Klamath Community College
Cosmetology Center

7390 S 6th St
Klamath Falls, OR 97603



ADDENDUM NO. 3
April 23, 2026

CLARIFICATIONS: To the Construction Documents
PART 1: Revisions to the Project Manual
PART 2: Revisions to the Working Drawings
PART 3: Substitution Approvals

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CLARIFICATIONS: TO THE CONSTRUCTION DOCUMENTS

1. Clarification regarding Div. 32 3300 Bicycle Racks (quantity and location)
    a. Sheet C2.10 Site Construction Plan - Area 1, provides the graphic illustration of a total quantity of and location of bike racks required for this project. .
2. Clarification regarding snow melt system (Electrical Drawing E6.03)
    a. Panel 'SNOW' and associate components and systems related as shown on E6.03 to be bid as "Alt #3"
3. Clarification regarding electrical floor box basis-of-design (sheet E3.01, keynote 2)
    a. See "Basis of design" within hex note 2 on sheet E3.01 for intended floorbox selection.
4. Clarification regarding missing EF-7 on Electrical Sheet E5.01 (Equipment Schedule)
    a. On the mechanical equipment connection schedule, "EF-2" located in Hallway 112 should be labeled as "EF-7"
5. Clarifications regarding section 07 2700 Air Barrier (WRB) - Attachment method & Primer Materials (for Self-Adhered Flashings)
    a. Addendum #1 clarified that the intent is for the WRB to be mechanically fastened. Drawings were revised in Addendum #2 to remove references to Self-Adhered WRB.
    b. Self-Adhered *Flashing* is still included in the project and thus the inclusion of primers in the project specification.
6. Clarifications regarding section 07 2700 Air Barrier (WRB) - ABAA requirements
    a. In specification section, requirements for ABAA certification and ABAA testing agency have been removed. See “Revisions to Project Manual” below.
7. Clarification regarding “Z” Furring at metal panel wall cladding
    a. Wall Assembly Section 2/G0.03 is a plan view drawing. The metal “Z” furring is run horizontally with the vertically oriented metal panels. The “Z” is secured through the high-density mineral wool to the wall studs.
8. Clarification regarding interior wood door species and finish (08 1416 Wood Doors)
    a. Doors to be VG Fir with a stain. Finish Material Legend on A9.01 to be updated with this addendum (see revisions to drawings below)
9. Clarification regarding procurement of resilient flooring/base and carpet tile/Walk-off mat:
    a. Resilient flooring/base and carpet tile/walk off mat will be listed in specs and drawings as OFOI. This will be updated in addendum #3.
10. .Clarification regarding electric snow melt system:
    a. “Hottwire” is the basis-of-design product for this project
11. Clarification regarding additional HVAC loads
    a. Additional HVAC load document provided (see attached)
12. Clarification regarding cabinet construction:
    a. Interior semi-exposed surfaces of cabinets to be high pressure plastic laminate. Melamine construction is not acceptable. Thermoset is acceptable for drawer box sides/backs/bottoms.
    b. Cabinet doors to be laminated with HPL on both sides.
    c. Bottom of cabinet interior to have HPL finish. Bottom of cabinet on exterior that creates the toe kick recess (horizontal surface) that is not visible during daily use does not need to be laminated.
13. Clarifications regarding floor boxes:
    a. Detail 9/E6.02 is calling for a floor duplex outlet because the furniture comes with plugin outlet strips and lighting plugs; as the detail explains “FACTORY PROVIDED OUTLET BOX; PLUGS INTO FLOORBOX OUTLET #1” and FACTORY PROVIDED CABLE FOR POWERED MIRRORS; PLUG INTO FLOORBOX.”
    b. Detail #4 on E6.02 (previously showing a floor box with flex coming out) no longer exists in the drawing set
    c. The floor boxes shown in detail 9/E6.02 are referring to note #2 on Drawing E3.01.

d. Plastic is acceptable for the interior/base/recessed portion of the floor boxes. However, the lid/exposed portion of the floorbox needs to be metal.

PART 1: REVISIONS TO THE PROJECT MANUAL

Note – Revisions are in italics, deletions have a strikethrough.

1. Specification section 00 2113 – Instructions to Bidders:
    a. ADD paragraph 25 - Apprenticeship Requirements
2. Specification Section 00 7300 – Supplementary Conditions
    a. ADD paragraph 1.21 Apprenticeship Requirements
3. Specification Section 06 400 - Architectural Woodwork
    a. Add Closet and Utility Shelving product information
    b. Add Closet and Utility Shelving Supports information
    c. Clarify cabinet lock requirements:
        i. All cabinet and drawer locks are to be keyed the same, except for lockers in Toilet ADA 204.
        ii. Casework lockers in Toilet ADA 204 to be master keyed.
4. Specification Section 07 2700 - Air Barriers
    a. Revise Section 1.7 Quality Assurance - remove references to ABAA Qualification requirements
    b. Revise Section 3.4, D - remove ABAA installer Audits requirement
5. Specification Section 07 5000 - Membrane Roofing
    a. Revise Section 2.2A. - Remove reference to fabric backing. Fleece backing is not a requirement of the project.
6. Specification Section 09 6500 - Resilient Flooring
    a. Add 1.1 note that all Resilient Flooring to be Owner Furnished, Owner Installed
7. Specification Section 10 5100 - Lockers
    a. Revise 2.2 B Configuration: refer to drawings for height and width
8. Specification Section 10 2800 - Toilet, Bath, and Laundry Accessories
    a. Revise Section 2.1 Owner Furnished, Owner Installed products list to include sanitary napkin disposal and waste disposal
    b. Revise Section 2.2 Public Use Toilet Room Accessories: Remove Sanitary Napkin Disposal and Waste Disposal
9. Specification Section 11 3013 - Residential Appliances
    a. Add 1.1 note that all Appliances to be Owner Furnished, Owner Installed
10. Specification Section 12 3600 - Countertops
    a. Add information about J-bead trim to 2.4 Plastic Laminate Countertops
11. Specification Section 210000-Fire Suppression Basic Requirements
    a. Added – Part 2.3 & 3.11, articles for access panels
12. Specification Section 220000-Plumbing Basic Requirements
    a. Added – Part 2.3 & 3.11, articles for access panels
13. Specification Section 230000-Heating, Ventilating and Air Conditioning (HVAC) Basic Requirements
    a. Added – Part 2.3 & 3.11, articles for access panels
14. Specification Section 230900-Instrumentation and Control Performance Specifications
    a. Revised – Part 3.9, A, sequence of operations to include further clarification for fan coil unit demand controlled ventilation operation
    b. Revised – Part 3.9, B, sequence of operations to update dedicated nail station exhaust fan controls
    c. Revised – Part 3.9, D, sequence of operations to include further clarification for energy recovery ventilator demand controlled ventilation operation
15. Specification Section 260000-Electrical Basic Requirements
    a. Added – Part 2.3 & 3.11, articles for access panels

16. Specification Section 260519-Low-Voltage Electrical Power Conductors and Cables
    a. Added – Part 2.1, B, Alcan/Stabiloy and Nexans/Energex 8000 as acceptable manufacturers
    b. Added – Part 2.1, C, clarification that feeder splices are not allowed
    c. Added – Part 2.3, B & 3.3, A, 6, paragraphs for aluminum in wires and cables articles
    d. Added – Part 2.4, B & 3.4, F, paragraphs for aluminum in connectors articles.
    e. Added – Part 3.3, H, 1, a, paragraph allowing MC cable where there is suspended ceiling
17. Specification Section 260534-Boxes
    a. Added – Part 2.3, A, Reference to drawings for BOD floor boxes.
18. Specification Section 260925-Digital Lighting Controls
    a. Added – Part 1.1, A & 2.8, articles for wired digital wall switch and timer for correlated color temperature (CCT).
    b. Deleted – Part 2.14, A, 4, a, 1-4 & 7.
19. Specification Section 263323-Central Battery Equipment
    a. Revised – Part 1.8, E & F, revisions to unit power capacity and input voltage.
    b. Revised – Part 2.1, A, 1, moved Myers to top of manufacturers list.
    c. Deleted – Part 2.1, three phase.
    d. Added – Part 2.1, clarification of Illuminator IE product is BOD from Myers.
    e. Deleted – Part 2.3, A, 4, Remote annunciator.
    f. Revised – Part 3.3, C, method of Owner communication for alarm conditions.
20. Specification Section 280001-Electronic Safety Basic Requirements
    a. Added – Part 2.3 & 3.11, articles for access panels.

PART 2: REVISIONS TO THE WORKING DRAWINGS

General Drawings:

None

Civil Drawings:

None

Landscape Drawings:

None

Architectural Drawings:

1. Sheet A1.00 - Overall Floor Plan - Level 1
    a. Revise floorplan equipment layout, door 201 location, window location, and chase walls at Nail/Pedi 201
    b. Revise pedicure pedestal configuration at wall termination in Nail/Esthetics Theory 100
    c. Add callouts for enlarged plan drawing of pedicure “pedestals” in Nail/Esthetics Theory 100 and Nail/Pedi 201
    d. Add corner guard in Collab 113
    e. Revise sink size and configuration in Classroom Shampoo 110
2. Sheet A1.10 - Overall Dimension Plan
    a. Revise dimensions at Hall B 112 locker alcove
    b. Revise floorplan dimensions, door 201 location, window locations, and chase walls at Nail/Pedi 201
    c. Add B3 window type @ Nail/Pedi 201
    d. Revise Window Dimensions
3. Sheet A2.01 - Overall Roof Plan

a. Revise Keynote #2 for Downspouts to indicate 3" Round size

4. Sheet A3.01 - Exterior Elevations
    a. Add detail callouts for vinyl window details to drawing 1/A3.01
    b. Add detail callout 6/A8.09 to elevation 2/A3.01
    c. Add detail callout 7/A8.09 to elevation 2/A3.01
    d. Add detail callout for 14/A8.10 to elevation 6/A3.01.
    e. Add detail callout 8/A8.10 to elevation 7/A3.01
    f. Add keynote 16 to exterior Keynotes
    g. Add callout for keynote 16 to elevation 1/A3.01
    h. Add detail callout 3/A8.12
5. Sheet A5.01 - Enlarged Plans and Elevations
    a. Revise sink size and configuration in Classroom Shampoo 110 on drawing 3/A5.01
    b. Revise sink size and configuration in Classroom Shampoo 110 on drawing 5C/A5.01
    c. Revise sink size and configuration in Classroom Shampoo 110 on drawing 5B/A5.01
    d. Revise sink size and configuration in Classroom Shampoo 110 on drawing 5D/A5.01
6. Sheet A5.02 - Enlarged Plans and Elevations
    a. Add enlarged plans for pedicure "pedestals" - Drawings 2/A5.02 and 3/A5.02
    b. Add wall base to elevation 6A/A5.02
7. Sheet A5.10 - Interior Elevations
    a. Revise keynote 14 to include "contractor to confirm final mounting location with owner"
    b. Revise door 201 location and window to elevation 3D/A5.10
    c. Remove shelving from elevation 5A/A5.10
    d. Revise elevation 5B/A5.10:
        i. Revise casework types and layout along wall
        ii. Add cabinet locks throughout
        iii. Add pedi mop sink and keynote 39
        iv. Revise to show updated door location and window
        v. Add WP-4 to elevation 5B/A5.10
        vi. Add keynote 40
    e. Revise locations of Pedicure pedestal source-capture on 5C/A5.10
    f. Revise elevation 5D/A5.10:
        i. Add shelving (keynote 14)
        ii. Add keynote 29
        iii. Add interior butt glazing windows (window type B3)
8. Sheet A5.11 - Interior Elevations
    a. Revise elevation 1A/A5.11:
        i. Add OFOI shelving (keynote 14) to elevation
        ii. Add keynote 2
    b. Revise teaching wall alignment, Revise AWP and markerboard size 1B/A5.11
    c. Revise teaching wall alignment, Revise AWP and markerboard size 2A/A5.11
    d. Revise teaching wall alignment, Revise AWP and markerboard size 3B/A5.11
    e. Revise typical teaching casework island, elevation 4B/A5.11:
        i. Revise cabinet layout
        ii. Add cabinet locks
        iii. Add PL-2 back panel to elevations 4A, 4B
        iv. Add keynote 41 to coordinate outlet at casework
9. Sheet A5.12 - Interior Elevations
    a. Revise locker configuration on elevation 4A/A5.11
    b. Add notes to Facial/Massage Esthetics to clarify curtain dimensions; 3A & 3C/A5.12
10. Sheet A5.13 - Interior Elevations

a. Add bracket dimensions to elevation 4C/A5.13
b. Revise keynote 20 to clarify material, mounting, and depth of shelves
c. Add dimension to adjustable shelves on elevation 5A, 5B, 5D
d. Revise elevation 6A, 6B, 6C titles to “Hall B 112”
e. Add high windows to Hall B 112, elevation 6B/A5.13

