided shall be new and of like materials provided through manufacturer authorized distributors. Provide equipment of same system and type by same manufacturer. Items of the same by different manufacturers will be rejected. Equipment shall conform to all applicable Code and applicable listing criteria as of the date of the Contract Documents. Equipment determined to be manufactured under any other listing or Code prior to the date of the Contract is not acceptable, even if the equipment is new or has not been used. All equipment provided to project shall be listed by an approved listing organization.

EXAMINATION OF SITE

Examine Site of Work prior to making Bid. Ascertain all related physical conditions.
Verify at the Site of Work prior to Bid scale dimensions shown due to exact locations, distances, and levels will be governed by actual field conditions.

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Owner will not be responsible for any loss or costs that may be incurred due to a Bidder's failure to fully inform themselves prior to Bid in regard to conditions pertaining to the Work and nature of the Work.

MINOR DEVIATIONS

Make minor changes in equipment locations and equipment connections as directed or required without extra cost.

RECORD DRAWINGS

Maintain a marked set of prints at job site at all times. Show all changes from the original drawing set whether visible or concealed. Include all addendums, field orders, change orders, clarifications, request for information drawn responses, and deviations. Dimension accurately from building lines, floor, or curb elevations. Show exact location, elevation, and size of conduit/raceway, access panels and doors, equipment, and all other information pertinent to the Work.
At project completion, submit marked set to Architect for review.

TRAINING

Provide training of Owner's selected staff for all electrical systems specified herein.
Training of all systems shall be digitally recorded, and two copies shall be distributed to Owner.
Notify and Coordinate with Owner for training and attendance not later than 15 Days prior to training.
Provide 4 hours of general system training in addition to training indicated below.
Lighting Controls- 4 hours
Training shall be conducted by qualified individuals familiar with the Work, and with the equipment.
Instructor shall be familiar with programming and operation of equipment and shall provide instruction to do such.
Provide contact information to Owner for an additional 8 hours support for all electrical systems.
Training shall not occur prior to systems being fully inspected, operational, and complete.
Utilize necessary training materials, conduct training at project location including walk-through of equipment on-site.
Provide Owner with all required Operation, Maintenance, and Programming manuals provided by equipment manufacturer.
Owner shall determine attendee's at training, not the contractor. Contractor shall re-train if attendee's were not selected by the Owner.

WARRANTY

Warrant Work, materials, and equipment for not less than five years.
Provide additional warranty as required herein.

PART 2 - PRODUCTS

THIS PART NOT USED

PAR 3 - EXECUTION

THIS PART NOT USED

END OF SECTION

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PART 1 - GENERAL

INTENT

The electrical system shall be adjusted to accommodate installation of the new work and is required to meet Code. Necessary adjustments are shown on Drawings and indicated herein.

EXISTING CONDITIONS

The locations of existing utilities and equipment are shown in an approximate way only and have not been independently verified by the Owner or Owner's Representative. Contractor shall determine the exact location of every existing utility before commencing work, and agrees to be fully responsible for any and all damages which might be occasioned by the Contractor's failure to exactly locate and preserve utilities and equipment. Replace damaged items with new material to match existing. Promptly notify Owner if utilities are found which are not shown.

Existing equipment to be removed contains PCB's, Mercury, and other hazardous materials.

PART 2 - PRODUCTS

THIS PART NOT USED

PART 3 – EXECUTIONS

DEMOLITION

Existing electrical light fixtures are denoted on demolition plans. Verify exact location of existing light fixtures in the field. Only partial existing electrical shown. Locations of items shown on the Drawings as existing are partially based on field inspection of unconcealed equipment and record drawings that may contain errors. The contractor shall verify the accuracy of the information shown prior to bidding and provide such labor and material as is necessary to accomplish the intent of the Contract Documents.

Remove existing fixtures, and associated electrical equipment from areas scheduled for remodeling, relocation, or demolition unless indicated as retained, or noted on the Drawings.

Maintain continuity of existing systems that remain. Remove or relocate electrical boxes, conduit, wiring, equipment, fixtures, etc. as may be encountered in removed or remodeled areas in the existing affected by this work. Wiring which serves usable existing equipment shall be removed and restored clear of the construction or demolition. If existing junction boxes will be made inaccessible, or if abandoned outlets serve as feed through boxes for other existing electrical equipment which is being retained, new conduit and wire shall be provided to bypass the abandoned equipment. If existing conduits pass through areas being removed or remodeled, new conduit and wire shall be provided to reroute clear of the construction or demolition and maintain service to the existing load.

Remove abandoned wiring, and leave site clean.

Do not disconnect service without approval from the Owner and Utility. Coordinate demolition work with the utility.

Verify with the General Contractor a location for storage of materials, supplies, tools, rubbish, etc. prior to start of Work.

Include disposal costs in bid unless item is specifically noted as salvage to Owner, or retained. Include removal, retainment, and salvage to Owner costs in bid; including relocating equipment to another location on the Owner's site. Owner has first right of refusal for any other equipment scheduled for demolition not already noted as salvaged to Owner. Owner may elect to salvage any equipment scheduled for disposal.

Protect equipment salvaged to Owner. For equipment with disposal/recycle/salvage value, such proceeds shall be passed to Owner through inclusion in total bid.

Equipment being retained shall be protected from damage, stored, labeled and reused. Contractor is responsible for damage to retained equipment. Contractor is responsible for labeling retained equipment with non-damaging labels. Should Contractor not label retained equipment, labels become separated, and/or labeling is inaccurate, Contractor shall be responsible for costs to determine equipment type, labeling, as part of a survey to re-install retained equipment in a specific condition, location, with specific required function. Equipment varies and labeling/function type of retained equipment is essential to protect success, schedule, and budget. Contractor is responsible for schedule delays, and equipment

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costs, as a result of equipment damage, replacement equipment procurement, (due to Contractor's damage or not labeling properly), and/or labeling errors, omission, adherent.
(E) Ballasts with PCB's and (E) Lamps: Contractor shall properly handle, prepare for disposal (such as box, barrel, etc.), and dispose of equipment as required. Recycling is to be used to the extent feasible where costs to recycle properly do not exceed cost to dispose of properly. (E) ballasts contain PCB's unless marked by the manufacturer on the ballast "No PCB's"
Barrel leaking PCB ballasts per disposal requirements in approved barrels, not exceeding barreling volume/quantity allowances. Dispose of PCB's ballasts in a facility regulated under the Federal Toxic Substances Control Act.
Non-leaking PCB ballasts not recycled shall be disposed at a PCB disposal facility in approved leak-proof containers.
See DEQ Fact Sheets attached herein. Follow regulatory requirements for proper disposal of removed equipment. Submit certificate of disposal.

END OF SECTION

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Fact Sheet

Managing Waste Lamps

State of Oregon
Department of
Environmental
Quality

Hazardous Waste
700 NE Multnomah St.,
Suite 600
Portland, OR 97232-4100
Phone: 503-229-5696
800- 452-4011
Fax: 503-229-5675
www.oregon.gov/DEQ

Background

This fact sheet provides tips for persons who create or manage wastes from lamps containing hazardous materials. Detailed regulations for managing these wastes are in the federal Code of Federal Regulations (Title 40, Parts 260 and 273) and in Oregon Administrative Rule Chapter 340, Divisions 101 and 113.

Environmental concerns

Fluorescent lamps as well as high-intensity discharge lamps – including mercury vapor, high-pressure sodium and metal halide lamps from businesses – can contain levels of mercury and lead that make them hazardous waste when disposed. Businesses and governments in Oregon discard several million lamps each year, making these lamps the state's largest source of mercury in the solid waste stream.

Mercury and lead are toxic metals that can accumulate in living tissue and cause adverse health effects. When a lamp breaks – either intentionally, during compaction or transport or while sent for incineration – metal vapors and lead- and mercury-contaminated dust enter the environment. This contaminates the air, surface water, groundwater and surface soil.

Mercury lamps

There are five basic approaches in dealing with using lamps containing mercury:

- Purchase lamps that contain amounts of mercury below hazardous waste levels; recycle glass, metal and low-level mercury
- Recycle waste lamps and reclaim the mercury
- Dispose of mercury-containing lamps as hazardous waste
- Dispose of lamps as solid waste in a landfill, if qualified (see below)
- Crush lamps and dispose of them as hazardous waste (see health warning on next page).

Lamp management disposal options

Most businesses have three legal options for disposing of waste lamps: universal waste, hazardous waste and special provisions for conditionally exempt generators.

Universal waste
(CFR Title 40, Part 273; OAR Chapter 340, Division 113). Universal wastes are a class of generated wastes which the U.S. Environmental Protection Agency allows to be managed by alternative standard or "universal waste rule." Advantages of managing waste lamps under this rule are:

- Universal wastes are not counted toward hazardous waste generator status
- Manifests are not required unless the waste lamps are transported through states or treated or disposed of in states that do not recognize mercury- containing lamps as a universal waste
- Waste lamps may be stored for up to a year, provided the facility tracks them by the date they became a waste
- Reduced recordkeeping, training and emergency preparedness compared with requirements for small- and large- quantity generators

Handlers of waste lamps managed under the universal waste rule must:

- Manage lamps in a way that prevents releases of the waste to the environment
- Place lamps in containers such as cardboard boxes or fiber drums, which are adequate to prevent breakage
- Keep containers closed
- Label each container with the words "Universal Waste – Lamps," "Waste Lamps" or "Used Lamps"
- Immediately clean up broken or damaged lamps
- Store broken lamps in a closed, structurally sound container

Universal waste handlers are prohibited from crushing lamps or diluting them with other wastes. They must send waste lamps to a universal waste destination facility for recycling or disposal.

Hazardous waste *(CFR 40, Parts 260-66, 268); OAR 340, Divisions 100-106, 108)*
Hazardous waste management requirements include:

- Storing waste lamps in a proper container (to protect lamps from breakage)
- Manifesting and contracting with a registered hauler
- Paying necessary fees
- Completing additional training and emergency planning
- Managing waste to a permitted hazardous waste landfill or recycling facility

Last Updated: 7/2016
By: M. Fritzmann

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- Filing an annual report quantifying the amount of hazardous waste generated
- Meeting other requirements based on facility status

Conditionally exempt generator status *(CFR 40, Part 261.5)*
Before a waste generator qualifies as conditionally exempt, it must:

- Generate less than 220 pounds of hazardous waste each month
- Store less than 2,200 pounds of hazardous waste at any one time

Some municipal landfills don't allow disposal of hazardous waste from conditionally exempt generators. Check with your hauler and with DEQ's hazardous waste technical assistance program (contacts below). In this case, conditionally exempt generators should manage this material as a hazardous waste – via recycling or disposal.

Solid waste considerations

(OAR 340-102-0011)
To manage waste lamp tubes as a solid waste, the waste cannot exhibit toxic characteristics for mercury or lead. The complete waste characterization must be based on laboratory analysis of lamps of the brand and model being disposed of. Waste lamps that don't exhibit hazardous waste characteristics may be disposed of in the municipal solid waste stream. Recycling is the preferred option.

For more on this, refer to DEQ's Hazardous Waste Determination fact sheet.

Crushing lamps

Universal waste regulations prohibit the crushing of universal waste lamps. Crushing is considered hazardous waste treatment. Applicable hazardous waste management and standards pertain to these generated wastes.

Crushing lamps poses human and environmental risks due to mercury vapor release. Crushing lamps in a drum top crushing unit reduces the waste volume. DEQ does not consider on-site lamp crushing a recycling process, even if the crushed glass is later sent to a recycling facility. This is because recycling involves reclaiming or recovering something of value from a waste. A drum top unit reduces waste volume but does not separate and reclaim the waste as recycling facilities do.

Crushing lamps is allowed if the lamps are managed under hazardous waste regulations or if the waste lamps are determined to be a solid waste before crushing. If solid waste bulbs are crushed with hazardous waste bulbs, the mixture must be managed as hazardous waste. Lamps must be crushed in commercially available crushing units designed to control mercury emissions.

Lamp collection services

The following is a partial list of firms that offer waste lamp services. DEQ does not endorse specific recyclers or disposal firms.

By providing this list, DEQ doesn't imply that the companies comply with applicable laws. DEQ cautions waste generators to personally evaluate the services and environmental compliance status of any company they use to manage their waste.

Waste Management
Portland, OR
1-800-833-3505

Northwest Hazmat, Inc.
Springfield, OR
1-541-988-9823
Spill response services

Lighting Resources Inc.
Ontario, CA
1- 888-923-7252

Waste-Pro
La Grande, OR
541-963-5459

Total Reclaim
Portland, OR
503-281-1899

AERC Recycling Solutions
30677 Huntwood Ave.
Hayward, CA 94544
Phone: 510-429-1129
Fax: 510-429-1498

Philip Services Corporation
20245 77th Ave
South Kent, WA 98032
1-800-548-8797

Veolia Environmental Services
Vancouver, WA
1-360-260-0882

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Where to find more information

DEQ has other fact sheets about handling mercury-containing materials. Search 'Mercury Containing' on the DEQ website

DEQ's universal waste regulations are in Oregon Administrative Rules Chapter 340, Division 113

DEQ's hazardous waste regulations are in Oregon Administrative Rules Chapter 340, Division 102

Other related federal requirements of interest are on the federal website for Title 40, "Protection of the Environment."

- Part 261 (hazardous waste identification)
- Part 262 (hazardous waste generators)
- Part 273 (universal waste)

DEQ regional offices and assistance

For more assistance, see the DEQ hazardous waste program specialist in your area.

Northwest Region Office: 700 NE Multnomah St, Suite 600, Portland, OR 97232-4100, 503-229-5696

Bend office: 475 NE Bellevue, Suite 110, Bend, OR 97701, 541-388-6146

Pendleton office: 800 SE Emigrant, Suite 330, Pendleton, OR 97801, 541-276-4063

Salem office: 4026 Fairview Industrial Dr, SE, Salem, OR 97302, 503-378-8240

Eugene office: 165 E. 7th Ave., Suite 100, Eugene, OR 97401, 541-686-7838

Alternative formats

Documents can be provided upon request in an alternate format for individuals with disabilities or in a language other than English for people with limited English skills. To request a document in another format or language, call DEQ in Portland at 503-229-5696, or toll-free in Oregon at 1-800-452-4011, ext. 5696; or email deqinfo@deq.state.or.us.

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PART 1 - GENERAL

REQUIREMENTS

Refer to Division 1

Organization

Provide 3-ring type hard cover notebook with 3-hole punch product data sheets.

Order submittals in logical form with tab dividers indicating specification section, and specification title

Equipment shown on schedules shall be in logical order as the equipment appears on the schedule (i.e. light fixture type A precedes light fixture type Z), and be submitted with IDs matching schedule(s).

Submit 5 copies for review. Not all copies will be returned to Contractor.

Clearly readable electronic submittals are permitted in – Lieu of initial hard copies provided they are printed by the Contractor with the O&M Manuals for Owner's hard-copy.

Contractor is responsible to verify receipt of electronic submittals by Engineer.

Electronic Submittals shall include the project title in the subject line with unique submittal number, and description of submittal.

Submit to Email address:

submittals@fluentengineering.com

Fluent Engineering has no limit on E-mail sizes; however, from time to time our email service provider may restrict incoming e-mails beyond our control.

Contractor is responsible for any damage as a result of viruses or other malicious software or links to such contained with submittal

Fluent Engineering will accept only PDF electronic files. ZIP files, links, images files, images within an email message, and Dropbox type services, etc. will not be opened/accepted.

Open file sharing programs such as Dropbox are not permitted and are considered a compromise of project security / non-disclosure agreements.

Coordinate with Engineer if PDF E-mail is too large to be sent.

Engineer may elect on a case by case basis to utilize the/a Contractor's online submittal system with Owner's approval.

Otherwise, use hardcopy format.

Allow no less than 20 Days for review by Engineer.

Contractor is responsible to submit and verify receipt of comments for all submittals.

Resubmittals shall contain all items included in pervious submittals with changes clearly identified with a cover letter listing the changed items, or if permitted by Division 1 only resubmit items that have changed with changes clearly identified. Only revised items will be reviewed.

No item requiring review shall be delivered to the site or otherwise provided to the Project until submittals have been reviewed by the Engineer.

DEFINITIONS

Manufacturing Data:

Information regarding the product(s) and equipment issued by the manufacturer as described below.

Manufacturer's Label:

Manufacturer's label shall include a typewritten list of manufacturer's name, sizes and model or catalog numbers.

Manufacturer's Catalog Data:

Manufacturer's catalog data shall include standard catalog information (Cut Sheets) marked to indicate specific equipment and options for complete and functional system. All components of the system shall be included. Include listing information. Include installation instructions.

Manufacturer's Technical and Engineering Data:

Manufacturer's technical and engineering data shall include materials, dimensions, details, installation instructions, weights, capacities, illustrations, wiring diagrams, control diagrams, control schematics, piping diagrams, connection diagrams, performance data, trip curves, listings, mix design, test results, and any other information required for a complete evaluation of the equipment specified, and to verify compliance with the Contract Documents. All available details shall be included with any modifications to the equipment indicated. All manufacturers and associated model numbers used for complete system shall be indicated.

Shop Drawings:

Shop drawings are Construction drawings of items manufactured specifically for this project. Shop

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drawings shall include dimensions, construction details, weights, and additional information to identify the physical features of the system or piece of equipment. Drawings shall be adequately sized and scaled for a complete review.

Samples:

Samples include actual example of the equipment to be installed. Include actual color, finish, and functioning replica of equipment to be installed. Samples will be returned to the Contractor when submitted with pre-paid postage.

Certifications and Qualifications:

Submit list of past projects with same systems. Submit information listing references, copies of certificates issued by manufacturer, school, and standards organizations. Submit information mandated in specific specification section.

SUBMITTALS REQUIRED

Product Evaluation Data. 5 copies of product literature. The submittal schedule for product evaluation data is as indicated below. Each item requiring a submittal is given the following code:

L	Manufacturer's Label
C	Manufacturer's catalog data (Cuts)
E	Manufacturer's technical and engineering data
S	Shop drawings
SA	Samples
CR	Certifications
Q	Qualifications

SUBMITTAL SCHEDULE

Division 26 - Electrical

Section 26 05 19- BUILDING WIRE AND CABLES……..C
Section 26 05 26- GROUNDING……..C
Section 26 05 29- SUPPORTING DEVICES……..L
Section 26 05 33- RACEWAYS & FITTINGS……..L,C
Section 26 05 33.16- OUTLET, JUNCTION, AND PULL BOXES……...C
Section 26 05 53- ELECTRICAL IDENTIFICATION……..…L
Section 26 05 60- OVERCURRENT PROTECTIVE DEVICES……C,E,S
Section 26 05 83- WIRE CONNECTIONS……...L
Section 26 24 16- PANELBOARDS……..C,E,S
Section 26 24 18 SURGE PROTECTION DEVICE……..C,E
Section 26 27 26- WIRING DEVICES……..C
Section 26 29 12- DISCONNECTS & MANUAL MOTOR STARTER……C,S
Section 26 33 13- EMERGENCY POWER PACKS……...C,E
Section 26 51 13.20- LIGHTING FIXTURES……..C,S
Drawings- AUTOMATIC LIGHTING CONTROL……..…C,E,S

PART 2 - PRODUCTS

THIS PART NOT USED

PART 3 - EXECUTION

THIS PART NOT USED

END OF SECTION

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PART 1 GENERAL

WORK INCLUDED
Wires and Cables

REFERENCE STANDARDS
National Fire Protection Association (NFPA).
NFPA 70 National Electrical Code.

DELIVERY, STORAGE AND HANDLING
Deliver new wire and new cable to site in new packaging with standard cable coils/reels. Packaging shall clearly show length, wire size, wire/cable type, and manufacturer.
Protect products from weather, moisture, and damage.

PART 2 PRODUCTS

MATERIALS
Building Wiring & Insulation:
Copper, 98 percent conductivity, stranded. Solid may be used at contractor's option for wire smaller than #8 AWG. 600 Volt insulation, Type THHN for dry interior and damp interior locations. Type THW, THWN or XHHW for wet locations, and exterior locations.
Listed MC (Metal-Clad) Cable with Listed outer sheath for ground path, interior dry-location use only.
Every MC Cable shall include dual ground path routing with outer sheath, and inherent ground conductor.
Bond ground conductor to equipment and outer sheath to metal termination boxes.
Cable conductors THHN- 90 Degree C. rated. Use of MC cable not permitted in wet/damp locations.
Number of conductors/cables as required per circuiting/load requirement.
Conductor cable with conductors smaller than #12 AWG for branch circuits not permitted.
Exterior cables exposed to sunlight shall be listed "sunlight resistant."
Control panel wiring no smaller than #14 AWG stranded switchboard Type MTW unless otherwise specified on the Drawings or required by system manufacturer.
Motor control wires shall be no smaller than #14 AWG.
Wire for other areas as shown on the Drawings.

PART 3 EXECUTION

INSTALLATION
Parallel feeders shall have identical conductor length.
Use UL listed pulling lubricant for greater than equivalent #4 AWG wire diameter.
Use UL listed pulling lubricant for pulls greater than 75 feet.
Remove moisture from raceway prior to wire pull.
Provide copper grounding conductors. Provide a ground wire through conduits. Utilize the ground wire as the equipment grounding conductor no smaller than #12 AWG otherwise sized as shown and per NEC.
Do not splice feeders, or services. Splices only permitted in accessible junction or outlet boxes where circuit routes deviate. Do not splice or tap branch circuits terminating in a single outlet.
Color code conductors per NEC to designate neutral, phase, and ground as follows:

CONDUCTOR	120/208
Phase A	Black, or per (E) facility standard
Phase B	Red, or per (E) facility standard
Phase C	Blue, or per (E) facility standard
Neutral	White
Ground	Green
Travelers	Pink, or per (E) facility standard

Identify facility High-Leg with signage and consistent coloring (Orange) as required by NEC.
Wires shall be factory color coded. Coloring shall be integral to the insulation. Plastic tape permitted on #6 AWG and larger where insulation coloring is not available or practical. Apply tape in spiral half-lap over

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exposed portions of cable at all locations that cable is accessible.
Conductors shall be identified with circuit number where conductors are accessible such as at terminals, outlets, switches, circuit breakers, motor control centers, etc. Identify the ends of a given conductor circuit the same.
Do not install wires of different voltage systems in same raceway, box, or other enclosure. Control voltage is permitted in same enclosure only where specific equipment is listed for multiple voltage use, and a listed voltage barrier is provided.
Radius of cable bends shall not be less than 10 times the outer diameter of the cable.
Do not install cable within conduit per NEC.
Follow standards of practice for storage, handling, and termination of aluminum conductors. Provide anti-oxidation gel, and remove any oxidation by approved means when terminating conductors.
Provide metal “nail guards” or EMT raceway where cables are subject to damage at studs from nails at exposure distances per NEC.
Route parallel or perpendicular to building lines.
No Cable (power, low voltage, etc.) shall be unconcealed in any finished area.
MC Cable may be utilized where permitted by NEC. MC cable shall not be routed in wet or damp locations which includes unconditioned spaces such as attics, out buildings, crawlspaces, garages, and the like. MC cable shall not be exposed in any areas including where there are no architectural ceilings.
Refer to Drawing Details, when present, for additional requirements, and restrictions. Do not use MC cable for homeruns.

END OF SECTION

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PART 1 GENERAL

WORK INCLUDED
Electrical systems grounding.
Signal systems grounding.

APPLICABLE STANDARDS
Underwriters Laboratories (UL)
UL 467 Standard for Grounding and Bonding Equipment
Institute of Electrical and Electronic Engineers (IEEE)
IEEE 81 Guide for Measuring Earth Resistively, Ground Impedance, and Earth Surface Potentials of a Ground System Part 1: Normal Measurements
IEEE 142 Recommended Practice for Grounding of Industrial and Commercial Power Systems

APPLICABLE REGULATIONS
National Fire Protection Association (NFPA)
NFPA 70 National Electrical Code (NEC)
NEC references below are based on the 2023 edition. Contractor shall meet current NEC requirements.

TESTS
Measure ground grid resistance with earth test megger and provide additional listed and approved earth grounding devices and conductors as required until resistance is 25 ohms or less. Inform engineer in writing, if resistance is greater than 5 ohms.

PART 2 PRODUCTS

GROUNDING ELECTRODES
Encased Electrode:
NEC 250.52(A). One, no smaller than #4 bare solid copper conductor. Install in concrete foundation or footing near contact with earth. Connect to steel reinforcing bars, where available, not less than two times.
Ground Rods:
3/4" diameter, 8' long, copper, with approved clamp near surface. Listed as ground rod for direct contact with earth.
Grounding Electrode:
NEC 250.52(A).

GROUNDING CONDUCTORS, AND JUMPERS
Size:
Per NEC 250.
Material:
Copper.
Protection:
Conductors not in raceway or concealed shall be insulated. Provide raceway where shown or required for physical protection.

PART 3 EXECUTION

INSTALLATION
Regardless of TESTS results above, Provide not less than the following:
Underground Metal Cold Water Pipe electrode; If underground Metal Cold Water Pipe is not available Provide Ground Ring.
Encased Electrode.
Two (2) Ground Rods or Ground Rods as shown.
Connection to building steel when present.
Grounding Electrodes:
Bond all electrodes together. Do not provide other type of electrode than shown without written approval.

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Provide additional quantity of electrodes as required by TESTS above.
Provide access to all grounding electrode conductor connections.
Electrically bypass water meters when required by utility with use of full-size bonding jumper rated for location installed and with pipe clamps routed around and clear of meter.

POWER AND SIGNAL SYSTEM GROUNDING
All equipment grounding conductors shall be routed through same equipment conductor raceway from beginning to end (distribution source to load).
Every metallic raceway (including MC Cable, and :Liquidtight Flexible Metal Conduit) circuit/feeder is intended to have dual ground paths from the raceway/sheath itself, and the separate equipment grounding conductor within the raceway/cable.
Metallic raceways are not approved as equipment grounds.
Circuit Grounding:
Install grounding bushings, studs, and jumpers at distribution centers, pullboxes, motor control centers, panelboards, and junction boxes.
Ground Connections:
Clean surfaces thoroughly before applying ground lugs or clamps. If surface is coated, the coating must be removed down to the conductive material. After the coating has been removed, apply a listed and approved noncorrosive compound to cleaned surface and connections. Where galvanizing is removed from metal, it shall be re-applied or painted.
Service Panel:
Connect the various feeder green grounding conductors to the ground bus in the enclosure with suitable pressure connectors.
Connect the grounding electrode conductor to the ground bus.
Connect metallic conduits, which terminate without mechanical conductive connection to the enclosure, by grounding bushings and ground wire to the ground bus.
Feeders and Branch Circuits:
Install green grounding conductors with feeders and branch circuits. Additional locations and systems as shown.
Raceway Systems:
Ground all metallic enclosed raceway systems.
All enclosed raceway connecting to equipment shall contain a grounding conductor.
Conduit systems shall contain a grounding conductor.
Bond grounding conductor at beginning and end of raceway provided for mechanical protection containing only a grounding conductor.
Boxes, Cabinets, Enclosures, and Panelboards:
Bond the grounding wires to each pullbox, junction box, outlet box, cabinets, and other enclosures through which the ground conductors pass.
Provide lugs in each box and enclosure for ground wire termination.
Provide ground bars in panelboards, bolted to the housing, with sufficient lugs for terminating the ground wires.
Receptacles - Refer to Section 26 27 26.
Ground lighting fixtures to the equipment grounding conductor of the wiring system.
Fixed electrical equipment shall have a ground lug installed for termination of the equipment ground conductor.
Motors:
Install a separate insulated equipment grounding conductor from the equipment ground connection in the motor controller through the raceway and flexible conduit to the ground terminal on the motor housing.
Ground motor controller through feeder raceway. No reductions.
Control and Signaling Equipment:
Ground metallic enclosures and raceways, terminate shields and drain wires to building ground system.
Provide additional grounding as required by equipment manufacturer.

TESTING
Test per IEEE 81.
Grounding Electrode Conductor:

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Measure resistance between switchboard ground bus and each grounding electrode, using a Megger and a single length of additional wire.
Measure resistance between both ends of the additional wire used.
Grounding Electrode Conductor resistance is the difference between 1 and 2.
Correct any inadequate connections as indicated.

END OF SECTION

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PART 1 GENERAL

WORK INCLUDED
Raceway Supports.
Cable supports.
Provide all hardware and materials to support, as required, a complete and congruent raceway system.

APPLICABLE STANDARDS
National Fire Protection Association (NFPA)
NFPA 70 National Electrical Code
Underwrites Laboratories (UL)
UL 2239 Hardware for the Support of Conduit, Tubing, and Cable
National Electrical Contractors Association (NECA)
ECA 101 Standard for Installing Steel Conduit

PART 2 PRODUCTS

RACEWAY SUPPORTS
Single Runs:
Steel rod hangers, galvanized single hole conduit straps, or ring bolt type hangers with spring clips.
Adhesives, tape, staples, zip/wire ties, or "J-nails" not acceptable.
Multiple Runs:
Rack with 25 percent spare capacity. Maximum width per manufacturer's recommendations.
Vertical Runs:
U-channel support with conduit fittings.
All hardware such as inserts, straps, bolts, nuts, screws and washers shall be galvanized or plated steel.
PVC coated galvanized steel in exterior and wet locations.
Channel manufacturers: Kindorf, Unistrut, or approved.

CABLE SUPPORTS
Approved plastic coated wire-ties.
Approved PVC coated hangers.
Building studs as permitted by Code and specifications.

PART 3 EXECUTION

INSTALLATION
Supporting devices shall be listed for the location installed. Supports shall be of like material of raceway and be rated for location installed.
Layout to maintain headroom, neat mechanical appearance, and to support equipment loads required.
Exact location and spacing between supports per manufacturer's recommendations and NEC requirements.
Provide adequate spacing to prevent moisture build-up. All runs of conduit shall be arranged so as to be devoid of traps wherever possible.
Cable “Sag” greater than 3-Inches from valley to peak of run, not acceptable.

END OF SECTION

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PART 1 GENERAL

WORK INCLUDED
Conduit, Fittings, and Tubing.
Flexible Conduit.

REFERENCE STANDARDS
National Fire Protection Association (NFPA).
NFPA 70 National Electrical Code--Chapter 3.
Underwriters Laboratories (UL) 6,
UL797
UL1990

PART 2 PRODUCTS

MATERIALS AND COMPONENTS
General:
No smaller than ¾-inch unless otherwise shown or indicated herein.
Conduit and Tubing:
Electrical metallic tubing, galvanized rigid steel threaded conduit, Schedule 40 PVC.
Flexible Conduit:
Flexible plastic jacketed type with liquidtight connectors and steel wrap armor (liquidtight flexible metallic conduit).
Metal Clad (MC Cable):
See Building Wires and Cables.
Fittings:
General:
Listed and approved for purpose. Water, gas, concrete tight where required.
Electrical Metallic Tubing (EMT):
Connectors to be steel. All connectors shall have factory insulated throats. Couplers and connectors shall be compression, setscrew type.
Galvanized Rigid Steel Conduit (GRC):
Threaded. Do not use pressure type. Provide factory insulated throats on bushings.
Liquidtight Flexible Metallic Conduit:
Continuous copper ground in core; approved watertight.
Metal Clad (MC Cable):
Listed for continuous outer sheath connection ground path, screw-in box termination with locking nut, screw-down compression type cable grips. Outer surface shall clamp-down on cable sheath. Use of screw(s) as pinching/clamp where screw comes into direct contact with cable is not permitted. “Snap-on/in”, “biting”, “shark-bite” type fittings are not approved. Box connections shall be tight with no movement of fitting when secured to box.
Expansion Joints:
Offset or sliding type with bending straps and clamps. Listed for purpose.
Entrance Seal:
Shall be modular, mechanical type, consisting of inter-locking synthetic rubber links shaped to continuously fill the annular space between the pipe and the wall opening. The elastomeric element shall be sized and selected per manufacturer’s recommendations. Garlock Link-Seal or approved.
Underground Marking Tape:
6-inches wide, yellow, low-density polyethylene 4 mil thickness. Imprinted: "CAUTION: STOP DIGGING - BURIED ELECTRIC LINE BELOW" and current date. Tape for telephone line similar, except green.

TYPE
Utilize GRC in concrete with concrete-tight connectors.
Utilize GRC for exterior with watertight connectors.
Utilize electrical metallic tubing, or MC cable concealed in finished interior spaces.
Utilize electrical metallic tubing exposed in unfinished spaces, where not subject to physical damage.
For underground conduit, utilize Schedule 40 PVC or GRC. Provide GRC elbows and GRC risers through

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penetrations where PVC is used.
Utilize surface metal raceways for exposed runs in finished areas. Paint to match wall finish. Use only where shown on Drawings or where approved.
Connections to motors, vibrating equipment, and movable equipment shall be with flexible metallic conduit or liquidtight flexible metallic conduit. Use liquidtight type in damp locations. No smaller than 1/2-inch for motor connections. Use 3/8-inch only for light fixture wiring where provided by light fixture manufacturer. Provide sufficient length of flexible conduit to stop vibration into connecting support. Sizes not noted on the Drawings shall be as required by the NEC and no smaller than upstream connection conduit size.
Flexible metallic conduit not to exceed 6-feet at any one location unless request is affected by engineer in writing.

PART 3 EXECUTION

INSTALLATION
Install raceway concealed in all areas where required concealment not required in mechanical and electrical rooms, connections to motors, above suspended ceilings, and underfloor spaces.
Coordinate installation of conduit in masonry, cabinetry, and building slab work.
Underground Raceways: Watertight, including fittings, slope 3 inches per 100 feet downward from building. Install underground marking tape. Bury 6 inches to 8 inches below grade directly above raceway. Seal exterior junction boxes or provide with drainage.
Galvanized rigid steel conduit installed in contact with earth shall be wrapped with 2-half laps of 10 mil, all weather, corrosion protection tape.
Route all conduits parallel or perpendicular to building lines.
Vertical Runs:
Straight and plumb.
Raceways Running in Groups:
Run at same elevation, properly spaced and supported.
Install conduit in concrete slab with minimum 2-inch cover. Do not install conduit larger than one inch maximum in concrete slabs unless approved.
Do not interfere with placement of concrete re-bar. Place raceway between re-bar layers. Space at least 8-inches on center. Space as far as possible where terminating at same area. Secure raceway, boxes, inserts, etc. by mechanical means prior to pour.
Install conduit free with no dents or bruises. Cap ends to prevent entry of foreign materials and moisture.
Clean raceway before installation of conductor.
Alter conduit routing to avoid obstructions, minimizing crossovers. Avoid use of bends and offsets where possible. Only bend raceway with an approved conduit bending machine or approved hand (hickey) bender.
Provide listed expansion complete fittings with grounding jumpers where conduits intersect building expansion joints and for longer runs where conduit expansion may be excessive.
Allow minimum of 6 inches clearance at flues, steam pipes, and heat sources.
Dissimilar Metals:
Avoid contact with pipe or duct runs of other systems.
Lengths and Bends:
Maximum number of bends in any run shall be the equivalent of four quarter bends (360 degrees total).
Maximum length of any run shall be 300 feet, less 50 feet for each equivalent quarter bend. Provide Junction and pull boxes to meet these limits.
Provide entrance seal for all exterior wall, underground, and exterior slab raceway penetrations.
All empty raceways shall be provided with pull string or #12 conductor. Provide #12 conductor for exterior empty PVC raceways.
Where MC Cable is utilized for fixture whips only, maximum length shall be 1.1 times distance of fixture connection point to structure. Utilize J-Boxes, as required above every suspended fixture. Cable hung fixture's connection point is at required J-Box above ceiling (not the additional structural mounted J-box).
Flexible connections lengths shall not be excessive as deemed by EOR.
Maintain separation of MC Cables. MC cables are not permitted in exposed areas, including exposed ceilings unless accepted by Architect, not subject to damage, and/or not within a wet/damp location. If

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accepted by Architect, exposed ceiling MC cables shall be racked, with no sag per Supporting Devices. Paint as per Architect. In no case, shall MC cabling exceed 5 total cables in any one group. In no case shall groups be tied, or otherwise held with zip-ties, string, and the like. Grouping if required, shall be routed through mechanical clamps, and in neat, professional, workman like manner parallel and perpendicular to building lines with group stacking, and racking as required maintaining separations; otherwise, provide EMT. Contractor shall provide legible layout/routing sketches with applicable elevations and separations, cable counts, etc. Submit for acceptance, provide grouping MC Cables in any exposed area accepted by Architect.

END OF SECTION

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PART 1 GENERAL

DESCRIPTION OF WORK
Provide electrical boxes and fittings as required for a complete, protected, and operable system.
Comply with local Codes and NEC as required for Providing electrical boxes and fittings.

REFERENCE STANDARDS
American National Standards Institute (ANSI).
C73 Series Dimensions of Attachment Plugs and Receptacles
National Electrical Manufacturers Association (NEMA)
OS 1 Sheet-Steel Outlets Boxes, Device Boxes, Covers, and Box Supports
FB 1 Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable

APPLICABLE REGULATIONS
American National Standards Institute (ANSI).
C2 National Electrical Safety Code (ANSI/IEEE C2)
National Fire Protection Association (NFPA).
NFPA 70 National Electrical Code.
Underwriters' Laboratories (UL).
UL50 Cabinets and Boxes (ANSI/UL50).
UL514 Outlet Boxes and Fittings (ANSI/UL514).

PART 2 PRODUCTS

OUTLET BOXES:
No smaller than 4-inch, 1-1/2-inches deep box. Provide raised covers where required for surface mounted outlets, plaster rings on flush outlets. Provide tile rings where flush outlets installed in tile. Concrete type where installed in concrete.
Receptacle Outlets and Flush Switch:
4-inch square box, 1-1/2-inches deep, with single or two-gang plaster ring.
Match one piece gang boxes to number of devices, install one device per gang. Devices requiring more than one-gang shall be installed in individual boxes matched to device size. Do not exceed 5-gang configuration per row of devices at same location.
Provide galvanized steel interior dry location outlet wiring boxes for emt raceway shaped and sized, to conform to each individual location and installation. Provide with factory knockouts in back and sides, and with threaded holes with screws for securing box covers or devices.
Provide outlet box accessories as required. Accessories include mounting brackets, wallboard hangers, extension rings, fixture studs, cable clamps and metal straps for supporting outlet boxes. Choice of accessories is Contractor’s option.
Outlet Box Covers:
Flush Mounting:
Bevelled, 302 stainless steel, or per Architect match device installed or full cover where no device installed.
Surface Mounting:
Bevelled, steel, pressure formed, or per Architect match device installed or full cover where no device installed.

WEATHERPROOF / WET LOCATION OUTLET BOXES:
Provide corrosion-resistant cast metal weatherproof outlet wiring boxes, shaped and sized, to conform to each individual location and installation. Provide with threaded conduit ends, suitably configured for each application, including face plate gasket and corrosion proof fasteners.
Weatherproof boxes shall have smooth sides, gray finish.
Boxes used in contact with earth shall be cast iron alloy with gasketed screw cover and water-tight hubs.
Weatherproof Plates:
Cast metal, gasketed for switches provide spring loaded sealed door(s).
Weatherproof Receptacle Outlet Cover: Cast metal, NEMA 3R, In-Use type, with locking tab. Match device configuration. 3 ¼ -inches internal depth. T&B CK series, or approved

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WEATHERPROOF JUNCTION AND PULL BOXES:
Provide galvanized sheet steel junction and pull boxes, with screw-on covers; of the type, shape and size, to suit each respective location and installation; with welded seams and equipped with stainless steel nuts, bolts, screws and washers.

KNOCKOUT CLOSURES:
Provide punched-steel knockout closures for steel boxes.

PULLBOXES
Provide sheet metal in interior dry locations for EMT raceway. Provide cast metal in exterior, or damp locations. Type and material shall conform to National Electrical Code, with screw-on cover.
Flush Mounted Pullboxes:
Provide overlapping covers with flush head screws, finished in light gray enamel.
Box volumes shall meet NEC for size and number of entering conduits and cables.

UNDERGROUND PULLBOXES
Underground Pull Boxes:
Cast concrete with suitable concrete cover to withhold loads in location installed. Provide heavy-duty traffic cover where installed with vehicle traffic. Cover and box shall not deform and be rated for location installed. Provide drainage and no less than 4 feet compacted gravel below installation. Size, and configuration to match installation. Provide where required, and shown on Drawings.

PART 3 EXECUTION

INSTALLATION
Match one piece gang boxes to number of devices, install one device per gang. Do not exceed 4-gang configurations per row of devices at same location.
Locate outlet boxes flush other than in mechanical rooms, electrical rooms, and above suspended ceilings. Provide insulation behind box to prevent condensation for boxes mounted in exterior walls.
Provide insulation behind box for walls with insulation for sound reduction.
Coordinate location and mounting heights with built-in units and cabinetry. Outlet mounting height shall be at same level required for equipment served.
When mounting receptacle, or voice/voice outlet boxes above bench or counter, mount box to the side (horizontally) for finished receptacle grounding pole at left.
Locate pullboxes and junction boxes concealed above suspended ceilings or in electrical rooms, mechanical rooms, or unfinished areas.
Support:
Provide adequate support of all outlet boxes. Secure boxes independent raceway, by attaching directly to building structure by approved means.
Identify each junction and pullbox with system description including branch circuit numbers of enclosed circuits, and voltage.
Secure all raceway to entering boxes with approved bushings, and locknuts.
Do not mount boxes back-to-back. Boxes on opposite sides of wall shall be separated by at least 3 inches.
Maintain sound transmission and fire properties of surface installed. Provide appropriate fire stop and sound stop materials as required to maintain these properties.
Provide separate boxes where two voltage systems have equipment at same location. Provide separate boxes for equipment on emergency power system.

END OF SECTION

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PART 1 GENERAL

WORK INCLUDED
Permanent Identification of system components.

APPLICABLE REGULATIONS
National Fire Protection Association (NFPA)
NFPA 70: National Electrical Code.

SUBMITTAL
Provide sample of each label type.

PART 2 PRODUCTS

MATERIALS
Phenolic Nameplate:
Three -layer, white front and back with black core.
Neatly engraved through outer layer to show white characters on black background.
Beveled edges, print lettering.
Other colors as specified or shown. Use red for fire alarm, or fire sprinkler only.
Stenciling and Silk Screening:
Printed lettering with enamel or lacquer paints. Legends contrasting with the background on which applied
Panelboard Directory Card:
Fiberboard typed. Laminate or place in protective cover.
Concealed Box Labels:
Permanent black ink such as “Sharpie” pen with neat and legible writing. Red permanent ink for fire alarm.
Concealed Conductor Labels:
Listed white tape wrapped around individual conductor or cable, with permanent black ink with printed lettering
Permanent Self-Adhesive Labels:
Temperature, moisture and UV resistant. Metallic and reflective background with printed contrasting lettering.
Exterior Weather-proof Adhesive Label. Temperature, moisture and UV resistant with printed contrasting lettering.
Outlet / Device covers:
Clear / transparent tape with matching printed black ink letter / numbering.

PART 3 EXECUTION

EQUIPMENT TO BE IDENTIFIED
Motor starters, panels, lighting panels and the disconnecting devices contained therein.
Egress/Emergency Lighting
Remote Emergency Inverters
Disconnects.
Control panels, starters, pushbutton stations, pilot lights and other control devices.
Transformers.
Remote control devices.
Conductors at both device and terminal strip terminations for control and instrumentation cables and conductors.
Other items as specified, required by NEC, or noted on Drawings
Devices in lighting panels and power panels shall be identified on the panelboard directory card.
Receptacles and Switches.
Junction Boxes.

PHENOLIC NAMEPLATES

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Power panels shall be labeled on the door of the interior with a nameplate. Letters for panels shall be printed and no less than 1/2 inch high.
Provide nameplate on switchboard
Provide nameplates where specified and as shown.

APPLYING IDENTIFICATION
Stenciled letters shall be applied by brush or by spraying.
Nameplates shall be attached with either adhesive or screws. If adhesive is used, it shall adequately adhere to the surface installed.

IDENTIFICATION REQUIREMENTS
Indicate Voltage for all concealed labels, and for Disconnects, panelboard and switchboard identification.
Identification for disconnecting devices contained in panels and motor control centers shall show the equipment name and location by floor, area, and direction to adequately indicate location of load. Do not include Voltage when the Voltage is the same as for the panel or motor control center.
Nameplates on disconnect devices located in the area but not part of a panel or motor control center shall have the equipment name, power source identification, and voltage designation. Nameplates for disconnect devices located remotely from the equipment shall also show the equipment location by floor, area, and direction to adequately indicate location of load.
All indicators and controls for control panels, starters, and the like shall be labeled, such as (Start, Stop, On, Off, Reset, Fault, etc.).
Panelboard directory cards shall list the circuit numbers and show the equipment name and location supplied by the circuits. Equipment locations shall be shown by floor, area and direction, or by room numbers.
Device covers to include serving circuit and panelboard name, include at receptacles, switches, outlets, system furniture connections, floor boxes, etc.
Apply clear/ translucent adhesive tape with typed black lettering not more than 1/4” in height via use of label maker.

END OF SECTION

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PART 1 GENERAL

WORK INCLUDED
Circuit Breakers.
Fuses.

REFERENCE STANDARDS
American National Standards Institute (ANSI).
C37.16 Preferred Ratings, Related Requirements, and Application Recommendations for Low Voltage Power Circuit Breakers and AC Power Circuit Protectors.
C37.17 Trip Devices for AC and General-Purpose DC Low-Voltage Power Circuit Breakers.
C37.50 Test Procedure for Low-Voltage AC Power Circuit Breakers Used in Enclosures - Test Procedures.
C97.1 Low Voltage Cartridge Fuses 600 Volts or Less.
Institute of Electrical and Electronic Engineers, Inc. (IEEE).
20-73 Low Voltage AC Power Circuit Breakers Used in Enclosures: ANSI C37.13.
National Electrical Manufacturer's Association (NEMA).
FU-1 Low Voltage Cartridge Fuses.

APPLICABLE REGULATIONS
Underwriters' Laboratories (UL).
UL 489-72 Molded Case Circuit Breakers and Circuit Breaker Enclosures.
UL 198 E Class R Fuses.
UL 869 Service Disconnects
UL 1066 Standard for Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures
National Fire Protection Association (NFPA).
NFPA 70 National Electrical Code.

QUALITY CONTROL
Breakers shall be inherently coordinated with feeder breakers by manufacture.
Breakers shall be of the same manufacturer.

PART 2 - PRODUCTS

CIRCUIT BREAKERS
Construction
Bolt-on connection to bus.
Thermal-magnetic, molded case, with inverse time current overload and instantaneous magnetic tripping.
Quick-make, quick-break, with tripped indication clearly shown by breaker handle taking a position between ON and OFF.
Multiple phase breakers shall have a common internal trip. Do not use handle ties between single pole breakers.
Breaker shall be switch (T) rated.
Include locking handle for each breaker provided it does not impede GFI/AFCI or other testing requirements. Utilize for maintenance lock-out tag-out.
Where used as service disconnects, breakers shall be listed for use as service entrance equipment and shall include locking handle.
Building normal power service main breaker shall include power monitoring with LCD display on breaker.
Voltage- each phase L-L, L-N
Amps- each phase
kW/KVA
Integrated customer meter in service panel, or service switchboard is acceptable in lieu of main breaker power monitoring.
Breakers, 400 amps and larger, shall include externally operable mechanical means to trip the circuit breaker, enabling maintenance personnel to verify the ability of the breaker trip mechanism to operate as well as exercising the breaker latch and operating mechanisms.
Fully rated at fault current of panel or switchboard.
Inherently coordinated by manufacturer with upstream protection device.

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Breakers, 100 amps and larger:
Shall include externally operable mechanical means to trip the circuit breaker, enabling maintenance personnel to verify the ability of the breaker trip mechanism to operate as well as exercising the breaker latch and operating mechanisms.
Long Delay Protection (Long Delay Pickup, Long Delay Time) setting
Short Delay Protection (Short Delay Pickup, Short Delay Time) setting
Instantaneous Setting
Arc-Flash Mitigation
Ground Fault Protection (Ground Fault Pickup, Ground Fault Delay)
Maintenance mode selection (engage/disengage instantaneous tripping for Arc flash safety)
Locking cover

GFI BRANCH CIRCUIT BREAKERS
Meet construction requirements herein.
Ground fault protection with integral push-to-test button.
Class 1.
Adjustable setting pickup from 0.03 to 30 Amps.
Adjustable time delay from instantaneous to 2.0 seconds.

TESTING
By Manufacturer at factory. Timed thermal trip test and timed magnetic trip test.
As required by local authority.
Submit test results to Engineer upon request.

PART 3 - EXECUTION

CIRCUIT BREAKER INSTALLATION
Label each breaker located in switchboard or separate enclosure to indicate load served.
Adjust settings on breakers to operate properly under actual field conditions and to provide selective system coordination.
Post breaker settings in electrical rooms, alongside one-line.
Torque breakers to bus per manufacturer’s requirements and installation procedures.

CIRCUIT BREAKER TESTING
Field Required, refer to Section 26 05 61.

END OF SECTION

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PART 1 GENERAL

WORK INCLUDED
Wires Connectors

REFERENCE STANDARDS
National Fire Protection Association (NFPA).
NFPA 70 National Electrical Code.
Underwriters' Laboratories, Inc (UL
UL 486A through UL 486E
American National Standards Institute (ANSI)
ANSI/UL 467

PART 2 PRODUCTS

TWIST-ON CONNECTOR
Pressure-type wound spring twist on connector.
Solderless pressure connectors.
Shell rating of 105 degrees C.
"Push-On" or "punch" type connectors not permitted.

COMPRESSION ADAPTER
Dual rated for use with both aluminum and copper cable conductors.
Diameter and ampacity as current carrying equivalent copper wire.
Pre-filled with approved joint compound
Connectors shall be clearly marked with Catalog Number, wire size and color-coded die index number.
Burndy "Hyplug" type AYP or equal by T&B, or approved.

TERMINAL, CRIMP TYPE
Flat; fork tongue, or flat circular matched to terminal size.
Color coded to wire size.
T&B "Sta-Kon", or approved.

WP COATING
Liquid
For use as an outer seal on vinyl tape splice, fast- drying, suitable for use for direct burial and moisture protection.
3M Scotchkote Electrical Coating FD, or approved

PART 3 EXECUTION

INSTALLATION
Provide Twist-On Connectors at taps and splices for conductors no larger than #10 AWG. Provide only in approved junction and outlet boxes.
Provide Compression Adapters for terminating a single conductor into mechanical connectors such as a circuit breaker or set screw lugs. Provide only where required for AL/CU transitions or where lugs require adapters.
Provide Crimp terminal at all Control voltage terminal blocks, unless otherwise recommended by manufacturer.
Do not nick conductor when stripping insulation. No "ringing"
Conductor and cable shall not be reduced at the terminal for connections.
Connectors shall be approved and listed for the purpose used.
Wrap all twist-on connectors with listed tape to maintain equivalent insulation of wire.
Exterior, Underground, and WP connections shall include 2-coats of WP Coating.
Remove any obstructions on connection to maintain continuity prior to installation of connectors, such as paint, dirt, and construction materials.
Copper conductors can be terminated in approved compression or mechanical connector, including set

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screws.
Provide slack at equipment to allow for a neat termination, access to conductors, and ability to repair or replace equipment.

END OF SECTION

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PART 1 GENERAL

WORK INCLUDED
Provide panelboards incorporating equipment of the number, rating and type specified herein and shown in Panel Schedules.

REFERENCE STANDARDS
American National Standards Institute (ANSI).
ANSI C37 Standard for Metal-Enclosed Low-Voltage Power Circuit Breaker Switchgear
Institute of Electrical and Electronics Engineers (IEEE).
Std. 241-74 Electric Systems for Commercial Buildings.
National Fire Protection Association (NFPA).
NFPA 70 National Electrical Code.
Underwriters' Laboratory (UL).
UL 67 Standard for Panelboards.
UL 869A Reference Standard for Service Equipment
National Electrical Contractors Associations (NECA)
NECA 407 Standard for Maintaining and Installing Panelboards
National Electrical Manufacturer's Association (NEMA)
NEMA PB 1.1 General Instructions for Proper Installation, Operation, and Maintenance of Panelboards Rated 600 Volts or Less.

QUALITY ASSURANCE
Panelboard breakers shall be selectively coordinated with feeder breakers.
Inherently coordinated by manufacture- i.e., manufacturer shall provide faster trip on smaller breakers such that a smaller rated breaker trips before a larger rated breaker.
Study not required, unless otherwise indicated, or unless AHJ and/or Code required study (such as medical, emergency, etc.)
Acceptable Manufacturers:
Eaton, Square D, Siemens (ITE), or approved.

PART 2 PRODUCTS

CONSTRUCTION
General:
Mounting hardware shall be captive type, and shall not pose a danger of dropping onto exposed parts if trim is opened, or removed.
Provide Arc-Flash Protection label per NEC.
Box:
Galvanized code gauge steel.
20-inch minimum width; 4-inch minimum gutter space on all sides. Larger as required by manufacturer and NEC.
Minimum 4 interior mounting studs.
Individual knockouts by manufacturer or field-cut per manufacturer requirements. Concentric knockouts are not permitted.
All exterior and interior steel surfaces of panelboard door and trim shall be cleaned and finished with industry standard gray baked enamel paint over a rust-inhibiting phosphatized primer coating approved by the paint manufacturer. Panelboards exposed in finished spaces shall have factory finish to match adjacent surfaces.
Bussing:
Copper- All phases, ground, and neutral.
Fully Rated. No reductions.
Bolt-on breaker Lugs
Tap Arrangement shall be phase sequence type, permitting any breaker configuration mounted at any location.
Short Circuit Bracing:
Fully rated.
Neutral Bussing:

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Full size, unless otherwise noted.
Properly sized lug for each outgoing neutral connection.
All bolts used to connect current-carrying parts together shall be accessible for tightening from the front of the panel.
Wiring terminals:
Compression or setscrew type for copper conductors; bolted to bus.
Secured not less than at 6 separate locations to the enclosure. Bus movement in any direction in excess of 1/8-inch. is not acceptable.
Trim:
Code gauge steel.
Flush panels shall include trim overlap around box not more than 1.5-inchs.
Surface Panels:
Same width and height as box.
Mountable by screwdriver, no special tools.
Tamper-proof:
Trim shall not be removable with door closed.
Include separate trim door and access door. Door-in-Door type construction.
Doors:
Shall conceal all breakers unless otherwise noted.
Provide internal concealed access door hinges. Exterior door hinge is not required to be concealed, but shall be painted to match exterior color of panel.
Over 48-inches in Height:
Shall have auxiliary fasteners at top and bottom of door in addition to flush latch (3-point).
Latches:
Spring-Type, flush, number as required by manufacturer
Where more than one latch is installed, access door shall be operable by only one person. Three simultaneously operated latches is not acceptable.
Equip latches with flush locks keyed alike. All panelboards shall be keyed alike.
Not less than NEMA 1 unless otherwise noted or otherwise required for location installed.

CIRCUIT BREAKERS
Main Breaker:
Provide where required and noted. Mount separate from branch breakers.
Covered by a metal plate, except for the operating handle, trip flag (if applicable), and trip button (if applicable).
Connection to breaker load side shall be contiguous bus bar. Connection by separate conductors is not acceptable.
Panel and breaker shall be listed as service disconnect where used in such applications, including alternate power service such as from an emergency generator.
Branch Breakers:
Bolt-on connection to bus. Securely mounted; Deflection of breaker with force applied in any direction greater than ¼-inch is not acceptable.
Additional requirements are noted elsewhere in these Specifications, shown on Drawings, and as per Code.

PART 3 EXECUTION

INSTALLATION
Provide mounting brackets, busbar drillings, and fillers for unused spaces.
Maintain fire properties of surface installed. Provide appropriate fire stop materials to maintain these properties.
Prepare and affix typed directory to inside cover of panelboard indicating loads and location of loads controlled by each circuit.
Provide panelboards flush in all finished areas. Unfinished areas include mechanical rooms and electrical rooms.
Securely mount raceway to panelboards with appropriate bushings. Bushings shall be insulated, and threaded through panelboard with locknut securing to box. Coordinate raceway size and locations entering box for neat a professional installation, as well as for appropriate routing.

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For flush panels, provide (1) 2-inch spare, (2) 1-inch spares, and (2) ¾-inch spares raceways stubbed to accessible ceiling space.

Combine all keys on one key ring and furnish to Owner at time of substantial completion.

END OF SECTION

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PART 1 GENERAL

DESCRIPTION

Provide surge suppression device (SPD) (previously known as TVSS- Transient Voltage Surge Suppression) equipment for the electrical distribution system.

REFERENCE STANDARDS

Underwriters Laboratories (UL)

UL 1449 Standard for Transient Voltage Surge Suppressers

UL 1283 Standard for Safety for Electromagnetic Interference Filters

American National Standards Institute (ANSI)

C62.41 IEEE Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits

PART 2 PRODUCTS

INTEGRAL PANELBOARD SURGE SUPPRESSOR

Provide in every Panelboard.

Unit shall be rated for Category B location per ANSI/IEEE C62.41-1991.

Unit shall be factory integrated into panelboard.

Each unit module shall be fused with a surge rated fuse and incorporate a thermal cutout device.

Minimum surge current capability shall be 80,000 amperes per phase, measured between L-N & L-G.

Unit diagnostics, mounted in door of distribution equipment, shall include the following:

Operational LEDs to indicate loss of protection and circuit fully operational for each protection status.

The internal design of the unit shall have a minimum EMI/RFI filtering of –50 dB from 100kHz to 100MHz

The UL 1449 Listed and Recognized Component Suppression Voltage ratings shall not exceed:

330 Volts for 120/208 or 240 voltage configurations.

700 Volts for 480 voltage configurations.

All required “burn-in” tests shall be conducted at factory, prior to shipment.

Rated for not less than 200,000 AIC.

Installation shall not decrease available over-current protection device spaces including main breaker.

Acceptable manufacturer: Advanced Protection Technologies, by panelboard manufacturer, or approved.

INTEGRAL SWITCHBOARD SURGE SUPPRESSOR

Provide in every Switchboard.

Unit shall be rated for Category C location per ANSI/IEEE C62.41-1991.

Unit shall be factory integrated into switchboard.

Each unit module shall be fused with a surge rated fuse and incorporate a thermal cutout device.

Minimum surge current capability shall be 120,000 amperes per phase, measured between L-N & L-G.

Unit diagnostics, mounted in distribution equipment, shall include the following:

Operational LEDs to indicate loss of protection and circuit fully operational for each protection status.

Dual LCD surge counter for L-N and L-G modes

Audible alarm with silence toggle switch

The internal design of the unit shall have a minimum EMI/RFI filtering of –50 dB from 100kHz to 100MHz.

The UL 1449 Listed and Recognized Component Suppression Voltage ratings shall not exceed:

330 Volts for 120/208 or 240 voltage configurations.

700 Volts for 480 voltage configurations.

All required “burn-in” tests shall be conducted at factory, prior to shipment.

Rated not less than 200,000 AIC.

Acceptable manufacturer:

Advanced Protection Technologies, by switchboard manufacturer, or approved.

PART 3 EXECUTION

INSTALLATION

System shall be complete.

Comply with applicable Sections of this Division.

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WARRANTY

Full five year warranty by manufacturer and includes unlimited replacement of all components.

END OF SECTION

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PART 1 GENERAL

WORK INCLUDED
Wall Switches.
Receptacles.
Ground Fault Receptacles.

REFERENCE STANDARDS
American National Standards Institute (ANSI).
C73 Series Dimensions of Attachment Plugs and Receptacles.
National Electrical Manufacturer's Association (NEMA).
WD 6 Wiring Devices- Dimensional Requirements
WD 1 General Color Requirements for Wiring Devices.
National Fire Protection Association (NFPA).
NFPA 70 National Electrical Code.
Underwriters' Laboratory (UL).
UL-20 Standard for Snap Switches.
UL 498 Attachment Plugs and Receptacles
UL 467 Grounding and Bonding Equipment
UL 514D Cover Plates for Flush-Mounted Wiring Devices
2006 UL 943 Safety for Ground-Fault Circuit-Interrupters

QUALITY ASSURANCE
Provide type 5362 receptacles in common, assembly, and office areas.
Provide type 5362 receptacles in residential/suite areas.
Acceptable Manufacturers: Hubbell, Pass and Seymour, Arrow-Hart, Leviton, or approved

PART 2 PRODUCTS

MATERIALS
Switches:
120/277 Volt. AC Quiet, slow make, slow break design, toggle style handle, with totally enclosed case, 20 Ampere, specification grade. Provide matching two-pole, three-way and four-way switches.
Keyed Switches:
Same as Switches, with tamper resistant keyed switch and matching wall plate.
Receptacles:
20 Ampere (unless otherwise indicated), 125 Volts (unless otherwise shown), duplex, polarized, full gang size, tamper type, specification grade, separate ground terminal, 20 Amp. break-off tab for split circuit wiring. Tamper not required in janitorial, or employee only areas where children will not be present.
Ground Fault (GFI) Receptacles:
20 Ampere, tamper type, specification grade duplex receptacle with integral ground fault circuit interrupter. LED operation indicator. Test and reset buttons. End of life protection- GFI component failure results in no power delivered to equipment (2006 UL 943).
Wall Plates:
302 Stainless Steel, or per Architect match device configuration.
Colors:
Verify colors with Architect.
Gray Receptacles, Gray Switches: In finished areas that are not dark brown in color.
Brown Receptacles, Brown Switches & Brown Nylon Wall Plate: In finished areas with dark brown or dark wood finish.

PART 3 EXECUTION

INSTALLATION
Do not use back wiring wells, terminate conductors on mechanical screw terminals.
Do not use GFI-Feed through function, GFI receptacles with test, reset, etc. required at each location

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where GFI is required.
Provide wiring devices as shown.
Install devices plumb and consistent with building lines. Wall Plates shall make contact on four corners and shall fit flush with device.
Devices to include same configuration outlet box, cover, wall plate and other necessary installation materials for a complete operating circuit.
Mount switches 42 inches (to center line of faceplate) above floor except as otherwise noted on the Drawings.
Coordinate mounting locations with architectural details.
Mount receptacles vertically at 15 inches (to bottom of faceplate) above finished floor, with grounding pole at bottom.
Coordinate receptacle height with benches and counters.
When mounting receptacle above bench or counter, mount receptacle to the side with grounding pole at left.
Where installed with disposal: Provide split switched GFI receptacle (or GFI via Breaker) for receptacles mounted under sinks. Provide switch for ½ duplex receptacle in approved ADA location such as under sink within counter, or above counter if ADA accessible. Delete switch if air-switch or other control device is specified.
Grounding:
Install a separate bare conductor between the receptacle strap grounding (green) screw and a screw into the outlet box. Self-grounding strap not approved as grounding means.
Where existing receptacle circuiting is changed to emergency power, remove existing receptacle, and replace with distinctive color per NEC. Replace with like receptacle removed including GFI, AFCI, etc.1
Where automatic control is required (At least 50% of all 125 V, 15 and 20 amp receptacles in private offices, conference rooms, rooms used primarily for printing and/or copying functions, break rooms, classrooms, and individual workstations), utilize dual relay occupancy sensors for this function. Refer to automatic lighting control requirements. Label automatically switched outlet per Energy Code.

END OF SECTION

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PART 1 GENERAL

WORK INCLUDED
Provide motor disconnects as shown, and as required by Codes.
Provide circuit disconnects as shown, and as required by Codes.
Provide manual motor starters for single phase motors below one horsepower where disconnect is shown as required by Codes.
Disconnects to include adequate support, required hardware, and accessories for com-plete functional installation.

APPLICABLE REGULATION
Conform to National Electrical Code and inspection authority.
Provide disconnects rated for the location installed, as required by National Electrical Code, as shown, and as indicated herein.

REFERENCE STANDARDS
Underwriters' Laboratory (UL).
UL-98 Enclosed Switches.
National Electrical Manufacturer's Association (NEMA).
NEMA KS-1 Enclosed Switches.

PART 2 PRODUCTS

MANUAL MOTOR STARTER
Toggle horsepower rated, switch with thermal overload and pilot light.
Switch tab for locking switch in “OFF” Position.

DISCONNECT
Motor and circuit disconnects shall have a UL label.
Construction:
Dry, Indoor Locations shall be not less than NEMA 1. Enclosures for outdoor, or wet locations shall be not less then NEMA 3R. Rated at 600 Volt. Heavy duty, quick make, quick break. Number of poles and ampacity as noted or required by Code. Fusible with dual element fuses where shown. Short circuit rating sufficient to withstand the available fault current. Solid ground, solid neutral.
Compression lugs or set-screw lugs approved for use with copper wire.
ON/OFF Positions clearly marked.
Lockable in "OFF" position.
Interlock:
Prevents switch from being opened when "ON."
Prevents closing switch when cover is open.
Provide defeater to permit authorized personnel to open door and inspect switch when "ON," or operate with cover open.

COMBINATION MOTOR STARTER AND DISCONNECT
Include features of Disconnect above.
Provide molded case magnetic only circuit breakers with operating handle and lock-off facility.
Provide contactors with three overload relays.
Holding coil at 120 Volts.
Provide pilot lights in cover, red & green neon or LED type.
Provide reset button, and Hand-Off-Automatic switch in cover, field convertible to Off/Auto or Start/Stop momentary pushbutton.
Provide starters with a sufficient number of auxiliary contacts (N.O. and N.C.) to afford the control and interlocking required in addition to standard auxiliary holding contacts supplied with each contactor.
Provide control transformer with 120 volt secondary voltage of sufficient capacity to handle operating coil and associated controls. Protect transformers with fuses on primary and secondary sides of transformers as required by Code.
Minimum size NEMA 1.

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Enclosure for dry, indoor locations:
NEMA 1, drip-proof. Others as required by location.

PART 3 EXECUTION

INSTALLATION
Install motor and circuit disconnects as recommended by manufacturer, required by Code, required by UL, and where shown.
Maintain Code clearances and access.
Provide Manual Motor Starter where shown for single phase motors rated less than one horsepower.
Manual Motor Starter is not required for motors with integral thermal overload protection. Provide Switch with locking tab for motors with integral thermal overload protection. Provide Manual Motor Starters as required for single phase motors without integral or other protection, otherwise provide Disconnect.
Provide a phenolic nameplate on each disconnect identifying the equipment item served.
Independently support disconnects. Do not mount disconnects on vibrating, HVAC, or Plumbing equipment.
Install heaters correlated with full load current of motors provided.
Set overload devices according to measured current of motors provided.

END OF SECTION

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PART 1 GENERAL

WORK INCLUDED
Emergency Lighting Battery Power Packs

PART 2 PRODUCTS

GENERAL
Power packs shall be UL listed and conform to Code requirements for emergency power devices.
Power packs shall fit into physical space allotted for such by lighting equipment manufacturer with temperature limits and heat transfer protections. Mount in ballast compartment, or external for retrofit fixtures only.
In upgrades to existing fixture applications emergency power pack to be located concealed above drop ceiling unless unsupported for specified power pack. Provide mounted near or on-top of fixture in fire rated enclosure. IC rated where required and meeting enclosure, fire, and temperature rating by power pack manufacturer.

OPERATION
Unit shall be capable of powering the specified lamp combinations for not less than 90 minutes at full operating lumens of the lamp(s).
Include provision for switched battery packs.
Lamp(s) switch ON/OFF under normal power conditions. Switched circuit shall be bypassed under emergency power conditions or loss of normal power.
Provide self-testing system
Automated self-testing. If problem is detected, status indicator light flashes, and an audible alarm is heard
Automated test schedule where unit operates on emergency power:
30 seconds every 30 days
90 minutes once a year

CONSTRUCTION
Solid-State, high frequency output, remote battery pack with the following:
Transfer relay
Sealed, Self-restoring battery charger
Transistor type inverter ballast
Remote test switch and disarrangement signal indicator light to be flush wall mounted. Provide nameplate “Emergency Light Test Switch”
Suitable for operation on either 120 or 277 Volts.
Self-Testing system with visual, and audible alarm.

QUALITY ASSURANCE
Initial Contractor Testing:
After initial full charge, test emergency power units by shutting down normal power for over 90 minutes. Replace any units that fail prior to 90 minutes. Coordinate test schedule with Engineer.
Warranty:
Provide 5-year product warranty.

PART 3 EXECUTION

MOUNTING – REMOTE TEST SWITCH
Mount remote test switch near fixture, and in location approved by Owner, Architect, and AHJ.
Mount on drop ceiling where power pack installed with ACT, or where approved by AHJ.
Mount in accessible locations where power pack installed in hard-lids.

END OF SECTION

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PART 1 GENERAL

WORK INCLUDED
Provide complete, supported, trimmed and finished lighting system operational for the use intended.

REFERENCE STANDARDS
National Electrical Manufacturer's Association (NEMA).
NEMA LE1:
Fluorescent Luminaires.
American National Standards Association (ANSI)
ANSI C62.41 IEEE Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits
Underwriters Laboratories (UL)
UL 1598 Luminaires
UL 1029 Standard for High-Intensity-Discharge Lamp Ballasts
UL 935 Standard for Fluorescent-Lamp Ballasts'
UL 8750 Safety Standard for Light Emitting Diode Equipment for Use in Lighting Products
National Fire Protection Association (NFPA)
NFPA 70 National Electrical Code
Oregon Energy Code

COORDINATION
Verify compatibility and coordination of other materials with luminaire and ceiling system, and mounting system. Inform discrepancies to the Architect, and do not order until clarified.
Coordinate with Division 23 to avoid conflicts with mechanical equipment.

QUALITY CONTROL
Acceptable Manufacturers- Refer to Fixture Schedule.

PART 2 PRODUCTS

GENERAL
Provide support and trim hardware required for adequate support and approved appearance of mounted equipment.
Factory balanced. Provide concealed weighted material to offset ballast and other component weight.
Fixtures that do not hang or mount level are not acceptable.
Provide A12 lens, semi-diffuse, not less than 0.125 thick acrylic or per lighting fixture schedule.
Fixtures installed in insulated cavities shall be IC rated.
Provide fire rated enclosures for all fixtures installed in fire rated structures and fire rated ceilings.
Enclosure shall be of the same rating as to not compromise the full rating of the structure where installed.
Fixtures used in fire rated enclosures shall be UL listed for such installation and shall have 3-inches clear from enclosure on all sides.
Equipment shall be certified, and approved per Oregon Energy Code.

LED LUMINAIRES
Painted finish, no exposed materials with potential to oxidize. Additional or other requirements per Lighting Fixture Schedule.
Not less than 20-guage steel housing and reflectors unless otherwise indicated and per light fixture schedule.
Provide Hinged Frames with Catches; removable for cleaning without tools. Support lay-in lenses on four sides with flip ends on short dimension. Include captive removable and reusable hardware to secure lens to frame.
Design Luminaire to adequately dissipate heat from LEDs/lamp, driver, and battery pack.
Provide formed endplates and trim.
Suitable for mounting where shown.

RECESSED LUMINAIRES
Incandescent type shall be prewired with J-box integral to fixtures. Conductors rated for area and for

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conductor connections.
Flush and plumb with exposed surface, no gaps, include required trim rings and materials of adequate type for flush appearance.

PENDANTS/CABLE HANGERS
Pendant:
Shall be contiguous, and color matched to fixture. Pendant type shall include swivel sockets permitting normal fixture motion and self-adjustment. Include color matched canopy at structural attachment. Provide safety cables secured to structure, wrapped around or through pendant where recommended by fixture manufacturer to independently support fixture. Route conductors through pendant as per manufacturer requirements.
Visible Cable:
Field adjustable length, with extra coiled and concealed. Equal lengths, with 18-inches. Additional cable and for future adjustments. Locking ring to adequately hold fixture at desired mounting height. Cable stop to prevent fixture from sliding off end of cable.
J-Box at Ceiling (may be in addition to J-box at structure), separately supported, per NEC.

CABLE HUNG FIXTURE CORDS
Visible Cords:
Straight (not pigtail type) along length of cable, black, by fixture manufacturer. Shall not provide supporting function.

PART 3 EXECUTION

GENERAL
Replace any damage to fixture, lamps, lens, or other lighting components with new fixture. Damage includes paint spray, and other construction materials adhering to fixtures. Damage or altering fixture as a result of mounting or placing fixture into applicable space is not acceptable.
Install per requirements of Oregon Energy Code.
Provide 0-10V dimming if included as standard, or as specified, and/or shown. The lighting fixture schedule and fixture dimming indication, and/or fixture includes dimming as standard has been developed with this requirement, and intents to include dimming in areas where fixtures are provided with dimming, even when fixtures include dimming without a specific indication on the lighting plans/schedule that dimming is required.

COORDINATION
See Reflected Ceiling plan for exact location of equipment and ceiling construction.
See Finish Schedule for additional finish requirements.
Coordinate fixture mounting system prior to ordering fixtures.
Provide price breakdown accounting as required and requested by Oregon Energy Trust, or Engineer.

ACCESS
All fixtures shall have Code accessible supplies. Use reach-through type where recessed in non-accessible spaces.

SUPPORT
Suspended ceiling:
Attach light fixtures to the suspended ceiling system where installed. Attachment shall have capacity of 5 times fixture weight in all directions.
Support fixtures with not smaller than number 12 AWG hangers attached to the grid members within 3 inches of the corner of each fixture, attached to building structure.
Attach two not smaller than number 12 AWG hangers from the fixture housing to the building structure.
Support pendent-hung lighting fixtures directly from the structure above with not smaller than number 9 AWG wire or approved alternate support.
J-box at every fixture mounted to structure.
Support all fixtures from structure rated at least five times support weight.
J-box for every suspended or recessed in suspended ceiling fixtures.

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SURFACE MOUNTING

Attach with mechanical means to secure fixture flush with structure. Attach at each corner of fixture not less than four places to building structure. Round fixtures shall be attached by forming a tripod configuration. Single center connection is not acceptable.

Seal around fixture so no light trespass can be observed.

ACCEPTANCE

Remove all debris, bugs, and other foreign materials from lamps and fixture housings. Clean all lamps, shades, reflectors, and lens removing all temporary labels, debris, dirt, and dust per manufacturer guidelines.

END OF SECTION

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

ATTACHMENT 2

MARION COUNTY
BEHAVIORAL HEALTH CRISIS CENTER REMODEL

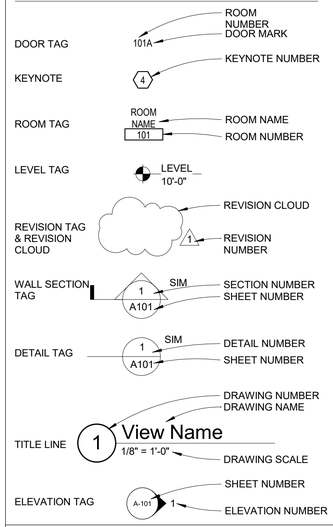
PROJECT DIRECTORY

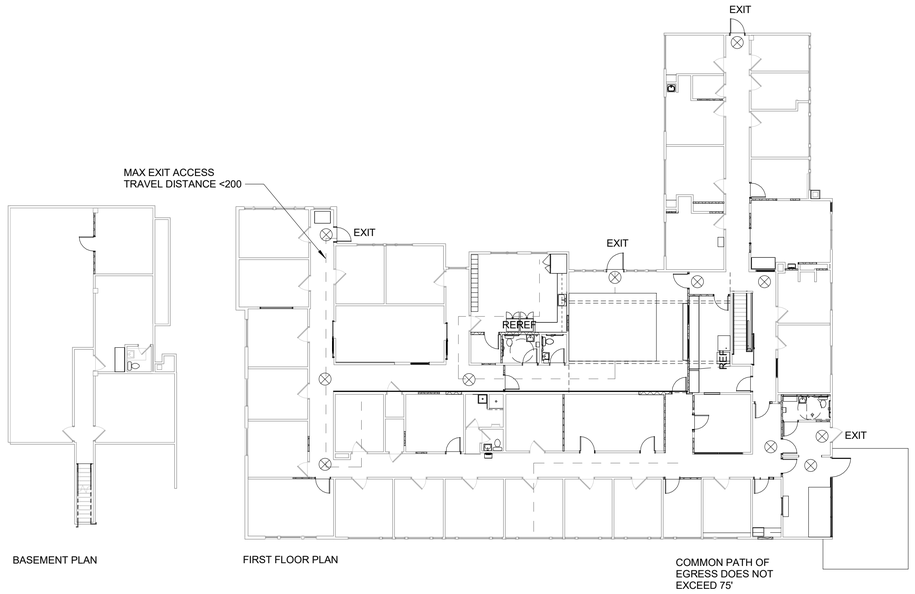
OWNER:
MARION COUNTY
555 COURT STREET NE
SALEM, OREGON 97301

ARCHITECT:
CARLSON VEIT JUNGE ARCHITECTS
3095 RIVER ROAD N
SALEM, OREGON 97303
PHONE: (503) 390-0281

MECHANICAL/ELECTRICAL ENGINEER:
FLUENT ENIGNEERING
2110 STATE ST
SALEM, OREGON 97301
PHONE: (503) 447-5030

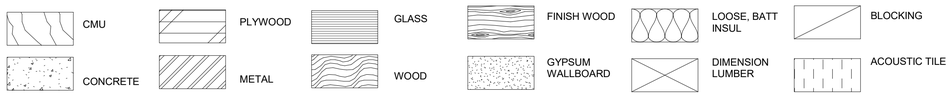
SYMBOLS LEGEND





EGRESS PLAN
1/16" = 1'-0"

MATERIAL REFERENCE



CODE SUMMARY

GOVERNING BUILDING CODE: OSSC 2022 (IBC 2021)

THIS PROJECT COMPRISES THE REMODEL OF AN EXISTING OFFICE BUILDING SPACE

ZONING CODE
PLANNING ZONE: MU-I - MIXED USE I

EXISTING PARKING AND LANDSCAPE TO REMAIN.

BUILDING CODE
OCCUPANCY GROUP: B
CONSTRUCTION TYPE: V-B
REMODEL: NON-SPRINKLERED

ALLOWABLE BUILDING AREA
B OCC BASIC ALLOWABLE AREA = 9,500 SF
BASEMENT ACTUAL AREA = 1,651 SF
FIRST FLOOR ACTUAL AREA = 9,195 SF

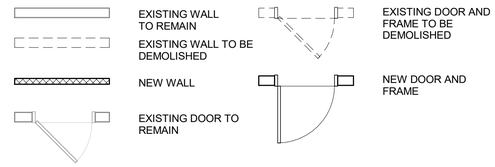
OCCUPANT LOAD
BASEMENT FLOOR
STORAGE AREAS (1198 SF/300) = 4
FIRST FLOOR
BUSINESS AREAS (6503 SF/150) = 43
UNCONCENTRATED ASSEMBLY (399 SF/15) = 27
CONCENTRATED ASSEMBLY (314 SF/7) = 45
ACCESSORY STORAGE (117 SF/300) = 1
TOTAL BUILDING OCCUPANT LOAD: = 120 OCC

MEANS OF EGRESS
EXITS REQUIRED: 2
EXITS PROVIDED: 4
EXIT WIDTH REQUIRED: 0.3 x 4, 0.2 x 116 = 24.4 IN
EXIT WIDTH PROVIDED: # EXITSxWIDTH = 144 IN

PLUMBING FIXTURES
OCCUPANCY GROUP B: = 120 OCC
WATER CLOSETS REQUIRED: 4
WATER CLOSETS PROVIDED: 5
LAVATORIES REQUIRED: 3
LAVATORIES PROVIDED: 5

DEFERRED SUBMITTALS:
WINDOW ENGINEERING

PHASING LEGEND



INDEX OF DRAWINGS

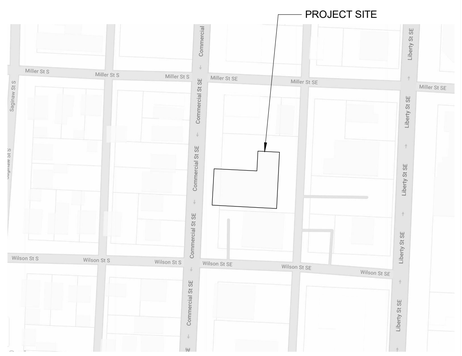
GENERAL
G-001 TITLE SHEET

ARCHITECTURAL
A-101 DEMOLITION FLOOR PLANS
A-102 FLOOR PLAN - NEW WORK
A-103 REFLECTED CEILING PLAN - DEMO
A-104 REFLECTED CEILING PLAN
A-201 EXTERIOR ELEVATIONS & DETAILS
A-202 INTERIOR ELEVATIONS
A-401 LARGE SCALE PLANS
A-501 INTERIOR DETAILS
A-502 INTERIOR DETAILS
A-701 FINISH PLAN

PLUMBING
P-000 TITLE SHEET
P-010 SCHEDULES
P-100 DEMOLITION PLANS
P-200 PLUMBING PLANS
P-600 TYP. DETAILS & ENLARGED PLANS

MECHANICAL
M-000 TITLE SHEET
M-010 SCHEDULES
M-011 VENTILATION SCHEDULE
M-020 THERMAL ZONE DIAGRAMS
M-100 DEMOLITION FLOOR PLANS
M-101 DEMOLITION PLANS - ROOF
M-200 HVAC FLOOR PLANS
M-201 ROOF PLAN
M-600 TYP. DETAILS

ELECTRICAL
E-000 LEGEND & SCHEDULES
E-010 ONE-LINE
E-100 POWER DEMOLITION PLAN
E-200 POWER PLAN
E-300 LIGHTING PLAN



VICINITY MAP

ABBREVIATIONS

(REFER TO CONSUTANT DRAWINGS FOR ADDITIONAL ABBREVIATIONS)

AB	ANCHOR BOLT
ACST	ACOUSTIC
ADJ	ADJUSTABLE, ADJUST
AFF	ABOVE FINISHED FLOOR
ALUM	ALUMINUM
ANOD	ANODIZED
APPROX	APPROXIMATELY
ASPH	ASPHALT
BD	BOARD
BLDG	BUILDING
BLKG	BLOCKING
BM	BENCH MARK, BEAM
BOT	BOTTOM
BUR	BUILT-UP ROOFING
CAB	CABINET
CB	CATCH BASIN, CORNER BEAD
CG	CORNER GUARD
CHBD	CHALKBOARD
CI	CAST IRON
CJ	CONTROL JOINT
CLG	CEILING
CLR	CLEAR, CLEARANCE
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONSTR	CONSTRUCTION
CONT	CONTINUOUS, CONTINUE
CONTR	CONTRACTOR
CNTR	COUNTER
CRS	COURSE, COURSES
CSK	COUNTERSINK, COUNTERSUNK
CW	COLD WATER
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIM	DIMENSION
DIV	DIVIDE, DIVIDED, DIVISION
DR	DOOR
DS	DOWNSPOUT
DTL	DETAIL
DWG	DRAWING
E	EAST
EA	EACH
EF	EXHAUST FAN
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRIC, ELECTRICAL
ELEV	ELEVATOR
ENCL	ENCLOSURE
EQ	EQUAL
EQUIP	EQUIPMENT
EW	EACH WAY
EXIST	EXISTING
EXP B	EXPANSION BOLT
EXT	EXTERIOR
FD	FLOOR DRAIN
FDTN	FOUNDATION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FH	FIRE HYDRANT
FHWS	FLATHEAD WOOD SCREW
FIN	FINISH, FINISHED
FIN FLR	FINISHED FLOOR
FL	FLOOR
FLASH	FLASHING
FTG	FOOTING
FOS	FACE OF STUD
GA	GAGE
GALV	GALVANIZED
GB	GRAB BAR
GL	GLASS
GLB	GLU-LAM BEAM
GYP BD	GYPSUM BOARD
HB	HOSE BIBB
HCP	HANDICAP, HOLLOW CORE
HDR	HEADER
HDW	HARDWARE
HC	HOLLOW CORE
HORIZ	HORIZONTAL
HS	HOLLOW STEEL, HIGH STRENGTH
HT	HEIGHT
HVAC	HEATING VENTILATING AIR CONDITIONING
HW	HOT WATER
INSUL	INSULATE, INSULATED, INSULATION
INT	INTERIOR
INV	INVERT
JAN	JANITOR
J-BOX	JUNCTION BOX
JST	JOIST
JT	JOINT
KD	KNOCKED DOWN
LAM	LAMINATE
LAV	LAVATORY
LS	LANDSCAPING
LT	LIGHT
MATL	MATERIAL
MAX	MAXIMUM
MB	MACHINE BOLT
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MI	MIRROR
MIN	MINIMUM
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MT	MOUNT
MTL	METAL
N	NORTH
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NUMBER
NTS	NOT TO SCALE
OA	OVERALL OUTSIDE AIR
OBS	OBSCURE
OC	ON CENTER
OCEW	ON CENTER EACH WAY
OD	OUTSIDE DIAMETER
OFCI	OWNER FURNISHED-CONTRACTOR INSTALLED
OH	OVERHEAD
OPG	OPENING
OFOI	OWNER FURNISHED-OWNER INSTALLED
OPP	OPPOSITE
PAF	POWDER ACUATED FASTNER
PBD	PARTICLE BOARD
PL	PROPERTY LINE, PLATE
PLAM	PLASTIC LAMINATE
PLBG	PLUMBING
PLYWD	PLYWOOD
PNL	PANEL
PR	PAIR
PRKG	PARKING
PTD	PAPER TOWEL DISPENSER
PTN	PARTITION
PT	POINT
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
QUAL	QUALITY
R	RADIUS, RISER
RC	RESILIENT CHANNEL
RD	ROOF DRAIN
RECEP	RECEPTACLE
REF	REFERENCE, REFRIGERATOR
REINF	REINFORCE, REINFORCEMENT
REQD	REQUIRED
REV	REVISION, REVISED
RHWS	ROUND HEAD WOOD SCREW
RM	ROOM
RO	ROUGH OPENING
ROW	RIGHT OF WAY
S	SOUTH
SC	SOLID CORE
SCR	SCREW
SD	SOAP DISPENSER, SMOKE DETECTOR, STORM DRAIN
SF	SQUARE FOOT
SHTHG	SHEATHING
SHT	SHEET
SIM	SIMILAR
SPEC	SPECIFICATION, SPECIFIED
SPKR	SPEAKER
SQ	SQUARE
SSK	SERVICE SINK
SST	STAINLESS STEEL
STD	STANDARD
STL	STEEL
STOR	STORAGE
STRUC	STRUCTURE, STRUCTURAL
SUSP	SUSPENDED
T	TEMPERED, TREAD
TEL	TELEPHONE
T&G	TONGUE & GROOVE
THK	THICK, THICKNESS, THICKENED
TOC	TOP OF CURB
TPD	TOILET PAPER DISPENSER
TYP	TYPICAL
ULMT	UNDERLAYMENT
UON	UNLESS OTHERWISE NOTED
UR	URINAL
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VNR	VENEER
VTR	VENT THROUGH ROOF
WAINS	WAINSCOT
W	WEST, WIDE, WIDTH
WC	WATER CLOSET
WD	WOOD
WDW	WINDOW
WH	WATER HEATER
W/O	WITHOUT
WP	WATERPROOFING
WT	WEIGHT
WWF	WELDED WIRE

SYMBOLS USED AS ABBREVIATIONS

@	AT
℄	CENTERLINE
°	DEGREE
±	PLUS/MINUS

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REGISTERED ARCHITECT
ANGELA M. FLORES
SALEM, OREGON
STATE OF OREGON

PERMIT SET

project:
MARION COUNTY
BEHAVIORAL HEALTH CRISIS CENTER REMODEL
1234 COMMERCIAL STREET SE SALEM, OREGON 97302

consultants:

revisions:

date: 06/06/2024
project: 01623
drawn by: NGB
checked by: AF

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TITLE SHEET

sheet: G-001
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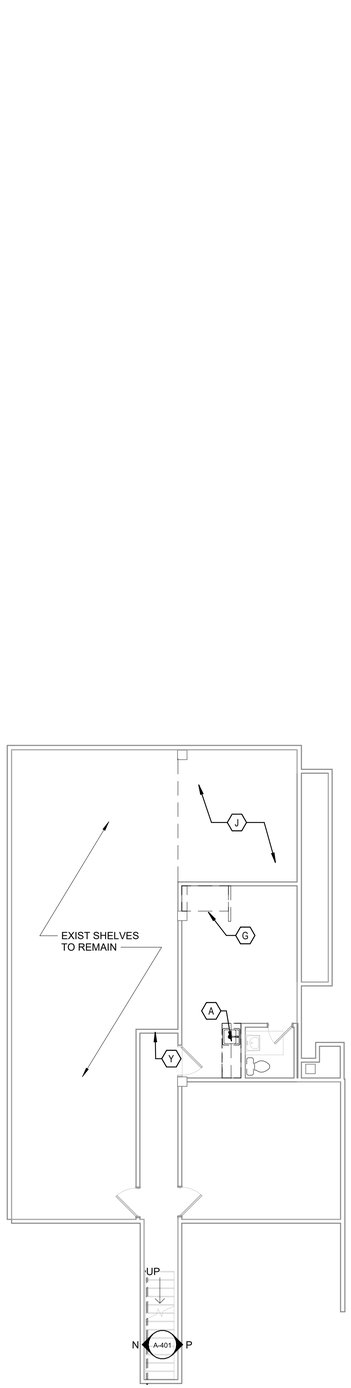
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GENERAL NOTES - DEMOLITION

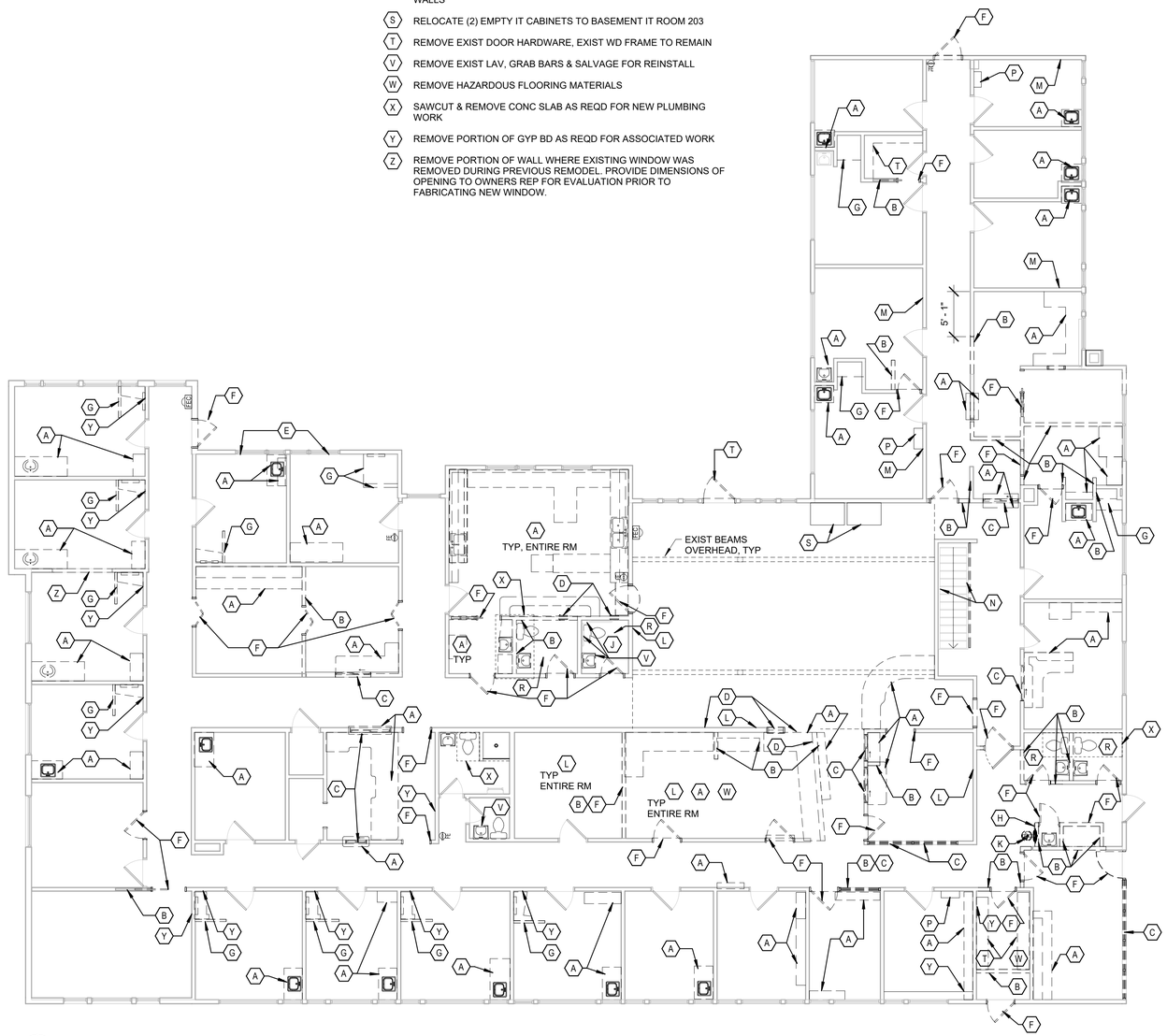
1. REMOVE ALL EXISTING FLOORING AND BASE, FIRST FLOOR, BASEMENT AND STAIRS.
2. THIS PROJECT CONTAINS HAZARDOUS MATERIALS AND MUST BE REMOVED BY A LICENSED ABATEMENT CONTRACTOR. REFER TO HAZARDOUS MATERIALS REPORT FOR MATERIAL CONTENT.
3. AT REMAINING EXISTING DOORS, REMOVE DOOR HARDWARE AS IDENTIFIED, PREP FOR NEW.
4. REMOVE ALL EXISTING WINDOW COVERINGS/VALANCES.
5. REMOVE ALL EXISTING PAPER TOWEL DISPENSERS, TISSUE DISPENSERS, AND CUP DISPENSERS WHERE CASEWORK IS REMOVED.
6. REMOVE ALL WALLCOVERING FROM ENTIRE BUILDING WALLS, TYP. WHERE GYP BD/PLASTER IS DAMAGED, REPLACE WITH NEW. PROVIDE UNIT PRICE TO REMOVE PLASTER/GYP BOARD & REPLACE W/ NEW. REFER TO SPECIFICATIONS FOR ALLOWANCE SF.
7. REMOVE ALL EXIST INTERIOR SIGNAGE & CORNER GUARDS.
8. REMOVE EXIST NOT-IN-USE LV WIREMOLD.
9. REMOVE EXIST FE/FEC/WALL BRACKETS AND DISCARD.
10. REFER TO PLUMBING, MECHANICAL, & ELECTRICAL DRAWINGS FOR ADDITIONAL DEMO WORK.

DEMO CONSTRUCTION NOTES

- A REMOVE EXISTING CASEWORK, UPPER AND LOWERS AND DISCARD
- B REMOVE PORTION OF WALL
- C REMOVE EXISTING WINDOWS/FRAME ASSEMBLY
- D REMOVE EXISTING PASS-THRU, PATCH AND REPAIR WALL
- E REMOVE PANEL OVER EXISTING WINDOW
- F REMOVE EXIST DOOR/FRAME ASSEMBLY
- G REMOVE BUILT IN CHANGING STATION, INCLUDING WALL, BENCH, CURTAIN/ROD, COAT HOOKS, & LIGHT FIXTURE
- H SALVAGE ADA OPERATOR FOR REINSTALLATION
- J REMOVE EXISTING SHELVING
- K REMOVE DRINKING FOUNTAIN, DISCARD
- L REMOVE EXISTING GYP BD OR PLASTER, THIS WALL
- M REMOVE EXISTING LIGHT BOX
- N REMOVE EXIST GUARDRAIL & HANDRAILS
- P EXIST MECH DUCT WORK TO REMAIN
- R REMOVE TOILET ACCESSORIES & PLAM WAINSCOAT, TYP ALL WALLS
- S RELOCATE (2) EMPTY IT CABINETS TO BASEMENT IT ROOM 203
- T REMOVE EXIST DOOR HARDWARE, EXIST WD FRAME TO REMAIN
- V REMOVE EXIST LAV, GRAB BARS & SALVAGE FOR REINSTALL
- W REMOVE HAZARDOUS FLOORING MATERIALS
- X SAWCUT & REMOVE CONC SLAB AS REQD FOR NEW PLUMBING WORK
- Y REMOVE PORTION OF GYP BD AS REQD FOR ASSOCIATED WORK
- Z REMOVE PORTION OF WALL WHERE EXISTING WINDOW WAS REMOVED DURING PREVIOUS REMODEL. PROVIDE DIMENSIONS OF OPENING TO OWNERS REP FOR EVALUATION PRIOR TO FABRICATING NEW WINDOW.



BASEMENT PLAN - DEMO
1/8" = 1'-0"



FIRST FLOOR PLAN
1/8" = 1'-0"

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DEMOLITION
FLOOR PLANS

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DOOR SCHEDULE

DOOR MARK	SIZE W	SIZE HT	SIZE THK	DOOR TYPE	DOOR CONST	DOOR FINISH	DOOR GLASS	FRAME CONST	FRAME FINISH	FRAME ELEVATION/DETAILS	RATING	HARDWARE	REMARKS	U VALUE	SHGC	SIGNS	EGRESS
101A	3'-6"	7'-0"	1 3/4"	D	SC	WE	1" T	SC	WE		-	1.0	1,6				
101B	3'-0"	7'-0"	1 3/4"	C	SC	WE	BRG	HS	ME	7,8/A-501	-	2.0	1				
101C	3'-0"	7'-0"	1 3/4"	C	SC	WE	BRG	HS	ME	7,8/A-501	-	2.0	1				
101D	3'-0"	7'-0"	1 3/4"	C	SC	WE	BRG	HS	ME	7,8/A-501	-	2.0	1				
102A	3'-0"	7'-0"	1 3/4"	B	SC	WE	1/4" T	HS	ME	7,8/A-501	-	2.0	1				
102B	3'-0"	7'-0"	1 3/4"	B	SC	WE	1/4" T	HS	ME	7,8/A-501	-	3.0					
103A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	4.0	5				
104A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	4.0	5				
105A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	4.0	5				
106A	2'-6"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	5.0	5				
107A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	4.0	5				
108A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	4.0	5				
109A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	4.0	5				
110A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	4.0	5				
111A	3'-0"	7'-0"	1 3/4"	B	SC	WE	1/4" T	HS	ME	7,8/A-501	-	15.0					
112A	3'-0"	7'-0"	1 3/4"							6/A-501	-						
113A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	4.0	5				
114A	2'-6"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	4.0	5				
115A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	HS	ME	7,8/A-501	-	7.0	1,4				
116A	3'-0"	7'-0"	1 3/4"	C	SC	WE	1/4" T	HS	ME	7,8/A-501	-	2.0	1				
116B	3'-0"	7'-0"	1 3/4"	D	AL	AN	1" T	AL	AN		-	8.0	1,5				
117A	4'-0"	7'-0"	1 3/4"	D	AL	AN	1" T	AL	AN	8,9/A-201	-	9.1	1				
117B	3'-0"	7'-0"	1 3/4"	C	SC	WE	1/4" T	HS	ME	7,8/A-501	-	3.0					
118A	3'-0"	7'-0"	1 3/4"	B	SC	WE	1/4" T	HS	ME	7,8/A-501	-	6.0					
119A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
120A	3'-0"	7'-0"	1 3/4"	C	SC	WE	1/4" T	HS	ME	7,8/A-501	-	10.0					
121A	3'-0"	7'-0"	1 3/4"	B	SC	WE	1/4" T	HS	ME	7,8/A-501	-	6.0					
122A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
123A	3'-0"	7'-0"	1 3/4"	C	SC	WE	1/4" T	HS	ME	7,8/A-501	-	10.0					
123B	3'-0"	7'-0"	1 3/4"	C	SC	WE	1/4" T	HS	ME	7,8/A-501	-	10.0					
124A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
125A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
126A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				

DOOR SCHEDULE

DOOR MARK	SIZE W	SIZE HT	SIZE THK	DOOR TYPE	DOOR CONST	DOOR FINISH	DOOR GLASS	FRAME CONST	FRAME FINISH	FRAME ELEVATION/DETAILS	RATING	HARDWARE	REMARKS	U VALUE	SHGC	SIGNS	EGRESS
127A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
128A	2'-6"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	11.0	5				
129A	2'-6"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	5.0	5				
130A	3'-0"	7'-0"	1 3/4"	B	SC	WE	1/4" T	HS	ME	7,8/A-501	-	6.0					
131A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
132A	2'-6"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	5.0	5				
133A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	5.0	5				
134A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
135A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
136A	3'-0"	7'-0"	1 3/4"	B	SC	WE	1/4" T	HS	ME	7,8/A-501	-	6.0					
137A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
138A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
139A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
140A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
141A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
142A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
143A	3'-6"	7'-2"	1 3/4"	B	SC	WE	1/4" T	HS	WE	4/A-501	-	12.0	2				
143B	3'-6"	7'-2"	1 3/4"	B	SC	WE	1/4" T	HS	WE	4/A-501	-	12.0	2				
144A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
145A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	13.0	1,5				
146A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	HS	ME	7,8/A-501	-	14.0					
147A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	HS	ME	7,8/A-501	-	7.0	1,4				
148A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	HS	ME	7,8/A-501	-	7.0	1,4				
150B	3'-0"	7'-0"	1 3/4"	A	HS	ME	-	HS	ME	7,8/A-501	-	9.0	1				
152A	3'-0"	7'-0"	1 3/4"	B	SC	WE	1/4" T	HS	ME	7,8/A-501	-	2.0	1				
152B	3'-0"	7'-2"	1 1/2"	A	SC	WE	-	HS	WE	4/A-501	-	17.0	1,2				
156A	3'-0"	7'-0"	1 3/4"	A	HS	ME	-	HS	ME		-	9.0	1				
B01A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	5.0	5				
B02A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	5.0	5				
B03A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	HS	ME	7,8/A-501	-	2.0	1				
B04A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
B05A	2'-6"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	11.0	5				

TYPE
SEE DOOR TYPES

CONSTRUCTION
SC = SOLID CORE WOOD
AL = ALUMINUM
HS = HOLLOW STEEL

FINISH
WT = WOOD TRANSPARENT
WE = WOOD ENAMEL
AN = ANODIZED ALUMINUM
ME = METAL ENAMEL

GLASS
T = TEMPERED
LS = LAMINATED SAFETY
PC = POLYCARBONATE
T/IN = TEMPERED INSULATING
BRG = BULLET RESITANT GLAZING

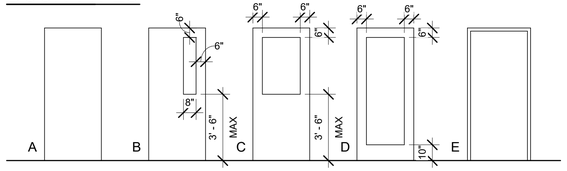
ELEVATION
SEE FRAME ELEVATIONS

RATING
20, 25, 60, 90 MINUTES
FIRE RATING IN MINUTES

HARDWARE
NUMBER REFERS TO HARDWARE GROUP IN HARDWARE SCHEDULE

REMARKS
1: CARD READER
2: SLIDING BARN DOOR
3: DOOR FRAME ONLY
4: REMOTE ENTRY
5: EXISTING DOOR & FRAME TO BE REUSED, REMOVE EXIST KNOB/HANDLE/DEADBOLT & REPLACE W/ NEW LEVERSET
6: EXIST WD FRAME TO REMAIN, PROVIDE NEW DOOR & HARDWARE

DOOR TYPES

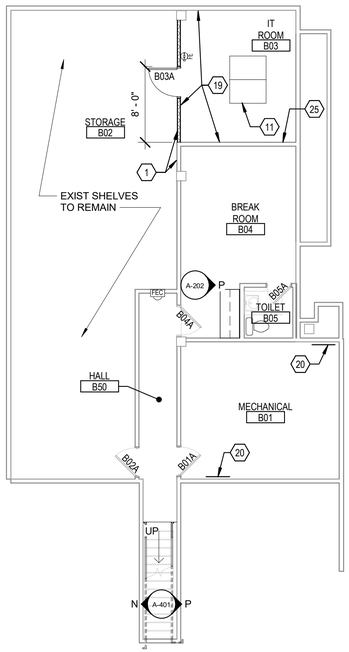


GENERAL NOTES

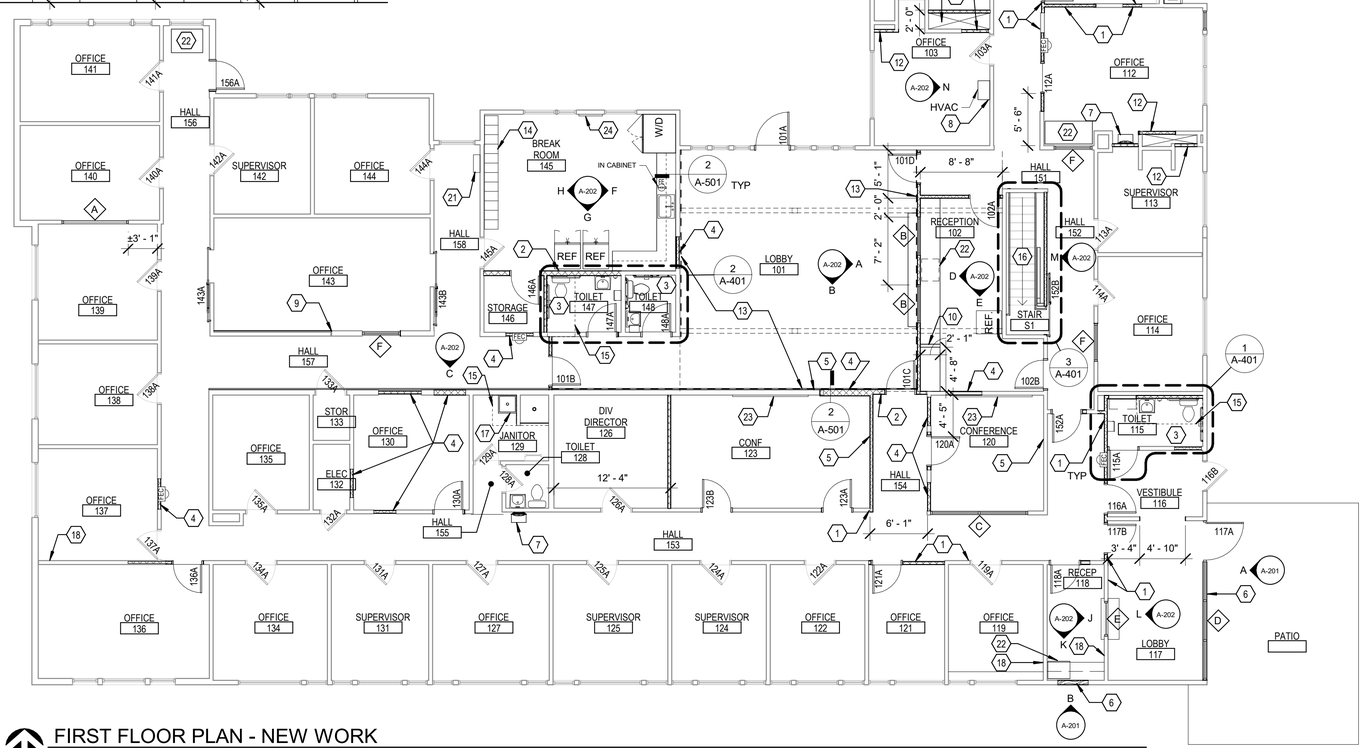
1. ALL WALLS, EXISTING DOORS & FRAMES TO BE PAINTED.
2. PROVIDE NEW INTERIOR SIGNAGE THROUGHOUT THE ENTIRE BLDG, SEE DTL 9 / A-501
3. ALL NEW WALLS TO BE 3 1/2" STL STUDS @ 16" OC W/ ACOUS BATT INSUL & (1) LAYER GYP BD EA SIDE, U/ON. DRAWINGS AND DETAILS ARE FOR METAL STUD WALL CONSTRUCTION AT INTERIOR. CONTRACTOR OPTION TO USE WOOD STUD FRAMING.
4. AT STAINED WOOD PANELING WALLS, REPAIR HOLES, STAIN TO MATCH EXIST FINISH.
5. AT PAINTED WOOD PANELING WALLS, REPAIR ANY DAMAGED AREAS, FINISH TO MATCH ADJ SURFACES.
6. AT ALL AREAS WHERE WALLPAPER REMOVED, REPLACE OR REPAIR DAMAGED GYP BD. FINISH TO MATCH ADJACENT WALL GYP BD FINISH.
7. PROVIDE NEW BLINDS, PER SPEC, ALL WINDOWS. WALK WITH OWNER TO VERIFY ALL LOCATIONS.
8. APPLIANCES TO BE OFCI.
9. AT ALL WALLS WHERE DEMOLITION HAS OCCURED, PROVIDE GYP BD & FINISH TO MATCH ADJ SURFACES.
10. REFER TO PLUMBING, MECHANICAL, & ELECTRICAL DRAWINGS FOR ADDITIONAL PATCHING REQUIRED FOR ASSOCIATED WORK.

CONSTRUCTION NOTES

1. ALIGN NEW WALL FACE OF FINISH WITH EXISTING FACE OF WALL FINISH, SEE DTL 1 / A-501
2. 6" STL STUDS W/ (1) LAYER GYP BD EA SIDE
3. ALL WALLS IN ROOM TO RECEIVE FULL HEIGHT FRP
4. INFILL EXIST OPENING W/ STL STUDS & GYP BD BOTH SIDES TO MATCH EXIST WALL THICKNESS, FINISH TO MATCH ADJ SURFACES, SEE DTL 1 / A-501
5. PROVIDE SOLID WD BACKING W/ GYP BD FINISH
6. INFILL PORTION OF EXTERIOR WALL W/ 2X WD STUDS, PLYWD, WRB & SIDING TO MATCH EXIST, PROVIDE GYP BD AT INTERIOR FINISH. FINISH EXTERIOR & INTERIOR SIDES TO MATCH ADJ SURFACES
7. BOTTLE FILLER
8. WHERE LIGHT BOX REMOVED, INFILL ANY HOLES IN WALL, PATCH AND REPAIR, MATCH ADJACENT WALL FINISH AND TEXTURE
9. WHERE WALL REMOVED, APPLY ADDITIONAL LAYER OF GYP TO CREATE EVEN WALL SURFACE
10. 48" PARTIAL HEIGHT WALL, SEE DTL 10 / A-502
11. RELOCATED IT CABINETS
12. PROVIDE NEW WALL FOR PLUMB/ELEC CHASE 6" CLR MIN, COORD FINAL LOCATIONS W/ FLOOR PENETRATIONS BY OWNER
13. AT THIS WALL, PROVIDE BULLET RESISTANT PANELS UP TO 8'-0" AFF. ABOVE 8'-0" PROVIDE GYP BD, FIN TO MATCH BR PANEL THICKNESS.
14. PRE-FABRICATED LOCKERS
15. PROVIDE NEW CONC SLAB INFILL OVER VAPOR RETARDER OVER 6" MIN CRUSHED ROCK BASE, SEE DTL 10 / A-501
16. PROVIDE NEW HANDRAILS, EA SIDE
17. MOP SINK W/ 4'H FRP EA SIDE
18. WALL ACCESS PANEL
19. PROVIDE FRT PLYWD SHTHG UP TO 8'-4" OVER WALL TYPE, ABV BASE, THIS WALL
20. PROVIDE SHT MTL COVER AT OPENING IN WALL. FASTEN TO WALL & SET IN SEALANT ALONG ENTIRE PERIMETER
21. KEYWATCHER SYSTEM MOUNT SUCH THAT THE BOTTOM OF THE KEYPAD IS 3'-0" AFF, VFY W/ OWNER
22. COPIER, OFOI
23. 8'-0" LONG MARKER BOARD
24. 30" X 40" TACKABLE PANEL
25. PROVIDE ACOUS BATT INSUL IN WALLS & (1) LAYER GYP BD



BASEMENT PLAN - NEW WORK
1/8" = 1'-0"



FIRST FLOOR PLAN - NEW WORK
1/8" = 1'-0"

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FLOOR PLAN - NEW WORK

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CEILING DEMO NOTES

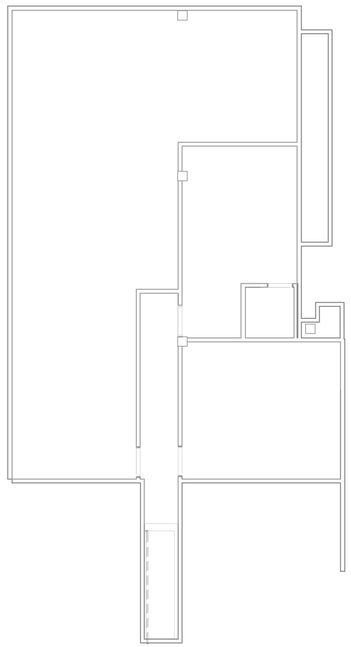
- (A) CAREFULLY REMOVE CEILING TILES, THIS LOCATION. SALVAGE FOR REUSE
- (B) REMOVE CEILING SOFFIT/GYP BD, SALVAGE UNDAMAGED CEILING TILES FOR REUSE
- (C) REMOVE CURTAIN AND CEILING MOUNTED TRACK
- (D) REMOVE EXISTING LIGHT FIXTURE, SALVAGE FOR REINSTALL IN SAME LOCATION
- (E) REMOVE PORTION OF CEILING TILES & SUBSTRATE FOR NEW CEILING ACCESS PANELS, COORD W/ OTHER TRADES

GENERAL NOTES

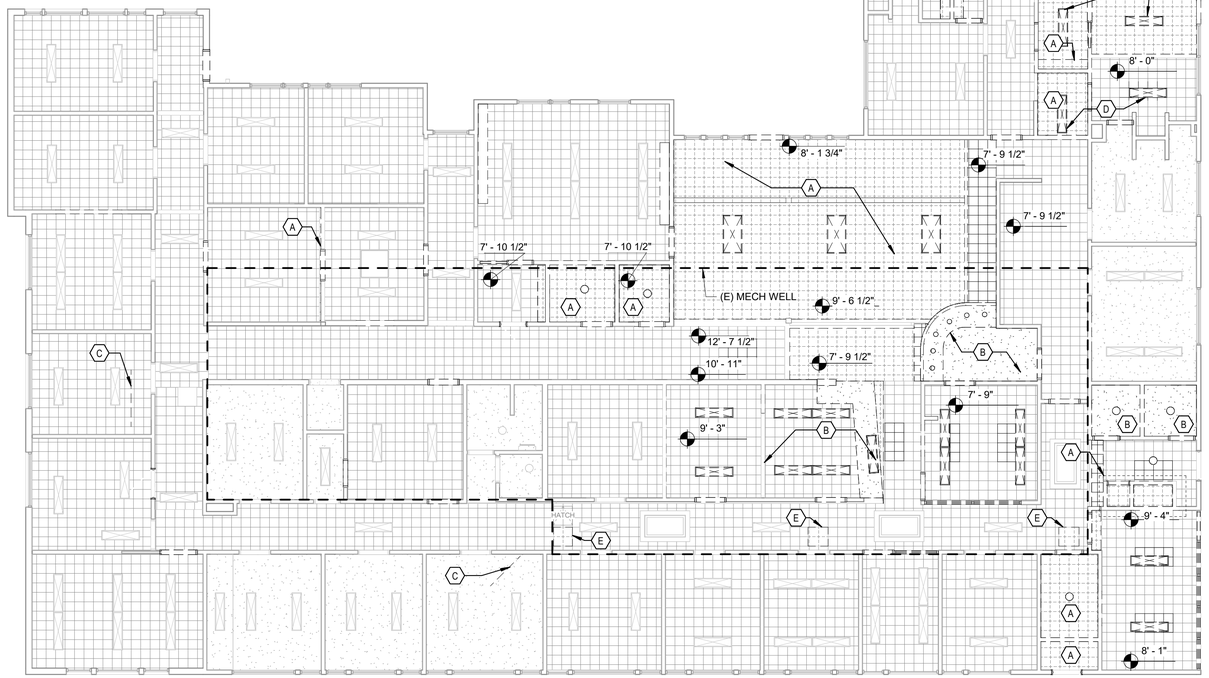
1. REMOVE DAMAGED & STAINED TILES AND DISCARD.
2. PROVIDE ALLOWANCE FOR 500 SF DAMAGED TILES. PROVIDE UNIT PRICE FOR ADDITIONAL DEMO, SEE SPECIFICATIONS.
3. AT AREAS OF DEMO'D CLG TILES, REMOVE SUBSTRATE AS REQD FOR NEW WORK.

DEMO CEILING LEGEND

- EXIST GYP BD CEILING, TO REMAIN
- EXIST ADHESIVE-APPLIED 12"X12" ACOUSTIC TILES, TO REMAIN
- REMOVE EXIST ADHESIVE-APPLIED 12"X12" TILES, SALVAGE FOR REVISE



BASEMENT FLOOR PLAN
1/8" = 1'-0"



FIRST FLOOR - DEMO
1/8" = 1'-0"

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consultants:

revisions:

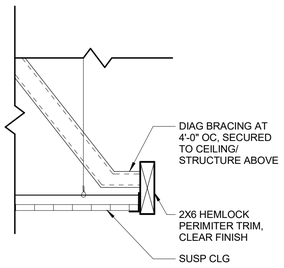
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REFLECTED CEILING PLAN - DEMO

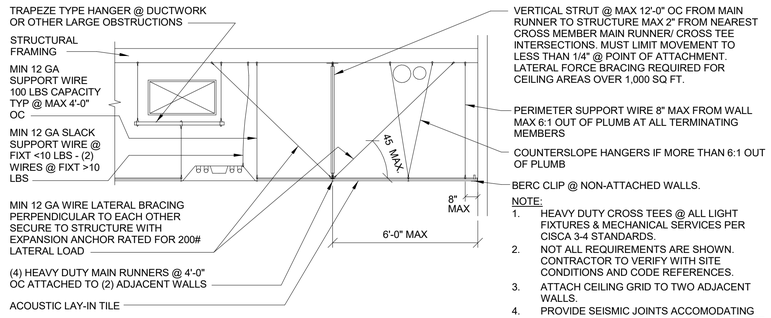
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of:

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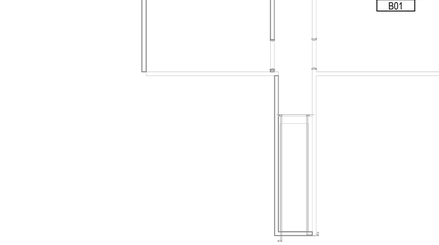
1 SUSP CLG DETAIL
1 1/2" = 1'-0"

CONSTRUCT SUSPENDED CEILINGS IN ACCORDANCE WITH NORTHWEST WALL & CEILING BUREAU - TECHNICAL BULLETIN 401.



NOTE:
1. HEAVY DUTY CROSS TEES @ ALL LIGHT FIXTURES & MECHANICAL SERVICES PER CISCA 3-4 STANDARDS.
2. NOT ALL REQUIREMENTS ARE SHOWN. CONTRACTOR TO VERIFY WITH SITE CONDITIONS AND CODE REFERENCES.
3. ATTACH CEILING GRID TO TWO ADJACENT WALLS.
4. PROVIDE SEISMIC JOINTS ACCOMODATING 3/4" MOVEMENT AT CEILING AREAS GREATER THAN 2,500 SQ FT.

2 SUSPENDED CEILING DETAIL
1/2" = 1'-0"



3 ROOF PIPE PENETRATION
1 1/2" = 1'-0"

CEILING LEGEND

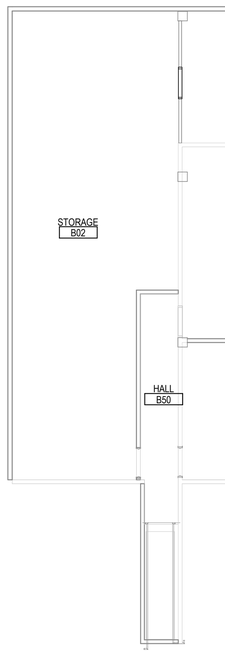
- EXIST GYP BD CEILING, TO REMAIN
- EXISTING ADHESIVE-APPLIED 12"X12" ACOUSTIC TILES, TO REMAIN
- NEW/REVISED ADHESIVE-APPLIED 12"X12" TILES
- NEW 2X4 SUSP CEILING TILES/GRID SYSTEM 2 / A-104
- NEW GYP BD CEILING
- A1, A1E — 2X4 LED LIGHT FIXTURE, CEILING MOUNTED, E= EMERGENCY
- A2, A2E — 2X4 LED RECESSED LIGHT FIXTURE, E= EMERGENCY
- ∅ — 11" ROUND SURFACE MOUNT
- ⊗ — EMERGENCY EXIT SIGN, BATTERY BACK UP

GENERAL NOTES

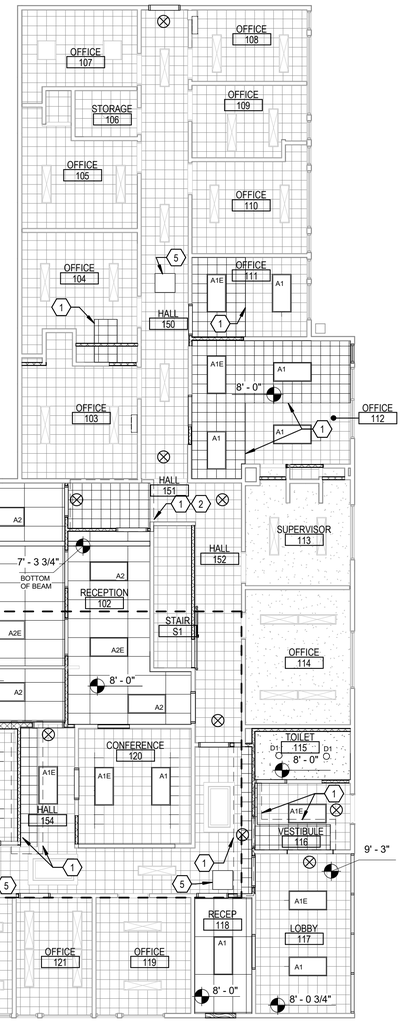
1. REMOVE ANY DEBRIS AND DUST FROM CEILING TILES, PREP TILES FOR NEW ACOUSITC CEILING TILE PAINT, PAINT CEILING TILES, ALL ROOMS.
2. NEW CLG HEIGHTS TO MATCH EXIST, UON

CONSTRUCTION NOTES

1. PATCH AREA WHERE WALL REMOVED WITH EXISTING SALVAGED CEILING TILES, ALIGN WITH EXISTING
2. WHERE EXIST WALL REMOVED , PROVIDE GYP BD SOFFIT
3. PROVIDE GYP BD CEILING THIS AREA, ALIGN WITH ADJACENT CEILING HEIGHT, MATCH TEXTURE AND FINISH
4. PROVIDE SUSP CLG CLOUD, SEE DTL 1 / A-104
5. CEILING ACCESS PANELS, COORD W/ OTHER TRADES



BASEMENT FLOOR PLAN - NEW WORK
1/8" = 1'-0"



FLOOR PLAN - NEW WORK
1/8" = 1'-0"

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SALEM, OREGON
STATE OF OREGON

project:
MARION COUNTY
BEHAVIORAL HEALTH CRISIS CENTER REMODEL
1234 COMMERCIAL STREET SE SALEM, OREGON 97302

consultants:

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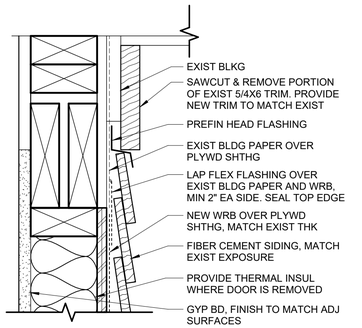
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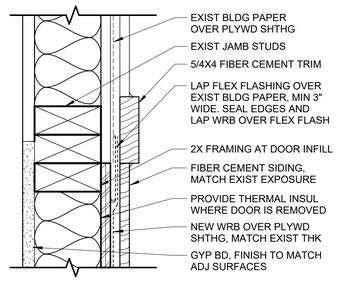
REFLECTED CEILING PLAN

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of:

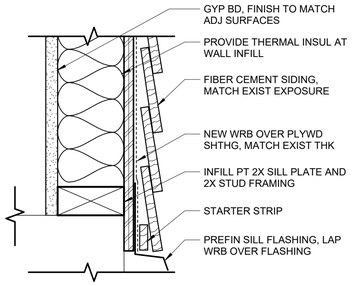
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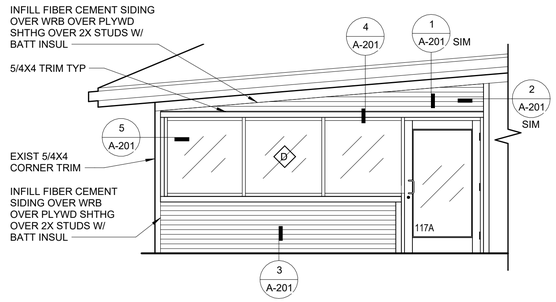
1 EXT WALL AT HEAD
3" = 1'-0"



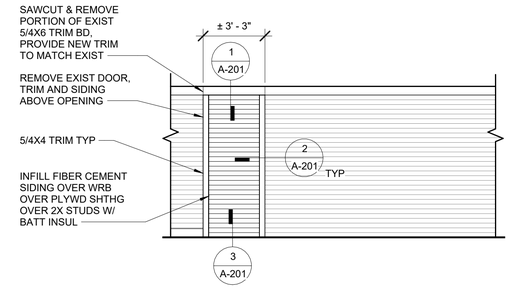
2 EXT WALL AT JAMB
3" = 1'-0"



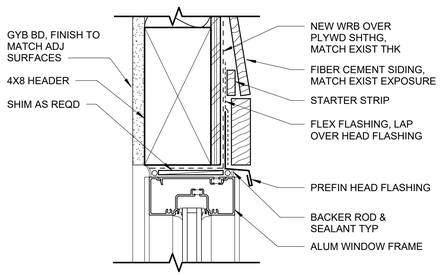
3 EXT WALL AT BASE
3" = 1'-0"



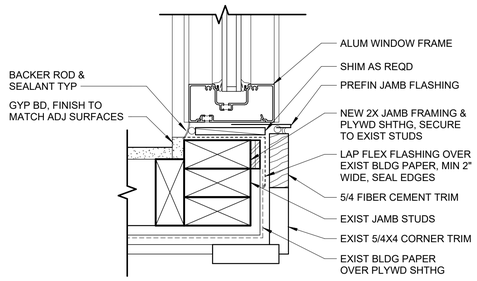
A PATIO - WEST EXTERIOR ELEVATION
1/4" = 1'-0"



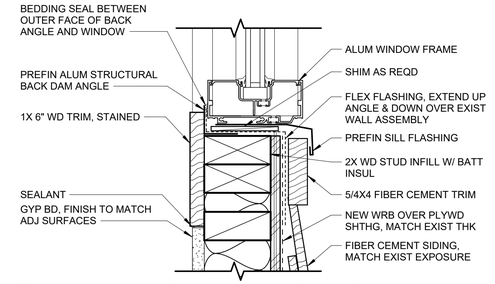
B SOUTH EXTERIOR ELEVATION
1/4" = 1'-0"



4 ALUM WINDOW AT HEAD
3" = 1'-0"



5 ALUM WINDOW AT JAMB
3" = 1'-0"



6 ALUM WINDOW - SILL AT SIDING
3" = 1'-0"

WINDOW SCHEDULE

MARK	WIDTH	HEIGHT	(A) OPERATION TYPE	FRAME MATERIAL	FRAME FINISH	GLASS THICKNESS	(E) GLASS TYPE	(F) GLASS COLOR	(G) REMARKS	U-VALUE	SHGC 2
A	7'-0"	2'-0"	F	HS	ME	1/4"	T	C			
B	4'-0"	3'-8"	F	HS	ME	1.25"	BR	C			
C	10'-3"	4'-0"	F	HS	ME	1/4"	L	C			
D	12'-8"	4'-2"	F	AL	AN	1"	T/IN	CO			
E	3'-8"	3'-8"	F	HS	ME	1.25"	BR	C			
F	4'-0"	4'-0"	F	HS	ME	1/4"	T	C			

OPERATION TYPE
F = FIXED

FRAME MATERIAL
AL = ALUMINUM
HS = HOLLOW STEEL

FRAME FINISH
ME = METAL ENAMEL
AN = ANODIZED ALUMINUM

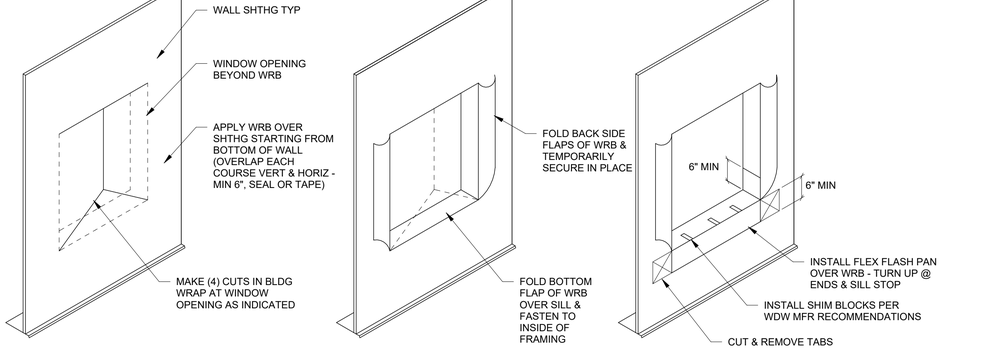
FRAME ELEVATIONS
SEE FRAME ELEVATIONS

GLASS THICKNESS
NUMBER REFERS TO OVERALL GLAZING THICKNESS.

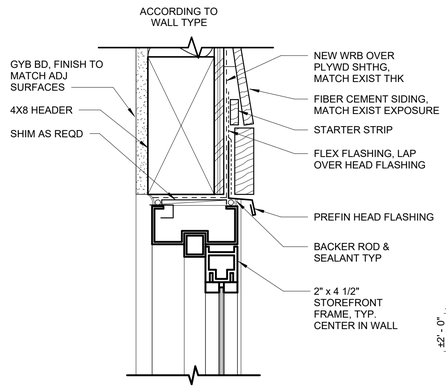
GLASS TYPE
T = TEMPERED
IN = INSULATING
LS = LAMINATED SAFETY
T/IN = TEMPERED INSULATING
BR = BULLET RESISTANT

GLASS COLOR
C = CLEAR
CO = LOW-E COATED

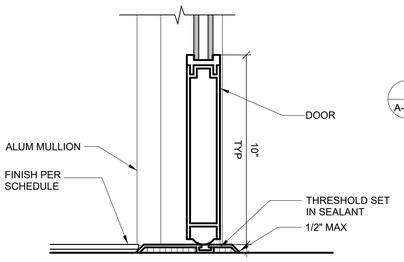
REMARKS
WINDOW NOTES & GENERAL INFORMATION



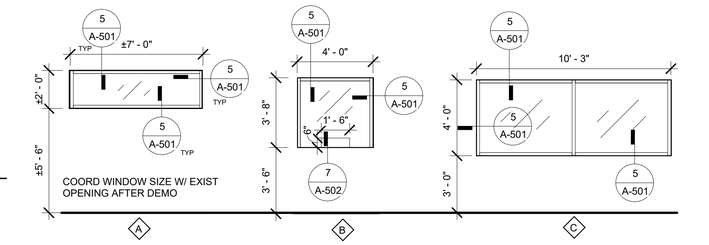
7 WINDOW FLASHING INSTALLATION
1/2" = 1'-0"

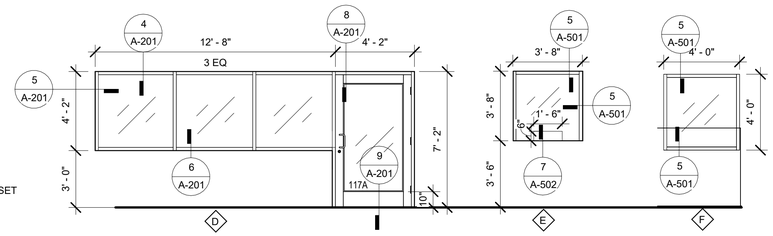


8 EXT ALUM DOOR AT HEAD
3" = 1'-0"



9 EXT ALUM DOOR THRESHOLD
3" = 1'-0"





WINDOW ELEVATIONS
1/4" = 1'-0"

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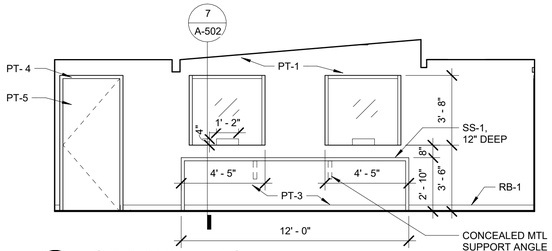
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EXTERIOR ELEVATIONS & DETAILS

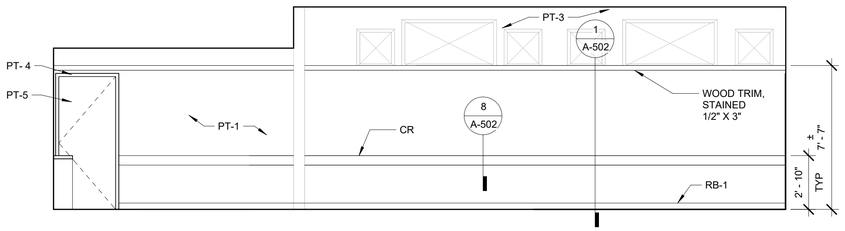
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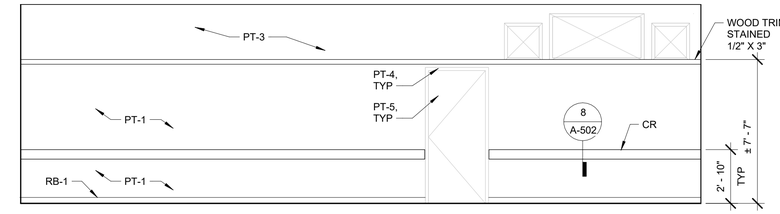
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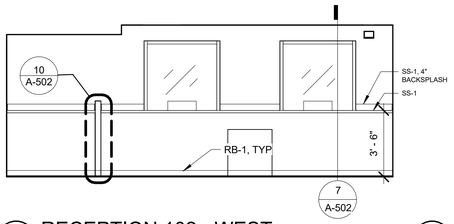
A LOBBY 101 - EAST
1/4" = 1'-0"



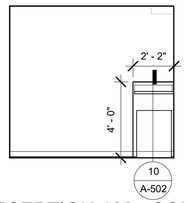
B LOBBY 101 - SOUTH
1/4" = 1'-0"



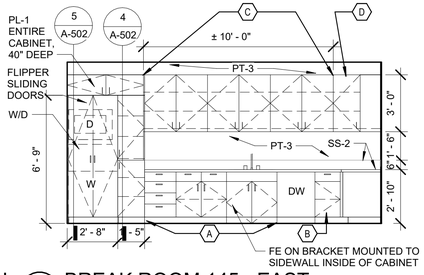
C HALL 157 - SOUTH
1/4" = 1'-0"



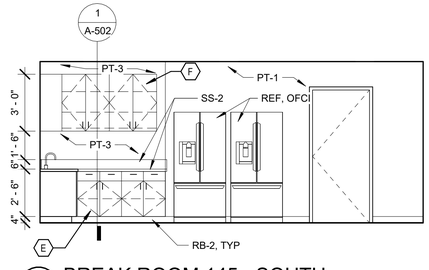
D RECEPTION 102 - WEST
1/4" = 1'-0"



E RECEPTION 102 - SOUTH
1/4" = 1'-0"

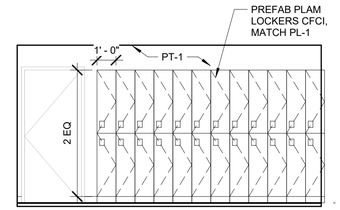


F BREAK ROOM 145 - EAST
1/4" = 1'-0"

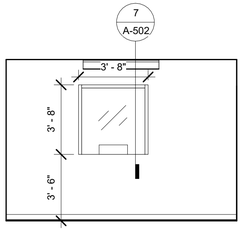


G BREAK ROOM 145 - SOUTH
1/4" = 1'-0"

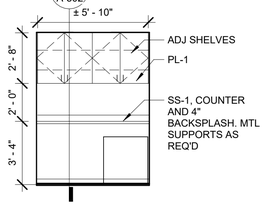
12" DEEP UPPER
24" DEEP BASE



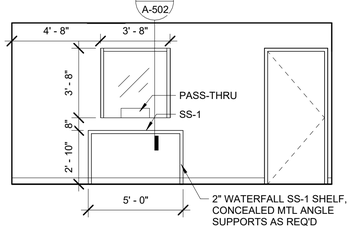
H BREAK ROOM 145 - WEST
1/4" = 1'-0"



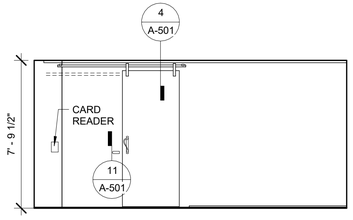
J RECEPTION 118 - EAST
1/4" = 1'-0"



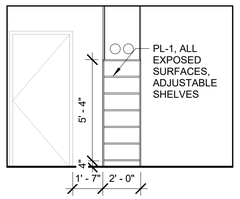
K RECEPTION 118 - SOUTH
1/4" = 1'-0"



L LOBBY 117 - WEST
1/4" = 1'-0"

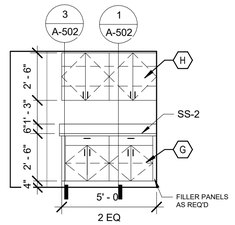


M HALL 152 - WEST
1/4" = 1'-0"



N OFFICE 103 - EAST
1/4" = 1'-0"

10" DEEP

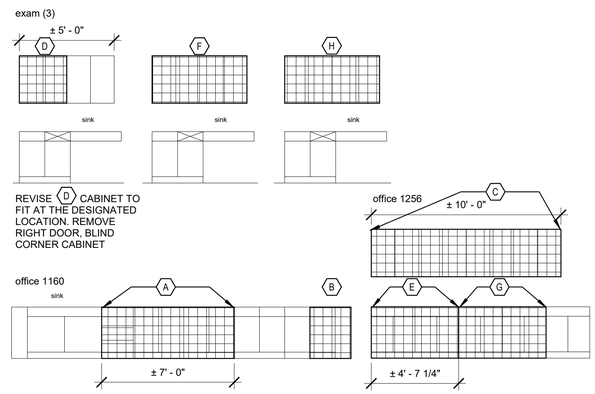


P BREAKROOM 204 - EAST
1/4" = 1'-0"

ELEVATION NOTES

1. ALL CASEWORK BASE AND UPPER CABINETS TO BE RELOCATED FROM MARION COUNTY BUILDING 3180, UON. CONTRACTOR TO VERIFY MEASUREMENTS
2. ALL COUNTERS HAVING A SINK TO BE SS-2, W/ AN INTEGRATED CORIAN SINK
3. ALL COUNTER SURFACES TO BE SS-1 OR SS-2, UON

(A) KEYNOTE CORRELATES TO SECTION OF RELOCATED CASEWORK FROM DETAIL 1 / A-202



1 EXISTING CASEWORK RELOCATED FROM MC 3180 CENTER ST.
1/4" = 1'-0"

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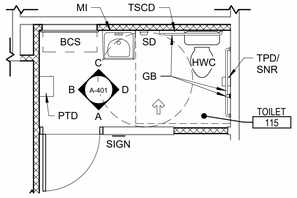
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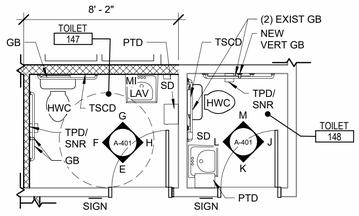
INTERIOR
ELEVATIONS

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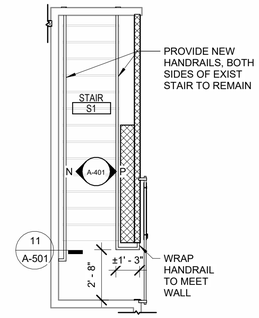
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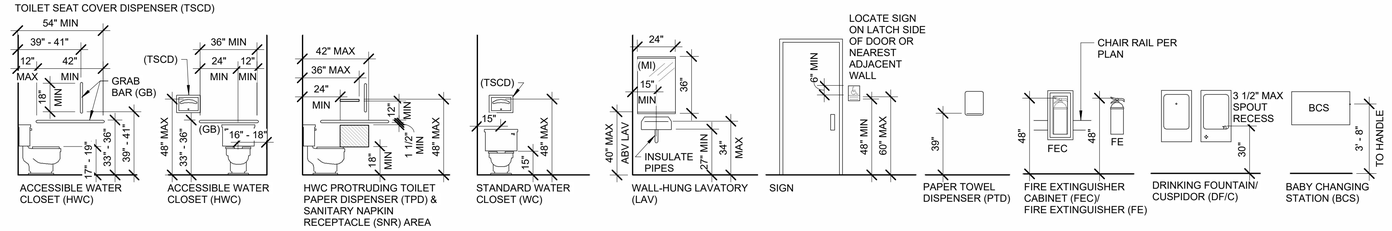
1 TOILET 115
1/4" = 1'-0"



2 TOILETS 147 & 148
1/4" = 1'-0"



3 STAIRWELL
1/4" = 1'-0"

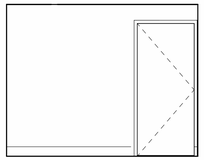


4 FIXTURE MOUNTING HEIGHTS
NTS

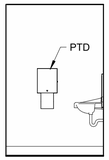
TYPICAL UNLESS OTHERWISE NOTED
ALL DIMENSIONS ARE CLEAR FINISH

LARGE SCALE GENERAL NOTES

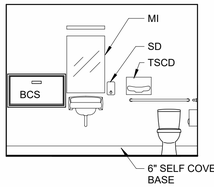
1. SELF-COVE BASE 6" HIGH AT ALL RESTROOM WALLS
2. OFCI RESTROOM ACCESSORIES: PTD, SD, SNR, TPD AND TSCD
3. FRP FULL HEIGHT ALL RESTROOM WALLS
4. REFER TO FIXTURE MOUNTING HEIGHTS FOR ACCESSORIES/ FIXTURES



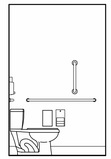
A TOILET 115 - SOUTH
1/4" = 1'-0"



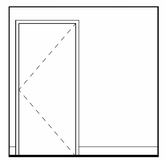
B TOILET 115 - NORTH
1/4" = 1'-0"



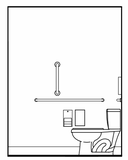
C TOILET 115 - NORTH
1/4" = 1'-0"



D TOILET 115 - EAST
1/4" = 1'-0"



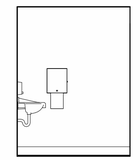
E TOILET 147 - SOUTH
1/4" = 1'-0"



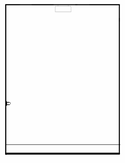
F TOILET 147 - WEST
1/4" = 1'-0"



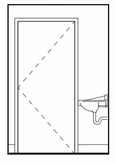
G TOILET 147 - NORTH
1/4" = 1'-0"



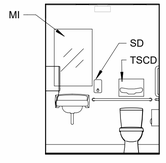
H TOILET 147 - EAST
1/4" = 1'-0"



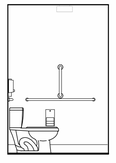
J TOILET 148 - EAST
1/4" = 1'-0"



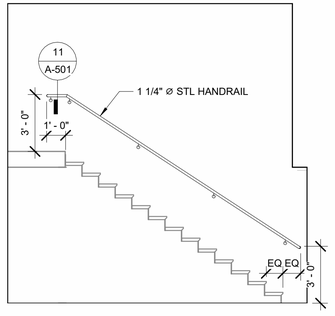
K TOILET 148 - SOUTH
1/4" = 1'-0"



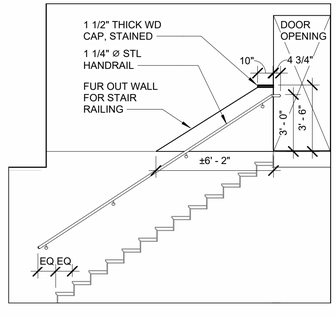
L TOILET 148 - WEST
1/4" = 1'-0"



M TOILET 148 - NORTH
1/4" = 1'-0"



N STAIRWELL - S1
1/4" = 1'-0"



P STAIRWELL - S1
1/4" = 1'-0"

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consultants:

revisions:

date: 06/06/2024
project: 01623
drawn by: NGB
checked by: AF

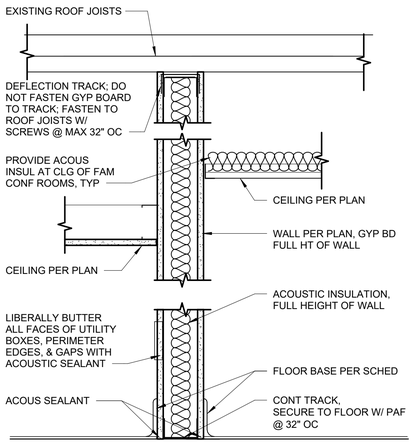
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LARGE SCALE PLANS

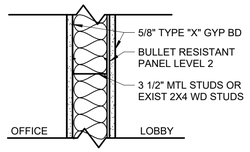
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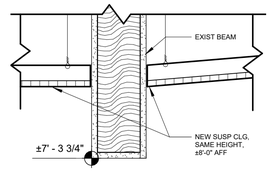
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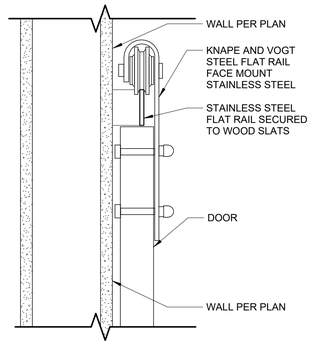
1 TYP WALL DTL
1 1/2" = 1'-0"



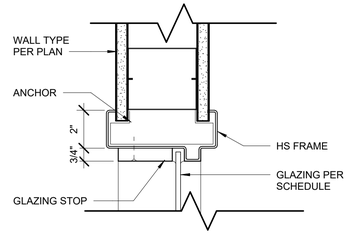
2 BULLET RESISTANT WALL
1 1/2" = 1'-0"



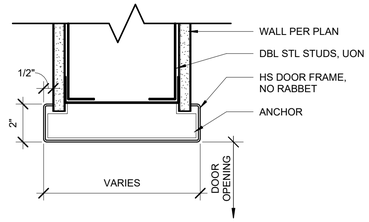
3 SUSP CLG DTL
1 1/2" = 1'-0"



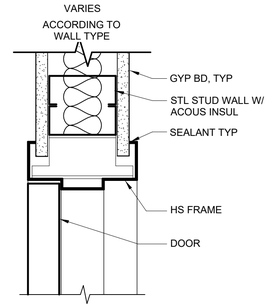
4 BARN DOOR
3" = 1'-0"



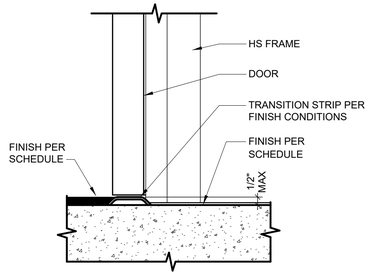
5 INT HS WINDOW - HEAD/JAMB SIM
3" = 1'-0"



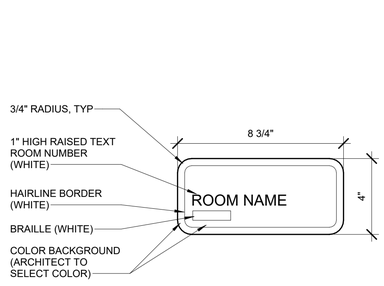
6 DOOR FRAME HEAD/JAMB SIM
3" = 1'-0"



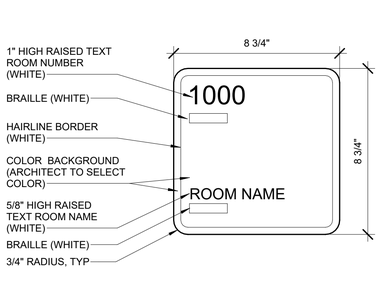
7 HS DOOR/HEAD JAMB SIM
3" = 1'-0"



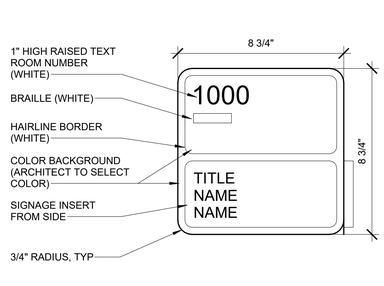
8 INTERIOR DOOR THRESHOLD
3" = 1'-0"



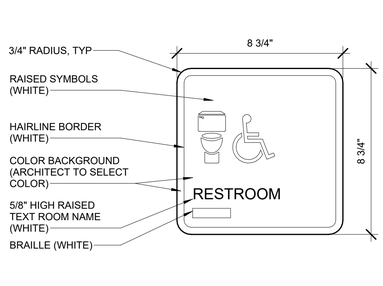
A ROOM NAME ONLY



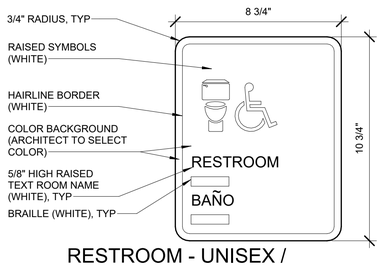
B FIXED ROOM NAME



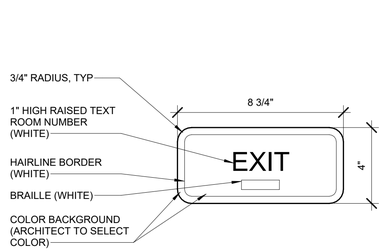
C INSERT ROOM NAME



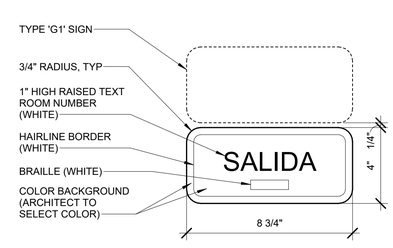
D1 RESTROOM - UNISEX



D2 RESTROOM - UNISEX / SPANISH

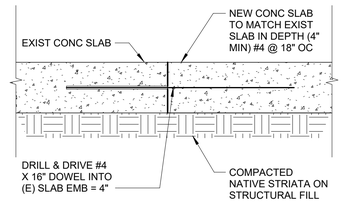


E EXIT SIGN

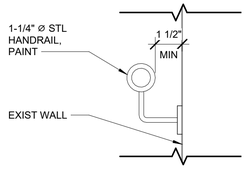


F EXIT SIGN / SPANISH

9 INTERIOR SIGNAGE DETAIL
3" = 1'-0"



10 CONC SLAB INFILL
1" = 1'-0"



11 HANDRAIL DTL
3" = 1'-0"

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REGISTERED ARCHITECT
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SALEM, OREGON
STATE OF OREGON

PERMIT SET

project:
MARION COUNTY
BEHAVIORAL HEALTH CRISIS CENTER REMODEL
1234 COMMERCIAL STREET SE SALEM, OREGON 97302

consultants:

revisions:

date: 06/06/2024
project: 01623
drawn by: NGB
checked by: AF

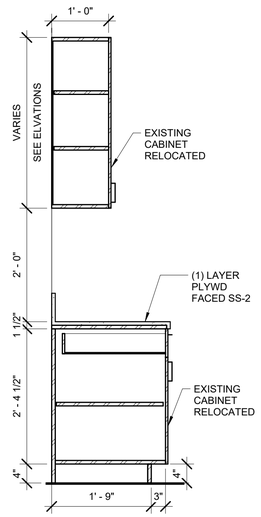
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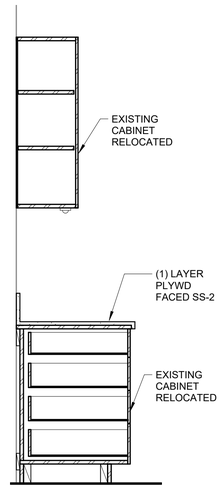
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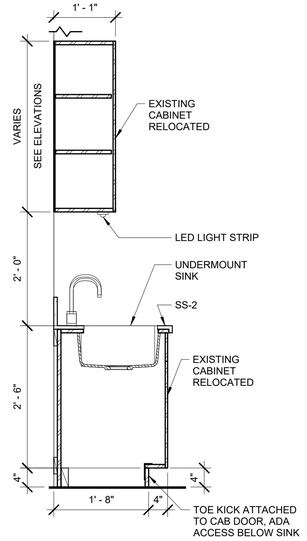
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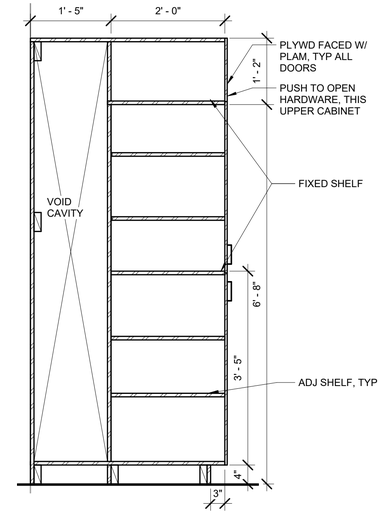
1 CASEWORK, TYP
3/4" = 1'-0"



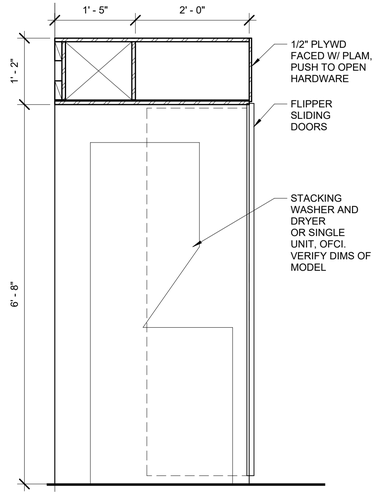
2 CASEWORK
3/4" = 1'-0"



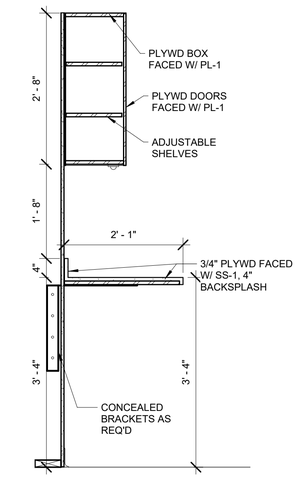
3 CASEWORK DTL
3/4" = 1'-0"



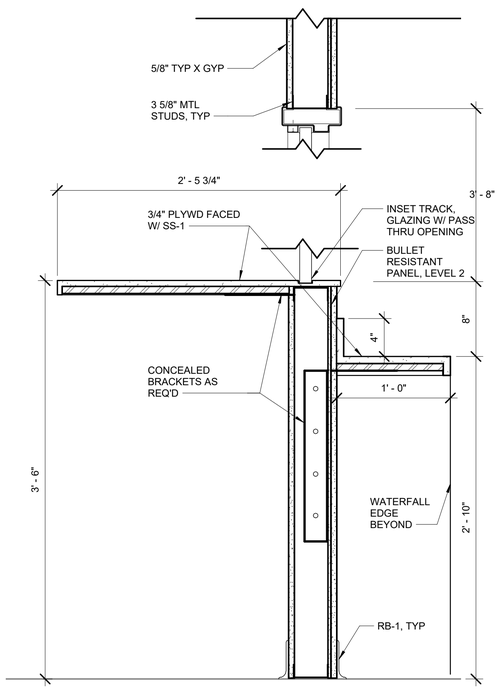
4 LAYER CABINET
3/4" = 1'-0"



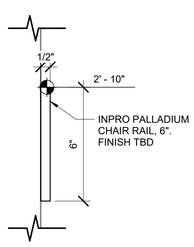
5 LAUNDRY CABINET
3/4" = 1'-0"



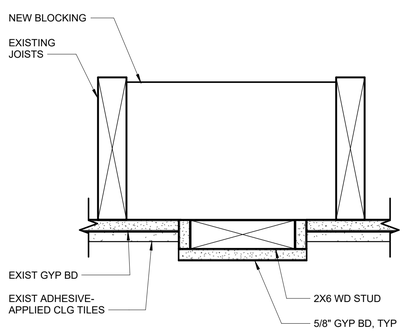
6 RECEPTION 118
3/4" = 1'-0"



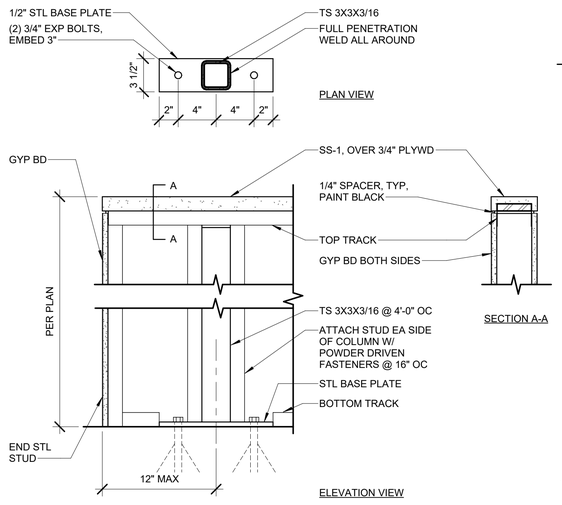
7 RECEPTION COUNTER
1 1/2" = 1'-0"



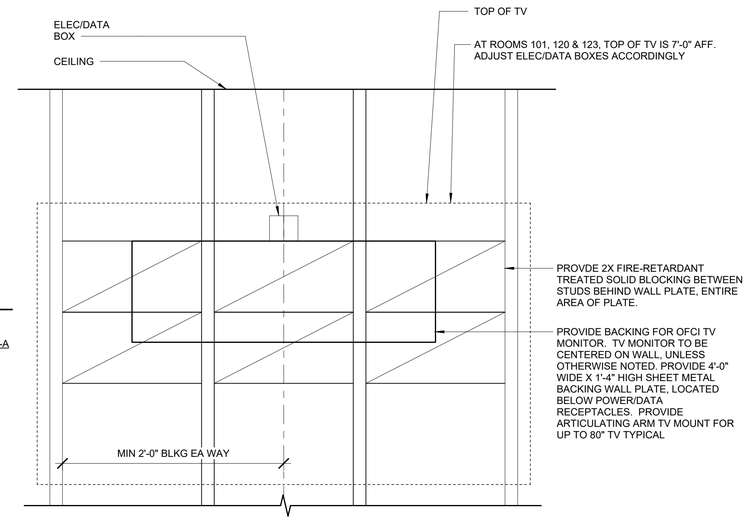
8 CHAIR RAIL DTL
3" = 1'-0"



9 CEILING SOFFIT
3" = 1'-0"



10 PARTIAL HT WALL LATERAL SUPPORT
1 1/2" = 1'-0"



11 TV MOUNT DIAGRAM
1" = 1'-0"

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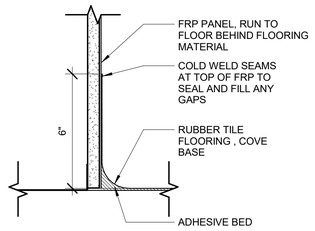
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INTERIOR DETAILS

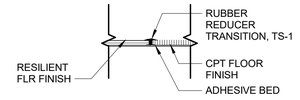
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of:

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INTERIOR MATERIAL SCHEDULE							
TAG	DESCRIPTION	MANUFACTURER	STYLE	COLOR/FINISH	SIZE	GRID/GROUT/ NOTES	LOCATION
CEILING							
ACT-1	SUSP ACOUS CLG TILES	CERTAINTEED	FINE FISSURED HIGH NRC	WHITE	24"X48"	SUSP CLG TILE & GRID	WHERE NOTED ON RCP
C-1	GYP BD CLG		PAINTED GYP BD	CP-1	-	-	WHERE NOTED ON RCP
FLOORING							
CPT-1	CARPET TILE	INTERFACE	OPEN AIR 418	14752 107798 OAT	50CM X 50CM	MONOLITHIC INSTALL	OFFICES, CONFERENCE
LVT-1	WOOD LOOK VINYL FLOORING	PATCRAFT	1466V SPLITWOOD	00130 RAW GOLD	7.25" 48.5"	1/3 STAGGERED OFFSET	HALLWAYS, LOBBY, RECEPTION, EXAM ROOMS
RS-1	RUBBER TILE	NORA	NORAMENT PADO	5502 CORAL	1004 MM X 1004 MM	1/4 TURN NORA COLD WELD COLOR 5105	BREAKROOM, RESTROOMS- COLD WELD SEAMS IN TOILET RMS, SELF-COVE IN TOILET RMS SEE A-701
ST-1	RUBBER STAIR TREAD & RISER	FLEXCO	1776 TREAD AND RISER	ABRASIVE STRIP BLACK	-	2" CONTRAST STRIP	STAIRS
TS-1	RUBBER TRANSITION	TRANSITION	RUBBER REDUCER FROM LVT TO CARPET	TANDUS JOHNSONITE	-	-	CHANGE IN FLOORING VINYL/CARPET
WO	WALK OFF CARPET	MANNINGTON	FORCE	VECTOR 14362	18" X 36"	HORIZONTAL BRICK ASHLAR	LOBBY, BACK VESTIBULES
PAINT							
CP-1	CEILING PAINT	MILLER PAINT		SUGAR DUST - FLAT	-	-	INTERIOR GYP BOARD CEILINGS
P-1	PAINT	MILLER PAINT		SUGAR DUST - SATIN	-	-	GENERAL WALL PAINT
P-2	NOT USED				-	-	
P-3	PAINT	SHERWIN WILLIAMS		SW 6187 ROSEMARY - SATIN	-	-	ACCENT WALL PAINT SEE A-701
P-4	PAINT	MILLER PAINT		THATCHED COTTAGE, SEMI-GLOSS ENAMEL	-	-	DOOR FRAME
P-5	PAINT	MILLER PAINT		SOFT LEATHER, SEMI-GLOSS ENAMEL			DOORS
SURFACES							
CR	CHAIR RAIL	INPRO	PALLADIUM		6"		SEE FINISH PLAN
FRP	FIBER REINFORCED PLASTIC	CRANE COMPOSITES	GLASBOARD PEBBLED EMBOSSED	SILVER (66)	-	-	RESTROOM WALLS FULL HEIGHT
PL-1	LAMINATE	NEVAMAR	-	WOODVINE S-5052	-	-	BREAKROOM, YOUTH RECEPTION
SS-1	SOLID SURFACE	WILSONART		IRON FALLS 9238SS	-	-	LOBBY/RECEPTION
SS-2	SOLID SURFACE	WILSONART		FLINT ROCK 9207CS			BREAKROOM
WALL BASE							
RB-1	VINYL BASE	NORA	WALL BASE 6254	DARK CHOCOLATE	4"	-	STANDARD WALL BASE SEE SHEET A-701
RB-2	VINYL BASE	ROPPE	WALL BASE	EVERGREEN 682	4"		BREAKROOM



1 COVE BASE DTL
3" = 1'-0"



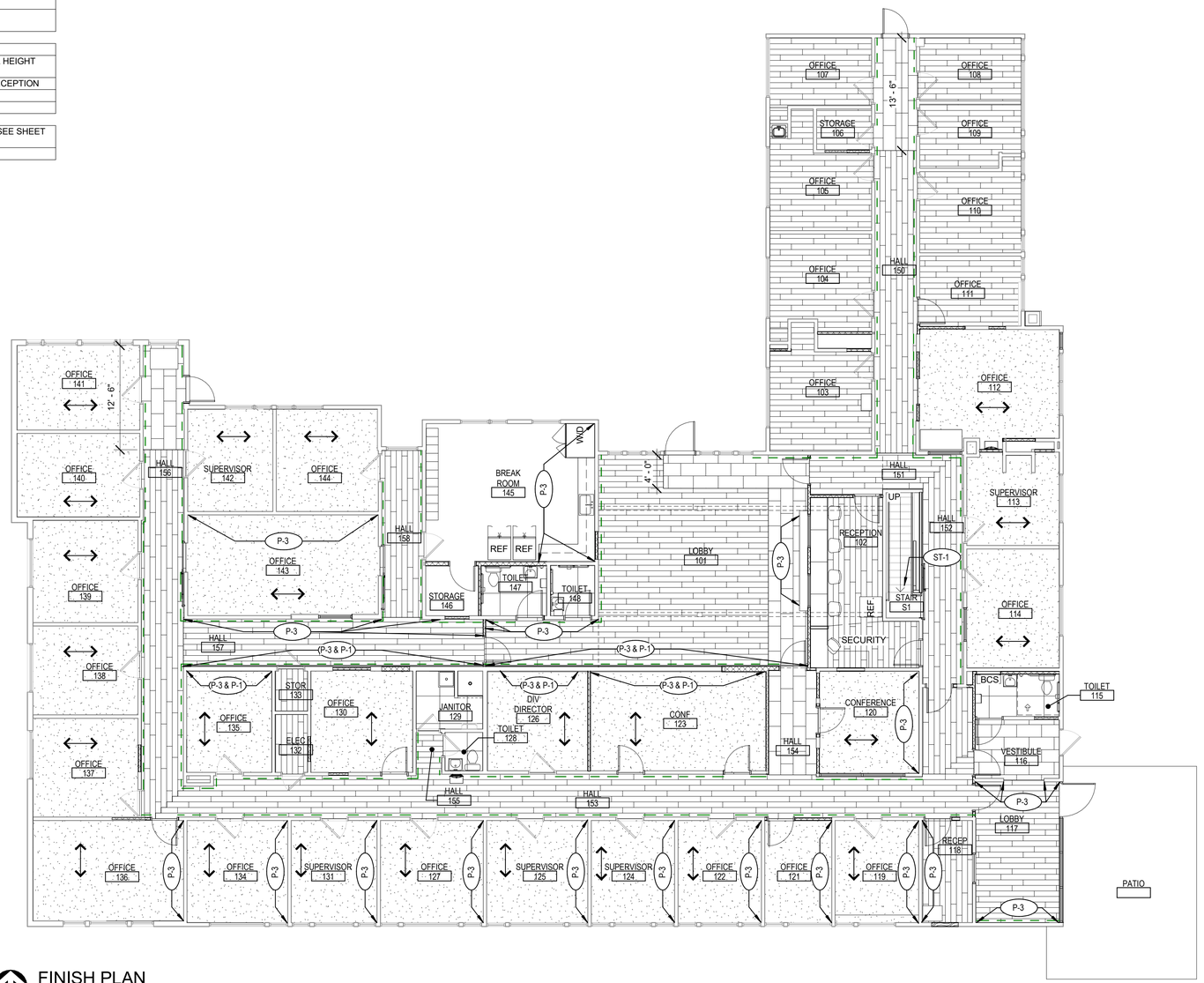
2 RUBBER TRANSITION
3" = 1'-0"

FINISH LEGEND

- LVT-1: LUXRY VINYL TILE
- CPT-1: CARPET TILES
- WO: WALK OFF CARPET TILES
- RS-1: RESILIENT TILE
- CR - CHAIR RAIL
- FLOORING DIRECTION

FINISH GENERAL NOTES

1. ALL WALLS, NEW AND EXISTING TO BE PAINTED, SEE FINISH SCHEDULE
2. CONTRACTOR TO VERIFY ALL SURFACES WITH WALLCOVERING. ALL WALLCOVERINGS TO BE REMOVED, WHERE GYP BD IS DAMAGED, REPLACE WITH NEW. APPLY TEXTURE TO MATCH ADJACENT WALL SURFACES. PAINT PER FINISH SCHEDULE AND FINISH PLAN
3. INSTALL RUBBER REDUCER AT ALL RESILIENT FLOORING TO CARPET FLOORING TRANSITIONS
4. AT ALL DAMAGED WALL SURFACES, PATCH AND REPAIR TO MATCH ADJACENT WALL TEXTURE
5. RUBBER BASE TO BE INSTALLED AT ALL WALLS
6. COVE BASE IN RESTROOMS, SEE DTL 1 / A-701
7. FRP INSTALL FULL HEIGHT ON ALL RESTROOM WALLS



FINISH PLAN
1/8" = 1'-0"

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revisions:

date: 06/06/2024
project: 01623
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FINISH PLAN

sheet: A-701
of:

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GENERAL PLUMBING SYMBOLS

- 1 — REVISION NUMBER - SHOWN ON PLANS
- POINT WHERE NEW CONNECTS TO EXISTING
- - / --- — NUMBER OF DETAIL ON SHEET / NUMBER OF SHEET WHERE DETAIL APPEARS
- 1 — KEYNOTE
- CONTINUATION SYMBOL
- Room / 7 — ROOM NAME AND NUMBER
- ITEM TO BE REMOVED OR DEMOLISHED
- AREA NOT IN CONTRACT
- 2" — PIPE SIZE TAG (DIAMETER)
- ABOVE GROUND PIPING
- 1/8" / 12" SLOPE — PIPE SLOPE TAG
- BELOW GROUND PIPING
- INVERT: -105' - 1" — PIPE INVERT ELEVATION TAG
- (E) — EXISTING PIPE TAG
- PIPING BEING DEMOLISHED

ABBREVIATIONS

Ø	ROUND DUCT	LWT	LEAVING WATER TEMPERATURE
ABV	ABOVE	M/A	MIXED AIR
AC	AIR CONDITIONING	MAX	MAXIMUM
AD	AREA DRAIN	MBH	ONE THOUSAND BTU PER HOUR
ADD	ADDENDUM	MCDB	MEAN COINCIDENT DRY BULB
AFF	ABOVE FINISHED FLOOR	MCWB	MEAN COINCIDENT WET BULB
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY	MCF	ONE THOUSAND CUBIC FEET
AFG	ABOVE FINISHED GRADE	MD	MOTORIZED DAMPER
AP	ACCESS PANEL	MECH	MECHANICAL
ARCH	ARCHITECT/ARCHITECTURAL	MFR	MANUFACTURER
BFF	BELOW FINISHED FLOOR	MIN	MINIMUM
BTUH	BRITISH THERMAL UNITS PER HOUR	MISC	MISCELLANEOUS
C/A	COMBUSTION AIR	MU/A	MAKE-UP AIR
CAP	CAPACITY	NC	NOISE CRITERIA
CFM	CUBIC FEET PER MINUTE	NC	NORMALLY CLOSED
CLG	COOLING	NIC	NOT IN CONTRACT
CO	CLEAN OUT	NO.	NUMBER
CW	COLD WATER	NO	NORMALLY OPEN
D	DEGREE	NC	NORMALLY CLOSED
DB	DRY BULB	NTS	NOT TO SCALE
DIA	DIAMETER	O/A	OUTSIDE AIR
DN	DOWN, DUCT OR PIPE DROP	OD	OUTER DIMENSION
EA	EACH	OFD	OVERFLOW FLOOR DRAIN
EAT	ENTERING AIR TEMPERATURE	ORD	OVERFLOW ROOF DRAIN
ELEC	ELECTRICAL	PLB	PLUMBING
ESP	EXTERNAL STATIC PRESSURE	PRV	PRESSURE REDUCING VALVE
EWC	ELECTRIC WATER COOLER	PSI	POUNDS PER SQUARE INCH
EWT	ENTERING WATER TEMPERATURE	PSIG	POUNDS PER SQUARE INCH GAUGE
E/A	EXHAUST AIR	PWR	POWER
EXIST	EXISTING	R	DUCT RISER
FDC	FIRE DEPARTMENT CONNECTION	R/A	RETURN AIR
FO	FUEL OIL	RCP	RADIANT CEILING PANEL
FOV	FUEL OIL VENT	RD	ROOF DRAIN
FOR	FUEL OIL RETURN	RH	RELATIVE HUMIDITY
FOS	FUEL OIL SUPPLY	RL/A	RELIEF AIR
FPM	FEET PER MINUTE	RM	ROOM
FT	FOOT/FEET	RPM	REVOLUTIONS PER MINUTE
GAL	GALLON	RW	RAIN WATER
GC	GENERAL CONTRACTOR	SF	SQUARE FOOT
GPM	GALLONS PER MINUTE	S/A	SUPPLY AIR
GW	GREASE WASTE	S-O/A	OUTSIDE AIR
HB	HOSEBIB	SMD	SMOKE DAMPER
HP	HORSE POWER	SP	STANDPIPE
HTG	HEATING	S.P.	STATIC PRESSURE
HYD	HYDRANT	T	THERMOSTAT
ID	INDIRECT	T/A	TRANSFER AIR
I.D.	INNER DIMENSION	TDR	TRENCH DRAIN
I.E.	INVERTED ELEVATION	TEMP	TEMPERATURE
IN	INCH	TYP	TYPICAL
LB/HR	POUNDS PER HOUR	UG	UNDERGROUND
LAT	LEAVING AIR TEMPERATURE	UOS	UNLESS OTHERWISE SPECIFIED
LP	LOW PRESSURE	UP	UP, DUCT OR PIPE RISER
LPG	LIQUEFIED PETROLEUM GAS	VAC	VACUUM
		V	VENT
		VAV	VARIABLE AIR VOLUME
		VENT	VENTILATION
		VTR	VENT THROUGH ROOF
		WB	WET BULB
		WCO	WALL CLEAN OUT

EQUIPMENT ABBREVIATIONS

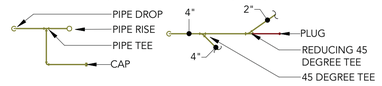
AHU	AIR HANDLING UNIT	FC	FAN COIL UNIT
AS	AIR SEPARATOR	GI	GREASE INTERCEPTOR
B	BOILER	GRV	GRAVITY ROOF VENTILATOR
BS	BRANCH SELECTOR	HWP	HEATING WATER PUMP
CH	CHILLER	HRU	HEAT RECOVERY UNIT
CT	COOLING TOWER	IH	INFARED HEATER
CHWP	CHILLED WATER PUMP	RTU	ROOFTOP UNIT
CU	CONDENSING UNIT	SP	SUMP PUMP
DBP	DOMESTIC WATER BOOSTER PUMP	SF	SUPPLY FAN
DCP	DOMESTIC WATER CIRCULATING PUMP	UH	UNIT HEATER
EF	EXHAUST FAN	WH	WATER HEATER
ET	EXPANSION TANK	VRF	VARIABLE REFRIGERANT VOLUME OUTDOOR UNIT
EWH	ELECTRIC WATER HEATER		
F	FURNACE		

* NOTE *

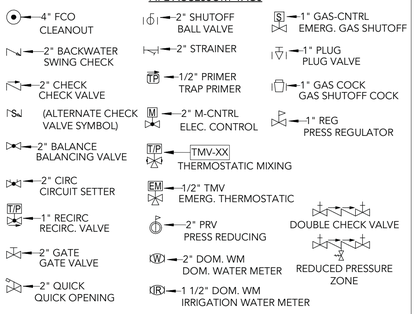
ALL OF GENERAL NOTES ON THIS SHEET ARE TO BE APPLIED TO ALL OTHER DRAWINGS IN THIS SET.THE SYMBOLS AND ABBREVIATIONS SHOWN ON THIS SHEET MAY OR MAY NOT BE USED IN THIS SET OF DRAWINGS.