11. Sheet A6.01 - Reflected Ceiling Plan
    a. Revise CE1 soffit height at lockers in Hall B 112
    b. Revise ceiling type at Southeast side of Barber Color Theory to be CE2
    c. Revise ceiling type at Nail/Esthetics Theory and Esthetics Lab from CE1 to CE5
    d. Add keynote 12 for curtain height and fire sprinkler design to Facial/Massage Esthetics
    e. Add soffit to Salon/Cutting
    f. Add soffit to Nail/Pedi
    g. Revise soffit dimensions at Nail/Pedi
12. Sheet A6.02 - Enlarged Ceiling Plan
    a. Add soffit and height/dimension information to Salon/Cutting
13. Sheet A8.01 - Specialty Equipment Plan and Door Schedule
    a. Revise Electrical requirements for various equipment items (in Specialty Equipment & Furniture Schedule)
    b. Add plumbing requirements for Cayman Shampoo system (in Specialty Equipment and Furniture Schedule)
    c. Revise Nail/Pedi 201 Room and Specialty Equipment configuration on 1/A8.01 (no change to equipment quantities)
14. Sheet A8.02 - Window Schedules
    a. Revise butt glazinng window type B1 height and width
    b. Add butt glazing window type B3
15. Sheet A8.03 - Casework Details and Schedule
    a. Add cabinet type BC13 legend and schedule to sheet
    b. Add cabinet type BC05D
16. Sheet A8.04 - Casework Details and Schedule
    a. Add detail 20 to sheet
    b. Revise detail 19/A8.04 to include grommet and note to include outlet coordination
17. Sheet A8.05 - Casework Details - Reception Desk
    a. Add BC13A to elevation 5/A8.05, 6/A8.05
18. Sheet A8.08 - Exterior Details - Canopy
    a. Revise detail 1 to show gutter and downspout
    b. Add note for 2x in detail 2/A8.08
    c. Add note for caulking and material in detail 3/A8.08
19. Sheet A8.09 - Exterior Details
    a. Add detail 6,7,8,9/A8.09
20. Sheet A8.10 - Exterior Details
    a. Remove note "SOFFIT FRAMING PER STRUCTURAL" on detail
    b. Add detail 14/A8.10
21. Sheet A8.11 - Exterior Details - Openings
    a. Add drawing 16/A8.11 - Vinyl Window Infill post w/fiber cement
    b. Revise note from "SEE RCP" to "SEE A9 SERIES" on detail 13/A8.11
    c. Revise FAF to SAMF in detail 12, 13, 14/A8.11
22. Sheet A8.12 - Exterior Details
    a. Add detail 3/A8.12
    b. Add detail 4, 5, 6/A8.12
23. Sheet A9.01 - Finish Legend & Schedules

a. Revise division 09 6500 Resilient Flooring to clarify that products will be owner furnished, owner installed on Finish Material Legend
b. Revise division 096813 Tile Carpeting to clarify that products will be owner furnished, owner installed on Finish Material Legend
c. Revise DR-1 wood species and finish on Finish Material Legend
d. Add color information for RT-3 on Finish Material Legend
e. Add color information for GRT-1 on Finish Material Legend
f. Add comment about primer for WP-1, WP-2, WP-3, WP-4 products to Room Finish Schedule
g. Revise paint and wallcovering locations in Nail/Pedi 201 on Room Finish Schedule

24. Sheet A9.10 – Finish Plan - Level 1
    a. Add General Note K referencing owner furnished and owner installed products
    b. Delete keynote #8 on Finish Plan Keynotes and Finish Floor Plan
    c. Revise pedicure pedestal to match floor plan
    d. Add keynote 9 for column finish to Finish Floor Plan
25. A9.12 - Interior Details
    a. Add detail 14/A9.12 for cornerguard at MDF wainscot
    b. Revise vent location at typical pedestal on 1/A9.12
    c. Revise 1/A9.12 to show pedestal pedestal continuing to wall at Nail/Pedi 201 room
    d. Revise dimensions of pedestal extensions on 1/A9.12
    e. Revise note for pedestal finish material on1/A9.12
    f. Add Section detail to drawing 2/A9.12
    g. Revise end condition of pedicure pedestal on drawing 2/A9.12
    h. Revise location of vents from end wall to side wall(s) in 2/A9.12

Structural Drawings:

1. Sheet S1.10 – Foundation and Mezzanine Floor Framing Plan
    a. Revised Baseplate Callout to BP-4 AT GL-5/A
    b. Added new GLC column on GL-4
    c. Thickened Concrete Stem wall on GL-4 at new column.
    d. Added Keynote #13.

2. Sheet S2.10 – Roof Framing Plan
    a. Revised Keynote #19 and #20
    b. Changed Glulam Beam Size on GL-D between 4 and 9
    c. Showing Beam being hung from Shear Wall End Post and added keynote 23 at GL-C/4
    d. Added Detail Cut for 5/S6.30
    e. Added Keynote #23
    f. Added Keynote 6 to GL-C at 2 and 3.

3. Sheet S4.10 – Roof Framing Plan
    a. Revised Detail 18/S4.10 to show BP-4 Baseplate

4. Sheet S6.10 – Roof Framing Details
    a. Added Column above beam on Detail 10/S6.10

5. Sheet S6.20 – Roof Framing Details
    a. Moved Knife Plate up on Detail 5/S6.20 and calling out to notch glulam beam

6. Sheet S6.30 – Roof Framing Details
    a. Added Detail 5/S6.30
    b. Added Detail 6/S6.30

Plumbing Drawings:

1. Sheet P0.02 – Schedules – Plumbing
    a. Added – Gas Calculation Schedule
    b. Revised – MS-2 faucet
    c. Revised – S-4 sink and faucet
2. Sheet P2.00 – Underfloor Plan – Plumbing
    a. Revised – Piping at Classroom Shampoo 110
    b. Revised – Piping at Nail/Pedi 201
3. Sheet P2.01 – Overall Floor Plan – Plumbing
    a. Added – Valves on piping serving All Gender RR 205
    b. Revised – Piping at Classroom Shampoo 110
    c. Revised – Wall hydrant location at Barber/Color Theory 109 and added valve.
    d. Revised – Piping at Nail/Pedi 201 due to sink and mop sink relocation.
    e. Added – Valve on cold water line serving wall hydrant at Reception/Lobby 200
    f. Added – Valves on water piping serving shampoo bowls
    g. Added – Gas piping to dryers and added valves on gas piping.
    h. Added – Valve on water piping serving wall hydrant at Bldg Storage 219.
    i. Added – Valve on water piping serving wall hydrant at Wax 215
4. Sheet P2.02 – Overall Roof Plan – Plumbing
    a. Added – VTR near grid lines C and 6
5. Sheet P3.01 – Details – Plumbing
    a. Revised pipe sizes on Water Heater detail.

Mechanical Drawings:

1. Sheet M0.02 – Schedules – Mechanical
    a. Revised - Fan Coil Unit and Heat Pump Condensing Unit Schedules to increase FCU/HP-8 from a 4-ton to 5-ton nominal capacity.
    b. Revised – Fan Coil Unit Schedule to include a note for FCU-13 to be provided with a door sensor to deactivate heating/cooling when the door is open.
    c. Revised - Fan Schedule to update EF-1, 2, 3, & 7 total airflow, based on updated pedicure/manicure station layout.
    d. Revised – Energy Recovery Ventilator Schedule to add a column for Minimum CFM, and revise “Total CFM” to be “DCV CFM”, to clarify demand controlled ventilation (DCV) operation. Also, added note #3.
    e. Revised - Energy Recovery Ventilator Schedule to add a note for 8kW electric heater accessory
    f. Revised – Electric Heater Schedule to include a note for maximum heating temperature set point of 60 deg. F.
2. Sheet M1.01 – Overall Floor Plan – Zoning Plan
    a. Added – Keynote #1
    b. Added – Zone outline for FCU-13 serving Electrical-221.
3. Sheet M2.01 – Overall Floor Plan – Mechanical
    a. Added – Keynotes #1, 2, & 3
    b. Revised - Nail exhaust system in Nail/Esthetics Theory-100 & Nail/Pedi-201 to accommodate updated Architectural layout.
    c. Added – Typical note for coordination of HVAC ceiling grilles with RCP.
    d. Revised – Ceiling exhaust grille locations in All Gender Restroom area to coordinate with light fixtures.
    e. Added – Supply and return grilles to serve Laundry-218
    f. Revised – Supply and return airflows for HVAC grilles associated with FCU-8.
    g. Revised – Mezzanine HVAC Section 3 to show updated nail station layout in Nail/Pedi-201.

Electrical Drawings:

6. Sheet E0.02 – Luminaire Schedule – Electrical

a. Revised – luminaire schedule lighting characteristics, additional luminaire types, and alternate manufacturers.
b. Revised – Lighting control matrix.

7. Sheet E2.01 – Overall Reflected Ceiling Plan – Lighting
   a. Added – CCT controlled switch in Barber/color theory 109 and keynote 5
   b. Deleted – daylight zone area and daylight controls in Salon/Cutting 202.
   c. Revised – luminaires and lighting layout within Nail/Pedi 201.
   d. Revised – luminaires and lighting layout within Barber/Color Theory 109.
   e. Revised – luminaire layout within Nail/pedi 201 in "E2.01/8 Enlarged Floor Plan – Nail/Pedi 201 Lighting".
8. Sheet E3.01 – Overall Floor Plan – Power
   a. Added – Enlarged overhead view of Nail/Pedi 201.
   b. Added – EF local fan control for nail stations in Nail/esthetics and Nail/Pedi.
   c. Added – Note for exhaust fan control and labeling.
   d. Added – Elevation view for teaching desk casework and receptacle location.
   e. Revised – Floor box locations in Nail/Esthetics, Barber/Color Theory, and Hair Texture.
   f. Add – Detail Callouts Added.
9. Sheet E4.01 – Single Line Diagrams – Electrical
   a. Revised – Note #5 to match single line
10. Sheet E5.02 – Panel Schedules – Electrical
    a. Revised – Breaker upsized for increased load on FCU-8H
11. Sheet E6.02 – Details – Electrical
    a. Revised – Detail 2
    b. Removed – Detail 4
    c. Removed – Detail 7

Technology Drawings:

None

PART 3: SUBSTITUTION APPROVALS

1. Section 07 5000 – Membrane Roofing
   a. Substitution request for Mulehide "fleeceback" roofing accepted
      i. See Specification section updates listed above
2. Section 26 5200 – Lighting
   a. Substitution request to replace Light Type F2 - QTL ZALA with F2-PureEdge-LRF7 – accepted
   b. Substitution request to replace Light Type B1 – Prudential Lighting – Accepted
   c. Substitution request to replace Light Type B2 – Prudential Lighting – Accepted
   d. Substitution request to replace Light Type B3 – Prudential Lighting – Accepted
   e. Substitution request to replace Light Type B4 – Prudential Lighting – Accepted
   f. Substitution request to replace Light Type C1 – Prudential Lighting – Accepted
   g. Substitution request to replace Light Type C2 – Prudential Lighting – Accepted
   h. Substitution request to replace Light Type C3 – Prudential Lighting – Accepted
   i. Substitution request to replace Light Type D1 – Zaniboni Lighting – Accepted
   j. Substitution request to replace Light Type D2 – Zaniboni Lighting – Accepted
   k. Substitution request to replace Light Type G1 – Corelite – Accepted
   l. Substitution request to replace Light Type J1 – Prudential Lighting – Accepted
   m. Substitution request to replace Light Type R1 – SPI Lighting – Accepted
   n. Substitution request to replace Light Type SB1 – Ligman Lighting – Accepted
   o. Substitution request to replace Light Type SB2 – Ligman Lighting – Accepted
   p. Substitution request to replace Light Type SC1 – ALW – Accepted
   q. Substitution request to replace Light Type X1 – Emergi-lite – Accepted
   r. Substitution request to replace Light Type Z1 – Metalux – Accepted
   s. Substitution request to replace Light Type Z2 – Metalux – Accepted

BIDDER SHALL NOTIFY ALL SUB-BIDDERS OF THIS ADDENDUM AND SHALL ACKNOWLEDGE RECEIPT OF THIS ADDENDUM BY INSERTING THE ABOVE ADDENDUM NUMBER IN THE SPACE PROVIDED ON THE BID FORM PRIOR TO SUBMITTING BIDS. FAILURE TO DO SO MAY SUBJECT THE BIDDER TO DISQUALIFICATION.