PLUMBING AND PIPING SYMBOLS

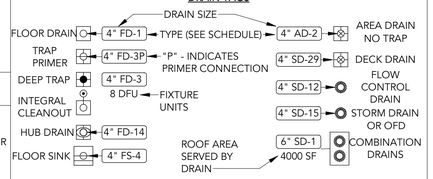
- CHWR — CHILLED WATER RETURN
- CHWS — CHILLED WATER SUPPLY
- CD — CONDENSATE DRAINAGE
- CWR — CONDENSER WATER RETURN
- CWS — CONDENSER WATER SUPPLY
- GWR — GEOTHERMAL WATER RETURN
- GWS — GEOTHERMAL WATER SUPPLY
- HWR — HEATING WATER RETURN
- HWS — HEATING WATER SUPPLY
- G — NATURAL GAS
- PG — PROPANE GAS
- REF-L — REFRIGERANT-LIQUID
- REF-S — REFRIGERANT-SUCTION
- REF-HG — REFRIGERANT-HOT GAS
- STM — STEAM
- CDR — CONDENSATE RETURN
- CWV — COMBINATION WASTE & VENT
- CA — COMPRESSED AIR
- CW — DOMESTIC COLD WATER
- H-CW — HARD COLD WATER
- S-CW — SOFT COLD WATER
- F-CW — FILTERED COLD WATER
- RO — REVERSE OSMOSIS WATER
- HW — HOT WATER
- HW 140° — HOT WATER 140°
- HW-R — HOT WATER RECIRCULATION
- HW-R 140° — HOT WATER RECIRCULATION 140°
- GV — GREASE VENT
- GW — GREASE WASTE
- IW — INDIRECT WASTE
- OV — OIL VENT
- OW — OIL WASTE
- PD — PUMP DISCHARGE
- V — SANITARY VENT
- SS — SANITARY SEWER
- SHWR — SOLAR HOT WATER RETURN
- SHWS — SOLAR HOT WATER SUPPLY
- SD — STORM DRAINAGE
- OSD — OVERFLOW STORM DRAINAGE



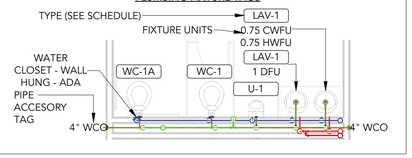
PIPE ACCESSORY TAGS



DRAIN TAGS



PLUMBING FIXTURE TAGS



PROJECT GENERAL NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING, PRIOR TO FINAL BID, ARCHITECTURAL, AND OTHER EXISTING CONDITIONS SHOWN ON THESE PLANS FOR PLUMBING SYSTEMS, MECHANICAL SYSTEMS, ARCHITECTURAL, AND OTHER BUILDING CONDITIONS WITHIN TENANT SPACE AND WITHIN CLOSE PROXIMITY OF TENANT SPACE. CONTRACTOR IS TO REMEDY, AT NO COST TO THE OWNER, ANY DEFICIENCIES CAUSED BY FAILURE TO PERFORM SUCH VERIFICATIONS. NOTIFY ARCHITECT AS SOON AS POSSIBLE OF ANY CONDITIONS IN CONFLICT WITH THESE PLANS.
2. THE CONTRACTOR SHALL FURNISH AND INSTALL COMPONENTS REQUIRED TO MEET THE REQUIRED SYSTEM PERFORMANCE AND THE PROPER EXECUTION AND COMPLETION OF WORK. CONTRACTOR SHALL FURNISH AND INSTALL NECESSARY WIRING, CONTROLS, HARDWARE, FITTINGS, PARTS, AND ACCESSORIES INCLUDING SAFETY DEVICES REQUIRED FOR PROPER OPERATION OF SYSTEM IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS.
3. BUILDING ENVELOPE PENETRATIONS ARE PER ARCHITECTURAL. REFER TO ARCHITECTURAL FOR ADDITIONAL REQUIREMENTS AT EACH PENETRATION.
4. WHERE FLOOR DRAINS OCCUR WITHIN THE LIMITS OF CONSTRUCTION, PREVENT CONSTRUCTION DEBRIS FROM ENTERING DRAIN BODY BY SEALING DRAIN OPENING PRIOR TO START OF WORK. UNSEAL DRAINS AT COMPLETION OF CONSTRUCTION.
5. COORDINATE INSTALLATION OF PIPING, CONDUIT, LIGHTS, CABLE TRAY, STRUCTURE, AND EQUIPMENT TO PREVENT CONFLICTS.
6. FINAL PRODUCT SHALL BE A COMPLETE AND FUNCTIONING SYSTEM, AND SHALL CONFORM TO REQUIREMENTS OF APPLICABLE FEDERAL, STATE, AND LOCAL CODES, INCLUDING BUT NOT LIMITED TO OREGON BUILDING CODE, OREGON PLUMBING CODE, AND MARION COUNTY STANDARDS.
7. PENETRATIONS OF RATED ASSEMBLIES SHALL BE FIRE STOPPED. FIRE STOPPING SHALL BE AN APPROVED MATERIAL AND SHALL BE U.L. LISTED.
8. PROVIDE SLEEVES AND/OR OPENINGS WHERE PIPES PENETRATE THROUGH FOUNDATIONS, FLOORS, WALLS, AND ROOF.
9. MAINTAIN CLEAR ACCESS TO SERVICE EQUIPMENT AND OTHER ACCESSORIES REQUIRING SERVICE, VISUAL INSPECTION OR HAND OPERATION. WHERE INDICATED OR REQUIRED, PROVIDE ACCESS PANELS OF THE TYPE SELECTED TO SUIT MATERIALS IN WHICH INSTALLED.
10. FOR DETAILS, EQUIPMENT CONNECTIONS, AND PIPE SIZES NOT SHOWN ON THE SEGMENTS, REFER TO DETAILS, SCHEDULES, AND SPECIFICATIONS.
11. INSTALL EQUIPMENT IN ACCORDANCE WITH RESPECTIVE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS, AT A LEVEL OF QUALITY AND WORKMANSHIP CONSISTENT WITH THE SPECIFICATIONS.
12. WASTE AND VENT PIPING BELOW FLOOR AND THROUGH FLOOR SHALL BE 2" MINIMUM.
13. PROVIDE LABELING FOR PLUMBING VALVES. ENSURE LABELING IDENTIFIES THE FIXTURE SERVED, ROOM NAME, AND AREA THE VALVE IS SERVING.
14. COORDINATE INSTALLATION OF PIPING BELOW AND ABOVE GRADE WITH STRUCTURAL COMPONENTS AND OTHER SYSTEMS.
15. COORDINATE FIXTURES, EQUIPMENT, CONNECTION LOCATIONS, AND DRAIN LOCATIONS WITH ARCHITECTURAL DRAWINGS.
16. ROUTE DOMESTIC WATER PIPING ABOVE THE CEILING AND BELOW DUCTWORK TO THE EXTENT POSSIBLE. CONCEAL PIPING IN FINISHED AREAS.
17. PROVIDE ACCESSIBLE BALL SHUTOFF VALVES WHERE NEW PIPE CONNECTS TO EXISTING PIPES OR FIXTURES.
18. EXISTING RECORD DRAWINGS SHOWING PLUMBING PIPE DRAWINGS WERE NOT AVAILABLE WHEN THESE PLANS WERE DEVELOPED. CONTRACTOR SHALL FIELD VERIFY EXISTING PIPE ROUTING AND SIZES WHERE NEW PLUMBING CONNECTS TO EXISTING. CONTRACTOR SHALL INFORM ARCHITECT AND EOR IF EXISTING PIPE SIZES OR SLOPE DO NOT MEET CODE REQUIREMENTS FOR THE FIXTURE UNIT COUNTS CONNECTED TO EXISTING PIPING.
19. HORIZONTAL WASTE PIPING SLOPE:
    A. 1/4" PER FOOT UNLESS OTHERWISE SPECIFIED. 1/8" PER FOOT PERMITTED FOR 4" WASTE PIPE IF APPROVAL IS GRANTED BY THE AHJ.

PLUMBING PIPE MATERIALS

1. DOMESTIC WATER:
   A. ABOVE GROUND:
      1. TYPE L COPPER WATER TUBE.
      2. PEX-A, MANUFACTURER: UPONOR.
   B. BELOW GROUND:
      1. TYPE K COPPER WATER TUBE
   C. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

1. SANITARY WASTE AND VENT
   A. INTERIOR ABOVE GROUND:
      1. PVC PLASTIC PIPE, SCHEDULE 40.
      2. ABS PLASTIC PIPE, SCHEDULE 40.
      3. USE OF HOLLOW OR FOAM CORE PVC NOT PERMITTED.
   B. INTERIOR BELOW GROUND:
      1. PVC PLASTIC PIPE, SCHEDULE 40.
      2. USE OF HOLLOW OR FOAM CORE PVC NOT PERMITTED.
   C. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

PLUMBING SHEET INDEX

P-000	TITLE SHEET
P-010	SCHEDULES
P-100	DEMOLITION PLANS
P-200	PLUMBING PLANS
P-600	TYP. DETAILS & ENLARGED PLANS

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revisions:

date: 06/06/2024
project: 23-115
drawn by: JW
checked by: JW

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TITLE SHEET

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PLUMBING FIXTURE SCHEDULE

ID	DESCRIPTION	MANUFACTURER	MODEL	MATERIAL DESCRIPTION	FINISH	TRIM				FLOW FIXTURE		WASTE ROUGH-IN PIPE SIZE	VENT PIPE SIZE	COLD WATER ROUGH-IN PIPE SIZE	HOT WATER ROUGH-IN PIPE SIZE	SPECIFICATION
						MANUFACTURER	MODEL	TYPE	MOTION SENSOR CONTROL	WATER FLOW	TIMER DURATION (SEC)					
EWC-1	WATER COOLER	ELKAY	LZ8WSSSMC	GALVANIZED STEEL	STAINLESS STEEL CABINET				Yes	0.1 GPM	15	2"	1 1/2"	1/2"		SINGLE LEVEL WALL HUNG BOTTLE FILLING STATION. THE UNIT SHALL BE COMPLETE WITH CABINET, MOUNTING FRAME, REFRIGERATING SYSTEM, AIR COOLED, 115 VOLT, 60 CYCLE, SINGLE PHASE POWER CONNECTION, FULLY AUTOMATIC, COMPLETE AND READY TO OPERATE.
JS-1	JANITOR SINK	ZURN	Z5850	ENAMELED CAST IRON		CHICAGO FAUCET CO	540-LD897SWXFXKCAB	MANUAL	No	2.5 GPM	0	3"	2"	3/4"	3/4"	CORNER MOUNT, ENAMELED CAST IRON SERVICE BASIN WITH 8 INCH HIGH CURB, CHROME PLATED 3" DRAIN AND CAST IRON TRAP. FAUCET SHALL INCLUDE PAIL HOOK AND ATMOSPHERIC VACUUM BREAKER SPOUT. FURNISH 5'-0" LENGTH OF 5-PLY GARDEN HOSE AND FITTINGS.
LAV-1	LAVATORY - WALL HUNG - ADA	AMERICAN STANDARD	LUCERNE	WHITE VITREOUS CHINA	WHITE	CHICAGO FAUCET CO	3600-E2805AB	METERING	No	0.5 GPM	12	2"	1 1/2"	1/2"	1/2"	WALL HUNG LAVATORY INSTALLED WITH LAVATORY SUPPORTS & BACKSPLASH, 3-HOLE, VANDAL-PROOF, DECK-MOUNTED, MANUAL PUSH METERING FAUCET, EXTERNAL ASSE 1070 COMPLIANT THERMOSTATIC MIXING VALVE, GRID DRAIN, LOOSE KEY ANGLE STOPS AND SUPPLIES. INSULATE WATER AND WASTE WITH ADA INSULATION KIT. MOUNT AT ADA COMPLIANT HEIGHT.
LAV-2	LAVATORY - WALL HUNG	EXISTING				SLOAN	EAF-200-PLG	ELECTRONIC	Yes	0.5 GPM	12	2"	1 1/2"	1/2"	1/2"	EXISTING LAVATORY. PROVIDE NEW DECK-MOUNTED FAUCET WITH SENSOR, PLUG-IN ADAPTER POWER, EXTERNAL ASSE 1070 COMPLIANT THERMOSTATIC MIXING VALVE, GRID DRAIN, LOOSE KEY ANGLE STOPS AND SUPPLIES. INSULATE WATER AND WASTE WITH ADA INSULATION KIT.
OB-1	ICE MAKER OUTLET BOX	SIOUX CHIEF	696	ABS PLASTIC	WHITE				No	0.5 GPM	0			1/2"		ICE MAKER SUPPLY BOX WITH COVER. PROVIDE 1/4 TURN BALL VALVES AND WATER HAMMER ARRESTORS IN BOX.
OB-2	WASHING MACHINE OUTLET BOX	SIOUX CHIEF	696	ABS PLASTIC	WHITE				No	0.5 GPM	0	2"	2"	1/2"	1/2"	FULLY RECESSED WASHING MACHINE SUPPLY BOX WITH COVER AND DRAIN. PROVIDE 1/4 TURN BALL VALVES AND WATER HAMMER ARRESTORS IN BOX. PROVIDE A 2" TRAPPED STANDPIPE IN CONCEALED WALL SPACE.
S-1	SINGLE BOWL SINK	ELKAY	ELUHAD211550	STAINLESS STEEL	STAINLESS STEEL	CHICAGO FAUCET CO	786	MANUAL	No	1.5 GPM	0	2"	2"	1/2"	1/2"	SINGLE COMPARTMENT, ADA COMPLIANT, UNDERMOUNT, 18 GAUGE. SINGLE LEVER SWIVEL FAUCET. P-TRAP, TAILPIECES, SUPPLIES AND STOPS. INSULATE WATER AND WASTE TO MEET ADA REQUIREMENTS.
WC-1	WATER CLOSET - FLOOR - TANK TYPE - ADA	TOTO	CST744EL	WHITE VITREOUS CHINA	WHITE	TANK TYPE			No			3"	2"	1/2"		ELONGATED FLOOR MOUNTED TANK TYPE WATER CLOSET W/ LESS SEAT, PROVIDE A 1/4" BRASS BALL VALVE AT WALL CONNECTION. INSTALL AT ADA COMPLIANT HEIGHT.

GAS-FIRED WATER HEATER SCHEDULE

ID	MANUFACTURER	MODEL NO.	GAS-FIRED HEAT EXCHANGER						COLD WATER INLET	HOT WATER INLET	UNIT DIMENSIONS		UNIT WEIGHT	NOTES
			INPUT	GAS BURNER		WATERSIDE					HEIGHT	DIAMETER		
				FUEL		STORAGE		MAX TEMP RISE						
				TYPE	PIPE DIA	RECOVERY	VOL							
WH-1	BRADFORD WHITE	LG250H653N	65000 Btu/h	NATURAL GAS	1/2"	63 gal/h	48.0 gal	100 °F	3/4"	3/4"	56 5/8"	22"	193 lb	1, 2, 3

NOTES:
1. PROVIDE SEISMIC RESTRAINTS.
2. PROVIDE DRAIN PAIN.
3. PROVIDE EXPANSION TANK, WATTS DETA-5 ASME TANK OR APPROVED.

THERMOSTATIC MIXING VALVE SCHEDULE

ID	MANUFACTURER	MODEL	MATERIAL	FINISH	FLUID PROPERTIES						VALVE PROPERTIES			SPECIFICATION
					TYPE	LWT SETPOINT	EWT		MIN FLOW	MAX PD	INLET SIZE	OUTLET SIZE	MAWP	
							HOT	COLD						
TMV-1	LEONARD	TM-186-520B-LF	LEAD FREE BRASS	ROUGH BRONZE	DOM. WATER	125 °F	140 °F	45 °F	0.5 GPM	5.0 psi	3/4"	1"	125 psi	ASSE 1017 COMPLIANT, EXPOSED STAINLESS STEEL CABINET

DOMESTIC CIRCULATING PUMP SCHEDULE

ID	SYSTEM	MANUFACTURER	MODEL NO.	TYPE	PUMP			MOTOR		UNIT WEIGHT	OPTIONS		FLA	MCA	MOCP	VOLT	PH	REMARKS
					DESIGN FLOW	HEAD	DRIVE TYPE	POWER	ECM		AQUASTAT	TIMER KIT						
DCP-1	DOM. HW-R	BELL & GOSSETT	ECOCIRC e3-6V	INLINE	1.0 GPM	2.2 FT	DIRECT	28 W	Yes	6 lb	Yes	Yes	4.4 A	5.5 A	15.0 A	120 V	1	1

NOTES:
1. PUMP TO BE OPERATED BASED ON PROGRAMMABLE TIME CLOCK AND RETURN WATER TEMPERATURE.

WATER AND WASTE SERVICE CALCULATION

ID	FIXTURE DESCRIPTION	Qty	HW (EACH)	CW (EACH)	WSFU (TOTAL)	HW (TOTAL)	CW (TOTAL)	MIN FIXTURE CONNECTION SIZE	DRAINAGE (EACH)	DRAINAGE (TOTAL)	COMMENTS
			FU	FU	FU	FU	FU	INCHES	DFU	DFU	
(E) HB	Hose Bibb	1		2.5	2.5		2.5	3/4"			
(E) HB	Hose Bibb, each additional	3		1	3		3	3/4"			
(E) HS	Hand Sink	1	0.75	0.75	1	0.75	0.75	1/2"	2	2	
(E) LAV	Lavatory	4	0.75	0.75	4	3	3	1/2"	1	4	
(E) SH	Shower, per head	1	1.5	1.5	2	1.5	1.5	1/2"	2	2	
(N) EWC	Drinking Fountain or Water Cooler	2		0.5	1		1	1/2"	1	1	
(N) OB	Clothes Washer, domestic	1	3	3	4	3	3	1/2"	3	3	
(N) OB	Icemaker, kitchen	2		0.5	1		1	1/2"			
(N) S	Kitchen Sink	1	1.125	1.125	1.5	1.125	1.125	1/2"	2	2	
(N) LAV	Lavatory	2	0.75	0.75	2	1.5	1.5	1/2"	1	2	
(N) WC	Water Closet, 1.6 GPF Gravity Tank	6		2.5	15		15	1/2"	4	24	
(N) JS	Service or Mop Basin 2"W	1	2.25	2.25	3	2.25	2.25	1/2"	3	3	
	TOTALS	**24**			**37**	**10.875**	**33.375**			**40**	
					TOTAL H2O	HW	CW			TOTAL DRAIN	

SUMMARY:
WATER SERVICE:
(E) 1.25" SERVICE W/ 1" METER ACCEPTABLE PER OPSC TABLE 610.4

BUILDING DRAIN:
(E) 5-INCH DRAIN IS ACCEPTABLE PER OPSC TABLE 703.2

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revisions:

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checked by: JW

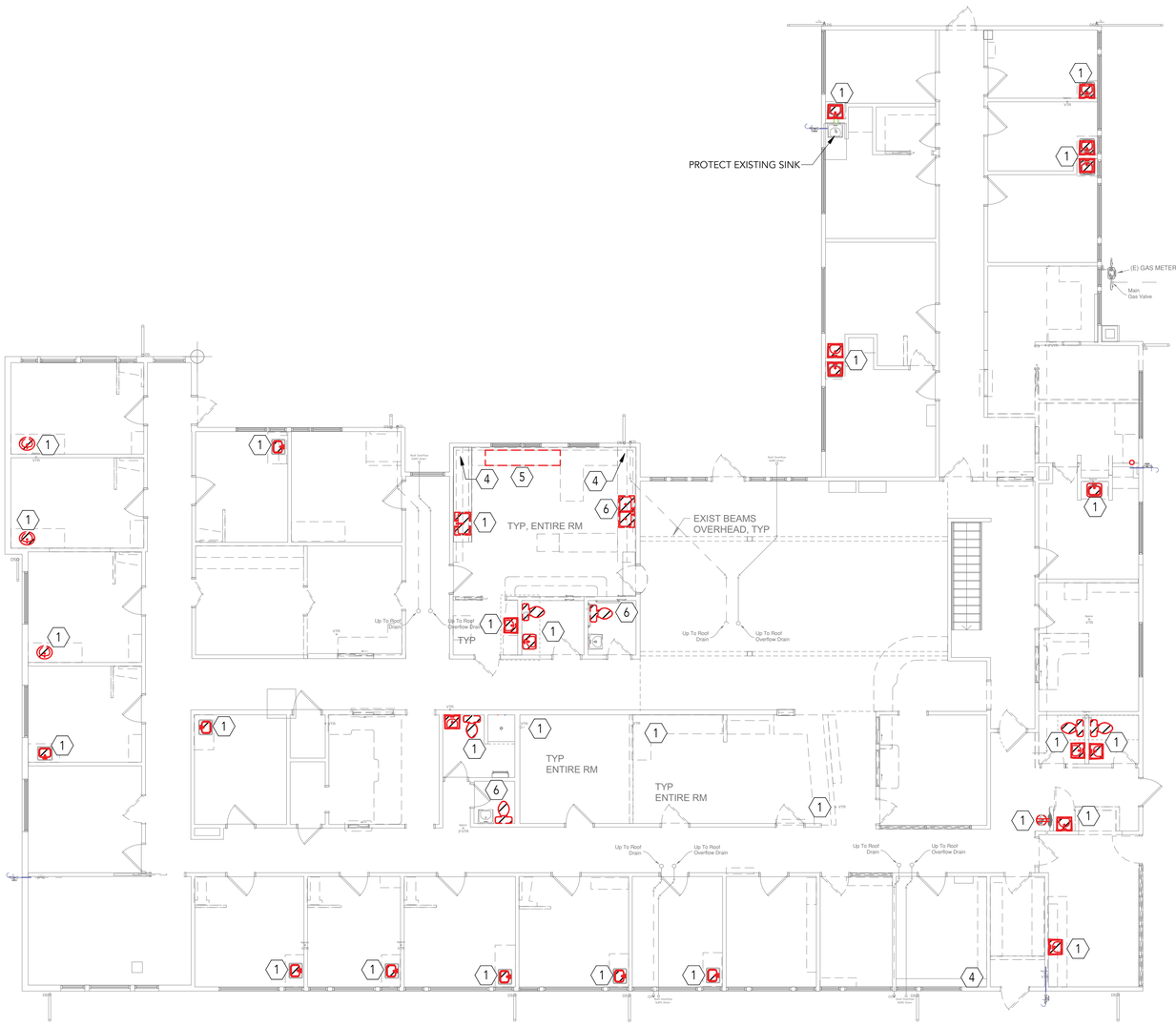
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SCHEDULES

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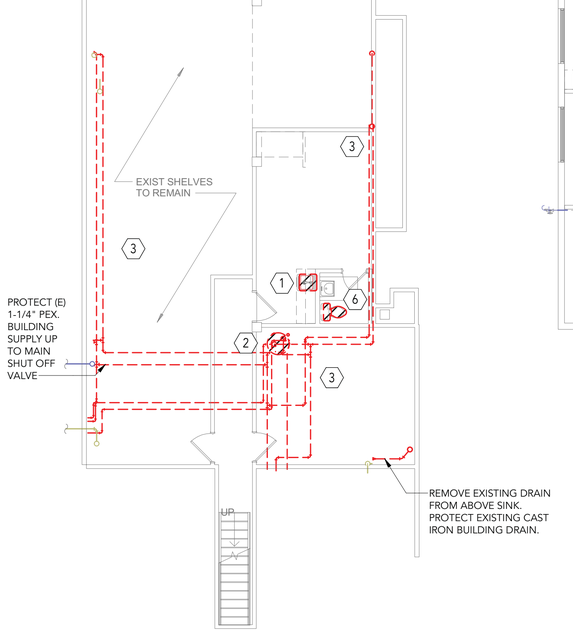
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1 P-100 LEVEL 1 PLUMBING DEMOLITION PLAN

1/8" = 1'-0"

0 4' 8' 16'



2 P-100 BASEMENT PLUMBING DEMOLITION PLAN

1/8" = 1'-0"

0 4' 8' 16'

SHEET NOTES

1. LOCATION OF EQUIPMENT SHOWN IS APPROX. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO START OF WORK.
2. THE CONTRACTOR SHALL PATCH AND REPAIR EXTERIOR WALLS TO MATCH ADJACENT MATERIAL, FINISH, AND COLOR UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL PATCH AND REPAIR OPENINGS MADE IN THE ROOF DUE TO DEMOLITION IN ACCORDANCE WITH ARCHITECT AND ROOF MFG REQUIREMENTS. WORK DONE TO ROOF SHALL NOT VIOLATE ROOF WARRANTY.
3. ITEMS TO BE REMOVED FROM THE SITE SHALL BE PROPERLY DISPOSED OF UNLESS OTHERWISE NOTED.
4. ITEMS CALLED TO BE REMOVED SHALL BE REMOVED COMPLETELY. THIS INCLUDES HANGERS, SUPPORTS, AND ASSOCIATED ITEMS.
5. CAP EXISTING SEWER PIPE WHERE FIXTURES ARE REMOVED.
6. OWNER SHALL HAVE FIRST RIGHT OF REFUSAL FOR REMOVED EQUIPMENT.
7. DEAD LEGS IN WATER SUPPLY PIPING ARE NOT PERMITTED PER OREGON PLUMBING CODE SECTION 309.5. DRAIN EXISTING DOMESTIC WATER BACK TO BASEMENT AND CAP SUPPLY WATER LINES IN WALL. CAP WATER LINE IN BASEMENT AS CLOSE TO WALL AS POSSIBLE.
8. PROTECT EXISTING SANITARY WASTE PIPING IN THE BASEMENT UOS.
9. PROTECT (E) NATURAL GAS PIPING.
10. **PLUMBING DEMOLITION IS TO BE COORDINATED WITH NEW WORK. SEE P-200 FOR REFERENCE.**

KEYNOTES (#)

1 REMOVE (E) FIXTURES. CAP (E) WASTE AND SUPPLY LINES INSIDE WALL CAVITY.

2 REMOVE (E) WATER HEATER, CIRCULATION PUMP, AND FLEXIBLE GAS CONNECTION. PROTECT EXISTING GAS LINES AND VENT PIPING. CLEAN EXISTING NG PIPE DIRT LEG. PREPARE GAS PIPING FOR NEW CONNECTION TO NEW WH.

3 REMOVE (E) DOMESTIC HOT AND COLD WATER LINES IN THE BASEMENT WHERE VISIBLE.

4 CAP (E) NATURAL GAS CONNECTION INSIDE OF WALL AND ADD A WALL ACCESS PANEL FOR FUTURE ACCESSIBILITY. ADD BALL COCK SHUTOFF VALVE UPSTREAM OF CAP. COORDINATE WITH ARCHITECT FOR ACCESS PANEL LOCATION AND LABELING REQUIREMENTS.

5 REMOVE (E) WATER FILTRATION AND PIPING UNDER COUNTER. CAP PIPING UNDER FLOOR.

6 REMOVE (E) FIXTURE. REPLACE WITH NEW. REUSED EXISTING WASTE AND VENT PIPE. EXISTING SUPPLIES AND STOPS TO BE REPLACED WITH NEW.

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DEMOLITION PLANS

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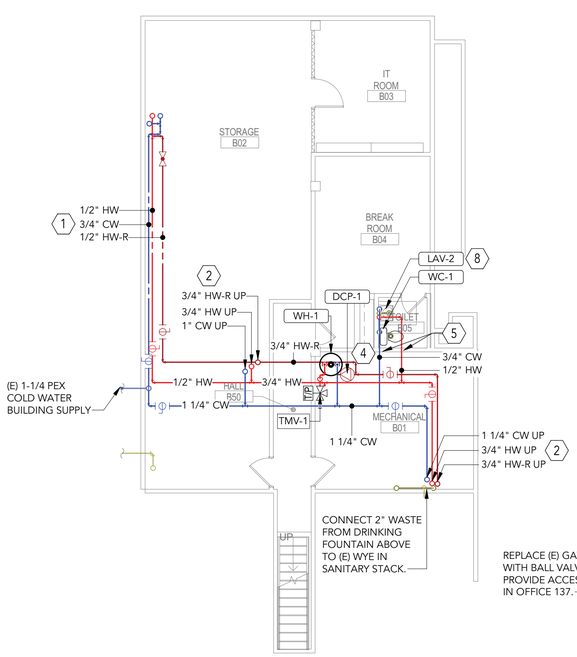
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EXISTING 1-1/4" WATER SERVICE LINE AND SHUTOFF VALVE TO BE REUSED. COPPER AND GALVANIZED PIPING DOWNSTREAM IS TO BE REPLACED.

3 P-200 EXISTING WATER SERVICE RISER

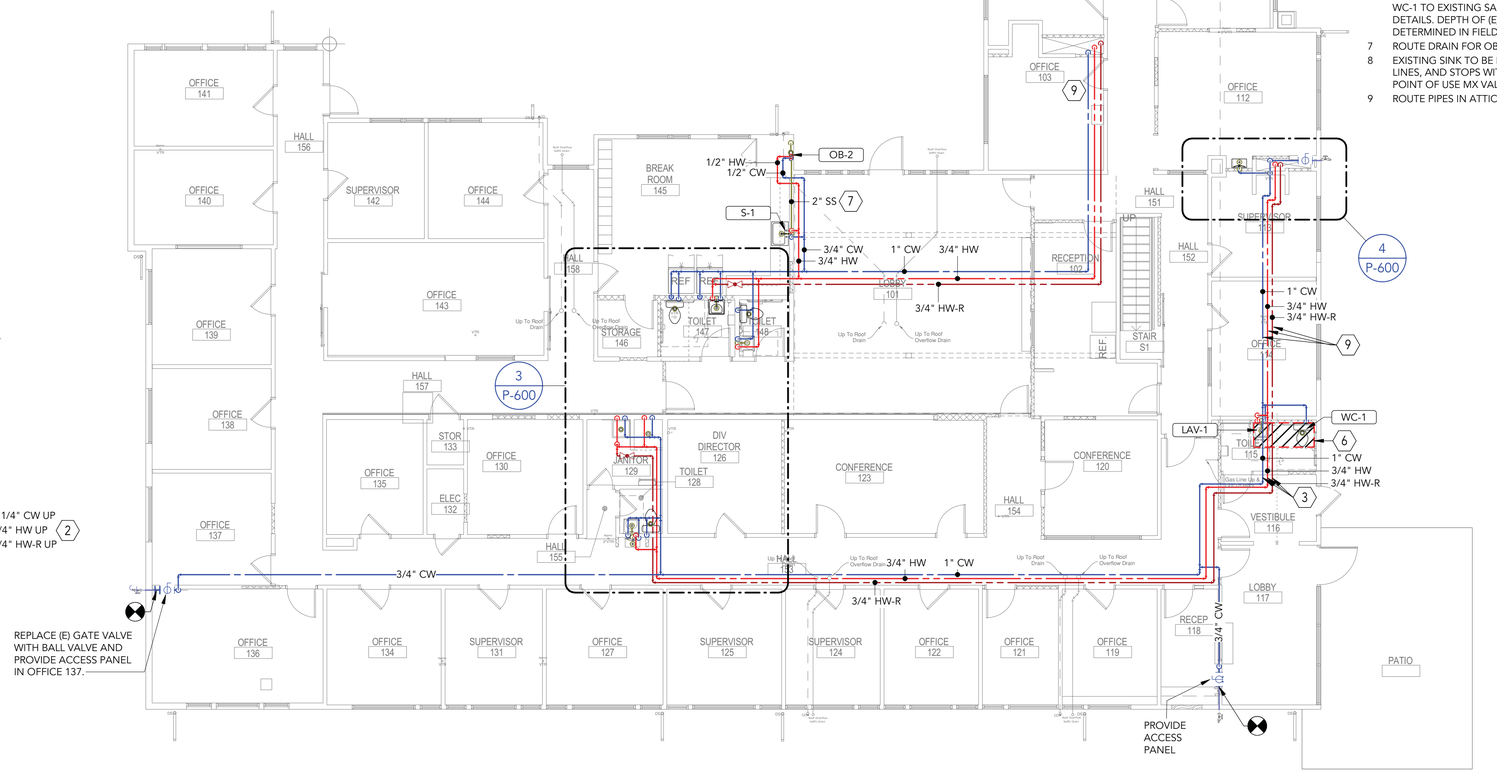
NOT TO SCALE



2 P-200 BASEMENT PLUMBING PLAN

1/8" = 1'-0"

0 4' 8' 16'



1 P-200 LEVEL 1 PLUMBING PLAN

1/8" = 1'-0"

0 4' 8' 16'

SHEET NOTES

1. SANITARY WASTE PIPING SHOWN IS UNDERFLOOR. DOMESTIC WATER AND VENT PIPING SHOWN IS ABOVE THE CEILING OF THE RESPECTIVE FLOOR.
2. GANG VENTS TO THE EXTENT POSSIBLE AND REUSE EXISTING VENT ROOF PENETRATIONS.
3. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY THE LOCATION OF EXISTING BELOW GRADE WASTE PIPING AND REFLECT ANY DEVIATION GREATER THAN 1'-0" FROM THIS PLAN ON THE AS-BUILT DRAWINGS.
4. CUTTING, BORING, SAWCUTTING, OR DRILLING THROUGH THE NEW AND EXISTING STRUCTURAL ELEMENTS TO BE DONE ONLY IN COORDINATION WITH ARCHITECT AND EOR.
5. DOMESTIC WATER PIPING LOCATED UNDERSLAB IS TO BE ABANDONED IN PLACE. ANY EXISTING PLUMBING FIXTURES THAT WERE CONNECTED TO BELOW GRADE DOMESTIC WATER PIPING SHALL BE RECONNECTED TO NEW DOMESTIC WATER PIPING FROM ABOVE. EXACT POINTS WHERE EACH FIXTURE PENETRATES THE SLAB SHALL BE DETERMINED IN THE FIELD BY THE CONTRACTOR.
6. PROVIDE COVER PLATES WHERE NEW SINGLE-HOLE FAUCETS ARE PROVIDED TO EXISTNG 3-HOLE SINKS OR LAVATORIES.
7. SEAL ANNULAR SPACE OF PIPE PENETRATIONS THROUGH FLOOR AND CEILINGS, INCLUDING WHERE PIPES ARE LOCATED IN A CHASE.
8. MAKE ALL HWR BALANCING VALVES ACCESSIBLE FROM BELOW. PROVIDE ACCESS DOORS AS REQUIRED.

KEYNOTES (#)

1 REMOVE (E) GALVANIZED PIPE AND REPLACE W/ PEX. PROVIDE NEW HANGERS AS REQ'D BY SPECIFICATIONS. REUSE (E) FLOOR PENETRATIONS TO THE EXTENT POSSIBLE.
2 CORE DRILL THROUGH EXISTING CONCRETE FLOOR FOR NEW PIPE PENETRATONS.
3 DROP DOWN TO ROUTE ABOVE FINISHED CEILING.
4 (E) WATER HEATER VENT DUCT TO BE REUSED.
5 REUSE (E) WALL PENETRATION.
6 SAW CUT FLOOR AND CONNECT NEW WASTE PIPING FOR LAV-1 AND WC-1 TO EXISTING SANITARY. COORDINATE WITH ARCH FOR SAW CUT DETAILS. DEPTH OF (E) WASTE PIPE UNKNOWN AND WILL NEED TO BE DETERMINED IN FIELD.
7 ROUTE DRAIN FOR OB-2 IN WALL TO (E) S-1 DRAIN.
8 EXISTING SINK TO BE REUSED. REPLACE FAUCET, TAILPIECE, SUPPLY LINES, AND STOPS WITH NEW. PROVIDE NEW ADA GUARDS AND POINT OF USE MX VALVE. FAUCET TO BE SAME AS USED ON LAV-2.
9 ROUTE PIPES IN ATTIC SPACE.

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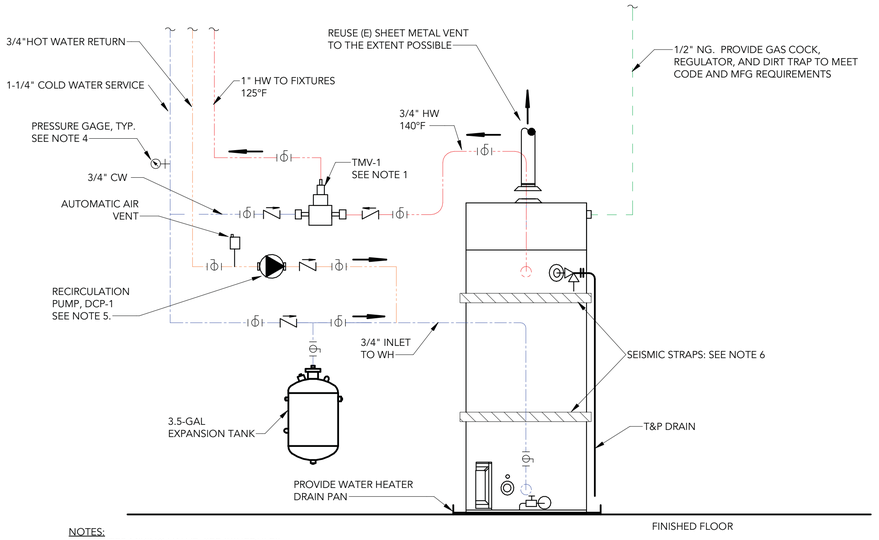
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PLUMBING PLANS

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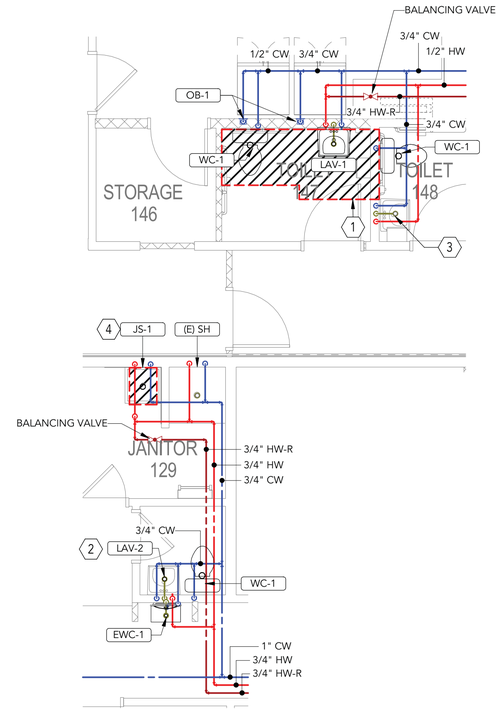
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NOTES:
1. MASTER MIXING VALVE, SEE SCHEDULES.
2. CONDENSATE DRAIN PIPE PER MFG.
3. T&P RELIEF PIPE SHALL BE 3/4" TYPE L OR TYPE K COPPER.
4. PRESSURE GAGE: 0-160 PSI, 1 PSI GRADUATION, 2-1/2" DIAL.
5. SEE PUMP SCHEDULE ON P-010 AND SPECIFICATIONS.
6. STRAP WH TO WALL STRUCTURE WITHIN UPPER 1/3 AND LOWER 1/3 OF WH TO RESIST HORIZONTAL DISPLACEMENT. MAINTAIN MIN. 4" CLEARANCE BETWEEN STRAPS AND UNIT CONTROLS.

1 P-600 WATER HEATER PIPING
NOT TO SCALE



3 P-600 ENLARGED CENTRAL RESTROOM PLUMBING
1/4" = 1'-0"

0 2' 4' 8'

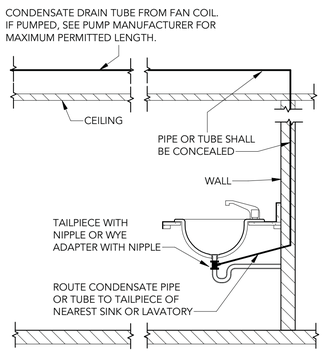
KEYNOTES

1 SAW CUT THIS AREA AS NEEDED TO CONNECT NEW LAV-1 DRAIN TO EXISTING BELOW GRADE SANITARY. DEPTH OF (E) WASTE PIPE UNKNOWN AND WILL NEED TO BE DETERMINED IN FIELD. PROVIDE NEW VENT FOR LAV-1 AND CONNECT TO (E) VTR.

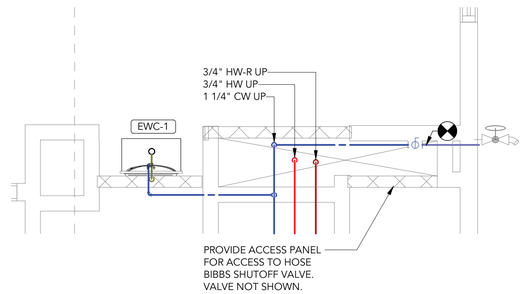
2 EXISTING LAV/SINK TO BE REUSED. REPLACE FAUCET, TAILPIECE, SUPPLY LINES, AND STOPS WITH NEW. PROVIDE NEW ADA GUARDS AND POINT OF USE MX VALVE.

3 REPLACE EXISTING FAUCET, TAILPIECE, SUPPLY LINES, AND STOPS WITH NEW. PROVIDE NEW ADA GUARDS AND POINT OF USE MX VALVE. FAUCET TO BE SAME AS USED ON LAV-1.

4 SAW CUT AROUND THIS AREA AS REQUIRED FOR RECONFIGURATION OF WATER CLOSET DRAIN TO MOP SINK DRAIN.



2 P-600 FAN COIL CONDENSATE DRAIN
NOT TO SCALE



4 P-600 ENLARGED WATER COOLER PLUMBING
1/2" = 1'-0"

0 1' 2' 4'

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GENERAL MECHANICAL SYMBOLS

- 1 — REVISION NUMBER - SHOWN ON PLANS
- POINT WHERE NEW CONNECTS TO EXISTING
- NUMBER OF DETAIL ON SHEET / NUMBER OF SHEET WHERE DETAIL APPEARS
- 1 — KEYNOTE
- CONTINUATION SYMBOL
- Room / 5 — ROOM NAME AND NUMBER
- ITEM TO BE REMOVED OR DEMOLISHED
- AREA NOT IN CONTRACT
- 2" — PIPE SIZE TAG (DIAMETER) / ABOVE GROUND PIPING
- 1/8" / 12" SLOPE — PIPE SLOPE TAG / BELOW GROUND PIPING
- INVERT: -105' - 1" — PIPE INVERT ELEVATION TAG
- (E) — EXISTING PIPE TAG / PIPING BEING DEMOLISHED

ABBREVIATIONS

Ø	ROUND DUCT	LWT	LEAVING WATER TEMPERATURE
ABV	ABOVE	M/A	MIXED AIR
AC	AIR CONDITIONING	MAX	MAXIMUM
AD	AREA DRAIN	MBH	ONE THOUSAND BTU PER HOUR
ADD	ADDENDUM	MCDB	MEAN COINCIDENT DRY BULB
AFF	ABOVE FINISHED FLOOR	MCWB	MEAN COINCIDENT WET BULB
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY	MCF	ONE THOUSAND CUBIC FEET
AFG	ABOVE FINISHED GRADE	MD	MOTORIZED DAMPER
AP	ACCESS PANEL	MECH	MECHANICAL
ARCH	ARCHITECT/ARCHITECTURAL	MFR	MANUFACTURER
BFF	BELOW FINISHED FLOOR	MIN	MINIMUM
BTUH	BRITISH THERMAL UNITS PER HOUR	MISC	MISCELLANEOUS
C/A	COMBUSTION AIR	MU/A	MAKE-UP AIR
CAP	CAPACITY	NC	NOISE CRITERIA
CFM	CUBIC FEET PER MINUTE	NC	NORMALLY CLOSED
CLG	COOLING	NIC	NOT IN CONTRACT
CO	CLEAN OUT	NO.	NUMBER
CW	COLD WATER	NO	NORMALLY OPEN
D	DEGREE	NC	NORMALLY CLOSED
DB	DRY BULB	NTS	NOT TO SCALE
DIA	DIAMETER	O/A	OUTSIDE AIR
DN	DOWN, DUCT OR PIPE DROP	OD	OUTER DIMENSION
EA	EACH	OFD	OVERFLOW FLOOR DRAIN
EAT	ENTERING AIR TEMPERATURE	ORD	OVERFLOW ROOF DRAIN
ELEC	ELECTRICAL	PLB	PLUMBING
ESP	EXTERNAL STATIC PRESSURE	PRV	PRESSURE REDUCING VALVE
EWC	ELECTRIC WATER COOLER	PSI	POUNDS PER SQUARE INCH
EWT	ENTERING WATER TEMPERATURE	PSIG	POUNDS PER SQUARE INCH GAUGE
E/A	EXHAUST AIR		
EXIST	EXISTING	PWR	POWER
FDC	FIRE DEPARTMENT CONNECTION	R	DUCT RISER
FO	FUEL OIL	R/A	RETURN AIR
FOV	FUEL OIL VENT	RCP	RADIANT CEILING PANEL
FOR	FUEL OIL RETURN	RD	ROOF DRAIN
FOS	FUEL OIL SUPPLY	RH	RELATIVE HUMIDITY
FPM	FEET PER MINUTE	RL/A	RELIEF AIR
FPR	FIBER REINFORCED PLASTIC	RM	ROOM
FT	FOOT/FEET	RPM	REVOLUTIONS PER MINUTE
GAL	GALLON	RW	RAIN WATER
GC	GENERAL CONTRACTOR	SF	SQUARE FOOT
GPM	GALLONS PER MINUTE	S/A	SUPPLY AIR
GW	GREASE WASTE	S-O/A	OUTSIDE AIR
HB	HOSEBIB	SMD	SMOKE DAMPER
HP	HORSE POWER	SP	STANDPIPE
HTG	HEATING	S.P.	STATIC PRESSURE
HYD	HYDRANT	T	THERMOSTAT
ID	INDIRECT	T/A	TRANSFER AIR
I.D.	INNER DIMENSION	TDR	TRENCH DRAIN
I.E.	INVERTED ELEVATION	TEMP	TEMPERATURE
IN	INCH	TYP	TYPICAL
LB/HR	POUNDS PER HOUR	UG	UNDERGROUND
LAT	LEAVING AIR TEMPERATURE	UOS	UNLESS OTHERWISE SPECIFIED
LP	LOW PRESSURE	UP	UP, DUCT OR PIPE RISER
LPG	LIQUEFIED PETROLEUM GAS	VAC	VACUUM
		V	VENT
		VAV	VARIABLE AIR VOLUME
		VENT	VENTILATION
		VTR	VENT THROUGH ROOF
		WB	WET BULB
		WCO	WALL CLEAN OUT

EQUIPMENT ABBREVIATIONS

AHU	AIR HANDLING UNIT	EWH	ELECTRIC WATER HEATER
AS	AIR SEPARATOR	F	FURNACE
AC	COOLING ONLY CONDENSING UNIT	FC	FAN COIL UNIT
B	BOILER	GI	GREASE INTERCEPTOR
BS	BRANCH SELECTOR	GRV	GRAVITY ROOF VENTILATOR
C	AIR CURTAIN	HWP	HEATING WATER PUMP
CH	CHILLER	HRU	HEAT RECOVERY UNIT
CT	COOLING TOWER	IH	INFARED HEATER
CHWP	CHILLED WATER PUMP	RTU	ROOFTOP UNIT
CU	CONDENSING UNIT	SP	SUMP PUMP
DBP	DOMESTIC WATER BOOSTER PUMP	SF	SUPPLY FAN
DCP	DOMESTIC WATER CIRCULATING PUMP	UH	UNIT HEATER
EF	EXHAUST FAN	WH	WATER HEATER
ET	EXPANSION TANK	VRF	VARIABLE REFRIGERANT VOLUME OUTDOOR UNIT

* NOTE *

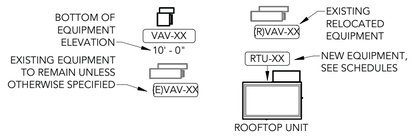
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HVAC SYMBOLS

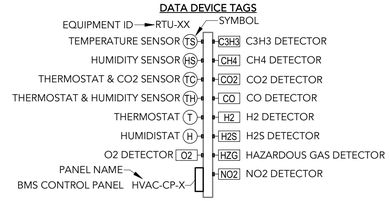
- 18"x12" — SQUARE DUCT SIZE TAG (WIDTH x HEIGHT)
- 18"/12" — OVAL DUCT SIZE TAG (WIDTH / HEIGHT)
- 18"Ø — ROUND DUCT SIZE TAG (DIAMETER)
- (E) — EXISTING DUCT TAG
- DUCT BEING DEMOLISHED
- 18"x18" S/A — SUPPLY AIR
- 18"x18" S-O/A — CONDITIONED OUTSIDE AIR
- 18"x18" O/A — OUTSIDE AIR
- 18"x18" R/A — RETURN AIR
- 18"x18" T/A — TRANSFER AIR
- 18"x18" E/A — EXHAUST AIR
- 18"x18" L/A — RELIEF AIR
- 18"x18" GE/A — GREASE EXHAUST AIR
- 18"x18" CE/A — CONDENSATE EXHAUST AIR
- 18"x18" SE/A — SMOKE EXHAUST AIR
- 6"Ø FLUE — EXHAUST GAS FLUE
- 6"Ø C/A — COMBUSTION AIR
- DROP — RECTANGULAR SUPPLY/OUTSIDE AIR DUCT RISE
- DROP — ROUND SUPPLY/OUTSIDE AIR DUCT RISE
- DROP — RECTANGULAR RETURN/TRANSFER AIR DUCT RISE
- DROP — ROUND RETURN/TRANSFER AIR DUCT RISE
- DROP — RECTANGULAR EXHAUST/RELIEF AIR DUCT RISE
- DROP — ROUND EXHAUST/RELIEF AIR DUCT RISE

GRILLES, REGISTERS & DIFFUSERS TAG

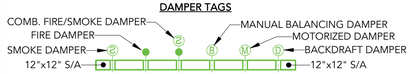
MECHANICAL EQUIPMENT TAGS



DATA DEVICE TAGS



DAMPER TAGS



PIPING SYMBOLS

- CHWR — CHILLED WATER RETURN
- CHWS — CHILLED WATER SUPPLY
- CD — CONDENSATE DRAINAGE
- CWR — CONDENSER WATER RETURN
- CWS — CONDENSER WATER SUPPLY
- GWR — GEOTHERMAL WATER RETURN
- GWS — GEOTHERMAL WATER SUPPLY
- HWR — HEATING WATER RETURN
- HWS — HEATING WATER SUPPLY
- G — NATURAL GAS
- PG — PROPANE GAS
- REF-L — REFRIGERANT-LIQUID
- REF-HG — REFRIGERANT-HOT GAS
- STM — STEAM
- CDR — CONDENSATE RETURN

PIPE ACCESSORY TAGS

- 2" SHUTOFF BALL VALVE
- 2" SHUTOFF BALL VALVE
- 2" BALANCING BALANCING VALVE
- 2" BUTTERFLY BUTTERFLY VALVE
- 2" CHECK CHECK VALVE
- 2" NEEDLE NEEDLE VALVE
- 2" CIRC CIRCUIT SETTER
- 2" GATE GATE VALVE
- 2" LOCKED LOCK SHIELD VALVE
- 2" QUICK QUICK OPENING
- 2" STRAINER
- 1" PLUG PLUG VALVE
- 1" GAS COCK GAS SHUTOFF COCK
- 1" GAS-CNTRL EMERG. GAS SHUTOFF
- 2" M-CNTRL ELEC. CONTROL
- 4" 3-WAY CNTRL 3-WAY ELEC. CONTROL
- 2" PRV PRESS REDUCING
- 1" REG PRESS REGULATOR

PROJECT GENERAL NOTES

GENERAL

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING, PRIOR TO FINAL BID, ARCHITECTURAL AND OTHER EXISTING CONDITIONS SHOWN ON THESE PLANS FOR PLUMBING SYSTEMS, MECHANICAL SYSTEMS, ARCHITECTURAL AND OTHER BUILDING CONDITIONS WITHIN TENANT SPACE AND WITHIN CLOSE PROXIMITY OF TENANT SPACE. CONTRACTOR IS TO REMEDY, AT NO COST TO THE OWNER, ANY DEFICIENCIES CAUSED BY FAILURE TO PERFORM SUCH VERIFICATIONS. NOTIFY ARCHITECT AS SOON AS POSSIBLE OF ANY CONDITIONS IN CONFLICT WITH THESE PLANS.
2. THE CONTRACTOR SHALL FURNISH AND INSTALL COMPONENTS REQUIRED TO MEET THE REQUIRED SYSTEM PERFORMANCE AND THE PROPER EXECUTION AND COMPLETION OF WORK. CONTRACTOR SHALL FURNISH AND INSTALL NECESSARY WIRING, CONTROLS, HARDWARE, FITTINGS, PARTS, AND ACCESSORIES INCLUDING SAFETY DEVICES REQUIRED FOR PROPER OPERATION OF SYSTEM IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS. EQUIPMENT CONTROLS SUCH AS THERMOSTATS, SENSORS, ETC., SHALL BE PROVIDED BY THE CONTRACTOR UNLESS OTHERWISE STATED.
3. THE CONTRACTOR SHALL PERFORM SERVICE AND REPAIR ON THE REUSED EXISTING EQUIPMENT AND ITS ACCESSORIES AS FOLLOWS: CLEAN ALL COILS, REPLACE FILTERS AND BELTS, INSPECT, REPAIR, OR IF NEEDED, REPLACE THE DRIVES AND FAN BEARINGS, MOTORS, CONTROL COMPONENTS, DAMPERS, AND ANY OTHER ITEM NECESSARY FOR A COMPLETE AND PROPER OPERATING SYSTEM. THIS CONTRACTOR SHALL ALSO VISIT THE SITE, PRIOR TO FINAL BIDDING, AND VERIFY ALL EXISTING SITE CONDITIONS. PROVIDE ALL MATERIAL AND COMPONENTS AS NEEDED TO BRING THE UNITS TO FULL COMPLIANCE OF OWNER'S CRITERIA AND LOCAL AUTHORITY HAVING JURISDICTION.
4. DRAWINGS INDICATE GENERAL MECHANICAL PROJECT SCOPE AND ARE SCHEMATIC IN NATURE. THE DRAWINGS DO NOT NECESSARILY INDICATE OR DESCRIBE ALL OF THE WORK CONTENT REQUIRED FOR A COMPLETE, WORKABLE INSTALLATION.
5. COORDINATE INSTALLATION OF DUCTWORK, PIPING, CONDUIT, LIGHTS, CABLE TRAY, STRUCTURE, AND EQUIPMENT TO PREVENT CONFLICTS.
6. CONCEAL CONNECTIONS (REFRIGERANT, CONDENSATE DRAIN, ELECTRICAL), AND PIPING/ELECTRICAL IN FINISHED AREAS.
7. LOCATE EQUIPMENT REQUIRING ACCESS NOT MORE THAN 18 INCHES FROM THE TOP OF SUSPENDED CEILING GRID TO BOTTOM EDGE OF EQUIPMENT.
8. MAINTAIN CLEAR ACCESS TO SERVICE EQUIPMENT AND OTHER ACCESSORIES REQUIRING SERVICE, VISUAL INSPECTION OR HAND OPERATION. WHERE INDICATED OR REQUIRED, PROVIDE ACCESS PANELS OF THE TYPE SELECTED TO SUIT MATERIALS IN WHICH INSTALLED.
9. EQUIPMENT IS TO BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND RECOMMENDATIONS, AND AS REQUIRED BY MECHANICAL CODE, ELECTRICAL CODE, AND AHJ. INSTALLATION SHALL BE AT A LEVEL OF QUALITY AND WORKMANSHIP CONSISTENT WITH THE SPECIFICATIONS. VERIFY ADEQUATE ACCESS FOR ROUTINE MAINTENANCE.
10. WHERE FLOOR DRAINS OCCUR THE LIMITS OF CONSTRUCTION, PREVENT CONSTRUCTION DEBRIS FROM ENTERING DRAIN BODY BY SEALING DRAIN OPENING PRIOR TO START OF WORK. UNSEAL DRAINS AT COMPLETION OF CONSTRUCTION.
11. EXISTING HVAC EQUIPMENT TO REMAIN SHALL BE TESTED FOR PROPER FUNCTIONALITY ACCORDING TO MANUFACTURER'S REQUIREMENTS. BRING TO THE ATTENTION OF THE ARCH AND EOR ANY EQUIPMENT THAT FAILS FUNCTIONAL TESTS.

DUCTING AND PIPE

1. DUCTWORK ROUTING SHOWN IS APPROXIMATE. NOT ALL OFFSETS AND BENDS IN THE DUCTWORK CAN BE ANTICIPATED OR SHOWN. COORDINATE FINAL LOCATION OF DUCTWORK, ROOF PENETRATIONS, AIR TERMINALS, AND ACCESSORIES WITH ARCHITECT AND STRUCTURAL ENGINEER. IF DESIGN INTENT IS ALTERED AS A RESULT OF ADDING OFFSETS AND BENDS, CONTRACTOR SHALL ADJUST DUCTWORK SIZING, AND SUBMIT SHOP DRAWINGS SHOWING DETAILED ALTERATIONS FOR ACCEPTANCE PRIOR TO BEGINNING THE ALTERATION.
2. DUCTWORK SHAPE IS PERMITTED TO CHANGE FROM WHAT IS SHOWN BUT THE CROSS SECTIONAL FLOW PATH AREA MAY NOT BE REDUCED FROM THE DESIGN. DUCTWORK ASPECT RATIO (LARGEST FRACTIONAL RATIO OF DUCT HEIGHT AND WIDTH) SHALL NOT EXCEED 2.5, WITHOUT APROVAL FROM E.O.R.
3. USE OF NON-RIGID FLEXIBLE DUCTWORK SHALL BE LIMITED TO BRANCH DUCT CONNECTIONS BETWEEN RIGID METAL DUCTWORK AND A SINGLE AIR DIFFUSER/GRILLE. FLEXIBLE DUCT IS ONLY PERMITTED ON SUPPLY AIR DUCTING AND WHERE INDICATED ON PLANS. MAXIMUM LENGTH PERMITTED FOR FLEXIBLE DUCTWORK IS 5' ON CONNECTIONS. FLEXIBLE DUCT MAY BE USED FOR THE ENTIRE LENGTH OF A LATERAL WITHIN A SINGLE SPACE IF THE LENGTH IS LESS THAN 10'. SEE SPECIFICATIONS.
4. EXHAUST DUCT BRACING AND SUPPORTS SHALL BE NON COMBUSTIBLE MATERIAL SECURELY ATTACHED TO THE STRUCTURE AND DESIGNED TO CARRY GRAVITY AND SEISMIC LOADS WITHIN THE STRESS LIMITATIONS OF THE BUILDING CODE. BOLTS, SCREWS, RIVETS AND OTHER MECHANICAL FASTENERS SHALL NOT PENETRATE THE DUCT WALLS.
5. DO NOT SUPPORT DUCT OR PIPE IN DIRECT CONTACT WITH THE BUILDING STRUCTURE WITHOUT ADEQUATE MEASURES TO PREVENT NOISE DUE TO VIBRATION OF NORMAL SYSTEM USE.
6. ADJUST PIPING AND DUCTWORK SIZES TO PROPERLY CONNECT TO MECHANICAL EQUIPMENT.
7. DUCTWORK, HANGERS, FITTINGS, AND OTHER ASSOCIATED COMPONENTS SHALL BE PAINTED **BLACK** WHERE VISIBLE TO BUILDING OCCUPANTS.
8. LOCATE DUTWORK, PIPING, AND MECHANICAL EQUIPMENT AWAY FROM THE SPACE DIRECTLY ABOVE ELECTRICAL PANELS, TRANSFORMERS, AND OTHER ELECTRICAL EQUIPMENT.

FIRE AND PENETRATIONS

1. BUILDING ENVELOPE PENETRATIONS ARE PER ARCHITECTURAL. REFER TO ARCHITECTURAL FOR ADDITIONAL REQUIREMENTS AT EACH PENETRATION.
2. MAINTAIN WALL/ASSEMBLY RATINGS. PROVIDE FIRE STOP SEALS AS REQUIRED.
3. PENETRATIONS OF RATED ASSEMBLIES SHALL BE FIRE FIRE STOPPING SHALL BE AN APPROVED MATERIAL AS PRESCRIBED IN DIVISION 07 AND SHALL BE U.L. LISTED.

CONTROLS

1. LINE VOLTAGE WIRING SHALL BE INSTALLED IN CONDUIT. ALL LINE VOLTAGE CONDUIT AND WIRING, INCLUDING FINAL CONNECTIONS, SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AS INDICATED ON THE ELECTRICAL DRAWINGS OR SPECIFIED IN THE ELECTRICAL SECTION OF THE SPECIFICATIONS. ALL ELECTRICAL WORK SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE CODES AND REGULATIONS OF GOVERNING BODIES HAVING JURISDICTION THEREOF.
2. LOW VOLTAGE CONDUIT AND WIRING AS APPLICABLE, INCLUDING FINAL CONNECTIONS, SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR AS INDICATED ON THE MECHANICAL DRAWINGS OR SPECIFIED IN THE MECHANICAL SECTION OF THE SPECIFICATIONS.
3. CONTROL WIRING INSTALLED IN EXISTING BUILDINGS WHERE WIRING CANNOT BE FED DOWN THROUGH EXISTING WALLS SHALL BE INSTALLED IN WIREMOLD (PVC).
4. THERMOSTATIC CONTROLS FOR HEAT PUMPS SHALL HAVE A 5 DEG. DEADBAND.

HVAC SHEET INDEX

M-000	TITLE SHEET
M-100	DEMOLITION PLANS
M-101	DEMOLITION PLAN - ROOF
M-020	THERMAL ZONE DIAGRAMS
M-010	SCHEDULES
M-011	VENTILATION SCHEDULE
M-200	HVAC FLOOR PLANS
M-201	ROOF PLAN
M-600	TYP. DETAILS

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revisions:

date: 06/06/2024
project: 23-115
drawn by: JW
checked by: JW

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TITLE SHEET

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ENERGY RECOVERY VENTILATOR SCHEDULE

ID	MANUFACTURER	MODEL NO.	SUPPLY FAN				EXHAUST FAN				OA FILTER EFF	EXHAUST FILTER EFF	UNIT WEIGHT	VOLT	PH	NOTES
			DESIGN AIRFLOW	ESP	MOTOR POWER	MOTOR ECM	DESIGN AIRFLOW	MOTOR POWER	MOTOR ECM							
ERV-1	RENEWAIRE	PREMIUM S	110 CFM	0.30 in-wg	53.00 W	Yes	110 CFM	53.00 W	Yes		MERV-8	MERV-8	38 lb	120 V	1	1, 2, 3

NOTES:
1. PROVIDE WALL MOUNTED SWITCH DISCONNECT LABELED "BASEMENT ERV". COORDINATE WITH DIVISION 26.
2. PROVIDE CONCENTRIC VENT KIT.
3. INTERLOCK WITH DUCT HEATER, EDC-1.

PACKAGED TERMINAL HEAT PUMP (PTHP) SCHEDULE

ID	MANUFACTURER	MODEL NO.	TYPE	ARRANGEMENT	OUTSIDE AIRFLOW	COOLING COIL		HEAT PUMP	HEATING ELEMENT	EER	COP	UNIT WEIGHT	FLA	VOLT	PH	NOTES
						NOMINAL CAP	AIRSIDE DESIGN FLOW	CAP	POWER							
TWHP-1	AMANA	PBH092G12CC	THROUGH WALL HEAT PUMP	HORIZONTAL	30 CFM	9000 Btu/h	265 CFM	8500 Btu/h	1 kW	9.8	3	92 lb	18.6 A	120 V	1	1, 2, 3

NOTES:
1. PROVIDE INSULATED METAL SLEEVE.
2. PROVIDE ARCHITECTURAL GRILLE KIT. COORDINATE WITH ARCHITECT FOR FINISH.
3. 5-15P NEMA PLUG CONFIGURATION.

GRILLES, REGISTERS AND DIFFUSERS SCHEDULE

ID	DESCRIPTION	MANUFACTURER	MODEL	MATERIAL	FINISH	SPECIFICATION	NOTES
CD-1	PLAQUE FACE DIFFUSER	Titus	OMNI	STEEL	WHITE ENAMEL	LAY-IN	
RG-1	PERFORATED DIFFUSER	Titus	PAR-AA	STEEL	WHITE ENAMEL	LAY-IN	
RWG-1	LOUVERED SINGLE DEFLECTION GRILLE	Titus	301RL	STEEL	WHITE ENAMEL	SINGLE DEFLECTION GRILLE, 3/4" BLADE SPACING, BLADES PARALLEL TO LONG DIMENSION	1, 2
SWG-1	LOUVERED SINGLE DEFLECTION GRILLE	Titus	301RL	STEEL	WHITE ENAMEL	SINGLE DEFLECTION GRILLE, 3/4" BLADE SPACING, BLADES PARALLEL TO LONG DIMENSION	1, 2

NOTES:
1. DUCT MOUNTED.
2. PROVIDE INTEGRAL VOLUME DAMPER.

SPLIT SYSTEM CONDENSING UNIT

ID	MANUFACTURER	MODEL NO.	NOMINAL COOLING CAP	NOMINAL HEATING CAP	SEER	EER	SOUND PRESS LEVEL	UNIT WEIGHT	MCA	MOCP	VOLT	PH	NOTES
HPO-1	MITSUBISHI ELECTRIC	PUZ-A12NKA7	1 ton	14000 Btu/h	21.1	13	46	93 lb	11.0 A	15.0 A	208 V	1	1, 2
HPO-2	MITSUBISHI ELECTRIC	PUZ-A12NKA7	1 ton	14000 Btu/h	21.3	13	46	93 lb	11.0 A	15.0 A	208 V	1	1, 2
HPO-3	MITSUBISHI ELECTRIC	PUZ-A12NKA7	1 ton	14000 Btu/h	21.3	13	46	93 lb	11.0 A	15.0 A	208 V	1	1, 2
HPO-4	MITSUBISHI ELECTRIC	PUZ-A24NKA7	2 ton	26000 Btu/h	21.3	12.2	48	179 lb	19.0 A	25.0 A	208 V	1	1, 3

NOTES:
1. NOMINAL CAPACITIES RATED PER AHRI 1230 STANDARD AT FOLLOWING CONDITIONS:
   A. COOLING: INDOOR 80°F DB/67°F WB ; OUTDOOR 95°F DB
   B. HEATING: INDOOR 70°F DB; OUTDOOR 47°F DB/43°F WB
2. PROVIDE 12 INCH HIGH, PREMANUFACTURED ROOF STAND.
3. PROVIDE WALL MOUNT BRACKETS AND HARDWARE FROM SAME DISTRIBUTER AS HEAT PUMP.

INDOOR FAN COIL SCHEDULE

ID	MANUFACTURER	MODEL NO.	TYPE	FAN DESIGN AIRFLOW	NOMINAL COOLING CAP	NOMINAL HEATING CAP	UNIT WEIGHT	INTERLOCK CONDENSING UNIT ID	NOTES
HPI-1	MITSUBISHI	PLFY-P32VEM-A	CASSETTE	353 CFM	1 ton	13600 Btu/h	11 lb	HPO-1	1, 2, 3, 5
HPI-2	MITSUBISHI	PKA-A12LA1	WALL MOUNTED FAN COIL	265 CFM	1 ton	14000 Btu/h	28 lb	HPO-2	1, 2, 3
HPI-3	MITSUBISHI	PKA-A12LA1	WALL MOUNTED FAN COIL	265 CFM	1 ton	14000 Btu/h	28 lb	HPO-3	1, 2, 3, 4
HPI-4	MITSUBISHI	PKA-A24KA8	WALL MOUNTED FAN COIL	635 CFM	2 ton	26000 Btu/h	46 lb	HPO-4	1, 3

NOTES:
1. INDOOR UNITS RECEIVE POWER FROM OUTDOOR UNITS THROUGH FIELD SUPPLIED INTERCONNECTED WIRING. FURNISH AND INSTALL NEW ACR REFRIGERANT PIPING FROM EACH CONDENSING UNIT TO THE RESPECTIVE INDOOR UNIT. REFRIGERANT PIPE SHALL BE SIZED PER MANUFACTURER'S REQUIREMENTS.
2. PROVIDE CONDENSATE LIFT PUMP ACCESSORY FROM FAN COIL MANUFACTURER. ROUTE CONDENSATE LINE UP TO ROOF ALONG SAME PATH AS REFRIGERANT LINESET AND DISCHARGE TO ROOF SURFACE. CONDENSATE LINE SHALL BE 3/4" PVC.
3. PROVIDE DELUXE PROGRAMMABLE, WIRED, WALL MOUNTED THEMOSTAT WITH DIGITAL DISPLAY. REMOTE, WIRELESS THERMOSTATS WILL NOT BE ACCEPTED. MOUNT THERMOSTATS APPROX 60" AFF AND A MINIMUM OF 8" AWAY FROM ANY ADJACENT LIGHT SWITCH.
4. PROVIDE CONDENSATE PUMP WITH SENSOR TO SHUT FAN COIL OFF WHEN CONDENSATE REACHES HIGH LEVEL.
5. PROVIDE FILTER BOX AND MERV-8 FILTER ON FAN COIL INLET.

EXHAUST FAN SCHEDULE

ID	MANUFACTURER	MODEL NO.	TYPE	ARRANGEMENT	FAN DESIGN AIRFLOW	FAN DRIVE TYPE	MOTOR POWER	MOTOR RPM	MOTOR ECM	VOLT	PH	NOTES
BEF-1	GREENHECK	SP-A90-QD	CEILING	ROUND OUTLET	80 CFM	DIRECT	16.70 W	900	Yes	120 V	1	1

NOTES:
1. PROVIDE KEYED SWITCH FOR FAN CONTROL. COORDINATE WITH ELECTRICAL.

SUPPLY FAN SCHEDULE

ID	MANUFACTURER	MODEL NO.	TYPE	FAN DESIGN AIRFLOW	FAN ESP	FAN RPM	FAN DRIVE TYPE	MOTOR QTY	MOTOR POWER	UNIT WEIGHT	VOLT	PH	REMARKS
SF-1	VENTS-US	TT-125	INLINE	90 CFM	0.10 in-wg	2191	DIRECT	1	0.02 hp	4 lb	120 V	1	1, 2

NOTES:
1. INTERLOCK WITH HPI-1 OPERATION.
2. PROVIDE VIBRATION ISOLATION AND FLEXIBLE CONNECTIONS ON DUCT INLET AND OUTLET.

ELECTRIC DUCT COIL SCHEDULE

ID	MANUFACTURER	MODEL NO.	ELECTRIC HEATING COIL CAP	ELECTRIC HEATING COIL AIRSIDE AIRFLOW	HEATING ELEMENT QTY	HEATING ELEMENT POWER	HEATING ELEMENT SCR	UNIT WEIGHT	VOLT	PH	REMARKS
EDC-1	RENEWAIRE	RH SERIES	6824 Btu/h	60 CFM	1	2 kW	Yes	10 lb	208 V	1	1, 2, 3

NOTES:
1. PROVIDE WALL MOUNTED THERMOSTAT.
2. DUCT MOUNTED DISCHARGE AIR SENSOR NOT LESS THAN 24 INCHES FROM DISCHARGE OF HEATER.
3. INTERLOCK WITH ERV-1 OPERATION.

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SCHEDULES

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MARION COUNTY BEHAVIORAL HEALTH VENTILATION SCHEDULE
BASED ON OMSC 403.3.1.1.2.2, TABLE 403.3.1.1

Zone Name / Space Name	Floor Area Az (ft²)	Maximum Occupants Pz	Required Outdoor Air Rp (CFM/person)	Required Outdoor Air Ra (CFM/ft²)	Zone Air Distribution Effectiveness Ez	Zone Outdoor Airflow Voz (CFM)	Design Ventilation CFM	Exhaust CFM/Sqft (CFM)	Exhaust CFM/Unit (CFM)	Exhaust Required (CFM)	Exhaust Design (CFM)
RTU-1											
OFFICE 112	257	1.285	5	0.06	0.8	27		0	-	-	-
OFFICES 113-114	298	1.49	5	0.06	0.8	32		0	-	-	-
COMBINED HALL 151-152	219	0	0	0.06	0.8	16	80	0	-	-	-
STAIR S1	65	0	0	0.06	0.8	5		0	-	-	-
Zone Total		**2.775**				**80**				0	0
							TOTAL DESIGN OUTSIDE AIR (CFM):			TOTAL EXHAUST AIR REQUIRED (CFM):	TOTAL DESIGN EXHAUST AIR (CFM):
							80			0	0
RTU-2											
HALL 150	256	0	0	0.06	0.8	19		0	-	-	-
OFFICES 103	172	0.86	5	0.06	0.8	18		0	-	-	-
OFFICES 104	166	0.83	5	0.06	0.8	18		0	-	-	-
OFFICES 105	190	0.95	5	0.06	0.8	20	90	0	-	-	-
OFFICES 107	114	0.57	5	0.06	0.8	12		0	-	-	-
Zone Total		**3.21**				**87**				0	0
							TOTAL DESIGN OUTSIDE AIR (CFM):			TOTAL EXHAUST AIR REQUIRED (CFM):	TOTAL DESIGN EXHAUST AIR (CFM):
							90			0	0
RTU-3											
OFFICES 108	99	0.495	5	0.06	0.8	11		0	-	-	-
OFFICES 109	97	0.485	5	0.06	0.8	10		0	-	-	-
OFFICES 110	132	0.66	5	0.06	0.8	14	50	0	-	-	-
OFFICES 111	109	0.545	5	0.06	0.8	12		0	-	-	-
Zone Total		**2.185**				**47**				0	0
							TOTAL DESIGN OUTSIDE AIR (CFM):			TOTAL EXHAUST AIR REQUIRED (CFM):	TOTAL DESIGN EXHAUST AIR (CFM):
							50			0	0
RTU-4											
LOBBY 101	630	6.3	5	0.06	0.8	87		-	-	-	-
RECEPTION 102	214	6.42	5	0.06	0.8	56	150	-	-	-	-
Zone Total		**12.72**				**143**				0	0
							TOTAL DESIGN OUTSIDE AIR (CFM):			TOTAL EXHAUST AIR REQUIRED (CFM):	TOTAL DESIGN EXHAUST AIR (CFM):
							150			0	0
RTU-6											
CONFERENCE 120	156	7.8	5	0.06	0.8	60		-	-	-	-
HALL 153 (EAST)	319	0	0	0.06	0.8	24		-	-	-	-
HALL 154	77	0	0	0.06	0.8	6		-	-	-	-
OFFICES 119-124	496	2.48	5	0.06	0.8	53	170	-	-	-	-
RECEPTION 118	80	2.4	5	0.06	0.8	21		-	-	-	-
TOILET 115	60	0	0	0	0.8	0		-	70	70	70
VESTIBULE 116	77	0	0	0.06	0.8	6		-	-	-	-
Zone Total		**12.68**				**170**				70	70
							TOTAL DESIGN OUTSIDE AIR (CFM):			TOTAL EXHAUST AIR REQUIRED (CFM):	TOTAL DESIGN EXHAUST AIR (CFM):
							170			70	70

RTU-8											
ELEC 132	31	0.31	5	0.12	0.8	7		-	-	-	-
HALL 155 (WEST)	374	0	0	0.06	0.8	28		-	-	-	-
JANITOR 129	62	0.62	5	0.12	0.8	13		-	-	-	-
OFFICE 126	156	0.78	5	0.06	0.8	17		-	-	-	-
OFFICE 136	232	1.16	5	0.06	0.8	25	185	-	-	-	-
OFFICES 125-134	603	3.015	5	0.06	0.8	64		-	-	-	-
OFFICES 130	161	0.805	5	0.06	0.8	17		-	-	-	-
OFFICES 135	131	0.655	5	0.06	0.8	14		-	-	-	-
TOILET 128	26	0	0	0	0.8	0		-	70	70	70
Zone Total		**7.345**				**185**				70	70
							TOTAL DESIGN OUTSIDE AIR (CFM):			TOTAL EXHAUST AIR REQUIRED (CFM):	TOTAL DESIGN EXHAUST AIR (CFM):
							185			70	70
RTU-9											
HALL 156	206	0	0	0.06	0.8	15		-	-	-	-
HALL 157-158	329	0	0	0.06	0.8	25		-	-	-	-
LOBBY 101 EXTERIOR STOREFRONT	101	1.01	5	0.06	0.8	14		-	-	-	-
OFFICE 143	286	1.43	5	0.06	0.8	30		-	-	-	-
STORAGE 133	23	0.23	5	0.12	0.8	5	100	-	-	-	-
STORAGE 146	44	0.44	5	0.12	0.8	9		-	-	-	-
TOILET 147	55	0	0	0	0.8	0		-	70	70	70
TOILET 148	40	0	0	0	0.8	0		-	70	70	70
Zone Total		**3.11**				**98**				140	140
							TOTAL DESIGN OUTSIDE AIR (CFM):			TOTAL EXHAUST AIR REQUIRED (CFM):	TOTAL DESIGN EXHAUST AIR (CFM):
							100			140	140
PTACS											
OFFICES 137-141	808	4.04	5	0.06	0.8	86		-	-	-	-
OFFICES 142 & 144	291	1.455	5	0.06	0.8	31	120	-	-	-	-
Zone Total		**5.495**				**117**				0	0
							TOTAL DESIGN OUTSIDE AIR (CFM):			TOTAL EXHAUST AIR REQUIRED (CFM):	TOTAL DESIGN EXHAUST AIR (CFM):
							120			0	0
BASEMENT BREAKROOM THROUGH WALL HEAT PUMP											
BREAK ROOM 204	226	11.3	5	0.06	0.8	88		-	-	-	-
TOILET 205	34	0	0	0	0.8	0	90	-	80	80	80
Zone Total		**11.3**				**88**				80	80
							TOTAL DESIGN OUTSIDE AIR (CFM):			TOTAL EXHAUST AIR REQUIRED (CFM):	TOTAL DESIGN EXHAUST AIR (CFM):
							90			80	80
HPI-1											
CONFERENCE 123	230	11.5	5	0.06	0.8	89	90	-	-	-	-
Zone Total		**11.5**				**89**				0	0
							TOTAL DESIGN OUTSIDE AIR (CFM):			TOTAL EXHAUST AIR REQUIRED (CFM):	TOTAL DESIGN EXHAUST AIR (CFM):
							90			0	0

TOTAL SUPPLY AIR	1125	TOTAL EXHAUST AIR	360

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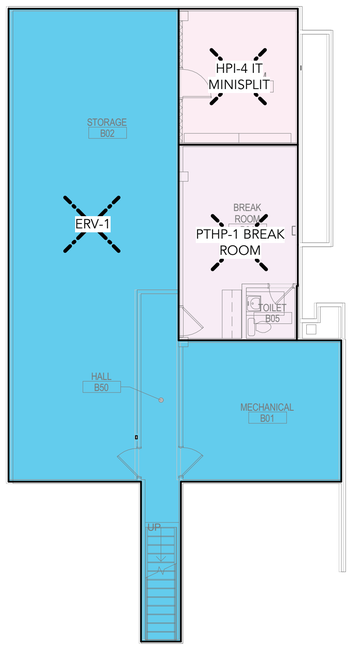
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- ERV-1
- HPI-4 IT MINISPLIT
- PTHP-1 BREAK ROOM



2 M-020 BASEMENT HVAC PLAN

1/8" = 1'-0"

0 4' 8' 16'

- (E) PTAC UNITS
- HPI-1 CONFERENCE ROOM
- HPI-2 BREAK ROOM MINISPLIT
- HPI-3 SE MINISPLIT
- RTU-1
- RTU-2
- RTU-3
- RTU-4
- RTU-6
- RTU-8
- RTU-9



1 M-020 LEVEL 1 THERMAL ZONE DIAGRAM

1/8" = 1'-0"

0 4' 8' 16'

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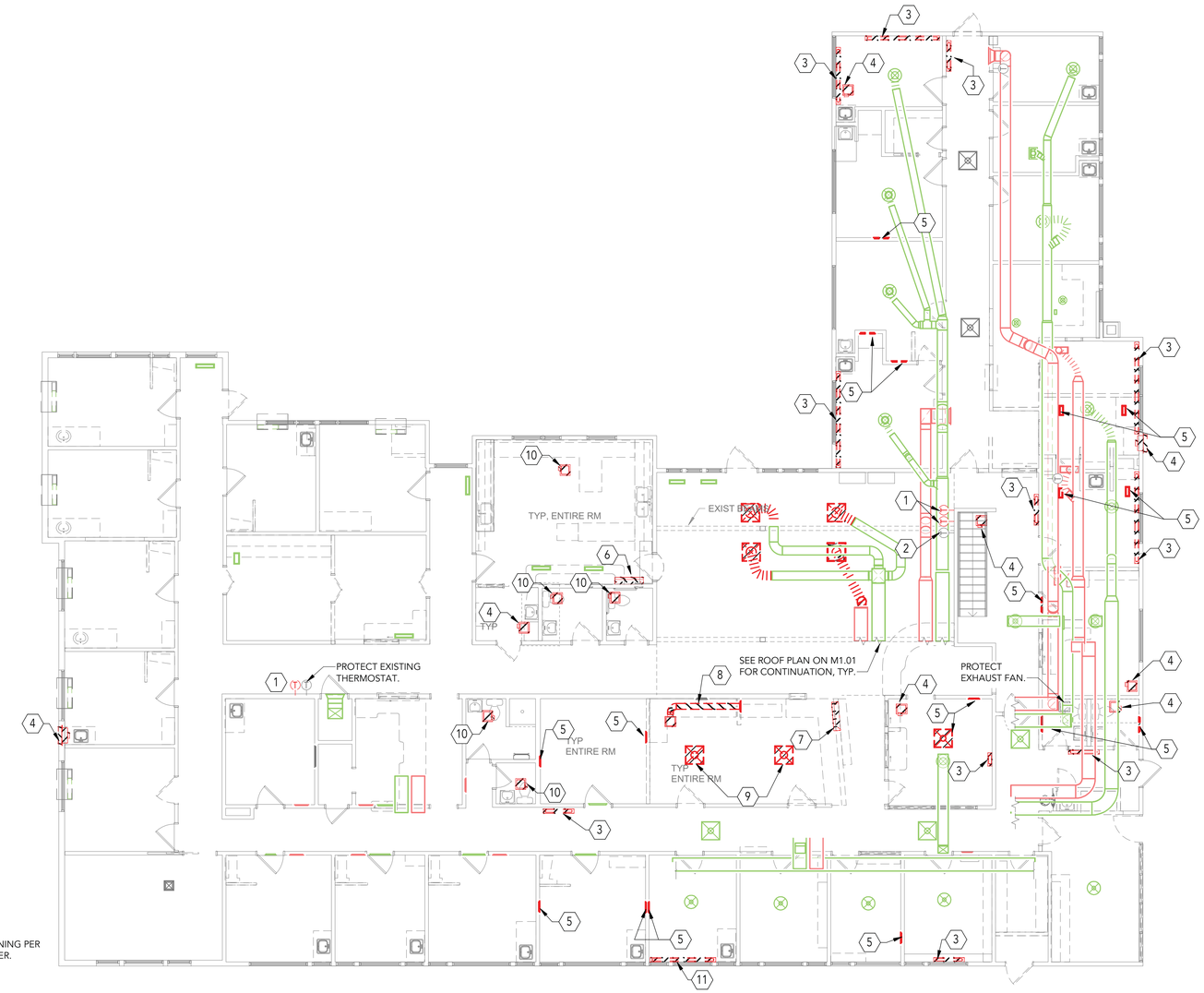
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THERMAL ZONE DIAGRAMS

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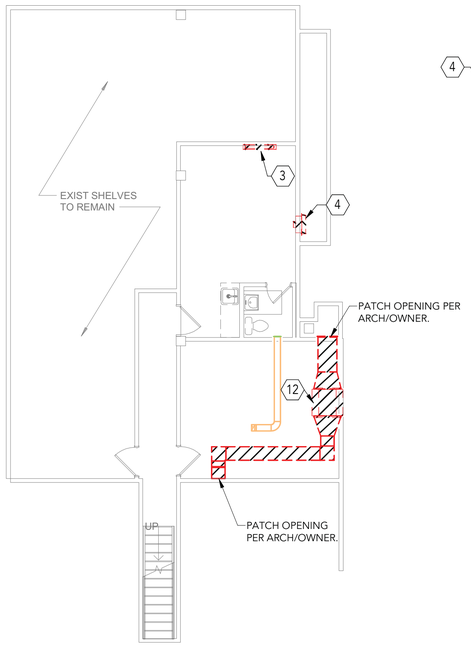
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1 M-100 LEVEL 1 HVAC DEMOLITION PLAN

1/8" = 1'-0"

0 4' 8' 16'



2 M-100 BASEMENT HVAC DEMOLITION PLAN

1/8" = 1'-0"

0 4' 8' 16'

SHEET NOTES

1. LOCATION OF EQUIPMENT SHOWN IS APPROX. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO START OF WORK.
2. PROTECT DUCTWORK, DIFFUSERS, REGISTERS, GRILLES, ETC. NOT SHOWN AS BEING REMOVED.
3. NOT ALL EQUIPMENT REQUIRING DEMOLITION MAY BE SHOWN, COMPLETE REMOVAL OF SYSTEMS AS INDICATED MAY REQUIRE ADDITIONAL REMOVAL OF EQUIPMENT NOT SHOWN.
4. THE CONTRACTOR SHALL PATCH AND REPAIR FLOORS AND EXTERIOR WALLS TO MATCH ADJACENT MATERIAL, FINISH, AND COLOR UNLESS OTHERWISE SPECIFIED. PATCHWORK SHALL BE COORDINATED WITH NEW WORK. THE GC SHALL PATCH AND REPAIR OPENINGS MADE IN THE ROOF DUE TO DEMOLITION IN ACCORDANCE WITH ARCHITECT AND ROOF MFG REQUIREMENTS. WORK DONE TO ROOF SHALL NOT VIOLATE ROOF WARRANTY.
5. REMOVED ITEMS SHALL BE REMOVED FROM THE SITE AND PROPERLY DISPOSED OF UNLESS OTHERWISE NOTED.
6. ITEMS CALLED TO BE REMOVED, SHALL BE REMOVED COMPLETELY. THIS INCLUDES BUT NOT LIMITED TO: HANGERS, SUPPORTS, AND ASSOCIATED ITEMS, UNLESS OTHERWISE SPECIFIED.
7. ANY ADDITIONAL HVAC ITEMS NOT SHOWN OR DESCRIBED IN THESE PLANS OR PROJECT SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER OF RECORD. THESE ITEMS SHALL NOT BE REMOVED WITHOUT EOR OR ARCH APPROVAL.
8. REMOVE ELECTRICAL AND CONTROLS SERVING REMOVED HVAC.
9. REMOVE REFRIGERANT PIPING AND ASSOCIATED COMPONENTS FROM SHOWN EQUIPMENT.
10. EXISTING EQUIPMENT CONTAINS REFRIGERANT THAT MAY BE CONSIDERED HAZARDOUS TO THE ENVIRONMENT. CONTRACTOR SHALL PROPERLY DISPOSE OF EQUIPMENT.
11. CAP NATURAL GAS PIPING WHERE DISCONNECTED FROM EQUIPMENT. CAP SHALL BE PLACED ON THE EQUIPMENT SIDE OF THE APPLIANCE SHUTOFF VALVE. REMOVE FLEX PIPING TO THE EQUIPMENT IF EXISTING UNLESS OTHERWISE SPECIFIED.
12. OWNER SHALL HAVE FIRST RIGHT OF REFUSAL OF REMOVED EQUIPMENT. CONTRACTOR SHALL MOVE SALVAGED TO OWNER EQUIPMENT TO LOCATION(S) ON-SITE DIRECTED BY OWNER INCLUDING INTO/ONTO OWNER'S TRANSPORTATION EQUIPMENT. CONTRACTOR SHALL INCLUDE COMPLETE DISPOSAL COSTS IN BID AND ASSUME NO EQUIPMENT SALVAGED TO OWNER.
13. ASBESTOS MITIGATION MAY BE REQUIRED FOR REMOVED STEAM EQUIPMENT AND PIPING. CONSULT WITH ASBESTOS REPORT, ARCH, AND OWNER BEFORE DISTURBING EQUIPMENT WHICH MAY CONTAIN ASBESTOS.
14. EXISTING ATTIC EXHAUST FANS NOT IN SERVICE OR SHOWN AS EXISTING TO BE REUSED SHALL BE ABANDONED IN PLACE.

KEYNOTES (#)

1 DEMO LEGACY THERMOSTATS WITH DIALS OR GLASS INDICATORS. PROTECT (E) DIGITAL THERMOMETERS UOS.
2 REMOVE AND SALVAGE DIGITAL THERMOSTAT FOR FUTURE REINSTALLATION. SEE M2.00 FOR NEW LOCATION.
3 REMOVE LEGACY STEAM RADIATOR, THERMOSTATS, AND ASSOCIATED COMPONENTS . STEAM PIPING TO BE ABANDONED IN PLACE WHERE CONCEALED BEHIND WALLS, ABOVE CEILINGS, OR UNDERNEATH FLOOR. PATCH AND REPAIR WALLS TO MATCH ADJACENT SURFACES IN COORDINATION WITH NEW ARCHITECTURAL PLAN.
4 REMOVE EXISTING EXHAUST FAN AND ASSOCIATED DUCTWORK. PATCH AND REPAIR WALLS, CEILINGS, AND BUILDING EXTERIORS TO MATCH ADJACENT SURFACES IN COORDINATION WITH NEW ARCHITECTURAL PLANS.
5 REMOVE EXISTING UNUSED AIR TERMINAL AND ASSOCIATED DUCTWORK. PATCH AND REPAIR WALLS, AND CEILINGS TO MATCH ADJACENT SURFACES IN COORDINATION WITH NEW ARCHITECTURAL PLANS.
6 REMOVE EXISTING SPLIT SYSTEM, AND ASSOCIATED CONTROLS, AND CONDENSATE PIPING. SYSTEM TO BE REPLACED WITH NEW IN APPROXIMATE SAME LOCATION.
7 REMOVE EXISTING SPLIT SYSTEM, AND ASSOCIATED CONTROLS. PROTECT CONDENSATE PIPING WHERE CONCEALED IN WALL. PATCH AND REPAIR WALL TO MATCH ADJACENT SURFACES IN COORDINATION WITH NEW ARCHITECTURAL PLANS.
8 REMOVE EXISTING OSA FAN AND ASSOCIATED DUCTWORK, AND DIFFUSERS. PROTECT EXISTING CEILING, AND ROOF PENETRATION. PENETRATION TO BE REUSED IN NEW PLANS. COORDINATE WITH M2.00.
9 REMOVE DIFFUSERS AND DISCONNECT AND CAP DUCTS SERVING CONFERENCE 123. EXISTING DUCT LOCATIONS TO BE FIELD VERIFIED.
10 REMOVE EXISTING EXHAUST FAN. PROTECT (E) DUCTWORK. FAN TO BE REPLACED WITH NEW IN SAME LOCATION.
11 REMOVE (E) FIN TUBE RADIATOR, THERMOSTATS, AND ASSOCIATED COMPONENTS. STEAM PIPING TO BE ABANDONED IN PLACE WHERE CONCEALED BEHIND WALLS, ABOVE CEILINGS, OR UNDERNEATH FLOOR. PATCH AND REPAIR WALLS TO MATCH ADJACENT SURFACES IN COORDINATION WITH NEW ARCHITECTURAL PLANS.
12 REMOVE (E) FAN COIL AND ASSOCIATED DUCTWORK, PIPING, AND COMPONENTS. PATCH AND REPAIR WALL OPENINGS PER ARCH.

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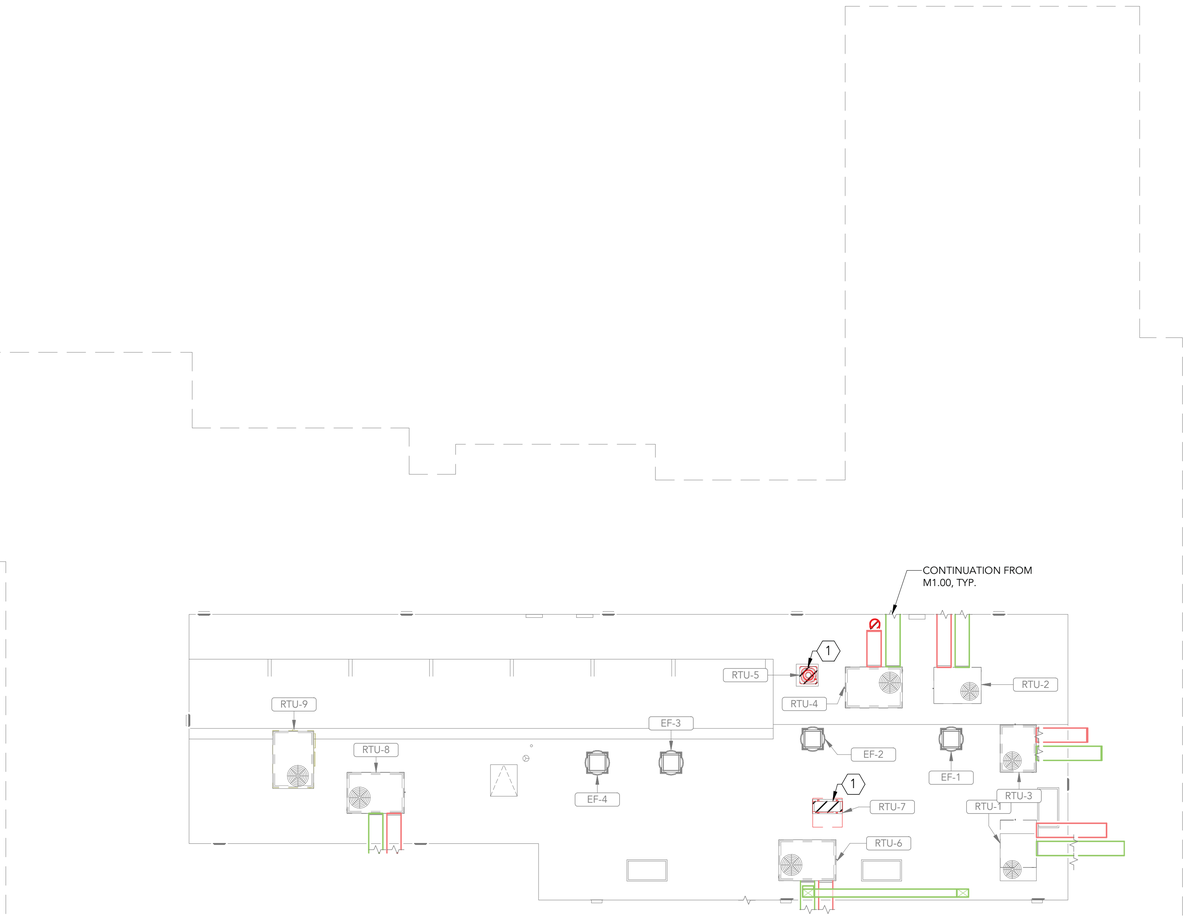
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DEMOLITION PLANS

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1 / M-101 LEVEL 2 HVAC DEMOLITION PLAN

1/8" = 1'-0"

0 4' 8' 16'

KEYNOTES (#)

1 REMOVE (E) RTU (SPLIT SYSTEM CONDENSING UNIT) AND ASSOCIATED CONTROLS. UNIT TO BE REPLACED WITH NEW IN APPROXIMATELY THE SAME LOCATION. PROVIDE PROTECTIVE COVER OVER EXISTING ROOFTOP PIPE PENETRATIONS UNTIL NEW WORK IS COMPLETE. PENETRATIONS TO BE REUSED.

SHEET NOTES

1. LOCATION OF EQUIPMENT SHOWN IS APPROX. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO START OF WORK.
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5. REMOVED ITEMS SHALL BE REMOVED FROM THE SITE AND PROPERLY DISPOSED OF UNLESS OTHERWISE NOTED.
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7. ANY ADDITIONAL HVAC ITEMS NOT SHOWN OR DESCRIBED IN THESE PLANS OR PROJECT SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER OF RECORD. THESE ITEMS SHALL NOT BE REMOVED WITHOUT EOR OR ARCH APPROVAL.
8. REMOVE ELECTRICAL AND CONTROLS SERVING REMOVED HVAC.
9. REMOVE REFRIGERANT PIPING AND ASSOCIATED COMPONENTS FROM SHOWN EQUIPMENT.
10. EXISTING EQUIPMENT CONTAINS REFRIGERANT THAT MAY BE CONSIDERED HAZARDOUS TO THE ENVIRONMENT. CONTRACTOR SHALL PROPERLY DISPOSE OF EQUIPMENT.
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12. OWNER SHALL HAVE FIRST RIGHT OF REFUSAL OF REMOVED EQUIPMENT. CONTRACTOR SHALL MOVE SALVAGED TO OWNER EQUIPMENT TO LOCATION(S) ON-SITE DIRECTED BY OWNER INCLUDING INTO/ONTO OWNER'S TRANSPORTATION EQUIPMENT. CONTRACTOR SHALL INCLUDE COMPLETE DISPOSAL COSTS IN BID AND ASSUME NO EQUIPMENT SALVAGED TO OWNER.
13. ASBESTOS MITIGATION MAY BE REQUIRED FOR REMOVED STEAM EQUIPMENT AND PIPING. CONSULT WITH ASBESTOS REPORT, ARCH, AND OWNER BEFORE DISTURBING EQUIPMENT WHICH MAY CONTAIN ASBESTOS.

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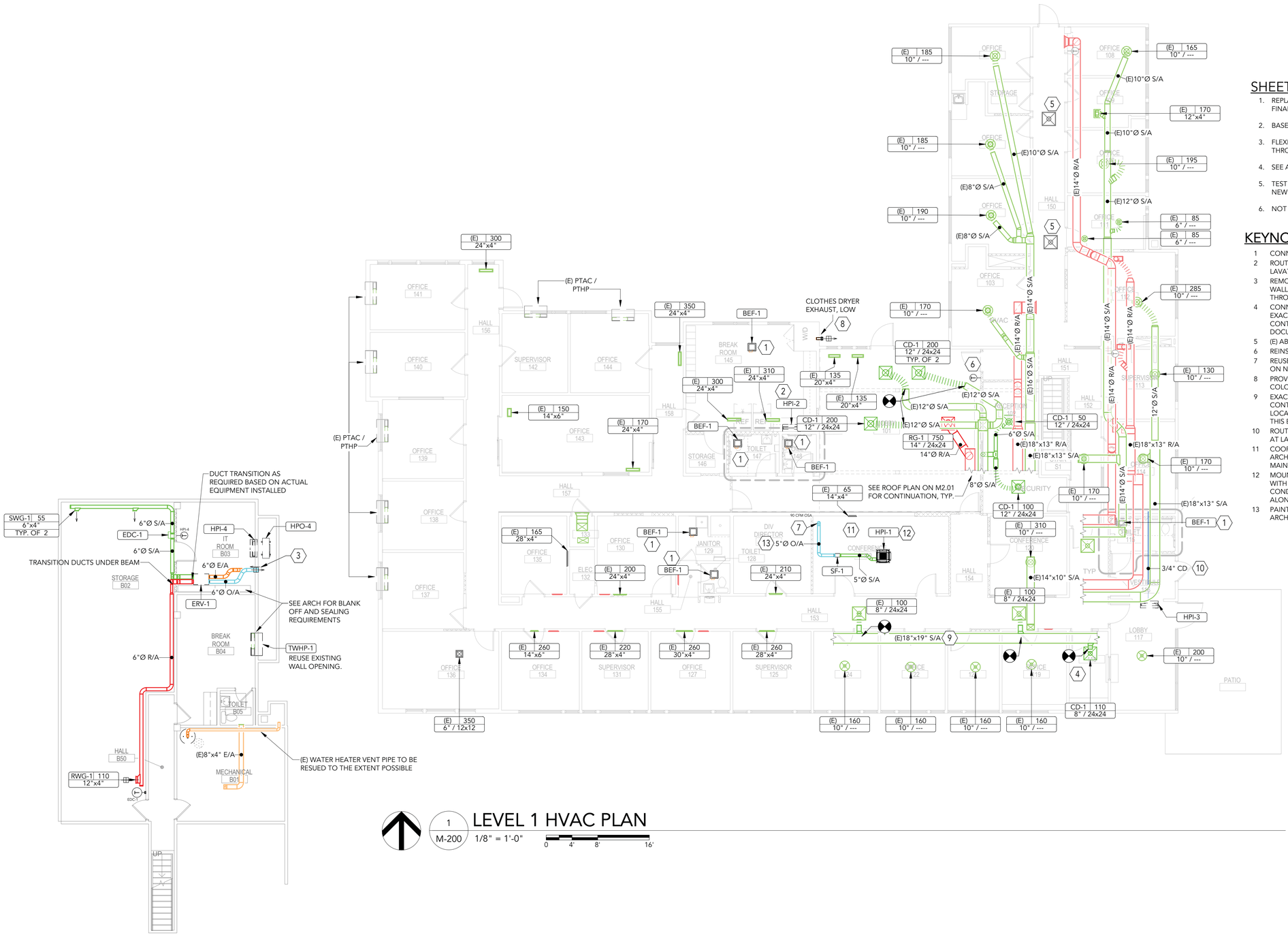
DEMOLITION PLAN - ROOF

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1 M-200 LEVEL 1 HVAC PLAN
1/8" = 1'-0"
0 4' 8' 16'

2 M-200 BASEMENT HVAC PLAN
1/8" = 1'-0"
0 4' 8' 16'

SHEET NOTES

1. REPLACE AIR FILTERS ON BOTH NEW AND EXISTING SYSTEMS PRIOR TO FINAL OCCUPANCY.
2. BASEMENT SUPPLY DUCTWORK IS EXISTING AND NOT SHOWN.
3. FLEXIBLE DUCTS AND AIR CONNECTORS ARE NOT PERMITTED TO PASS THROUGH ANY FIRE-RATED ASSEMBLY.
4. SEE ARCHITECTURAL PLANS FOR FIRE RATINGS.
5. TEST AND BALANCE DIFFUSER AIRFLOW PER AIRFLOWS SHOWN ON NEW AND EXISTING HVAC EQUIPMENT.
6. NOT ALL EXISTING DUCTWORK IS SHHOWN OR IDENTIFIED.

KEYNOTES

1. CONNECT EXHAUST FAN TO EXISTING DUCTWORK.
2. ROUTE CONDENSATE LINE CONCEALED AND TERMINATE AT LAVATORY TAILPIECE IN TOILET ROOM 147 OR 148.
3. REMOVE (E) LOUVER AND IN-FILL PER ARCHITECT. PROVIDE NEW WALL CAP FROM ERV-1 MFG WHICH ALLOWS SUPPLY AND EXHAUST THROUGH SINGLE TERMINAL/CONCENTRIC VENT.
4. CONNECT NEW DIFFUSER TO EXISTING DUCTWORK OVERHEAD. EXACT ROUTING AND SIZE OF EXISTING BRANCH IS UNKNOWN. CONTRACTOR TO FIELD VERIFY EXACT DUCTWORK LOCATION AND DOCUMENT ON RECORD DRAWINGS.
5. (E) ABANDONED DIFFUSER.
6. REINSTALL (E) RTU-4 THERMOSTAT.
7. REUSE (E) CEILING/ROOF PENETRATION. PATCH AS REQUIRED BASED ON NEW DUCT SIZE.
8. PROVIDE DRYER EXHAUST WALL CAP. PRIMEX WC28 OR APPROVED. COLOR PER ARCH.
9. EXACT LOCATION AND SIZE OF THIS DUCT IS UNKNOWN. CONTRACTOR TO COORDINATE WITH ARCHITECT FOR ACCESS LOCATIONS AND PANELS REQUIRED FOR NEW CONNECTIONS TO THIS EXISTING DUCT.
10. ROUTE CONDENSATE ABOVE CEILING AND TERMINATE CONCEALED AT LAVE TAILPIECE.
11. COORDINATE DUCT AND EQUIPMENT LOCATIONS WITH ARCHITECTURAL CLOUD. SEE ARCHITECTURAL CEILING PLANS. MAINTAIN PROPER ACCESS AND CLEARANCES TO EQUIPMENT.
12. MOUNT IN ARCHITECTURAL CLOUD. COORDINATE EXACT LOCATION WITH ARCHITECTURAL CEILING PLAN. PUMP CONDENSATE TO ROOF. CONDENSATE LINE SHALL BE 3/4" TYPE L COPPER AND ROUTED ALONG SAME PATH AS LINESET. DISCHARGE TO ROOF DRAIN.
13. PAINT OSA DUCT WHITE TO MATCH CEILING. COORDINATE WITH ARCHITECT.

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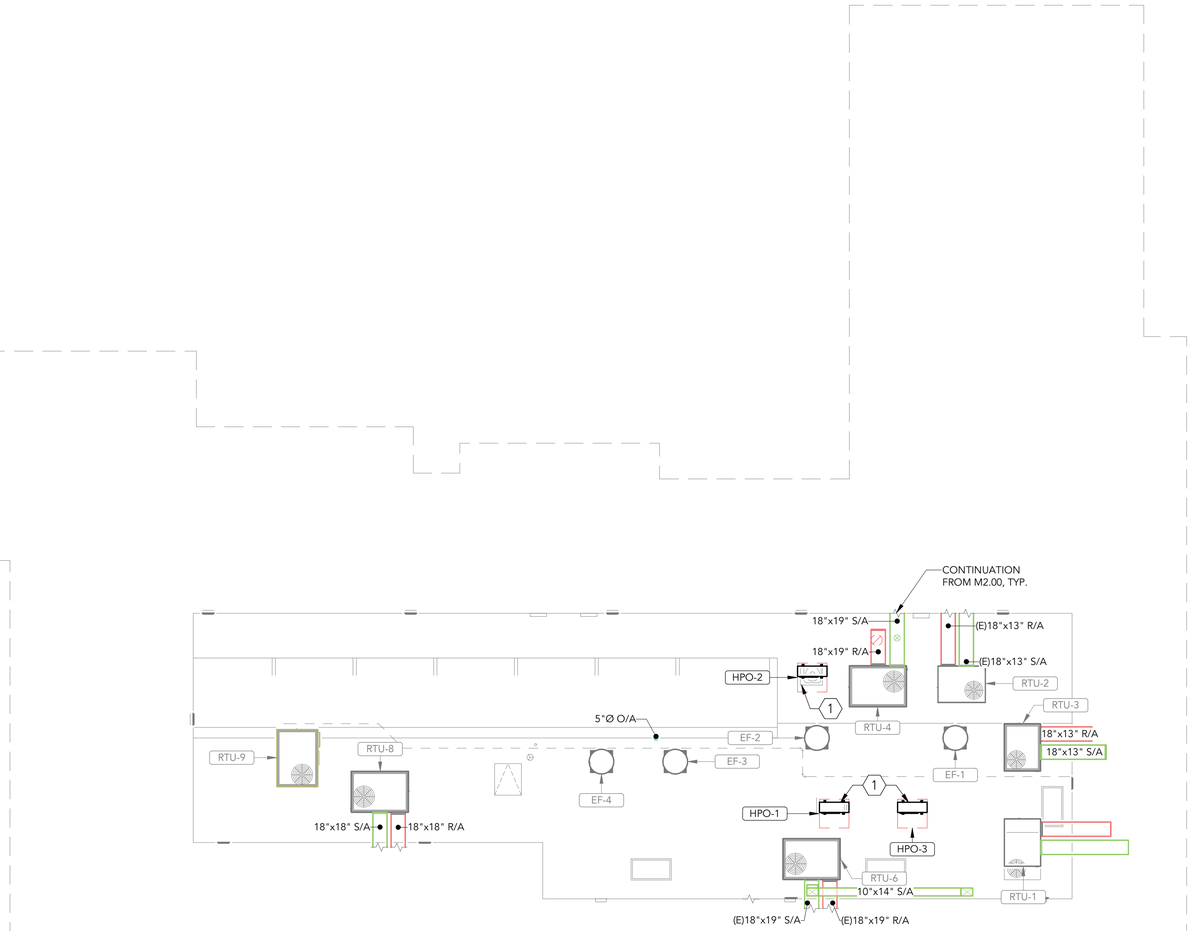
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HVAC FLOOR PLANS

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1 M-201 ROOF HVAC PLAN

1/8" = 1'-0"

0 4' 8' 16'

SHEET NOTES

1. CONTACT EOR AND ARCH IF NEW ROOF PENETRATIONS ARE REQUIRED. LOCATION OF EQUIPMENT SHOWN IS APPROXIMATE AND MAY BE ADJUSTED BASED ON EXISTING CONDITIONS.
2. PROVIDE ROOF STAND FOR NEW SPLIT SYSTEM CONDENSING UNITS. SEE DETAIL 6/M-600.

KEYNOTES (#)

1 REUSE (E) ROOF PENETRATIONS FOR SPLIT SYSTEM REFRIGERANT LINES. SEE DETAILS FOR ROOF JACK DETAIL.

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ROOF PLAN

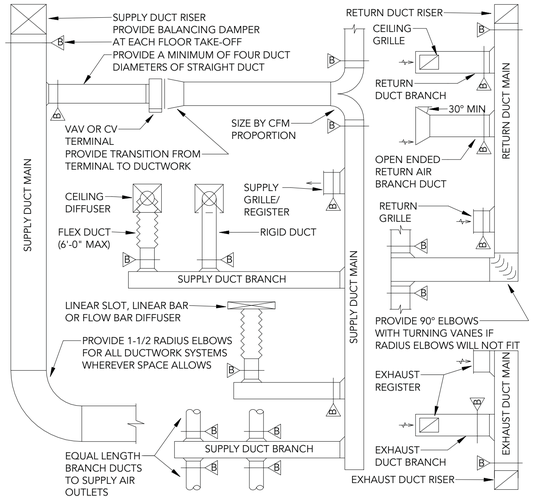
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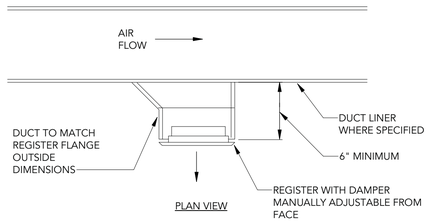
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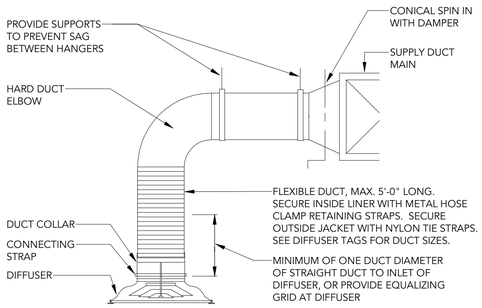
NOTES:
1. REFER TO HVAC FLOOR PLANS FOR DUCT SIZES.
2. REFER TO SCHEDULES FOR GRILLES, REGISTERS, DIFFUSERS AND TERMINAL SIZES, AND TYPES.
3. PROVIDE A MANUAL TYPE BALANCING DAMPER FOR EACH SUPPLY OUTLET AND RETURN INLET.
4. ALL DUCT RUNOUTS TO DIFFUSERS SHALL BE THE SAME SIZE AS DIFFUSER NECK SIZE, UNLESS OTHERWISE NOTED.
5. FLEX DUCT WILL NOT BE ALLOWED ON RETURN OR EXHAUST DUCTWORK SYSTEMS.
6. PROVIDE 12" AIR CUSHION AT THE END OF EACH SUPPLY MAIN AND BRANCH DUCT.
7. INDIVIDUAL BRANCH BALANCING DAMPERS NOT REQUIRED FOR SUPPLY OR EXHAUST REGISTERS.



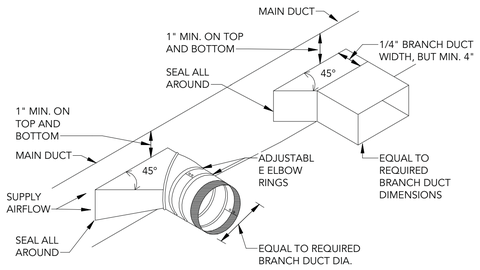
1 M-600 DUCTWORK INSTALLATION DIAGRAM
NOT TO SCALE



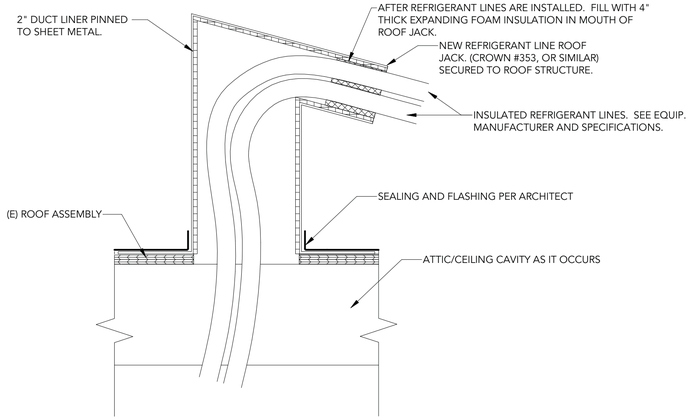
4 M-600 TYPICAL DUCT MOUNTED REGISTER (RECTANGULAR DUCT)
NOT TO SCALE



2 M-600 DIFFUSER FLEXIBLE DUCT CONNECTION
NOT TO SCALE



3 M-600 TYPICAL BRANCH TAKEOFF FITTING DETAIL
NOT TO SCALE



5 M-600 REFRIGERANT LINE ROOF JACK
NOT TO SCALE



NOTES:
1. BASIS OF DESIGN: DIVERSITECH 12 INCH HEAT PUMP STAND, OR APPROVED.
2. WIDTH AND LENGTH OF STAND ARE ADJUSTABLE
3. COORDINATE WITH OWNER AND ARCHITECT FOR ROOFTOP FASTENING REQUIREMENTS.

6 M-600 MINISPLIT ROOF STAND
NOT TO SCALE

DRAWINGS ORIGINALLY PRODUCED IN COLOR FOR ADDITIONAL CLARITY AND CONVENIENCE. FLUENT IS NOT RESPONSIBLE FOR ERRORS OR OMISSIONS IN DRAWING INTERPRETATION FOR DRAWINGS NOT REPRODUCED IN COLOR.

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DIGITALLY SIGNED
OREGON
NOV 9, 2021
JEREMY J. WENGER
EXPIRES: 06/30/2024

project:
MARION COUNTY
BEHAVIORAL HEALTH CRISIS CENTER REMODEL
1234 COMMERCIAL STREET SE SALEM, OREGON 97302

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revisions:

date: 06/06/2024
project: 23-115
drawn by: JW
checked by: JW

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TYP. DETAILS

sheet: M-600
of:

100% CONSTRUCTION DOCUMENTS

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ELECTRICAL SYMBOL LEGEND

ABBREVIATIONS

AFF, A.F.F.	ABOVE FINISHED FLOOR
ARCH.	ARCHITECT/ARCHITECTURAL
BLDG.	BUILDING
C	CONDUIT
CD	CANDELA
CKT	CIRCUIT
C.L.	COLUMN LINE
(E)	EXISTING
ELEC	ELECTRICAL
EMERG	EMERGENCY
FAM/FACP	FIRE ALARM MASTER/FIRE ALARM CONTROL PANEL
FT.	FEET
GFI/B	GROUND FAULT INTERRUPTER/BREAKER
GND, G	GROUND
HVAC	HEATING, VENTILATION & AIR CONDITIONING
IDF	INTERMEDIATE DISTRIBUTION FRAME
LV	LOW VOLTAGE
MDF	MAIN DISTRIBUTION FRAME
MECH	MECHANICAL
N.L.	NIGHT LIGHT
PNL	PANEL
PROVIDE	FURNISH AND INSTALL
SD	SUB - DISTRIBUTION
TTB	TELEPHONE TERMINAL BOARD
TVSS / SPD	TRANSIENT VOLTAGE SURGE SUPPRESSION/SURGE PROTECTION DEVICE
TYP	TYPICAL
WP	WEATHER PROOF
"	INCH/INCHES
'	FOOT/FEET

GENERAL

- KEYNOTE
- REVISION TAG
- EQUIPMENT TAG (EXHAUST FAN 1 SHOWN)
- CALLOUT (SHEET E0.00, DETAIL #1)
- KITCHEN EQUIPMENT TAG
- ELECTRICAL EQUIPMENT AS IDENTIFIED ON DRAWINGS.
- UNDERGROUND/ UNDERFLOOR RACEWAY
- HOMERUN WITH 2 #12 CONDUCTORS (GROUND NOT SHOWN)
- HOMERUN WITH 2 #10 CONDUCTORS (GROUND NOT SHOWN)
- HOMERUN WITH 3 #10 CONDUCTORS (GROUND NOT SHOWN)
- CONCEALED RACEWAY AND CONDUCTORS. NUMBER OF SLASHES INDICATES NUMBER OF CONDUCTORS. PROVIDE GROUND CONDUCTOR NOT SHOWN. ZERO SLASHES = 2 CONDUCTORS WITH 3RD GROUND CONDUCTOR. PROVIDE #12 CONDUCTORS UNLESS OTHERWISE SHOWN.
- LOW VOLTAGE CABLE/ HOMERUN C = CONTROL
- FLEX CONNECTION

POWER

- POWER PANEL - SURFACE
- POWER PANEL - RECESSED
- DUPLEX RECEPTACLE
- GROUND FAULT, WEATHERPROOF TYPE
- SPLIT WIRED WITH 1/2 SWITCHED, +44 A.F.F UNO
- SPECIALTY RECEPTACLE, NEMA SIZE AS NOTED.
- DOUBLE DUPLEX RECEPTACLE
- FLOOR BOX, FLOOR BOX WITH DATA
- JUNCTION BOX
- MOTOR
- DISCONNECT (F=FUSED, "BLANK"=SWITCH ONLY)
- SPECIFIC RECEPTACLE, SEE PNL SCHED. AND MECH FOR CONFIGURATION. MATCH CONFIGURATION PER EQUIPMENT INSTALLED

ONE-LINE

- VSD VARIABLE SPEED DRIVE
- SPD SURGE PROTECTIVE DEVICE
- R RELAY
- BREAKER
- GFI BREAKER
- SWITCH
- TRANSFORMER
- M METER
- GROUND
- FUSE

LIGHTING

- $ SWITCH
- $a/3 SWITCH, a = LIGHTS CONTROLLED, 3 = THREE-WAY.
- $OC OCCUPANCY SENSING WALL SWITCH
- $LV LOW VOLTAGE WALL SWITCH
- $D DIMMABLE WALL SWITCH
- $K KEYED SWITCH
- 2x2/2x4/LINEAR RECESSED LIGHT FIXTURE.
- 2x2/2x4/LINEAR SURFACE FIXTURE
- STRIP/WRAP FIXTURE
- PENDANT, SURFACE MOUNT FIXTURE
- RECESSED DOWN LIGHT FIXTURE.
- LINEAR FIXTURE IN 4', 8', AND 12' LENGTHS.
- WALL SCONCE
- WALL MOUNT LIGHT
- EXIT SIGN WITH DIRECTIONAL ARROWS.
- POLE MOUNTED LIGHTING
- A1/A1E — LIGHTING FIXTURE NOTATION: A1 = FIXTURE TYPE "A1". E = EMERGENCY POWER.
- OCCUPANCY SENSOR
- PHOTOCELL

EQUIPMENT SCHEDULE

ID	DESCRIPTION	VOLTS	PHASE	AMPS	HP	DISCONNECT	WIRE SIZE	CIRCUIT	NOTES
ERV-1	ENERGY RECOVERY VENTILATOR	120	1	0.88	-	PROVIDE RATED DISCONNECT	3/4"C 2#10, 1#10 GND	F-28	1,2,3
TWHP-1	THROUGH WALL HEAT PUMP	120	1	11	-	PROVIDE RATED RECEPTACLE	3/4"C 2#8, 1#10 GND	F-30	1,3
BEF-1	BATHROOM EXHAUST FAN	120	1	0.14	-	PROVIDE RATED INTEGRAL DISCONNECT	3/4"C 2#10, 1#10 GND	VARIES, SEE PANEL SCHEDULES	1,3,4
SF-1	SUPPLY FAN	120	1	0.12	0.02	PROVIDE RATED DISCONNECT	3/4"C 2#10, 1#10 GND	F-5	1,2,3
EDC-1	ELECTRIC DUCT COIL	208	1	9.6	-	PROVIDE RATED DISCONNECT	3/4"C 3#10, 1#10 GND	F-24,26	1,2
HPO-1	HEAT PUMP	208	1	11	-	PROVIDE RATED DISCONNECT	1"C 3#8, 1#10 GND	F-2,4	1,2
HPO-2	HEAT PUMP	208	1	11	-	PROVIDE RATED DISCONNECT	1"C 3#8, 1#10 GND	F-6,8	1,2
HPO-3	HEAT PUMP	208	1	11	-	PROVIDE RATED DISCONNECT	1"C 3#8, 1#10 GND	F-10,12	1,2
HPO-4	HEAT PUMP	208	1	19	-	PROVIDE RATED DISCONNECT	1 1/4"C 3#6, 1#10GND	F-14,16	1,2

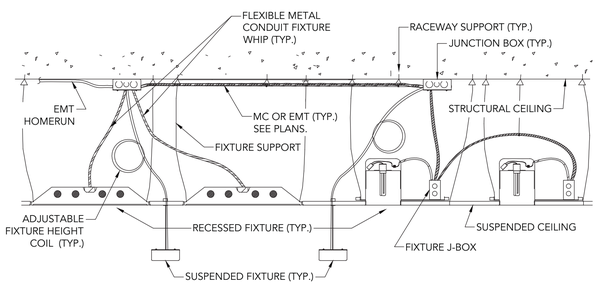
NOTES

1. NOT ALL MATERIALS, HARDWARE, AND DEVICES INDICATED. CONTRACTOR IS REQUIRED TO REVIEW ALL MANUFACTURERS INSTRUCTIONS AND PROVIDE MATERIALS AND HARDWARE AS INDICATED BY MANUFACTURER, CODE, AND THESE DOCUMENTS FOR A COMPLETE AND FUNCTIONAL INSTALLATION. PROVIDE CODE REQUIRED EQUIPMENT, RATINGS, SIZES, AND THE LIKE COORDINATED WITH ACTUAL EQUIPMENT INSTALLED.
2. ENSURE DISCONNECTS ARE CAPABLE OF BEING LOCKED IN THE OPEN POSITION.
3. WHERE MOTOR RATED SWITCH IS REQUIRED, PROVIDE MANUAL MOTOR STARTER IF INSTALLED MOTOR IS NOT PROVIDED WITH INTEGRAL OVERLOAD PROTECTION. EVERY MOTOR TO INCLUDE OVERLOAD PROTECTION, COORDINATE SETTINGS WITH ELECTRICAL ENGINEER IF NOT INCLUDED BY MANUFACTURER.
4. CONTROLS PER MECH, CONNECT TO OC WHERE SHOWN.

LIGHTING FIXTURE SCHEDULE

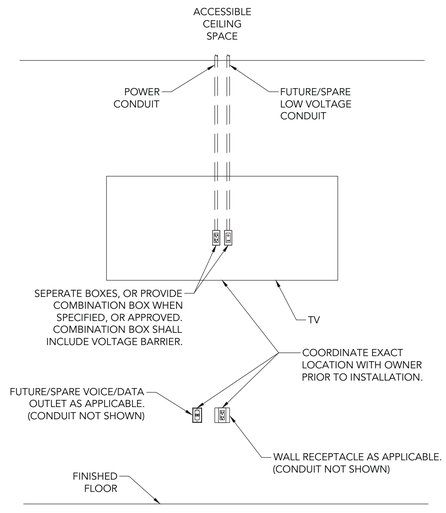
ID	DESCRIPTION	MANUFAC.	MOUNTING HEIGHT	LAMP (QTY) WATTS	NOTES
A1	2'X4' SURFACE MOUNTED CURVED LINEAR PRISM LED VOLUMETRIC WITH 0 - 10V DIMMING AND INTEGRATED PDT DUAL TECHNOLOGY OCCUPANCY SENSOR AND DIMMING PHOTOCELL - 2VLTX4 60L ADP LP940 EZ1 RES7PDT	LITHONIA	CEILING SURFACE	53W INTEGRAL LED, 4000K, 6305 LUMENS	1
A1E	2'X4' SURFACE MOUNTED CURVED LINEAR PRISM LED VOLUMETRIC WITH 0 - 10V DIMMING AND INTEGRATED PDT DUAL TECHNOLOGY OCCUPANCY SENSOR AND DIMMING PHOTOCELL, INCLUDES INTEGRATED BATTERY BACKUP - 2VLTX4 60L ADP LP940 EZ1 EL14L RES7PDT	LITHONIA	CEILING SURFACE	53W INTEGRAL LED, 4000K, 6305 LUMENS	1,2
A2	2'X4' RECESSED MOUNTED SMOOTH LINEAR PRISM LED VOLUMETRIC WITH 0 - 10V DIMMING AND INTEGRATED PDT DUAL TECHNOLOGY OCCUPANCY SENSOR AND DIMMING PHOTOCELL - 2VTS4 60L ADP LP940 EZ1 RES7PDT	LITHONIA	CEILING RECESSED	47.7W INTEGRAL LED, 4000K, 5446 LUMENS	1
A2E	2'X4' RECESSED MOUNTED CURVED LINEAR PRISM LED VOLUMETRIC WITH 0 - 10V DIMMING AND INTEGRATED PDT DUAL TECHNOLOGY OCCUPANCY SENSOR AND DIMMING PHOTOCELL, INCLUDES INTEGRATED BATTERY BACKUP - 2VTS4 60L ADP LP940 EZ1 EL14L RES7PDT	LITHONIA	CEILING RECESSED	47.7W INTEGRAL LED, 4000K, 5446 LUMENS	1,2
C1	SURFACE MOUNT COVE FROSTED LED FIXTURE WITH 0 - 10V DIMMING, LENGTH OF RUNS AS SHOWN ON PLANVIEW LCS2 HO 120 30K FR DIM.	LUMENPULSE	SURFACE ABOVE ARCHITECTURAL CLOUD	19W INTEGRAL LED, 3000K, 1957 LUMENS PER FOOT	1,3
D1	11" WET LOCATION LOW PROFILE ROUND SURFACE MOUNT LED DOWN LIGHT WITH 0 - 10V DIMMING AND INTEGRATED ADJUSTABLE COLOR TEMPERATURE - JSF 11IN 13LM 30K 90 CRI MVOLT ZT	JUNO	CEILING SURFACE	14.4W INTEGRAL LED, 3000K, 1532 LUMENS	1
D1E	11" WET LOCATION LOW PROFILE ROUND SURFACE MOUNT LED DOWN LIGHT WITH 0 - 10V DIMMING AND INTEGRATED ADJUSTABLE COLOR TEMPERATURE, INCLUDES INTEGRATED BATTERY BACKUP- JSF 11IN 13LM 30K 90 CRI MVOLT ZT EM	JUNO	CEILING SURFACE	14.4W INTEGRAL LED, 3000K, 1532 LUMENS	1,2
V1	2' NOMINAL LENGTH TRADITIONAL SQUARE WALL MOUNTED LED BATHROOM VANITY FIXTURE - FMVTSL 24IN 30K 90 CRI	LITHONIA	WALL SURFACE	18.1W INTEGRAL LED, 3000K, 1302 LUMENS	1,3
W1E	LOW PROFILE WALL MOUNTED WIDE THROW LED EGRESS PENDANT, NORMALLY OFF OPERATION WITH SELF TESTING INTEGRAL BATTERY BACKUP - AFF OEL UVOLT LTP SDRT WT	LITHONIA	7'5" AFF, WALL SURFACE	11.28W INTEGRAL LED, 4000K, 635 LUMENS	1,2
X1	LOW PROFILE SURFACE MOUNTED EMERGENCY LIGHT/EXIT COMBO WITH INTEGRATED SELF TESTING BATTERY BACKUP - EMCOMBO2 R W BB ST	LIGHT FIXTURE INDUSTRIES	CEILING SURFACE	5W INTEGRAL LED	1,2,4

NOTES: 1. COORDINATE FIXTURE FINISH OPTIONS WITH ARCHITECT.
2. PROVIDE INTEGRATED BATTERY BACKUP.
3. COORDINATE EXACT MOUNTING HEIGHT WITH ARCHITECT.
4. COORDINATE DISPLAY DIRECTION WITH ARCHITECT .



3 E-000 EMT/MC CABLE LIGHTING BRACING DETAIL

SCALE: NTS



1 E-000 WALL TV POWER & LOW VOLTAGE DETAIL

SCALE: NTS

GENERAL NOTES

1. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2. DRAWINGS ARE DEVELOPED AS DIGITAL DOCUMENTS. IF CONTRACTOR ELECTS TO PRINT, CONTRACTOR SHALL OBSERVE COPYRIGHT AND DRAWING OWNERSHIP AS WELL AS PRINT TO PROPER SCALE INCLUDING TEXT SIZE READABILITY IS THE RESPONSIBILITY OF THE CONTRACTOR. IF TEXT IS UNREADABLE ON PRINTED VERSION, CONTACT THE AUTHOR. DRAWINGS ARE INTENDED TO BE READ WITH DIGITAL ZOOM FUNCTION.
3. DRAWING DETAIL CALL-OUTS MAY BE PARTIAL. EVERY DETAIL IS APPLICABLE TO THE PROJECT AS A WHOLE WHERE SUCH DETAILED CONDITION EXISTS.
4. ROUTE VIA ATTIC, DERATE AS INDICATED.

SHEET INDEX

E-000	LEGENDS & SCHEDULES
E-010	ONE-LINE
E-100	POWER DEMOLITION PLAN
E-101	LIGHTING DEMOLITION PLAN
E-200	POWER PLAN
E-300	LIGHTING PLAN

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REGISTERED PROFESSIONAL ENGINEER 59,920
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MATTHEW J. CASH
EXPIRES: 12/31/2025

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project: MARION COUNTY BEHAVIORAL HEALTH CRISIS CENTER REMODEL
1234 COMMERCIAL STREET SE SALEM, OREGON 97302

consultants: FLUENT ENGINEERING

revisions:

date: 06/06/2024
project: 23-115
drawn by: MJS
checked by: BMJ

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LEGENDS & SCHEDULES

sheet: E-000

of:

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(E) SERVICE BUILDING CALCULATION

EXISTING MAXIMUM DEMAND FROM UTILITY: 148A (53 kW) @ 208V 3-PHASE, 148 AMPS X 1.25 (NEC) = 185 AMPS

ADDITIONAL LOAD FROM THIS PROJECT	
LIGHTING (LED)	7.4A @ 208V 3P
RECEPTACLES	67.3A @ 208V 3P
MECHANICAL	41.8A @ 208V 3P
TOTAL ADDITIONAL	117A @ 208V 3P
TOTAL ADDTIONAL	117A @ 208V 3P
EXISTING LOAD	185A @ 208V 3P
TOTAL AMPS	302A @ 208V 3P

600A>302A

EXISTING SERVICE SIZE:600 AMPS, SERVICE MEETS AMPACITY REQUIREMENTS FOR PERMANENT AND TEMPORARY SERVICE LOADING.

AMPACITY CALCULATION: CONDUCTORS IN ATTIC (AND ASSOCIATED HOME RUNS

AMBIENT DESIGN TEMPERATURE (NOT BY EOR): 130 DEGREES FAHRENHEIT

ADJUSTMENT FACTOR FOR 75 DEGREE RATED CONDUCTORS (GREATER THAN 100A, THHN SPECIFIED) PER NEC TABLE 310.15(B)(1)(2): 0.76 (76%)

ADJUSTMENT FACTOR FOR 60 DEGREE RATED CONDUCTORS (LESS THAN 100A, THHN SPECIFIED) PER NEC TABLE 310.15(B)(1)(2): 0.50 (50%)

15A RATED BRANCH CIRCUITS: (#10 AWG CU PER NEC 310.16) 30A X 0.50 = 15A
15A ≥ 15A
UTILIZE #10 AWG

20A RATED BRANCH CIRCUITS: (#8 AWG CU PER NEC 310.16) 40A X 0.50 = 20A
20A ≥ 20A
UTILIZE #8 AWG

30A RATED BRANCH CIRCUITS: (#6 AWG CU PER NEC 310.16) 55A (NEXT SIZE UP RULE) -> 60 X 0.50 = 30A
30A ≥ 30A
UTILIZE #6 AWG

225A RATED FEEDER: (#350 CU PER NEC 310.16) 310A X 0.76 = 235.6A
235.6A ≥ 225A
UTILIZE #350

PANEL SCHEDULE
PANEL F
SURFACE MOUNTED

23,869 SCA AVAILABLE | 3 PHASE | 120/208 VOLTS
225 AMP BUS | 225 AMP THRU LUGS

SERVICE	LOAD (AMP)	BREAKER (A/P)	CIRCUIT (# & Φ)				BREAKER (A/P)	LOAD (AMP)	SERVICE
CONFERENCE 123, 126 RECPTS	4.5	20/1	1	A	2		20/2	11.0	HPO-1
CONFERENCE 123, 126 RECPTS	3.0	20/1	3	B	4			11.0	HPO-1
CONFERENCE SP-1	0.1	15/1	5	C	6		20/2	11.0	HPO-2
CONFERENCE 120 RECPTS	6.0	20/1	7	A	8			11.0	HPO-2
RECEPTION 118, 117 RECPTS	6.0	20/1	9	B	10		20/2	11.0	HPO-3
LOBBY 117, 118 RECPTS	3.0	20/1	11	C	12			11.0	HPO-3
VESTIBULE 116 RECPTS	3.0	20/1	13	A	14		25/2	19.0	HPO-4
BATHROOM 115 RECPTS	1.5	20/1	15	B	16			19.0	HPO-4
RECEPTION 102 RECPTS	4.5	20/1	17	C	18		20/1	1.5	OFFICE 112 WF RECPTS
RECEPTION 102 RECPTS	4.5	20/1	19	A	20		20/1	6.0	OFFICE 112, 111 RECPTS
REFRIGERATOR RECPTS	1.5	20/1	21	B	22		20/1	6.0	OFFICE 111, 112 RECPTS
VENDING MACH* RECPTS	1.5	20/1	23	C	24		15/2	9.6	EDC-1
SERVER RACK	19.0	30/2	25	A	26			9.6	EDC-1
SERVER RACK	19.0		27	B	28		15/1	0.9	ERV-1
SERVER RACK	19.0	30/2	29	C	30		20/1	11.0	TWHP-1
SERVER RACK	19.0		31	A	32		20/1	1.4	EAST EGRESS LIGHTS
SERVER RM RECPTS	3.0	20/1	33	B	34		20/1	2.7	OFFICE 111 & 112 LIGHTS
PRINTER/COPPIER	12.0	20/2	35	C	36		20/1	0.0	CONF RMS LIGHTS
PRINTER/COPPIER	12.0		37	A	38		20/1	2.5	EAST ENTRY AREA LIGHTS
PRINTER/COPPIER	12.0	20/2	39	B	40		20/1	0.0	SPARE
PRINTER/COPPIER	12.0		41	C	42		20/1	0.0	SPARE

NOTES: PROVIDE INTEGRAL SPD
* = PROVIDE GFI BREAKER PROTECTION

SUMMARY (AMPS):

		PHASE LOAD A	B	C
THIS PANEL CONNECTED		128.5	96.5	96.2
THIS PANEL DEMAND		128.5	77.5	96.2
SUB-PANEL PANEL G CONNECTED		53.2	30.7	56.4
SUB-PANEL PANEL G DEMAND		53.2	30.7	56.4
TOTALS :	*CONNECTED*	181.7	127.2	152.6
	DEMAND	181.7	108.2	152.6

DEMAND LOAD	181.7
CONTINUOUS LOAD (INCLUDES SUB-PANEL PANEL G)	2.6
SPARE LOAD	9.1
TOTAL LOAD	193.4
FUTURE	9.7
	203.1 DESIGN LOAD

PANEL SCHEDULE
PANEL G
FLUSH MOUNTED

18,574 SCA AVAILABLE | 3 PHASE | 120/208 VOLTS
225 AMP BUS | 225 AMP LUGS

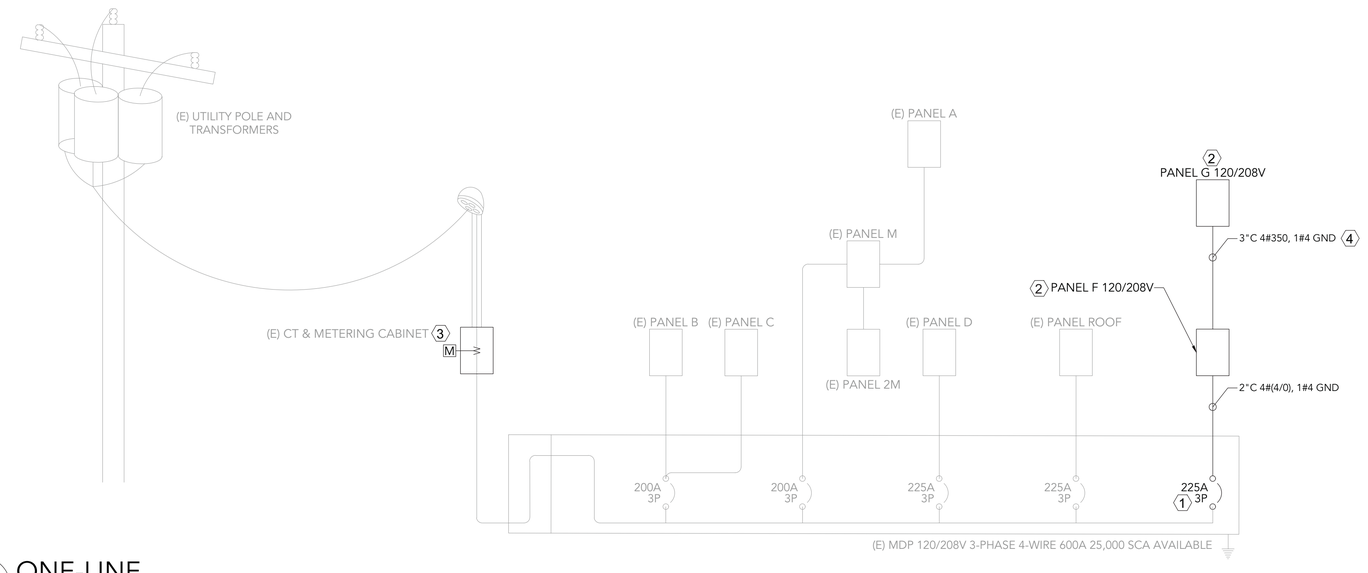
SERVICE	LOAD (AMP)	BREAKER (A/P)	CIRCUIT (# & Φ)				BREAKER (A/P)	LOAD (AMP)	SERVICE
OFFICE 143 RECPTS	4.5	20/1	1	A	2		20/1	1.5	REFRIGERATOR* RECPTS
OFFICE 143 RECPTS	3.0	20/1	3	B	4		20/1	1.5	REFRIGERATOR* RECPTS
STORAGE 146 RECPTS	1.5	20/1	5	C	6		20/1	4.5	BREAK RM 145 FLR RECPTS
BATHROOM 147 BEF-1	0.1	15/1	7	A	8		20/1	1.5	BREAK RM UNDER CAB RECPTS
BATHROOM 148 BEF-1	0.1	15/1	9	B	10		20/1	3.0	BREAK RM COUNTER RECPTS
OFFICE 130 RECPTS	6.0	20/1	11	C	12		20/1	3.0	BREAK RM COUNTER RECPTS
JANITOR 129 BEF-1	0.1	15/1	13	A	14		15/1	0.1	BREAK RM BEF-1
BATHROOM 128 BEF-1	0.1	15/1	15	B	16		20/1	10.0	WASHER*
DIV DIRECTOR, CONF 123 RECPTS	6.0	20/1	17	C	18		30/2	20.0	DRYER
WEST EGRESS LIGHTS	1.3	20/1	19	A	20			20.0	DRYER
WEST RESTROOMS LIGHTS	0.9	20/1	21	B	22		20/1	0.0	SPARE
NORTH LOBBY AREA LIGHTS	3.4	20/1	23	C	24		20/1	0.0	SPARE
PRINTER/COPPIER	12.0	20/2	25	A	26		20/1	0.0	SPARE
PRINTER/COPPIER	12.0		27	B	28		20/1	0.0	SPARE
PRINTER/COPPIER	12.0	20/2	29	C	30		20/1	0.0	SPARE
PRINTER/COPPIER	12.0		31	A	32		20/1	0.0	SPARE
SPARE	0.0	20/1	33	B	34		20/1	0.0	SPARE
SPARE	0.0	20/1	35	C	36		20/1	0.0	SPARE
SPARE	0.0	20/1	37	A	38		20/1	0.0	SPARE
SPARE	0.0	20/1	39	B	40		20/1	0.0	SPARE
SPARE	0.0	20/1	41	C	42		20/1	0.0	SPARE

NOTES: PROVIDE INTEGRAL SPD
* = PROVIDE GFI BREAKER PROTECTION

SUMMARY (AMPS):

	PHASE LOAD A	B	C
CONNECTED	53.2	30.7	56.4
DEMAND	53.2	30.7	56.4

DEMAND LOAD	56.4
CONTINUOUS LOAD	0.5
SPARE LOAD	2.8
TOTAL LOAD	59.7
FUTURE	3.0
	62.7 DESIGN LOAD



1 E-010 ONE-LINE
SCALE: NTS

SHEET NOTES

A. NEW BREAKERS SHALL BE BY THE SAME MANUFACTURER.

B. DOORS TO ELECTRIC ROOMS SHALL BE SIGNED AS SUCH. CIRCUIT BREAKERS SHALL BE LEGIBLY AND PERMANENTLY MARKED, SEE SPECIFICATIONS.

C. EXTERIOR ELECTRICAL EQUIPMENT SHALL BE NEMA 3R OR MORE STRINGENT AS REQUIRED.

D. NEW PANELBOARD FAULT CURRENT RATING SHALL MATCH, OR EXCEED RATING OF EXISTING ELECTRICAL EQUIPMENT, AND NOT BE LESS THAN SHOWN ON PANEL SCHEDULES.

#KEYNOTES

1. PROVIDE EATON KPH SERIES RETROFIT KIT AND 225A 3-POLE BREAKER IN EXISTING BLANK SPACE AVAILABLE IN (E) CUTLER HAMMER MP40 MDP. NEW BREAKER MANUFACTURER AND FAULT CURRENT RATING SHALL MATCH EXISTING.
2. PROVIDE NEW 120/208V 225A 3-PHASE 4-WIRE PANELBOARD. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
3. RELOCATE (E) CT, AND METERING CABINET MOUNTED ON (E) HVAC DUCT WORK. COORDINATE WITH PGE FOR NEW LOCATION. EXTEND CUSTOMER SIDE RACEWAY AND CONDUCTORS AS REQUIRED.
4. ROUTE VIA ATTIC, DERATED AS INDICATED.

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JANUARY 18, 2005
MATTHEW J. CASH
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MARION COUNTY
BEHAVIORAL HEALTH CRISIS CENTER REMODEL
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consultants: FLUENT ENGINEERING

revisions:

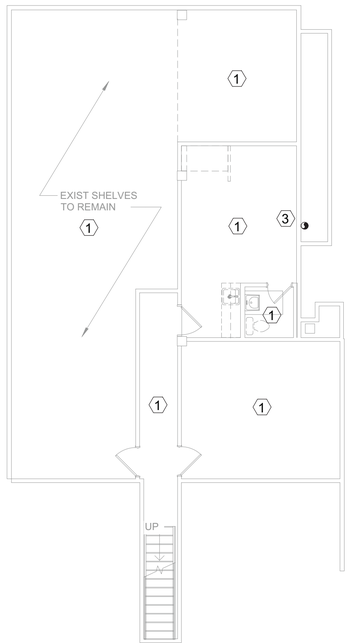
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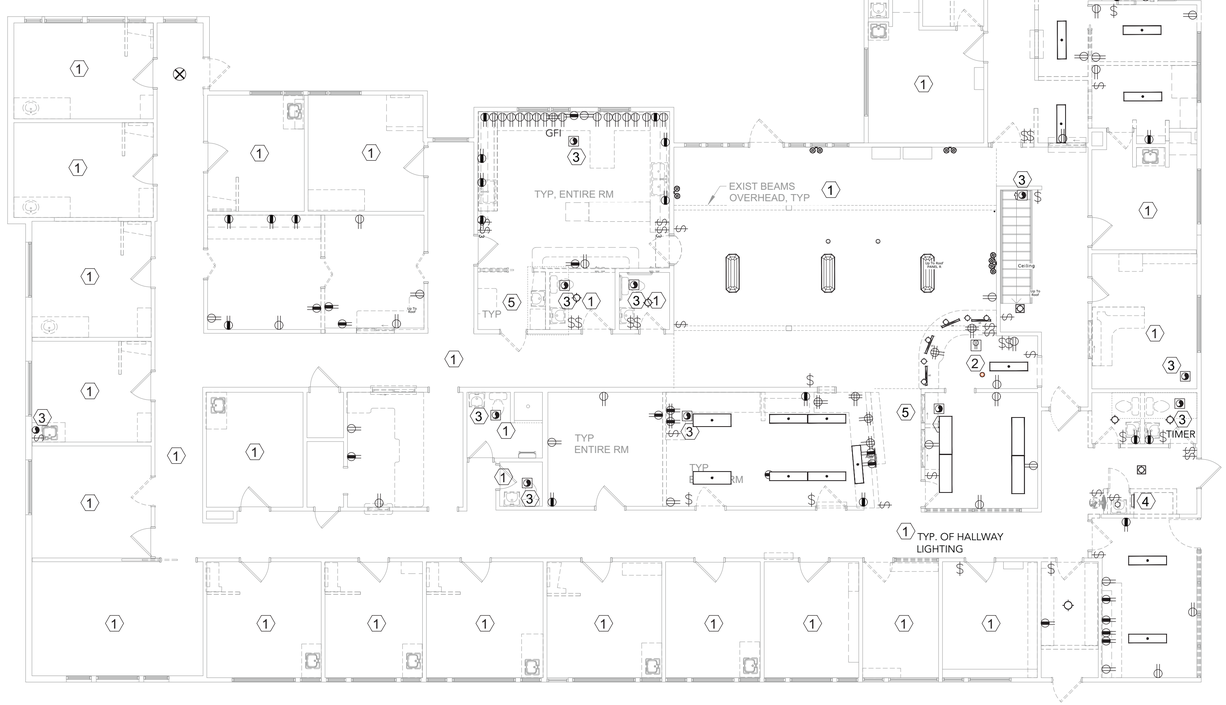
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2 E-100 BASEMENT POWER DEMOLITION
SCALE: 0 4' 8' 16'



1 E-100 LEVEL 01 POWER DEMOLITION
SCALE: 0 4' 8' 16'

SHEET NOTES

A. OWNER SHALL HAVE FIRST RIGHT OF REFUSAL OF REMOVED EQUIPMENT. CONTRACTOR SHALL INCLUDE COMPLETE DISPOSAL COSTS IN BID AND ASSUME NO EQUIPMENT SALVAGED TO OWNER.

B. LOCATION OF EQUIPMENT SHOWN IS APPROXIMATE, CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO START OF WORK.

C. CONTRACTOR SHALL SEAL, PATCH, PAINT, AND REPAIR FLOORS, AND WALLS TO MATCH ADJACENT MATERIAL, FINISH, AND COLOR UNLESS OTHERWISE NOTED. PATCHWORK SHALL BE COORDINATED WITH NEW WORK. SEE ARCHITECT FOR ADDITIONAL REQUIREMENTS.

D. SEE DEMOLITION SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

#KEYNOTES

1. PROTECT EXISTING ELECTRICAL IN THIS AREA.
2. REMOVE (E) FLOOR BOX. PROVIDE PATCH AS REQUIRED TO SEAL PENETRATION. PATCH SHALL MATCH EXISTING FLOOR SPACE.
3. REMOVE ELECTRICAL CONNECTION FOR SHOWN EXHAUST FAN, SEE MECHANICAL FOR EXACT LOCATION, AND ADDITIONAL REQUIREMENTS.
4. PROTECT AND RE-LOCATE EXISTING FIRE ALARM CONTROL PANEL (FACP) AS REQUIRED.
5. SEE PLANS FOR NEW FIXTURES IN THIS LOCATION REMOVE (E) AS REQUIRED.

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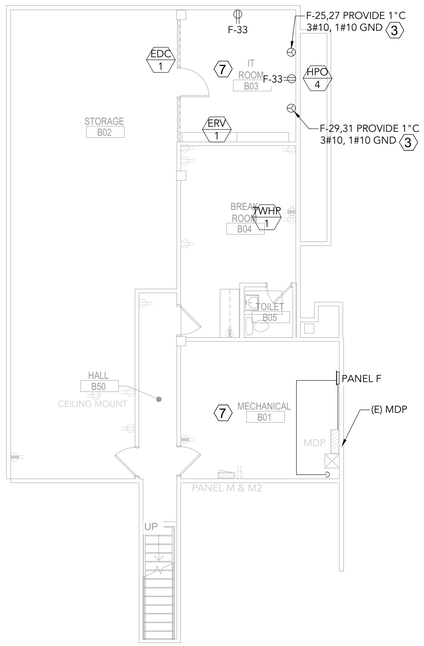
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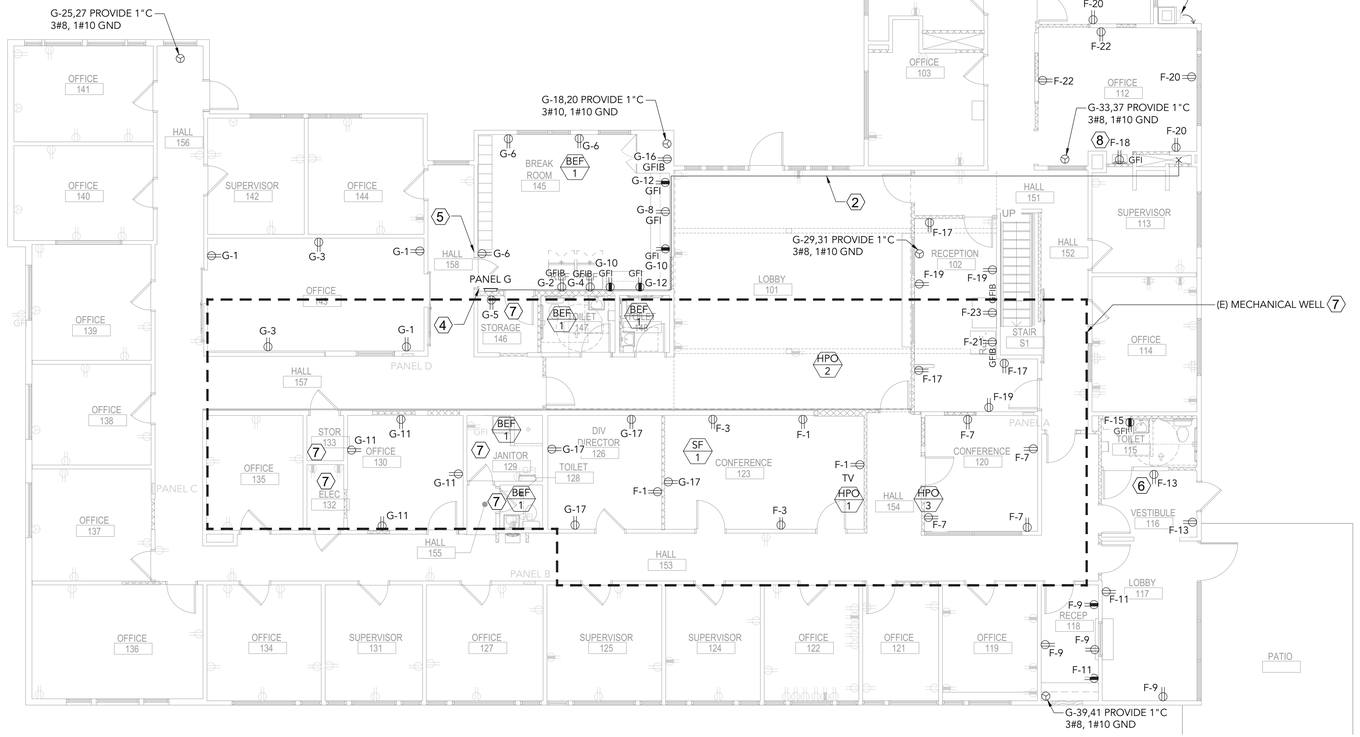
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ELECTRICAL DEMOLITION POWER PLAN

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SHEET NOTES

A. EXISTING PANELBOARD AND RECEPTACLES SHOWN AS REFERENCE ONLY.

B. SEE ONE-LINE FOR ADDITIONAL REQUIREMENTS .

C. SEE SPECIFICATIONS FOR J-BOX REQUIREMENTS, NOT ALL J-BOXES REQUIRED ARE SHOWN.

D. BUILDING PENETRATIONS SHALL BE WEATHERPROOF SEALED, PROVIDE LINK SEAL OR APPROVED.

E. SEE MECHANICAL FOR EXACT HVAC, AND PLUMBING EQUIPMENT LOCATIONS.

F. CONTRACTOR SHALL NOT ROUTE RACEWAY THROUGH, OR ACROSS (E) MECHANICAL WELL.

G. PRIOR TO START OF WORK, SUBMIT EXACT ELEVATIONS, ROUTING, AND PENETRATIONS LOCATIONS FOR ANY UNCONSEALED RACEWAY. FOR ACCEPTANCE. DO NOT ROUTE RACEWAY ON, OR PENETRATE VISIBLE PORTIONS OF THE BUILDING IN UNCONCEALED LOCATIONS WITHOUT ACCEPTANCE. WP SEAL REQUIRED PER SPECIFICATIONS. SUBMIT ANY OTHER AREA FOR UNCONSEALED RACEWAY REQUESTED PRIOR TO BID.

H. REFER TO SPECIFICATIONS FOR RACEWAY TYPE AND ROUTING REQUIREMENTS.

I. PER SPECIFICATIONS ROUTE RACEWAY CONSEALED, UNLESS OTHERWISE ACCEPTED PER KN7, THORUGHOUT. UTILIZE ATTIC FOR ROUTE. DE-RATE AS REQUIRED.

J. PROVIDE LARGER CONDUCTOR AND RACEWAY FOR ANY CIRCUITS ROUTED IN/THROUGH ATTIC PER AMPACITY CALCULATION TABLE ON E-010. TYPICAL OF CIRCUITS NOT ROUTED FROM BASEMENT BELOW.

#KEYNOTES

1. RELOCATE (E) PGE UTILITY METER TO NEW LOCATION. COORDINATE WITH PGE FOR ADDITIONAL REQUIREMENTS.
2. ROUTE FEEDER IN ARCHITECTURAL SOFFIT. SEE ARCHITECT FOR ADDITIONAL REQUIREMENTS.
3. COORDINATE SERVER RACK RECEPTACLE LOCATION WITH OWNER.
4. PROVIDE DOOR STOP BEHIND DOOR TO AVOID PHYSICAL CONTACT WITH PANELBOARD. SEE ARCHITECT.
5. PROVIDE CONCEALED RACEWAY AND CONDUCTORS FROM PANEL G FOR FUTURE ACCESS CONTROL. TERMINATE CONDUCTORS IN ACCESSIBLE RECESSED JUNCTION BOX. COORDINATE LOCATION WITH OWNER.
6. RELOCATE (E) FACP TO THIS LOCATION. COORDINATE WITH ARCHITECT, AND OWNER.
7. UNCONSEALED RACEWAY IS PERMITTED WITH ACCEPTANCE PER SHEET NOTE IN THIS AREA.
8. PROVIDE DRINKING FOUNTAIN CONNECTION.

2 / E-200 BASEMENT POWER PLAN
SCALE: 0 4' 8' 16'

1 / E-200 LEVEL 01 POWER PLAN
SCALE: 0 4' 8' 16'

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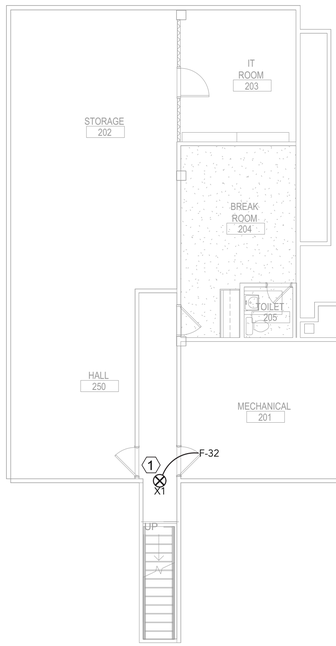
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POWER PLAN

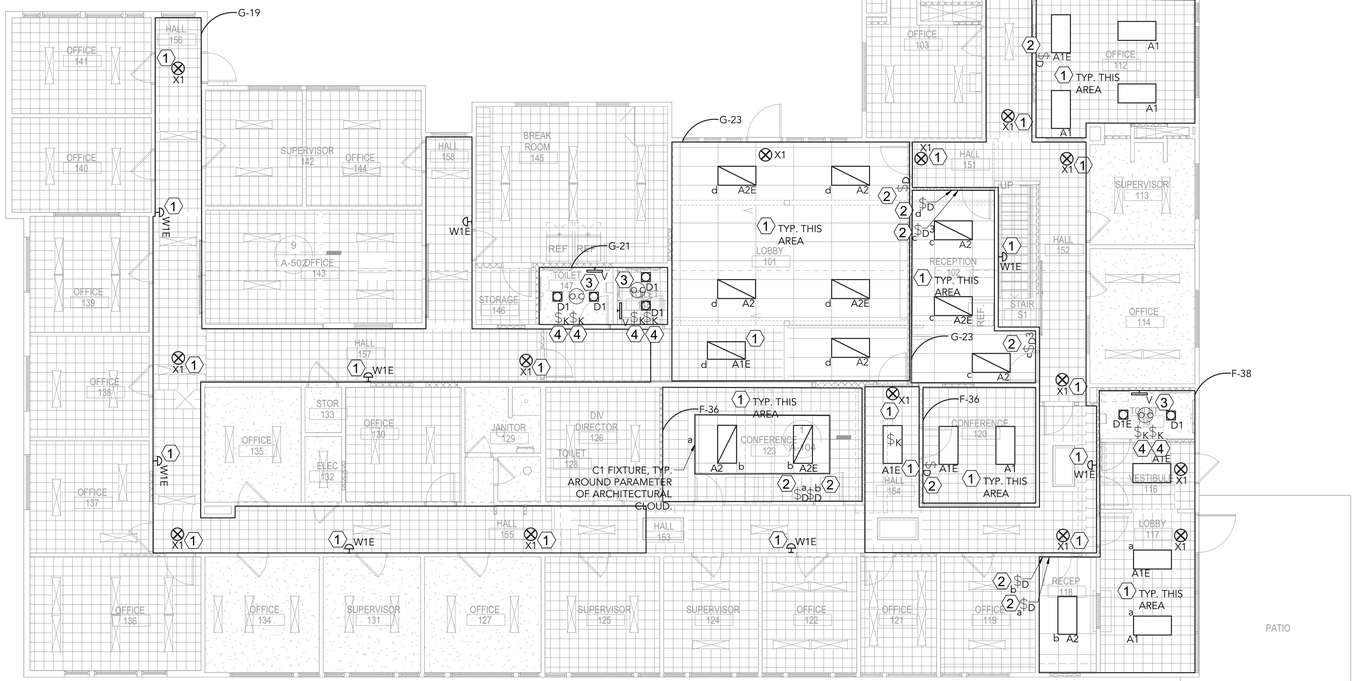
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3 E-300 BASEMENT LIGHTING PLAN

SCALE: 0 4' 8' 16'



2 E-300 LEVEL 01 LIGHTING PLAN

SCALE: 0 4' 8' 16'

SHEET NOTES

A. EXIT SIGNS SHOWN FOR QUANTITIES. COORDINATE EXACT LOCATION WITH PATH OF EGRESS, AND AHJ.

B. COORDINATE EXACT LIGHT SWITCH LOCATION WITH ARCHITECT.

C. EMERGENCY FIXTURES SHALL TURN ON UPON POWER LOSS INDEPENDENT OF CONTROLS.

D. INTERIOR LIGHTING CONTROLS INTENT:

D.1. PROVIDE ON/OFF WALL SWITCH WITH MANUAL DIMMING FOR OFFICES. NLIGHT AIR OR APPROVED.

D.2. PROVIDE SEPARATE, OR DUAL RELAY SEPARATELY PROGRAMMABLE DUAL-TECH OCCUPANCY SENSOR ON/OFF WALL SWITCH. NLIGHT AIR OR APPROVED.

D.3. PROVIDE 3-WAY ON/OFF WALL SWITCH WITH MANUAL DIMMING FOR CONFERENCE ROOMS. NLIGHT AIR OR APPROVED.

D.4. PROVIDE ON/OFF WALL SWITCH WITH MANUAL DIMMING FOR RECEPTION AREA AND LOBBIES, SWITCHES SHALL BE LOCATED AS SHOWN IN RECEPTION AREA. NLIGHT AIR OR APPROVED.

E. SEE FIXTURE SCHEDULE FOR ADDITIONAL REQUIREMENTS.

F. (E) LIGHTING TO REMAIN, SHOWN FOR REFERENCE ONLY.

G. PROGRAMMING FOR WIRELESS LIGHT FIXTURE CONTROLS, OCCUPANCY SENSORS, DIMMER SWITCHES, KEYED SWITCHES, AND OVERRIDE CONTROLS SHALL BE PROVIDED BY CONTRACTOR.

H. WIRELESS SHALL BE GROUPED/CHANNELED PER SEPARATE ROOMS AS SHOWN.

I. CONTRACTOR SHALL VERIFY LIGHT CONTROL COVERAGE PRIOR TO INSTALLATION.

J. PRIOR TO ORDERING, PROVIDE SHOP DRAWINGS OF LIGHTING CONTROL SYSTEM.

K. LIGHTING CONTROL SYSTEM SHALL HAVE A 5 YEAR WARRANTY.

#KEYNOTES

1. PROVIDE UNSWITCHED HOT FOR EXIT SIGN.
2. WIRELESS SWITCH POWERS VIA 120V LINE-VOLTAGE NLIGHT AIR OR APPROVED.
3. PROVIDE CEILING MOUNTED OCCUPANCY SENSOR WITH MICROPHONICS PDT OPTION, SENSORSWITCH, NLIGHT OR APPROVED.
4. PROVIDE SEPARATE KEYED SWITCH FOR LIGHTING AND EF. LIGHTS (CANS & VANITY) SHALL ROUTE THROUGH OCCUPANCY SENSOR SHOWN AND SWITCH TOGETHER. EF SHALL BE DEDICATED SWITCH TO ALLOW FOR 24/7 OPERATION.

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LIGHTING PLAN

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ATTACHMENT 3

Pre-Renovation
Asbestos Survey Report

Marion County BHCC

1234 Commercial Street

Salem, OR 97302

Prepared for:

Marion County

General Information	1.1
Inspection Summary	1.2
Survey Drawings	2.1
Sample Inventories	3.1
Laboratory Data	Not Numbered
AHERA Certificates	Not Numbered

PBS
AN APEX COMPANY

June 2024

Project No.: 23791.018 Phase No.: 0001

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GENERAL INFORMATION

BUILDING DATA

Marion County BHCC
1234 Commercial Street
Salem, OR 97302

CLIENT DATA

Marion County
PO Box 14500
Salem, OR 97309

BACKGROUND INFORMATION

The building is a wood-framed structure, approximately 9,500 square feet in size. The original building was constructed in 1957 and expanded in 1979.

SURVEY SCOPE

PBS endeavored to locate all the suspect asbestos-containing materials in the building; however, suspect asbestos-containing materials may be present and concealed within wall, ceiling, or floor spaces. If suspect materials are uncovered during demolition activities that are not identified in this report, testing should be performed prior to impact.

- The type, location, and approximate quantity of suspect asbestos-containing materials
- Bulk sampling of selected suspect building materials
- Inspection summary
- Floor plan diagrams indicating sample locations
- Laboratory analytical data of bulk material sampled

PBS has conducted a physical inspection of the building, compiled this report consistent with the survey scope, and certifies that the information is correct and accurate within the standards of professional quality and contractual obligations.

Dale Voeller, CHMM, CSP
Project Manager
Accreditation #: IRO-24-7646A

Signature Date

James Mastanduno
Prime Inspector
Accreditation #: IR-23-4993B

Signature Date

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INSPECTION SUMMARY

DATES	SURVEYED BY	ACTIVITY
5/30/2024	James Mastanduno	Asbestos Survey
5/31/2024	Dale Voeller	Asbestos Survey

PBS has investigated accessible areas within the scope of work area to locate suspect asbestos-containing building materials (ACBM). Suspect materials may be present in concealed areas (e.g., behind walls and under carpet). The findings are listed below.

ASBESTOS MATERIALS

The following materials either tested positive, or, based on the experience of PBS field personnel, were not tested and should be considered asbestos-containing. Materials that had mixed results are considered positive. Materials not sampled may contain asbestos and should be tested to verify asbestos content prior to impact through demolition, renovation, etc.
(+) Tested Positive, (M) Mixed Results, (P) Presumed Positive, (T) Previously Tested Positive.

See sample inventory for specific results.

Results		Material Description	Location	Details
(P)		Air Cell/Hard Fittings	Concealed in wall and ceiling spaces throughout the building	NOT QUANTIFIED Friable Good
(P)		Black Mastic Inside of Ceiling-Mounted Air Handling Unit	Basement	1 EA Non-friable Good
(+)	8%	Black Sink Undercoating	Lab, on double stainless steel sink	1 EA Non-friable Good
(+)	50%	Brown Mosaic Pattern Sheet Floor Covering	North end of the lab	180 SF Non-friable Good

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INSPECTION SUMMARY

(+)	35%	Built-up Roofing	Original roof on 1957 section of the building, now in the attic	6,500 SF Non-friable Good
(P)		Cement Asbestos Board Panels Below Windows	SE corner of the building	30 SF Non-friable Good
(+)	3%	Silver Paint on Original Rooftop Vents	Original roof on 1957 section of the building, now in the attic	20 EA Non-friable Good
(+)	4%	Vinyl Floor Tile/Mastic	Throughout the 1957 section of the building - mostly under carpet or sheet vinyl flooring	6,500 SF Non-friable Poor

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INSPECTION SUMMARY

MATERIALS THAT TESTED NEGATIVE FOR ASBESTOS

No asbestos was detected in samples of the following materials:

Material (type)	Location
12"x12" Glued-on Ceiling Tiles	Throughout the building
Asphalt Impregnated Vapor Barrier	North exterior, under wood siding
Beige Stair Skirt	Stairs to basement
Black Foam Pipe Insulation	Basement storage area
Black Mastic With Leveling Compound	Sampled in Room 12
Black Mechanical Isolation Cloth	On AHU in basement
Brown Backsplash Mastic	Sampled in Room 5
Brown Tile Pattern Sheet Floor Covering	Room 17
Canvas Wallpaper and Yellow Mastic	Room 5
Cork Floor Tile and Mastic	Sampled in Room 11
Cove Base and Associated Mastic	Throughout the building
Gray "Kentile" Brand Vinyl Floor Tile	Unused tile, still stored in the box
Gray Caulk	Room 11, around door frame
Gray Sheet Floor Covering	Restrooms throughout the building
Gypsum and Plaster	Throughout the building
Gypsum Wallboard/Joint Compound	Throughout the building
Laminate Wainscot Wall Panels and Mastic	Restrooms throughout the building
Leveling Compound	Where sampled throughout the building
Light Blue/Green Sheet Floor Covering	Central reception area, under carpet
Residual Brown Covebase Mastic	Throughout the 1957 section of the building
Roof Penetration Sealant	SW attic space, old rooftop flashing
Roofing Debris	Throughout the attic in the 1957 area of the building
Sink Undercoating	Where sampled throughout the building, EXCEPT for black mastic on the double sink in the lab
Tan Sand Pattern Sheet Floor Covering	Lab
Wall and Ceiling Plaster	Throughout the building
Wall paper and mastic	Room 16
Wood Grain Laminate Plank Flooring	Room 17

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INSPECTION SUMMARY

Yellow and Brown Carpet Mastic	Throughout the building (underlying residual black mastic is asbestos-containing)

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INSPECTION SUMMARY

BACKGROUND

On May 30 and 31, 2024, PBS performed a comprehensive pre-renovation asbestos survey of the former medical office building located at 1234 Commercial Street SE in Salem, Oregon.