ATTACHMENTS:

- See above for all Specification Sections, Drawing Sheets, approved substitution requests, and additional clarifying documents.

Heating load file name: **KCC Cosmotology.htg**
Cooling load file name: **KCC Cosmotology.clg**
Date: **2025-12-22**

Use global inputs for oversizing (yes/no):	**yes**
Cooling (Sensible) Load Oversizing Factor:	**10%**
Cooling (Latent) Load Oversizing Factor:	**10%**
Heating Load Oversizing Factor:	**10%**

Loads reported below are non-coincident room- and zone-level loads

Zone group	Zone	Room	Template	Floor area (ft^2)	Volume (ft^3)	Cooling design load (kBtu/h)	Design latent cooling load (kBtu/h)	Heating design load (kBtu/h)
	1							
		Nail/Esthetics Theory - 103	Classroom/Lab	727.0	9,984.0	16.95	3.90	11.49
		TOTAL		***727.0***		***16.95***	***3.90***	***11.49***
	2							
		Esthetics Lab - 104	Classroom/Lab	730.0	10,230.0	16.49	4.50	9.95
		TOTAL		***730.0***		***16.49***	***4.50***	***9.95***
	3							
		Large Office 123	Large Office	142.0	1,440.0	2.41	0.40	2.01
		Office 126	Office	107.0	1,152.0	1.73	0.40	1.26
		Vestibule - 108	Other	126.0	1,820.0	1.80	0.00	3.04
		Reception - 109	Reception	257.0	3,640.0	5.80	1.20	5.09
		TOTAL		***632.0***		***11.74***	***2.00***	***11.41***
	4							
		Hallway 107	Hallway	242.0	1,368.0	0.47	0.00	0.99
		Office - 125	Large Office	127.0	1,872.0	2.58	0.70	1.60
		Office 124	Office	87.0	1,620.0	2.20	0.50	1.65
		Office 127	Office	87.0	1,458.0	2.04	0.50	1.49
		TOTAL		***543.0***		***7.28***	***1.70***	***5.73***
	5							
		Nail/Pedi - 110	Nail/Pedi	625.0	5,764.0	7.84	3.20	1.90
		TOTAL		***625.0***		***7.84***	***3.20***	***1.90***
	6							
		Cutting Perimeter	Cutting Perimeter	1,044.0	13,032.0	31.66	9.00	21.97
		Building Storage - 117	Storage	288.0	3,780.0	1.60	1.50	3.74
		TOTAL		***1,332.0***		***33.26***	***10.50***	***25.71***
	7							
		Cutting Interior	Cutting Interior	1,033.0	15,048.0	21.60	7.30	9.09
		Laundry - 137	Laundry	124.0	1,980.0	1.33	1.20	1.55
		TOTAL		***1,157.0***		***22.93***	***8.50***	***10.64***
	8							
		Facial/Massage Esthetics - 129	Facial/Massage Esthetics	733.0	14,580.0	11.82	13.00	7.99
		Wax 135	Wax	118.0	1,188.0	1.19	1.50	0.54
		Wax 203	Wax	129.0	1,188.0	1.19	0.40	0.56
		Facial Bar - 202	Facial Bar	137.0	1,320.0	1.26	0.40	0.61
		TOTAL		***1,117.0***		***15.46***	***15.30***	***9.70***
	9							
		All Gender RR - 193	All Gender RR	580.0	11,172.0	4.16	0.10	5.45
		Hallway 112	Hallway	689.0	14,846.0	4.34	0.00	6.85
		Collab - 194	Collab	150.0	1,872.0	2.89	1.60	0.84
		TOTAL		***1,419.0***		***11.40***	***1.70***	***13.14***
	10							
		Hair/Texture - 106	Classroom/Lab	728.0	13,320.0	18.01	21.70	8.14
		Classroom Storage 141	Storage	113.0	2,700.0	0.93	0.90	1.81
		TOTAL		***841.0***		***18.94***	***22.60***	***9.95***
	11							
		Barber/Color Theory - 105	Classroom/Lab	778.0	12,240.0	17.36	20.10	9.54
		Classroom Shampoo - 131	Hallway	119.0	1,650.0	0.38	0.40	0.68
		Classroom Storage 140	Storage	94.0	1,950.0	0.82	0.80	1.50
		TOTAL		***991.0***		***18.56***	***21.30***	***11.73***

PART 1
REVISIONS TO THE PROJECT MANUAL

1. SUBMISSION OF BIDS AND BID OPENING:

A. In accordance with ORS 279C.365, bids will be received by Denise Reid, Vice-President, Administrative Services, Klamath Community College, and will be opened and read aloud at the times and places set forth in the Advertisement for Bids. Bidders, or their representatives, and other interested persons may be present at the opening of proposals.

B. The envelope containing the Bid form and required attachments must be sealed and addressed to Klamath Community College, 7390 South 6th Street, Klamath Falls, Oregon 97603, and marked on the outside: "Cosmetology Center", with name of the Bidder and its Oregon State Construction Contractor's Board Registration Number. A similar, separate envelope shall be used to submit the First-Tier Subcontractor Disclosure Statement at the time and location identified in the Advertisement for Bids.

C. The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

2. BIDDING DOCUMENTS:

A. Bidding Documents include the Advertisement for Bids, Instructions to Bidders, Bid Form, First Tier Subcontractor Disclosure Statement, the Bid Bond, Affidavit of Non-Collusion, the Statement of Qualifications, and the proposed Contract Documents, including any Addenda issued prior to receipt of bids. All requirements and obligations of the Bidding Documents are hereby incorporated by reference into the Contract Documents and are binding on the Successful Bidder upon award of the Contract.

B. Bidders may obtain complete sets of the Bidding Documents from the builder's exchanges and plan centers designated in the Advertisement for Bids. Bidders are responsible for all costs of reproduction.

C. Bidders shall use complete sets of Bidding Documents in preparing Bids; neither the College or the Architect shall assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

D. The College, in making copies of the Bidding Documents available on the above terms, does so only for the purpose of obtaining Bids on the Work and does not confer a license or grant authority for any other use.

3. DEFINITIONS:

A. <u>THE BID</u>:

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

B. <u>BASE BID</u>:

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

C. ALTERNATES:

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

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

A. Bidder has read and understands the Bidding Documents and its Bid is made in accordance therewith; and Bidder agrees to be bound by the terms and requirements set forth in the Bidding and Contract Documents.

B. Bidder has visited the site, has familiarized itself with the local conditions under which the Work is to be performed in accordance with Paragraph 12 herein, and has correlated its observations with the requirements of the proposed Contract Documents.

C. Its Bid is based upon the materials, systems and equipment required by the Bidding Documents without exception.

D. Bidder has the capability, in all respects, and the moral and business integrity, reliability, technical ability, financial resources, physical plant, management, superintendence, equipment and materials which will assure effective and efficient good-faith performance in full compliance with the Contract Documents and with any and all schedules and completion dates required by the College.

E. The Bidder acknowledges and represents that it has made allowances for normal inclement weather indigenous to the Project Site, in its estimating, planning and scheduling of the Work.

F. The Bidder further acknowledges that the Contract Documents are, in its opinion, appropriate and adequate for completing this project and for the construction of sound and suitable work.

G. The Bidder hereby certifies that the Work shall be completed, in place, in full accordance with the Contract Documents, within the time limits specified.

5. PREPARATION AND SUBMITTAL OF BID FORM:

A. Bids shall be submitted utilizing the Bid Form provided with the Bidding Documents, and shall be complete in every respect. The total Bid amount shall be entered in words and figures in the space provided. Where applicable, the unit price of lump sum items, and their extensions, shall be entered in figures in the respective columns provided for each bid item. All entries shall be typewritten or printed in ink. The signatures of all persons shall be in longhand. Any entry of an amount that appears on the face of the bid to have involved an erasure, deletion, whiteout, substitution and/or other such change or alteration shall be initialed by the person signing the bid and show the date of the change or alteration. A failure to comply with this requirement may be cause for disqualification of the Bid.

B. For lump sum Bids, in the event of a discrepancy between the Bid amount in writing and that in figures, the written value shall govern.

C. Bids shall not contain any restatement or qualifications of work to be done, and alternate bids will not be considered unless called for. No oral, email, facsimile or telephonic bids or modifications will be considered.

D. Bids shall be delivered to the College on or before the day and hour set for the receipt of bids, enclosed in a sealed, opaque envelope and bearing the title of the work, name of the Bidder and Bidder's CCB Registration Number.

6. BID SECURITY:

A. Each Bid must be accompanied by bid security in the form of: (1) an irrevocable letter of credit; or (2) a cashier's check or a Certified Check of the Bidder, made payable to the College; or (3) a surety bond on the Bid Bond Form provided herein or on a similar form which in every respect materially complies with said Bid Bond. Bid security shall be in the amount of ten percent (10%) of the Base Bid plus any positive alternate amounts. Any Bid Bond shall be issued by a Surety company licensed to conduct business in the State of Oregon and be acceptable to the College. The Surety signing the Bid Bond shall be registered with the Oregon State Insurance Commissioner, and the Surety's name shall appear in the current Authorized Insurance Company list in the State of Oregon published by the office of the Insurance Commissioner. Each Surety's name must also appear on the United States Treasury Department's list of authorized sureties, circular 570, as amended.

B. The Bid security is given as a guarantee that the Bidder will enter into a Contract if awarded the Work and, in the case of refusal or failure to so enter into said Contract, the security shall be declared forfeited to the College, in accordance with ORS 279C.385. Such security shall be returned to all but the three (3) lowest Bidders within seven (7) days after the opening of the Bids and the remaining security will be returned within forty-eight (48) hours after the College and the successful Bidder have executed the Contract. If no Contract has been awarded or the Bidder has not been notified of the acceptance of its Bid, within thirty (30) days of the Bid opening, the Bidder may withdraw its Bid and request the return of its Bid security. If, at the College's request, the Bidder agrees to extend and maintain its' Bid beyond the specified thirty (30) days, its Bid security will not be returned until after the College and the Successful Bidder have executed the Contract.

7. INSURANCE BINDER:

A. Each Bid shall be accompanied by a letter or form from the Bidder's insurance company stating that upon award of the Contract the types and amount of insurance required elsewhere in these specifications will immediately become effective.

8. UNIT PRICES:

A. The Bidder shall include in the spaces provided on the Bid Form a Bid for each unit price.

B. The College may accept or reject any or all of these unit prices and include them in the Contract. The College is not obligated to use these unit prices and may require the Contractor to provide a complete breakdown of costs listed therein.

9. LIQUIDATED DAMAGES (Forfeiture of Security Deposit):

The successful Bidder, upon its failure or refusal to execute the Contract within ten (10) days after it has received a Notice of Intent to Award, shall forfeit to the College the security deposited with its Bid, as liquidated damages for such failure or refusal.

10. SITE CONDITIONS AND CONDITIONS OF THE WORK:

A. Each Bidder must acquaint itself thoroughly as to the character and nature of the Work to be done and the conditions under which the work will be performed. Each Bidder furthermore must make a careful examination of the site of the Work and inform itself fully as to the difficulties to be encountered in the performance of the Work, the facilities for delivering, storing and placing materials

and equipment, existing and available services and utilities, environmental and access constraints, permit requirements and other conditions relating to construction and labor.

B. The Successful Bidder, subject to Paragraph 12.6 of the General Conditions, **Section 02 3200, entitled "Geotechnical Investigation"**, assumes all risk as to the nature and behavior of the soil or subsurface conditions which underlie the Work or is adjacent thereto, or difficulties that may be due to any unfavorable conditions that may be encountered in the Work, whether apparent on surface inspection or disclosed after construction begins.