The purpose of the survey was to locate, identify, and quantify accessible friable and non-friable asbestos-containing building materials likely to be impacted by planned renovation work. The survey is intended to satisfy Occupational Safety and Health Administration (OSHA) hazard communication requirements as well as requirements by the Oregon Department of Environmental Quality (DEQ) to perform an asbestos inspection prior to renovation or demolition activities under Oregon Administrative Rule (OAR) 340-248-0270.

The building is approximately 9,500 square feet in size. The original section of the building was constructed in 1957. An addition in 1979 expanded the lobby and added a lab, restrooms, and additional exam rooms at the north and west of the building. The south and west sections of the building were reportedly damaged by a fire in 1996. The existing exterior siding and pitched roofs were added as part of a renovation project in 2004. The pitched roofs were built on top of an existing flat built-up roof that contains asbestos.

ASBESTOS SUMMARY

An accredited Asbestos Hazard Emergency Response Act (AHERA) inspector inspected the building to determine the presence, location, and approximate quantity of asbestos-containing materials (ACM). Fifty-nine bulk samples of suspect asbestos-containing building materials were collected and submitted under chain of custody to Eurofins laboratory in Portland, Oregon for polarized light microscopy (PLM) analysis.

Asbestos was found in samples of the following materials:

- Vinyl floor tile and/or associated mastic throughout the 1957 wing. The floor tile has been removed in some areas, but the residual black mastic remains. While exposed in some areas, most of the material is concealed by carpet or sheet vinyl flooring.
- Built-up roofing on the original flat roof over the 1957 section of the building.
- Silver paint on original rooftop vents on the 1957 section of the building.
- Brown mosaic pattern sheet vinyl flooring in the north half of the lab.
- Black mastic undercoating on the double stainless steel sink in the lab.
- Cement asbestos board panels under windows at the SE corner of the building are presumed to contain asbestos.
- Pipe insulation, concealed in wall and ceiling spaces, is presumed to contain asbestos.
- Black mastic, if present, inside of the abandoned ceiling-mounted air handling unit in the basement, should be presumed to contain asbestos.

Please refer to the attached asbestos bulk sample inventory for additional details.

Marion County provided a previous asbestos survey report of this building for our review. The report, dated March 3, 2004, was completed by Bullseye Precision Analytical & Environmental Services of Rickreall, Oregon. The report was apparently completed before the 2004 renovation work as several materials identified in the report as asbestos-containing have been removed, including floor tile and mastic in the basement and accessible pipe insulation in the basement.

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INSPECTION SUMMARY

Asbestos Regulations

Oregon DEQ, Environmental Protection Agency (EPA), and OSHA regulations require proper removal and handling of ACM by licensed and trained asbestos abatement contractors prior to building renovations or demolition.

The EPA, DEQ, and OSHA all define ACM as any material containing more than 1% asbestos. Although materials equal to or less than 1% are not considered by regulatory agencies to be an ACM, they still have some asbestos content, and Oregon OSHA has specific requirements for situations in which workers may encounter, disturb, or remove materials containing any level of asbestos. These materials are included in the asbestos-containing materials section of this report for the purpose of hazard communication.

In 1995, Oregon OSHA adopted 29 Code of Federal Regulations (CFR) Part 1926.1101 governing asbestos under OAR 437-003-1926.1101. The regulation has made significant changes in work procedures and how asbestos materials are managed. OSHA believes that the single biggest risk of asbestos exposure is to workers who unknowingly or improperly disturb ACM. Hazard communication, training, personal protection, work practices, exposure monitoring, and recordkeeping are all major components of the regulation.

DEQ's OAR 340, Division 248 also covers asbestos abatement requirements, removal notifications, licensing, and certifications for contractors.

For more information regarding the removal of asbestos-containing materials, please refer to the following:

1. Oregon Occupational Safety and Health Administration, OAR 437-003-1926.1101
2. Department of Environmental Quality, OAR-340, Division 248

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GENERAL NOTES

1. THIS DRAWING IS DIAGRAMMATIC. IT IS FOR GENERAL INFORMATION AND SAMPLE LOCATIONS.
2. ACCESSIBLE SPACES WERE SURVEYED FOR SUSPECT HAZARDOUS MATERIALS. WHEN OBSERVED, THE MATERIALS WERE NOTED ON THE DRAWING.

SURVEY NOTES

1. ASBESTOS-CONTAINING PIPE INSULATION IS PRESENT IN WALL AND CEILING SPACES THROUGHOUT THE ORIGINAL 1957 WING.
2. ASBESTOS-CONTAINING BUILT-UP ROOFING IS PRESENT IN THE ATTIC, UNDER THE MODERN PITCHED ROOF.
3. ASBESTOS-CONTAINING SILVER PAINT IS PRESENT ON ORIGINAL ROOF VENTS IN THE ATTIC.

LEGEND

- APPROXIMATE EXTENT OF ASBESTOS-CONTAINING BUILT UP ROOFING IN THE ATTIC
- ASBESTOS-CONTAINING RESIDUAL BLACK MASTIC UNDER CARPET OR SHEET VINYL FLOORING
- ASBESTOS-CONTAINING FLOOR TILE AND MASTIC UNDER CARPET OR SHEET VINYL FLOORING
- ASBESTOS-CONTAINING SHEET VINYL FLOORING
- CEMENT ASBESTOS BOARD WINDOW PANELS
- SINK WITH ASBESTOS-CONTAINING MASTIC UNDERCOATING
- AHU — AIR HANDLING UNIT WITH PRESUMED INTERIOR ASBESTOS-CONTAINING MASTIC

ASBESTOS SAMPLE SYMBOLS

◇ 007 — DRAWING REFERENCE TO BULK SAMPLE FIELD CODE, SEE INVENTORY OF SAMPLES
MATERIAL SYMBOL

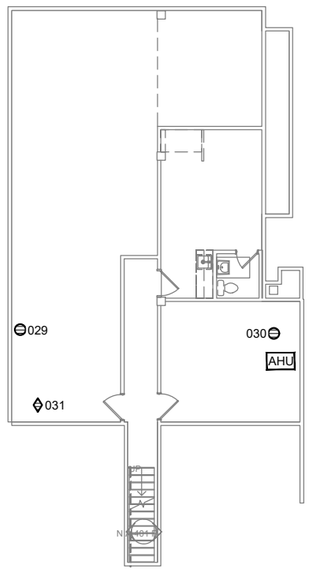
NOT TESTED	NEGATIVE -	POSITIVE +	
○	⊖	●	THERMAL SYSTEM INSULATION
□	▤	■	SURFACING MATERIAL
◇	◈	◆	MISCELLANEOUS MATERIAL

INVENTORY OF ASBESTOS SAMPLES

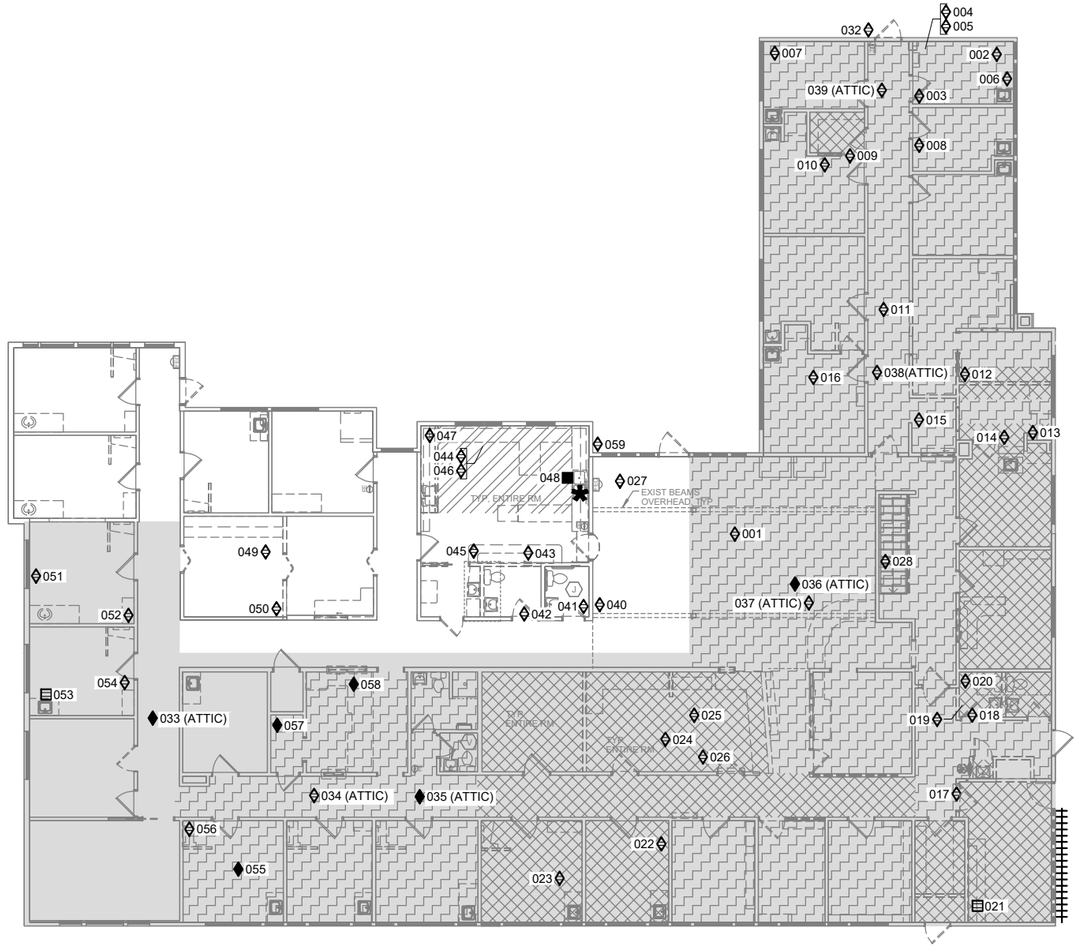
DRAWING REFERENCE	FIELD CODE	LAB RESULT	MATERIAL SAMPLED
◇001	23791.018-0001	(-)	VINYL FLOOR TILE
◇002	23791.018-0002	(-/-/-)	CORK TILE
◇003	23791.018-0003	(-/-/-)	GYPSUM WALLBOARD/ JOINT COMPOUND
◇004	23791.018-0004	(-/-/-)	GLUED-ON CEILING TILES/MASTIC (01)
◇005	23791.018-0005	(-/-)	GYPSUM WALLBOARD
◇006	23791.018-0006	(-/-)	WALL AND CEILING PLASTER
◇007	23791.018-0007	(-/-/-)	MASTIC (01)
◇008	23791.018-0008	(-/-/-)	COVEBASE/MASTIC (01)
◇009	23791.018-0009	(-/-/-)	MASTIC (02)
◇010	23791.018-0010	(-/-/-/-)	GYPSUM AND PLASTER
◇011	23791.018-0011	(-)	MASTIC (01)
◇012	23791.018-0012	(-/-/-)	GYPSUM WALLBOARD/ JOINT COMPOUND
◇013	23791.018-0013	(-/-)	MASTIC (03)
◇014	23791.018-0014	(-/-)	WALLPAPER
◇015	23791.018-0015	(-)	GLUED-ON CEILING TILES/MASTIC (02)
◇016	23791.018-0016	(-/-)	MASTIC (04)
◇017	23791.018-0017	(-/-)	MASTIC (02)
◇018	23791.018-0018	(-/-)	SHEET FLOOR COVERING (01)
◇019	23791.018-0019	(-/-)	COVEBASE/MASTIC (02)
◇020	23791.018-0020	(-/-)	WAINSCOT
▤021	23791.018-0021	(-)	SINK UNDERCOATING (01)
◇022	23791.018-0022	(-)	WALLPAPER
◇023	23791.018-0023	(-)	GLUED-ON CEILING TILES/MASTIC (03)
◇024	23791.018-0024	(-)	PLANK FLOOR
◇025	23791.018-0025	(-)	SHEET FLOOR COVERING (02)
◇026	23791.018-0026	(-)	LEVELING COMPOUND
◇027	23791.018-0027	(-/-)	MASTIC (05)
◇028	23791.018-0028	(-/-)	STAIR SKIRT
⊖029	23791.018-0029	(-)	FOAM PIPE
⊖030	23791.018-0030	(-)	MECHANICAL ISOLATION CLOTH (01)
◇031	23791.018-0031	(-/-)	GLUED-ON CEILING TILES/MASTIC (01)
◇032	23791.018-0032	(-)	CAULK
◆033	23791.018-0033	(+/-)	ROOF PENETRATION SEALANT
◇034	23791.018-0034	(-)	ROOF PENETRATION SEALANT
◆035	23791.018-0035	(+)	ASPHALT IMPREGNATED PAPER
◆036	23791.018-0036	(+)	ASPHALT IMPREGNATED PAPER
◇037	23791.018-0037	(-)	ROOF DEBRIS
◇038	23791.018-0038	(-)	ROOF DEBRIS
◇039	23791.018-0039	(-)	ROOF DEBRIS
◇040	23791.018-0040	(-/-)	GYPSUM WALLBOARD/ JOINT COMPOUND
◇041	23791.018-0041	(-/-/-)	MASTIC
◇042	23791.018-0042	(-/-/-)	SHEET FLOOR COVERING (01)
◇043	23791.018-0043	(+/-)	SHEET FLOOR COVERING (03)

INVENTORY OF ASBESTOS SAMPLES (CONTINUED)

DRAWING REFERENCE	FIELD CODE	LAB RESULT	MATERIAL SAMPLED
◇044	23791.018-0044	(-/+)	SHEET FLOOR COVERING (04)
◇045	23791.018-0045	(-/-/-)	COVEBASE/MASTIC
◇046	23791.018-0046	(-/-)	COVEBASE/MASTIC
◇047	23791.018-0047	(-/-/-/-)	GYPSUM WALLBOARD/ JOINT COMPOUND
■048	23791.018-0048	(+)	SINK UNDERCOATING
◇049	23791.018-0049	(-/-)	GLUED-ON CEILING TILES (02)
◇050	23791.018-0050	(-/-/-)	GYPSUM WALLBOARD/ JOINT COMPOUND
◇051	23791.018-0051	(-)	MASTIC
◇052	23791.018-0052	(-/-/-/-)	GYPSUM WALLBOARD/ JOINT COMPOUND
▤053	23791.018-0053	(-)	SINK UNDERCOATING
◇054	23791.018-0054	(-)	MASTIC
◆055	23791.018-0055	(+)	MASTIC
◇056	23791.018-0056	(-/-/-/-/-)	GYPSUM WALLBOARD/ JOINT COMPOUND
◆057	23791.018-0057	(-/-/+)	SHEET FLOOR COVERING
◆058	23791.018-0058	(-/-/+/-)	LEVELING COMPOUND
◇059	23791.018-0059	(-/-)	ASPHALT IMPREGNATED PAPER



BASEMENT



FIRST FLOOR

SCALE: 1" = 10'
0 5' 10' 20'

PREPARED FOR: MARION COUNTY

FULL SIZE SHEET FORMAT IS 24X36". IF PRINTED SIZE IS NOT 24X36", THEN THIS SHEET FORMAT HAS BEEN MODIFIED & INDICATED DRAWING SCALE IS NOT ACCURATE.

PBS Engineering and Environmental LLC
4412 SW Corbett Avenue
Portland, OR 97239
503.248.1939
pbsusa.com

HAZARDOUS MATERIAL SURVEY PLAN
BEHAVIORAL HEALTH CRISIS CENTER
1234 COMMERCIAL STREET SE, SALEM, OREGON

NO	REVISION	DATE	BY	APP'D

DRAWN BY: JAB
CHECKED: DV
DATE: JUNE 2024
PROJECT NUMBER: 23791.018
SHEET DRAWING NO: HS1
SHEET 1 OF 1

Filename: L:\Projects\23000\23700-23799\23791_MarionCo\23791.018_1234 Commercial_St_SE\Dwgs\23791.018_HS1.dwg Layout Tab: 11X17 User: Jim Blanco CAD Plot Date/Time: 6/14/2024 9:40:29 AM

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

Code	Material	Location	Results	Lab
23791.018-0001	Vinyl Floor Tile	Stored material; gray "Kentile" brand stored floor tile		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Gray/White Floor Tile	No Asbestos Detected	
23791.018-0002	Cork Tile	1957 building - room 11; cork floor tile and mastic on concrete		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Gray Leveling Compound with Mastic	No Asbestos Detected	
	Layer 2	Light Brown Foam	No Asbestos Detected	
	Layer 3	Transparent Mastic	No Asbestos Detected	
23791.018-0003	Gypsum Wallboard/Joint Compound	1957 building - room 11; gypsum wallboard and joint compound with orange peel		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	White Compound with White Paint	No Asbestos Detected	
	Layer 2	Cream Tape	No Asbestos Detected	
	Layer 3	White Drywall with Brown Paper	No Asbestos Detected	
23791.018-0004	Glued-on Ceiling Tiles/Mastic (01)	1957 building - room 11; 1x1 white wood fiber ceiling tile with brown mastic		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	White Coating	No Asbestos Detected	
	Layer 2	Brown Fibrous Material	No Asbestos Detected	
	Layer 3	Brown Mastic	No Asbestos Detected	
23791.018-0005	Gypsum Wallboard	1957 building - room 11; gypsum ceiling above ceiling tile		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Light Brown Fibrous Material	No Asbestos Detected	
	Layer 2	White Drywall with Brown Paper	No Asbestos Detected	
23791.018-0006	Wall and Ceiling Plaster	1957 building - room 11; plaster perimeter wall with orange peel		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	White Skim Coat with White Paint	No Asbestos Detected	
	Layer 2	White Plaster	No Asbestos Detected	

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

Code	Material	Location	Results	Lab
23791.018-0007	Mastic (01)	1957 building - room 12; black mastic with leveling compound on concrete		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	White Compound with Yellow Mastic	No Asbestos Detected	
	Layer 2	Black Mastic	No Asbestos Detected	
	Layer 3	Off-White Leveling Compound	No Asbestos Detected	
23791.018-0008	Covebase/Mastic (01)	1957 building - room 9; 4" beige covebase with white mastic		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Tan Cove Base	No Asbestos Detected	
	Layer 2	Off-White Mastic	No Asbestos Detected	
	Layer 3	White Compound (Trace)	No Asbestos Detected	
23791.018-0009	Mastic (02)	1957 building - room 10; residual brown covebase mastic		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Off-White Plaster	No Asbestos Detected	
	Layer 2	Brown Mastic	No Asbestos Detected	
	Layer 3	Off-White Mastic	No Asbestos Detected	
23791.018-0010	Gypsum and Plaster	1957 building - room 10; gypsum and plaster wall		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Beige Wallpaper with Cream Mastic	No Asbestos Detected	
	Layer 2	White Skim Coat with Paint	No Asbestos Detected	
	Layer 3	Off-White Plaster	No Asbestos Detected	
	Layer 4	White Drywall with Brown Paper	No Asbestos Detected	
23791.018-0011	Mastic (01)	1957 building - northeast hall; black mastic on concrete under carpet		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Gray Leveling Compound with Mastic	No Asbestos Detected	

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

Code	Material	Location	Results	Lab
23791.018-0012	Gypsum Wallboard/Joint Compound	1957 building - room 5; gypsum wallboard and joint compound with knock-down texture		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	White Compound with White Paint	No Asbestos Detected	
	Layer 2	Cream Tape	No Asbestos Detected	
	Layer 3	White Drywall with Brown Paper	No Asbestos Detected	
23791.018-0013	Mastic (03)	1957 building - room 5; brown backsplash mastic		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Brown Mastic	No Asbestos Detected	
	Layer 2	White Compound (Trace)	No Asbestos Detected	
23791.018-0014	Wallpaper	1957 building - room 5; canvas wallpaper and yellow mastic		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	White Wallpaper with Cream Mastic	No Asbestos Detected	
	Layer 2	Off-White Compound	No Asbestos Detected	
23791.018-0015	Glued-on Ceiling Tiles/Mastic (02)	1957 building - room 5 hall; 1x1 white paint texture gray ceiling tile		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Tan Ceiling Tile with White Surface	No Asbestos Detected	
23791.018-0016	Mastic (04)	1957 building - room 6; brown carpet mastic		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Tan Mastic	No Asbestos Detected	
	Layer 2	Gray Plaster	No Asbestos Detected	
23791.018-0017	Mastic (02)	1957 building - southeast hall; residual brown covebase mastic		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Off-White Plaster	No Asbestos Detected	
	Layer 2	Brown Mastic	No Asbestos Detected	

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

Code	Material	Location	Results	Lab
23791.018-0018	Sheet Floor Covering (01)	1957 building - southeast bathroom; gray sheet flooring		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Gray Flooring	No Asbestos Detected	
	Layer 2	Gray Fibrous Material	No Asbestos Detected	
23791.018-0019	Covebase/Mastic (02)	1957 building - southeast bathroom; 6" gray covebase with white mastic		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Gray Cove Base	No Asbestos Detected	
	Layer 2	Gray Mastic	No Asbestos Detected	
23791.018-0020	Wainscot	1957 building - southeast bathroom; wainscot and yellow mastic		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Brown Countertop	No Asbestos Detected	
	Layer 2	Tan Mastic with white and pink paint	No Asbestos Detected	
23791.018-0021	Sink Undercoating (01)	1957 building - southeast kitchenette; gray metal sink coating		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Gray Debris	No Asbestos Detected	
23791.018-0022	Wallpaper	1957 building - room 16; wallpaper and mastic		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Off-White Semi-Fibrous Material	No Asbestos Detected	
23791.018-0023	Glued-on Ceiling Tiles/Mastic (03)	1957 building - room 18; 1x1 white wormhole pattern gray ceiling tile		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Gray Ceiling Tile with White Surface	No Asbestos Detected	
23791.018-0024	Plank Floor	1957 building - room 17; wood-look laminate plank		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Gray Semi-Fibrous Material with wood-pattern coating	No Asbestos Detected	

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

Code	Material	Location	Results	Lab
23791.018-0025	Sheet Floor Covering (02)	1957 building - room 17; brown tile pattern sheet flooring		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Off-White Sheet Flooring with wood-pattern coating	No Asbestos Detected	
23791.018-0026	Leveling Compound	1957 building - room 17; gray leveling compound		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Gray Powdery Material	No Asbestos Detected	
23791.018-0027	Mastic (05)	1979 building - lobby; yellow carpet mastic		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Tan Mastic	No Asbestos Detected	
	Layer 2	Gray Plaster	No Asbestos Detected	
23791.018-0028	Stair Skirt	1957 building - stairs; beige stair skirt		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Gray Cove Base	No Asbestos Detected	
	Layer 2	Green Mastic with thin white powder	No Asbestos Detected	
23791.018-0029	Foam Pipe	1957 building - basement storage; black foam pipe insulation		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Black Foam	No Asbestos Detected	
23791.018-0030	Mechanical Isolation Cloth (01)	1957 building - boiler room; black HVAC isolation cloth		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Black Woven Material	No Asbestos Detected	
23791.018-0031	Glued-on Ceiling Tiles/Mastic (01)	1957 building - basement storage; 1x1 white ceiling tile with brown mastic		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Tan Ceiling Tile with White Surface	No Asbestos Detected	
	Layer 2	Brown Mastic	No Asbestos Detected	

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

Code	Material	Location	Results	Lab
23791.018-0032	Caulk	1957 building - door by room 11; gray doorframe caulk - exterior		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Gray Sealant with tan wood fibers	No Asbestos Detected	
23791.018-0033	Roof Penetration Sealant	Southwest building - attic; silver paint and sealant on old rooftop vent		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Silver Paint	3% Chrysotile	
	Layer 2	Black Tar	No Asbestos Detected	
23791.018-0034	Roof Penetration Sealant	Southwest building - attic; granules and tar sheet on dd rooftop flashing		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Black Roofing Shingle with gray rocks	No Asbestos Detected	
23791.018-0035	Asphalt Impregnated Paper	Southwest building - attic; residual black tar and paper on old roof deck		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Black Roofing Felt	35% Chrysotile	
23791.018-0036	Asphalt Impregnated Paper	1957 building - attic; residual black tar and paper on old roof deck		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Black Roofing Felt	35% Chrysotile	
23791.018-0037	Roof Debris	1957 building - loose black roof debris below wood deck		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Black Debris with wood fibers	No Asbestos Detected	
23791.018-0038	Roof Debris	1957 building - loose black roof debris below wood deck		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Black Debris with tan and silver particulate	No Asbestos Detected	
23791.018-0039	Roof Debris	1957 building - loose black roof debris below wood deck		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Black Debris with wood fibers	No Asbestos Detected	

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

Code	Material	Location	Results	Lab
23791.018-0040	Gypsum Wallboard/Joint Compound	Lobby, west wall; gypsum wallboard and joint compound		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Off-White Joint Compound with off-white paint	No Asbestos Detected	
	Layer 2	Off-White Drywall with Brown Paper	No Asbestos Detected	
23791.018-0041	Mastic	Lobby restrooms; laminate wall panels with yellow mastic		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Brown/Gray Countertop	No Asbestos Detected	
	Layer 2	Tan Mastic	No Asbestos Detected	
	Layer 3	Off-White Powdery Material with brown paper	No Asbestos Detected	
23791.018-0042	Sheet Floor Covering (01)	Lobby restrooms; gray pebble pattern sheet flooring		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Gray Mastic	No Asbestos Detected	
	Layer 2	Gray Flooring	No Asbestos Detected	
	Layer 3	Gray Fibrous Material	No Asbestos Detected	
23791.018-0043	Sheet Floor Covering (03)	Lab; tan sand pattern sheet flooring		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Tan Flooring	No Asbestos Detected	
	Layer 2	Gray Fibrous Material	No Asbestos Detected	
	Layer 3	Tan Mastic	No Asbestos Detected	
23791.018-0044	Sheet Floor Covering (04)	Lab; brown mosaic pattern sheet flooring		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Brown Flooring	No Asbestos Detected	
	Layer 2	Tan Fibrous Material	50% Chrysotile	
23791.018-0045	Covebase/Mastic	Lab; gray 6-inch with white and residual brown mastic		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Tan Cove Base	No Asbestos Detected	
	Layer 2	Tan Mastic with thin white powder	No Asbestos Detected	
	Layer 3	Brown Mastic	No Asbestos Detected	

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

Code	Material	Location	Results	Lab
23791.018-0046	Covebase/Mastic	Lab; off-white 4-inch with tan and residual brown mastic		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Off-White Cove Base	No Asbestos Detected	
	Layer 2	Brown Mastic	No Asbestos Detected	
23791.018-0047	Gypsum Wallboard/Joint Compound	Lab; north wall		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	White Joint Compound with White Paint	No Asbestos Detected	
	Layer 2	Cream Tape	No Asbestos Detected	
	Layer 3	White Joint Compound	No Asbestos Detected	
	Layer 4	White Drywall with Brown Paper	No Asbestos Detected	
23791.018-0048	Sink Undercoating	Lab; black undercoating on double stainless steel sink		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Black Mastic	8% Chrysotile	
23791.018-0049	Glued-on Ceiling Tiles (02)	Room 28; 1'x1' east/west crevice pattern with brown mastic		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Brown Ceiling Tile with White Surface	No Asbestos Detected	
	Layer 2	Brown Mastic	No Asbestos Detected	
23791.018-0050	Gypsum Wallboard/Joint Compound	Room 18 east wall; gypsum wallboard and joint compound		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	White Paint with Cream Tape	No Asbestos Detected	
	Layer 2	White Joint Compound	No Asbestos Detected	
	Layer 3	White Drywall with Brown Paper	No Asbestos Detected	
23791.018-0051	Mastic	Room 27; tan carpet mastic with residual black mastic		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Brown/Black Mastic	No Asbestos Detected	

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

Code	Material	Location	Results	Lab
23791.018-0052	Gypsum Wallboard/Joint Compound	Room 27; gypsum wallboard and joint compound wall		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Off-White Joint Compound with White Paint	No Asbestos Detected	
	Layer 2	Cream Tape	No Asbestos Detected	
	Layer 3	Off-White Joint Compound	No Asbestos Detected	
	Layer 4	White Drywall with Brown Paper	No Asbestos Detected	
23791.018-0053	Sink Undercoating	Room 26; white undercoating on stainless steel sink		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Off-White Sink Undercoating	No Asbestos Detected	
23791.018-0054	Mastic	Room 26; yellow carpet mastic		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Yellow Mastic	No Asbestos Detected	
23791.018-0055	Mastic	Room 22; yellow carpet mastic with residual black mastic		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Black Mastic	4% Chrysotile	
23791.018-0056	Gypsum Wallboard/Joint Compound	Room 22; west wall, over plaster wall		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	White Plaster with Beige Paint	No Asbestos Detected	
	Layer 2	Gray Plaster	No Asbestos Detected	
	Layer 3	White Joint Compound with White Paint	No Asbestos Detected	
	Layer 4	Cream Tape	No Asbestos Detected	
	Layer 5	White Joint Compound	No Asbestos Detected	
	Layer 6	White Drywall with Brown Paper	No Asbestos Detected	
23791.018-0057	Sheet Floor Covering	Central reception; light blue/green sheet vinyl flooring over residual black mastic, under carpet		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Semi-Transparent Mastic	No Asbestos Detected	
	Layer 2	Light Green Sheet Flooring	No Asbestos Detected	
	Layer 3	Black Mastic	3% Chrysotile	

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

Code	Material	Location	Results	Lab
23791.018-0058	Leveling Compound	Central reception; leveling compound over residual black mastic, with tan carpet mastic		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	Tan Mastic	No Asbestos Detected	
	Layer 2	White Compound	No Asbestos Detected	
	Layer 3	Black/Yellow Mastic	2% Chrysotile	
	Layer 4	Gray Mastic	No Asbestos Detected	
23791.018-0059	Asphalt Impregnated Paper	North exterior; rubberized vapor barrier beneath wood siding		Eurofins LabCor PDX
	Layer:	**Description:**	**Analysis:**	
	Layer 1	White Paint with Brown Paper	No Asbestos Detected	
	Layer 2	Black Non-Fibrous Material	No Asbestos Detected	

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

eurofins | Built Environment Testing

Report for:

John Yuly
PBS Engineering and Environmental: Portland
4412 S Corbett Ave.
Portland, OR 97239

Regarding: Eurofins EPK Built Environment Testing, LLC
Project: 23791.018 Phase 0001
EML ID: 3662686

Approved by:

Technical Manager
Ryan Talaski-Brown

Dates of Analysis:
Asbestos PLM: 06-06-2024

Service SOPs: Asbestos PLM (EPA 40CFR App E to Sub E of Part 763 & EPA METHOD 600/R-93-116, SOP EM-AS-S-1267)
NVLAP Lab Code 200741-0

All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. The results relate only to the samples as received and tested. The results include an inherent uncertainty of measurement associated with estimating percentages by polarized light microscopy. Measurement uncertainty data for sample results with >1% asbestos concentration can be provided when requested.

Eurofins EPK Built Environment Testing, LLC ("the Company"), a member of the Eurofins Built Environment Testing group of companies, shall have no liability to the client or the client's customer with respect to decisions or recommendations made, actions taken or courses of conduct implemented by either the client or the client's customer as a result of or based upon the Test Results. In no event shall the Company be liable to the client with respect to the Test Results except for the Company's own willful misconduct or gross negligence nor shall the Company be liable for incidental or consequential damages or lost profits or revenues to the fullest extent such liability may be disclaimed by law, even if the Company has been advised of the possibility of such damages, lost profits or lost revenues. In no event shall the Company's liability with respect to the Test Results exceed the amount paid to the Company by the client therefor.

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

Eurofins EPK Built Environment Testing, LLC
4321 S. Corbett Ave. Suite A, Portland, OR 97239
(833) 465-5857 www.eurofinsus.com/Built

Client: PBS Engineering and Environmental: Portland
C/O: John Yuly
Re: 23791.018 Phase 0001

Date of Sampling: 06-03-2024
Date of Receipt: 06-03-2024
Date of Report: 06-06-2024

ASBESTOS PLM REPORT

Total Samples Submitted:	59
Total Samples Analyzed:	59
Total Samples with Layer Asbestos Content > 1%:	8

Location: 23791.018-0001 Lab ID-Version‡: 17945402-1

Sample Layers	Asbestos Content
Gray/White Floor Tile	ND
Sample Composite Homogeneity:	Good

Location: 23791.018-0002 Lab ID-Version‡: 17945403-1

Sample Layers	Asbestos Content
Gray Leveling Compound with Mastic	ND
Light Brown Foam	ND
Transparent Mastic	ND
Sample Composite Homogeneity:	Poor

Location: 23791.018-0003 Lab ID-Version‡: 17945404-1

Sample Layers	Asbestos Content
White Compound with White Paint	ND
Cream Tape	ND
White Drywall with Brown Paper	ND
Composite Non-Asbestos Content:	15% Cellulose 2% Glass Fibers
Sample Composite Homogeneity:	Moderate

Location: 23791.018-0004 Lab ID-Version‡: 17945405-1

Sample Layers	Asbestos Content
White Coating	ND
Brown Fibrous Material	ND
Brown Mastic	ND
Composite Non-Asbestos Content:	50% Cellulose
Sample Composite Homogeneity:	Moderate

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ASBESTOS PLM REPORT

Location: 23791.018-0005 Lab ID-Version‡: 17945406-1

Sample Layers	Asbestos Content
Light Brown Fibrous Material	ND
White Drywall with Brown Paper	ND
Composite Non-Asbestos Content:	20% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 23791.018-0006 Lab ID-Version‡: 17945407-1

Sample Layers	Asbestos Content
White Skim Coat with White Paint	ND
White Plaster	ND
Sample Composite Homogeneity:	Moderate

Location: 23791.018-0007 Lab ID-Version‡: 17945408-1

Sample Layers	Asbestos Content
White Compound with Yellow Mastic	ND
Black Mastic	ND
Off-White Leveling Compound	ND
Sample Composite Homogeneity:	Poor

Location: 23791.018-0008 Lab ID-Version‡: 17945409-1

Sample Layers	Asbestos Content
Tan Cove Base	ND
Off-White Mastic	ND
White Compound (Trace)	ND
Sample Composite Homogeneity:	Moderate

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ASBESTOS PLM REPORT

Location: 23791.018-0009 Lab ID-Version‡: 17945410-1

Sample Layers	Asbestos Content
Off-White Plaster	ND
Brown Mastic	ND
Off-White Mastic	ND
Composite Non-Asbestos Content:	2% Talc
Sample Composite Homogeneity:	Poor

Location: 23791.018-0010 Lab ID-Version‡: 17945411-1

Sample Layers	Asbestos Content
Beige Wallpaper with Cream Mastic	ND
White Skim Coat with Paint	ND
Off-White Plaster	ND
White Drywall with Brown Paper	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Poor

Location: 23791.018-0011 Lab ID-Version‡: 17945412-1

Sample Layers	Asbestos Content
Gray Leveling Compound with Mastic	ND
Sample Composite Homogeneity:	Moderate

Location: 23791.018-0012 Lab ID-Version‡: 17945413-1

Sample Layers	Asbestos Content
White Compound with White Paint	ND
Cream Tape	ND
White Drywall with Brown Paper	ND
Composite Non-Asbestos Content:	15% Cellulose 2% Glass Fibers
Sample Composite Homogeneity:	Poor

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ASBESTOS PLM REPORT

Location: 23791.018-0013 Lab ID-Version‡: 17945414-1

Sample Layers	Asbestos Content
Brown Mastic	ND
White Compound (Trace)	ND
Composite Non-Asbestos Content:	2% Talc
Sample Composite Homogeneity:	Moderate

Location: 23791.018-0014 Lab ID-Version‡: 17945415-1

Sample Layers	Asbestos Content
White Wallpaper with Cream Mastic	ND
Off-White Compound	ND
Composite Non-Asbestos Content:	25% Cellulose
Sample Composite Homogeneity:	Poor

Location: 23791.018-0015 Lab ID-Version‡: 17945416-1

Sample Layers	Asbestos Content
Tan Ceiling Tile with White Surface	ND
Composite Non-Asbestos Content:	60% Cellulose 10% Glass Fibers
Sample Composite Homogeneity:	Moderate

Location: 23791.018-0016 Lab ID-Version‡: 17945417-1

Sample Layers	Asbestos Content
Tan Mastic	ND
Gray Plaster	ND
Sample Composite Homogeneity:	Poor

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ASBESTOS PLM REPORT

Location: 23791.018-0017 Lab ID-Version‡: 17945418-1

Sample Layers	Asbestos Content
Off-White Plaster	ND
Brown Mastic	ND
Sample Composite Homogeneity:	Moderate

Location: 23791.018-0018 Lab ID-Version‡: 17945419-1

Sample Layers	Asbestos Content
Gray Flooring	ND
Gray Fibrous Material	ND
Composite Non-Asbestos Content:	50% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 23791.018-0019 Lab ID-Version‡: 17945420-1

Sample Layers	Asbestos Content
Gray Cove Base	ND
Gray Mastic	ND
Sample Composite Homogeneity:	Good

Location: 23791.018-0020 Lab ID-Version‡: 17945421-1

Sample Layers	Asbestos Content
Brown Countertop	ND
Tan Mastic with white and pink paint	ND
Sample Composite Homogeneity:	Moderate

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ASBESTOS PLM REPORT

Location: 23791.018-0021 Lab ID-Version‡: 17945422-1

Sample Layers	Asbestos Content
Gray Debris	ND
Sample Composite Homogeneity:	Poor

Location: 23791.018-0022 Lab ID-Version‡: 17945423-1

Sample Layers	Asbestos Content
Off-White Semi-Fibrous Material	ND
Composite Non-Asbestos Content:	10% Synthetic Fibers
Sample Composite Homogeneity:	Good

Location: 23791.018-0023 Lab ID-Version‡: 17945424-1

Sample Layers	Asbestos Content
Gray Ceiling Tile with White Surface	ND
Composite Non-Asbestos Content:	40% Cellulose 40% Glass Fibers
Sample Composite Homogeneity:	Moderate

Location: 23791.018-0024 Lab ID-Version‡: 17945425-1

Sample Layers	Asbestos Content
Gray Semi-Fibrous Material with wood-pattern coating	ND
Composite Non-Asbestos Content:	30% Cellulose
Sample Composite Homogeneity:	Moderate

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ASBESTOS PLM REPORT

Location: 23791.018-0025 Lab ID-Version‡: 17945426-1

Sample Layers	Asbestos Content
Off-White Sheet Flooring with wood-pattern coating	ND
Sample Composite Homogeneity:	Good

Location: 23791.018-0026 Lab ID-Version‡: 17945427-1

Sample Layers	Asbestos Content
Gray Powdery Material	ND
Composite Non-Asbestos Content:	5% Cellulose
Sample Composite Homogeneity:	Good

Location: 23791.018-0027 Lab ID-Version‡: 17945428-1

Sample Layers	Asbestos Content
Tan Mastic	ND
Gray Plaster	ND
Sample Composite Homogeneity:	Moderate

Location: 23791.018-0028 Lab ID-Version‡: 17945429-1

Sample Layers	Asbestos Content
Gray Cove Base	ND
Green Mastic with thin white powder	ND
Sample Composite Homogeneity:	Good

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ASBESTOS PLM REPORT

Location: 23791.018-0029 Lab ID-Version‡: 17945430-1

Sample Layers	Asbestos Content
Black Foam	ND
Sample Composite Homogeneity:	Good

Location: 23791.018-0030 Lab ID-Version‡: 17945431-1

Sample Layers	Asbestos Content
Black Woven Material	ND
Composite Non-Asbestos Content:	70% Cellulose
Sample Composite Homogeneity:	Good

Location: 23791.018-0031 Lab ID-Version‡: 17945432-1

Sample Layers	Asbestos Content
Tan Ceiling Tile with White Surface	ND
Brown Mastic	ND
Composite Non-Asbestos Content:	60% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 23791.018-0032 Lab ID-Version‡: 17945433-1

Sample Layers	Asbestos Content
Gray Sealant with tan wood fibers	ND
Composite Non-Asbestos Content:	5% Cellulose
Sample Composite Homogeneity:	Moderate

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ASBESTOS PLM REPORT

Location: 23791.018-0033 Lab ID-Version‡: 17945434-1

Sample Layers	Asbestos Content
Silver Paint	3% Chrysotile
Black Tar	ND
Sample Composite Homogeneity:	Moderate

Location: 23791.018-0034 Lab ID-Version‡: 17945435-1

Sample Layers	Asbestos Content
Black Roofing Shingle with gray rocks	ND
Composite Non-Asbestos Content:	5% Cellulose 3% Glass Fibers
Sample Composite Homogeneity:	Moderate

Location: 23791.018-0035 Lab ID-Version‡: 17945436-1

Sample Layers	Asbestos Content
Black Roofing Felt	35% Chrysotile
Composite Non-Asbestos Content:	30% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 23791.018-0036 Lab ID-Version‡: 17945437-1

Sample Layers	Asbestos Content
Black Roofing Felt	35% Chrysotile
Composite Non-Asbestos Content:	30% Cellulose
Sample Composite Homogeneity:	Moderate

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ASBESTOS PLM REPORT

Location: 23791.018-0037 Lab ID-Version‡: 17945438-1

Sample Layers	Asbestos Content
Black Debris with wood fibers	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Poor

Location: 23791.018-0038 Lab ID-Version‡: 17945439-1

Sample Layers	Asbestos Content
Black Debris with tan and silver particulate	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Poor

Location: 23791.018-0039 Lab ID-Version‡: 17945440-1

Sample Layers	Asbestos Content
Black Debris with wood fibers	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Poor

Location: 23791.018-0040 Lab ID-Version‡: 17945441-1

Sample Layers	Asbestos Content
Off-White Joint Compound with off-white paint	ND
Off-White Drywall with Brown Paper	ND
Composite Non-Asbestos Content:	5% Cellulose
Sample Composite Homogeneity:	Moderate

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ASBESTOS PLM REPORT

Location: 23791.018-0041 Lab ID-Version‡: 17945442-1

Sample Layers	Asbestos Content
Brown/Gray Countertop	ND
Tan Mastic	ND
Off-White Powdery Material with brown paper	ND
Composite Non-Asbestos Content:	10% Cellulose
Sample Composite Homogeneity:	Poor

Location: 23791.018-0042 Lab ID-Version‡: 17945443-1

Sample Layers	Asbestos Content
Gray Mastic	ND
Gray Flooring	ND
Gray Fibrous Material	ND
Composite Non-Asbestos Content:	30% Cellulose
Sample Composite Homogeneity:	Good

Location: 23791.018-0043 Lab ID-Version‡: 17945444-1

Sample Layers	Asbestos Content
Tan Flooring	ND
Gray Fibrous Material	ND
Tan Mastic	ND
Composite Non-Asbestos Content:	40% Cellulose
Sample Composite Homogeneity:	Good

Location: 23791.018-0044 Lab ID-Version‡: 17945445-1

Sample Layers	Asbestos Content
Brown Flooring	ND
Tan Fibrous Material	50% Chrysotile
Sample Composite Homogeneity:	Good

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ASBESTOS PLM REPORT

Location: 23791.018-0045 Lab ID-Version‡: 17945446-1

Sample Layers	Asbestos Content
Tan Cove Base	ND
Tan Mastic with thin white powder	ND
Brown Mastic	ND
Sample Composite Homogeneity:	Moderate

Location: 23791.018-0046 Lab ID-Version‡: 17945447-1

Sample Layers	Asbestos Content
Off-White Cove Base	ND
Brown Mastic	ND
Sample Composite Homogeneity:	Moderate

Location: 23791.018-0047 Lab ID-Version‡: 17945448-1

Sample Layers	Asbestos Content
White Joint Compound with White Paint	ND
Cream Tape	ND
White Joint Compound	ND
White Drywall with Brown Paper	ND
Composite Non-Asbestos Content:	10% Cellulose
Sample Composite Homogeneity:	Poor

Location: 23791.018-0048 Lab ID-Version‡: 17945449-1

Sample Layers	Asbestos Content
Black Mastic	8% Chrysotile
Sample Composite Homogeneity:	Good

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ASBESTOS PLM REPORT

Location: 23791.018-0049 Lab ID-Version‡: 17945450-1

Sample Layers	Asbestos Content
Brown Ceiling Tile with White Surface	ND
Brown Mastic	ND
Composite Non-Asbestos Content:	75% Cellulose
Sample Composite Homogeneity:	Good

Location: 23791.018-0050 Lab ID-Version‡: 17945451-1

Sample Layers	Asbestos Content
White Paint with Cream Tape	ND
White Joint Compound	ND
White Drywall with Brown Paper	ND
Composite Non-Asbestos Content:	10% Cellulose
Sample Composite Homogeneity:	Poor

Location: 23791.018-0051 Lab ID-Version‡: 17945452-1

Sample Layers	Asbestos Content
Brown/Black Mastic	ND
Sample Composite Homogeneity:	Good

Location: 23791.018-0052 Lab ID-Version‡: 17945453-1

Sample Layers	Asbestos Content
Off-White Joint Compound with White Paint	ND
Cream Tape	ND
Off-White Joint Compound	ND
White Drywall with Brown Paper	ND
Composite Non-Asbestos Content:	10% Cellulose
Sample Composite Homogeneity:	Poor

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‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

Eurofins EPK Built Environment Testing, LLC
4321 S. Corbett Ave. Suite A, Portland, OR 97239
(833) 465-5857 www.eurofinsus.com/Built

Client: PBS Engineering and Environmental: Portland
C/O: John Yuly
Re: 23791.018 Phase 0001

Date of Sampling: 06-03-2024
Date of Receipt: 06-03-2024
Date of Report: 06-06-2024

ASBESTOS PLM REPORT

Location: 23791.018-0053 Lab ID-Version‡: 17945454-1

Sample Layers	Asbestos Content
Off-White Sink Undercoating	ND
Composite Non-Asbestos Content:	8% Cellulose
Sample Composite Homogeneity:	Good

Location: 23791.018-0054 Lab ID-Version‡: 17945455-1

Sample Layers	Asbestos Content
Yellow Mastic	ND
Sample Composite Homogeneity:	Good

Location: 23791.018-0055 Lab ID-Version‡: 17945456-1

Sample Layers	Asbestos Content
Black Mastic	4% Chrysotile
Sample Composite Homogeneity:	Good

Location: 23791.018-0056 Lab ID-Version‡: 17945457-1

Sample Layers	Asbestos Content
White Plaster with Beige Paint	ND
Gray Plaster	ND
White Joint Compound with White Paint	ND
Cream Tape	ND
White Joint Compound	ND
White Drywall with Brown Paper	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Poor

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Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

Eurofins EPK Built Environment Testing, LLC
4321 S. Corbett Ave. Suite A, Portland, OR 97239
(833) 465-5857 www.eurofinsus.com/Built

Client: PBS Engineering and Environmental: Portland
C/O: John Yuly
Re: 23791.018 Phase 0001

Date of Sampling: 06-03-2024
Date of Receipt: 06-03-2024
Date of Report: 06-06-2024

ASBESTOS PLM REPORT

Location: 23791.018-0057 Lab ID-Version‡: 17945458-1

Sample Layers	Asbestos Content
Semi-Transparent Mastic	ND
Light Green Sheet Flooring	ND
Black Mastic	3% Chrysotile
Sample Composite Homogeneity:	Moderate

Location: 23791.018-0058 Lab ID-Version‡: 17945459-1

Sample Layers	Asbestos Content
Tan Mastic	ND
White Compound	ND
Black/Yellow Mastic	2% Chrysotile
Gray Mastic	ND
Composite Non-Asbestos Content:	5% Glass Fibers
Sample Composite Homogeneity:	Poor

Location: 23791.018-0059 Lab ID-Version‡: 17945460-1

Sample Layers	Asbestos Content
White Paint with Brown Paper	ND
Black Non-Fibrous Material	ND
Composite Non-Asbestos Content:	25% Cellulose 5% Glass Fibers
Sample Composite Homogeneity:	Moderate

The test report shall not be reproduced except in full, without written approval of the laboratory. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. The Company reserves the right to dispose of all samples after a period of thirty (30) days, according to all state and federal guidelines, unless otherwise specified.

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

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PBS
AN APEX COMPANY

003662686

TRANSMITTAL AND CHAIN OF CUSTODY FOR ASBESTOS BULK SAMPLES

Project No.: 23791.018 Phase 0001

Individuals signing this form warrant that the information provided is correct and complete. The Sender should keep a copy and send the original. The Receiver should complete the form, keep a copy and return the original to the Sender. Receiver shall report damage of package immediately to Sender.

SENDER

Date Sent: June 03, 2024

PBS Engineering and Environmental LLC
4412 S Corbett Avenue
Portland, OR 97239
503.248.1939, Fax: 866.727.0140

John Yuly
Name

Authorized Signature 6/3/24 **Date** 9:38 **Time**

RECEIVER

Date Received: 6/3/24

Company: Eurofins LabCor PDX
Address: 4321 S Corbett Avenue
Portland, OR 97239
(503) 224-5055

Mark Donahue
Name

Authorized Signature 6/3/24 **Date** 5:40 **Time**

Sender's ID No.	Brief Description	Receiver's ID No.
23791.018-0001		
23791.018-0002		
23791.018-0003		
23791.018-0004		
23791.018-0005		
23791.018-0006		
23791.018-0007		
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PBS
AN APEX COMPANY

003662686

TRANSMITTAL AND CHAIN OF CUSTODY FOR ASBESTOS BULK SAMPLES

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PBS
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003662686

TRANSMITTAL AND CHAIN OF CUSTODY FOR ASBESTOS BULK SAMPLES

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23791.018-0059		

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PBS
AN APEX COMPANY

003662686

TRANSMITTAL AND CHAIN OF CUSTODY FOR ASBESTOS BULK SAMPLES

Please analyze the enclosed 59 sample(s) for asbestos content using PLM with dispersion staining. PBS requests prior notification if samples will be disposed.
Request verbal results by: _____ AM/PM _____Date.

Please fax and mail the results to the above address.

TURNAROUND DESIRED: **72 Hour**

SPECIAL INSTRUCTIONS:

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

THIS IS TO CERTIFY THAT

JAMES MASTANDUNO

HAS SUCCESSFULLY COMPLETED THE TRAINING COURSE

for

ASBESTOS INSPECTOR REFRESHER

In accordance with TSCA Title II, Part 763, Subpart E, Appendix C of 40 CFR

Course Date: 11/13/2023

Course Location: Portland, OR

Certificate: IR-23-4993B

For verification of the authenticity of this certificate contact:
PBS Engineering and Environmental Inc.
4412 S Corbett Avenue
Portland, OR 97239
503.248.1939

CCB #SRA0615 4-Hr Training

4-Hour AHERA Inspector Refresher Training; AHERA is the Asbestos Hazard Emergency Response Act enacting Title II of Toxic Substance Control Act (TSCA)

Expiration Date: 11/13/2024

Andy Fridley, Instructor

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

THIS IS TO CERTIFY THAT

DALE VOELLER

HAS SUCCESSFULLY COMPLETED THE TRAINING COURSE

for

ONLINE AHERA ASBESTOS INSPECTOR REFRESHER

In accordance with TSCA Title II, Part 763, Subpart E, Appendix C of 40 CFR

Course Date: 01/23/2024

Course Location: Online

Certificate: IRO-24-7646A

CCB #SRA0615 4-Hr Training

4-Hour Online AHERA Inspector Refresher Training; AHERA is the Asbestos Hazard Emergency Response Act enacting Title II of Toxic Substance Control Act (TSCA)

Expiration Date: 01/23/2025

For verification of the authenticity of this certificate contact:
PBS Engineering and Environmental Inc.
4412 S Corbett Avenue
Portland, OR 97239
503.248.1939

Andy Fridley, Instructor

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

ATTACHMENT 4

SECTION 02 82 00: ASBESTOS AIR MONITORING REQUIREMENTS

PART 1 GENERAL

1.1. AIR MONITORING BY CONTRACTOR

A. An Independent Testing Laboratory shall be retained by the Contractor. All air-monitoring analysis shall be performed by an Industrial Hygienist. The Hygienist must be experienced and trained in asbestos sampling and analysis. At a minimum, documentation of prior asbestos sampling and analysis experience, plus satisfactory completion of the NIOSH 582 course or equivalent formal asbestos education, will be required. The laboratory must meet the requirements specified in Section 02 82 13. Air sample collection may be performed by an Industrial Hygienist or the Contractor's foreman at the Contractor's option.

B. Documentation shall be kept for each filter sample procured as to worker sampled, work area location, date and time taken, volume of air drawn through filter, pump identification number and calibration. Documentation shall indicate in what areas tests were taken and shall clearly indicate the specified maximum allowable fiber levels for each area tested. Report all data on copies of "Asbestos Air Sampling Data Form" bound in these Specifications or similar form. Fill in all information on every form. Submit chain-of-custody records along with all samples.

C. The samples shall be collected on 25 mm filters and analyzed within 12 hours using the membrane filter method at 400-500x magnification with phase contrast illumination - NIOSH Analytical Method No. 7400 - for laboratory and field analysis. The analyst shall sign and submit permanent records of all samples analyzed directly to the Environmental Consultant. The Independent Testing Laboratory shall seal the unused portion of all filters in airtight containers so that individual samples can be reanalyzed at a later date if necessary. The containers shall be clearly labeled with Project Name and Sample Number and shall become property of the Owner at work completion at the Owner's request.

D. The Contractor's testing laboratory shall submit sample analysis results to the Owner or Environmental Consultant verbally within 18 hours from the time of collection and written within two weeks including chain-of-custody and equipment calibration records.

E. Contractor's Sampling During Abatement:

1. Air monitoring shall be performed to provide samples during the period of asbestos abatement in each work area. Begin sampling when asbestos removal commences. Samples are to be taken where Class I or II work is being conducted during each 8-hour work shift until abatement is complete in that work area or until a negative exposure assessment is established per 29 CFR 1926.1101.

2. The Contractor shall determine which worker(s) in each work area is probably experiencing the most severe exposure. This is the "Most Contaminated Worker(s)". 8-hour TWA and 30-minute excursion samples shall be collected on this worker(s). This worker shall wear a personal sampling pump and the sample shall be drawn from the breathing zone of this worker. All other samples are area samples.

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3. The number of air samples collected shall be determined by the Contractor, and may be altered during the project based on work activity and results.

4. The maximum allowable fiber levels shall be as determined by the Owner or Environmental Consultant based on the respiratory protection being utilized.

F. Contractor shall notify the Department of Environmental Quality of air monitoring clearance results as supplied by the Owner or Environmental Consultant. Notification shall be within 30 days after monitoring procedures were performed in accordance to OAR 340-32-465.

1.2. AIR MONITORING BY OWNER

A. The Owner may retain an experienced Industrial Hygienist/Environmental Consultant to collect and analyze asbestos air samples. Documentation of sample results will be forwarded to the Contractor as appropriate to regulatory requirements.

B. Samples analyzed by phase contrast microscopy will use NIOSH Analytical Method No. 7400. Samples analyzed by transmission electron microscopy will use either the AHERA methodology, 40 CFR Part 763, or Yamate Level Two.

C. Owner's Air Sampling During and After Abatement:

1. Air Sampling Table is to be used as a guide. The Owner's Industrial Hygienist/Environmental Consultant may modify criteria. Modifications to the Maximum Allowable Fiber Count shall be made in writing by the Owner.

Type of Sample	Average Samples per Eight-Hour Work Shift	Sample Volume—L (Liters)	Approximate Flow Rate	Maximum Allowable Fiber Count (f/cc)
HEPA Fan Exhaust	0 or selected units	400–2,000 L	2 to 10 LPM	0.01 f/cc
Outside of Work Area	0–5	400–2,000 L	2 to 10 LPM	0.01 f/cc or <pre-abatement
Clearance PCM	5 per work area	800–3,000 L	2 to 10 LPM	0.01 f/cc
Clearance TEM	5 per work area	1,200–1,800 L	2 to 10 LPM	<70 s/mm2 average

2. Air sampling for post-abatement work in isolated work areas will use the aggressive sampling method. Use of aggressive sampling in other areas shall be as directed by the Owner or Environmental Consultant. Aggressive sampling shall be conducted to assure that fibers remain airborne during sample collection.

3. Analysis of clearance samples shall be via both phase contrast microscopy (PCM) and transmission electron microscopy (TEM) as required to meet AHERA regulations.

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4. The Owner reserves the right to monitor Contractor's performance via air samples on abatement workers and in the work area in addition to the Contractor's air monitoring.

1.3. QUALITY ASSURANCE

A. If, at any time during the work, analysis of an air sample taken by the Contractor, Owner, or Owner's representative, indicates a fiber count in excess of the allowable maximums specified, the Industrial Hygienist who analyzed the air sample shall immediately notify:

1. The Contractor's Foreman

2. The Environmental Consultant

3. Project Manager and/or Project Superintendent

4. Other workers, employees, occupants, etc. in affected area(s).

B. Immediately upon being notified of fiber count exceeding the specified maximum allowable levels, the Contractor shall perform the following steps in the order presented, at no additional cost to the Owner:

1. Stop abatement work.

2. Identify source of high fiber counts.

3. Immediately correct any containment breaches, pressure differential changes, or other potential cause, and other concerns with the Environmental Consultant or Owner. The Environmental Consultant or Owner will determine the affected area and affected adjacent areas considered to be contaminated. The Environmental Consultant or Owner will determine the actions to be taken by the Contractor at no additional cost to the Owner.

a. Clean the affected area and the affected adjacent areas. Cleaning shall use wet methods and HEPA vacuuming.

b. Resample air until fiber counts are determined to be below one half of the specified maximum levels.

c. Secure and repair containment barriers, repair or add equipment.

d. Modify work procedures, and make other changes determined to be the possible cause of high fiber counts.

4. Complete every part of the “Fiber Count Above Control Limit Data Form” bound into these Specifications.

5. Carefully resume work under close air monitoring.

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6. The Contractor shall be responsible for costs of any testing, cleanup, repair, down time loss, etc. that is a result of the Contractor's negligence, poor maintenance of isolated areas or improper procedures.

PART 2 PRODUCTS

2.1. Not applicable.

PART 3 EXECUTION

3.1. Not applicable.

END OF SECTION

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SECTION 02 82 13: ASBESTOS ABATEMENT

PART 1 GENERAL

1.1. SCOPE

A. This section covers the removal, patching, encapsulation, repair, or enclosure of materials that contain or are suspected to contain asbestos.

B. Contractor shall provide all labor, materials, equipment, services, permits, and insurance required to complete asbestos abatement procedures as indicated in these Specifications, the drawings, or elsewhere in this bid package.

C. The quantities and locations of ACM indicated in this specification package are limited by the physical constraints imposed by occupancy and limited surveying of the building. Accordingly, minor variations of plus or minus 10% of the estimated quantities of ACM within the limits of containment for each abatement stage are considered as having no impact on contract price and time of this contract. Locations of ACM different than indicated on drawings, but within the limits of the containment, are considered as having no impact on contract price and time of this contract.

1.2. DEFINITIONS

A. Abatement: Procedures to control fiber release from asbestos-containing building materials, which include encapsulation, enclosure, removal, repair, and related activities.

B. Aggressive Sampling: Air sampling method that assures that asbestos fibers remain airborne during sampling. All surfaces inside the work area will be agitated by the liberal use of compressed air. Fans will then be run throughout the sampling period to keep all suspended fibers airborne.

C. AHERA: Asbestos Hazard Emergency Response Act, 40 CFR Part 763.

D. Air Lock: A system for permitting ingress or egress without permitting air movement between a contaminated area and an uncontaminated area, typically consisting of two curtained doorways at least three feet apart.

E. Air Monitoring: The process of measuring the asbestos fiber content of a specific volume of air in a stated period of time.

F. Amended Water: Water containing a surfactant additive.

G. Asbestos-containing Material (ACM): Any material containing more than 1% asbestos as defined under NESHAPS CFR 40, Part 61, OAR Chapter 340, Division 248, OR-OSHA 437, 1926.1101, and OSHA 29 CFR Part 1926.1101.

H. Authorized Visitor: The owner or designated representative, or a representative of any regulatory or other agency having jurisdiction over the project, and having required training, medical, fit test, etc.

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I. Certified Industrial Hygienist (CIH): An industrial hygienist certified in comprehensive practice by the American Board of Industrial Hygiene.

J. Construction, Manager/General Contractor (CMGC): A construction delivery method in which the construction manager acts as the general contractor with schedule and cost risk. The CMGC provides design phase assistance in evaluating costs, schedule, and implications of systems and materials during design.

K. Class I Asbestos Work: Activities involving the removal of TSI and surfacing ACM and PACM.

L. Class II Asbestos Work: Activities involving the removal of ACM, which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and mastics.

M. Clean Room: An uncontaminated area or room that is part of the worker decontamination enclosure system, with provisions for storing workers' street clothes and clean protective equipment.

N. Critical Barrier: Solid barrier constructed from minimum of 2- by 4-inch studs, 16-inch o.c.; ½-inch plywood or drywall sealed airtight and covered on both sides (where applicable) with two layers of 6-mil plastic.

O. Curtained Doorway: A device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms, typically constructed by placing three overlapping sheets of plastic over an existing or temporarily-framed doorway, securing each along the top of the doorway in a pleated fashion and securing one vertical side of each sheet on alternating sides of consecutive sheets. Two curtained doorways spaced a minimum of three feet apart to form an air lock.

P. Disposal: Procedures necessary to transport and deposit the asbestos-contaminated material in an approved waste disposal site in compliance with Environmental Protection Agency (EPA) and other applicable regulations.

Q. Enclosure: Procedures necessary to completely seal all asbestos-containing material behind airtight, impermeable, permanent barriers, including PVC jackets.

R. Encapsulant (Sealant): A liquid material that can be applied to asbestos-containing material and that controls the possible release of asbestos fibers from the material either by creating a membrane over the surface (bridging encapsulant), or by penetrating into the material and binding its components together (penetrating encapsulant).

S. Environmental Consultant: Environmental consultant specializing in asbestos abatement.

T. Equipment Room: A contaminated area or room, which is part of the worker decontamination enclosure system, with provisions for storage of contaminated clothing and equipment.

U. Fitting: With regard to pipe insulation, a fitting is any elbow, offset, reducer, tee, etc.

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V. Fixed Object: Fixtures that are attached to the building or too heavy or bulky to remove from the work area.

W. Glovebag: A manufactured device consisting of a transparent plastic bag with inward projecting sleeves, an internal tool pouch, provisions for fastening and sealing at the top and sides, and a receptacle in the bottom to hold asbestos waste. The glovebag is installed to surround the material to be removed and contain all fibers released during the process. Glovebags are used to remove insulation from small sections of pipe and fittings.

X. High Efficiency Particulate Air (HEPA) Filter: A HEPA (absolute) filter capable of trapping and retaining 99.97% of asbestos fibers greater than 0.3 microns in length.

Y. HEPA Vacuum Equipment: HEPA (absolute) filtered vacuuming equipment with a filter system capable of collecting and retaining asbestos fibers. Filters of 99.97% efficiency for retaining fibers of 0.3 microns in length or larger shall be installed for filtering discharge air.

Z. Independent Testing Laboratory: A laboratory financially independent from and hired by the owner, architect, or contractor that is either AIHA-accredited for asbestos with demonstrated proficiency via the AIHA PAT program or has analysts proficient in the AIHA AAR program for air sample analysis.

AA. Industrial Hygienist: An employee of the Independent Testing Laboratory who is experienced and trained in asbestos sampling and analysis as specified.

BB. Isolated Work Area: A totally contained area of the facility where abatement activities are performed.

CC. Movable Object: Furnishings not attached to the building structure that can be removed from the work area.

DD. Negative-air Glovebag: A manufactured device consisting of a transparent plastic bag with inward projecting sleeves, an internal tool pouch, provisions for fastening and sealing it at the top and sides, and a receptacle in the bottom to hold asbestos waste. The glovebag is installed to surround the material to be removed and contain all fibers released through the process, with provisions for allowing continuous airflow through the bag while maintaining negative pressure inside.

EE. Owner Representative: Designated by the Owner, and/or designated employee(s) of the Owner Representative.

FF. PACM: Presumed asbestos-containing materials.

GG. Pressure Differential Fan System: An air-purifying fan system located inside or outside the isolated work area that draws air out of the work area through a HEPA filter, keeping static air pressure in the work area lower than in adjacent areas, and preventing escape of contaminated air from work area to adjacent areas.

HH. Public Area: Any area outside the isolated work area. When work area isolation measures are removed, the work area becomes a public area.

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II. Removal: All operations where ACM and/or PACM are taken out or stripped from structures or substrates and include demolition activities.

JJ. Shower Room: A room between the clean room and the equipment room in the worker decontamination enclosure system that is equipped with soap, shampoo, and hot and cold running water controllable at the faucet, and suitably arranged for complete showering during decontamination. The shower room must be separated from the clean room and equipment room by air locks.

KK. Special Fitting: With regard to pipe insulation, a special fitting is any valve, union, strainer, thermometer, flange, etc.

LL. Surfactant: A chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.

MM. Tack Coat: A coat of penetrating encapsulant applied to all surfaces from which asbestos-containing materials have been removed.

NN. Thermal System Insulation (TSI): ACM applied to pipes, fittings, boilers, breeching, tanks, ducts, or other structural components to prevent heat loss or gain.

OO. Vacuum Loader Removal: Wetting and pneumatic conveying of loose material through a vacuum hose to a sealed collection tank specially equipped to prevent escape of fibers.

PP. Wet Cleaning: The process of eliminating asbestos from building surfaces and objects by using cloths, mops, or other cleaning tools that have been dampened with water.

QQ. Worker Decontamination Enclosure System: A showering facility for workers, typically consisting of a clean room, a shower room, and an equipment room. Each of these rooms is separated from the others by air locks. The equipment room is separated from the work area by a curtained doorway. The clean room is separated from the public area by a curtained doorway.

RR. Worksite Entry Logbook: A logbook kept in the clean room that must be signed by everyone entering or leaving the work area. All pages of the logbook must be the same as the sample page bound into these Specifications.

1.3. DOCUMENTS INCORPORATED BY REFERENCE

A. The current issue of each document shall govern. Where conflict among requirements or with these Specifications exists, the most stringent requirements shall apply.

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

2. US Environmental Protection Agency Office of Toxic Substances Guidance Document, "Guidance for Controlling Friable Asbestos-Containing Materials in Buildings." EPA Report Number 560/5-85-024 ("Purple Book").

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3. US Department of Labor Occupational Safety and Health Administration (OSHA):

    a. Title 29 Code of Federal Regulations Section 1910.1001—General Industry Standard for Asbestos.

    b. Title 29 Code of Federal Regulations Section 1910.134—General Industry Standard for Respiratory Protection.

    c. Title 29 Code of Federal Regulations Section 1910 et al.—Occupational Exposure to Asbestos; Final Rule.

    d. Title 29 Code of Federal Regulations 1926.1101—Construction Standard for Asbestos.

    e. Title 29 Code of Federal Regulations Section 1910.1020—Access to Employee Exposure and Medical Records.

    f. Title 29 Code of Federal Regulations Section 1910.1200—Hazard Communication.

4. National Institute for Occupational Safety and Health (NIOSH), 42 CFR, Part 84, Respiratory Protective Devices.

5. American National Standards Institute (ANSI) NY; ANSI Standard Z 88.2-1980 "American National Standards Practice for Respiratory Protection," latest edition.

6. Oregon Administrative Rules Chapter 340, Division 248, Department of Environmental Quality; Chapter 340, Division 33, Licensing and Certification Requirements.

7. Oregon Administrative Rules Chapter 437, Divisions 2 and 3.

8. Oregon Revised Statutes (ORS), Chapters 279C, Certified Asbestos Contractors and Prevailing Wage; 656, Workers Compensation; and 701, Construction Contractors and Contracts.

9. All related electrical work shall be performed in accordance with the National Electrical Code.

10. All local ordinances, regulations, or rules pertaining to asbestos, including its storage, transportation, and disposal.

1.4. SUBMITTALS AND NOTICES

A. Contractors shall submit copies of each submittal package as indicated below.

B. Contractors shall submit to the Owner and/or environmental consultant the following information prior to beginning work on the project:

1. CONTRACTOR'S LICENSE. Submit proof that the asbestos abatement contractor is currently and for the duration of the project licensed with the State of Oregon to

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perform asbestos abatement, per ORS Chapter 701, and OAR Chapter 340, Division 248.

2. ASBESTOS SUPERVISOR. Submit the name and resume of the assigned on-site foreman. At minimum, the foreman shall have successfully completed the Department of Environmental Quality (DEQ) asbestos supervisor course as approved by the State of Oregon. Other criteria such as references and similar projects will also be reviewed. At the Owner's or environmental consultant's request, the contractor shall arrange an oral interview with the assigned on-site foreman. The Owner, and the environmental consultant reserve the right to reject the foreman from the work at any time during the project. The contractor shall then assign another on-site foreman for the Owner, and/or environmental consultant's approval as described above.

3. INSURANCE CERTIFICATE. Submit a copy of the certificate of asbestos-specific liability insurance policy.

4. WORKER CERTIFICATION. Submit written proof indicating that all employees impacting asbestos-containing materials are State of Oregon certified asbestos workers. Proof shall include photocopies of certificates and a signature from the contractor's principal indicating that all employees assigned to this project have completed such a program.

5. RESPIRATOR PROGRAM. Submit written proof indicating respirator program is in compliance with all parts of OSHA Asbestos Regulations CFR Title 29, Part 1910.134 and 1926.1101, OR-OSHA Chapter 437, 1910.134 and 1926.1101.

6. MEDICAL PROGRAM. Submit written proof medical exam program is in compliance with OSHA Asbestos Regulations CFR Title 29, Section 1926.1101 and OR-OSHA Chapter 437, 1926.1101.

7. EMERGENCY PLANS. Submit a written emergency control and cleanup plan to be followed by the contractor in the event of an accidental breach in containment, power failure, and accidental disturbance of ACMs in non-isolated areas.

8. NOTIFICATION. Submit copy of written notification to DEQ of the proposed asbestos work not fewer than 10 days before work commences on this project.

9. DISPOSAL PLAN. Submit written proof that all required permits and arrangements regarding the transportation and disposal of asbestos-containing or contaminated materials, supplies, etc. have been obtained. The disposal site must be approved by the EPA and/or DEQ and other responsible agencies.

10. WORK PLAN. Submit a written work plan satisfactory to the Owner and/or environmental consultant describing the schedule for asbestos abatement, decontamination procedures, and plans for construction and location of decontamination enclosure systems, pressure differential exhaust fans, etc. in compliance with these Specifications and applicable regulations, including calculations for determining required number of negative-air filtration units. The plan shall schedule the systematic flow of work throughout the facility per Specifications on a

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day-by- day basis, outlining room-by-room, or area-by-area procedures and planned alternative control measures. The contractor shall keep close coordination of his work with the Owner and/or environmental consultant.

11. AIR MONITORING. Submit information pertaining to the proposed air monitoring program for this project, if appropriate. This information shall include the name(s) of the certified industrial hygienist appointed, the name of the on-site industrial hygiene technician working under his supervision, types of equipment, and sampling schedule, sampling procedures, calibration recordkeeping, and testing laboratory proposed.

12. PRODUCT INFORMATION. Submit complete product information for any materials and products for which the contractor requests approval for use on this job (other than those specified).

13. EMERGENCY PHONE NUMBER. Submit a local phone number at which the contractor or on-site foreman can be reached on a 24-hour basis during the course of the work.

C. The contractor shall not begin work until submittals are reviewed and accepted by the Owner and/or the environmental consultant. Allow a 10-day review period.

D. During the work, the contractor shall submit the following to the Owner and/or environmental consultant, on a periodic basis as agreed to by the Owner, environmental consultant, and the contractor:

1. Waste shipment and disposal documentation.

2. Air monitoring data.

3. Notification updates.

E. Contractor shall submit to the Owner and/or environmental consultant, in writing, all information required above regarding any new asbestos workers hired by, or subcontracted to, the contractor before these new asbestos abatement workers begin work.

F. Prior to removal of decontamination systems and isolation barriers, the contractor shall obtain specific written permission from the environmental consultant or Owner.

G. Prior to making final application for payment the contractor shall:

1. Complete all work under this contract.

2. Submit to the environmental consultant or Owner all required submittals, including all waste shipment records completely filled out and signed.

3. Submit to the owner all payroll reports for work on this contract and other information as described elsewhere in the Specifications, if appropriate, under the contract.

4. Submit to the environmental consultant or Owner as-abated drawings along with a signed affidavit stating that all ACMs have been removed as indicated on the drawings.

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H. See other sections of these Specifications, and EPA, OSHA, and other standards referenced therein, for further information and requirements not included above.

1.5. BUILDING PROTECTION

A. Building Security and Protection

1. The contractor shall post adequate warning signs at all potential entrances to work areas as required by the EPA and OSHA.

2. The contractor shall protect all existing fixed equipment, building finishes that are to remain, and existing systems and functions from damage during the abatement process. Extra precautions are to be taken in protecting existing electrical panels, light fixtures, etc. Any damage to existing building, services, and/or equipment shall be remedied by the contractor at their expense.

3. Contractor shall clean external surfaces of contaminated containers and equipment thoroughly by wet sponging and HEPA vacuum.

4. Contractor shall maintain access and use of existing fire lanes.

1.6. PERSONNEL PERSONAL PROTECTION

A. Training

1. Prior to commencement of work, contractor shall ensure that all workers have been trained as specified.

2. The contractor shall provide and post, in the clean room(s) and the equipment room(s), the decontamination, respirator, and work procedures to be followed by the workers.

3. For demolition of non-asbestos containing walls and ceilings in areas containing friable asbestos materials, the contractor has the option to train qualified demolition workers. Such training shall be the sole responsibility of the contractor and shall consist of a minimum of eight hours, unless applicable regulatory agencies accept a lesser amount of classroom time. Topics shall include the background of asbestos, health effects, personnel protection, use of worker decontamination and other topics. Training shall be acceptable to Oregon OSHA (OR-OSHA), DEQ, and other applicable agencies.

B. Personnel Personal Protective Equipment for Asbestos Removal

1. Work clothes shall consist of disposable full-body coveralls and head and foot covers (Tyvek or approved), boots, or sneakers. Eye, hearing, fall protection, and hard hats should be available as appropriate.

2. At minimum, respiratory protection shall be approved by National Institute for Occupational Safety and Health/Mine Safety and Health Administration (NIOSH/MSHA); US Department of Labor; US Department of Health, Education, and

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Welfare; Centers for Disease Control; and as listed below. Respiratory protection shall provide workers with a maximum calculated fiber level inside the mask of 0.01 f/cc.

a. Glovebag or modified glovebag: full-face mask, powered air-purifying respirator with disposable HEPA filter cartridges (magenta/purple color code). Protection factor: 100.

b. Demolition of walls and ceilings that may impact friable asbestos-containing material: half-face mask, negative-pressure respirator with disposable HEPA filter cartridges (magenta/purple color code). Protection factor: 10.

c. Pre-abatement work in close proximity to friable asbestos-containing materials: half-face mask, negative-pressure respirator with disposable HEPA filter cartridges (magenta/purple color code). Protection factor: 10.

d. Abatement in isolated areas: full-face mask, powered air-purifying respirator with disposable HEPA filter cartridges (magenta/purple color code). Protection factor: 100.

e. HEPA vacuuming and wet cleaning of surfaces: half-face mask, negative-pressure respirator with disposable HEPA filter cartridges (magenta/purple color code). Protection factor: 10.

f. Vinyl asbestos floor tile removal: half-face mask, negative-pressure respirator with disposable HEPA filter cartridges (magenta/purple color code). Protection factor: 10.

g. Handling of double-bagged asbestos-contaminated waste: half-face mask, negative-pressure respirator with disposable HEPA filter cartridges (magenta/purple color code). Protection factor: 10.

3. Additional respiratory protection shall be as required by CFR 29 1910.134 and 1926.1101, OR-OSHA Chapter 437, 1910.134 and 1926.1101.

4. As part of the contractor's respiratory protection program, all workers shall be provided with a selection of brands and sizes of respirators to choose from. At a minimum, all workers shall be qualitatively fit-tested at the time of respirator selection per OR-OSHA Worker's Compensation Department Rule 22-069 (4)(e)(5)(i), and semiannually thereafter.

5. Contractor shall supply replacement filter cartridges, as required. Cartridges that have become wet or clogged shall be replaced immediately.

C. Worker Decontamination Enclosure System

1. The contractor shall construct a personnel decontamination facility immediately outside of the isolated work area consisting of three chambers and two air locks as follows:

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a. The equipment room shall consist of an air lock to the shower room, and a curtained doorway to the work area.

b. The shower room shall have two air locks, one to the equipment room and one to the clean room. All showers shall have hot and cold water controllable at the taps and installed in this room. The contractor shall supply and maintain soap, shampoo, and towels at all times in the shower area. Shower wastewater shall be filtered to remove all fibers larger than five microns, or as required by local regulations, before disposal in the municipal sewer system, or shall be collected and disposed of as asbestos-contaminated material. Permits shall be obtained, and all water discharge regulations complied with, as required by local municipalities. Water filters shall be disposed of as asbestos-contaminated material.

c. The clean room shall consist of an air lock to the shower room and a curtained doorway to the adjacent building area. The clean room shall contain a first aid kit, a place to sit down, the worksite entry logbook, and storage for workers' and visitors' clothing and shoes. Work, respirator, and decontamination procedures; regulations; and prevailing wage rates shall be conspicuously posted. There shall be a supply of clean, protective clothing, and respirators and cartridges in the clean room at all times.

2. The contractor shall not begin asbestos abatement work unless this system is functional, in good repair, and has been found acceptable for specification compliance by the Environmental Consultant or Owner.

D. Personnel Protection Procedures in Isolated Work Areas

1. Each worker shall, upon entering the job site, remove street clothes in the clean change room, put on and fit-test his respirator, put on clean protective clothing, and sign in on the worksite entry logbook before entering the equipment room or the work area.

2. Workers shall, each time they leave the work area, remove gross contamination from clothing before leaving the work area; proceed to the equipment room and remove and dispose of disposable work clothes; remove and store shoes, boots, and other equipment except respirators; still wearing the respirator, proceed to the showers and clean the outside of the respirator with soap and water while showering; remove the respirator; thoroughly shampoo and wash themselves; remove filters, dispose of filters in the container provided for that purpose, and wash and rinse the inside of the respirator.

3. Following showering and drying off, each worker shall proceed directly to the clean change room and dress in clean clothes at the end of each day's work or before eating, smoking, or drinking. Before reentering the work area from the clean change room, each worker shall put on his respirator with clean filters, dress in clean protective clothing, and sign in on the worksite entry logbook.

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4. Contaminated work footwear and other equipment shall be stored in the equipment room when not in use in the work area. Upon completion of asbestos abatement, footwear shall be disposed of as contaminated waste or cleaned thoroughly inside and out, using soap and water, before removing from work area.

5. Workers shall not eat, drink, or chew gum at the worksite except in the established clean room. Smoking or using other tobacco products is prohibited.

6. Workers shall be fully protected with respirators and protective clothing immediately prior to the first disturbance of asbestos-containing or contaminated material and until final cleanup is completed.

E. Access to Isolated Work Area by Others

1. Except for emergency personnel, the contractor shall limit access to the work area to authorized visitors.

2. The contractor shall provide protective clothing, respirators, and equipment for all authorized visitors, as specified above.

3. All authorized visitors shall be subject to the personnel protection provisions specified above and shall sign in and out on the worksite entry logbook.

F. Personnel Personal Protection during Work in Non-Isolated Work Areas:

1. Work clothes per Section 1.6 B.

2. Respiratory protection per Section 1.6 B.

3. Worker protection procedures will differ from Section 1.6 D, in that two layers of coveralls shall be worn after removal of street clothes. Worker decontamination through a worker decontamination enclosure is required. The first layer of coveralls must be removed when exiting the glovebag work area. The worker shall immediately proceed to the worker decontamination unit. The remaining requirements of Section 1.6 D still apply.

4. Contractor shall submit to the architect and environmental consultant for approval an emergency control and cleanup plan to be followed in the event of asbestos contamination during glovebag use. Contractor shall ensure all workers are thoroughly familiar with approved plan.

5. Contractor shall promptly remove all bags as they are used to the bag-holding and decontamination enclosure system.

G. Emergency Precautions

1. The contractor shall establish emergency and fire exits from the work area. Contractor shall ensure these exits are well marked and remain unobstructed.

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2. The contractor shall be prepared to administer first aid to injured personnel after decontamination. Seriously injured personnel shall be treated immediately or evacuated without delay for decontamination.

3. The contractor shall notify the local fire department of the asbestos abatement project prior to beginning work area preparation.

1.7. SAFETY

With regard to the work of this contract, the safety of the contractor's employees, the owner's employees, and the public is the sole responsibility of the contractor.

1.8. LIABILITY

The contractor is an independent contractor and not an employee of the Owner or the environmental consultant. The Owner, and environmental consultant shall have no liability to the contractor, or any third persons, for the contractor's failure to faithfully perform and follow the provisions of these Specifications and the requirements of the governing agencies. Notwithstanding the failure of the Owner, or the environmental consultant to discover a violation by the contractor of any of the provisions of these Specifications, or to require the contractor to fully perform and follow any of them, shall not constitute a waiver of any of the requirements of these Specifications, which shall remain fully binding upon the contractor.

1.9. DELIVERY

The contractor shall deliver all materials to the worksite in the original packages, containers or bundles bearing the name of the manufacturer and the brand name.

1.10. STORAGE

The contractor shall store all materials subject to damage off the ground, away from wet or damp surfaces, away from heat sources, and under cover sufficient to prevent damage, contamination, or fire.

1.11. PROTECTION

Damaged or deteriorating materials shall not be used and shall be removed from the premises by the contractor. Materials that become contaminated with asbestos shall be disposed of in accordance with the applicable regulations by the contractor.

1.12. SUBCONTRACTORS

Any subcontractors employed by the contractor shall be bound to all the work and safety standards specified elsewhere in this Specification. Subcontractor's personnel shall be fully trained and supervised by the contractor during performance of this work.

PART 2 PRODUCTS

2.1. MATERIALS

A. Plastic Sheet: Plastic sheet shall be flame-retardant polyethylene material sized in lengths and widths to minimize the frequency of joints. The minimum thickness shall be 6-mil.

B. Plastic Bags: Plastic bags shall be 6-mil polyethylene printed with warning labels per OSHA and EPA regulations.

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C. Tape: Tape shall be capable of sealing joints of adjacent sheets of plastic; attaching plastic sheet to finished or unfinished surfaces of dissimilar materials; and adhering under dry and wet conditions, including use of amended water. Minimum of 2-inch-wide tape must be used.

D. Disposal Containers: Disposal containers shall be suitable to receive and retain any asbestos-containing or contaminated materials until disposal at an approved site. The containers shall be labeled in accordance with OSHA and EPA regulations. Containers must be both airtight and watertight, and have hard top, bottom, and sides.

E. Warning Labels and Signs: Warning labels and signs shall be posted as required by OR-OSHA, Oregon Department of Transportation, and DEQ regulations.

F. Amended Water: Clean potable water containing a surfactant additive. The surfactant additive shall be 50% polyoxyethylene ether and 50% polyethylene ester, or equivalent, and shall be mixed with water at a concentration of one-ounce surfactant to five gallons of water, or as recommended by the manufacturer in the case of an equivalent.

G. Encapsulants (Sealants): Encapsulants shall be of the bridging or penetrating variety and shall be listed as "satisfactory" by the EPA. Encapsulants shall provide a suitable substrate bonding agent for application of new material where appropriate. Penetrating Encapsulant: No. 207 Special Sealer #33775-27A as manufactured by Makus-Cincinnatus, Inc.; "Asbestop 30B-2" as manufactured by Asbesco Corp.; "Cable Coating 22-P" as manufactured by American Coatings Corp. or approved. Bridging Encapsulant: Decadex Firecheck, manufacturer's standard color "Magnolia," as manufactured by Pentagon Plastics, Inc.; "Cable Coating 2-B," manufacturer's standard color gray, as manufactured by American Coatings Corp.; or approved.

H. Rewettable Lagging Cloth: Twelve-ounce glass fabric lagging cloth saturated with dried lagging adhesive. "Dip-Lag" as manufactured by Claremont Co. or approved.

I. Enclosure: Protective plastic jacketing systems, framed gypsum board enclosures, suspended ceilings or other materials as specified elsewhere.

J. Other Materials: Provide all other materials such as lumber, nails, and hardware, which may be required to construct and dismantle the decontamination area, and the barriers that isolate the work area, and as required to complete the work, as specified.

2.2. TOOLS AND EQUIPMENT

A. Water Sprayer: The water sprayer shall be an airless or other low-pressure sprayer for amended water application.

B. Air-Purifying Equipment: Air-purifying equipment shall consist of HEPA filtration systems. No air movement system or air equipment shall discharge asbestos fibers outside the work area. Each unit shall be capable of variable volume from a minimum of 500 cubic feet per minute (CFM) to at least 1700 CFM under load and shall have at least two stages of pre-filtration ahead of the HEPA final filter. Each unit shall be overload protected and equipped with an elapsed time indicator (hour meter), static pressure gauge with low flow alarm, and heat and

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smoke sensors that visually and audibly warn workers and shut unit fan down within 30 seconds. The units shall be: Micro-Trap Portable Air Filtration System manufactured by Asbestos Control Technology, Inc., "HOG 2000" Negative-air Protection System manufactured by Control Resource Systems or approved.

C. Pressure Differential Monitoring Equipment: A combination sensing, alarm, and recording device shall be in operation at all times during use of the HEPA air-purifying equipment. The unit shall be a "Neg-A-Master," manufactured by Control Resource Systems, Inc., or approved.

D. Water-purifying Equipment: Water-purifying equipment shall be capable of removing all fibers longer than five microns, or as required by local regulations, from water used in abatement work and decontamination showers. Control Resource Systems, Inc. "AQUA-HOG" or approved.

E. Airless Sprayer: An airless sprayer, suitable for application of penetrating encapsulant material, shall be used.

F. Vacuum Equipment: All vacuum equipment used in the work area shall be HEPA equipment, and suitable for wet/dry usage.

G. Scaffolding: Scaffolding, as required to accomplish the specified work, shall meet all applicable safety regulations. All special scaffolding shall have drawings and calculations stamped and signed by a civil or structural engineer registered with the State of Oregon.

H. Transportation Equipment: Transportation equipment, as required, shall be suitable for loading, temporary storage, transit, and unloading of contaminated waste without exposure to persons or property. Equipment shall have a hard top, bottom, and sides. If equipment is rented, notify rental agency in advance, in writing, of intended use of equipment.

I. Electrical: Electrical tools, equipment, and lighting shall meet all applicable codes and regulations. Ground fault protection as required by OSHA, shall be in effect at all times. The contractor shall take all additional precautions and measures necessary to ensure a safe working environment during wet removal.

J. Glovebags: Bags shall be clean poly bags seamless at the bottom, with pre-printed asbestos warning labels, 6-mil PVC with attached TYVEK arms, and latex gloves. Bags shall be Profo' Bag manufactured by Asbestos Control Technology, Inc., or Asbest'O'Saf/SAC by Control Resource Systems, Inc., or approved.

K. Remote Filter Housing: Stainless steel housing shall have pre-filters and HEPA filter sealed to cabinet flanges by Century Equipment "Advance Guard II" or approved equal.

L. Other Tools and Equipment: Other suitable tools shall be provided for the removal, enclosure, encapsulation, patching, and disposal activities including, but not limited to, hand-held scrapers, wire brushes, sponges, and rounded-edge shovels.

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PART 3 EXECUTION

3.1. FULL ISOLATION WORK AREA PREPARATION

A. Contractor shall perform the following isolation procedures in the order in which they are presented. Any alternative control measures considered for Class I work shall be performed in accordance with 29 CFR 1926.1101.

1. Shut down, remove filters, and isolate HVAC systems to prevent contamination and fiber dispersal. Coordinate with building users and CMGC prior to shutdown.

2. Coordinate all electrical, safety, and other service connections, requirements, and equipment with the CMGC. Use a journeyman electrician at a minimum. It is the Contractor's responsibility to verify operation of systems that will be shut off during abatement. If any system is found to be defective or not operating satisfactorily, the contractor shall notify the CMGC or environmental consultant in writing prior to shutoff.

3. Install critical barriers as follows: seal off all openings including, but not limited to, doorways, windows, and other penetrations of the work area with solid critical barriers except openings left for HEPA air-purification system, which shall be properly HEPA-filtered. Where doors exist, sealing may be done by closing door, sealing with tape on both sides, and then covering both sides with two layers of plastic sheeting.

4. Pre-clean movable objects, such as furniture and equipment to be removed (and carpeting), within the proposed work areas using HEPA-filtered vacuum equipment and/or wet cleaning methods as appropriate and remove such objects from work areas to a temporary location or consolidate such objects away from removal work and enclose with critical barriers.

5. Pre-clean fixed objects within the proposed work areas using HEPA-filtered vacuum equipment and/or wet cleaning methods as appropriate and enclose with critical barriers. Equipment that must continue operating shall be enclosed and ventilated to avoid damage.

6. Set up the worker decontamination enclosure system (decon). Once this system is installed and abatement commences, it shall be used in the specified manner for the ingress and egress of all personnel and equipment, except in emergency situations. All personnel shall sign the worksite entry logbook each time they pass in or out of the decontamination enclosure.

7. Install HEPA air-purifying equipment pressure differential fan system so as to ensure lower static pressure in the isolated work area than in surrounding areas, a flow of air through all parts of the isolated work area towards the air-purifying equipment, and minimum air contamination levels at abatement worker breathing zones. Discharge from air-purifying equipment shall be ducted outside the building. Use one or more units of capacity as recommended by the manufacturer for the volume of the isolated work area, but in no case shall airflow be less than six air changes every 60 minutes

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with a minimum pressure differential of 0.02 inches wg between the work area and the decon clean room.

8. Cover floor and wall surfaces with plastic sheeting sealed with tape. Cover floors first so that plastic extends at least 12 inches up on walls, then cover walls with plastic sheeting to overlap floor plastic by a minimum of 24 inches, thus overlapping the horizontal floor material by a minimum of 12 inches. Install additional layer of plastic sheeting on floor and walls in similar manner. The contractor may use mechanical fastening techniques, such as tack strips, as necessary to secure wall plastic sheeting. The contractor shall repair any damage resulting from mechanical fasteners.

9. Maintain emergency and fire exits from the work areas, or establish alternative exits satisfactory to the local building or fire department officials. Ensure that all exits remain unobstructed and well marked.

10. Adequate portable fire extinguishing equipment shall be maintained within work area as defined by OSHA and/or local fire department officials.

B. No asbestos abatement work shall occur unless the work area isolation has been found acceptable for Specification compliance by the environmental consultant or Owner.

C. Isolated work area enclosure system maintenance. The contractor shall be responsible for daily documentation of the following:

1. Prior to the first use, and at the beginning of each shift during abatement work, containments shall be given a complete visual inspection by the contractor's shift foreman and industrial hygienist. Inspection shall include the HEPA air-purification system and associated filters. A smoke tube test by the shift foreman shall then be made of the worker decontamination enclosure system and other critical areas to verify that the isolated area is under negative air pressure. Work shall not begin until all defects have been repaired.

2. Periodic inspections shall be made, as required, during each shift to assure continued proper functioning of the containment and HEPA system.

3.2. NON-ISOLATED WORK AREA PREPARATION

A. The contractor shall perform the following procedures in the order in which they are presented and describe procedures for glovebag work and other work in non-isolated work areas. Any alternative control measures considered for Class II work shall be performed in accordance with 29 CFR 1926.1101.

1. Shut down HVAC systems. Coordinate with building users and the CMGC prior to shutdown.

2. Restrict access to work area and post warning signs. Do not perform glovebag work or any abatement work in an occupied area.

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3. Completely pre-clean entire work area using HEPA vacuum equipment or wet cleaning methods.

4. Set up the worker decontamination enclosure system. Once this system is installed and abatement commences, it shall be used in the specified manner for the ingress and egress of all personnel, except in emergency situations. All personnel shall sign the worksite entry logbook each time they pass in or out of the decontamination enclosure.

5. At the direction of the environmental consultant or Owner, install HEPA exhaust fan in work area. Duct fan intake to immediate area of work in such a manner that any fibers released will be drawn away from the worker and into intake duct.

6. Cover floor and other surfaces below work area with 6-mil plastic sheeting. Seal openings and install curtained doorways and air locks as directed by the environmental consultant or Owner.

7. Have emergency cleanup equipment and supplies, including HEPA vacuum, amended water, disposal bags, mop, buckets, towels, and sponges on hand prior to start of abatement work.

B. No asbestos abatement work shall occur unless the work area has been found acceptable for Specification compliance by the environmental consultant or industrial hygiene technician.

3.3. REMOVAL OF ASBESTOS-CONTAINING MATERIALS IN FULL ISOLATION WORK AREAS

A. The contractor shall isolate work area as specified.

B. The contractor shall remove all asbestos-containing pipe insulation, surfacing material, and other asbestos-containing materials as defined in the project-specific scope of work.

1. The contractor shall spray the asbestos material with amended water. A fine spray of this solution shall be applied to prevent fiber disturbance preceding the removal of the asbestos material. The asbestos shall be sufficiently saturated to prevent emission of airborne fibers in excess of specified fiber levels.

2. The contractor shall remove asbestos material while damp and pack it in sealable plastic bags (6-mil minimum thickness). Bags shall be moved to bag load out facility or equipment room in the worker decontamination system. Outside surface shall be washed and placed inside a second plastic bag (6-mil minimum thickness) bearing DEQ warning label, name of waste generator, and location from which waste was generated.

3. After completion of stripping work, the contractor shall clean all surfaces from which asbestos has been removed by brushing and/or wet sponging or cleaning by an equivalent method to remove all visible material. During this work the surfaces being cleaned shall be kept wet. Avoid using wire brushes if possible.

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4. The contractor shall collect all water used in the removal and cleaning process and dispose of as contaminated waste or filter to remove all fibers more than five microns in length before disposal in the municipal sewer system, or as required by local regulations. Water filters shall be disposed of as asbestos-contaminated material.

C. Removal of non-friable materials, such as floor tiles, shall be accomplished by such manner as to minimize breakage and maintain non-friability. Do not drop, throw, saw, or scrape non-friable materials during removal, handling, or disposal. The use of spud bars to remove floor tiles is an acceptable practice.

D. The contractor shall maintain a safe and uncluttered work area, worker decontamination system, and bag load out facility on a daily basis.

3.4. REMOVAL OF ASBESTOS-CONTAINING MATERIALS IN NON-ISOLATED AREAS

A. The contractor shall apply spray coat of amended water to material to be removed; material shall be kept damp during entire removal process.

B. Glovebag work shall be as follows. All removal using the glovebag method shall be performed strictly according to regulations, manufacturer's printed instructions, and as demonstrated by the manufacturer's representative or as further specified in this section. Workers are not to smoke or wear hand or wrist jewelry while using glovebags.

1. The contractor shall coordinate the shutoff of all sources of heat to objects to be worked on. Do no work on objects above 150 degrees Fahrenheit (°F).

2. The contractor shall install port for hose of HEPA vacuum to create reduced pressure inside glovebag. Installing of fresh air intake and/or bridging to prevent collapse of bag are acceptable. Reduced pressure shall be maintained throughout entire abatement procedure.

3. During the removal phase, the contractor shall use amended water to reduce potential for airborne fibers.

4. After completion of insulation removal and cleaning, but prior to removal of glovebag, the contractor shall apply a single "tack" coat of penetrating encapsulant to surface of pipe and any remaining non-asbestos insulation, within the glovebag.

5. After the pipe has been sealed, but prior to removal of glovebag, the contractor shall thoroughly wash the upper chamber of the glovebag and seal the contents of the bag in the lower chamber.

6. The contractor shall seal flap if used and, using a HEPA vacuum, remove all contaminated air in the upper chamber.

7. The contractor shall follow procedures set forth in Section 02 82 13.11 in case of a spill or if air analysis indicates a fiber count in excess of limits.

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8. The contractor shall promptly double-bag the glovebag after removal is complete, place it into a sealed container, and remove to the bag holding enclosure.

9. The contractor shall cover ends of remaining existing insulation with rewettable lagging cloth. Lagging cloth shall be extended a minimum of 6 inches back along existing insulation.

C. Wrap and cut method shall be as follows: at intervals determined by the contractor, glovebag-remove 2 to 3 feet of asbestos-containing pipe insulation as specified. Seal remaining pipe, with asbestos-containing pipe insulation intact, in two separate layers of 6-mil plastic sheeting. Cut pipe wrap sections at ends taking care to not damage adjacent wrapped or unwrapped insulated sections. Label double-wrapped pipe as specified for disposal. Obtain approval of landfill prior to utilizing this method. Dispose as contaminated waste in accordance with Specifications and approved landfill requirements.

D. Removal of cement asbestos board and similar material shall be as follows: material shall be removed one sheet or piece at a time. Material shall be kept continuously wet. Cut or remove fasteners one at a time while running HEPA vacuum at the point where work is being done so as to collect all dislodged particles and fibers.

1. When all fasteners have been removed, carefully remove entire sheet or piece and wrap in 6-mil plastic sheeting while still wet. Do not drop, throw, break, saw, or scrape cement asbestos board during removal, handling, or disposal.

2. Label, transport, and dispose of wrapped sheets as specified in the Disposal section.

3. Clean entire substrate with HEPA vacuum or wet cleaning methods and leave ready for application of replacement material.

3.5. CLEANUP IN FULL ISOLATION WORK AREAS

A. At the conclusion of removal in the isolated work area, conduct cleanup in the sequence described below. Windows, doors, HVAC vents, etc. shall remain sealed and HEPA-filtered pressure differential fan systems shall remain in service.

1. REMOVE MATERIAL AND EQUIPMENT. The contractor shall remove visible accumulations of material and debris (including filters removed from HVAC equipment and HEPA air-purification equipment). Contractor shall include all sealed containers and equipment used in the work area in the cleanup and remove them from the work area after decontamination of outer surfaces.

2. FIRST CLEAN. The contractor shall clean all surfaces in the work area and any other contaminated areas with water and/or HEPA-filtered vacuum equipment.

3. WAIT 24 HOURS. After the first cleaning of the work area, wait 24 hours to allow for settlement of dust. During this settling period, no entry to the work area shall be allowed.

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

4. SECOND CLEAN. Wet-clean or clean with HEPA-filtered vacuum equipment all surfaces in the work area. After completion of the second cleaning operation, perform a complete visual inspection of the work area to ensure that the work area is free of visible debris.

5. VISUAL INSPECTION. Prior to application of post-removal encapsulant, contact the environmental consultant for a visual observation of the work area. The work area shall be free of visible debris. Observation by the consultant does not alleviate the contractor of responsibility to provide work in compliance with the Specifications. The contractor shall contact the environmental consultant at least 24 hours prior to desired inspection time.

6. REMOVE PLASTIC SHEETING. After visual observation by the consultant, the contractor shall apply a coat of approved encapsulant to all surfaces in the work area where asbestos has been removed and to disposable plastic sheeting as a post-removal encapsulant. Encapsulant application shall follow all applicable manufacturer recommendations and shall provide a compatible bonding agent for application of new material.

7. FINAL CLEAN. After the encapsulation is complete, the contractor shall remove all noncritical plastic and clean all floors, walls, fixtures, and other surfaces within the work area with only critical barriers in place using wet methods or HEPA-filtered vacuum equipment. Plastic sheeting over carpets may remain in place.

8. CONTACT ENVIRONMENTAL CONSULTANT. The environmental consultant shall be contacted for a visual observation of the work area. The work area shall be free of visible debris. Observation by the consultant does not alleviate the contractor of responsibility to provide work in compliance with the Specifications. The contractor shall contact the environmental consultant at least 24 hours prior to desired inspection time. The consultant shall conduct final air monitoring as specified after work area has been allowed sufficient time to dry.

9. TEARDOWN. When the final observation by the environmental consultant and air sampling test results are satisfactory, the contractor shall then remove the decontamination systems and remaining barriers.

10. DISPOSAL. The contractor shall properly dispose of all waste materials. All polyethylene material, tape, cleaning material, and contaminated clothing shall be double-bagged, sealed, and labeled as described above for asbestos waste material.

3.6. CLEANUP IN NON-ISOLATED WORK AREAS

A. FIRST CLEAN. The contractor shall remove visible accumulations of asbestos material and debris. All surfaces shall be cleaned within the affected work area. Cleaning shall be with amended water and/or HEPA-filtered vacuum equipment. In a large open area, the affected work area shall include the immediate work area and an area that encompasses at least 6 feet in all directions or as defined by the environmental consultant. In small work areas, the affected work area shall include the entire room.

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B. AFFECTED AREA. The affected work area may be further defined in the scope of work by the environmental consultant. During the work, high fiber levels, as indicated by air monitoring results, may increase the area to be cleaned. The increase in the affected area due to high fiber levels or other indications of fiber dispersal will be defined by the environmental consultant, and the contractor shall bear all costs of additional cleaning.

C. VISUAL INSPECTION. After completion of the cleaning operation, the environmental consultant shall perform a visual observation of the affected work area to ensure that the affected work area is free of visible dust and debris. Observation by the consultant does not alleviate the contractor of responsibility to provide work in compliance with the Specifications. The contractor shall contact the environmental consultant at least 24 hours prior to desired inspection time.

D. ENCAPSULANT. After visual observation by the environmental consultant, the contractor shall spray-apply encapsulant to the material substrate, all temporary plastic sheeting, and other temporary protective materials.

E. CLEARANCE SAMPLING. Post-abatement air sampling shall be at the discretion of the environmental consultant and will be determined by the ongoing sample results.

F. TEARDOWN. When the final observation by the environmental consultant and air sampling test results (if required) are satisfactory, the temporary plastic sheeting and other temporary protective materials shall be removed by the contractor.

G. DISPOSAL. The contractor shall properly dispose of all waste materials, all polyethylene material, tape, and cleaning material, and contaminated clothing shall be double-bagged, sealed, and labeled as described for asbestos waste material.

3.7. RE-ESTABLISHMENT OF OBJECTS AND SYSTEMS

A. When cleanup is complete, the contractor shall:

1. Relocate objects moved to temporary locations in the course of the work to their former positions. Coordinate with the Owner.

2. Clean, repair and/or repaint all surfaces soiled, discolored, or damaged by removal of tape, adhesive, or other work of this contract to match existing surfaces. The contractor shall bear all costs associated with damage incurred during the abatement, which includes, but is not limited to, perimeter plaster walls, wall murals, windows, and mullions

3. If the contractor uses caulking to seal cracks in concrete floor, the caulking must be removed to the architect’s satisfaction at completion of project.

4. Return mechanical, electrical, and other systems shut down by the contractor to complete and functional operation.

5. Re-secure objects removed in the course of work in their former positions, including air dampers in plenums, and adjust for proper operation.

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6. Clean, repair and/or repaint all surfaces soiled, discolored, or damaged by removal of tape, adhesive, or other work of this contract to match adjacent surfaces.

3.8. DISPOSAL

A. The contractor shall affix warning labels having waterproof print and permanent adhesive to the lid and sides of all containers. Warning labels shall be conspicuous and legible, and contain the following words:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD
AVOID BREATHING AIRBORNE ASBESTOS FIBERS

B. The contractor shall determine current waste handling, transportation, and disposal regulations for the work site and for each waste disposal landfill. The contractor must comply with these regulations and all US Department of Transportation, DEQ, and EPA requirements. Double-bagged material in containers shall be delivered to the pre-designated disposal site for burial. Labels and all necessary signs shall be in accordance with DEQ and OSHA standards.

C. The contractor shall remove decontaminated containers from the site as soon as possible and notify the disposal site in advance of material delivery to assure immediate burial of containers.

D. If the bags are broken or damaged, or the container is contaminated, the contractor shall clean and decontaminate the entire container for reuse.

E. The contractor shall submit written proof of disposal at approved disposal site to the environmental consultant or Owner prior to completion of the abatement work specified in this section. The contractor shall use copies of the DEQ Waste Shipment Record ASN-4, completely filled out and signed, and accompanied by tickets and/or receipts from disposal site.

END OF SECTION

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

ATTACHMENT 5

July 25, 2022

Geoffrey Bonney
Marion County Facilities and Construction Management
100 High Street NE
Salem, Oregon 97301

Via email: GBonney@co.marion.or.us

Regarding: Limited Lead Sampling Report
1234 Commercial Street SE
Salem, Oregon 97301
PBS Project Number 23791.014

Dear Mr. Bonney:

On July 12, 2022, PBS Engineering and Environmental Inc. (PBS) completed sampling for lead in paint at the commercial building located at 1234 Commercial Street SE in Salem, Oregon. The sampling focused on interior building components likely to be impacted by planned improvements to the building.

Seven paint chip samples were collected and submitted under chain of custody to RJ Lee Group of Monroeville, Pennsylvania, for analysis of lead content via flame atomic absorption (FLAA).

The concentration of lead in the samples ranged from below the method limit of detection up to 2,800 parts per million (ppm). As such, lead-safe engineering controls, work practices, and worker protection protocols should be followed when completing any other work that will impact painted surfaces.

Please see the attached PBS lead sample inventory for additional details.

LEAD-CONTAINING PAINT REGULATIONS

The Consumer Product Safety Commission has set a limit for lead in consumer paint products of 0.009% or 90 ppm or greater. The Department of Housing and Urban Development (HUD) and the EPA define lead-based paint as that which contains 0.5% or 5,000 ppm. Under OSHA, any lead concentration in paint that may become airborne during construction operations triggers requirements in the OSHA Lead in Construction Standard 29 CFR 1926.62 to protect employees impacting the paint.

In 1993, Oregon OSHA adopted the federal OSHA Lead Standard for the Construction Industry Title 29 CFR 1926.62 under Oregon Administrative Rule 437 Division 3 1926.62. This standard outlines worker exposure limits, personal protection requirements, and employer responsibility for exposure assessment, training, housekeeping, and recordkeeping. OSHA's lead standard applies to all work where employees may be exposed to lead in

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

construction, alteration, or repair activities. This includes demolition or renovation of structures where lead-containing materials are present.

Disposal

According to DEQ's *Hazardous Waste/Toxics Reduction Policy Clarification*, disposal of building demolition waste coated with lead-based paint generally will not require a hazardous waste determination (i.e., Toxicity Characteristic Leaching Procedures [TCLP] testing) if demolition debris is disposed of at a DEQ-permitted solid waste landfill that meets the current design standards for municipal solid waste disposal facilities specified in 40 CFR Part 258.

Refer to the DEQ hazardous waste reduction policy and follow all requirements under the DEQ, Management of Building Demolition Waste, 97-002A for proper disposal of demolition waste containing lead paint.

LIMITATIONS OF SCOPE

This study was limited to the tests and locations as indicated above. The site as a whole may have other environmental concerns that will not be characterized by this study. The findings and conclusions of this work are not scientific certainties but probabilities based on professional judgment concerning the significance of the data gathered during the course of this investigation.

The lead sampling and analysis completed as part of this survey is for hazard identification and communication purposes only. The sampling was limited in scope and was not intended to be an exhaustive investigation of lead-containing paint on all building surfaces nor a lead hazard assessment.

Please feel free to contact me at 503.515.4726 or dale.voeller@pbsusa.com with any questions or comments.

Sincerely,

Dale Voeller, CHMM, CSP
Senior Project Manager

Attachments: Lead Sample Inventories and Laboratory Analysis

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

Code	Material	Analysis	Location	Lab
PAINT				
LB23791.014-1001	Paint	51.2 ppm	Front reception; wall, gypsum, white, good condition	R.J. Lee Group
LB23791.014-1002	Paint	2,800 ppm	Front reception entryway; door frame, wood, brown, good condition	R.J. Lee Group
LB23791.014-1003	Paint	61.0 ppm	Break room; current, wall, gypsum, white, good condition	R.J. Lee Group
LB23791.014-1004	Paint	<12.3 ppm	Room 20; wall, gypsum, white, good condition	R.J. Lee Group
LB23791.014-1005	Paint	<12.4 ppm	Nurses station across from 21; wall, gypsum, white, good condition	R.J. Lee Group
LB23791.014-1006	Paint	<40.5 ppm	Future break room; wall, gypsum, white, good condition	R.J. Lee Group
LB23791.014-1007	Paint	<15.7 ppm	Main entry near restroom; wall, gypsum, white, good condition	R.J. Lee Group

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

RJ LEE GROUP

RJ Lee Group, Inc.
350 Hochberg Road, Monroeville, PA 15146
Tel: (724) 325-1776 | Fax: (724) 733-1799

LABORATORY REPORT

PBS Engineering & Environmental
4412 South Corbett Ave
Portland, OR 97239

Attn: Alex Johnson
Phone: 503-248-1939

Email: alex.johnson@pbsusa.com

RJ Lee Group Job No.: PA130720220012
Samples Received: July 13, 2022
Report Date: July 20, 2022
Client Project: 23791.014 Phase 0001
Purchase Order No.: N/A
Matrix: Solid
Prep/Analysis: EPA 3050B / EPA 6010C-Paint

Client Sample ID	RJ Lee Group ID	Sampling Date	Analyte	Sample Concentration		Minimum Reporting Limit		Analysis Date	Q
				Weight Percent (%)	Parts per Million (PPM) - mg/kg	Weight Percent (%)	Parts per Million (PPM) - mg/kg		
LB23791.014-1001	PA130720220012-001	NP	Lead	0.00512	51.2	0.00227	22.7	7/14/2022	A
LB23791.014-1002	PA130720220012-002	NP	Lead	0.280	2800	0.0123	123	7/15/2022	A
LB23791.014-1003	PA130720220012-003	NP	Lead	0.00610	61.0	0.00128	12.8	7/14/2022	A
LB23791.014-1004	PA130720220012-004	NP	Lead	< 0.00123	< 12.3	0.00123	12.3	7/14/2022	A
LB23791.014-1005	PA130720220012-005	NP	Lead	< 0.00124	< 12.4	0.00124	12.4	7/14/2022	A
LB23791.014-1006	PA130720220012-006	NP	Lead	< 0.00405	< 40.5	0.00405	40.5	7/14/2022	A
LB23791.014-1007	PA130720220012-007	NP	Lead	< 0.00157	< 15.7	0.00157	15.7	7/14/2022	A

Comments:

Report Qualifiers (Q):

P *: PA-DEP Accredited (PA DEP Lab ID 02-00396, NELAP)*
N *: NY ELAP Accredited (NY ELAP Lab Code 10884)*

A *: AIHA LAP, LLC Accredited (Lab ID 100364)*
— : Test (analyte-matrix-preparation-analysis) is performed under RJLG's General Quality System requirements and is not part of any of the above scopes of accreditations

E = Value above highest calibration standard
J = Value below lowest calibration standard but above MDL (Method Detection Limit)
L = LCS (Laboratory Control Standard)/SRM (Standard Reference Material) recovery outside accepted recovery limits
H = Holding times for preparation or analysis exceeded

B = Analyte detected in the associated Method Blank
S = Spike Recovery outside accepted limits
R = RPD (relative percent difference) outside accepted limits
D = RL (reporting limit verification) outside accepted limits
NP = Not Provided

These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified in writing to return the samples covered by this report, RJ Lee Group will store the samples for a period of thirty (30) days before discarding. A shipping and handling fee will be assessed for the return of any samples.
This laboratory operates in accord with ISO 17025:2017 guidelines, and holds a limited scope of accreditations under different accrediting agencies; refer to http://www.rjlg.com/about-us/accreditations/ for more information and current status. Unless it is specifically stated otherwise (under the Q column using the appropriate accrediting agency qualifier(s)) the work contained in this report is performed under RJLG's General Quality System requirements and is not part of any scope of accreditations. This report may not be used to claim product endorsement by any laboratory accrediting agency. The results contained in this report relate only to the items tested or to the sample(s) as received by the laboratory. Any reproduction of this document must be in full for the report to be valid.

Unless otherwise noted (either in the comments section of the report and/or with the appropiate qualifiers under the report qualifiers (Q) column) the following apply: (a) Samples were received in good condition, (b) All QC samples are within acceptable established limits, (c) All samples designated as NELAP meet the requirements of the NELAC standard; if not applicable qualifiers will be used to designate the non-compliance and (d) Results have not been blank corrected. Quality Control data is available upon request.

Erin Repine
Scientist

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PBS

PA 13072022001Z

TRANSMITTAL AND CHAIN OF CUSTODY FOR LEAD BULK SAMPLES

Project No.: 23791.014 Phase 0001

Individuals signing this form warrant that the information provided is correct and complete. The Sender should keep a copy and send the original. The Receiver should complete the form, keep a copy and return the original to the Sender. Receiver shall report damage of package immediately to Sender.

SENDER

Date Sent: July 12, 2022

PBS Engineering and Environmental Inc.
4412 S Corbett Avenue
Portland, OR 97239
503.248.1939, Fax: 866.727.0140

Alex Johnson
Name

Authorized Signature

7/12/22
Date

RECEIVER

Date Received: 07/13/22 10:39am

Company: R.J. Lee Group
Address: 350 Hochberg Road
Monroeville, PA 15146
724-325-1776

Emily Vargo
Name

Emily Vargo
Authorized Signature

07/13/22 10:39am
Date

Sender's ID No.	Brief Description	Receiver's ID No.
LB23791.014-1001		
LB23791.014-1002		
LB23791.014-1003		
LB23791.014-1004		
LB23791.014-1005		
LB23791.014-1006		
LB23791.014-1007		

ANALYSIS REQUESTED:

LEAD:
- ☑ **Paint**
- ☐ **Wipe**
- ☐ **Soil/Misc.**
- ☐ **Air**
- ☐ **TCLP**

Please analyze the enclosed 7 sample(s) for LEAD content using Atomic Absorption Method. PBS requests prior notification if samples will be disposed.

Please fax and mail the results to the above address.

TURNAROUND DESIRED:

5 Day

SPECIAL INSTRUCTIONS:

SZ/av

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

ATTACHMENT 6

Marion County
OREGON

ADDENDUM #1
TO THE
INVITATION TO BID
BS1553-24 - BEHAVIORAL HEALTH CRISIS CENTER NEW LOCATION REMODEL
ISSUED ON 7/29/2024 9:00:00 AM

The following information in this addendum, hereby become part of the Invitation To Bid. It is essential that all prospective Offerors note the content of this Addendum.

A. Clarifications:

- The Bid Due Date and Time is extended to 2:00 pm (PDT) on October 1, 2024.
- Addendum 2 will be issued on September 17, 2024, and will include a significant increase to the number of interior lights to be replaced with LED fixtures and related controls and respond to questions.
- An additional optional site walkthrough will be held at 10:00 am (PDT) on September 19, 2024, at 1234 Commercial St SE, Salem, OR, 97302.

B. Question and Answers: Questions from Bidders will be accepted until 5:00 pm (PDT) on September 20, 2024. An Addendum will be issued if needed no later than September 26, 2024, responding to further questions, and modifying the scope of work, if necessary.

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

ADDENDUM #2
TO THE
INVITATION TO BID
BS1553-24 - BEHAVIORAL HEALTH CRISIS CENTER NEW LOCATION REMODEL
ISSUED ON 7/29/2024 9:00:00 AM

The following information in this addendum, hereby become part of the Invitation To Bid. It is essential that all prospective Offerors note the content of this Addendum.

A. Clarifications:

- The Bid Due Date and Time is extended to 2:00 pm (PDT) on October 15, 2024.
- Addendum 3 will be issued the week of September 17, 2024, and will include a significant increase to the number of interior lights to be replaced with LED fixtures and related controls and respond to questions.
- An additional optional site walkthrough will be held at 1:00 pm (PDT) on September 24, 2024, at 1234 Commercial St SE, Salem, OR, 97302.
- Questions and Substitution Requests from Bidders will be accepted until 5:00 pm (PDT) on October 1, 2024. An Addendum will be issued if needed no later than October 8, 2024, responding to further questions, and modifying the scope of work, if necessary.

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

CARLSON VEIT JUNGE ARCHITECTS PC
ARCHITECTURE • INTERIOR DESIGN

Addendum No. 3

Date: September 17, 2024

Project: Marion County Behavioral Health Crisis Center

To: Prospective Bidders

This addendum forms a part of the Contract Documents and modifies the original Construction Documents dated 06-06-2024 as noted below, and becomes a part of the Contract Documents.

This addendum consists of 2 pages, 14 drawing sheets, and 7 specification sections.

ARCHITECTURAL DRAWINGS:

1. Sheet G-001: Replace this sheet in its entirety. Updated drawing index and egress plan.
2. Sheet A-102: Replace this sheet in its entirety. Updated for added TV locations, marker boards, and tack boards.
3. Sheet A-103: Replace this sheet in its entirety. Updated for demolition of all interior light fixtures.
4. Sheet A-104: Replace this sheet in its entirety. Updated for replacement of all interior light fixtures and updated egress lighting.
5. Sheet A-201: Replace this sheet in its entirety. Updated exterior wall/door details.
6. Sheet A-202: Replace this sheet in its entirety. Updated to show speak-thru devices at receptions.
7. Sheet A-501: Replace this sheet in its entirety. Updated to add building lettering details.
8. Sheet A-502: Replace this sheet in its entirety. Revised interior details.

ELECTRICAL DRAWINGS:

1. Sheet E-000: Replace this sheet in its entirety. Schedule revisions.
2. Sheet E-010: Replace this sheet in its entirety. Schedule revisions.
3. Sheet E-100: Replace this sheet in its entirety. Lighting demolition revisions.
4. Sheet E-200: Replace this sheet in its entirety. Power receptacle revisions.
5. Sheet E-300: Replace this sheet in its entirety. Lighting revisions.
6. Sheet E-600: Add this sheet in its entirety. Added lighting/power details.

PROJECT MANUAL:

1. Section 00 01 00 Table of Contents: replace this section in its entirety. Updated for added/removed sections.
2. Section 01 21 00 Allowances, page 1, line 13: delete “500” and replace with “1,000”.
3. Section 08 71 00 Door Hardware: replace this section in its entirety. Added hardware set 18.0.
4. Section 10 11 16 Marker Boards and Tack Boards, page 2, line 19: delete and replace with “Color: Linen.”
5. Section 10 51 16 Wood Lockers: delete this section in its entirety.
6. Section 26 00 01 General Electrical Provisions: replace this section in its entirety.
7. Section 26 00 26 Submittals and Shop Drawings: replace this section in its entirety.
8. Section 26 05 33.16 Outlet, Junction, and Pullboxes: replace this section in its entirety.
9. Section 26 27 26 Wiring Devices: replace this section in its entirety.
10. Section 26 51 20 Automatic Lighting Control: add this section in its entirety.

ACCEPTED SUBSTITUTIONS:

1. Specification Section 10 11 16 Marker Boards and Tack Boards,
    a. Page 1, line 43, add: “ASI 9800 Series”. Must meet requirements listed in specifications.

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2. Specification Section 10 28 13 Toilet Accessories,
    a. Page 1, line 19, add: “ASI 10-3701 Series”.
    b. Page 1, line 25, add: “ASI 10-20852”.
    c. Page 1, line 31, add: “ASI 10-0477-SM”.
    d. Page 1, line 38, add: “ASI 10-7340-S”.

End of Addendum 3.

Attachments:
Sheet G-001
Sheet A-102
Sheet A-103
Sheet A-104
Sheet A-201
Sheet A-202
Sheet A-501
Sheet A-502
Sheet E-000
Sheet E-010
Sheet E-100
Sheet E-200
Sheet E-300
Sheet E-600
Section 00 01 00 Table of Contents
Section 08 71 00 Door Hardware
Section 26 00 01 General Electrical Provisions
Section 26 00 26 Submittals and Shop Drawings
Section 26 05 33.16 Outlet, Junction, and Pullboxes
Section 26 27 26 Wiring Devices
Section 26 51 20 Automatic Lighting Control

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

MARION COUNTY
BEHAVIORAL HEALTH CRISIS CENTER REMODEL

PROJECT DIRECTORY

OWNER:
MARION COUNTY
555 COURT STREET NE
SALEM, OREGON 97301

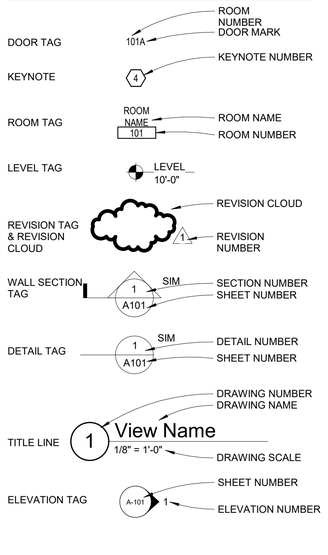
ARCHITECT:
CARLSON VEIT JUNGE ARCHITECTS
3095 RIVER ROAD N
SALEM, OREGON 97303
PHONE: (503) 390-0281

MECHANICAL/ELECTRICAL ENGINEER:
FLUENT ENIGNEERING
2110 STATE ST
SALEM, OREGON 97301
PHONE: (503) 447-5030

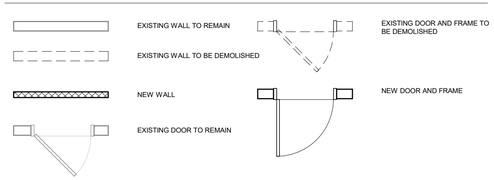
MATERIAL REFERENCE

CMU
CONCRETE
GLASS
WOOD
LOOSE, BATT INSUL
DIMENSION LUMBER
PLYWOOD
METAL
FINISH WOOD
GYPSUM WALLBOARD
BLOCKING
ACOUSTIC TILE

SYMBOLS LEGEND



PHASING LEGEND



CODE SUMMARY

GOVERNING BUILDING CODE: OSSC 2022 (IBC 2021)

THIS PROJECT COMPRISES THE REMODEL OF AN EXISTING OFFICE BUILDING SPACE

ZONING CODE
PLANNING ZONE — MU-I - MIXED USE I

EXISTING PARKING AND LANDSCAPE TO REMAIN.

BUILDING CODE
OCCUPANCY GROUP — B
CONSTRUCTION TYPE — V-B
REMODEL — NON-SPRINKLERED

ALLOWABLE BUILDING AREA
B OCC BASIC ALLOWABLE AREA = 9,500 SF
BASEMENT ACTUAL AREA = 1,651 SF
FIRST FLOOR ACTUAL AREA = 9,195 SF

OCCUPANT LOAD
BASEMENT FLOOR
STORAGE AREAS (1198 SF/300) = 4
FIRST FLOOR
BUSINESS AREAS (6503 SF/150) = 43
UNCONCENTRATED ASSEMBLY (399 SF/15) = 27
CONCENTRATED ASSEMBLY (314 SF/7) = 45
ACCESSORY STORAGE (117 SF/300) = 1
TOTAL BUILDING OCCUPANT LOAD: = 120 OCC

MEANS OF EGRESS
EXITS REQUIRED: 2
EXITS PROVIDED: 4
EXIT WIDTH REQUIRED: 0.3 x 4, 0.2 x 116 = 24.4 IN
EXIT WIDTH PROVIDED: # EXITSxWIDTH = 144 IN

PLUMBING FIXTURES
OCCUPANCY GROUP B: = 120 OCC
WATER CLOSETS REQUIRED: 4
WATER CLOSETS PROVIDED: 5
LAVATORIES REQUIRED: 3
LAVATORIES PROVIDED: 5

DEFERRED SUBMITTALS:
WINDOW ENGINEERING

INDEX OF DRAWINGS

GENERAL
G-001 TITLE SHEET

ARCHITECTURAL
A-101 DEMOLITION FLOOR PLANS
A-102 FLOOR PLAN - NEW WORK
A-103 REFLECTED CEILING PLAN - DEMO
A-104 REFLECTED CEILING PLAN
A-201 EXTERIOR ELEVATIONS & DETAILS
A-202 INTERIOR ELEVATIONS
A-401 LARGE SCALE PLANS
A-501 INTERIOR DETAILS
A-502 INTERIOR DETAILS
A-701 FINISH PLAN

PLUMBING
P-000 TITLE SHEET
P-010 SCHEDULES
P-100 DEMOLITION PLANS
P-200 PLUMBING PLANS
P-600 TYP. DETAILS & ENLARGED PLANS

MECHANICAL
M-000 TITLE SHEET
M-010 SCHEDULES
M-011 VENTILATION SCHEDULE
M-020 THERMAL ZONE DIAGRAMS
M-100 DEMOLITION FLOOR PLANS
M-101 DEMOLITION PLANS - ROOF
M-200 HVAC FLOOR PLANS
M-201 ROOF PLAN
M-600 TYP. DETAILS

ELECTRICAL
E-000 LEGEND & SCHEDULES
E-010 ONE-LINE
E-100 POWER DEMOLITION PLAN
E-200 POWER PLAN
E-300 LIGHTING PLAN
E-600 DETAILS

2

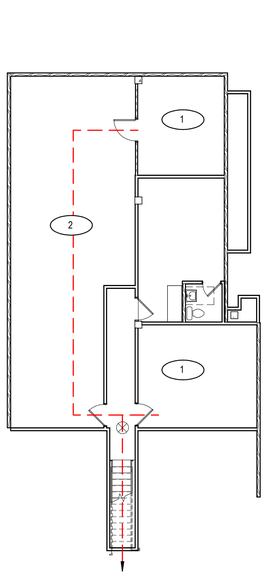
ABBREVIATIONS

(REFER TO CONSUTANT DRAWINGS FOR ADDITIONAL ABBREVIATIONS)

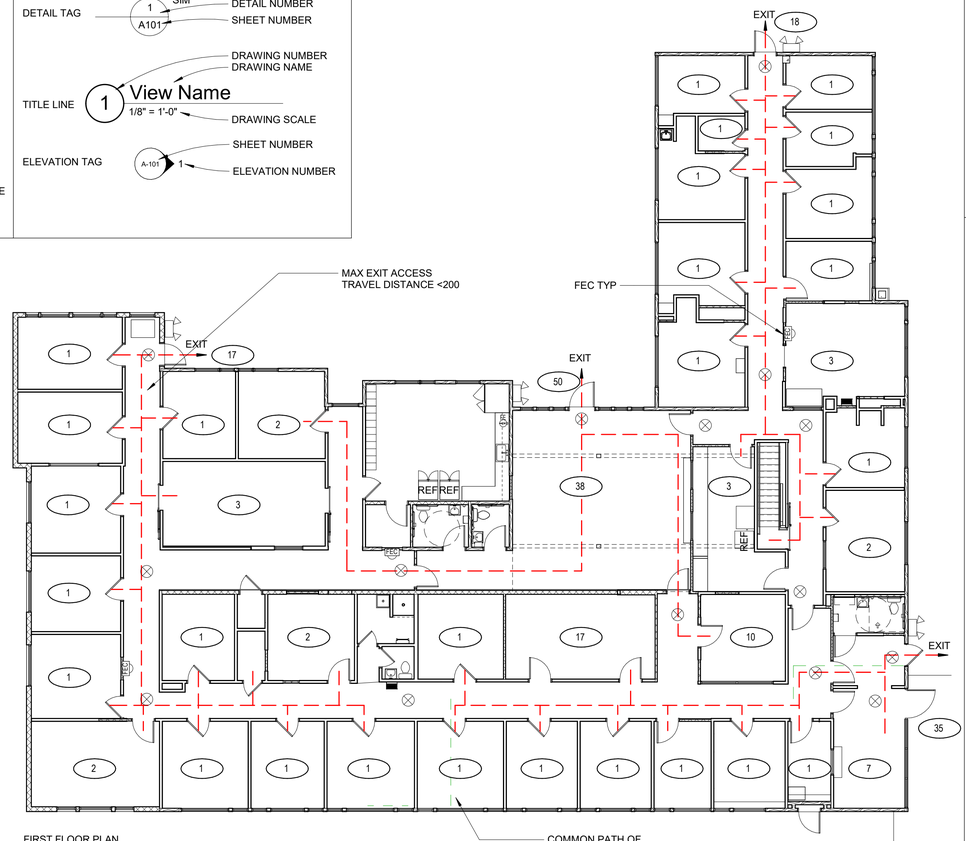
AB	ANCHOR BOLT	FD	FLOOR DRAIN	MO	MASONRY OPENING	S	SOUTH
ACST	ACOUSTIC	FDTN	FOUNDATION	MT	MOUNT	SC	SOLID CORE
ADJ	ADJUSTABLE, ADJUST	FE	FIRE EXTINGUISHER	MTL	METAL	SCR	SCREW
AFF	ABOVE FINISHED FLOOR	FEC	FIRE EXTINGUISHER CABINET			SD	SOAP DISPENSER, SMOKE DETECTOR, STORM DRAIN
ALUM	ALUMINUM	FH	FIRE HYDRANT	N	NORTH		
ANOD	ANODIZED	FHWS	FLATHEAD WOOD SCREW	NIC	NOT IN CONTRACT	SF	SQUARE FOOT
APPROX	APPROXIMATELY	FIN	FINISH, FINISHED	NL	NIGHT LIGHT	SHTHG	SHEATHING
ASPH	ASPHALT	FIN FLR	FINISHED FLOOR	NO	NUMBER	SHT	SHEET
		FL	FLOOR	NTS	NOT TO SCALE	SIM	SIMILAR
BD	BOARD	FLASH	FLASHING			SPEC	SPECIFICATION, SPECIFIED
BLDG	BUILDING	FTG	FOOTING	OA	OVERALL OUTSIDE AIR	SPKR	SPEAKER
BLKG	BLOCKING	FOS	FACE OF STUD	OBS	OBSCURE	SQ	SQUARE
BM	BENCH MARK, BEAM			OC	ON CENTER	SSK	SERVICE SINK
BOT	BOTTOM	GA	GAGE	OCEW	ON CENTER EACH WAY	SST	STAINLESS STEEL
BUR	BUILT-UP ROOFING	GALV	GALVANIZED	OD	OUTSIDE DIAMETER	STD	STANDARD
		GB	GRAB BAR	OFCI	OWNER FURNISHED-CONTRACTOR INSTALLED	STL	STEEL
CAB	CABINET	GL	GLASS			STOR	STORAGE
CB	CATCH BASIN, CORNER BEAD	GLB	GLU-LAM BEAM	OH	OVERHEAD	STRUC	STRUCTURE, STRUCTURAL
CG	CORNER GUARD	GYP BD	GYPSUM BOARD	OPG	OPENING	SUSP	SUSPENDED
CHBD	CHALKBOARD			OFOI	OWNER FURNISHED-OWNER INSTALLED		
CI	CAST IRON	HB	HOSE BIBB			T	TEMPERED, TREAD
CJ	CONTROL JOINT	HCP	HANDICAP, HOLLOW CORE	OPP	OPPOSITE	TEL	TELEPHONE
CLG	CEILING	HDR	HEADER			T&G	TONGUE & GROOVE
CLR	CLEAR, CLEARANCE	HDW	HARDWARE	PAF	POWDER ACUATED FASTNER	THK	THICK, THICKNESS, THICKENED
CMU	CONCRETE MASONRY UNIT	HC	HOLLOW CORE	PBD	PARTICLE BOARD	TOC	TOP OF CURB
COL	COLUMN	HORIZ	HORIZONTAL	PL	PROPERTY LINE, PLATE	TPD	TOILET PAPER DISPENSER
CONC	CONCRETE	HS	HOLLOW STEEL, HIGH STRENGTH	PLAM	PLASTIC LAMINATE	TYP	TYPICAL
CONSTR	CONSTRUCTION			PLBG	PLUMBING		
CONT	CONTINUOUS, CONTINUE	HT	HEIGHT	PLYWD	PLYWOOD		
CONTR	CONTRACTOR	HVAC	HEATING VENTILATING AIR CONDITIONING	PNL	PANEL	ULMT	UNDERLAYMENT
CNTR	COUNTER	HW	HOT WATER	PR	PAIR	UON	UNLESS OTHERWISE NOTED
CRS	COURSE, COURSES			PRKG	PARKING	UR	URINAL
CSK	COUNTERSINK, COUNTERSUNK			PTD	PAPER TOWEL DISPENSER		
CW	COLD WATER	INSUL	INSULATE, INSULATED, INSULATION	PTN	PARTITION	VCT	VINYL COMPOSITION TILE
				PT	POINT	VERT	VERTICAL
DF	DRINKING FOUNTAIN	INT	INTERIOR	PVC	POLYVINYL CHLORIDE	VNR	VENEER
DIA	DIAMETER	INV	INVERT	PVMT	PAVEMENT	VTR	VENT THROUGH ROOF
DIM	DIMENSION						
DIV	DIVIDE, DIVIDED, DIVISION	JAN	JANITOR	QUAL	QUALITY	WAINS	WAINSCOT
DR	DOOR	J-BOX	JUNCTION BOX			W	WEST, WIDE, WIDTH
DS	DOWNSPOUT	JST	JOIST	R	RADIUS, RISER	WC	WATER CLOSET
DTL	DETAIL	JT	JOINT	RC	RESILIENT CHANNEL	WD	WOOD
DWG	DRAWING	KD	KNOCKED DOWN	RD	ROOF DRAIN	WDW	WINDOW
				RECEP	RECEPTACLE	WH	WATER HEATER
E	EAST	LAM	LAMINATE	REF	REFERENCE, REFRIGERATOR	W/O	WITHOUT
EA	EACH	LAV	LAVATORY	REINF	REINFORCE, REINFORCEMENT	WP	WATERPROOFING
EF	EXHAUST FAN	LS	LANDSCAPING	REQD	REQUIRED	WT	WEIGHT
EJ	EXPANSION JOINT	LT	LIGHT	REV	REVISION, REVISED	WWF	WELDED WIRE
EL	ELEVATION			RHWS	ROUND HEAD WOOD SCREW		
ELEC	ELECTRIC, ELECTRICAL	MATL	MATERIAL	RM	ROOM		
ELEV	ELEVATOR	MAX	MAXIMUM	RO	ROUGH OPENING		
ENCL	ENCLOSURE	MB	MACHINE BOLT	ROW	RIGHT OF WAY		
EQ	EQUAL	MECH	MECHANICAL				
EQUIP	EQUIPMENT	MFR	MANUFACTURER	S	SOUTH		
EW	EACH WAY	MH	MANHOLE	SC	SOLID CORE		
EXIST	EXISTING	MI	MIRROR	SCR	SCREW		
EXP B	EXPANSION BOLT	MIN	MINIMUM	SD	SOAP DISPENSER, SMOKE DETECTOR, STORM DRAIN		
EXT	EXTERIOR	MISC	MISCELLANEOUS				

SYMBOLS USED AS ABBREVIATIONS

@	AT
℄	CENTERLINE
°	DEGREE
±	PLUS/MINUS



BASEMENT PLAN



FIRST FLOOR PLAN

1
EGRESS PLAN
3/32" = 1'-0"

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REGISTERED ARCHITECT
ANGELA M. FLORES
SALEM, OREGON
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PERMIT SET

project:
MARION COUNTY
BEHAVIORAL HEALTH CRISIS CENTER REMODEL
1234 COMMERCIAL STREET SE SALEM, OREGON 97302

consultants:

revisions:

#	Description	Date
1	CITY COMMENTS	08/09/24
2	ADDENDUM #3	09/17/24

date: 06/06/2024
project: 01623
drawn by: NGB
checked by: AF

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TITLE SHEET

sheet: G-001
of:

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

DOOR SCHEDULE

DOOR MARK	SIZE W	SIZE HT	SIZE THK	DOOR TYPE	DOOR CONST	DOOR FINISH	DOOR GLASS	FRAME CONST	FRAME FINISH	FRAME ELEVATION/DETAILS	RATING	HARDWARE	REMARKS	U VALUE	SHGC	SIGNS	EGRESS
101A	3'-6"	7'-0"	1 3/4"	D	SC	WE	1" T	SC	WE		-	1.0	1,6				
101B	3'-0"	7'-0"	1 3/4"	C	SC	WE	BRG	HS	ME	7,8/A-501	-	2.0	1				
101C	3'-0"	7'-0"	1 3/4"	C	SC	WE	BRG	HS	ME	7,8/A-501	-	2.0	1				
101D	3'-0"	7'-0"	1 3/4"	C	SC	WE	BRG	HS	ME	7,8/A-501	-	2.0	1				
102A	3'-0"	7'-0"	1 3/4"	B	SC	WE	1/4" T	HS	ME	7,8/A-501	-	2.0	1				
102B	3'-0"	7'-0"	1 3/4"	B	SC	WE	1/4" T	HS	ME	7,8/A-501	-	3.0					
103A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
104A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	4.0	5				
105A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	4.0	5				
106A	2'-6"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	5.0	5				
107A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	4.0	5				
108A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	4.0	5				
109A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	4.0	5				
110A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	4.0	5				
111A	3'-0"	7'-0"	1 3/4"	B	SC	WE	1/4" T	HS	ME	7,8/A-501	-	15.0					
112A	3'-0"	7'-0"	1 3/4"							6/A-501	-						
113A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
114A	2'-6"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	4.0	5				
115A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	HS	ME	7,8/A-501	-	7.0	1,4				
116A	3'-0"	7'-0"	1 3/4"	C	SC	WE	1/4" T	HS	ME	7,8/A-501	-	2.0	1				
116B	3'-0"	7'-0"	1 3/4"	D	AL	AN	1" T	AL	AN		-	8.0	1,5				
117A	4'-0"	7'-0"	1 3/4"	D	AL	AN	1" T	AL	AN	8,9/A-201	-	9.1	1,5				
117B	3'-0"	7'-0"	1 3/4"	C	SC	WE	1/4" T	HS	ME	7,8/A-501	-	3.0					
118A	3'-0"	7'-0"	1 3/4"	B	SC	WE	1/4" T	HS	ME	7,8/A-501	-	6.0					
118B	3'-0"	7'-0"	1 3/4"	A	HS	ME	-	HS	ME	1,2/A-201	-	18.0					
119A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
120A	3'-0"	7'-0"	1 3/4"	C	SC	WE	1/4" T	HS	ME	7,8/A-501	-	10.0					
121A	3'-0"	7'-0"	1 3/4"	B	SC	WE	1/4" T	HS	ME	7,8/A-501	-	6.0					
122A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
123A	3'-0"	7'-0"	1 3/4"	C	SC	WE	1/4" T	HS	ME	7,8/A-501	-	10.0					
123B	3'-0"	7'-0"	1 3/4"	C	SC	WE	1/4" T	HS	ME	7,8/A-501	-	10.0					
124A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
125A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				

DOOR SCHEDULE

DOOR MARK	SIZE W	SIZE HT	SIZE THK	DOOR TYPE	DOOR CONST	DOOR FINISH	DOOR GLASS	FRAME CONST	FRAME FINISH	FRAME ELEVATION/DETAILS	RATING	HARDWARE	REMARKS	U VALUE	SHGC	SIGNS	EGRESS
126A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
127A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
128A	2'-6"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	11.0	5				
129A	2'-6"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	5.0	5				
130A	3'-0"	7'-0"	1 3/4"	B	SC	WE	1/4" T	HS	ME	7,8/A-501	-	6.0					
131A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
132A	2'-6"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	5.0	5				
133A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	5.0	5				
134A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
135A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
136A	3'-0"	7'-0"	1 3/4"	B	SC	WE	1/4" T	HS	ME	7,8/A-501	-	6.0					
137A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
138A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
139A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
140A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
141A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
142A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
143A	3'-6"	7'-2"	1 3/4"	B	SC	WE	1/4" T	HS	WE	4/A-501	-	12.0	2				
143B	3'-6"	7'-2"	1 3/4"	B	SC	WE	1/4" T	HS	WE	4/A-501	-	12.0	2				
144A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
145A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	13.0	1,5				
146A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	HS	ME	7,8/A-501	-	14.0					
147A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	HS	ME	7,8/A-501	-	7.0	1,4				
148A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	HS	ME	7,8/A-501	-	7.0	1,4				
150B	3'-0"	7'-0"	1 3/4"	A	HS	ME	-	HS	ME	1,2/A-201	-	9.0	1				
152A	3'-0"	7'-0"	1 3/4"	B	SC	WE	1/4" T	HS	ME	7,8/A-501	-	2.0	1				
152B	3'-0"	7'-2"	1 1/2"	A	SC	WE	-	HS	WE	4/A-501	-	17.0	1,2				
156A	3'-0"	7'-0"	1 3/4"	A	HS	ME	-	HS	ME	1,2/A-201	-	9.0	1				
B01A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	5.0	5				
B02A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	5.0	5				
B03A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	HS	ME	7,8/A-501	-	2.0	1				
B04A	3'-0"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	16.0	5				
B05A	2'-6"	7'-0"	1 3/4"	A	SC	WE	-	SC	WE		-	11.0	5				

TYPE

SEE DOOR TYPES

CONSTRUCTION

SC = SOLID CORE WOOD
AL = ALUMINUM
HS = HOLLOW STEEL

FINISH

WT = WOOD TRANSPARENT
WE = WOOD ENAMEL
AN = ANODIZED ALUMINUM
ME = METAL ENAMEL

GLASS

T = TEMPERED
LS = LAMINATED SAFETY
PC = POLYCARBONATE
T/IN = TEMPERED INSULATING
BRG = BULLET RESITANT GLAZING

ELEVATION

SEE FRAME ELEVATIONS

RATING

20, 25, 60, 90 MINUTES
FIRE RATING IN MINUTES

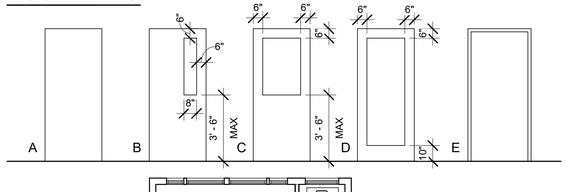
HARDWARE

NUMBER REFERS TO HARDWARE GROUP IN HARDWARE SCHEDULE

REMARKS

1: CARD READER
2: SLIDING BARN DOOR
3: DOOR FRAME ONLY
4: REMOTE ENTRY
5: EXISTING DOOR & FRAME TO BE REUSED, REMOVE EXIST KNOB/HANDLE/DEADBOLT & REPLACE W/ NEW LEVERSET
6: EXIST WD FRAME TO REMAIN, PROVIDE NEW DOOR & HARDWARE

DOOR TYPES

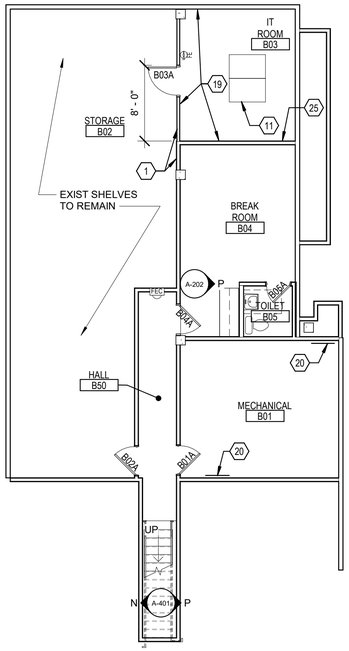


GENERAL NOTES

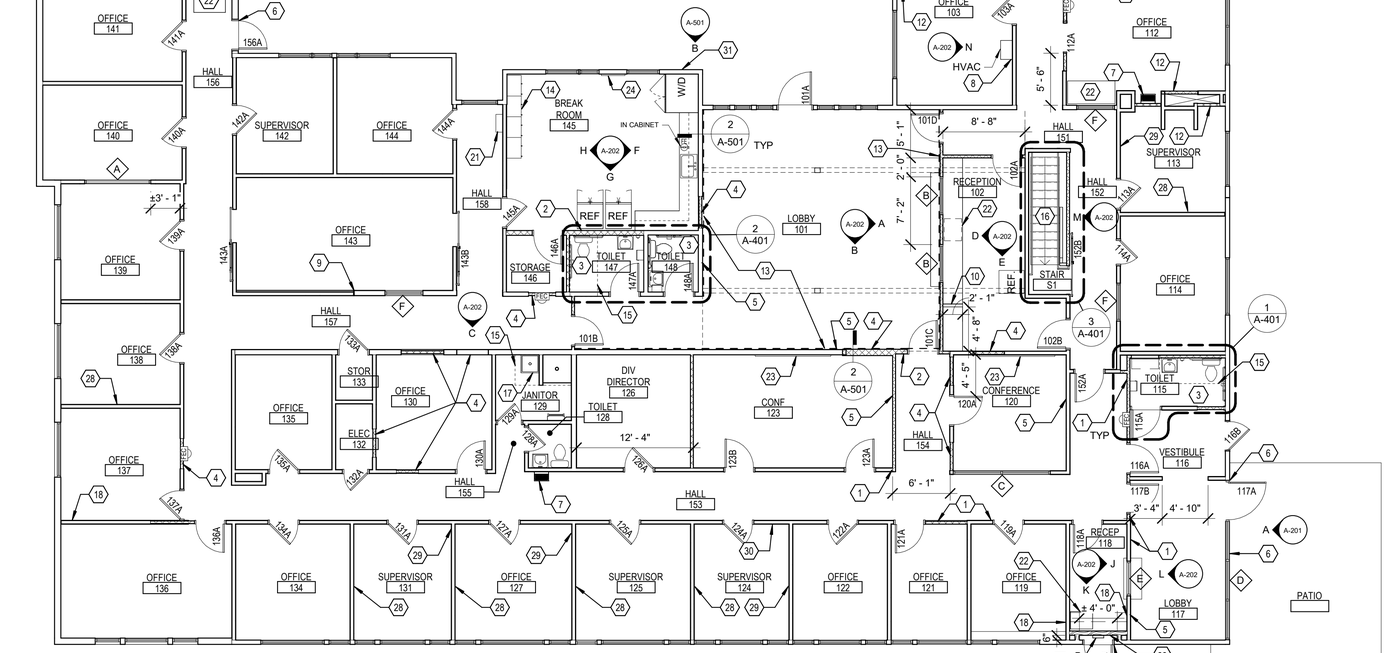
1. ALL WALLS, EXISTING DOORS & FRAMES TO BE PAINTED.
2. PROVIDE NEW INTERIOR SIGNAGE THROUGHOUT THE ENTIRE BLDG, SEE DTL 9 / A-501
3. ALL NEW WALLS TO BE 3 1/2" STL STUDS @ 16" OC W/ ACOUS BATT INSUL & (1) LAYER GYP BD EA SIDE. UON. DRAWINGS AND DETAILS ARE FOR METAL STUD WALL CONSTRUCTION AT INTERIOR. CONTRACTOR OPTION TO USE WOOD STUD FRAMING.
4. AT STAINED WOOD PANELING WALLS, REPAIR HOLES, STAIN TO MATCH EXIST FINISH.
5. AT PAINTED WOOD PANELING WALLS, REPAIR ANY DAMAGED AREAS, FINISH TO MATCH ADJ SURFACES.
6. AT ALL AREAS WHERE WALLPAPER REMOVED, REPLACE OR REPAIR DAMAGED GYP BD. FINISH TO MATCH ADJACENT WALL GYP BD FINISH.
7. PROVIDE NEW BLINDS, PER SPEC, ALL WINDOWS. WALK WITH OWNER TO VERIFY ALL LOCATIONS.
8. APPLIANCES TO BE OFCI.
9. AT ALL WALLS WHERE DEMOLITION HAS OCCURED, PROVIDE GYP BD & FINISH TO MATCH ADJ SURFACES.
10. REFER TO PLUMBING, MECHANICAL, & ELECTRICAL DRAWINGS FOR ADDITIONAL PATCHING REQUIRED FOR ASSOCIATED WORK.

CONSTRUCTION NOTES

1. ALIGN NEW WALL FACE OF FINISH WITH EXISTING FACE OF WALL FINISH, SEE DTL 1 / A-501
2. 6" STL STUDS W/ (1) LAYER GYP BD EA SIDE
3. ALL WALLS IN ROOM TO RECEIVE FULL HEIGHT FRP
4. INFILL EXIST OPENING W/ STL STUDS & GYP BD BOTH SIDES TO MATCH EXIST WALL THICKNESS, FINISH TO MATCH ADJ SURFACES, SEE DTL 1 / A-501
5. PROVIDE BACKING & MONITOR MOUNT FOR OFCI TV, SEE DETAIL 11 / A-502. PROVIDE KANTO PDX680 TYP
6. PATCH /REPAIR BLDG ENVELOPE WRAP AND EXTERIOR FINISHES AT NEW EXTERIOR DOOR/FRAME ASSEMBLY
7. BOTTLE FILLER
8. WHERE LIGHT BOX REMOVED, INFILL ANY HOLES IN WALL, PATCH AND REPAIR, MATCH ADJACENT WALL FINISH AND TEXTURE
9. WHERE WALL REMOVED, APPLY ADDITIONAL LAYER OF GYP TO CREATE EVEN WALL SURFACE
10. 48" PARTIAL HEIGHT WALL, SEE DTL 10 / A-502
11. RELOCATED IT CABINETS
12. PROVIDE NEW WALL FOR PLUMB/ELEC CHASE 6" CLR MIN, COORD FINAL LOCATIONS W/ FLOOR PENETRATIONS BY OWNER
13. AT THIS WALL, PROVIDE BULLET RESISTANT PANELS UP TO 8'-0" AFF. ABOVE 8'-0" PROVIDE GYP BD, FIN TO MATCH BR PANEL THICKNESS.
14. OFCI LOCKERS
15. PROVIDE NEW CONC SLAB INFILL OVER VAPOR RETARDER OVER 6" MIN CRUSHED ROCK BASE, SEE DTL 10 / A-501
16. PROVIDE NEW HANDRAILS, EA SIDE
17. MOP SINK W/ 4'H FRP EA SIDE
18. WALL ACCESS PANEL
19. PROVIDE FRT PLYWD SHTHG UP TO 8'-4" OVER WALL TYPE, ABV BASE, THIS WALL
20. PROVIDE SHT MTL COVER AT OPENING IN WALL. FASTEN TO WALL & SET IN SEALANT ALONG ENTIRE PERIMETER
21. KEYWATCHER SYSTEM MOUNT SUCH THAT THE BOTTOM OF THE KEYPAD IS 3'-0" AFF, VFY W/ OWNER
22. COPIER, OFOI
23. 8'-0" LONG MARKER BOARD
24. 30" X 40" TACKABLE PANEL
25. PROVIDE ACOUS BATT INSUL IN WALLS & (1) LAYER GYP BD
26. PROVIDE 6" CLEAR SPACE FOR EXIST COMCAST BOX
27. PROVIDE 1/2" FRT PLYWD TYP (3) WALLS, HOLD 1/2" AFF. PROVIDE SEALANT AT FLOOR/WALL GAP
28. 4'-0" x 3'-0" TACKABLE PANEL, COORD W/OWNER FOR EXACT LOCATION
29. 5'-0" LONG MARKER BOARD
30. 3'-0" LONG MARKER BOARD
31. EXTERIOR BLDG SIGNAGE



BASEMENT PLAN - NEW WORK
1/8" = 1'-0"



FIRST FLOOR PLAN - NEW WORK
1/8" = 1'-0"

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consultants:

revisions:

#	Description	Date
2	ADDENDUM #3	09/17/24

date: 06/06/2024
project: 01623
drawn by: NGB/ MP
checked by: AMF
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FLOOR PLAN - NEW WORK

sheet: A-102
of:

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CEILING DEMO NOTES

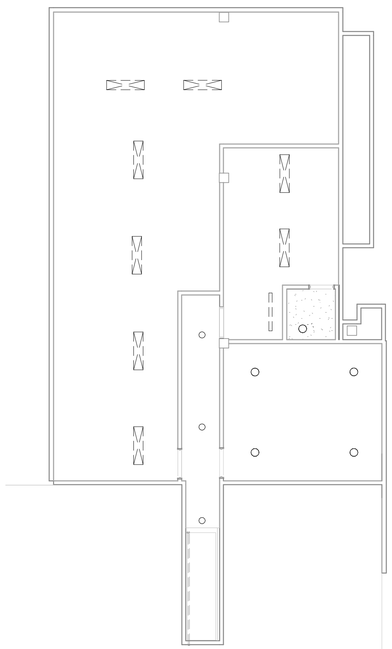
- (A) CAREFULLY REMOVE CEILING TILES, THIS LOCATION. SALVAGE FOR REUSE
- (B) REMOVE CEILING SOFFIT/GYP BD, SALVAGE UNDAMAGED CEILING TILES FOR REUSE
- (C) REMOVE CURTAIN AND CEILING MOUNTED TRACK
- (D) REMOVE EXISTING LIGHT FIXTURE, SALVAGE FOR REINSTALL IN SAME LOCATION
- (E) REMOVE PORTION OF CEILING TILES & SUBSTRATE FOR NEW CEILING ACCESS PANELS, COORD W/ OTHER TRADES

GENERAL NOTES

1. REMOVE DAMAGED & STAINED TILES AND DISCARD.
2. PROVIDE ALLOWANCE FOR 1000 SF DAMAGED TILES. PROVIDE UNIT PRICE FOR ADDITIONAL DEMO, SEE SPECIFICATIONS.
3. AT AREAS OF DEMO'D CLG TILES, REMOVE SUBSTRATE AS REQD FOR NEW WORK.

DEMO CEILING LEGEND

- EXIST GYP BD CEILING, TO REMAIN
- EXIST ADHESIVE-APPLIED 12"X12" ACOUSTIC TILES, TO REMAIN
- REMOVE EXIST ADHESIVE-APPLIED 12"X12" TILES, SALVAGE FOR REVISE



2 BASEMENT FLOOR PLAN
1/8" = 1'-0"



2 FIRST FLOOR - DEMO
1/8" = 1'-0"

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REGISTERED ARCHITECT
ANGELA M. FLORES
SALEM, OREGON
STATE OF OREGON

PERMIT SET

project:
MARION COUNTY
BEHAVIORAL HEALTH CRISIS CENTER REMODEL
1234 COMMERCIAL STREET SE SALEM, OREGON 97302

consultants:

revisions:

#	Description	Date
2	ADDENDUM #3	09/17/24

date: 06/06/2024
project: 01623
drawn by: NGB
checked by: AF

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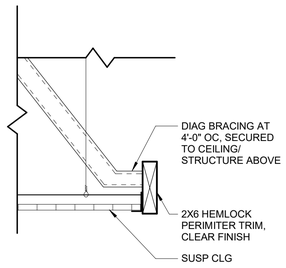
REFLECTED CEILING PLAN - DEMO

sheet: A-103

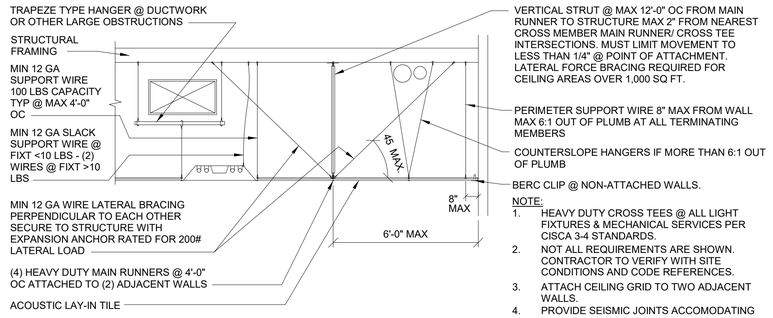
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CONSTRUCT SUSPENDED CEILINGS IN ACCORDANCE WITH NORTHWEST WALL & CEILING BUREAU - TECHNICAL BULLETIN 401.

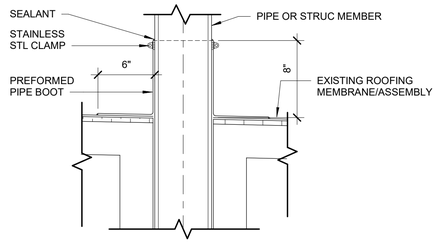


1 SUSP CLG DETAIL
1 1/2" = 1'-0"



NOTE:
1. HEAVY DUTY CROSS TEES @ ALL LIGHT FIXTURES & MECHANICAL SERVICES PER CISCA 3-4 STANDARDS.
2. NOT ALL REQUIREMENTS ARE SHOWN. CONTRACTOR TO VERIFY WITH SITE CONDITIONS AND CODE REFERENCES.
3. ATTACH CEILING GRID TO TWO ADJACENT WALLS.
4. PROVIDE SEISMIC JOINTS ACCOMODATING 3/4" MOVEMENT AT CEILING AREAS GREATER THAN 2,500 SQ FT.

2 SUSPENDED CEILING DETAIL
1/2" = 1'-0"



3 ROOF PIPE PENETRATION
1 1/2" = 1'-0"

CEILING LEGEND

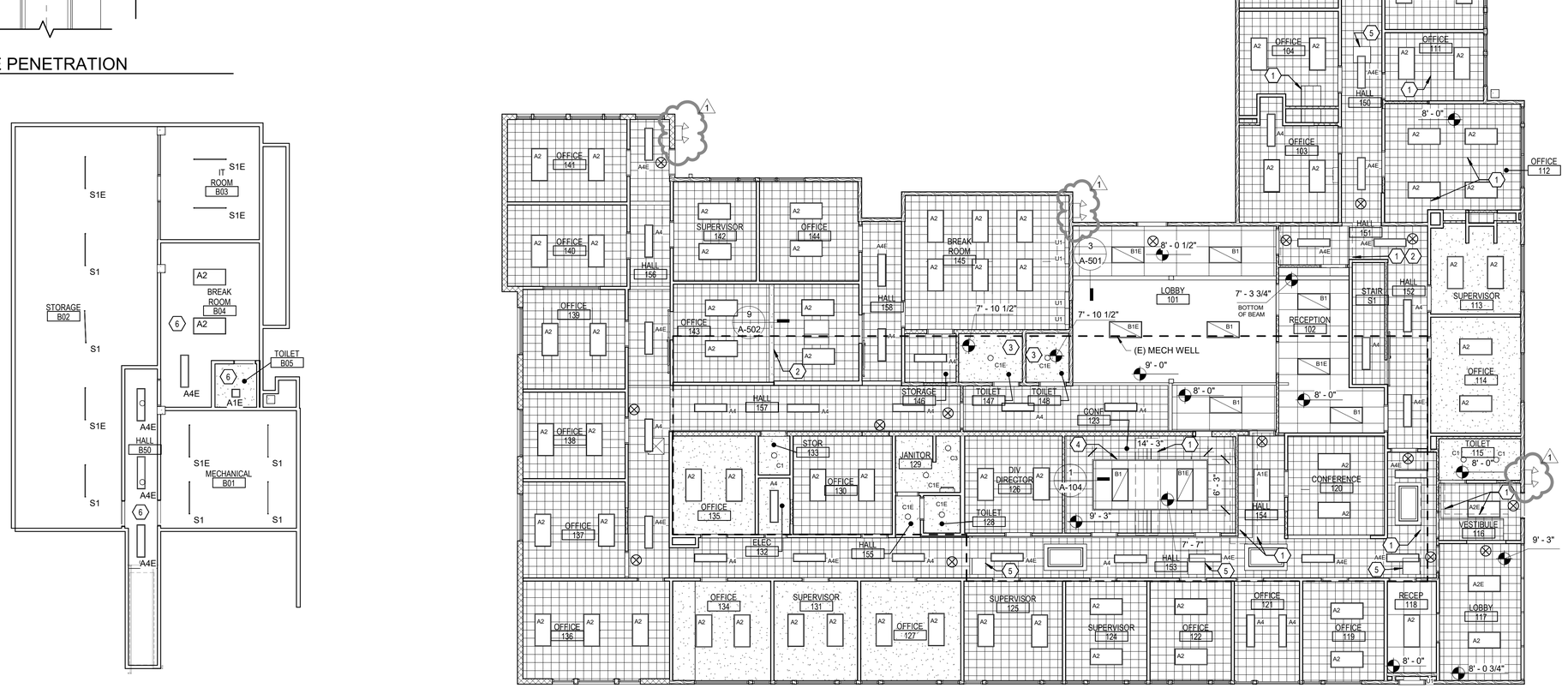
- EXIST GYP BD CEILING, TO REMAIN
- EXISTING ADHESIVE-APPLIED 12"X12" ACOUSTIC TILES, TO REMAIN
- NEW/REVISED ADHESIVE-APPLIED 12"X12" TILES
- NEW 2X4 SUSP CEILING TILES/GRID SYSTEM 2 / A-104
- NEW GYP BD CEILING
- A2, A2E — 2X4 LED LIGHT FIXTURE, CEILING MOUNTED, E= EMERGENCY
- B1, B1E — 2X4 LED RECESSED LIGHT FIXTURE, E= EMERGENCY
- A1, A1E — 1X1 LED LIGHT FIXTURE, CEILING MOUNTED, E= EMERGENCY
- A4, A4E — 1X4" LED LIGHT FIXTURE, CEILING MOUNTED, E= EMERGENCY
- C1, C1E — 8" RECESSED DOWNLIGHT FIXTURE, E= EMERGENCY
- S1, S1E — 48" STRIP DOWNLIGHT CEILING MOUNTED, E= EMERGENCY
- U1 — 24" UNDERCABINET LIGHT
- EMERGENCY EXIT SIGN, BATTERY BACK UP
- EMERGENCY EXIT LIGHT, WALL MOUNTED

GENERAL NOTES

1. REMOVE ANY DEBRIS AND DUST FROM CEILING TILES, PREP TILES FOR NEW ACOUSITC CEILING TILE PAINT, PAINT CEILING TILES, ALL ROOMS.
2. NEW CLG HEIGHTS TO MATCH EXIST, UON

CONSTRUCTION NOTES

1. PATCH AREA WHERE WALL REMOVED WITH EXISTING SALVAGED CEILING TILES, ALIGN WITH EXISTING
2. WHERE EXIST WALL REMOVED , PROVIDE GYP BD SOFFIT
3. PROVIDE GYP BD CEILING THIS AREA, ALIGN WITH ADJACENT CEILING HEIGHT, MATCH TEXTURE AND FINISH
4. PROVIDE SUSP CLG CLOUD, SEE DTL 1 / A-104
5. CEILING ACCESS PANELS, COORD W/ OTHER TRADES
6. WHERE LIGHT FIXTURE IS REMOVED & REPLACED, PATCH/REPAIR GYP BD CLG TO MATCH ADJACENT SURFACE



BASEMENT FLOOR PLAN - NEW WORK
1/8" = 1'-0"

FLOOR PLAN - NEW WORK
1/8" = 1'-0"

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consultants:

revisions:

#	Description	Date
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2	ADDENDUM #3	09/17/24

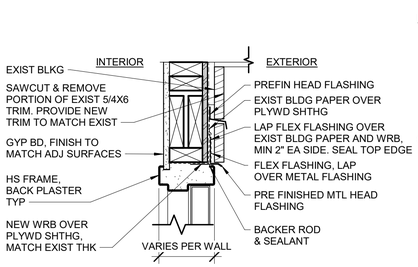
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project: 01623
drawn by: NGB
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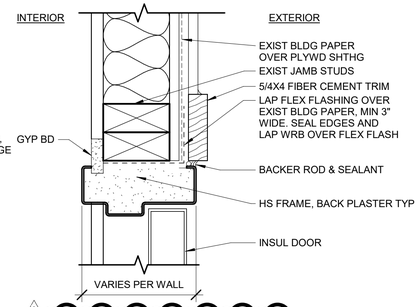
REFLECTED CEILING PLAN

sheet: A-104
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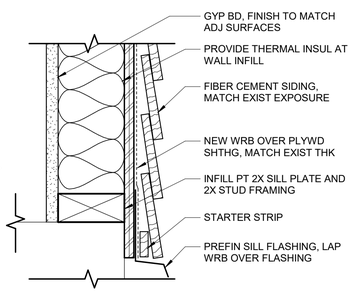
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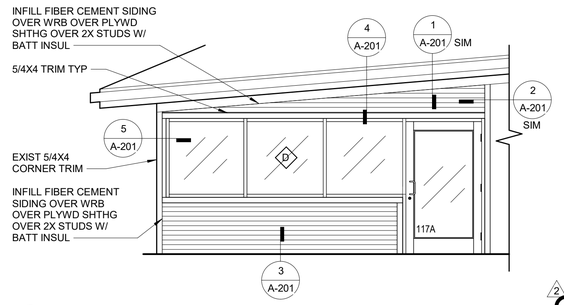
1 EXT DOOR AT HEAD
1 1/2" = 1'-0"



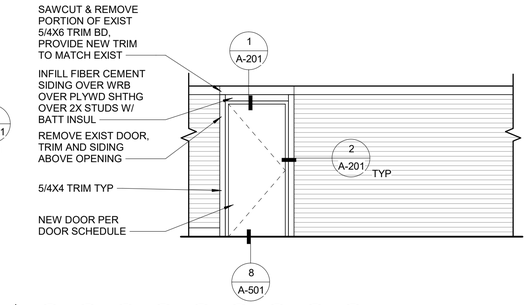
2 EXT DOOR AT JAMB
3" = 1'-0"



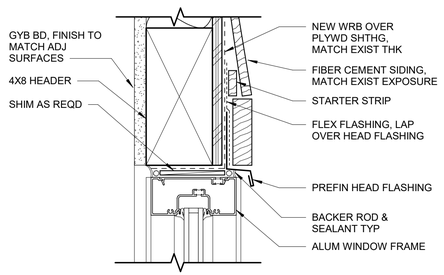
3 EXT WALL AT BASE
3" = 1'-0"



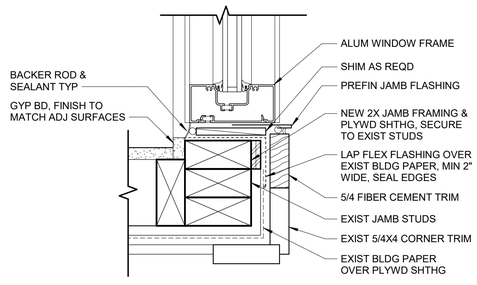
A PATIO - WEST EXTERIOR ELEVATION
1/4" = 1'-0"



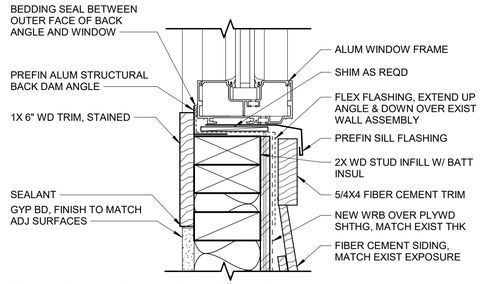
B SOUTH EXTERIOR ELEVATION
1/4" = 1'-0"



4 ALUM WINDOW AT HEAD
3" = 1'-0"



5 ALUM WINDOW AT JAMB
3" = 1'-0"



6 ALUM WINDOW - SILL AT SIDING
3" = 1'-0"

WINDOW SCHEDULE

MARK	WIDTH	HEIGHT	(A) OPERATION TYPE	FRAME MATERIAL	FRAME FINISH	GLASS THICKNESS	(E) GLASS TYPE	(F) GLASS COLOR	(G) REMARKS	U-VALUE	SHGC 2
A	7'-0"	2'-0"	F	HS	ME	1/4"	T	C			
B	4'-0"	3'-8"	F	HS	ME	1.25"	BR	C			
C	10'-3"	4'-0"	F	HS	ME	1/4"	L	C			
D	12'-8"	4'-2"	F	AL	AN	1"	T/IN	CO			
E	3'-8"	3'-8"	F	HS	ME	1.25"	BR	C			
F	4'-0"	4'-0"	F	HS	ME	1/4"	T	C			

OPERATION TYPE
F = FIXED

FRAME MATERIAL
AL = ALUMINUM
HS = HOLLOW STEEL

FRAME FINISH
ME = METAL ENAMEL
AN = ANODIZED ALUMINUM

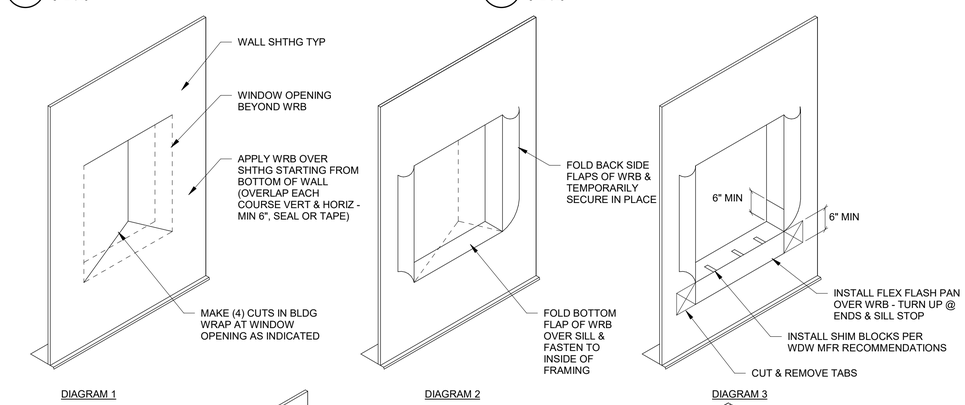
FRAME ELEVATIONS
SEE FRAME ELEVATIONS

GLASS THICKNESS
NUMBER REFERS TO OVERALL GLAZING THICKNESS.