C. No plea of ignorance of conditions that exist or may hereafter exist on the site of the Work, or difficulties that may be encountered in the execution of the Work, as a result of failures to make necessary investigations and examinations, will be accepted as an excuse for any failure or omission on the part of the Successful Bidder to fulfill in every detail all the requirements of the Contract Documents and to complete the Work for the consideration set forth therein, or as a basis for any claim whatsoever.

D. Insofar as possible, the Successful Bidder, in carrying out its work, must employ such methods or means as will not cause interruption of or interference with the Work of the College or any separate Contractor.

E. The Contract includes excavation on an unclassified basis. The cost of all excavation and backfill required under this Contract is a part of the Base Bid. No distinction will be made insofar as payment is concerned between earth and rock.

11. BIDDER'S QUESTIONS, ADDENDA AND INTERPRETATIONS:

A. Bidders and Sub-Bidders shall promptly notify the College of any ambiguity, inconsistency or error which they may discover upon examination of the Bidding and Contract Documents or of the site and local conditions. No interpretation of the meaning of the drawings, specifications or other Contract Documents will be made to any Bidder orally.

B. Every request for such technical and design interpretation shall beemailed to Nathan Buckley (KCC), Denise Reid (KCC), and BBT Architects. Contact emails are as follows:

Nathan Buckley (KCC) – buckley@klamathcc.edu
Denise Reid (KCC) – reid@klamathcc.edu
Kyle Burke (BBT Architects) – kburke@bbtarchitects.com
Bennett Sapin (BBT Architects) – bsapin@bbtarchitects.com

To be given consideration the request must be received by the Architect at least fourteen (14) calendar days prior to the date fixed for the opening of the Bids.

C. Any and all such interpretations and any supplemental instruction will be in the form of written addenda to the Bidding Documents which, if issued, will be mailed or transmitted via email to all prospective Bidders (to the respective addresses and email addresses furnished for such purposes) not later than three (3) calendar days prior to the date fixed for the opening of the Bids. The College will be responsible for any other explanations or interpretations of the proposed documents. Failure of any Bidder to receive any such addendum or interpretation shall not relieve any Bidder from any obligation under its Bid as submitted. All addenda so issued shall become a part of the Contract Documents.

D. If the Bidder (or any person bidding to Bidder and/or subsequently in contract with the Bidder, relating to the subject project) knows, or should have known, that an ambiguity, discrepancy, error,

omission or conflicting statement exists in the Bidding or Contract Documents, said Bidder (or sub-bidder) has an obligation to seek a clarification thereof from the College prior to the Bid. The College will welcome such a clarification request, and, if deemed necessary by the College, the College will issue a written addendum clarifying the matter in question. Change orders presented at the initial meeting between the College and the Contractor will be presumed to have been the proper subject of a clarification and will be disallowed.

E. Each Bidder shall ascertain prior to submitting its Bid that it has received all Addenda issued, and shall acknowledge receipt and inclusion in its Proposal of all Addenda.

12. PROTEST PROCESS:

A. A Bidder may protest the Specifications or Contract terms and conditions by delivering a written protest on those matters to the College not less than seven (7) days prior to the date fixed for the opening of the Bids. All protests of Specifications or Contract terms and conditions must be in writing, and must comply with OAR 137-049-0260(3).

B. A Bidder may submit to the College a written protest of the College's intent to award the Contract within seven (7) days after the College's issuance of the notice of intent to award the Contract. A Bidder may submit a protest of the award only as allowed by, and only in compliance with, OAR 137-049-0450(4).

13. SECURITY FOR FAITHFUL PERFORMANCE:

The Successful Bidder shall furnish a Performance Bond and Payment Bond, each in an amount equal to one hundred percent (100%) of the Contract sum, as security for the faithful performance of this Contract and also as security for the payment of all persons performing labor and furnishing materials under this Contract. The Performance and Payment Bonds shall be acceptable to the College, in accordance with State law and shall be delivered to the College not later than the date of execution of the Contract. The Surety signing the Bidder's Bond shall be registered with the Oregon State Insurance Commissioner, and the Surety's name shall appear in the current Authorized Insurance Company list in the State of Oregon published by the office of the Insurance Commissioner. Each Surety's name must also appear on the United States Treasury Department's list of authorized sureties, circular 570, as amended. No Work shall commence at the project site until approved Bonds are received by the College. Both bonds shall be in compliance with ORS Sections 279C.375, 279C.625 and 701.430.

14. TIME FOR COMPLETION:

The time for completion of this Contract shall be as listed in the Bid Form, Specification Section 00 4100 and in the Supplementary General Conditions, Specification Section 00 7300, and as fixed in the Owner-Contractor Agreement.

15. LOCATION OF THE WORK:

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

16. LIABILITY INSURANCE AND WORKER'S COMPENSATION:

The Successful Bidder will be required to carry public liability and worker's compensation and other insurance in the amounts and under the terms stipulated under the General Conditions. No Work shall commence at the project site until approved Certificates are received by the College.

17. BIDDERS REFERRED TO LAWS:

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

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

C. The College will not receive or consider a Bid for a Public Improvement Contract unless the Bidder is registered with the Construction Contractors Board, or is licensed by the State Landscape Contractors Board, as specified in OAR 137-049-0230, as applicable.

18. TAXES:

Contractor shall include in its Bid and pay for all applicable taxes. Refer to General Conditions regarding further discussion.

19. RIGHT TO REJECT BIDS:

The College may reject any Bid not in compliance with all prescribed public contracting procedures and requirements, including the requirement to demonstrate the Bidder's responsibility under ORS 279C.375(3)(b), and may reject for good cause all Bids after finding that doing so is in the public interest. The College reserves the right to cancel the solicitation at any time in its sole discretion and to waive minor informalities and irregularities, in accordance with applicable law, when it deems necessary or advisable, in its sole discretion.

20. MODIFICATION OR WITHDRAWAL OF BID:

A. Prior to the time and date designated for receipt of Bids, any Bid submitted may be modified or withdrawn by notice to the party receiving Bids at the place designated for receipt of Bids. Such notice shall be in writing over the signature of the Bidder, and must be received by the College on or before the date and time set for receipt of Bids, and it shall be so worded as not to reveal the amount of the original Bid.

B. Withdrawn Bids may be resubmitted up to the time designated for the receipt of the Bids provided that they are then fully in conformance with the Instructions to Bidders.

C. After Bid opening, the College may permit a Bidder to withdraw its Bid, based on one or more clerical errors in the Bid, only if the Bid shows with objective proof and by clear and convincing evidence:

1. The nature of the error;
2. That the error is not a minor informality under this subsection or an error in judgment;
3. That the error cannot be corrected or waived under DJ-AR 49-0350;
4. That the Bidder acted in good faith in submitting a Bid that contained the claimed error and in claiming that the alleged error in the Bid exists;
5. That the Bidder acted without gross negligence in submitting a Bid that contained a claimed error;
6. That the Bidder will suffer substantial detriment if the Contracting Agency does not grant the Bidder permission to withdraw the Bid;

7. That the Contracting Agency's or the public's status has not changed so significantly that relief from the forfeiture will work a substantial hardship on the Contracting Agency or the public it represents; and
8. That the Bidder promptly gave notice of the claimed error to the Contracting Agency.

D. Bid security, if any is required, shall be in an amount sufficient for the Bid as modified or resubmitted.

E. A decision denying withdrawal of Bid pursuant to Article 21.A herein shall be final and conclusive unless the Bidder appeals the decision within ten (10) days after receipt of the decision.

F. If, upon appeal, it is determined that the decision refusing withdrawal of the Bid was arbitrary or capricious, the sole relief shall be withdrawal of the Bid and return of the Bid security.

21. DISCLOSURE AND SUBSTITUTION OF FIRST-TIER SUBCONTRACTORS

A. Within two (2) working hours after the date and time of the deadline when the bids are due to the public contracting agency, for any Public Improvement project exceeding $100,000, all Bidders shall submit to the Agency a disclosure form, included in the Bid Form (Section 00 4100), identifying any first-tier subcontractors (those Entities that would be contracting directly with the prime contractor) that will be furnishing labor and/or materials on the contract, if awarded, whose subcontract value would be equal to or greater than:

1. Five percent (5%) of the total Contract Price, but at least $15,000; or
2. $350,000, regardless of the percentage of the total Contract Price.

B. Bidders are required to disclose the following information about each required first-tier subcontractor:

1. The subcontractor’s name and address,
2. The category of Work that the subcontractor would be performing,
3. The subcontractor’s Construction Contractor Board (CCB) registration number, if one is required, and
4. The subcontract dollar value.

C. The College must reject a bid if the Bidder fails to submit the disclosure form with this information by the stated deadline. (DJ-AR 49-0360) If there are no subcontractors or suppliers required to be disclosed, Bidder must provide the required disclosure form, noting on the completed form “None”. Compliance with the disclosure and submittal requirements of ORS 279C.370 and this rule is a matter of Responsiveness. Bids which are submitted by Bid Closing, but for which the separate disclosure submittal has not been made by the specified deadline, are not Responsive and shall not be considered for Contract Award. A First Tier Subcontractor Disclosure Form which has no subcontractors or suppliers and is completed with the word “None” must be submitted separately and be properly marked in the same manner as any other first-tier subcontractor disclosure form.

D. Substitution of affected first-tier subcontractors shall be made only in accordance with ORS 279C.585.

22. DETAILED BID BREAKDOWN:

A. Upon notification from the College to the Bidder that it has submitted the apparent lowest responsive Bid, the Bidder shall, within twenty-four (24) hours, provide a detailed breakdown of its Bid in a form acceptable to the College.

B. The breakdown may be used by the College to verify accounting requirements, and to determine whether the Bidder has grossly misjudged the requirements of any area.

C. The Bidder's failure to provide the requested detailed breakdown in the specified time may result in rejection of the Bid Proposal in the sole discretion of the College.

23. AWARD OF CONTRACT:

If the College determines that a contract is to be awarded, it will award the contract to the lowest responsive and responsible Bidder. The "lowest responsible bidder" will be the lowest bidder who has substantially complied with all bidding requirements and procedures and who has not been disqualified by the College under ORS 279C.440. In determining the lowest responsible bidder, the College shall add a percentage increase of the bid of nonresident bidder as required by ORS 279A.120. In the event that all Bids exceed the College's cost estimate, the College may negotiate with the lowest responsive and responsible Bidder in accordance with ORS 279C.340 to solicit value engineering and other options to attempt to bring the contract within the contracting agency's cost estimate.

A. The Lowest Bidder is determined by the aggregate amount of the Base Bid, plus any Alternates selected by the College.

B. A Responsive Bidder shall mean a Bidder who has submitted a Bid which conforms, in all material respects, to the Bidding Documents.

C. A Responsible Bidder shall mean a Bidder who has the capability, in all respects, to perform fully the Contract requirements and the moral and business integrity and reliability which will assure good faith performance. In determining responsibility, the College must determine that the Bidder:

1. Has available the appropriate financial, material, equipment, facility and personnel resources and expertise, or ability to obtain the resources and expertise, necessary to meet all contractual responsibilities;

2. Has completed previous contracts of a similar nature with a satisfactory record of performance. A satisfactory record of performance means that, to the extent the costs associated with and time available to perform a previous contract were within the Bidder's control, the Bidder stayed within the time and budget allotted for the procurement and otherwise performed the contract in a satisfactory manner. A Contracting Agency should carefully scrutinize a Bidder's record of contract performance if the Bidder is or recently has been materially deficient in contract performance. In reviewing the Bidder's performance, the Contracting Agency should determine whether the Bidder's deficient performance was expressly excused under the terms of contract, or whether the Bidder took appropriate corrective action. The Contracting Agency may review the Bidder's performance on both private and Public Contracts in determining the Bidder's record of contract performance. The Contracting Agency shall make its basis for determining that a Bidder is not responsible under this paragraph part of the Solicitation file;

3. Has a satisfactory record of integrity. A Bidder may lack integrity if a Contracting Agency determines the Bidder demonstrates a lack of business ethics such as violation of state environmental laws or false certifications made to a Contracting Agency. A Contracting Agency may find a Bidder not Responsible based on the lack of integrity of any Person having influence or control over the Bidder (such as a key employee of the Bidder that has the authority to significantly influence the Bidder's performance of the Contract or a parent company, predecessor or successor Person). The standards for Conduct Disqualification under DJ-AR 49-0370 may be used to determine a Bidder's integrity. A Contracting Agency may find a Bidder non-responsible based on previous convictions of offenses related to

obtaining or attempting to obtain a contract or subcontract or in connection with the Bidder's performance of a contract or subcontract. The Contracting Agency shall make its basis for determining that a Bidder is not responsible under this paragraph part of the Solicitation file;

4. Is legally qualified to contract with the Contracting Agency; and

5. Has supplied all necessary information in connection with the inquiry concerning responsibility. If the Bidder fails to promptly supply information requested by the Contracting Agency concerning responsibility, the Contracting Agency shall base the determination of responsibility upon any available information, or may find the Bidder not responsible.