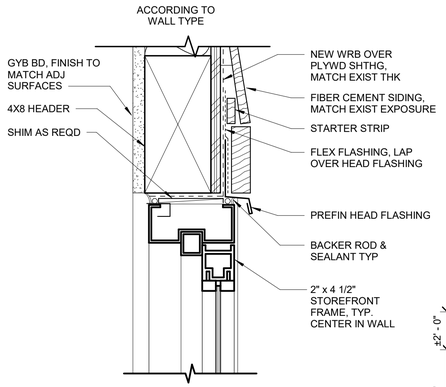
GLASS TYPE
T = TEMPERED
IN = INSULATING
LS = LAMINATED SAFETY
T/IN = TEMPERED INSULATING
BR = BULLET RESISTANT

GLASS COLOR
C = CLEAR
CO = LOW-E COATED

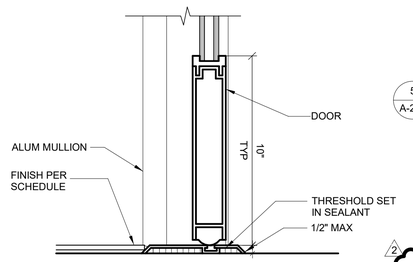
REMARKS
WINDOW NOTES & GENERAL INFORMATION



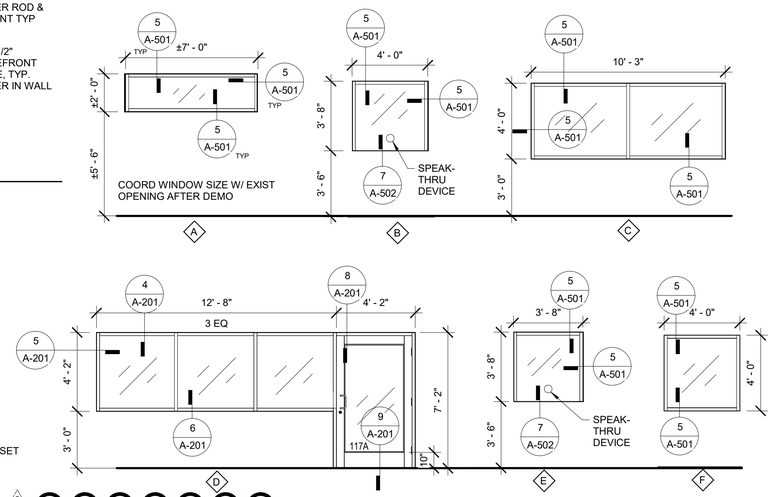
7 WINDOW FLASHING INSTALLATION
1/2" = 1'-0"



8 EXT ALUM DOOR AT HEAD
3" = 1'-0"



9 EXT ALUM DOOR THRESHOLD
3" = 1'-0"



WINDOW ELEVATIONS
1/4" = 1'-0"

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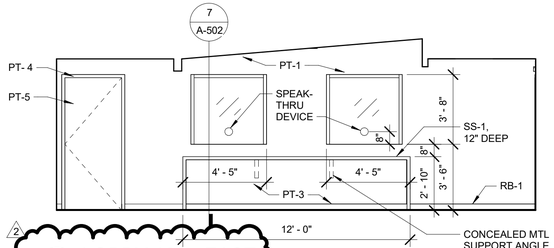
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EXTERIOR ELEVATIONS & DETAILS

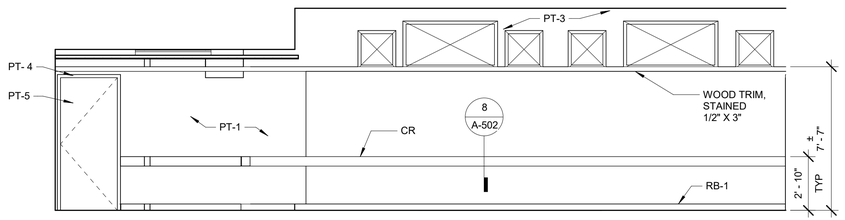
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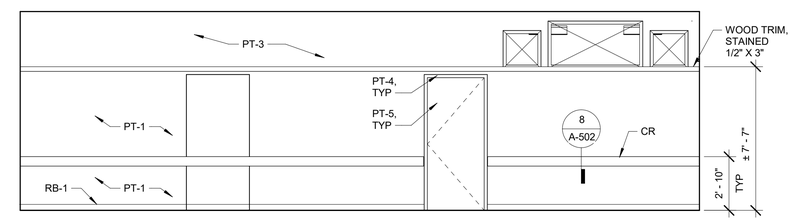
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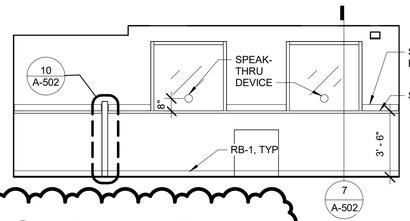
A LOBBY 101 - EAST
1/4" = 1'-0"



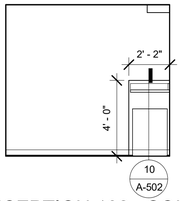
B LOBBY 101 - SOUTH
1/4" = 1'-0"



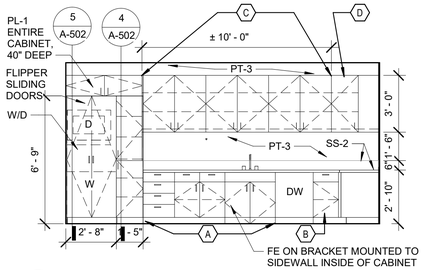
C HALL 157 - SOUTH
1/4" = 1'-0"



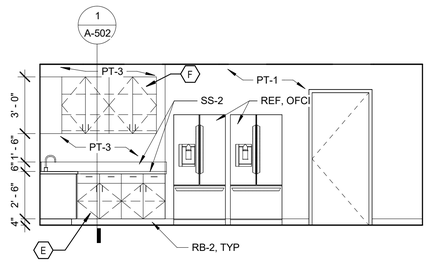
D RECEPTION 102 - WEST
1/4" = 1'-0"



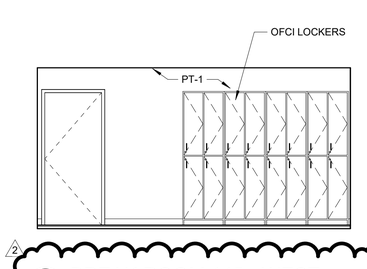
E RECEPTION 102 - SOUTH
1/4" = 1'-0"



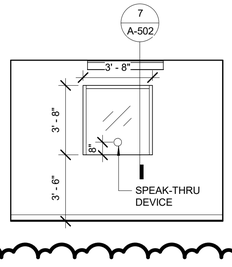
F BREAK ROOM 145 - EAST
1/4" = 1'-0"



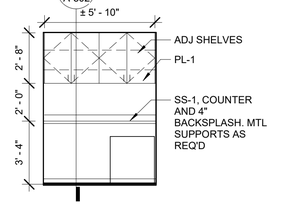
G BREAK ROOM 145 - SOUTH
1/4" = 1'-0"
12" DEEP UPPER
24" DEEP BASE



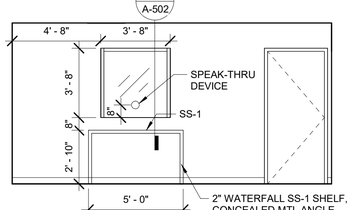
H BREAK ROOM 145 - WEST
1/4" = 1'-0"



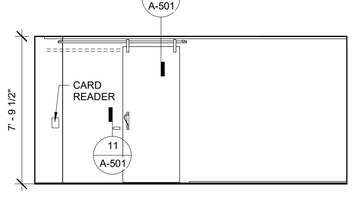
J RECEPTION 118 - EAST
1/4" = 1'-0"



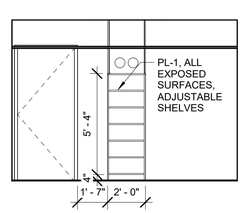
K RECEPTION 118 - SOUTH
1/4" = 1'-0"



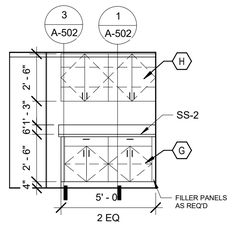
L LOBBY 117 - WEST
1/4" = 1'-0"



M HALL 152 - WEST
1/4" = 1'-0"



N OFFICE 103 - EAST
1/4" = 1'-0"
10" DEEP

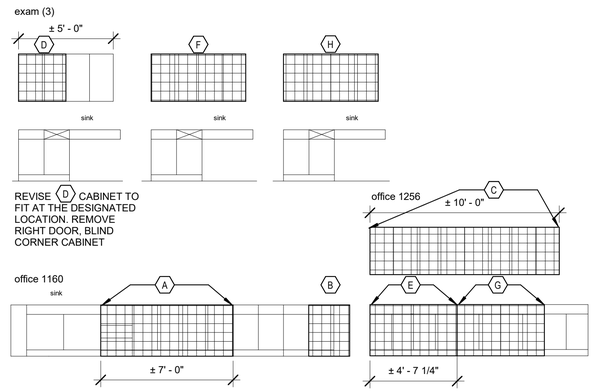


P BREAKROOM 204 - EAST
1/4" = 1'-0"

ELEVATION NOTES

1. ALL CASEWORK BASE AND UPPER CABINETS TO BE RELOCATED FROM MARION COUNTY BUILDING 3180, UON. CONTRACTOR TO VERIFY MEASUREMENTS
2. ALL COUNTERS HAVING A SINK TO BE SS-2, W/ AN INTEGRATED CORIAN SINK
3. ALL COUNTER SURFACES TO BE SS-1 OR SS-2, UON

(A) KEYNOTE CORRELATES TO SECTION OF RELOCATED CASEWORK FROM DETAIL 1 / A-202



1 EXISTING CASEWORK RELOCATED FROM MC 3180 CENTER ST.
1/4" = 1'-0"

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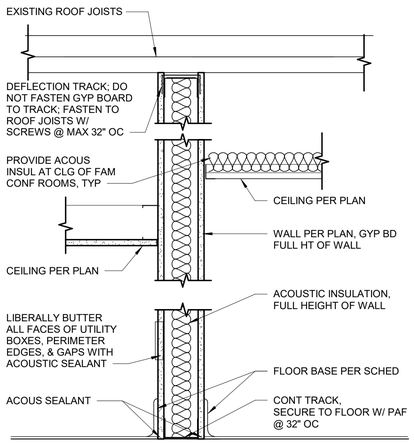
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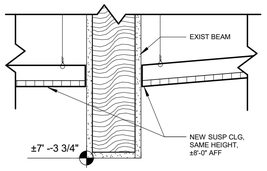
INTERIOR
ELEVATIONS

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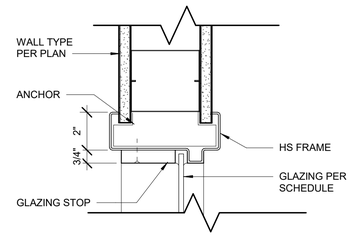
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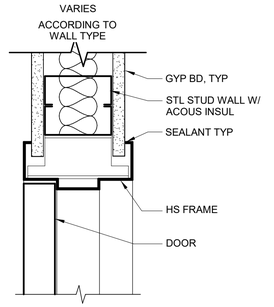
1 TYP WALL DTL
1 1/2" = 1'-0"



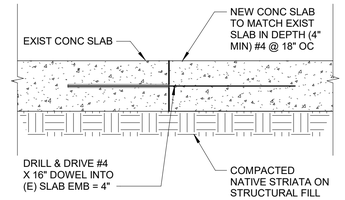
3 SUSP CLG DTL
1 1/2" = 1'-0"



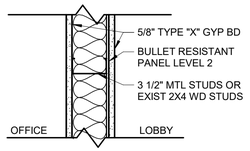
5 INT HS WINDOW - HEAD/JAMB SIM
3" = 1'-0"



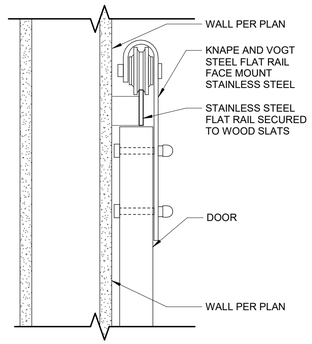
7 HS DOOR/HEAD JAMB SIM
3" = 1'-0"



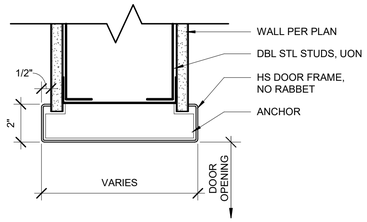
10 CONC SLAB INFILL
1" = 1'-0"



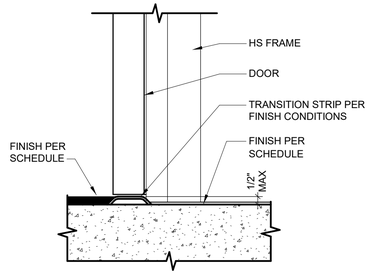
2 BULLET RESISTANT WALL
1 1/2" = 1'-0"



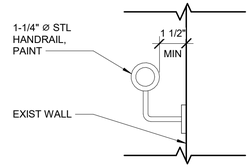
4 BARN DOOR
3" = 1'-0"



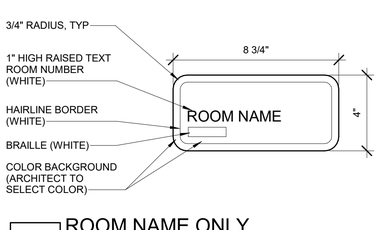
6 DOOR FRAME HEAD/JAMB SIM
3" = 1'-0"



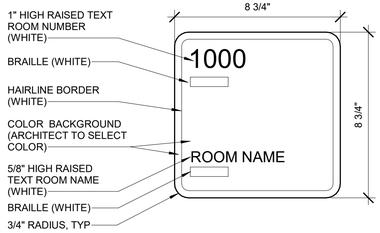
8 INTERIOR DOOR THRESHOLD
3" = 1'-0"



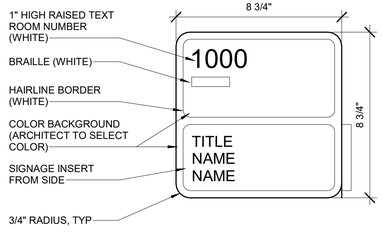
11 HANDRAIL DTL
3" = 1'-0"



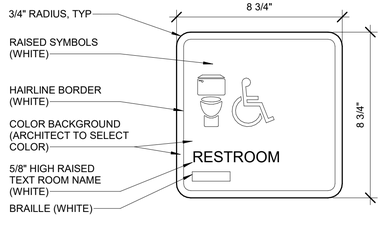
A ROOM NAME ONLY



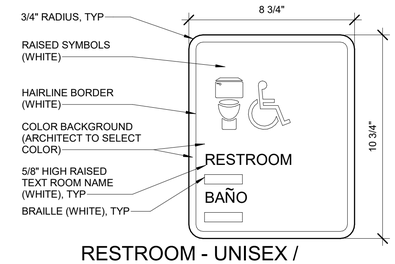
B FIXED ROOM NAME



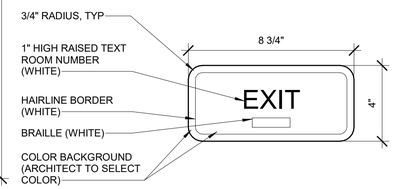
C INSERT ROOM NAME



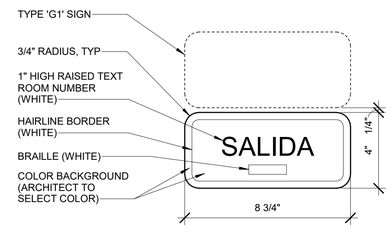
D1 RESTROOM - UNISEX



RESTROOM - UNISEX / SPANISH
D2



E EXIT SIGN



F EXIT SIGN / SPANISH

9 INTERIOR SIGNAGE DETAIL
3" = 1'-0"



2 A PARTIAL WEST ELEVATION
NTS



2 B PARTIAL SOUTH ELEVATION
NTS

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ARCHITECTURE • INTERIOR DESIGN
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REGISTERED ARCHITECT
ANGELA M. FLORES
SALEM, OREGON
STATE OF OREGON

PERMIT SET

project:
MARION COUNTY
BEHAVIORAL HEALTH CRISIS CENTER REMODEL
1234 COMMERCIAL STREET SE SALEM, OREGON 97302

consultants:

revisions:

#	Description	Date
2	ADDENDUM #3	09/17/24

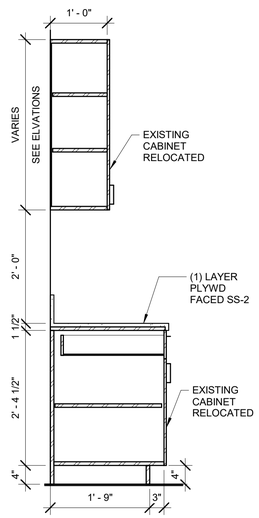
date: 06/06/2024
project: 01623
drawn by: NGB
checked by: AF

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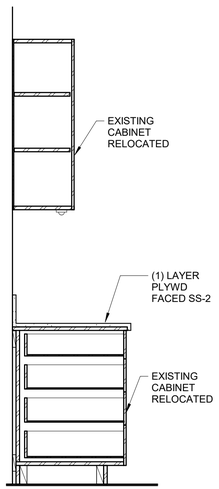
INTERIOR DETAILS

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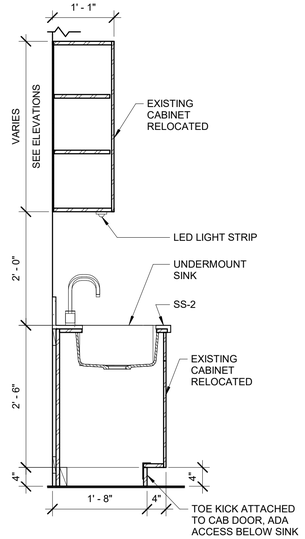
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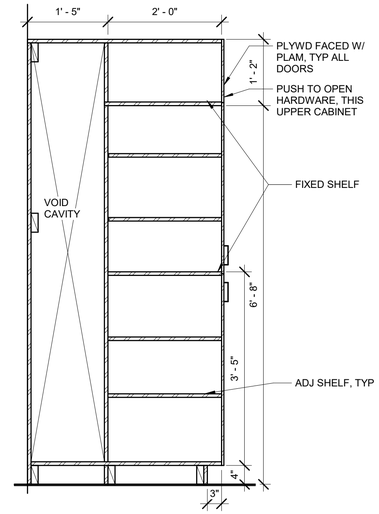
1 CASEWORK, TYP
3/4" = 1'-0"



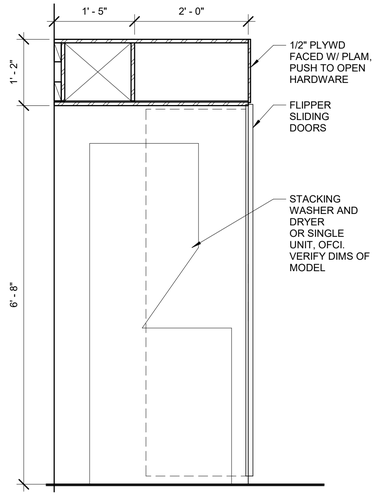
2 CASEWORK
3/4" = 1'-0"



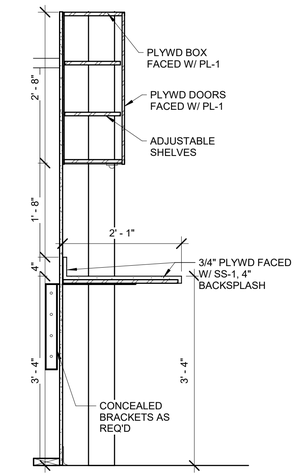
3 CASEWORK DTL
3/4" = 1'-0"



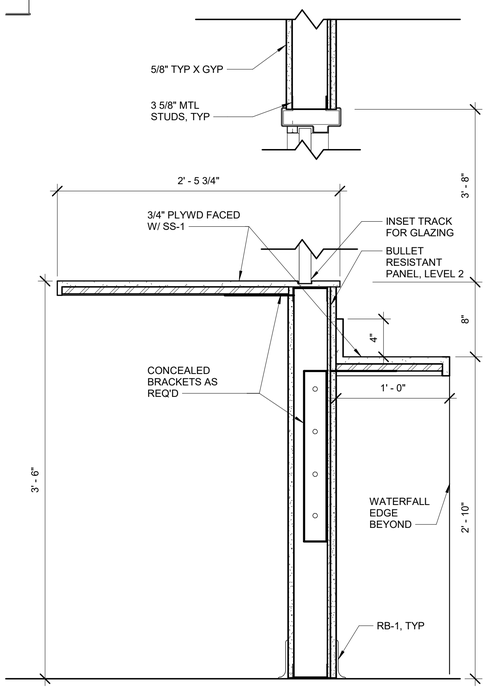
4 LAUNDRY CABINET
3/4" = 1'-0"



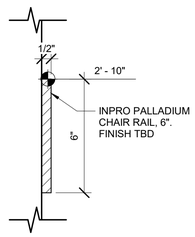
5 LAUNDRY CABINET
3/4" = 1'-0"



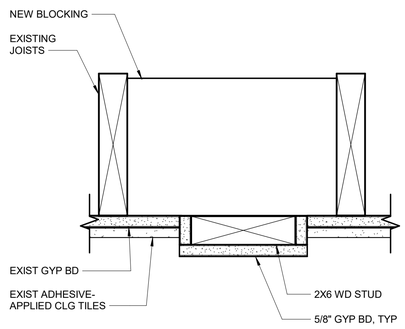
6 RECEPTION 118
3/4" = 1'-0"



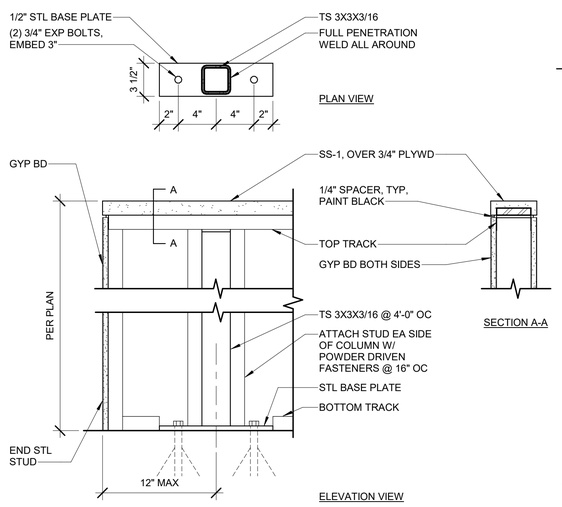
2
7 RECEPTION COUNTER
1 1/2" = 1'-0"



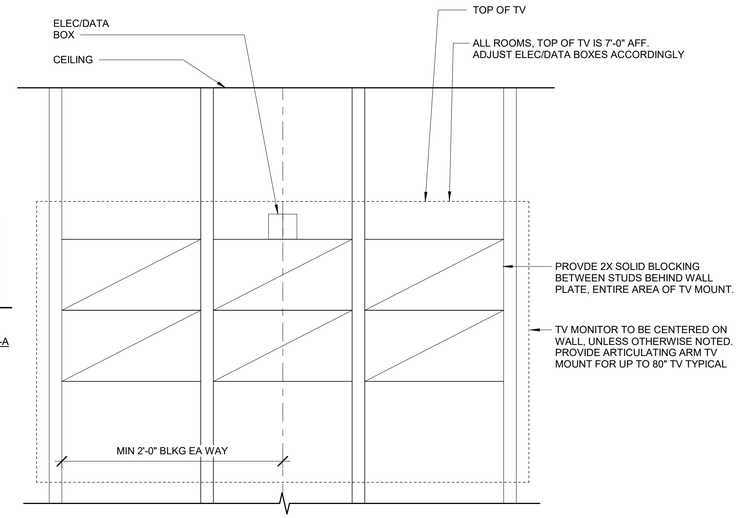
8 CHAIR RAIL DTL
3" = 1'-0"



9 CEILING SOFFIT
3" = 1'-0"



10 PARTIAL HT WALL LATERAL SUPPORT
1 1/2" = 1'-0"



2
11 TV MOUNT DIAGRAM
1" = 1'-0"

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revisions:

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2	ADDENDUM #3	09/17/24

date: 06/06/2024
project: 01623
drawn by: NB
checked by: AF
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INTERIOR DETAILS

sheet: A-502
of:

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ELECTRICAL SYMBOL LEGEND

ABBREVIATIONS

AFF, A.F.F.	ABOVE FINISHED FLOOR
AHJ	AUTHORITY HAVING JURISDICTION
ARCH.	ARCHITECT/ARCHITECTURAL
BLDG.	BUILDING
C	CONDUIT
CD	CANDELA
CKT	CIRCUIT
C.L.	COLUMN LINE
(E)	EXISTING
ELEC	ELECTRICAL
EMERG	EMERGENCY
FAM/FACP	FIRE ALARM MASTER/FIRE ALARM CONTROL PANEL
FT.	FEET
GFI/B	GROUND FAULT INTERRUPTER/BREAKER
GND, G	GROUND
HVAC	HEATING, VENTILATION & AIR CONDITIONING
IDF	INTERMEDIATE DISTRIBUTION FRAME
LV	LOW VOLTAGE
MDF	MAIN DISTRIBUTION FRAME
MECH	MECHANICAL
N.L.	NIGHT LIGHT
PNL	PANEL
PROVIDE	FURNISH AND INSTALL
SD	SUB - DISTRIBUTION
TTB	TELEPHONE TERMINAL BOARD
TVSS / SPD	TRANSIENT VOLTAGE SURGE SUPPRESSION/SURGE PROTECTION DEVICE
TYP	TYPICAL
WP	WEATHER PROOF
"	INCH/INCHES
'	FOOT/FEET

GENERAL

- KEYNOTE
- REVISION TAG
- EQUIPMENT TAG (EXHAUST FAN 1 SHOWN)
- CALLOUT (SHEET E0.00, DETAIL #1)
- KITCHEN EQUIPMENT TAG
- ELECTRICAL EQUIPMENT AS IDENTIFIED ON DRAWINGS.
- UNDERGROUND/ UNDERFLOOR RACEWAY
- HOMERUN WITH 2 #12 CONDUCTORS (GROUND NOT SHOWN)
- HOMERUN WITH 2 #10 CONDUCTORS (GROUND NOT SHOWN)
- HOMERUN WITH 3 #10 CONDUCTORS (GROUND NOT SHOWN)
- CONCEALED RACEWAY AND CONDUCTORS. NUMBER OF SLASHES INDICATES NUMBER OF CONDUCTORS. PROVIDE GROUND CONDUCTOR NOT SHOWN. ZERO SLASHES = 2 CONDUCTORS WITH 3RD GROUND CONDUCTOR. PROVIDE #12 CONDUCTORS UNLESS OTHERWISE SHOWN.
- LOW VOLTAGE CABLE/ HOMERUN C = CONTROL
- FLEX CONNECTION

POWER

- POWER PANEL - SURFACE
- POWER PANEL - RECESSED
- DUPLEX RECEPTACLE
- GROUND FAULT, WEATHERPROOF TYPE
- SPLIT WIRED WITH 1/2 SWITCHED, +44 A.F.F UNO
- SPECIALTY RECEPTACLE, NEMA SIZE AS NOTED.
- DOUBLE DUPLEX RECEPTACLE
- FLOOR BOX, FLOOR BOX WITH DATA
- JUNCTION BOX
- MOTOR
- DISCONNECT (F=FUSED, "BLANK"=SWITCH ONLY)
- SPECIFIC RECEPTACLE, SEE PNL SCHED. AND MECH FOR CONFIGURATION. MATCH CONFIGURATION PER EQUIPMENT INSTALLED

ONE-LINE

- VSD VARIABLE SPEED DRIVE
- SPD SURGE PROTECTIVE DEVICE
- R RELAY
- BREAKER
- GFI BREAKER
- SWITCH
- TRANSFORMER
- M METER
- GROUND
- FUSE

LIGHTING

- $ SWITCH
- $a SWITCH, a = LIGHTS CONTROLLED, 3 = THREE-WAY.
- $OC OCCUPANCY SENSING WALL SWITCH
- $LV LOW VOLTAGE WALL SWITCH
- $D DIMMABLE WALL SWITCH
- $K KEYED SWITCH
- $ WIRELESS SWITCH
- $ DIMMABLE WIRELESS SWITCH
- $a,b DIMMABLE WIRELESS DUAL SWITCH a,b = LIGHTS CONTROLLED (SEPARATE).
- 2x2/2x4/LINEAR RECESSED LIGHT FIXTURE.
- 2x2/2x4/LINEAR SURFACE FIXTURE
- STRIP/WRAP FIXTURE
- PENDANT, SURFACE MOUNT FIXTURE
- RECESSED DOWN LIGHT FIXTURE.
- DIRECTIONAL RECESSED DOWN LIGHT FIXTURE.
- LINEAR FIXTURE IN 4', 8', AND 12' LENGTHS. WALL SCONCE
- WALL MOUNT LIGHT
- EXIT SIGN WITH DIRECTIONAL ARROWS. TYPE "X1"
- POLE MOUNTED LIGHTING
- A1/A1E LIGHTING FIXTURE NOTATION: A1 = FIXTURE TYPE "A1". E = EMERGENCY POWER.
- LINE-VOLTAGE OCCUPANCY SENSOR

EQUIPMENT SCHEDULE

ID	DESCRIPTION	VOLTS	PHASE	AMPS	HP	DISCONNECT	WIRE SIZE	CIRCUIT	NOTES
ERV-1	ENERGY RECOVERY VENTILATOR	120	1	0.88	-	PROVIDE RATED DISCONNECT	3/4"C 2#10, 1#10 GND	F-28	1,2,3
TWHP-1	THROUGH WALL HEAT PUMP	120	1	11	-	PROVIDE RATED RECEPTACLE	3/4"C 2#8, 1#10 GND	F-30	1,3
BEF-1	BATHROOM EXHAUST FAN	120	1	0.14	-	PROVIDE RATED INTEGRAL DISCONNECT	3/4"C 2#10, 1#10 GND	VARIES, SEE PANEL SCHEDULES	1,3,4
SF-1	SUPPLY FAN	120	1	0.12	0.02	PROVIDE RATED DISCONNECT	3/4"C 2#10, 1#10 GND	F-5	1,2,3
EDC-1	ELECTRIC DUCT COIL	208	1	9.6	-	PROVIDE RATED DISCONNECT	3/4"C 3#10, 1#10 GND	F-40,42	1,2
HPO-1	HEAT PUMP	208	1	11	-	PROVIDE RATED DISCONNECT	1"C 3#8, 1#10 GND	F-2,4	1,2
HPO-2	HEAT PUMP	208	1	11	-	PROVIDE RATED DISCONNECT	1"C 3#8, 1#10 GND	F-6,8	1,2
HPO-3	HEAT PUMP	208	1	11	-	PROVIDE RATED DISCONNECT	1"C 3#8, 1#10 GND	F-10,12	1,2
HPO-4	HEAT PUMP	208	1	19	-	PROVIDE RATED DISCONNECT	1 1/4"C 3#6, 1#10GND	F-14,16	1,2

NOTES

1. NOT ALL MATERIALS, HARDWARE, AND DEVICES INDICATED. CONTRACTOR IS REQUIRED TO REVIEW ALL MANUFACTURERS INSTRUCTIONS AND PROVIDE MATERIALS AND HARDWARE AS INDICATED BY MANUFACTURER, CODE, AND THESE DOCUMENTS FOR A COMPLETE AND FUNCTIONAL INSTALLATION. PROVIDE CODE REQUIRED EQUIPMENT, RATINGS, SIZES, AND THE LIKE COORDINATED WITH ACTUAL EQUIPMENT INSTALLED.
2. ENSURE DISCONNECTS ARE CAPABLE OF BEING LOCKED IN THE OPEN POSITION.
3. WHERE MOTOR RATED SWITCH IS REQUIRED, PROVIDE MANUAL MOTOR STARTER IF INSTALLED MOTOR IS NOT PROVIDED WITH INTEGRAL OVERLOAD PROTECTION. EVERY MOTOR TO INCLUDE OVERLOAD PROTECTION, COORDINATE SETTINGS WITH ELECTRICAL ENGINEER IF NOT INCLUDED BY MANUFACTURER.
4. CONTROLS PER MECH, CONNECT TO OC WHERE SHOWN.

LIGHTING FIXTURE SCHEDULE

ID	DESCRIPTION	CAT. No	MANUFAC.	MOUNTING HEIGHT	LAMP (QTY) WATTS
A4	SURFACE, 1X4 W/ TUNABLE WHITE, WIRELESS ON/OFF, 0-10V DIMMING, W/ INTEGRAL OCCUPANCY CONTROL	DIALED 14 3100 90 TW2750 VL W UNV TW(DPTW) 1 SM DOS (RES7 PDT XX) WC(RES7 PDT XX)+WC(RIO) C SHALL INCLUDE BOTH RIO+RES7 PDT XX(BOTH REQUIRED)	AXIS	CEILING SURFACE	30W
A4E	SURFACE, 1X4 W/ TUNABLE WHITE, WIRELESS ON/OFF, 0-10V DIMMING, W/ INTEGRAL OCCUPANCY CONTROL, EMERGENCY BATTERY PACK.	DIALED 14 3100 90 TW2750 VL W UNV TW(DPTW) 1 SM Bxx DOS (RES7 PDT EM XX) WC(RES7 PDT EM XX)+WC(RIO) C SHALL INCLUDE BOTH RIO+RES7 PDT EM XX(BOTH REQUIRED)	AXIS	CEILING SURFACE	31W
A2	SURFACE, 2X4 W/ TUNABLE WHITE, WIRELESS ON/OFF, 0-10V DIMMING, W/ INTEGRAL OCCUPANCY CONTROL	DIALED 24 3100 90 TW2750 VL W UNV TW(DPTW) 1 SM DOS (RES7 PDT XX) WC(RES7 PDT XX)+WC(RIO) C SHALL INCLUDE BOTH RIO+RES7 PDT XX(BOTH REQUIRED)	AXIS	CEILING SURFACE	31W
A2E	SURFACE, 2X4 W/ TUNABLE WHITE, WIRELESS ON/OFF, 0-10V DIMMING, W/ INTEGRAL OCCUPANCY CONTROL, EMERGENCY BATTERY PACK.	DIALED 24 3100 90 TW2750 VL W UNV TW(DPTW) 1 SM Bxx DOS (RES7 PDT EM XX) WC(RES7 PDT EM XX)+WC(RIO) C SHALL INCLUDE BOTH RIO+RES7 PDT EM XX(BOTH REQUIRED)	AXIS	CEILING SURFACE	31W
A4H	CEILING-SUSPENDED, 1X4 W/ TUNABLE WHITE, WIRELESS ON/OFF, 0-10V DIMMING, W/ INTEGRAL OCCUPANCY CONTROL. FIELD FABRICATED SEPARATE MOUNTING PLATE MAY BE REQUIRED. FACTORY BALANCING REQUIRED.	DIALED 14 3100 90 TW2750 VL W UNV TW(DPTW) 1 xx DOS (RES7 PDT XX) WC(RES7 PDT XX)+WC(RIO) C SHALL INCLUDE BOTH RIO+RES7 PDT XX(BOTH REQUIRED)	AXIS	ADJUSTABLE AIRCRAFT CABLE	30W
A4HE	CEILING-SUSPENDED, 1X4 W/ TUNABLE WHITE, WIRELESS ON/OFF, 0-10V DIMMING, W/ INTEGRAL OCCUPANCY CONTROL. FIELD FABRICATED SEPARATE MOUNTING PLATE MAY BE REQUIRED. INTEGRAL EMERGENCY BATTERY PACK. FACTORY BALANCING REQUIRED.	DIALED 14 3100 90 TW2750 VL W UNV TW(DPTW) 1 xx DOS (RES7 PDT EM XX) WC(RES7 PDT EM XX)+WC(RIO) C SHALL INCLUDE BOTH RIO+RES7 PDT EM XX(BOTH REQUIRED)	AXIS	ADJUSTABLE AIRCRAFT CABLE	30W
B1	RECESSED, 2X4 W/ TUNABLE WHITE, WIRELESS ON/OFF, 0-10V DIMMING, W/ INTEGRAL OCCUPANCY CONTROL	DIALED 24 3100 90 TW2750 VL W UNV TW(DPTW) 1 DOS (RES7 PDT XX) WC(RES7 PDT XX)+WC(RIO) C SHALL INCLUDE BOTH RIO+RES7 PDT XX(BOTH REQUIRED)	AXIS	CEILING RECESSED	31W
B1E	RECESSED, 2X4 W/ TUNABLE WHITE, WIRELESS ON/OFF, 0-10V DIMMING, W/ INTEGRAL OCCUPANCY CONTROL	DIALED 24 3100 90 TW2750 VL W UNV TW(DPTW) 1 Bxx DOS (RES7 PDT EM XX) WC(RES7 PDT EM XX)+WC(RIO) C SHALL INCLUDE BOTH RIO+RES7 PDT EM XX(BOTH REQUIRED)	AXIS	CEILING RECESSED	31W
C1	RECESSED HIGH ABUSE CAN LIGHT,0-10V DIMMING, 40K 90CRI. PROVIDE CM-9 LINE-VOLTAGE OCCUPANCY SENSOR W/ ACIPE HUBBLE COVER	HADL6 FF 2FW 22L 40K9 W FW 9 RIG6 DV DIM1	KENALL	CEILING RECESSED	24W
C1E	RECESSED HIGH ABUSE CAN LIGHT,0-10V DIMMING, 40K 90CRI WITH BATTERY BACKUP. INCLUDE CMR LINE-VOLTAGE OCCUPANCY SENSOR W/ ACIPE HUBBLE COVER.	HADL6 FF 2FW 22L 40K9 W FW 9 RIG6 DV DIM1 LEL	KENALL	CEILING RECESSED	24W
C2	WALL WASH WITH BAFFLE AND FULL REFLECTOR, E26 6" TRIM SERIES, 35-DEGREE TILT, 600LM, 4000K (COORDINATE TEMPERATURE WITH ARCHITECT), DAMP-LISTED	430W+DAMP LISTED	HALO	RECESSED, EXT, TRIM	100W
S1	STRIP LIGHT, WIRELESS ON/OFF, 0-10V DIMMING, OCCUPANCY SENSOR	CLX L48 5000LM SEF WDL WD MVOLT GZ1 40K 80CRI NLIGHTAIR2 RES7 PDT XX WH	LITHONIA	CEILING SURFACE	32W
S1E	STRIP LIGHT, WIRELESS ON/OFF, 0-10V DIMMING, OCCUPANCY SENSOR, EMERGENCY BATTERY PACK.	CLX L48 5000LM SEF WDL WD MVOLT GZ1 40K 80CRI E10WLCP NLIGHTAIR2 RES7 PDT EM XX WH	LITHONIA	CEILING SURFACE	32W
S2	24" STRIP LIGHT, WIRELESS ON/OFF, 0-10V DIMMING, OCCUPANCY SENSOR	CLX L24 4500LM SEF FDL WD MVOLT GZ1 40K 80CRI NLIGHTAIR2 RES7 PDT XX WH	LITHONIA	CEILING SURFACE	38W
U1	KNOOK OCCUPANCY SENSOR WHITE, ROCKER SWITCH, 120V INPUT, 8"	OCSKNOOKFAW	RAB	UNDERCABINET	4.4W
U2	PULL-STRING VANITY, BAKER CHROME, 2-LAMP LIGHT LAMPS BY OWNER	MODEL #: VL3375CH	PATRIOT LIGHTING	VANITY	(2) x 60W 120W
V1	COLOR TEMPERATURE ADJUSTABLE LED STRIP. WAC DRIVER. WAC LINEAR CHANNEL. PROVIDE INTERFACE POWER PACK CONTROLLED BY NLIGHT AIR. SUBMIT SHOP DRAWINGS SHOWING FIXTURE INTEGRATED TO CLOUD CEILING. LENGTHS PER ARCHITECTURAL FEATURE APPROX. 6'X14' REQUIRING (2) DRIVERS, AND MULTIPLE CHANNEL LENGTHS. PROVIDE ADDITIONAL INTERFACE POWER PACK FOR EACH DRIVER AS NECESSARY.	T24-CS4 XX 2750 WT, PS-24DC-U96R-CS-SM, LED-T-CH3-WF, LED-T-CL2-PT	WAC	ARCHITECTURAL CLOUD	92W
W1E	EXTERIOR DOWN WALLPACK, NON-MAINTAINED, 635 LUMENS, 4000K	PEL OEL DDBTXD UVOLT LTP SDRT FCT	LITHONIA	7'5" AFF, WALL SURFACE	11.28W
W2E	EXTERIOR, WALL-MOUNT, NON-MAINTAINED, 600 LUMENS, 3000k	OWL - EM - BZ - MB	ISOLITE	ABOVE DOOR, PER AHJ	17W
X1	EXIT SIGN	LQM S W 3 R 120/277 M6	LQM QUANTUM	CEILING SURFACE	0.62W

NOTES:
1. FIXTURE FINISH PER ARCH.ITECT.
2. EVERY FIXTURE WITH ID-SUFFIX "P" WILL UTILIZE OCCUPANCY CONTROL, AND DAYLIGHT HARVESTING. EVERY FIXTURE WITH ID-SUFFIX "C" WILL UTILIZE OCCUPANCY SENSING ONLY. FIXTURES WITH NO "P", OR "C" SUFFIX SHALL BE MANUALLY CONTROLLED. PROVIDE BOTH OCCUPANCY, AND PHOTOCELL HARDWARE WHERE SPECIFIED EVEN IF NOT UTILIZED.
3. FIXTURES WITH "E" DESIGNATION TO INCLUDE INTEGRAL BATTERY PACK.

GENERAL NOTES

1. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2. DRAWINGS ARE DEVELOPED AS DIGITAL DOCUMENTS. IF CONTRACTOR ELECTS TO PRINT, CONTRACTOR SHALL OBSERVE COPYRIGHT AND DRAWING OWNERSHIP AS WELL AS PRINT TO PROPER SCALE INCLUDING TEXT SIZE READABILITY IS THE RESPONSIBILITY OF THE CONTRACTOR. IF TEXT IS UNREADABLE ON PRINTED VERSION, CONTACT THE AUTHOR. DRAWINGS ARE INTENDED TO BE READ WITH DIGITAL ZOOM FUNCTION.
3. HARD-COPY SINGED AND STAMPED FINAL DOCUMENTS THAT ARE PRINTED, AND/OR UTILIZED SHALL BE PRINTED AT THE INTENDED SCALE, AND SHALL BE PRINTED SUCH THAT ENGINEER'S SEAL IS LEGIBLE, AND NOT LESS THAN 2-INCHES BY 2-INCHES POINT-TO-POINT PER OAR 820-025-0005. SCALE OF ENGINEER'S SEAL MAY BE DIFFERENT THAN INTENDED DRAWING SCALE SUCH THAT ENGINEER'S SEAL SIZE SHALL NOT BE RELIED UPON AS CORRECT DRAWING SCALE, AND/OR PAPER SIZE. DRAWINGS ARE INTENDED AS DIGITAL DOCUMENTS WHERE SEAL SIZE IS ZOOMABLE TO MEET OAR 820-025-0005.
4. DRAWING DETAIL CALL-OUTS MAY BE PARTIAL. EVERY DETAIL IS APPLICABLE TO THE PROJECT AS A WHOLE WHERE SUCH DETAILED CONDITION EXISTS.
5. ROUTE VIA ATTIC, DERATE AS INDICATED.
6. LOW-VOLT RACEWAY PROVIDED BY OWNER.
7. rPODLA 2P DX SWITCHES WITH DUPLICATE ZONE INDICATION WILL USE EACH ZONE(ON SWTCH) FOR RESPECTIVE TWO-CHANNEL CONTROL.

SHEET INDEX

E-000	LEGENDS & SCHEDULES
E-010	ONE-LINE
E-100	POWER DEMOLITION PLAN
E-200	POWER PLAN
E-300	LIGHTING PLAN
E-600	DETAILS

LIGHTING CONTROLS SCHEDULE

CONTROL ID	DESCRIPTION
$	STANDARD LINE-VOLTAGE SWITCH
$	2-BUTTON STYLE WIRELESS SWITCH. SEE DETAILS.
$D	3-BUTTON STYLE SWITCH. SEE DETAILS.
$a D	3-BUTTON STYLE SWITCH. SEE DETAILS.
$a,b D	6-BUTTON STYLE SWITCH. SEE DETAILS

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ELECTRICAL ENGINEERING • CONSULTING

project: MARION COUNTY BEHAVIORAL HEALTH CRISIS CENTER REMODEL
1234 COMMERCIAL STREET SE SALEM, OREGON 97302

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2 ADDENDUM 2

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LEGENDS & SCHEDULES

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(E) SERVICE BUILDING CALCULATION

EXISTING MAXIMUM DEMAND FROM UTILITY: 148A (53 kW) @ 208V 3-PHASE, 148 AMPS X 1.25 (NEC) = 185 AMPS

ADDITIONAL LOAD FROM THIS PROJECT	
LIGHTING (LED)	0.0A @ 208V 3P *
RECEPTACLES	70.3A @ 208V 3P
MECHANICAL	41.8A @ 208V 3P
TOTAL ADDITIONAL	120A @ 208V 3P
TOTAL ADDTIONAL	120A @ 208V 3P
EXISTING LOAD	185A @ 208V 3P
TOTAL AMPS	305A @ 208V 3P

600A>305A

EXISTING SERVICE SIZE:600 AMPS, SERVICE MEETS AMPACITY REQUIREMENTS FOR PERMANENT AND TEMPORARY SERVICE LOADING.

* LED LIGHTING TO REPLACE EXISTING, LED IS LESS LOAD THAN EXISTING LIGHTING, AND THUS OVERALL LIGHTING LOAD DECREASES (NOT SHOWN AS NEGATIVE)

AMPACITY CALCULATION: CONDUCTORS IN ATTIC (AND ASSOCIATED HOME RUNS)

AMBIENT DESIGN TEMPERATURE (NOT BY EOR): 130 DEGREES FAHRENHEIT

ADJUSTMENT FACTOR FOR 75 DEGREE RATED CONDUCTORS (GREATER THAN 100A, THHN SPECIFIED) PER NEC TABLE 310.15(B)(1)(2): 0.76 (76%)

ADJUSTMENT FACTOR FOR 60 DEGREE RATED CONDUCTORS (LESS THAN 100A, THHN SPECIFIED) PER NEC TABLE 310.15(B)(1)(2): 0.50 (50%)

15A RATED BRANCH CIRCUITS: (#10 AWG CU PER NEC 310.16) 30A X 0.50 = 15A
15A ≥ 15A
UTILIZE #10 AWG

20A RATED BRANCH CIRCUITS: (#8 AWG CU PER NEC 310.16) 40A X 0.50 = 20A
20A ≥ 20A
UTILIZE #8 AWG

30A RATED BRANCH CIRCUITS: (#6 AWG CU PER NEC 310.16) 55A (NEXT SIZE UP RULE) -> 60 X 0.50 = 30A
30A ≥ 30A
UTILIZE #6 AWG

225A RATED FEEDER: (#350 CU PER NEC 310.16) 310A X 0.76 = 235.6A
235.6A ≥ 225A
UTILIZE #350

PANEL SCHEDULE

PANEL F

SURFACE MOUNTED

23,869 SCA AVAILABLE | 3 PHASE | 120/208 VOLTS

225 AMP BUS | 225 AMP THRU LUGS

SERVICE	LOAD (AMP)	BREAKER (A/P)	CIRCUIT (# & Φ)			BREAKER (A/P)	LOAD (AMP)	SERVICE
CONFERENCE 123, 126 RECPTS	4.5	20/1	1	A	2	20/2	11.0	HPO-1
CONFERENCE 123, 126 RECPTS	3.0	20/1	3	B	4		11.0	HPO-1
CONFERENCE SF-1	0.1	15/1	5	C	6	20/2	11.0	HPO-2
CONFERENCE 120 RECPTS	6.0	20/1	7	A	8		11.0	HPO-2
RECEPTION 118, 117 RECPTS	6.0	20/1	9	B	10	20/2	11.0	HPO-3
LOBBY 117, 118 RECPTS	3.0	20/1	11	C	12		11.0	HPO-3
VESTIBULE 116 RECPTS	3.0	20/1	13	A	14	25/2	19.0	HPO-4
BATHROOM 115 RECPTS	1.5	20/1	15	B	16		19.0	HPO-4
RECEPTION 102 RECPTS	4.5	20/1	17	C	18	20/1	1.5	* OFFICE 112 DRINKING FTN
RECEPTION 102 RECPTS	4.5	20/1	19	A	20	20/1	6.0	OFFICE 112, 111 RECPTS
REFRIGERATOR RECPTS	5.0	20/1	21	B	22	20/1	6.0	OFFICE 111, 112 RECPTS
VENDING MACH *	1.5	20/1	23	C	24	20/1	0.0	SPARE
SERVER RACK	19.0	30/2	25	A	26	20/1	0.0	SPARE
SERVER RACK	19.0		27	B	28	15/1	0.9	ERV-1
SERVER RACK	19.0	30/2	29	C	30	20/1	11.0	TWHP-1
SERVER RACK	19.0		31	A	32	20/1	1.4	EAST EGRESS LIGHTS
SERVER RM RECPTS	3.0	20/1	33	B	34	20/1	2.7	OFFICE 111 & 112 LIGHTS
PRINTER/COPPIER	12.0	20/2	35	C	36	20/1	6.0	CONF RMS LIGHTS
PRINTER/COPPIER	12.0		37	A	38	20/1	2.5	EAST ENTRY AREA LIGHTS
PRINTER/COPPIER	12.0	20/2	39	B	40	15/2	9.6	EDC1
PRINTER/COPPIER	12.0		41	C	42		9.6	EDC1

NOTES: PROVIDE INTEGRAL SPD
* = PROVIDE GFI BREAKER PROTECTION

SUMMARY (AMPS):

		PHASE LOAD A	B	C
THIS PANEL CONNECTED		118.9	109.6	102.2
THIS PANEL DEMAND		118.9	90.6	102.2
SUB-PANEL PANEL G CONNECTED		44.2	45.7	59.4
SUB-PANEL PANEL G DEMAND		44.2	45.7	59.4
TOTALS :	*CONNECTED*	163.1	155.3	161.6
	DEMAND	163.1	136.3	161.6

DEMAND LOAD	163.1
CONTINUOUS LOAD (INCLUDES SUB-PANEL PANEL G)	3.1
SPARE LOAD	8.2
TOTAL LOAD	174.4
FUTURE	8.7
183.1 DESIGN LOAD	

PANEL SCHEDULE

PANEL G

FLUSH MOUNTED

18,574 SCA AVAILABLE | 3 PHASE | 120/208 VOLTS

225 AMP BUS | 225 AMP LUGS

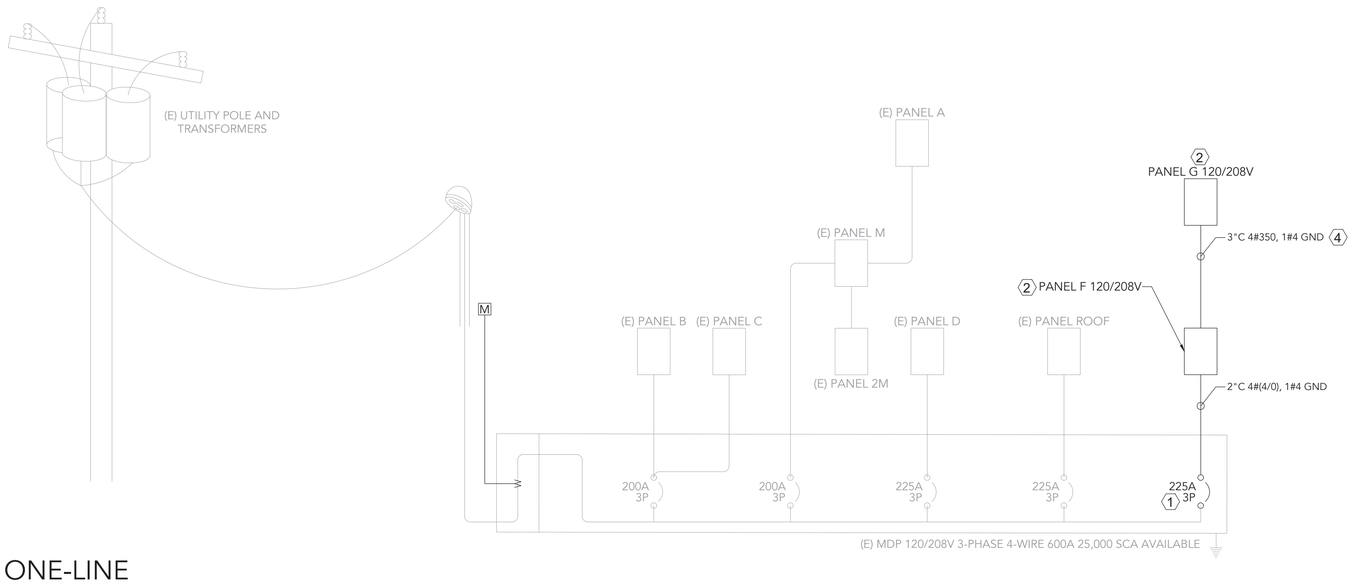
SERVICE	LOAD (AMP)	BREAKER (A/P)	CIRCUIT (# & Φ)			BREAKER (A/P)	LOAD (AMP)	SERVICE
OFFICE 143 RECPTS	4.5	20/1	1	A	2	20/1	1.5	REFRIGERATOR* RECPTS
OFFICE 143 RECPTS	3.0	20/1	3	B	4	20/1	1.5	REFRIGERATOR* RECPTS
STORAGE 146 RECPTS	1.5	20/1	5	C	6	20/1	4.5	BREAK RM 145 FLR RECPTS
BATHROOM 147 BEF-1	0.1	15/1	7	A	8	20/1	1.5	BREAK RM UNDER CAB RECPTS
BATHROOM 148 BEF-1	0.1	15/1	9	B	10	20/1	3.0	BREAK RM COUNTER RECPTS
OFFICE 130 RECPTS	6.0	20/1	11	C	12	20/1	3.0	BREAK RM COUNTER RECPTS
JANITOR 129 BEF-1	0.1	15/1	13	A	14	15/1	0.1	BREAK RM BEF-1
BATHROOM 128 BEF-1	0.1	15/1	15	B	16	20/1	10.0	WASHER*
DIV DIRECTOR, CONF 123 RECPTS	6.0	20/1	17	C	18	30/2	20.0	DRYER
WEST EGRESS LIGHTS	1.3	20/1	19	A	20		20.0	DRYER
WEST RESTROOMS LIGHTS	0.9	20/1	21	B	22	20/1	1.5	KEYWATCHER RECPTS
NORTH LOBBY AREA LIGHTS	3.4	20/1	23	C	24	20/1	1.5	TV RECPTS
PRINTER/COPPIER	12.0	20/2	25	A	26	20/1	1.5	TV RECPTS
PRINTER/COPPIER	12.0		27	B	28	20/1	1.5	TV RECPTS
SPARE	0.0	20/1	29	C	30	20/1	1.5	TV RECPTS
SPARE	0.0	20/1	31	A	32	20/1	1.5	*DRINKING FNTN
PRINTER/COPPIER	12.0	20/2	33	B	34	20/1	0.0	SPARE
PRINTER/COPPIER	12.0		35	C	36	20/1	0.0	SPARE
SPARE	0.0	20/1	37	A	38	20/1	0.0	SPARE
SPARE	0.0	20/1	39	B	40	20/1	0.0	SPARE
SPARE	0.0	20/1	41	C	42	20/1	0.0	SPARE

NOTES: PROVIDE INTEGRAL SPD
* = PROVIDE GFI BREAKER PROTECTION

SUMMARY (AMPS):

	PHASE LOAD A	B	C
CONNECTED	44.2	45.7	59.4
DEMAND	44.2	45.7	59.4

DEMAND LOAD	59.4
CONTINUOUS LOAD	0.5
SPARE LOAD	3.0
TOTAL LOAD	62.8
FUTURE	3.1
66.0 DESIGN LOAD	



1 E-010 ONE-LINE

SCALE: NTS

SHEET NOTES

A. NEW BREAKERS SHALL BE BY THE SAME MANUFACTURER.

B. DOORS TO ELECTRIC ROOMS SHALL BE SIGNED AS SUCH. CIRCUIT BREAKERS SHALL BE LEGIBLY AND PERMANENTLY MARKED, SEE SPECIFICATIONS.

C. EXTERIOR ELECTRICAL EQUIPMENT SHALL BE NEMA 3R OR MORE STRINGENT AS REQUIRED.

D. NEW PANELBOARD FAULT CURRENT RATING SHALL MATCH, OR EXCEED RATING OF EXISTING ELECTRICAL EQUIPMENT, AND NOT BE LESS THAN SHOWN ON PANEL SCHEDULES.

#KEYNOTES

1. PROVIDE EATON KPH SERIES RETROFIT KIT AND 225A 3-POLE BREAKER IN EXISTING BLANK SPACE AVAILABLE IN (E) CUTLER HAMMER MP40 MDP. NEW BREAKER MANUFACTURER AND FAULT CURRENT RATING SHALL MATCH EXISTING.
2. PROVIDE NEW 120/208V 225A 3-PHASE 4-WIRE PANELBOARD. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
3. NOT USED.
4. ROUTE VIA ATTIC, DERATED AS INDICATED.

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project:
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revisions:
1 ADDENDUM 1
2 ADDENDUM 2

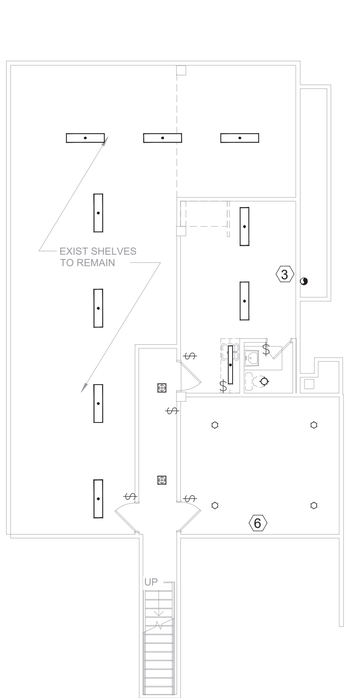
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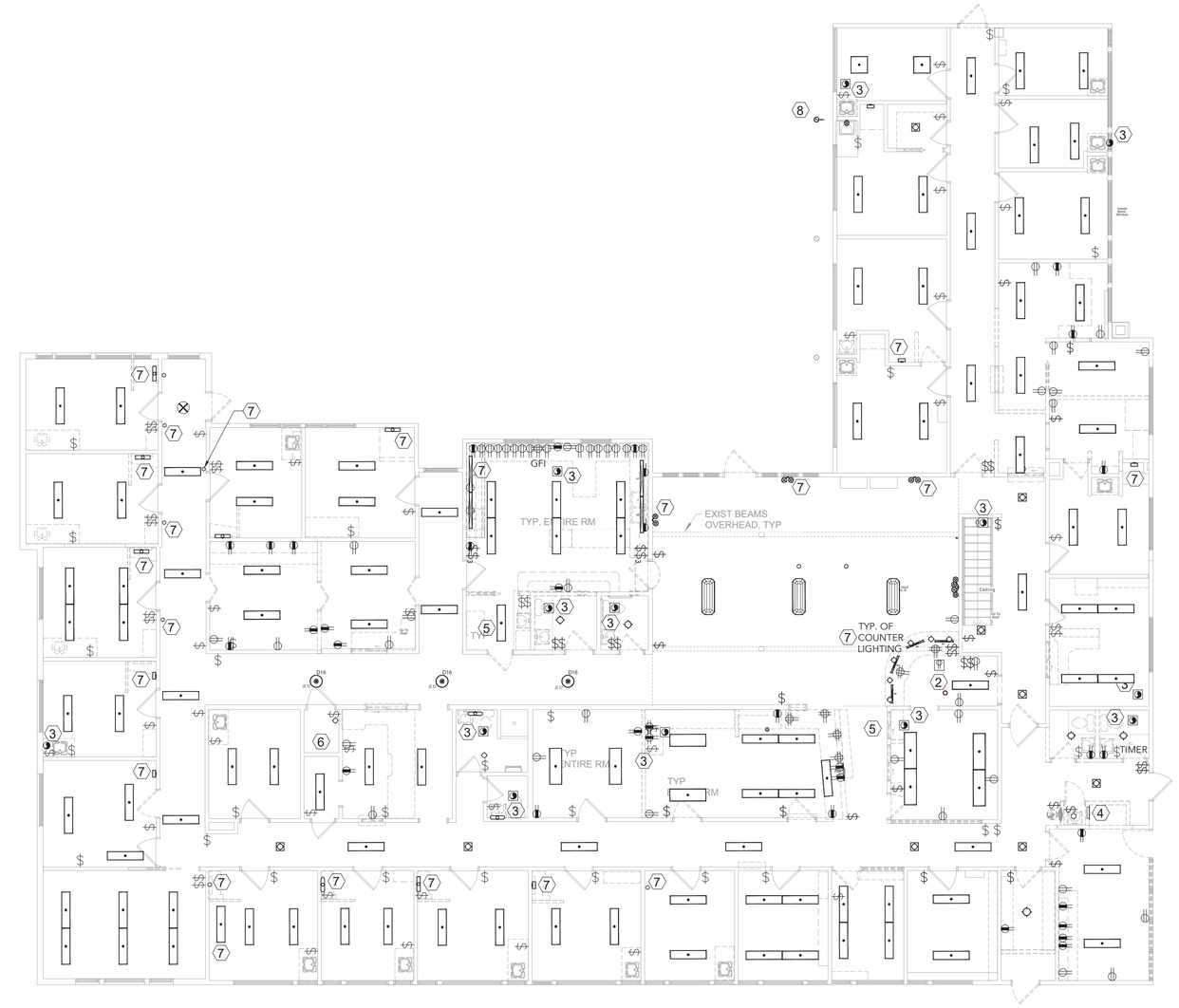
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2 E-100 BASEMENT POWER DEMOLITION
SCALE: 0 4' 8' 16'



1 E-100 LEVEL 01 POWER DEMOLITION
SCALE: 0 4' 8' 16'

SHEET NOTES

A. OWNER SHALL HAVE FIRST RIGHT OF REFUSAL OF REMOVED EQUIPMENT. CONTRACTOR SHALL INCLUDE COMPLETE DISPOSAL COSTS IN BID AND ASSUME NO EQUIPMENT SALVAGED TO OWNER.

B. LOCATION OF EQUIPMENT SHOWN IS APPROXIMATE, CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO START OF WORK.

C. CONTRACTOR SHALL SEAL, PATCH, PAINT, AND REPAIR FLOORS, AND WALLS TO MATCH ADJACENT MATERIAL, FINISH, AND COLOR UNLESS OTHERWISE NOTED. PATCHWORK SHALL BE COORDINATED WITH NEW WORK. SEE ARCHITECT FOR ADDITIONAL REQUIREMENTS.

D. SEE DEMOLITION SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. NOT ALL DEMOLITION WORK MAY BE SHOWN.

E. UNLESS OTHERWISE INDICATED, REMOVED EXISTING FIXTURE. PROTECT AND REUSE (E) CIRCUITRY.

F. VERIFY (E) EXTERIOR CIRCUIT R-19 TO ROOF PHOTOCELL. REMOVE ANY EXISTING TIMERS AND (E) PHOTOCELL. PROVIDE UNSWITCHED HOT TO (E) EXTERIOR SOFFIT LIGHTS THOUGHT TO BE ON ROOF R-19 CIRCUIT WITH PHOTOCELL.

G. REFER TO NEW PLANS SHOWING NEW FIXTURES, NOT ALL LOCATIONS WILL BE REUSED. SEE KN 7, NOT ALL LOCATIONS SHOWN WHERE KN 7 MAY APPLY.

#KEYNOTES

1. NOT USED.
2. REMOVE (E) FLOOR BOX. PROVIDE PATCH AS REQUIRED TO SEAL PENETRATION. PATCH SHALL MATCH EXISTING FLOOR SPACE.
3. REMOVE ELECTRICAL CONNECTION FOR SHOWN EXHAUST FAN, SEE MECHANICAL FOR EXACT LOCATION, AND ADDITIONAL REQUIREMENTS.
4. PROTECT AND RE-LOCATE EXISTING FIRE ALARM CONTROL PANEL (FACP); COORDINATE WITH OWNER.
5. SEE PLANS FOR NEW FIXTURES IN THIS LOCATION. REMOVE EXISTING AS REQUIRED.
6. REMOVE (E) TIME CLOCK FOR (E) PTAC. RETAIN (E) BRANCH CIRCUIT TO PTAC RECEPTACLE, AND CONDUCTORS. EXTEND AS REQUIRED TO MAINTAIN CONNECTION. SEE DETAIL PHOTOS FOR CONDITION.
7. REMOVE COMPLETE, CIRCUIT IN THIS SPECIFIC LOCATION IS NOT REUSED..
8. REMOVE (E) FIXTURE TRIM. PROTECT (E) HOUSING FOR NEW INSTALLATION. SEE PLANS.

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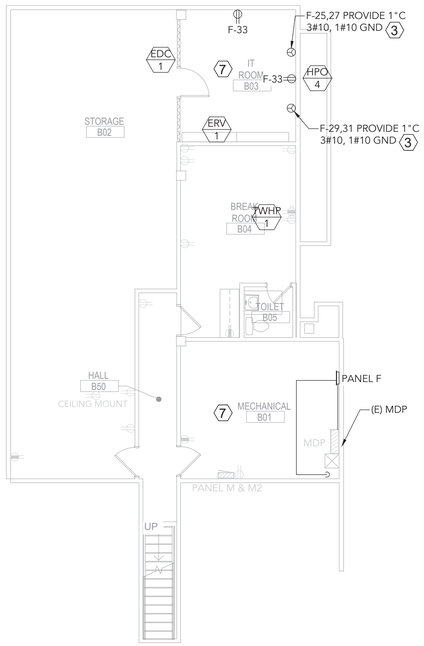
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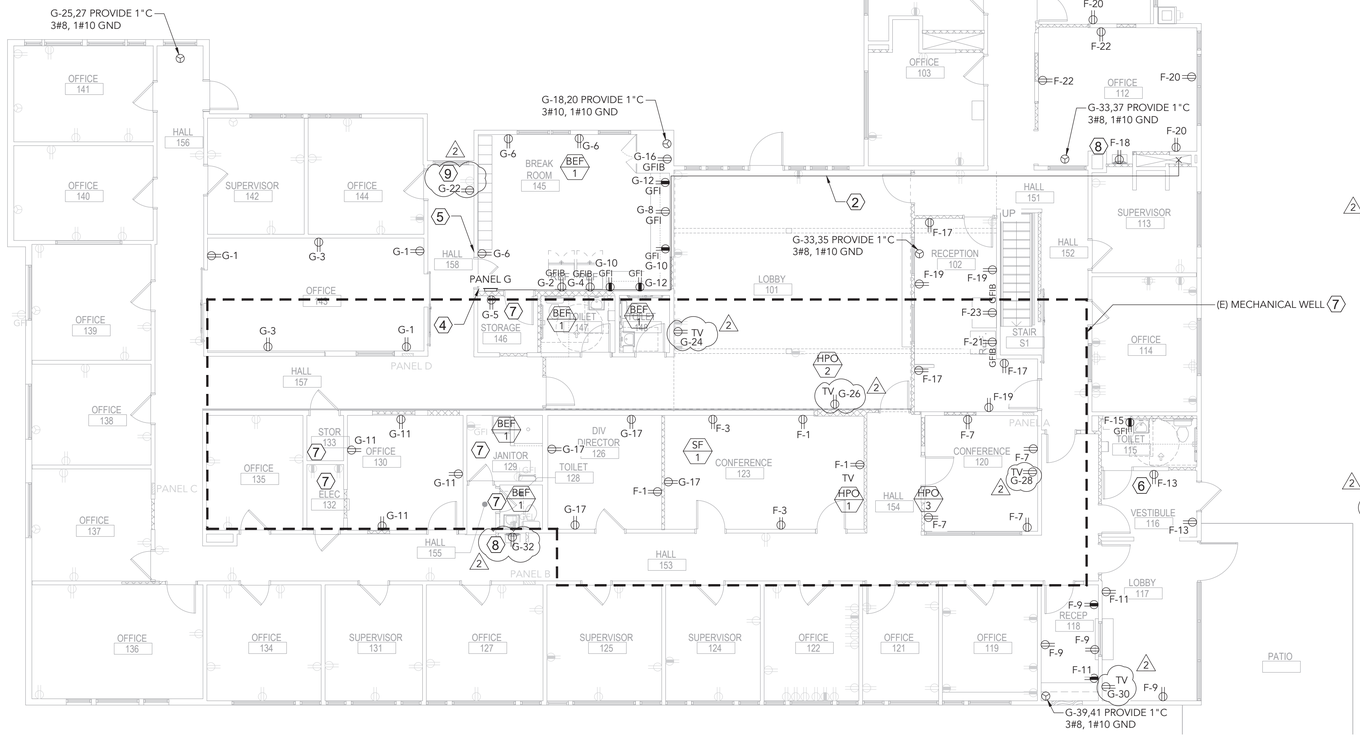
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ELECTRICAL
DEMOLITION
POWER PLAN

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SHEET NOTES

A. EXISTING PANELBOARD AND RECEPTACLES SHOWN AS REFERENCE ONLY.

B. SEE ONE-LINE FOR ADDITIONAL REQUIREMENTS .

C. SEE SPECIFICATIONS FOR J-BOX REQUIREMENTS, NOT ALL J-BOXES REQUIRED ARE SHOWN.

D. BUILDING PENETRATIONS SHALL BE WEATHERPROOF SEALED, PROVIDE LINK SEAL OR APPROVED.

E. SEE MECHANICAL FOR EXACT HVAC, AND PLUMBING EQUIPMENT LOCATIONS.

F. CONTRACTOR SHALL NOT ROUTE RACEWAY THROUGH, OR ACROSS (E) MECHANICAL WELL.

G. PRIOR TO START OF WORK, SUBMIT EXACT ELEVATIONS, ROUTING, AND PENETRATIONS LOCATIONS FOR ANY UNCONSEALED RACEWAY. FOR ACCEPTANCE. DO NOT ROUTE RACEWAY ON, OR PENETRATE VISIBLE PORTIONS OF THE BUILDING IN UNCONCEALED LOCATIONS WITHOUT ACCEPTANCE. WP SEAL REQUIRED PER SPECIFICATIONS. SUBMIT ANY OTHER AREA FOR UNCONSEALED RACEWAY REQUESTED PRIOR TO BID.

H. REFER TO SPECIFICATIONS FOR RACEWAY TYPE AND ROUTING REQUIREMENTS.

I. PER SPECIFICATIONS ROUTE RACEWAY CONSEALED, UNLESS OTHERWISE ACCEPTED PER KN7, THORUGHOUT. UTILIZE ATTIC FOR ROUTE. DE-RATE AS REQUIRED.

J. PROVIDE LARGER CONDUCTOR AND RACEWAY FOR ANY CIRCUITS ROUTED IN/THROUGH ATTIC PER AMPACITY CALCULATION TABLE ON E-010. TYPICAL OF CIRCUITS NOT ROUTED FROM BASEMENT BELOW.

#KEYNOTES

1. NOT USED.
2. ROUTE FEEDER IN ARCHITECTURAL SOFFIT. SEE ARCHITECT FOR ADDITIONAL REQUIREMENTS.
3. COORDINATE SERVER RACK RECEPTACLE LOCATION WITH OWNER.
4. PROVIDE DOOR STOP BEHIND DOOR TO AVOID PHYSICAL CONTACT WITH PANELBOARD. SEE ARCHITECT.
5. PROVIDE CONCEALED RACEWAY AND CONDUCTORS FROM PANEL G FOR FUTURE ACCESS CONTROL. TERMINATE CONDUCTORS IN ACCESSIBLE RECESSED JUNCTION BOX. COORDINATE LOCATION WITH OWNER.
6. RELOCATE (E) FACP TO THIS LOCATION. COORDINATE WITH ARCHITECT, AND OWNER.
7. UNCONSEALED RACEWAY IS PERMITTED WITH ACCEPTANCE PER SHEET NOTE IN THIS AREA.
8. PROVIDE GFI BREAKER FOR DRINKING FOUNTAIN.
9. COORDINATE KEYWATCHER RECEPTACLE HEIGHT WITH OWNER.

2 / E-200 BASEMENT POWER PLAN
SCALE: 0 4' 8' 16'

1 / E-200 LEVEL 01 POWER PLAN
SCALE: 0 4' 8' 16'

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REGISTERED PROFESSIONAL ENGINEER
59,920
DIGITALLY SIGNED BY:
Matthew J. Cash
OREGON
JANUARY 18, 2005
MATTHEW J. CASH
EXPIRES: 12/31/2025

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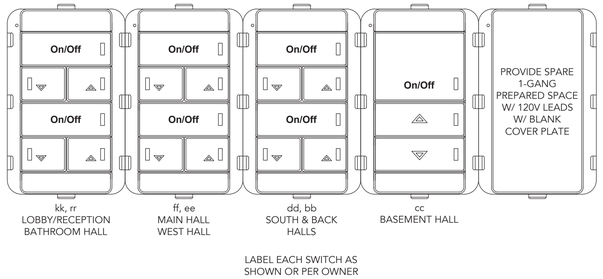
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2 ADDENDUM 2

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project: 23-115
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POWER PLAN

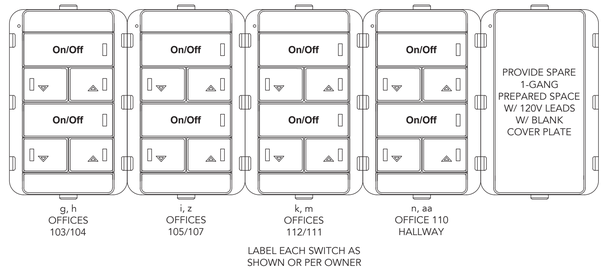
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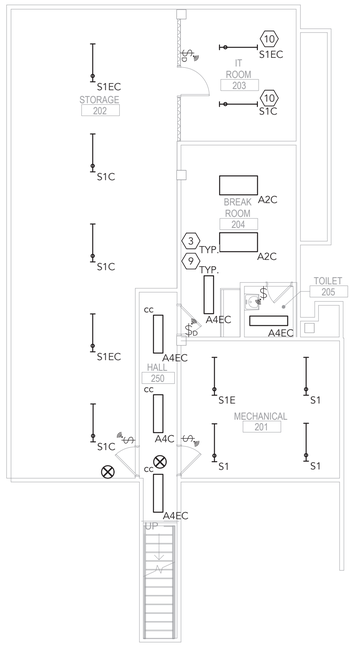
4 E-300 REMOTE COMMON AREA WIRELESS CONTROLS ③

WALL PLATES NOT SHOWN



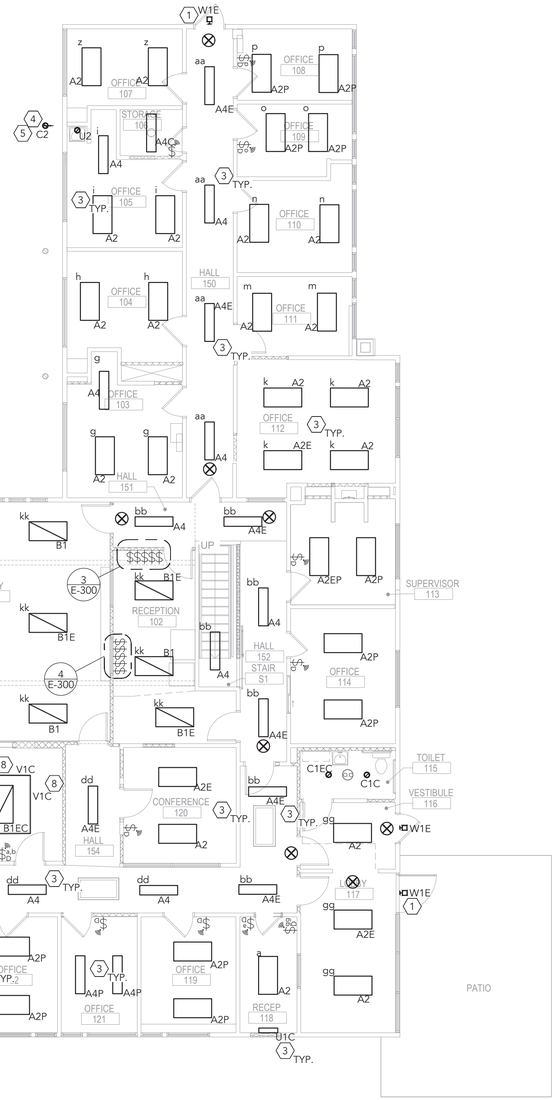
3 E-300 REMOTE OFFICE WIRELESS CONTROLS ③

WALL PLATES NOT SHOWN



2 E-300 BASEMENT LIGHTING PLAN

SCALE: 0 4' 8' 16'



1 E-300 LEVEL 01 LIGHTING PLAN

SCALE: 0 4' 8' 16'

SHEET NOTES

A. EXIT SIGNS SHOWN FOR QUANTITIES. COORDINATE EXACT LOCATION WITH PATH OF EGRESS, AND AHJ.

B. PROVIDE NEUTRAL TO SWITCH LOCATIONS. COORDINATE EXACT WALL SWITCH LOCATIONS WITH ARCHITECT.

C. PROVIDED UNSWITCHED HOT TO FIXTURES. FIXTURES WITH EMERGENCY BATTERY PACK SHALL TURN ON UPON POWER LOSS, INDEPENDENT OF CONTROL SYSTEM.

D. LEVEL 01 BATHROOM LIGHTS SHALL BE CONNECTED IN SERIES WITH LINE-VOLTAGE OCCUPANCY SENSOR.

E. TUNABLE WHITE SHALL BE SELECTED BY OWNER AND PROGRAMMED ONCE USING CLARITY PROGRAMMING FOR EVERY INDIVIDUAL TUNABLE FIXTURE.

F. PROGRAMMING FOR WIRELESS LIGHT FIXTURE CONTROLS, OCCUPANCY SENSORS, DIMMER SWITCHES, DAYLIGHT HARVESTING, AND CONTROLS SHALL BE PROVIDED BY CONTRACTOR.

G. WIRELESS CONTROLS/ZONES SHALL BE GROUPED/CHANNELED AS SHOWN OR PER OWNER.

H. PROVIDE UNSWITCHED HOT FOR WIRELESS CONTROLLED FIXTURES.

I. SEE ARCH. FOR CEILING PATCHING AND MODIFICATION FOR REMOVAL OF (E) FIXTURES.

J. ALIGN FIXTURE WITH (E) J-BOXES EXTEND CIRCUITS AS REQUIRED TO LOCATE FIXTURE IN EXACT LOCATIONS PER ARCH. PROVIDE SURFACE METAL RACEWAY IN FINISHED AREA WHERE CONCEALMENT OF RACEWAY NOT POSSIBLE. SEE SPECIFICATIONS.

K. UNLESS OTHERWISE INDICATED RE-CONNECT NEW FIXTURES SHOWN TO SAME CIRCUIT OF REMOVED FIXTURE.

L. PROVIDE UNSWITCHED HOT FOR EXIT SIGNS.

M. (E) SWITCH LOCATIONS THAT ARE NOT BEING REPLACED BY A NEW SWITCH SHALL BE PROTECTED, SAFED, AND PROVIDE BLANK WALL PLATE.

#KEYNOTES

1. PROVIDE UNSWITCHED HOT TO EXTERIOR EGRESS FIXTURE. FIXTURE SHALL BE CONNECTED TO BE NORMALLY-OFF, AND OPERATE ONLY DURING NORMAL POWER LOSS.
2. EXTERIOR LIGHT MOUNTED TO SIDING MAY REQUIRE BACKING-BLOCK BETWEEN SIDING AND FIXTURE.
3. PROVIDE EXTENSION TO EXISTING LIGHTING CIRCUIT WIRING IN NEW LOCATION OF FIXTURE, OR FOR NEW FIXTURE.
4. USE (E) HOUSING FOR INSTALLATION. SEE LIGHTING SCHEDULE.
5. CONTROL OF THIS FIXTURE SHALL BE SAME TYPE AS (E) EXTERIOR LIGHTING CONTROL. COORDINATE WITH OWNER. SEE DEMOLITION AND R-19 CIRCUIT.
6. SWITCH MUST BE PROVIDED A COVER TO PREVENT UNEXPECTED SHUT-OFF.
7. NOT USED
8. COORDINATE PER ARCHITECTURAL DETAILS. MOUNT AN ADJACENT BRACKET, ON TOP OF CLOUD FACING ROOF. PROVIDE SEPARATE DRIVER PER V1 FIXTURE SHOWN. SUBMIT SHOP DRAWING W/ SPECIFIC APPLICATION.
9. COORDINATE POSITION OF THESE SURFACE MOUNT FIXTURES WITH POSITIONS OF OPEN WASHER /DRYER DOORS, AND OR ROOM CABINETRY, AND /OR ENTRY DOOR(S).
10. LOCATE FIXTURES PER OWNER, IN COORDINATE WITH OWNER'S IT.

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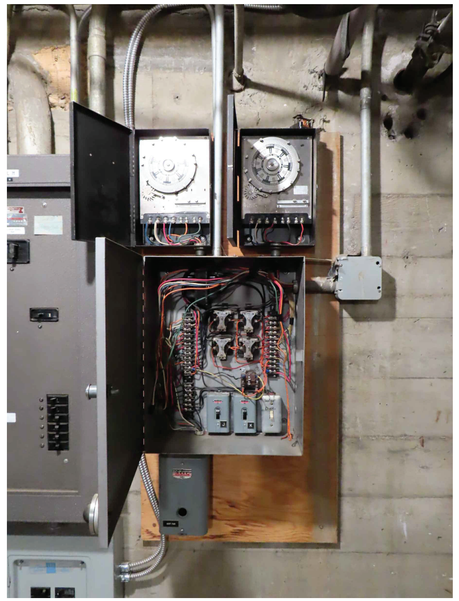
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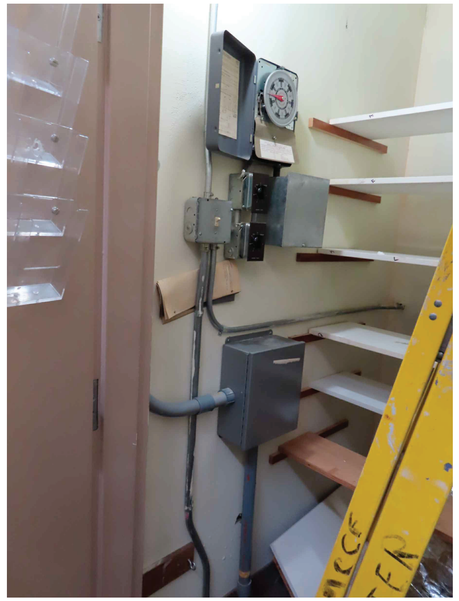
LIGHTING PLAN

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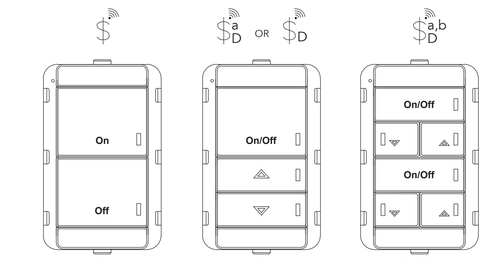
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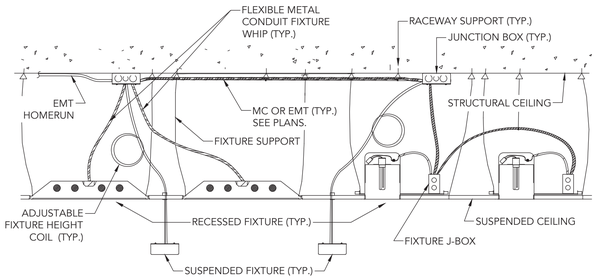
4 E-600 PTAC TIME-CLOCK - MECHANICAL ROOM



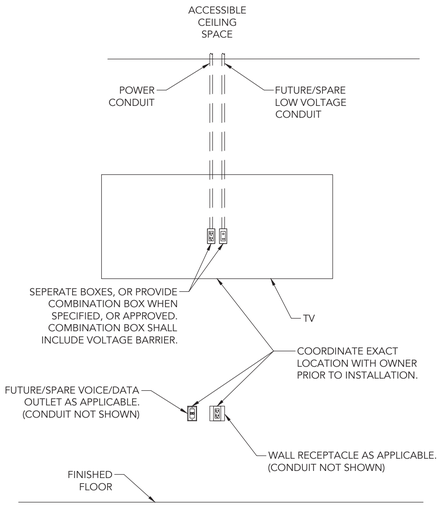
5 E-600 PTAC TIME-CLOCK - UTILITY ROOM



1 E-600 WIRELESS LIGHTING SWITCH DETAILS



3 E-600 EMT/MC CABLE LIGHTING BRACING DETAIL



2 E-600 WALL TV POWER & LOW VOLTAGE DETAIL

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DETAILS

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The following Specifications have been organized under the format of the Construction Specifications Institute (CSI). Section numbers listed are for identification, and may not be consecutive. The Contractor shall check his copy of the Specifications against the Table of Contents to be sure his copy is complete.