D. The ability of the low Bidder to provide the required bonds will not of itself demonstrate responsibility of the Bidder.

E. The College reserves the right to defer award of this Contract for a period of thirty (30) days after the due date of the Bids. During this period of time, the Bidder shall guarantee the prices quoted in its Bid.

24. SUBCONTRACTORS:

A. All Subcontractors proposed for the Work must be acceptable to the College.

B. The College reserves the right to request the proposed Subcontractors to complete qualification forms and/or current financial statements prepared by a Certified Public Accountant.

25. APPRENTICESHIP REQUIREMENTS (ADDENDUM #3):

Labor required for the construction of this project is subject to the minimum apprenticeship requirements as provided in the Supplementary General Conditions. No Bid will be received or considered by the College unless the Bid contains a statement by the Bidder as a part of its Bid that "Contractor agrees to be bound by and will comply with the provisions of 279C.533."

26. MINIMUM WAGE RATES:

Labor required for the construction of this project is subject to the minimum wage rates as provided in the Supplementary General Conditions. No Bid will be received or considered by the College unless the Bid contains a statement by the Bidder as a part of its Bid that "Contractor agrees to be bound by and will comply with the provisions of 279C.838, 279C.840."

27. PRE-BID CONFERENCE (MANDATORY):

A Mandatory Pre-Bid Conference will be conducted by the College at the time indicated in the Advertisement for Bids to afford Bidders the opportunity to question the College and the Architect. The meeting will be held at the location identified in the Advertisement for Bids. (If no time is given in the Advertisement for Bids, no Pre-Bid Conference will be held.) Any statements made by the College's representatives at the conference are not binding upon the College unless confirmed by written addendum.

28. MILESTONE DATES AND SCHEDULE:

A. A list of Milestone Dates is included in the Bidding Documents. Each Bidder shall submit the list of Milestone Dates, in its original form, with its bid and, in so doing, will attest that the Bidder intends to complete the Work and other aspects of the Project within the Milestone Dates. The Bidder may not condition its Bid on the acceptance College of delayed Milestone Dates.

B. Within seven (7) calendar days after issuance of Notice to Proceed, the Contractor shall deliver to the College a detailed construction schedule for review and acceptance by the College and shall thereafter be referred to as the Schedule. The Schedule shall be, in form and content, acceptable to the College.

C. The Bidder's attention is drawn to Division 1, Section 01 3200 of the General Requirements entitled "Schedule and Reports" for additional requirements.

29. SUBSTITUTIONS:

The attention of potential bidders and other interested parties is called to the conditions set forth in Division 1, Section 01 2500 of General Requirements, “Substitutions”, regarding approval and product options for substitutions.

30. CONTRACTOR’S DRUG TESTING PROGRAM

Per ORS 279C.505(2), prior to Contract Award, Contractor shall certify to the College that it has a drug testing program in place for its employees that includes, at a minimum, the following:

A. A written employee drug-testing policy.
B. 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
C. Required testing of a Subject Employee when the Contractor has reasonable cause to believe the Subject Employee is under the influence of drugs.

31. PERMITS & FEES

Contractor is to obtain and the College is to pay for all permits necessary to obtain the general building permit for the Project. The contractor will be required to provide the necessary contractor information and signatures. Upon notification by the Contractor to the College, of the fees owing, the College will pay for these permits. The contractor will be required to secure the permits and to maintain the permit documents at the site as required by the governing authority. The Contractor is responsible to obtain ~~and pay for~~ any permits not listed herein **(ADDENDUM #1)**. The Contractor is responsible for coordinating and obtaining all required inspections and approval signatures. The Contractor is required to submit all inspection records to the College at the completion of the project and as a prerequisite for final payment.

END OF SECTION

PART 1 - GENERAL

The following Supplements modify the General Conditions. Where a portion of the General Conditions is modified, or deleted by these Supplementary Conditions, the unaltered provisions of the General Conditions shall remain if effect.

1.1 CONTRACT DRAWINGS

A. Article 1.1.1.1 shall be added as follows:

1. 1.1.1.1 The Contract Drawings are identified on the Title Page of the Drawings.

1.2 DIVISION, SECTION, & PARAGRAPH NUMBERING

A. Article 1.1.6 shall be added to as follows:

1. Numbering or lettering of Divisions, Sections, and Paragraphs in the Specification are merely for identification and may not be consecutive.
2. The Divisions and Sections included are listed in the Table of Contents. The Contractor shall check his copies of the Project Manual to be sure that the Manual is complete.

1.3 SPECIFICATIONS WORDING

A. Article 1.1.6 shall be added to as follows:

1. The Specifications are of abbreviated or streamlined type and frequently include incomplete sentences. Words such as "shall", "shall be", "Contractor shall", and similar mandatory phrases shall be supplied by inference in same manner as they are in a note on Drawings. Contractor shall provide all items listed and perform all operations required, in accordance with Article 1.1.2 of "General Conditions", if and as modified in these Specifications.
2. In the interest of brevity, the Contract Documents frequently omit modifying words such as "all", "each", and "every" and articles such as "the", "a", and "an", but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

1.4 ADDITIONAL DEFINITIONS

A. Article 1.1.9 shall be added as follows:

1. "Directed", "Requested", "Approved", "Authorized", "Selected", "Required", and "Permitted" mean directed by the Architect, requested by the Architect, etc.

2. "Furnish" means to supply and deliver to the Project Site, ready for unloading, unpacking, assembly, installation, and similar operations.

3. "Indicated" means references to graphic representations; notes or schedules on the Drawings, or other paragraphs or schedules in the Specifications; and similar requirements in the Contract Documents. Terms such as "shown", "noted", "scheduled", and "specified" are used to help the User locate the Reference.

4. "Install" means operations at the Project Site including actual unloading, temporary storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

5. "OFOI" (Owner Furnished & Owner Installed) means Product in question will be furnished and installed by the Owner. The Contractor shall verify all requirements affecting his Work.

6. "OFCI" (Owner Furnished & Contractor Installed) means Product in question will be furnished by the Owner and installed by the Contractor. The Contractor shall verify all requirements affecting his Work.

7. Where words "or approved" are used, the Architect is sole judge of quality and suitability of proposed substitution.

8. "Product" includes Materials, Systems, and Equipment.

9. "Project Site" means space available to Contractor for performing Work activities, either exclusively or in conjunction with others performing other work as part of the Project.

10. "Provide" means furnish, install, and where appropriate connect, ready for the intended use.

11. "Regulations" mean laws, ordinances, statutes, and lawful orders issued by Authorities having jurisdiction, as well as rules, conventions, and agreements within the Construction Industry that control performance of the Work.

1.5 CONFLICTS

A. Article 1.2.1.1 shall be added as follows:

1. 1.2.1.1 In event of conflict or discrepancy among the Contract Documents, interpretations will be based on the following priorities:

a. Agreement.
b. Addenda, with those of later date having precedence over those of earlier date.
c. Supplementary Conditions.
d. General Conditions of the Contract.
e. Schedules.
f. Drawings & Specifications.
1) In the case of inconsistency between Drawings 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 Architect's interpretation.
g. Large Scale Drawings.
h. Small Scale Drawings.

2. Dimension Numbers written on Drawings prevail and take precedence over Dimensions scaled from Drawings.

1.6 CONTRACTOR'S USE OF CONTRACT DOCUMENTS IN ELECTRONIC FORM

A. Article 1.6 shall be added to as follows:

1. The Architect may furnish to the Contractor versions of the Contract Documents in electronic form. The Contract Documents executed or identified in accordance with Subparagraph 1.5.1 shall prevail in case of an inconsistency with subsequent versions made through manipulatable electronic operations involving computers.

2. The Contractor shall not transfer or reuse Contract Documents in electronic or machine readable form without prior written consent of the Architect.

1.7 ALTERING RESPONSIBILITIES OF OWNER, ARCHITECT OR CONTRACTOR

A. Article 2, 3, & 4 shall be added to as follows:

1. No provision in any Referenced Standard, Specification, Manual or Code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the privileges, duties, or responsibilities of the Owner, Architect, or Contractor, or any of their consultants, agents, or employees from those set forth in the Contract Documents, nor shall it be effective to assign to the Architect or any of the Architect's consultants, agents, or employees any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provision of the Contract Documents.

1.8 COPIES FURNISHED

A. Article 2.2.5 shall be changed to read as follows:

1. The Contractor shall pay the cost of reproduction, postage, and handling for all copies required to bid and perform the Work.

1.9 SPECIAL TESTS AND INSPECTIONS

A. Article 2.2.6 shall be added as follows:

1. The Owner will procure and bear costs of Tests and Inspections as required by the Building Code.

1.10 OWNER'S RIGHT TO PAY CLAIMS AGAINST CONTRACTOR

A. Article 2.5 shall be added as follows:

2.5 OWNER'S RIGHT TO PAY CLAIMS AGAINST CONTRACTOR

2.5.1 If the Contractor fails, neglects, or refuses to make prompt payment of any valid claim for labor or services furnished to the Contractor or any Subcontractor as such claim becomes due for Work performed on this Project, the Owner may pay such claim to the person furnishing such labor or services, and charge the amount of the payment against funds due, or to become due, to the Contractor by reason of this Contract.

2.5.2 The Owner's payment of such claim will not relieve the Contractor or his Surety from his obligation with respect to any unpaid claims.

1.11 INDEPENDENT CONTRACTOR

A. Article 3.1.4 shall be added as follows:

1. 3.1.4 Contractor is engaged hereby as an independent contractor, and will be deemed for the purposes of the following:

a. Contractor will be solely responsible for payment of any Federal or State taxes required as a result of the Agreement.
b. This Agreement is not intended to entitle Contractor to any benefits generally granted to The Owner's employees. Without limitation, but by way of illustration, the benefits which are not intended to be extended by this Agreement to Contractor are vacation, holiday and sick leave, other leaves with pay, tenure, medical and dental coverage, life and disability insurance, overtime, Social Security, Workers' Compensation, unemployment compensation, or retirement benefits (except insofar as benefits are otherwise required by law if Contractor is presently a member of the Public Employees Retirement System).

1.12 CONTRACTOR NOT AN AGENT OF OWNER

A. Article 3.1.5 shall be added as follows:

1. 3.1.5 It is agreed by and between the parties that Contractor is not carrying out a function on behalf of The Owner, and The Owner does not have the right of direction or control of the manner in which Contractor delivers services under this Contract or exercise any control over the activities of Contractor.

1.13 PARTNERSHIP

A. Article 3.1.6 shall be added as follows:

1. 3.1.6 The Owner is not, by virtue of this Contract, a partner or joint venturer with Contractor in connection with activities carried out under this Contract, and shall have not obligation with respect to Contractor's debts or any other liabilities of each and every nature.

1.14 CONTRACTOR'S REQUESTS FOR INFORMATION

A. Article 3.2.4 shall be added as follows:

1. The Owner shall be entitled to deduct from the Contract Sum amounts paid by the Owner to the Architect for the Architect to evaluate and respond to the Contractor's requests for information, where such information was available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor-prepared coordination drawings, or prior Project correspondence or documentation.

2. Additionally, comply with requirements specified in Section 00 9300.

1.15 PRODUCT SUBSTITUTIONS

A. Article 3.4.2 Shall be changed to read as follows:

1. 3.4.2 Only the products listed, or approved through the process outlined in Section 01 2500 will be allowed to be used in the construction of the Project. The Contractor may make substitutions only with the approval of the Owner & Architect and shall be in compliance with the requirements as outlined in Section 01 2500.

1.16 PERMITS

A. Article 3.7.1.1 shall be added as follows:

1. 3.7.1.1 All Permit Fees will be paid by the Owner.

1.17 USE OF NON-OREGON RESIDENT CONTRACTORS

A. Article 3.7.2 shall be added to as follows:

1. Any Foreign Contractor shall promptly report to the Dept. of Revenue, on forms furnished by the Dept., the total Contract Price, terms of payment, length of Contract, and such other information as the Dept. may require before final payment will be paid by the Owner to the Contractor.

1.18 OREGON PRODUCTS

A. Article 3.7.2 shall be added to as follows:

1. In accordance with Oregon Law ORS 279, the Contractor is encouraged to use products which have been manufactured in Oregon, provided that prices, fitness, availability, and quality are otherwise equal.

1.19 EQUAL EMPLOYMENT OPPORTUNITY

B. Article 3.7.2 shall be added to as follows:

1. It shall be the policy of the Klamath Community College District to affirm the right of all individuals to equal education, activities, facilities and employment without regard to age, sex, disability, national origin, race, marital status, religion, sexual orientation, or gender identity in accordance with federal and state laws. Klamath Community College complies with Titles IV and VII of the Civil Rights Act of 1964, Title IX of the Educational Amendments of 1972 and Section 504 of the Rehabilitation Act 1973 and the Americans with Disabilities Act of 1990. Inquiries or grievances concerning the application of these laws and regulations to the College may be directed to the College’s Director of Human Resources or to the Director, Office for Civil Rights, U.S. Department of Education, Washington D.C. 20201

1.20 WORKING HOURS

A. Article 3.7.2 shall be added to as follows:

1. No person shall be employed on this Project for more than 8 hours in any one day, or more than 40 hours in any one week, unless otherwise required by conditions specified elsewhere, or in cases of necessity, emergency, or when public policy absolutely requires it, and in such cases the Workman shall be paid at least time and one-half pay for all overtime work, unless otherwise excepted by ORS 279.
2. To permit arrangements for inspections, the Contractor shall notify the Owner at least 48 hours in advance of any overtime work, including nights, weekends and holidays. Do no overtime work without notifying Owner.

*1.21 APPRENTICESHIP REQUIREMENTS **(ADDENDUM #3)***

A. Article 3.7.2 shall be added to as follows:

1. Contractor shall comply with ORS 279C.533 and shall employ apprentices to perform not less than twelve percent (12%) of the total work hours performed in apprenticeable occupations on this Contract, and shall require each subcontractor with a subcontract price of $750,000 or more to meet the same apprenticeship utilization requirement for its subcontracted work; Contractor and subcontractors shall pay apprentices at the hourly rates required by the applicable registered apprenticeship agreement or apprenticeship training program; Contractor shall establish, implement, and maintain a documented plan for outreach to, and recruitment and retention of, women, minority individuals, and veterans to perform work on the Project; Contractor shall provide all reports and records required by the contracting agency and the Oregon Bureau of Labor and Industries to demonstrate compliance; and Contractor acknowledges that failure to meet the apprenticeship utilization or reporting requirements may result in payment reductions, withholding, or other remedies as provided by law, with any required reductions paid to the State Treasury for the benefit of apprenticeship training programs.

1.22 MINIMUM WAGE RATES

A. Article 3.7.2 shall be added to as follows:

1. Wage paid to Workman on this Project shall not be less than the current Prevailing Wage Rates for Public Works Contracts in Oregon.

2. Current Oregon Prevailing Wage Rates can be found on the Bureau of Labor and Industries (BOLI) web site at www.oregon.gov/boli

1.23 POSTING MINIMUM WAGE RATES

A. Article 3.7.2 shall be added to as follows:

1. The Contractor and Subcontractors shall post and maintain for the Project duration, in a conspicuous location accessible to Project Employee, the Oregon Prevailing Wage Rates as said above.

1.24 WAGE CERTIFICATION

A. Article 3.7.2 shall be added to as follows:

1. Additionally, follow requirements specified in Section 01 2900.

1.25 PAYMENTS TO WORKMEN & MATERIALMEN

A. Article 3.7.2 shall be added to as follows:

1. The Contractor shall make prompt payment as due to persons supplying labor for the Work of this Project.

1.26 STATE INDUSTRIAL ACCIDENT FUND CONTRIBUTIONS

A. Article 3.7.2 shall be added to as follows:

1. The Contractor shall pay all required contributions or amounts due the State Industrial Fund for Work on this Project.

1.27 WITHHOLDING TAXES

A. Article 3.7.2 shall be added to as follows:

1. The Contractor shall pay Department of Revenue all sums withheld from Employees pursuant to ORS requirements.

1.28 ENVIRONMENTAL & NATURAL RESOURCES

A. Article 3.7.2 shall be added to as follows:

1. The Contractor shall comply with federal, state and local ordinances and regulations dealing with prevention of environmental pollution and preservation of natural resources that affect Work of this Project. If the Contractor is delayed or must undertake additional Work due to enactment of a new or amended statute, ordinance, or regulation relating to preventing environmental pollution or preserving natural resources occurring after the Date of the Owner-Contractor Agreement, the Owner will issue a Change Order which extends the Contract Time and/or sets forth any additional Work that must be undertaken together with any reasonably required change in the Contract Sum.

1.29 MEDICAL PAYMENTS

A. Article 3.7.2 shall be added to as follows:

2. The Contractor shall promptly, as due, make payments to any organization furnishing medical, surgical, or hospital care or other needed care or attention incident to sickness or injury to the Contractor's Employees, of all sums which the Contractor agrees to pay for such services and all moneys and sums which the Contractor has collected or deducted from his Employee's wages pursuant to any law, contract, or agreement for the purpose of providing or paying for such service.

1.30 CONTRACTOR'S SUPERINTENDENT

A. Article 3.9.2 shall be added as follows:

1. The Superintendent that is assigned to the Project by the Contractor shall not be relieved of his position until after the Project has had it's Final completion with the Punch List completed in it's entirety, all the O & M Manuals complete, As-Built drawings complete and accepted, and all demonstrations have been delivered.

B. Article 3.9.3 shall be added as follows:

1. If the Owner and/or Architect object to the Contractor's Project Team (i.e. Superintendent, Project Manager, etc.) that has been assigned to the Project, the Architect will reply in writing within seven (7) days after bid. Contractor will then assign different members to perform the Work acceptable to both Owner and Architect.

1.31 PROGRESS SCHEDULE

A. Article 3.10.1 shall be added to as follows:

1. Additionally, follow requirements specified in Section 01 3200.

1.32 SHOP DRAWINGS, PRODUCT DATA & SAMPLES

A. Article 3.12.5 shall be added to as follows:

1. Additionally, follow requirements specified in Section 01 3300.

1.33 CLEANING & TRASH REMOVAL

A. Article 3.15.1 shall be added to as follows:

1. Additionally, follow requirements specified in Section 01 7300.

1.34 OFF-SITE INSPECTIONS

A. Article 4.2.2 shall be added to as follows:

1. Upon the Contractor's request, the Architect will inspect Construction Components prior to job-site delivery. In such case, the Contractor shall reimburse reasonable per diem, travel, and lodging expenses incurred by the Architect, or other duly authorized agent of the Owner, while making the inspection.

1.35 SUBCONTRACTS

A. Article 4.2.2 shall be added to as follows:

1. Except for the Owner's right to reject Subcontractors, as specified in Article 5.2, neither the Owner nor the Architect will interfere with the Contractor's right and responsibility to

divide the Work among Subcontractors, or to establish the extent of the Work to be performed by any Subcontractor.

1.36 CHANGES IN THE WORK

A. Article 7.3.7 shall be amended as follows:

1. In the first sentence, delete the words "a reasonable allowance for overhead and profit" and substitute "an allowance for overhead and profit in accordance with the schedule set forth below."
2. The maximum allowance for overhead and profit combined, included in the total cost to the Owner, shall be based on the following Schedule:

a. For the Contractor for any Work performed by the Contractor's own forces the following percent of the cost:
Costs up to $1000: 15%
Costs between $1001 and $10,000: 12%
Costs over $10,000: 10%

b. For the Contractor, for Work performed by the Contractor's Subcontractor, the following percent of the amount due the Contractor:
Costs up to $1000: 10%
Costs between $1001 and $10,000: 7%
Costs over $10,000: 5%

c. For each Subcontractor or Sub-subcontractor involved, for Work performed by that Subcontractor's or Sub-subcontractor's own forces, the following percent of the cost:
Costs up to $1000: 15%
Costs between $1001 and $10,000: 12%
Costs over $10,000: 10%

d. For each Subcontractor, for Work performed by the Subcontractor's Sub-subcontractors, the following percent of the amount due the Sub-subcontractor:
Costs up to $1000: 10%
Costs between $1001 and $10,000: 7%
Costs over $10,000: 5%

3. Cost to which overhead and profit is to be applied shall be determined in accordance with Subparagraph 7.3.6.

a. In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials, and Subcontract.
b. Labor and materials shall be itemized in the manner prescribed. Where major cost items are Subcontracts, they shall be itemized also. In no case will a change involving over $500.00 be approved without such itemization.

1.37 CHANGES IN THE WORK

A. Articles 7.3.7.1 to 7.3.7.5 shall be amended as follows:

1. Cost shall be limited to the following: cost of materials and equipment, including cost of delivery; cost of in field labor not including project staff or supervision, including Social Security, payroll taxes, fringe benefits, unemployment insurance; workers' compensation insurance; rental rate of and fuel for power tools and equipment not normally on the project.

2. Overhead and profit shall include the following: project insurance, bond premiums, general administration, supervision which includes project managers and staff not completing direct material work in the field, superintendence, general foremen, wages of time-keepers, watchmen and clerks, small tools, incidentals, general office expense, home office overhead, project office overhead and expenses, and all other expenses not included in 'cost'.

1.38 TIME OF COMPLETION

A. Article 8.1.1 shall be added to as follows:

1. Work of this Contract shall commence on the date defined in Paragraph 8.1.2 and be Substantially Complete as defined in Paragraph 8.1.3 prior to the date noted below. Final completion shall occur within 30 days here after.

2. The Contractor may complete the Project sooner then the specified Completion Date, provided the Contractor performs the following:

a. Communicates and documents intended "early completion" date to Owner prior to submitting the first Request for Payment; and
b. Satisfactorily demonstrates to Owner that "early completion" date is feasible and obtainable, and is in accordance with industry standards; and
c. Personally gives Owner sufficient advance notice of when any Owner furnished product or service must be delivered in order that "early completion" date will not be delayed (Indicating required delivery dates on Progress Schedule will not be considered adequate advance notice.); and
d. If the Contractor claims that his opportunity to attain "early completion" has been interfered with by the Owner's actions or inactions, the Contractor must clearly demonstrate that interference was solely the Owner's responsibility.

B. Article 8.1.2 shall be changed to read as follows:

1. The date of commencement of the Work shall be on or before **May 28th, 2026** with a Notice to Proceed from the Owner.

1.39 SUBSTANTIAL COMPLETION

A. Article 8.1.3 shall be added to as follows:

1. WORK SHALL BE SUBSTANTIALLY COMPLETE by **May 28th, 2027**

1.40 DEFINITION OF "DAY"

A. Article 8.1.4 shall be changed to read as follows:

1. In this Contract, unless elsewhere specifically stipulated otherwise, the term "day" shall mean a calendar day of 24 hours beginning at 12:00 midnight. The term "working day" shall mean any calendar day except Saturdays, Sundays, and Legal Holidays at the place of building.

1.41 LIQUIDATED DAMAGES

Liquidated damages shall be set at $1000 per day past date of substantial completion.

1.42 APPLICATIONS FOR PAYMENT

A. Article 9.3.1 shall be added to as follows:

1. Additionally, follow requirements specified in Section 01 2900.

1.43 PAYMENT FOR PRODUCTS STORED OFF THE PROJECT SITE

A. Article 9.3.2 shall be added to as follows:

1. Additionally, follow requirements specified in Section 01 2900.

1.44 INTEREST DUE FOR NON-PAYMENT TO SUBCONTRACTORS, SUPPLIERS, ETC.

A. Article 9.6.2.1 shall be added as follows:

1. In accordance with ORS 279, if Contractor or any 1st tier Subcontractor fails, neglects, or refuses to make payment to person or entity furnishing labor or materials for this Project within 30 days after receipt of payment from the Owner, the Contractor or 1st tier Subcontractor shall owe the person or entity the amount due plus interest charges commencing at end of 10-day period that payment is due, unless payment is subject to good faith dispute as defined in ORS 279.

2. The Rate of Interest charged shall be equal to 3 times the discount rate on 90-day commercial paper in effect at Federal Reserve Bank on the date 30 days after date payment was received from Owner, but Rate of Interest shall not exceed 30 percent. The amount of Interest may not be waived.