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Provided under separate cover by Marion County.		
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01 22 00	Unit Prices	1
01 23 00	Alternates..	1
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01 31 19	Project Meetings	2
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01 33 00	Submittal Procedures	3
01 35 43	Environmental Procedures	2
01 42 00	References	3
01 45 00	Quality Control	2
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01 74 19	Recycling and Environmental Requirements	1
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06 20 00	Finish Carpentry	2
06 41 16	Plastic Laminate-Clad Architectural Cabinets	4
06 61 00	Solid Surfacing Fabrications	3
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07 25 00	Weather Barriers	4
07 46 46	Fiber Cement Siding	3
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08 14 00 Wood Doors…. 3
08 31 13 Access Doors & Frames 2
08 41 13 Aluminum Framed Entrances & Storefronts 4
08 71 00 Door Hardware 19
08 71 13 Power Door Operators 2
08 80 00 Glazing 5

DIVISION 09 -FINISHES
09 29 00 Gypsum Board 5
09 51 00 Acoustical Ceilings 3
09 59 00 Acoustical Tile Restoration 3
09 65 00 Resilient Flooring 4
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09 90 00 Painting & Coating 6

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~~10 51 16 Wood Lockers…. ..... 2~~
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12 21 00 Window Blinds…. 1

DIVISION 13 - 14
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DIVISION 21 – FIRE SUPPRESSION
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DIVISION 22 - PLUMBING
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22 05 05 Selective Demolition for Plumbing 3
22 05 23 General Duty Valves for Plumbing Piping 2
22 05 29 Hangers and Supports for Plumbing Piping and Equipment 3
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22 07 19 Plumbing Piping Insulation 8
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22 11 19 Domestic Water Piping Specialties 5
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23 07 13 Duct Insulation…… 4
23 11 23 Natural-Gas Piping 10
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26 24 17 Panelboards…… 3
26 24 18 SPD (Surge Protection) Equipment 2
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PART 1 - GENERAL

SECTION INCLUDES

Operating hardware and accessories for doors and windows not specifically supplied as part of the manufactured item. Door hardware includes, but is not necessarily limited to mechanical door hardware, electromechanical door hardware, power supplies, back-ups and surge protection, automatic operators, and cylinders specified for doors in other sections.

CODES AND REFERENCES

Comply with the version year adopted by the Authority Having Jurisdiction.
ANSI A117.1 - Accessible and Usable Buildings and Facilities.
ICC/IBC - International Building Code.
NFPA 80 - Fire Doors and Windows.
NFPA 101 - Life Safety Code.
NFPA 105 - Installation of Smoke Door Assemblies.
UL/ULC and CSA C22.2 – Standards for Automatic Door Operators Used on Fire and Smoke Barrier Doors and Systems of Doors.
State Building Codes, Local Amendments.
Standards: All hardware specified herein shall comply with the following industry standards:
ANSI/BHMA Certified Product Standards - A156 Series
UL10C – Positive Pressure Fire Tests of Door Assemblies
Conform to Building Code requirements if more restrictive than those specified herein.
Notify Architect of difference prior to starting work.

SUBMITTALS

Provide in accordance with Section 01 33 00.
Product Data:
Submit three (3) copies of manufacturer's data for each item of finish hardware.
Submit manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
Hardware Schedule:
Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, and procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
Content: Include the following information:
Type, style, function, size, label, hand, and finish of each door hardware item.
Manufacturer of each item.
Fastenings and other pertinent information.
Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
Explanation of abbreviations, symbols, and codes contained in schedule.
Mounting locations for door hardware.
Door and frame sizes and materials.
Submittal Sequence: Submit three (3) copies of the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
Submit a keying schedule in accordance with the Owner's representative.
Shop Drawings:
Show details of electrified access control hardware indicating the following:
Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system

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electrified hardware. Differentiate between manufacturer-installed and field-installed wiring.
Include the following:
Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
Complete (risers, point-to-point) access control system block wiring diagrams.
Electrical Coordination: Coordinate with related Division 26 Electrical Sections the voltages and wiring details required at electrically controlled and operated hardware openings.

Keying Schedule:

Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.

Operating and Maintenance Manuals:

Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required by Section 01 78 23. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.

Warranties and Maintenance:

Special warranties and maintenance agreements specified in this Section.

QUALITY ASSURANCE

Hardware Supplier shall employ person qualified for membership in American Society of Hardware Consultants, who shall be available for consultation with Architect and Contractor during course of work.
Prior to final project acceptance supplier's representative shall make one field inspection and notify Architect if hardware installation complies with manufacturers instructions.
Prior to final project acceptance supplier's representative shall instruct Owner how to properly adjust and maintain hardware.

Manufacturers Qualifications:

Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

Installer Qualifications:

Approved by supplier.
Installers, trained by the primary product manufacturers, with a minimum 3 years documented experience installing both standard and electrified builders hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

Door Hardware Supplier Qualifications:

Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor in good standing by the manufacturers of the primary materials with a warehousing facility in Project's vicinity.
Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
Scheduling Responsibility: Preparation of door hardware and keying schedules.

Source Limitations:

Obtain each type and variety of Door Hardware specified in this Section from a single source, qualified supplier unless otherwise indicated.
Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

Regulatory Requirements:

Comply with NFPA 70, NFPA 80, NFPA 101 and ANSI A117.1 requirements and guidelines as directed in the model building code including, but not limited to, the following:
NFPA 70 "National Electrical Code", including electrical components, devices, and accessories listed and

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labeled as defined in Article 100 by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1 as follows:
- Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
- Door Closers: Comply with the following maximum opening-force requirements indicated:
- Interior Hinged Doors: 5 lbf applied perpendicular to door.
- Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.

NFPA 101: Comply with the following for means of egress doors:
- Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
- Thresholds: Not more than 1/2 inch high

Keying Conference:
Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
- Function of building, purpose of each area and degree of security required.
- Plans for existing and future key system expansion.
- Requirements for key control storage and software.
- Installation of permanent keys, cylinder cores and software.
- Address and requirements for delivery of keys.

Pre-Submittal Conference:
Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
Review sequence of operation narratives for each unique access controlled opening.
Review and finalize construction schedule and verify availability of materials.
Review the required inspecting, testing, commissioning, and demonstration procedures
At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

DELIVERY, STORAGE, AND HANDLING
Deliver to General Contractor for installation in original, unopened containers with legible labels intact.
Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
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.
Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".
Include complete set of specialized hardware maintenance and removal tools for Owner's use. Store where directed by Owner.
Protect against theft, damage, and discoloration

COORDINATION
Coordinate with other trades affecting or affected by work of this section.
Templates:
Furnish hardware templates for fabricators of doors, frames and other work to be factory prepared for hardware. Check shop drawings of such other work to confirm that adequate provisions will be made for installation of hardware.

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Door Hardware and Electrical Connections:
Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.
Door and Frame Preparation:
Related Division 08 Sections (Steel, Aluminum and Wood) doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

WARRANTY
General Warranty:
Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
Warranty Period:
Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
Structural failures including excessive deflection, cracking, or breakage.
Faulty operation of the hardware.
Deterioration of metals, metal finishes, and other materials beyond normal weathering.
Electrical component defects and failures within the systems operation.
Standard Warranty Period:
One year from date of Substantial Completion, unless otherwise indicated.
Special Warranty Periods:
Ten years for mortise locks and latches.
Five years for exit hardware.
Twenty five years for manual surface door closers.
Two years for electromechanical door hardware.

MAINTENANCE SERVICE
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 door hardware.
Continuing Service:
Beginning at Substantial Completion, and running concurrent with the specified warranty period, provide continuous (6) months full maintenance including repair and replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door opening operation. Provide parts and supplies as used in the manufacture and installation of original.

PART 2 - PRODUCTS

SCHEDULED DOOR HARDWARE
General:
Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
Designations:
Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
    Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
Substitutions:
Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

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MATERIALS
Recycled Content of Steel Products: Postconsumer recycled content plus one-half of pre-consumer recycled content not less than the following:
Mortise Locks: 57%
Exit Devices: 54%
Door Closers: 51%

BUTT HINGES
Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles as specified in the Door Hardware Sets.
Type: Mortise.
Sizes: Provide the following, unless otherwise scheduled, with hinge widths sized for door thickness and clearances required:
Widths up to 3'-0": 4-1/2" standard or heavy weight as specified.
Sizes from 3'-1" to 4'-0": 5" standard or heavy weight as specified.
Size Hinges to clear any projecting trim or other obstructions where necessary to obtain maximum possible door opening.
Quantity: Provide the following hinge quantity, unless otherwise scheduled:
Two Hinges: For doors with heights up to 60 inches.
Three Hinges: For doors with heights 61 to 90 inches.
Four Hinges: For doors with heights 91 to 120 inches.
For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
Hinge Options: Comply with the following where indicated in the Hardware Sets or on Drawings:
Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:
Out-swinging exterior doors.
Out-swinging access controlled doors.
Out-swinging lockable doors.
Provide non-rising loose pins at all other doors unless otherwise scheduled.
Acceptable Manufacturers:
Hager Companies (HA).
McKinney Products (MK).

BARN DOOR HARDWARE
Carrier Hardware Kit: Knape and Vogt: FR-BZTM-96 Flat RailTop Mount, black. RT-HKBZ-06
Salzburg Series, black.

POWER TRANSFER DEVICES
Electrified Quick Connect Transfer Hinges:
Provide electrified transfer hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.
Acceptable Manufacturers:
McKinney Products (MK) - QC (# wires) Option.
Electric Door Hardware Cords:
Provide electric transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

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Acceptable Manufacturers:
McKinney Products (MK) – QC-C Series.
Provide one each of the following tools as part of the base bid contract:
McKinney Products (MK) - Electrical Connecting Kit: QC-R001.
McKinney Products (MK) - Connector Hand Tool: QC-R003.

MECHANICAL LOCKS AND LATCHING DEVICES
Cylindrical Locksets:
Grade 1 (Heavy Duty), ANSI/BHMA A156.2, Series 4000, Operational Grade 1 certified bored locksets furnished in the functions as specified in the Hardware Sets.
Locksets to be manufactured with a corrosion resistant, stamped 12 gauge minimum formed steel case and be field-reversible for handing without disassembly of the lock body.
Lockset trim (including levers, escutcheons, roses) to be the product of a single manufacturer. Furnish with standard 2 3/4" backset, 3/4" throw anti-friction stainless steel latchbolt, and a full 1" throw stainless steel bolt for deadbolt functions.
Manufacturer: Sargent Manufacturing (SA) – 10X Series, no substitutions (facility standard).
Lock Trim Design: As specified in Hardware Sets.
Mortise Locksets:
Grade 1 (Heavy Duty), ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified mortise locksets furnished in the functions as specified in the Hardware Sets.
Locksets to be manufactured with a corrosion resistant, stamped 12 gauge minimum formed steel case and be field-reversible for handing without disassembly of the lock body.
Lockset trim (including levers, escutcheons, roses) to be the product of a single manufacturer. Furnish with standard 2 3/4" backset, 3/4" throw anti-friction stainless steel latchbolt, and a full 1" throw stainless steel bolt for deadbolt functions.
Manufacturer: Sargent Manufacturing (SA) – 8200 Series, no substitutions (facility standard).
Lock Trim Design: As specified in Hardware Sets.

LOCK AND LATCH STRIKES
Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
Standards: Comply with the following:
Strikes for Mortise Locks and Latches: BHMA A156.13.
Strikes for Bored Locks and Latches: BHMA A156.2.
Strikes for Auxiliary Deadlocks: BHMA A156.5.
Dustproof Strikes: BHMA A156.16.

PUSH PLATES AND PULL BARS
ANS/BHMA A156.6 certified door pushes and pulls of type and design specified below or in the Hardware Sets.
Coordinate and provide proper width and height as required where conflicting hardware dictates.
Push/Pull Plates:
Thickness: Minimum .050 inch thick.
Size: As indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
Door Pull and Push Bar: Design, size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
Acceptable Manufacturers:
Rockwood Manufacturing (RO).
Trimco (TC).

CYLINDERS AND KEYING
General:

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Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

Source Limitations:

Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.

Cylinders

Original manufacturer cylinders complying with the following:

- Mortise Type: Threaded cylinders with rings and straight- or clover-type cam.
- Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
- Bored-Lock Type: Cylinders with tailpieces to suit locks.
- Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
- Keyway: Manufacturer's Standard.

High Security Cylinders:

High security cylinder conforming to UL437, including both pick and drill resistance.

Pick resistance incorporates two or more independent locking mechanisms including a pin tumbler device with six top pin chambers, mushroom-shaped driver pins, and coded sidebar locking mechanism operated independently from the six top pin tumbler device.

Drill resistance incorporates cylinder housing with fixed case-hardened inserts protecting the pin tumbler shear line, cylinder plugs with case-hardened inserts protecting both the pin tumbler shear line and the side bar, mushroom-shaped stainless steel driver pins, and stainless steel sidepins.

Factory key cylinders.

Acceptable Manufacturers: Medeco (MC) – M3 Series.

Keying System:

All Keying shall be part of Contractor's scope. Contractor to subcontract with Owner's locksmith, Oregon Lock. Each type of lock and cylinders to be keyed by Owner's locksmith.

Conduct specified "Keying Conference" to define and document keying system instructions and requirements.

Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.

Incorporate decisions made in keying conference, and as follows:

- Master Key System: Cylinders are operated by a change key and a master key.
- Grand Master Key System: Cylinders are operated by a change key, a master key, and a grand master key.
- Great-Grand Master Key System: Cylinders are operated by a change key, a master key, a grand master key, and a great-grand master key.
- Existing System: Master key or grand master key locks to Owner's existing system.
- Keyed Alike: Key all cylinders to same change key.

Key Quantity:

Provide the following minimum number of keys:

- Top Master Key: One (1)
- Change Keys per Cylinder: Two (2)
- Master Keys (per Master Key Group): Two (2)
- Grand Master Keys (per Grand Master Key Group): Two (2)
- Construction Keys (where required): Ten (10)
- Construction Control Keys (where required): Two (2)
- Permanent Control Keys (where required): Two (2)

Construction Keying:

Provide construction master keyed cylinders or temporary keyed construction cores where specified.

Provide construction master keys in quantity as required by project Contractor. Replace construction cores with permanent cores.

Furnish permanent cores for installation as directed under specified "Keying Conference".

Key Registration List:

Provide keying transcript list to Owner's representative.

Key Control Software:

Provide one network version of "Key Wizard" branded key management software package that includes one year of technical support and upgrades to software at no charge. Provide factory key system formatted for importing into "Key Wizard" software.

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CONVENTIONAL EXIT DEVICES

General:

All exit devices specified herein shall meet or exceed the following criteria:

At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.

Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.

Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.

Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is not acceptable except in any case where the door light extends behind the device as in a full glass configuration.

Flush End Caps: Provide heavy weight impact resistant flush end caps made of architectural metal in the same finish as the devices as in the Hardware Sets. Plastic end caps will not be acceptable.

Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty trim with cold forged escutcheons, beveled edges, and four threaded studs for thru-bolts.

Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets. Provided free-wheeling type trim where indicated.

Where function of exit device requires a cylinder, provide an interchangeable core type keyed cylinder (Rim or Mortise) as specified in Hardware Sets.

Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.

Dummy Push Bar: Nonfunctioning push bar matching functional push bar.

Rail Sizing: Provide exit device rails factory sized for proper door width application.

Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

Conventional Push Rail Exit Devices (Heavy Duty):

Conform to ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets.

Mounting rails to be formed from smooth stainless steel, brass or bronze architectural materials no less than 0.072" thick, with push rails a minimum of 0.062" thickness.

Painted or aluminum metal rails are not acceptable.

Exit device latch to be investment cast stainless steel, pullman type, with deadlock feature.

Acceptable Manufacturers: Sargent Manufacturing (SA) - 80 Series, no substitutions (facility standard).

Tube Steel Removable Mullions:

Conform to ANSI/BHMA A156.3 removable steel mullions with malleable-iron top and bottom retainers and a primed paint finish.

Provide keyed removable feature, stabilizers, and mounting brackets as specified in the Hardware Sets.

At openings designed for severe wind load conditions due to hurricanes or tornadoes, provide manufacturers approved mullion and accessories to meet applicable state and local windstorm codes.

Acceptable Manufacturers:

Sargent Manufacturing (SA).

ELECTROMECHANICAL EXIT DEVICES

Electrified Conventional Push Rail Devices (Heavy Duty):

Subject to same compliance standards and requirements as mechanical exit devices, electrified devices to be of type and design as specified below.

Acceptable Manufacturers: Sargent Manufacturing (SA) - 80 Series, no substitutions (facility standard).

Electrified Options:

As indicated in hardware sets, provide electrified exit device options including: electric latch retraction (shall be motorized type that fully retracts the touchpad/push bar), electric dogging, outside door trim control, exit alarm, delayed egress, latchbolt monitoring, lock/unlock status monitoring, touchbar monitoring and request-to-exit signaling.

Unless otherwise indicated, provide electrified exit devices standard as fail secure.

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DOOR CLOSERS

General:

Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size.

Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.

Unless specified elsewhere, do not restrict door swing.

Fasteners: Concealed.

Standards:

Closers to comply with UL-10C and UBC 7-2 for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

Cycle Testing:

Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.

Size of Units:

Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.

Closer Arms:

Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

Where closers are indicated to have mechanical dead-stop, provide heavy duty arms and brackets with an integral positive stop.

Where closers are indicated to have mechanical hold open, provide heavy duty units with an additional built-in mechanical holder assembly designed to hold open against normal wind and traffic conditions. Holder to be manually selectable to on-off position.

Where closers are indicated to have a cushion-type stop, provide heavy duty arms and brackets with spring stop mechanism to cushion door when opened to maximum degree.

Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

Provide drop plates or other accessories as required for proper mounting.

Closer Accessories:

Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates, and through-bolt or security type fasteners as specified in the door Hardware Sets.

Door Closers, Surface Mounted (Heavy Duty):

Conform to ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force.

Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control.

Provide non-handed units standard.

Acceptable Manufacturers: Sargent Manufacturing (SA) - 351 Series, no substitution, (facility standard).

AUTOMATIC DOOR OPERATORS

Refer to section 08 71 13.

DOOR PROTECTIVE TRIM:

Metal Protection Plates:

ANSI/BHMA A156.6 certified metal protection plates (kick, armor, or mop), beveled on four edges (B4E), fabricated from the following:

- Stainless Steel: 300 series, 050-inch thick, with countersunk screw holes (CSK).
- Brass or Bronze: 050-inch thick, with countersunk screw holes (CSK).
- Laminate Plastic or Acrylic: 1/8-inch thick, with countersunk screw holes (CSK).

Door protective trim units to be of type and design as specified below or in the Hardware Sets.

Size: Not more than 2" less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side.

Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.

Fasteners:

Provide manufacturer's designated fastener type as specified in the Hardware Sets.

Acceptable Manufacturers:

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Rockwood Manufacturing (RO).
Trimco (TC).

DOOR STOPS AND HOLDERS
Door Stops and Bumpers:
ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers.
Provide wall bumpers with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets.
Do not mount floor stops where they will impede traffic.
Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
Acceptable Manufacturers:
    Rockwood Manufacturing (RO).
    Trimco (TC).

DOOR SILENCERS
At Metal Frames: Glynn Johnson #64, or accepted substitute.
Three silencers for single doors, 4 for pairs of doors.

ARCHITECTURAL SEALS
General:
Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets.
Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated.
At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
Sound-Rated Gasketing:
Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated, based on testing according to ASTM E 1408.
Replaceable Seal Strips:
Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
Acceptable Manufacturers: Pemko Manufacturing (PE).
Threshold:
Extruded aluminum, maximum 1/2 inch height, mill finish unless otherwise scheduled.

ELECTRONIC ACCESSORIES
Proximity Card Readers:
Card readers to support HID 125 kHz proximity technology or 13.56 MHz contactless smart cards as specified in the hardware sets.
Provide hard wired signal connection.
Card readers to meet the following minimum design and performance specifications:
    Reader power supply: 4-16 VDC.
    Reader to be suitable for outdoor use.
    Contactless smart card versions to be compatible with the following technologies: iCLASS, iCLASS Seos, iCLASS SE, ISO1443B UID, Mifare, Mifare Plus, Desfire SE, Desfire EV1, NFC
    Reader to come pre-paired with an Aperio hub and communicate with the hub via IEEE802.14.4 (2.4 GHz) wireless technology.
    Reader to have green LED status indicator.
    Reader type and model to meet the design and mounting applications needs of each entry point as indicated on the drawings.
    Acceptable Manufacturers: HID (HD) – Indala 603 Series.
Power Supplies:
Provide Nationally Recognized Testing Laboratory Listed 12VDC or 24VDC (field selectable) filtered and regulated power supplies.
Include battery backup option with integral battery charging capability in addition to operating the DC load in event of line voltage failure.
Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.
Acceptable Manufacturers: Securitron (SU) - BPS Series.

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FASTENERS
Provide required screws, bolts, and other fasteners.
Match hardware material and finish.
Use phillips head type where exposed to view.

KEYS
Material: Nickel-silver, or approved.
Keying Instructions: Masterkey and otherwise key locks as directed by Owner.
Number of keys required: Furnish 2 keys for each lock unless otherwise instructed.

FABRICATION
Make hardware for prefitted doors and frames to template. Send templates, together with hardware schedule, to door and frame manufacturer not later than two weeks after hardware schedule approval.
Lock and latch components shall be manufactured by only one manufacturer, and carry that manufacturer's warranty.
Fabricate joints with smooth, hair-line seams.
Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

FINISHES
Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
Finish unless otherwise scheduled: BHMA No. 626 (US26D) satin chrome except:
Door Closers: Spray painted to match hardware color.
Thresholds: As listed.
Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

EXAMINATION
Verify that surfaces to receive finish hardware are properly prepared, including necessary backing.
Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
Prior to starting work notify General Contractor of defects requiring correction.
Do not start work until conditions are satisfactory.

PREPARATION
Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
Wood Doors: Comply with ANSI/DHI A115-W series.
Provide solid blocking for all wall stops.
Fasteners: Use fastening devices as needed to securely anchor all hardware per manufacturer's templates. Self tapping sheet metal screws are not acceptable. Closers on wood doors shall be through bolted.

INSTALLATION
General:
Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
Accurately locate, fit, and install square, plumb, and secure in accordance with manufacturer's directions and templates.
Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of

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fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
After fitting mortised hardware to surfaces to be painted remove and store hardware in original package until painting completion, then permanently install.
Mounting Heights:
Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
Retrofitting:
Install door hardware to comply with manufacturer's published templates and written instructions.
Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections.
Do not install surface-mounted items until finishes have been completed on substrates involved.
Thresholds:
Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
Storage:
Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

FIELD QUALITY CONTROL
Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

ADJUSTING
Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit.
Replace units that cannot be adjusted to operate as intended.
Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
Adjust moving parts to operate satisfactorily at time of final project acceptance and during warranty period.

CLEANING AND REPAIRING
Including work of other sections, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this section.
Remove debris from project site upon work completion or sooner, if directed.
Clean operating items as necessary to restore proper finish and provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

DEMONSTRATION
Instruct Owner's personnel in proper adjustment and maintenance of hardware and hardware finishes.

PROTECTION
Protect other surfaces against damage and discoloration caused by work of this section.

HARDWARE SCHEDULE
The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule.
Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect

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with corrections made prior to the bidding process.
Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
Manufacturer's Abbreviations:

- MK - McKinney
- MR - Markar
- PE - Pemko
- RO - Rockwood
- SA - Sargent
- MC - Medeco
- GE - GE
- SU – Securitron
- NO – Norton
- RF - Rixon
- DT – Detex
- SC – Schlage
- AC – Accurate

Hardware Sets

Set: 1.0

Doors: 101A

2 Hinge, Full Mortise	T4A3386xNRP 5" x 4-1/2"	US32D	MK ⚡
1 Hinge, Full Mortise	T4A3786 NRP QC12 4-1/2" x 4-1/2"	US32D	MK
1 Exit Device, Fail Secure	55 56 8774 ETL	US32D	SA
1 Drop Plate	351D	US32D	SA
1 Kickplate	K1050 10X1.5LDW CSK BEV	US32D	RO
1 Threshold	2705DT		PE
1 Dust Proof Strike	570	US26D	RO
1 Gasketing	S773D		PE
1 Power Door Operator	See section 08 71 13		
1 Frame Harness	QC-C1500 (as required)		MK ⚡
1 Door Harness	QC-C__ (as required)		MK ⚡
1 Door Position Switch	1076-G		GE
1 Power Supply	AQL4-R8E1		SU ⚡
2 Battery Backup	B-24-5		SU
1 Card Reader	By Owner's contractor.		

Notes:

Latch retraction, locked and unlocked on schedule via EAC system.
Presenting valid credentials retracts exit device latches to allow entry, depressing opens door.
Free egress allowed at all times.
Access Control to be coordinated with Owner's contractor. Access Control components provided by Owner's contractor. GC to prep doors for wiring harness and DPS.

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Set: 2.0
Doors: 101B, 101C, 101D, 102A, 116A, 152A, B03A

3 Hinge, Full Mortise	T4A3786 (NRP)	US26D	MK
1 Storeroom Lock	RGD-LC-10XG04-LL	US26D	SA
1 Medeco Cylinder X3	as required MK match existing	26	MC
1 Door Closer	351 P10	689	SA
1 Kick Plate	K1050 10X1.5LDW CSK BEV	US32D	RO
1 Wall Stop	403	US26D	RO
1 Gasketing	S773D		PE
1 Electric Strike	HES 1500		SU
1 Frame Harness	QC-C1500 (as required)		MK
1 Door Position Switch	1076-G		GE
1 Card Reader	By Owner's contractor.		

Notes:
Presenting valid credentials retracts exit device latches to allow entry, depressing opens door.
Free egress allowed at all times.
Access Control to be coordinated with Owner's contractor. Access Control components provided by Owner's contractor. GC to prep doors for wiring harness and DPS.

Set: 3.0
Doors: 102B, 117B

3 Hinge, Full Mortise	T4A3786 (NRP)	US26D	MK
1 Exit Lock	10XG15-3-LL	US26D	SA
1 Medeco Cylinder X3	as required MK match existing	26	MC
1 Door Closer	351 P10	689	SA
1 Kick Plate	K1050 10X1.5LDW CSK BEV	US32D	RO
1 Wall Stop	403	US26D	RO
1 Gasketing	S773D		PE

Set: 4.0
Doors: 104A, 105A, 107A, 108A, 109A, 110A, 114A

1 Passage Latchset	10XU15-LL	US26D	SA

Reuse balance of existing hardware.

Set: 5.0
Doors: 106A, 129A, 132A, 133A, B01A, B02A

1 Storeroom Lock	RGD-LC-10XG04-LL	US26D	SA
1 Medeco Cylinder X3	as required MK match existing	26	MC

Reuse balance of existing hardware.

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

Set: 6.0

Doors: 118A, 121A, 130A, 136A

3 Hinge, Full Mortise	T4A3786 (NRP)	US26D	MK
1 Dormitory Lock	RGD-LC-10XG53-LL	US26D	SA
1 Medeco Cylinder X3	as required MK match existing	26	MC
1 Wall Stop	403	US26D	RO
1 Gasketing	S773D		PE

Set: 7.0

Doors: 115A, 147A, 148A

3 Hinge, Full Mortise	T4A3786 (NRP)	US26D	MK
1 Privacy Lock w/Occupancy Indicator	L/LV9492EL/EU w/ XL13-439	US26D	SC
1 Medeco Cylinder X3	as required MK match existing	26	MC
1 Door Closer	351 P10	689	SA
1 Kick Plate	K1050 10X1.5LDW CSK BEV	US32D	RO
1 Wall Stop	403	US26D	RO
1 Gasketing	S773D		PE
1 Electric Strike	HES 1500		SU
1 Frame Harness	QC-C1500 (as required)		MK
1 Door Position Switch	1076-G		GE
1 Card Reader	By Owner’s contractor.		

Notes:
Presenting valid credentials retracts exit device latches to allow entry, depressing opens door.
Free egress allowed at all times.
Remote entry from Reception rooms.
Thumb turn latched will disable card reader/remote entry.
Emergency key will override thumb turn.
Access Control to be coordinated with Owner’s contractor. Access Control components provided by Owner’s contractor. GC to prep doors for wiring harness and DPS.

Set: 8.0

Doors: 116B

1 Power Door Operator	See section 08 71 13		
1 Electric Strike	HES 9600		SU
1 Frame Harness	QC-C1500 (as required)		MK
1 Door Position Switch	1076-G		GE
1 Card Reader	By Owner’s contractor.		

Reuse balance of existing hardware.

Notes:
Presenting valid credentials retracts exit device latches to allow entry, depressing opens door.
Free egress allowed at all times.
See hardware set 1.0 for power supply.

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

Access Control to be coordinated with Owner's contractor. Access Control components provided by Owner's contractor. GC to prep doors for wiring harness and DPS.

Set: 9.0

Doors: 150B, 156A

3 Hinge, Full Mortise	T4A3386xNRP 5" x 4-1/2"	US32D	MK
1 Storeroom Lock	RGD-LC-10XG04-LL	US26D	SA
1 Medeco Cylinder X3	as required MK match existing	26	MC
1 Door Closer	351 P10	689	SA
1 Kick Plate	K1050 10X1.5LDW CSK BEV	US32D	RO
1 Gasketing	S773D		PE
1 Threshold	2705DT		PE
1 Rain Guard	346D		PE
1 Sweep	315CN		PE
1 Electric Strike	HES 1500		SU
1 Frame Harness	QC-C1500 (as required)		MK
1 Door Position Switch	1076-G		GE
1 Card Reader	By Owner's contractor.		

Notes:
Presenting valid credentials retracts exit device latches to allow entry, depressing opens door.
Free egress allowed at all times.
Access Control to be coordinated with Owner's contractor. Access Control components provided by Owner's contractor. GC to prep doors for wiring harness and DPS.

Set: 9.1

Doors: 117A

3 Hinge, Full Mortise	T4A3386xNRP 5" x 4-1/2"	US32D	MK
1 Storeroom Lock	RGD-LC-10XG04-LL	US26D	SA
1 Medeco Cylinder X3	as required MK match existing	26	MC
1 Door Closer	351 P10	689	SA
1 Kick Plate	K1050 10X1.5LDW CSK BEV	US32D	RO
1 Rain Guard	346D		PE
1 Sweep	315CN		PE
1 Electric Strike	HES 1500		SU
1 Frame Harness	QC-C1500 (as required)		MK
1 Door Position Switch	1076-G		GE
1 Card Reader	By Owner's contractor.		

Notes:
Presenting valid credentials retracts exit device latches to allow entry, depressing opens door.
Free egress allowed at all times.
Threshold and weatherstripping by aluminum door and frame supplier.
Access Control to be coordinated with Owner's contractor. Access Control components provided by Owner's contractor. GC to prep doors for wiring harness and DPS.

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Set: 10.0

Doors: 120A, 123A, 123B

3 Hinge, Full Mortise	T4A3786 (NRP)	US26D	MK
1 Passage Latchset	10XU15-LL	US26D	SA
1 Wall Stop	403	US26D	RO
1 Kick Plate	K1050 10X1.5LDW CSK BEV	US32D	RO
1 Gasketing	S773D		PE

Set: 11.0

Doors: 128A, B05A

1	Privacy Lock w/Occupancy Indicator	ND40-RHO	626	SC
1	Gasketing	S773D		PE

Reuse balance of existing hardware.

Set: 12.0

Doors: 143A, 143B

1 Side Wall Track System	280C-SWTKIT/8		PE
1 Bottom Channel	94A		PE
1 Pull Plate	8302-8	630	IV

Set: 13.0

Doors: 145A

1 Storeroom Lock	RGD-LC-10XG04-LL	US26D	SA
1 Medeco Cylinder X3	as required MK match existing	26	MC
1 Door Closer	351 O	689	SA
1 Kick Plate	K1050 10X1.5LDW CSK BEV	US32D	RO
1 Wall Stop	403	US26D	RO
1 Gasketing	S773D		PE
1 Electric Strike	HES 1500		SU
1 Frame Harness	QC-C1500 (as required)		MK
1 Door Position Switch	1076-G		GE
1 Card Reader	By Owner’s contractor.		

Reuse balance of existing hardware.

Notes:
Presenting valid credentials retracts exit device latches to allow entry, depressing opens door.
Free egress allowed at all times.
Access Control to be coordinated with Owner’s contractor. Access Control components provided by Owner’s contractor. GC to prep doors for wiring harness and DPS.

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Set: 14.0
Doors: 146A

3 Hinge (heavy weight)	T4A3786 (NRP)	US26D	MK
1 Storeroom Lock	RGD-LC-10XG04-LL	US26D	SA
1 Medeco Cylinder X3	as required MK match existing	26	MC
1 Wall Stop	403	US26D	RO
3 Silencers	608		RO

Set: 15.0
Doors: 111A

3 Hinge, Full Mortise	T4A3786 (NRP)	US26D	MK
1 Passage Latchset	10XU15-LL	US26D	SA
1 Wall Stop	403	US26D	RO
1 Gasketing	S773D 17'		PE

Set: 16.0
Doors: 103A, 113A, 119A, 1222A, 124A, 125A, 126A, 127A, 131A, 134A, 135A, 137A, 138A, 139A, 140A, 141A, 142A, 144A, B04A

1 Dormitory Lock	RGD-LC-10XG53-LL	US26D	SA
1 Medeco Cylinder X3	as required MK match existing	26	MC
1 Wall Stop	403	US26D	RO

Reuse balance of existing hardware.

Set: 17.0
Doors: 152B

1 Mortise Lockset	SL-M915XE		AC
1 Medeco Cylinder X3	as required MK match existing	26	MC
1 Side Wall Track System	280C-SWTKIT/8		PE
1 Bottom Channel	94A		PE
1 Electric Strike	HES 1500		SU
1 Frame Harness	QC-C1500 (as required)		MK
1 Door Position Switch	1076-G		GE
1 Card Reader	By Owner's contractor.		

Presenting valid credentials retracts exit device latches to allow entry, depressing opens door. Free egress allowed at all times.
Access Control to be coordinated with Owner's contractor. Access Control components provided by Owner's contractor. GC to prep doors for wiring harness and DPS.

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Set: 18.0
Doors: 118B

3 Hinge, Full Mortise	T4A3386xNRP 5" x 4-1/2"	US32D	MK
1 Deadbolt	486	US26D	SA
1 Vandal Resistant Pull	VRP30	US32D	RO
1 Medeco Cylinder X3	as required MK match existing	26	MC
1 Gasketing	S773D		PE
1 Threshold	2705DT		PE
1 Rain Guard	346D		PE
1 Sweep	315CN		PE

END OF SECTION

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

PART 1 - GENERAL

Products under this contract must meet minimum specifications requirements in detail without exception unless specifically noted and approved as provided in these Specifications. Equipment submitted for review must clearly state on cover sheet any differences from specified product. Equipment substitution or submittal review does not relieve Contractor from meeting all requirements of specified item.

DEFINITIONS

Definitions herein are intended as advisory and shall not limit requirements within the Contract Documents. Where a conflict of definitions exists, the more stringent standard shall be used. Where a term is defined on a Drawing the Drawing definition shall be used for that drawing. Not all definitions are included. Trade standard terms are not defined.

CONTRACT DOCUMENTS

The Contract Documents are inclusive. All requirements of all Contract Documents shall be binding as if repeated herein and within this Division as required by any other Division or Contract Document.
This Division does not express or imply separation of the Contract Documents and shall not be considered as separation of the Work.
See Advertisement For Bids, Instructions to Bidders, Supplemental Instructions to Bidders, General Conditions, Supplemental General Conditions, Drawings and Specifications, and modifications incorporated in the documents before execution of the Agreement.
Conflicts: If any conflicts exist the more stringent is required.

SCOPE OF WORK

General:

Provide complete and functional electrical systems as specified, as shown on Drawings, as required, and as intended. Work generally includes, inspections, electrical distribution, lighting, devices, wiring systems, raceways, and control systems.

Omissions:

Contractor shall be responsible for additional labor, or additional material necessary for the proper execution of the Work. Omissions of expressed reference to any item shall not relieve the responsibly to conform to the Contract Documents

SCOPE OF ELECTRICAL WORK

All materials and workmanship shall be furnished for complete, tested, and operating electrical systems as shown on the drawings and specified herein.
Electrical work is to include the electrical service. Complete to the point of connection with the serving utility. Any changes of or work required by the serving utility, are part of this work and shall be fully included in the bid price.
Work is also to include main distribution panel, feeder system and branch circuit panels. Complete branch circuit wiring. Light fixtures, wall switches, receptacles and similar items, and wiring and connection to all mechanical equipment as required.
Provide Power Connections to Equipment provided by others, specified not shown, and/or part of a complete and operable system. This equipment may, or may not be shown, and generally includes, and is not limited to:
Lighting Control Panels, Lighting Controller Equipment, Lighting Controls.
Building Management Control System, HVAC Controls, and the like.
Automatic Door Operators, ADA Doors, Sliding Automatic Doors, and the like.
Unitary, generally self-contained access controls.
Domestic Water circulation pump(s).
Plumbing fixtures with automatic sink/flush valves, and the like.
Automatic plumbing electronic trap primers.
Control Connections to unitary Equipment provided by others, specified, not shown, and/or part of a complete and operable system. This equipment may, or may not be shown, and generally includes, and is not limited to, control wiring for:
Automatic Door Operators, ADA Doors, Sliding Automatic Doors, and the like.

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Unitary, generally self-contained access controls
Automatic plumbing fixtures, and trap primer systems.
The lists above are intended to indicate equipment that is generally shown/specified elsewhere. Where specified, and/or shown otherwise, and/or specified by electrical follow additional power, and control requirements as indicated.

CONFORMANCE WITH REQUIREMENTS

General:

All Work shall conform to the reasonable requirements of the project within the scope of the project and authorizations. All work shall conform to the methods and requirements of Code at the location of the Work.

Access and inspection:

All portions of the Work shall be accessible to inspections and review at all reasonable times during construction. Contractor is responsible for providing access for review and inspection of the Work. Contractor shall secure written inspection reports prior to concealing Work. Contractor is responsible for damages to properly review the Work due to lack of at least 7 Days advance written notification to the Architect, and Engineer that Work is ready for inspection.
Plenums: Provide raceway where conductors, and/or cables are routed through plenums. If specifically noted, or specified raceway is not required, plenum routes may utilize conductors/cables rated for use in plenums, and shall be marked as such per NEC. Supporting devices utilized shall also be rated for use in plenums.

Accounting:

Provide general accounting information as to labor and equipment costs to assist in determination of modifications to the Contract. Provide accounting breakdown when required for securing Owner financing, or for analysis of equipment costs or equipment payback periods, as well as information for Owner incentives.

COORDINATION OF TRADES

Check all other trade drawings to avert potential installation conflicts. Should major changes from the Drawings be required to resolve potential conflicts, notify the Architect and secure written approval and agreement on necessary adjustments prior to start of installation.
Check all equipment locations and connections on the site for coordination with other Divisions equipment and connections and structure and the like.
Contractor is responsible for scheduling trades to properly execute all the Work as intended.

STANDARD OF CARE AND QUALIFICATIONS

General:

Contractor shall be experienced and knowledgeable to Provide Work. Owner is not responsible for improper operation, incompliance, or installation due to Contractor’s lack of knowledge or experience. Upon request, and where requested herein the Contractor shall supply qualifications and experience.
Drawings are presented with industry terms, statements, and trade practices and it is the responsibility of the Contractor to be familiar. Provide written notification prior to Bid to the Architect if any representation is not understood, or outside standard practice.

Like Materials and Quality Control:

All systems provided shall be new and of like materials provided through manufacturer authorized distributors. Provide equipment of same system and type by same manufacturer. Items of the same by different manufacturers will be rejected. Equipment shall conform to all applicable Code and applicable listing criteria as of the date of the Contract Documents. Equipment determined to be manufactured under any other listing or Code prior to the date of the Contract is not acceptable, even if the equipment is new or has not been used. All equipment provided to project shall be listed by an approved listing organization.

EXAMINATION OF SITE

Examine Site of Work prior to making Bid. Ascertain all related physical conditions.
Verify at the Site of Work prior to Bid scale dimensions shown due to exact locations, distances, and levels will be governed by actual field conditions.

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Owner will not be responsible for any loss or costs that may be incurred due to a Bidder's failure to fully inform themselves prior to Bid in regard to conditions pertaining to the Work and nature of the Work.

MINOR DEVIATIONS

Make minor changes in equipment locations and equipment connections as directed or required without extra cost.

RECORD DRAWINGS

Maintain a marked set of prints at job site at all times. Show all changes from the original drawing set whether visible or concealed. Include all addendums, field orders, change orders, clarifications, request for information drawn responses, and deviations. Dimension accurately from building lines, floor, or curb elevations. Show exact location, elevation, and size of conduit/raceway, access panels and doors, equipment, and all other information pertinent to the Work.
At project completion, submit marked set to Architect for review.

TRAINING

Provide training of Owner's selected staff for all electrical systems specified herein.
Training of all systems shall be digitally recorded, and two copies shall be distributed to Owner.
Notify and Coordinate with Owner for training and attendance not later than 15 Days prior to training.
Provide 4 hours of general system training in addition to training indicated below.
User Lighting Controls- 4 hours
Factory Authorized Rep. Programming Lighting Controls- 8 hours
(not less than 12 hours)
Training shall be conducted by qualified individuals familiar with the Work, and with the equipment.
Instructor shall be familiar with programming and operation of equipment and shall provide instruction to do such.
Provide contact information to Owner for an additional 8 hours support for all electrical systems.
Training shall not occur prior to systems being fully inspected, operational, and complete.
Utilize necessary training materials, conduct training at project location including walk-through of equipment on-site.
Provide Owner with all required Operation, Maintenance, and Programming manuals provided by equipment manufacturer.
Owner shall determine attendee's at training, not the contractor. Contractor shall re-train if attendee's were not selected by the Owner.

WARRANTY

Warrant Work, materials, and equipment for not less than five years.
Provide additional warranty as required herein.

PART 2 - PRODUCTS

THIS PART NOT USED

PAR 3 - EXECUTION

THIS PART NOT USED

END OF SECTION

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PART 1 - GENERAL

REQUIREMENTS

Refer to Division 1

Organization

Provide 3-ring type hard cover notebook with 3-hole punch product data sheets.
Order submittals in logical form with tab dividers indicating specification section, and specification title
Equipment shown on schedules shall be in logical order as the equipment appears on the schedule (i.e. light fixture type A precedes light fixture type Z), and be submitted with IDs matching schedule(s).
Submit 5 copies for review. Not all copies will be returned to Contractor.
Clearly readable electronic submittals are permitted in – Lieu of initial hard copies provided they are printed by the Contractor with the O&M Manuals for Owner's hard-copy.
Contractor is responsible to verify receipt of electronic submittals by Engineer.
Electronic Submittals shall include the project title in the subject line with unique submittal number, and description of submittal.
Submit to Email address:
submittals@fluentengineering.com
Fluent Engineering has no limit on E-mail sizes; however, from time to time our email service provider may restrict incoming e-mails beyond our control.
Contractor is responsible for any damage as a result of viruses or other malicious software or links to such contained with submittal
Fluent Engineering will accept only PDF electronic files. ZIP files, links, images files, images within an email message, and Dropbox type services, etc. will not be opened/accepted.
Open file sharing programs such as Dropbox are not permitted and are considered a compromise of project security / non-disclosure agreements.
Coordinate with Engineer if PDF E-mail is too large to be sent.
Engineer may elect on a case by case basis to utilize the/a Contractor's online submittal system with Owner's approval.
Otherwise, use hardcopy format.
Allow no less than 20 Days for review by Engineer.
Contractor is responsible to submit and verify receipt of comments for all submittals.
Resubmittals shall contain all items included in pervious submittals with changes clearly identified with a cover letter listing the changed items, or if permitted by Division 1 only resubmit items that have changed with changes clearly identified. Only revised items will be reviewed.
No item requiring review shall be delivered to the site or otherwise provided to the Project until submittals have been reviewed by the Engineer.

DEFINITIONS

Manufacturing Data:

Information regarding the product(s) and equipment issued by the manufacturer as described below.

Manufacturer's Label:

Manufacturer's label shall include a typewritten list of manufacturer's name, sizes and model or catalog numbers.

Manufacturer's Catalog Data:

Manufacturer's catalog data shall include standard catalog information (Cut Sheets) marked to indicate specific equipment and options for complete and functional system. All components of the system shall be included. Include listing information. Include installation instructions.

Manufacturer's Technical and Engineering Data:

Manufacturer's technical and engineering data shall include materials, dimensions, details, installation instructions, weights, capacities, illustrations, wiring diagrams, control diagrams, control schematics, piping diagrams, connection diagrams, performance data, trip curves, listings, mix design, test results, and any other information required for a complete evaluation of the equipment specified, and to verify compliance with the Contract Documents. All available details shall be included with any modifications to the equipment indicated. All manufacturers and associated model numbers used for complete system shall be indicated.

Shop Drawings:

Shop drawings are Construction drawings of items manufactured specifically for this project. Shop

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drawings shall include dimensions, construction details, weights, and additional information to identify the physical features of the system or piece of equipment. Drawings shall be adequately sized and scaled for a complete review.

Samples:

Samples include actual example of the equipment to be installed. Include actual color, finish, and functioning replica of equipment to be installed. Samples will be returned to the Contractor when submitted with pre-paid postage.

Certifications and Qualifications:

Submit list of past projects with same systems. Submit information listing references, copies of certificates issued by manufacturer, school, and standards organizations. Submit information mandated in specific specification section.

SUBMITTALS REQUIRED

Product Evaluation Data. 5 copies of product literature. The submittal schedule for product evaluation data is as indicated below. Each item requiring a submittal is given the following code:

L	Manufacturer's Label
C	Manufacturer's catalog data (Cuts)
E	Manufacturer's technical and engineering data
S	Shop drawings
SA	Samples
CR	Certifications
Q	Qualifications

SUBMITTAL SCHEDULE

Division 26 - Electrical

Section 26 05 19- BUILDING WIRE AND CABLES……C
Section 26 05 26- GROUNDING……..C
Section 26 05 29- SUPPORTING DEVICES……..L
Section 26 05 33- RACEWAYS & FITTINGS……..L,C
Section 26 05 33.16- OUTLET, JUNCTION, AND PULL BOXES……...C
Section 26 05 53- ELECTRICAL IDENTIFICATION……..…L
Section 26 05 60- OVERCURRENT PROTECTIVE DEVICES……C,E,S
Section 26 05 83- WIRE CONNECTIONS……...L
Section 26 24 16- PANELBOARDS……..C,E,S
Section 26 24 18 SURGE PROTECTION DEVICE……..C,E
Section 26 27 26- WIRING DEVICES……..C
Section 26 29 12- DISCONNECTS & MANUAL MOTOR STARTER……C,S
Section 26 33 13- EMERGENCY POWER PACKS……...C,E
Section 26 51 13.20- LIGHTING FIXTURES……..C,S
Section 26 51 20- AUTOMATIC LIGHTING CONTROL……..……..…C,E,S

PART 2 - PRODUCTS

THIS PART NOT USED

PART 3 - EXECUTION

THIS PART NOT USED

END OF SECTION

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PART 1 GENERAL

DESCRIPTION OF WORK
Provide electrical boxes and fittings as required for a complete, protected, and operable system.
Comply with local Codes and NEC as required for Providing electrical boxes and fittings.

REFERENCE STANDARDS
American National Standards Institute (ANSI).
C73 Series Dimensions of Attachment Plugs and Receptacles
National Electrical Manufacturers Association (NEMA)
OS 1 Sheet-Steel Outlets Boxes, Device Boxes, Covers, and Box Supports
FB 1 Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable

APPLICABLE REGULATIONS
American National Standards Institute (ANSI).
C2 National Electrical Safety Code (ANSI/IEEE C2)
National Fire Protection Association (NFPA).
NFPA 70 National Electrical Code.
Underwriters' Laboratories (UL).
UL50 Cabinets and Boxes (ANSI/UL50).
UL514 Outlet Boxes and Fittings (ANSI/UL514).

PART 2 PRODUCTS

OUTLET BOXES:
No smaller than 4-inch, 1-1/2-inches deep box. Provide raised covers where required for surface mounted outlets, plaster rings on flush outlets. Provide tile rings where flush outlets installed in tile. Concrete type where installed in concrete.
Receptacle Outlets and Flush Switch:
4-inch square box, 1-1/2-inches deep, with single or two-gang plaster ring.
Match one piece gang boxes to number of devices, install one device per gang. Devices requiring more than one-gang shall be installed in individual boxes matched to device size. Do not exceed 5-gang configuration per row of devices at same location.
Provide galvanized steel interior dry location outlet wiring boxes for emt raceway shaped and sized, to conform to each individual location and installation. Provide with factory knockouts in back and sides, and with threaded holes with screws for securing box covers or devices.
Provide outlet box accessories as required. Accessories include mounting brackets, wallboard hangers, extension rings, fixture studs, cable clamps and metal straps for supporting outlet boxes. Choice of accessories is Contractor’s option.
Outlet Box Covers:
Flush Mounting:
Bevelled, Nylon White, or per Architect match device installed or full cover where no device installed.
Surface Mounting:
Bevelled, steel, pressure formed, or per Architect match device installed or full cover where no device installed.

WEATHERPROOF / WET LOCATION OUTLET BOXES:
Provide corrosion-resistant cast metal weatherproof outlet wiring boxes, shaped and sized, to conform to each individual location and installation. Provide with threaded conduit ends, suitably configured for each application, including face plate gasket and corrosion proof fasteners.
Weatherproof boxes shall have smooth sides, gray finish.
Boxes used in contact with earth shall be cast iron alloy with gasketed screw cover and water-tight hubs.
Weatherproof Plates:
Cast metal, gasketed for switches provide spring loaded sealed door(s).
Weatherproof Receptacle Outlet Cover: Cast metal, NEMA 3R, In-Use type, with locking tab. Match device configuration. 3 ¼ -inches internal depth. T&B CK series, or approved

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WEATHERPROOF JUNCTION AND PULL BOXES:
Provide galvanized sheet steel junction and pull boxes, with screw-on covers; of the type, shape and size, to suit each respective location and installation; with welded seams and equipped with stainless steel nuts, bolts, screws and washers.

KNOCKOUT CLOSURES:
Provide punched-steel knockout closures for steel boxes.

PULLBOXES
Provide sheet metal in interior dry locations for EMT raceway. Provide cast metal in exterior, or damp locations. Type and material shall conform to National Electrical Code, with screw-on cover.
Flush Mounted Pullboxes:
Provide overlapping covers with flush head screws, finished in light gray enamel.
Box volumes shall meet NEC for size and number of entering conduits and cables.

UNDERGROUND PULLBOXES
Underground Pull Boxes:
Cast concrete with suitable concrete cover to withhold loads in location installed. Provide heavy-duty traffic cover where installed with vehicle traffic. Cover and box shall not deform and be rated for location installed. Provide drainage and no less than 4 feet compacted gravel below installation. Size, and configuration to match installation. Provide where required, and shown on Drawings.

PART 3 EXECUTION

INSTALLATION
Match one piece gang boxes to number of devices, install one device per gang. Do not exceed 4-gang configurations per row of devices at same location.
Locate outlet boxes flush other than in mechanical rooms, electrical rooms, and above suspended ceilings. Provide insulation behind box to prevent condensation for boxes mounted in exterior walls.
Provide insulation behind box for walls with insulation for sound reduction.
Coordinate location and mounting heights with built-in units and cabinetry. Outlet mounting height shall be at same level required for equipment served.
When mounting receptacle, or voice/voice outlet boxes above bench or counter, mount box to the side (horizontally) for finished receptacle grounding pole at left.
Locate pullboxes and junction boxes concealed above suspended ceilings or in electrical rooms, mechanical rooms, or unfinished areas.
Support:
Provide adequate support of all outlet boxes. Secure boxes independent raceway, by attaching directly to building structure by approved means.
Identify each junction and pullbox with system description including branch circuit numbers of enclosed circuits, and voltage.
Secure all raceway to entering boxes with approved bushings, and locknuts.
Do not mount boxes back-to-back. Boxes on opposite sides of wall shall be separated by at least 3 inches.
Maintain sound transmission and fire properties of surface installed. Provide appropriate fire stop and sound stop materials as required to maintain these properties.
Provide separate boxes where two voltage systems have equipment at same location. Provide separate boxes for equipment on emergency power system.

END OF SECTION

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PART 1 GENERAL

WORK INCLUDED
Wall Switches.
Receptacles.
Ground Fault Receptacles.

REFERENCE STANDARDS
American National Standards Institute (ANSI).
C73 Series Dimensions of Attachment Plugs and Receptacles.
National Electrical Manufacturer's Association (NEMA).
WD 6 Wiring Devices- Dimensional Requirements
WD 1 General Color Requirements for Wiring Devices.
National Fire Protection Association (NFPA).
NFPA 70 National Electrical Code.
Underwriters' Laboratory (UL).
UL-20 Standard for Snap Switches.
UL 498 Attachment Plugs and Receptacles
UL 467 Grounding and Bonding Equipment
UL 514D Cover Plates for Flush-Mounted Wiring Devices
2006 UL 943 Safety for Ground-Fault Circuit-Interrupters

QUALITY ASSURANCE
Provide type 5362 receptacles in common, assembly, and office areas.
Provide type 5362 receptacles in residential/suite areas.
Acceptable Manufacturers: Hubbell, Pass and Seymour, Arrow-Hart, Leviton, or approved

PART 2 PRODUCTS

MATERIALS
Switches:
120/277 Volt. AC Quiet, slow make, slow break design, toggle style handle, with totally enclosed case, 20 Ampere, specification grade. Provide matching two-pole, three-way and four-way switches.
Keyed Switches:
Same as Switches, with tamper resistant keyed switch and matching wall plate.
Receptacles:
20 Ampere (unless otherwise indicated), 125 Volts (unless otherwise shown), duplex, polarized, full gang size, tamper type, specification grade, separate ground terminal, 20 Amp. break-off tab for split circuit wiring. Tamper not required in janitorial, or employee only areas where children will not be present.
Ground Fault (GFI) Receptacles:
20 Ampere, tamper type, specification grade duplex receptacle with integral ground fault circuit interrupter. LED operation indicator. Test and reset buttons. End of life protection- GFI component failure results in no power delivered to equipment (2006 UL 943).
Wall Plates:
Nylon, White or per Architect match device configuration.
Colors:
Verify colors with Architect.
White Receptacles, White Switches: In finished areas that are not dark brown in color.
Brown Receptacles, Brown Switches & Brown Nylon Wall Plate: In finished areas with dark brown or dark wood finish.

PART 3 EXECUTION

INSTALLATION
Do not use back wiring wells, terminate conductors on mechanical screw terminals.
Do not use GFI-Feed through function, GFI receptacles with test, reset, etc. required at each location

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where GFI is required.
Provide wiring devices as shown.
Install devices plumb and consistent with building lines. Wall Plates shall make contact on four corners and shall fit flush with device.
Devices to include same configuration outlet box, cover, wall plate and other necessary installation materials for a complete operating circuit.
Mount switches 42 inches (to center line of faceplate) above floor except as otherwise noted on the Drawings.
Coordinate mounting locations with architectural details.
Mount receptacles vertically at 15 inches (to bottom of faceplate) above finished floor, with grounding pole at bottom.
Coordinate receptacle height with benches and counters.
When mounting receptacle above bench or counter, mount receptacle to the side with grounding pole at left.
Where installed with disposal: Provide split switched GFI receptacle (or GFI via Breaker) for receptacles mounted under sinks. Provide switch for ½ duplex receptacle in approved ADA location such as under sink within counter, or above counter if ADA accessible. Delete switch if air-switch or other control device is specified.
Grounding:
Install a separate bare conductor between the receptacle strap grounding (green) screw and a screw into the outlet box. Self-grounding strap not approved as grounding means.
Where existing receptacle circuiting is changed to emergency power, remove existing receptacle, and replace with distinctive color per NEC. Replace with like receptacle removed including GFI, AFCI, etc.1
Where automatic control is required (At least 50% of all 125 V, 15 and 20 amp receptacles in private offices, conference rooms, rooms used primarily for printing and/or copying functions, break rooms, classrooms, and individual workstations), utilize dual relay occupancy sensors for this function. Refer to automatic lighting control requirements. Label automatically switched outlet per Energy Code.

END OF SECTION

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

PART 1 GENERAL

WORK INCLUDED

Provide complete operational lighting control system and complete operational lighting control equipment as specified and shown. Equipment includes all necessary programming, hardware, and materials for satisfactory system.

Utilize a wireless retrofit control system as shown on Drawings. Replace existing line-voltage switches with line-voltage wireless controls where shown. Provide new line-voltage to locations with new wireless controls. Re-configure existing circuiting for neutral to existing switch locations (re-characterize existing conductor), and provide unswitched hot to new fixtures as applicable (those fixtured controlled with wireless controls). Some circuiting includes line-voltage occupancy controls (publicly accessible restrooms), or controls removed (exterior soffit lighting) for unswitched hot (Owner furnished lamps controlled with separate Owner's wireless App.- Roof-19 circuit).

REFERENCE STANDARDS

Underwriters Laboratories (UL)

UL 733A Standard for Nonindustrial Photoelectric Switches for Lighting Control

UL 916 Energy Management Equipment

UL 917 Standard for Clock-Operated Switches

UL 924 Standard for Emergency Lighting and Power Equipment

Oregon Energy Code

SUBMITTALS

Provide Shop Drawings showing wiring diagrams, models, switch labels, schematics, labels, and interconnections.

Manufacturer verification of occupancy coverage, and wireless reach (signal strength)

PART 2 PRODUCTS

GENERAL

Lighting controls shall be certified, and approved per Oregon Energy Code.

INTERFACE POWER PACK- WIRELESS

Input Side:

Wireless Interface (Input)

Daisy Chain Interoperability with multiple power packs, multiple control devices via Wireless Network

MVOLT Wired power controlling Fixture, and Power Pack Input Power.

nLight Network Communication

Central Networkable interface (i.e. Eclypse)

Plenum Rated

Configurable Relay Logic

Output Side:

20A Rated Protection interface (16A max continuous load)

LED compatible

0-10V DC Dimming

120V, 208V, 220V, 240V, 277V (MVOLT/UNIVERSAL) compatible

See Drawings for additional requirements

Acceptable Products: nLight rPP20D Series

LOW VOLTAGE ROOM SWITCH / ROOM CONTROL SWITCH- WIRELESS

1-gang (gang each 1-gang controller together where shown)

nLight Network Communications

Compatible with 120V connection with WIRELESS output

Gray Color, Verify Color with Architect

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Compatible Wall Plate (302 Stainless Steel as Standard, change to nylon if color not Gray)
Configurations as shown on Drawings
Where not shown, default to 3 Button Style
Controls- 3 Button Style
ON/OFF (Single Button)
Raise Dimming (Single Button)
Lower Dimming (Single Button)
No scenes
rPODLA DX MVOLT Series
Controls- 2 Button Style
ON (Single Button)
OFF (Single Button)
rPODLA MVOLT Series
Controls- 6 Button Style
(2) ON/OFF (Single Buttons)
(2) Raise Dimming (Single Buttons)
(2) Lower Dimming (Single Buttons)
rPODLA 2P DX MVOLT Series
Drawings may show additional details/Requirements
Color/Wallplates- Match Wiring Devices (Switches)
Acceptable products: nLight rPODLAXX Series

INTEGRATED FIXTURE CONTROLS- WIRELESS
Compatible with control system
Occupancy Sensor- same features as CEILING OCCUPANCY SENSOR with Wireless Input, different housing.
0-10V DC Dimming (output)
ON/OFF Control (MVOLT output)
Photosensor- save features as AUTOMATIC INTERIOR PHOTOCELL with Wireless Input for Manual Dimming, and 0-10V DC direct fixture control output
Additional as shown on Fixture Schedule
Finish per fixture
Acceptable products: RES7 with PDT (Microphonics) and additional as required/shown such as rIO for additional functions such as wireless tunable white. Clairity App. programming/nLight Air.

CEILING OCCUPANCY SENSOR With Photosensor- WIRELESS
Motion sensor shall detect motion by using passive infrared and audible sound technology (microphonics).
Compatible with wireless protocol
100% Digital PIR detection
nLight Network Communications
Adjustable time delay, pushbutton programming. Time delay-off shall not exceed energy code.
Sensor shall be immune to false activation due to air movement and ambient sound.
Sensor shall be immune to RFI, EMI, and normal operating voltage fluctuations.
White housing unless non-white ceiling, then provide housing color per Architect.
Provide Low Temperature High Humidity sensors in unconditioned spaces, or high humidity spaces.
Utilize Hubbel ACIPE 4X cover for use in vandal/high abuse areas, in spray down/shower areas, and where shown.
Integrated Photosensor
Acceptable products: nLight rCMS PDT Series. Provide power pack(s) as required to supply sensor(s), or connect to applicable INTERFACE POWER PACK where present.
9/10/6 Option per coverage map and height conditions
6 Option not anticipated on this project

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LINE VOLTAGE RELAY CEILING OCCUPANCY SENSOR
Same as CEILING OCCUPANCY SENSOR with no photosensor
Not Wireless, not networkable. Provide line voltage input control with on-board relay for direct local fixture control.
Utilize Hubbel ACIPE 4X cover for each. PDT option still required.
Utilize only where shown (publicly accessible bathrooms)
Acceptable product: Sensor Switch (or nLight same) CMR PDT 9 LT Series

PROGRAMMING SOFTWARE AND DEVICES
Factory Authorized System Programming Required.
Provide complete wireless programming devices including but not limited to tablets, Bluetooth dongles, wi-fi, etc. for complete owner control of programmable system. Every programming password, shall be provided to Owner. Include not less than (2) pre-software loaded tablets for Owner's use including pre-install floor plans/room numbers as required. Provide Owner with as-left programming pre-installed into both tablets. Owner shall not have to re-address or otherwise re-obtain, load/data entry into software for as-left programming. Program system on-side of Owner. Owner's staff shall be present for entire system programming. Owner's staff may be up to 10 people during programming phase of Construction. Provide software, licenses, download links, etc. for unlimited programming availability as well as not less than 15 years of software license (if software license is yearly). Provide Clarity programming software, and not less than 2 sets of any other hardware to program the system. If Owner elects to use cellular phone device, both tablets still required. Provide same hardware, software, etc. utilized by Factory Authorized Programmer to Owner.

PART 3 EXECUTION

INSTALLATION
System shall be installed as shown on Drawings.
Provide plenum rated equipment where installed in plenums.
Provide Wet Location / Vandal Location Ceiling Occupancy Sensor where required.
Provide High Humidly sensors where installed in shower areas.
Motion sensor manufacturer shall verify Drawings to ensure coverage is adequate, and does not sense motion is other areas causing undesirable operation.
Return once no later than 90 days but not sooner than 30 days after Project Substantial Completion to adjust sensitivity of all motion sensors and to adjust programming of lighting control system.
Install per requirements of Oregon Energy Code.
Fixtures with integral 0-10V dimming included shall include dimmers within the spaces they are installed. Dimming may not shown on Drawings. Provide manual dimmer capability where other control means are included including but not limited to: Ceiling mounted occupancy sensor, wall mounted occupancy sensor, local automatic room controller control, and manual switching. Manual dimmer may be part of local room controller system if present. Dimming not required in storage, mechanical, electrical, utility, hallway, areas where safety related tasks are performed (such as shops/kitchens/cutting areas/ machinery, etc.), and bathrooms. The lighting fixture schedule and fixture dimming indication, and/or fixture includes dimming as standard has been developed with this requirement, and intents to include dimming in areas where fixtures are provided with dimming, even when fixtures include dimming without a specific indication on the lighting plans/schedule that dimming is required.
Provide Emergency Bypass Relay for emergency fixtures installed with separate emergency conductors and locations with emergency fixtures connected to switching. Emergency bypass relay shall be installed to automatically switch emergency lights ON independent of any other switching, or dimming scenario, and/or settings. Additional details and requirements may be included with drawings.

Provide factory authorized representative programming per requirements shown on drawings.
Train Owner's personal for complete programming training separate from user training. Owner shall be trained for use of Clarity programming system/software/wireless systems.
Owner shall be able to- readdress fixtures (assign to new/other rooms), turn occupancy sensing on/off,

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turn photocell dimming on/off, photosensor dimming controls/settings, occupancy sensing controls/settings time delays, etc. Owner shall be able to completely re-program system, and be trained for such without requiring call-back, or service. Should Owner deem training is inadequate or incomplete, Substantial Completion may not be granted. Include not less than (2) return programming trips upon request of Owner at no additional charge to the Owner, up to 1.5 years after Substantial Completion (which shall include lighting controls programming as initially indicated on Drawings).

WARRANTY

Provide 5 year warranty.

END OF SECTION

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CARLSON VEIT JUNGE ARCHITECTS PC
ARCHITECTURE • INTERIOR DESIGN

Addendum No. 4

Date: October 9, 2024

Project: Marion County Behavioral Health Crisis Center

To: Prospective Bidders

This addendum forms a part of the Contract Documents and modifies the original Construction Documents dated 06-06-2024 as noted below, and becomes a part of the Contract Documents.

This addendum consists of 2 pages, plus attachments.

CHANGES TO ITB:

1. Exhibit 1 Pricing Submittal Form: replace with attached submittal form.
2. Exhibit 7 Supplemental General Conditions: Add item SC-2 regarding permit fees.
3. Add: Attachment E Pre-Renovation Lead Paint Survey Report, dated July 25, 2022.

ARCHITECTURAL DRAWINGS:

4. Sheet A-101, General Note 4, delete and replace with: “Bid Alternate to remove existing window coverings at all exterior windows. Refer to specification section 01 23 00.”
5. Sheet A-102, general note 7, delete and replace with: “Bid Alternate to provide new window blinds at all exterior windows. Refer to specification section 01 23 00.”
6. Sheet A-103, Ceiling Demo Note D, delete: “salvage for reinstallation in the same location”.
7. Sheet A-202, Elevation Note 1, add: Contractor to remove from 3180 Center Street NE, Salem OR, transport items to site, and install where shown on plans. See attached photos for reference.
8. Sheet A-401, Large Scale General Note 2: delete TSCD and SNR from OFCI list. These are CFCI as noted in 10 23 13.

ELECTRICAL DRAWINGS:

1. Sheet E-200:
    a. Office 112, circuits for copier: delete “G-33,37” and replace with “F-35,37”.
    b. Reception 118, circuits for copier: delete “G-39,41” and replace with “F-39,41”.

PROJECT MANUAL:

1. Section 01 21 00 Allowances, page 1, line 17, add:
   Allowance No. 3:
   Remove 1,900 SF of asbestos-containing vinyl floor tile or sheet vinyl and mastic from concrete substrate.
   Allowance No. 4:
   Remove 4,000 SF of asbestos-containing mastic under existing, non-asbestos-containing floor finish from concrete substrate.
   Allowance No. 5:
   Remove 50 LF of asbestos-containing pipe insulation and associated hard fittings.
   Allowance No. 6:
   Remove 10 Glove Bags of up to three linear feet of asbestos-containing pipe insulation and associated hard fittings, or up to 6 hard fittings in a single glove bag.
   Allowance No. 7:
   Create 5 new openings in asbestos-containing roofing to accommodate new construction.
2. Section 01 22 00 Unit Prices, page 1, line 22, add:
   Item No. 3:

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Price per square foot for removal of asbestos-containing vinyl floor tile or sheet vinyl and mastic from concrete substrate.
Item No. 4:
Price per square foot for removal of asbestos-containing mastic under existing, non-asbestos-containing floor finish from concrete substrate.
Item No. 5:
Price per lineal foot for removal of asbestos-containing pipe insulation and associated hard fittings.
Item No. 6:
Price per glove bag for removal of up to three linear feet of asbestos-containing pipe insulation and associated hard fittings, or up to 6 hard fittings in a single glove bag.
Item No. 7:
Price per opening to create a new opening in asbestos-containing roofing to accommodate new construction.

3. Section 09 29 00 Gypsum Board:
    a. Page 2, line 58, add: Finish Texture: USG “Spray Texture”, or accepted substitute.
    b. Page 4 lines 29-30: delete and replace with: Level 3 finish, light orange peel or finish to match adjacent surfaces: delete this section in its entirety.

End of Addendum 4.

Attachments:
Exhibit 1
Exhibit 7
Attachment E
Photos of 3180 Casework

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EXHIBIT 1
PRICING SUBMITTAL FORM

BS1553-24

PRICING SUBMITTAL INSTRUCTIONS:

Bidders shall enter pricing and other required information for all Bid Items listed in this Pricing Submittal Form. If this Pricing Submittal Form is replaced by Addendum, Bidders shall use the Addendum form to provide pricing and other required information. If the Pricing Submittal Form is only modified by Addendum, Bidders shall follow the instructions in the Addendum for making modifications to the Pricing Submittal Form. Failure to supply the required information in the Pricing Submittal Form or subsequent Addenda may result in Bid rejection as non-responsive.

BASE BID and ALTERNATES: To include all work described in the ITB, Plans, Specifications and any issued Addenda, including Allowances.

BASE BID - LUMP SUM: $_____, including all allowances.

ALTERNATE NO. 1

Remove existing window coverings at all exterior windows and provide new window blinds.

LUMP SUM: $_____

TOTAL BASE BID AND ALL ALTERNATES: $_____

SCHEDULE OF ALLOWANCES TO BE INCLUDED IN BASE BID – LUMP SUM

Item	Description	Quantity	UOM	Unit Cost	Total Cost
1	Replace damaged 12x12 ceiling tiles with salvaged tiles.	1,000	SF		
2	Remove gyp board damaged due to wallcovering removal and replace with new gyp board.	2,000	SF		
3	Remove asbestos-containing vinyl floor tile or sheet vinyl and mastic from concrete substrate.	1,900	SF		
4	Remove asbestos-containing mastic under existing, non-asbestos-containing floor finish from concrete substrate.	4,000	SF		

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5	Remove asbestos-containing pipe insulation and associated hard fittings.	50	LF		
6	Remove up to three linear feet of asbestos-containing pipe insulation and associated hard fittings, or up to 6 hard fittings in a single glove bag.	10	Glove Bag		
7	Create new openings in asbestos-containing roofing to accommodate new construction.	5	Each		
			Total Items 1 - 7		

UNIT PRICES:

Unit price is an amount offered by Bidders as a price per unit of measure for materials or services added or deducted from the Contract sum by appropriate Contract modifications. These unit prices will be used in conjunction with the General Conditions, Section D, for changes to the Work, as required by the Owner, and for determining Allowances in conjunction with General Conditions, Section B.17. The Work described below is part of the base bid or alternate or item. The unit price is being established only for Work added or deducted from the base bid or alternate or item.

Bidders shall provide unit pricing for the following items. These unit prices will be used in determining the value of Allowances incorporated in the Base Bid. Failure of the Bidder to provide these unit prices shall result in Bid rejection.

==========

UNIT PRICE NO. 1: Price per square foot for removal and replacement of 12” x 12” adhesive applied ceiling tile.

PRICE PER SQUARE FOOT: $_____

==========

UNIT PRICE NO. 2: Price per square foot for removal of plaster/gyp board finish and replacement with (1) layer gyp board.

PRICE PER SQUARE FOOT: $_____

==========

UNIT PRICE NO. 3: Price per square foot to remove asbestos-containing vinyl floor tile or sheet vinyl and mastic from concrete substrate.

PRICE PER SQUARE FOOT: $_____

==========

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UNIT PRICE NO. 4: Price per square foot to remove asbestos-containing mastic under existing, non-asbestos-containing floor finish from concrete substrate.

PRICE PER SQUARE FOOT: $_____

==========

UNIT PRICE NO. 5: Price per linear foot to remove asbestos-containing pipe insulation and associated hard fittings.

PRICE PER LINEAR FOOT: $_____

==========

UNIT PRICE NO. 6: Price per glove bag to remove up to three linear feet of asbestos-containing pipe insulation and associated hard fittings, or up to 6 hard fittings in a single glove bag.

PRICE PER GLOVE BAG: $_____

==========

UNIT PRICE NO. 7: Price per penetration to create a new opening in asbestos-containing roofing to accommodate new construction.

PRICE PER PENETRATION: $_____

==========

BIDDER NAME: _____

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EXHIBIT 7
SUPPLEMENTAL GENERAL CONDITIONS

Contract No. BS1553-24

Project Name Behavioral Health Crisis Center Remodel

For the above Contract, the following supplements modify the "Marion County General Conditions for Public Improvement Contracts" set forth in Exhibit 6. Where a portion of the General Conditions is modified or deleted by these Supplemental General Conditions, the unaltered portions of the General Conditions shall remain in effect.

SG-1. Section B.13 is augmented as follows: Owner intends to contract with Northside Electric and Reece Complete Security Solutions to furnish and install Low Voltage Systems and Door Control Systems respectively. Some of the equipment will be built into or interface with work done under this contract for construction of the building. The Contractor shall coordinate with Northside Electric and Reece Complete Security Solutions to accommodate sequencing of the work, and to accommodate items provided by Northside Electric and Reece Complete Security Solutions that require dimensional and construction coordination for proper fit and operation.

SG-2. Section B.4 is augmented as follows: The Owner will pay the plan review fee, general building permit fee and systems development charges.

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ATTACHMENT E
Limited Lead Sampling Report
dated July 25, 2022

*** Download from Marion County Procurement Collaboration Portal ***

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July 25, 2022

Geoffrey Bonney
Marion County Facilities and Construction Management
100 High Street NE
Salem, Oregon 97301

Via email: GBonney@co.marion.or.us

Regarding: Limited Lead Sampling Report
1234 Commercial Street SE
Salem, Oregon 97301
PBS Project Number 23791.014

Dear Mr. Bonney:

On July 12, 2022, PBS Engineering and Environmental Inc. (PBS) completed sampling for lead in paint at the commercial building located at 1234 Commercial Street SE in Salem, Oregon. The sampling focused on interior building components likely to be impacted by planned improvements to the building.

Seven paint chip samples were collected and submitted under chain of custody to RJ Lee Group of Monroeville, Pennsylvania, for analysis of lead content via flame atomic absorption (FLAA).

The concentration of lead in the samples ranged from below the method limit of detection up to 2,800 parts per million (ppm). As such, lead-safe engineering controls, work practices, and worker protection protocols should be followed when completing any other work that will impact painted surfaces.

Please see the attached PBS lead sample inventory for additional details.

LEAD-CONTAINING PAINT REGULATIONS

The Consumer Product Safety Commission has set a limit for lead in consumer paint products of 0.009% or 90 ppm or greater. The Department of Housing and Urban Development (HUD) and the EPA define lead-based paint as that which contains 0.5% or 5,000 ppm. Under OSHA, any lead concentration in paint that may become airborne during construction operations triggers requirements in the OSHA Lead in Construction Standard 29 CFR 1926.62 to protect employees impacting the paint.

In 1993, Oregon OSHA adopted the federal OSHA Lead Standard for the Construction Industry Title 29 CFR 1926.62 under Oregon Administrative Rule 437 Division 3 1926.62. This standard outlines worker exposure limits, personal protection requirements, and employer responsibility for exposure assessment, training, housekeeping, and recordkeeping. OSHA's lead standard applies to all work where employees may be exposed to lead in

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construction, alteration, or repair activities. This includes demolition or renovation of structures where lead-containing materials are present.

Disposal

According to DEQ's *Hazardous Waste/Toxics Reduction Policy Clarification*, disposal of building demolition waste coated with lead-based paint generally will not require a hazardous waste determination (i.e., Toxicity Characteristic Leaching Procedures [TCLP] testing) if demolition debris is disposed of at a DEQ-permitted solid waste landfill that meets the current design standards for municipal solid waste disposal facilities specified in 40 CFR Part 258.

Refer to the DEQ hazardous waste reduction policy and follow all requirements under the DEQ, Management of Building Demolition Waste, 97-002A for proper disposal of demolition waste containing lead paint.

LIMITATIONS OF SCOPE

This study was limited to the tests and locations as indicated above. The site as a whole may have other environmental concerns that will not be characterized by this study. The findings and conclusions of this work are not scientific certainties but probabilities based on professional judgment concerning the significance of the data gathered during the course of this investigation.

The lead sampling and analysis completed as part of this survey is for hazard identification and communication purposes only. The sampling was limited in scope and was not intended to be an exhaustive investigation of lead-containing paint on all building surfaces nor a lead hazard assessment.

Please feel free to contact me at 503.515.4726 or dale.voeller@pbsusa.com with any questions or comments.

Sincerely,

Dale Voeller, CHMM, CSP
Senior Project Manager

Attachments: Lead Sample Inventories and Laboratory Analysis

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Code	Material	Analysis	Location	Lab
PAINT				
LB23791.014-1001	Paint	51.2 ppm	Front reception; wall, gypsum, white, good condition	R.J. Lee Group
LB23791.014-1002	Paint	2,800 ppm	Front reception entryway; door frame, wood, brown, good condition	R.J. Lee Group
LB23791.014-1003	Paint	61.0 ppm	Break room; current, wall, gypsum, white, good condition	R.J. Lee Group
LB23791.014-1004	Paint	<12.3 ppm	Room 20; wall, gypsum, white, good condition	R.J. Lee Group
LB23791.014-1005	Paint	<12.4 ppm	Nurses station across from 21; wall, gypsum, white, good condition	R.J. Lee Group
LB23791.014-1006	Paint	<40.5 ppm	Future break room; wall, gypsum, white, good condition	R.J. Lee Group
LB23791.014-1007	Paint	<15.7 ppm	Main entry near restroom; wall, gypsum, white, good condition	R.J. Lee Group

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RJ LEE GROUP

RJ Lee Group, Inc.
350 Hochberg Road, Monroeville, PA 15146
Tel: (724) 325-1776 | Fax: (724) 733-1799

LABORATORY REPORT

PBS Engineering & Environmental
4412 South Corbett Ave
Portland, OR 97239

Attn: Alex Johnson
Phone: 503-248-1939

Email: alex.johnson@pbsusa.com

RJ Lee Group Job No.: PA130720220012
Samples Received: July 13, 2022
Report Date: July 20, 2022
Client Project: 23791.014 Phase 0001
Purchase Order No.: N/A
Matrix: Solid
Prep/Analysis: EPA 3050B / EPA 6010C-Paint

Client Sample ID	RJ Lee Group ID	Sampling Date	Analyte	Sample Concentration		Minimum Reporting Limit		Analysis Date	Q
				Weight Percent (%)	Parts per Million (PPM) - mg/kg	Weight Percent (%)	Parts per Million (PPM) - mg/kg		
LB23791.014-1001	PA130720220012-001	NP	Lead	0.00512	51.2	0.00227	22.7	7/14/2022	A
LB23791.014-1002	PA130720220012-002	NP	Lead	0.280	2800	0.0123	123	7/15/2022	A
LB23791.014-1003	PA130720220012-003	NP	Lead	0.00610	61.0	0.00128	12.8	7/14/2022	A
LB23791.014-1004	PA130720220012-004	NP	Lead	< 0.00123	< 12.3	0.00123	12.3	7/14/2022	A
LB23791.014-1005	PA130720220012-005	NP	Lead	< 0.00124	< 12.4	0.00124	12.4	7/14/2022	A
LB23791.014-1006	PA130720220012-006	NP	Lead	< 0.00405	< 40.5	0.00405	40.5	7/14/2022	A
LB23791.014-1007	PA130720220012-007	NP	Lead	< 0.00157	< 15.7	0.00157	15.7	7/14/2022	A

Comments:

Report Qualifiers (Q):

P *: PA-DEP Accredited (PA DEP Lab ID 02-00396, NELAP)*
N *: NY ELAP Accredited (NY ELAP Lab Code 10884)*

A *: AIHA LAP, LLC Accredited (Lab ID 100364)*
— : Test (analyte-matrix-preparation-analysis) is performed under RJLG's General Quality System requirements and is not part of any of the above scopes of accreditations

E = Value above highest calibration standard
J = Value below lowest calibration standard but above MDL (Method Detection Limit)
L = LCS (Laboratory Control Standard)/SRM (Standard Reference Material) recovery outside accepted recovery limits
H = Holding times for preparation or analysis exceeded

B = Analyte detected in the associated Method Blank
S = Spike Recovery outside accepted limits
R = RPD (relative percent difference) outside accepted limits
D = RL (reporting limit verification) outside accepted limits
NP = Not Provided

These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified in writing to return the samples covered by this report, RJ Lee Group will store the samples for a period of thirty (30) days before discarding. A shipping and handling fee will be assessed for the return of any samples.
This laboratory operates in accord with ISO 17025:2017 guidelines, and holds a limited scope of accreditations under different accrediting agencies; refer to http://www.rjlg.com/about-us/accreditations/ for more information and current status. Unless it is specifically stated otherwise (under the Q column using the appropriate accrediting agency qualifier(s)) the work contained in this report is performed under RJLG's General Quality System requirements and is not part of any scope of accreditations. This report may not be used to claim product endorsement by any laboratory accrediting agency. The results contained in this report relate only to the items tested or to the sample(s) as received by the laboratory. Any reproduction of this document must be in full for the report to be valid.

Unless otherwise noted (either in the comments section of the report and/or with the appropiate qualifiers under the report qualifiers (Q) column) the following apply: (a) Samples were received in good condition, (b) All QC samples are within acceptable established limits, (c) All samples designated as NELAP meet the requirements of the NELAC standard; if not applicable qualifiers will be used to designate the non-compliance and (d) Results have not been blank corrected. Quality Control data is available upon request.

Erin Repine
Scientist

Docusign Envelope ID: F0BDFE26-77F2-43DF-97A5-B8199A3DFBC5

PBS

PA 13072022001Z

TRANSMITTAL AND CHAIN OF CUSTODY FOR LEAD BULK SAMPLES

Project No.: 23791.014 Phase 0001

Individuals signing this form warrant that the information provided is correct and complete. The Sender should keep a copy and send the original. The Receiver should complete the form, keep a copy and return the original to the Sender. Receiver shall report damage of package immediately to Sender.

SENDER

Date Sent: July 12, 2022

PBS Engineering and Environmental Inc.
4412 S Corbett Avenue
Portland, OR 97239
503.248.1939, Fax: 866.727.0140

Alex Johnson
Name

Authorized Signature

7/12/22
Date

RECEIVER

Date Received: 07/13/22 10:39am

Company: R.J. Lee Group
Address: 350 Hochberg Road
Monroeville, PA 15146
724-325-1776

Emily Vargo
Name

Emily Vargo
Authorized Signature

07/13/22 10:39am
Date

Sender's ID No.	Brief Description	Receiver's ID No.
LB23791.014-1001		
LB23791.014-1002		
LB23791.014-1003		
LB23791.014-1004		
LB23791.014-1005		
LB23791.014-1006		
LB23791.014-1007		

ANALYSIS REQUESTED:

LEAD:
- ☑ **Paint**
- ☐ **Wipe**
- ☐ **Soil/Misc.**
- ☐ **Air**
- ☐ **TCLP**

Please analyze the enclosed 7 sample(s) for LEAD content using Atomic Absorption Method. PBS requests prior notification if samples will be disposed.

Please fax and mail the results to the above address.

TURNAROUND DESIRED:

5 Day

SPECIAL INSTRUCTIONS:

SZ/av

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ADDENDUM #5
TO THE
INVITATION TO BID
BS1553-24 - BEHAVIORAL HEALTH CRISIS CENTER NEW LOCATION REMODEL
ISSUED ON 7/29/2024 9:00:00 AM

The following information in this addendum, hereby become part of the Invitation To Bid. It is essential that all prospective Offerors note the content of this Addendum.

A. Clarifications:

- The Bid Due Date and Time is extended to 2:00 pm (PDT) on November 19, 2024

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ADDENDUM #6
TO THE
INVITATION TO BID
BS1553-24 - BEHAVIORAL HEALTH CRISIS CENTER NEW LOCATION REMODEL
ISSUED ON 7/29/2024 9:00:00 AM

The following information in this addendum, hereby become part of the Invitation To Bid. It is essential that all prospective Offerors note the content of this Addendum.

A. Preproposal Conference:

A **mandatory** pre-bid conference will be held on October 29, 2024, at 10:00 am (PDT), located at 1234 Commercial Street SE, Salem, Oregon. Vendors that previously attended the mandatory pre-bid conference on August 8, 2024, are ***not required*** to attend this mandatory pre-bid conference.

An optional pre-bid conference will be held on October 29. 2024, at 1:00 pm at 3180 Center St NE, Salem, Oregon for vendors to view cabinets that will be relocated to 1234 Commercial Street SE, Salem, Oregon.

B. Clarifications:

- Questions may be submitted until November 5, 2024, at 5:00 pm (PST)
- Offerors that previously submitted offers may modify their offer in writing prior to the new closing date of November 19, 2024 in accordance with Marion County Public Contracting Rules (MCPCR) Section 40-0320, located at https://www.co.marion.or.us/FIN/Pages/contracts.aspx
- An offeror shall prepare and submit any modification to its offer to the county in accordance with section 40-0280 unless otherwise specified in the solicitation document. Any modification must include the offeror's statement that the modification amends and supersedes the prior offer. The offeror shall mark the submitted modification as follows:

  “Bid modification to BS1553-24 - Behavioral Health Crisis Center New Location Remodel”

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CARLSON VEIT JUNGE ARCHITECTS PC
ARCHITECTURE • INTERIOR DESIGN

Addendum No. 7

Date: November 8, 2024

Project: Marion County Behavioral Health Crisis Center

To: Prospective Bidders

This addendum forms a part of the Contract Documents and modifies the original Construction Documents dated 06-06-2024 as noted below, and becomes a part of the Contract Documents.

This addendum consists of 1 page.

ELECTRICAL DRAWINGS:

1. All E Sheets, add general note: Every emergency fixture shall include battery backup. Include Self-Diagnostic option on every emergency fixture when self-diagnostic option is available as standard option with fixture.
2. Sheet E-000, Lighting Fixture Schedule:
    a. X1 Fixture:
        i. Include (add) EL N (Battery) and SD (self-diagnostic) options to X1 Fixture.
        ii. Change X1 fixture to MVOLT.
    b. Light Fixture Accepted Substitutions:
        i. U1: LEGION LIGHTING- 112-0904-120-WH-112SWBOX-WH.
        ii. V1: Accepted as Noted: LUCETTA-DI-24V-VL-TW1840-16-DI-CPCHB-SQ- RC-MAG-FAC CHANNEL.
            1. Driver is does not appear to be self-contained/suitable for exposure (is not enclosed), provide ventilated enclosure as required for exposure above ceiling cloud.
        iii. W2E: BEGHELLI- MUR-SA-DBZ-120-277V.
        iv. X1: Accepted as Noted: BEGHELLI- EPX-HT-ATR.
            1. Include/Change to with battery option (SA Option) and Include Self-Diagnostics

End of Addendum 7.