3. Additionally, if Contractor or any Subcontractor fails, neglects, or refuses to pay person or entity furnishing labor or material for this Project, the person or entity may file complaint with Construction Contractors Board, unless payment is subject to a good faith dispute as defined in ORS 279.

1.45 SUBSTANTIAL COMPLETION

A. Article 9.8.1 shall be added to as follows:

1. The project will not be considered Substantially Complete unless all utilities and systems are connected and operating as required for normal use, Contractor has performed the training procedures with the Owner and the Owner can perform all “move-in” requirements.

1.46 CONTRACT CLOSEOUT INSPECTIONS

A. Article 9.8.3.1 shall be added as follows:

1. Except with the consent of the Owner, the Architect will perform no more than 2 inspections to determine whether the Work or a designated portion thereof has attained Substantial Completion in accordance with the Contract Documents. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for any additional inspections.

2. Additionally, follow requirements specified in Section 01 7700.

1.47 LIENS

A. Article 9.10.2 shall be added to as follows:

1. The Contractor shall indemnify and save the Owner harmless against any liens and claims arising out of this Contract and filed or prosecuted against the Owner on account of any furnished labor or materials, provided the Owner shall have paid all amounts due to the Contractor for the said labor or materials.

1.48 INSURANCE

A. Article 11.1.2 the second sentence shall be changed to read as follows:

1. Coverages, whether written on an Occurrence or a Claims-made basis, shall be and remain in effect from the date of commencement of the Work until the expiration of the longest running Warranty Period.

B. Article 11.1.2.1 shall be added as follows:

1. 11.1.2.1 The Insurance required by Subparagraph 11.1.1 shall be written for not less than the following limits, or greater if required by law:

a. Worker's Compensation: Insurance in compliance with ORS 656.017, requiring Contractor and all subcontractors to provide worker’s compensation coverage for all subject workers, or provide certification of exempt status.
b. Employer's Liability: $1,000,000.
c. Contractor's Liability & Designated Contractual Liability as follows:
   1) Form: Comprehensive or Commercial General Liability, including Premises-operations; Independent Contractor's Protective; Broad-form Property Damage; Contractual Liability and Products and Completed Operations.
   2) Policy Limits: $2,000,000 each occurrence / $5,000,000 aggregate or lower CGL limits with Excess or umbrella liability providing total insurance limit of $5,000,000 products and
d. Personal Injury with Employment Exclusion deleted: $1,000,000.
e. Excess Liability or Umbrella Excess Liability required if underlying CGL policy has lower aggregate limit: provide $5,000,000 above primary general and automobile liability policies, including contractual liability coverage.

CGL insurance shall name Klamath Community College, its officers, directors, agents, employees and volunteers as an additional insured by endorsement.

The additional insured endorsement shall provide primary and non-contributory coverage.

f. Comprehensive Automobile Liability, including owner, non-owned, and hired Vehicles with a combined single limit of $1,000,000.

g. Completed Operations & Products Liability: Furnish and maintain for 1 year period after Final Project Acceptance.

h. Coverage against Explosion, Collapse and Underground Damage.

i. Aircraft Liability owned and non-owned, if Aircraft are utilized, as follows: Bodily Injury: $500,000. 1) Property Damage $1,000,000

j. Coverage against on site pollution, including environmental, occurring from unauthorized disposal of material.

C. Article 11.1.3 shall be added to as follows:

1. If Insurance is written on Comprehensive General Liability form, Insurance Certificate shall be AIA Document G705.
2. If Insurance is written on Commercial General Liability form, Insurance Certificate may be AIA Document G706 or ACORD form 25S.
3. Cancellation Notices and any Endorsements subsequently issued amending coverage or limits shall be delivered to Owner by Registered Mail.
4. Should insurance be canceled or reduced prior to the Contract close out and should any insurance bearing on adequacy of performance be reduced prior to end of warranty periods, and if Contractor fails immediately to procure other insurance as specified, the Owner reserves the right to procure such insurance and to charge the cost thereof to the Contractor.
5. If any of the foregoing insurance coverages are required to remain in force after final payment, an additional Certificate of Insurance which evidences the continuation of such coverage shall be submitted with the final Application for Payment.

D. Article 11.1.4 shall be added as follows:

1. 11.1.4 Nothing contained in these Insurance Requirements shall be construed as limiting the extent of the Contractor's responsibilities for payment of damages resulting from his operations under this Contract.

E. Article 11.3.1.3 shall be changed as follows:

1. 11.3.1.3 Contractor shall pay for all property and all-risk insurance deductibles at all occurrences.

F. Article 11.3.7 shall be added to as follows:

1. 11.3.7 All references to property insurance shall be changed to “builder all-risk” insurance.

1.49 PERFORMANCE & PAYMENT BONDS

A. Article 11.4.1 shall be changed to read as follows:

1. The Contractor shall furnish bonds covering the faithful performance of the Contract and payment of obligations arising thereunder. Bonds may be obtained through the Contractor's usual sources and the cost thereof shall be included in the Contract Sum. The amount of each bond shall be equal to 100% of the Contract Sum.

2. The Contractor shall deliver the required bonds to the Architect for forwarding to the Owner not after than 3 days following the date the Agreement is entered into, or if the Work is to be commenced prior thereto in response to a Letter of Intent, the Contractor shall, prior to commencement for the Work, submit evidence satisfactory to the Owner that such bonds will be furnished.
3. The Contractor shall require the attorney-in-fact who executed the required bonds on behalf of the Surety to affix thereto a certified and current copy of the power of attorney.

1.50 CORRECTION PERIOD FOR NON-COMPLYING WORK

A. Article 12.2.2.1 shall be added to as follows:
1. The date relating to Work found to be defective or not in accordance with the Contract Documents will begin on the date appearing on the Certificate of Substantial Completion, or if a Certificate of Substantial Completion is not issued, on the date appearing on the final Certificate of Payment to the Contractor, whichever is earlier. The Owner's occupancy or use of the Work will not alter the date.

B. Article 12.2.5 shall be added to as follows:

1. Just prior to the completion of the general one-year warrantee period, Owner and Contractor shall walk the construction project together to identify all items requiring attention that are to be corrected by the Contractor. Contractor shall be responsible for scheduling said meeting.

1.51 TESTS AND INSPECTIONS

A. Article 13.5.1 shall be amended as follows:

1. Delete the last sentences.

1.52 LABORATORY TESTING COSTS

A. Article 13.5.1.1 shall be added as follows:

13.5.1.1 Owner will pay for laboratory testing costs as stipulated in Section 01 4000.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 064000

ARCHITECTURAL WOODWORK

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Plastic-laminate-faced wood cabinets.
   2. *Closet and utility shelving.* **(ADDENDUM #03)**
   3. Cabinet hardware.

B. Related Requirements:
   1. Section 123600.

1.2 REFERENCES

A. Abbreviations and Acronyms:
   1. HPDL: High Pressure Decorative Laminate.
   2. ABS: Acrylonitrile butadiene styrene.

B. Definitions:
   1. Sheen Levels: ASTM D523.
      a. Flat: Five gloss units at 60 degrees and 10 gloss units at 85 degrees, maximum.
      b. Satin: 20 to 35 gloss units at 60 degrees and 35 gloss units minimum at 85 degrees.
      c. Semigloss: 35 to 70 gloss units at 60 degrees.
      d. Gloss: 70 gloss units at 60 degrees, minimum.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting Attendees and Procedures:
   1. Conduct meeting one week, minimum, before starting Work of this Section.

1.4 ACTION SUBMITTALS

A. Submittals - General: AWI 100.

B. Product Data:
   1. Panel products.
   2. Adhesives.

3. Manufactured trim profiles and ornamental components.
4. Hardware.
5. Finish materials.
6. Shop primers.
7. Fire retardant treatment.
8. Initial selection color Samples.

C. Shop Drawings:
1. Dimensioned plans and elevations showing architectural woodwork elements locations.
2. Show materials, profiles, assembly methods, joint details, fastening methods, hardware locations and sizes and locations of cutouts and finishes.
3. Veneered Cabinetry Paneling: Show and dimension panel sizes, veneer leaves, and grain direction.

D. Samples:
1. Finished Material: Provide Samples for each wood species and finish.
a. Range Samples: Submit three each of light, medium and dark stain samples for color and grain selection.
b. Linear Elements: 12 inches long.
c. Veneer Panels: 12 by 12 inches.
2. Plastic Laminates: 2 by 3 inches, minimum.
3. Thermoset Decorative Panels: 2 by 3 inches, minimum.
4. Hardware: Each type and finish.
5. Edge Material: Each type.

1.5 SUSTAINABILITY SUBMITTALS

A. Building Product Disclosure and Optimization: Environmental product declarations documentation.
1. Product specific EPD for High pressure plastic laminates, adhesives, substrates.

B. Indoor Air Quality Certificates:
1. Certify VOC content for interior adhesives.
2. Certify composite wood and agrifiber products contains no added urea-formaldehyde resins.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For <Product>.

B. Warranty Documentation: For <Product>.

1.7 QUALITY ASSURANCE

A. Qualifications:
   1. Fabricator: 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.
   2. Installer: Woodwork fabricator.

B. Mockups: Construct typical base cabinet with one door and one drawer and plastic laminate countertop, 12 inches in width minimum size. Demonstrate product interfaces, intersections, and terminations.
   1. Mockups Location: Field.
   2. Approved mockups establish products and work results standard.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Storage and Handling Requirements: AWI 200.

1.9 FIELD CONDITIONS

A. Ambient Conditions: Perform Work within following limitations.
   1. Building enclosed and environmental systems maintaining design conditions for Owner occupancy.

B. Existing Conditions: Verify field measurements before fabrication. Show field measurements on Shop Drawings.

1.10 WARRANTY

A. Manufacturer Warranty:
   1. Casework: Warrant against product, installation, and total system failure.
      a. Failure includes Delamination of Plastic Laminate or Edge Banding.
      b. Warranty Period: 3 years.

PART 2 PRODUCTS

2.1 WOODWORK GENERAL REQUIREMENTS

A. Quality Standard: Follow AWI Standards for aesthetic and performance grades.

B. Woodwork Grade: Premium.

2.2 PLASTIC LAMINATE FACED CABINETS

A. Wood Cabinets General Requirements: ANSI/AWI 0641.
   1. Duty Level: 3.

B. Aesthetic Grade: Premium.

C. Cabinet Construction: Frameless.

D. Panel Cores: Veneer core and Construction of the cabinetry shall be high-pressure laminate over NAUF plywood sheathing. Particle board or MDF is not allowed in the cabinet construction, unless noted otherwise..

E. Cabinets and Laminates in proximity to water sources:
   1. All countertops and casework within 36 inches of a water source shall use marine grade plywood.
   2. No seams are permitted in laminates within 24 inches of a water source.

F. Door and Drawer Configuration: Reveal overlay.
   1. Reveal Dimension: 1/2 inch.

G. Plastic Laminate[, Tag]:
   1. Manufacturers and Products: See Finish Schedule and Finish Legend (ADDENDUM #01) on Drawings.

H. Exposed Exterior and Exposed Interior Surfaces: High-pressure decorative laminate.
   1. Horizontal Surfaces Other Than Tops: Grade HGS.
   2. Postformed Surfaces: Grade HGP.
   3. Vertical Surfaces: Grade [HGS].
   4. Chemical resistant finish for products indicated in Finish Legend (ADDENDUM #01)
   5. Edge Banding: [0.12 inch PVC edge banding matching exposed laminate (ADDENDUM #01)] and [Acrylonitrile butadiene styrene, 3mm thick, color of edge banding will be custom to match the laminate].

I. Semi-Exposed Surfaces Other Than Drawer Bodies: Grade HGS.
   1. Edge Banding: 0.12 inch PVC edge banding matching exposed laminate (ADDENDUM #01) and Acrylonitrile butadiene styrene, , 3mm thick, color of edge banding will be custom to match the laminate.

J. Drawer Semi-Exposed Surfaces: Thermoset decorative panels.
   1. Edge Banding: 0.12 inch PVC edge banding matching exposed laminate (ADDENDUM #01) and Acrylonitrile butadiene styrene, 3mm thick, color of edge banding will be custom to match the laminate.

K. Drawer Construction: Match cabinet duty level.
   1. Box Material: Veneer core.
      a. Thickness: [1/2 inch] and [3/4 inch], minimum.
   2. Joinery: Join drawer sides, backs, and subfronts with glued dovetail joints.

2.3 (ADDENDUM #01) COMPACT LAMINATE SURFACES:

A. Grade: Premium.

B. Exposed Surfaces: Self-supporting, high-impact homogenous panels filled with melamine surface.
   1. Grade: NEMA LD3, Grade CGS
   2. Double-faced with decorative color/pattern on front and back.
   3. Core: Black

C. Plastic Laminate, PL-5:
   1. Manufacturers and Products: See Finish Legend on Drawings.
   2. Substitutions: Permitted.

2.4 **(ADDENDUM #03)** *CLOSET AND UTILITY SHELVING*

A. Grade: Premium.

B. Wood Cabinets General Requirements: ANSI/AWI 0641.
   1. Duty Level: 3

C. Shelf Material:
   1. HPDL Finished Panels.

D. Plastic Laminate:
   1. Manufacturers and Products: See Finish Legend on Drawings.
   2. Substitutions: Permitted.
   3. Edge Banding: 0.12 inch PVC matching exposed laminate and Acrylonitrile butadiene styrene.

2.5 CABINET HARDWARE AND ACCESSORIES

A. General: BHMA A156.9 and ANSI/AWI 0641.

B. Cabinet Hinges: [Butt (ADDENDUM #01)].
   1. Opening Angle: 95 to 110 degrees.
   2. 1-3/4-inch, 5-knuckle steel hinges made from 0.095-inch thick metal (ADDENDUM #01)
   3. Finish: Polished stainless steel (ADDENDUM #01)

C. Door and Drawer Pulls: BHMA A156.9, B02011, back mounted wire type, 5/16 inch diameter, 5 inches long.
   1. (ADDENDUM #01) Finish: Brushed Stainless Steel

D. Cabinet Shelf Supports:
   1. Adjustable Shelf Standards: BHMA A156.9, B04071 standards with shelf rests B04081.

2. Shelf Standards and Brackets: BHMA A156.9, B54102 standards; with shelf brackets, B54112; match cabinet Duty Level.
3. Shelf Rests: BHMA A156.9 B04013, match cabinet Duty Level.

E. Drawer Slides: BHMA A156.9. Side mounted extending under bottom edge of drawer; with polymer rollers or internal ball-bearing system, zinc-plated steel, full extension type.
1. Pencil Drawers 3 inches by 24 inches: Grade 1.
2. Box Drawers 6 inches by 24 inches: Grade 1HD-100.
3. File Drawers 12 inches by 24 inches: Grade 1HD-200.
4. Keyboard Slides: Grade 1HD-100.

F. Locks: Provide complete system for each lock, including removable lock core, cylinder body, and strike plates.
1. Cabinet Door Locks: BHMA A156.11, E07121.
2. Drawer Locks: BHMA A156.11, E07041.
3. Provide two keys for each lock.
4. All cabinet & drawer locks are to be keyed the same, **(ADDENDUM #03)** *except for TC04 3 Door Stacked cabinets in Toilet ADA 204.*
5. **(ADDENDUM #03)** *Toilet ADA 204: TC04 3 Door Stacked Cabinets - Master keyed*.

G. Grommets: Plastic spring loaded cover and outer ring.
1. Color: Architect selected.
2. Location: To be installed minimum of 5-feet on center, locations to be determined after casework installation and coordinated with Owner

H. Countertop Support Bracket:
1. Rakks; EH Counter Supports:
   a. 1212 at Shelf and Rod, countertops (maximum of 18"depth)
   b. EH1818 at countertops with maximum of 25" depth
   c. Finish: Primed for field painting, paint to match adjacent wall color, and Paint System PS-3.

I. (ADDENDUM #01) Concealed Countertop Support Plate:
1. Iron Supports, Hidden Granite Countertop Flat Bracket:
   a. At 16" deep counters: 2.5" wide x .5" thick x 16" long
   b. At 10" - 13" deep counters: 2.5" wide x .5" thick x 12" long
   c. Finish: White

J. Hardware Finishes: BHMA A156.18.
1. Exposed Hardware: (ADDENDUM #01) As indicated in spec section for each hardware type.
2. Concealed Hardware: Manufacturer standard.

K. (ADDENDUM #01) Concealed Floating Shelf Brackets:
1. Sheppard Brackets, Floating Shelf Bracket, 1" back plate x 7 inch rod length: https://www.sheppardbrackets.com/product-page/floatingshelfbracket-1inchbackplate

L. (ADDENDUM #01) Concealed Bench Bracket
   1. Iron Supports, Hidden Floating Bench Bracket
      a. 2.5" wide x 1/2" thick x 17.5" long support arm with 2.5" wide x 1/4" thick steel stud mounting flange
      b. Matte Black finish

M. **(ADDENDUM #03)** *Closet and Utility Shelving Supports:*
   1. Adjustable shelf standards & brackets, BHMS Grade 2 Compliant, able to support 450 lbs/pair
   2. Standards: 14 gauge steel construction, Brackets: 16 gauge steel construction
   3. Finish: White

2.6 PERFORMANCE

A. Surface Burning Performance: ASTM E84 Class B.
   1. Flame Spread Index: 75, maximum.
   2. Smoke Developed Index: 450, maximum.

B. Accessibility Requirements: Applicable provisions in ICC/ANSI A117.1.

2.7 MATERIALS

A. Wood Materials, General: AWI 300 for grade specified.

B. Panel Products:
   1. Hardwood Plywood, Veneer Core, and Veneers: ANSI HPVA HP-1.
   2. Medium Density Fiberboard: ANSI A208.2, Grade 130.

C. Interior Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber.

D. High Pressure Decorative Laminate: ISO 4586-3.

E. Thermally Fused Melamine Facing: ISO 4586, Grade VGL, panels faced with melamine impregnated decorative paper.

F. Adhesives: Recommended by facing material manufacturers, VOC compliant.

G. Fasteners: Type, size, and material to suit each application.
   1. Exterior: Hot-dip galvanized.

2.8 LUMBER AND PANEL MATERIAL TREATMENT

A. Wood Preservative Pressure Treatment: WDMA I.S. 4-15A.

2.9 FABRICATION

A. Shop assemble Work for delivery to site, permitting passage through building openings.

B. When necessary to cut and fit on site, fabricate materials with ample allowance for cutting. Furnish trim for scribing and site cutting.

C. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.

D. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on Shop Drawings before disassembling for shipment.

E. Shop-cut openings to maximum extent possible to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
   1. Seal edges of openings in countertops with a coat of varnish.

F. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
   1. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members 3/4 Inch Thick or Less: 1/16 inch.
   2. Edges of Rails and Similar Members More Than 3/4 Inch Thick: 1/8 inch.
   3. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members and Rails: 1/16 inch.

G. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.

H. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.

I. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

J. High-Pressure Decorative Laminate Finished Faces:
   1. Apply HPDL in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; conceal with concealed fasteners. Slightly bevel arises.
   2. Apply laminate backing sheet to reverse face of HPDL finished surfaces.

K. Fabrication Tolerances: ANSI/AWI 0641, specified grade.

2.10 FINISHES

A. Shop Finishing - General:
   1. Grade: Same as item being finished.
   2. Sand Work smooth and set exposed nails [and screws].
   3. Apply wood filler in exposed nail [and screw] indentations.
   4. Use wood filler matching surrounding surfaces of types recommended for applied finishes.
   5. Backpriming: Compatible with finish coats; apply two coats to concealed surfaces of paneling and to end grain surfaces.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify location and sizes of utility rough-in associated with woodwork.

3.2 PREPARATION

A. Surface Preparation: ANSI/AWI 0620.

B. Conditioning:
   1. Acclimate products to installation environment per AWI 200 and ANSI/AWI 0620.

3.3 INSTALLATION

A. Follow ANSI/AWI 0620.

B. Installation Grade: Premium.

C. Install woodwork plumb and level.

D. Scribe Work abutting other components.
   1. Gaps: ANSI/AWI 0620, specified aesthetic grade. Do not use additional overlay trim to conceal larger gaps.

E. Install trim with adhesive and fine, finishing nails.

F. Cabinets: Anchor to substrates.
   1. Anchor wall cabinets per ANSI/AWI 0641, specified duty level.
   2. Secure cabinets to floor using appropriate angles and anchorages.
   3. End Panels and Fillers: Scribe to walls and securely fit to cabinets.

4. Install finish hardware not installed in shop.

G. Wall Paneling: Install with full bed contact adhesive applied to substrate and face screws.

3.4 ADJUSTING

A. Test installed Work for rigidity and ability to support loads.

B. Lubricate and adjust hardware so doors and drawers operate smoothly.

3.5 CLEANING

A. Cleaning: Clean exposed and semi-exposed surfaces of woodwork.

B. Touch up shop-applied finishes. Replace damaged items that cannot be repaired.

3.6 PROTECTION

A. Protection: Protect installed woodwork from damage due to subsequent construction operations.

END OF SECTION

SECTION 072700

AIR BARRIERS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes.
   1. Vapor permeable sheet membrane air barrier (Tagged: WEATHER RESISTANT BARRIER on drawings)

B. Related Requirements.
   1. Section 061600 - Sheathing: Sheathing at exterior wall assembly for air barrier attachment
   2. Section 072100 - Thermal and Sound Insulation: Continuous insulation over WRB at exterior wall assembly .
   3. Section 074213.13 - Formed Metal Wall Panels: Metal wall panel at exterior wall assembly
   4. Section 074246 - Cementitious Wall Panels: Fiber Cement Siding at exterior wall assembly
   5. Section 075000 - Membrane Roofing; For transition between membrane roofing and air barrier at facias and eaves.
   6. Section 076200 - Sheet Metal Flashing and Trim: Various metal trim which interfaces with air barrier at exterior wall assemblies
   7. Section 079200 - Joint Sealants: Sealants required in conjunction with air barriers and vapor retarders
   8. Section 081113 - Hollow Metal doors and Frames: Doors and frames at exterior wall assemblies which interface with air barrier
   9. Section 084313 - Aluminum Framed Storefronts: Storefront at exterior wall assemblies which interfaces with air barrier
   10. Section 085300 - Plastic Windows: Windows at openings which interface with Air Barrier
   11. Section 08 9119 Fixed Louvers; Louvers at exterior wall assemblies which interface with air barrier

1.2 REFERENCES

A. Abbreviations and Acronyms:
   1. WRB - "Weather Resistant Barrier"

B. Reference Standards:
   1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.<Document Number>
   2. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics; 2025 <Issue>

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination Procedures:
   1. Coordinate air barrier installation with roofing, wall openings, and waterproofing installation.

B. Preinstallation Meeting Attendees and Procedures:
   1. Conduct meeting one week, minimum, before starting Work of this Section.
   2. Additional Attendees:
      a. Air barrier substrate installers.
      b. Installers of items penetrating air barriers.
      c. Adjacent roofing and waterproofing installers.
      d. Installers of storefront, window, doors, and louvers.
      e. Installers of cladding systems installed over air barriers.
      f. Testing agency.
   3. Additional Agenda Items:
      a. Substrate preparation.
      b. Transition detailing.
      c. Air barrier protection and repair.
      d. Air barrier testing and inspection.
      e. Positive lapping requirements.

C. Sequencing Procedures:
   1. Complete air barrier installation after roofing.
   2. Ultraviolet exposure. Do not expose air barrier materials to sunlight longer than manufacturer recommends.

1.4 ACTION SUBMITTALS

A. Product Data:
   1. Air barrier membrane.
   2. Primers.
   3. Preformed silicone seals.
   4. Mechanical Fasteners

B. Shop Drawings:
   1. Locations and extent of air barriers.
   2. Termination conditions.
   3. Gap bridging.
   4. Interface with other assemblies and materials.
   5. Outside and inside corners.
   6. Penetration sealing.

1.5 INFORMATIONAL SUBMITTALS

A. Manufacturer Certificates: Certify air barrier membrane chemical and adhesive compatibility with adjacent and contacted materials.

B. Test and Evaluation Reports: Manufacturer test results showing:
   1. <Performance report>.

C. Source Quality Control Submittals: Shop test reports.

D. Field Quality Control Submittals: Field test and inspection reports.

E. Qualification Statements: Manufacturer and installer.

1.6 CLOSEOUT SUBMITTALS

A. Warranty Documentation: For air barrier.

1.7 QUALITY ASSURANCE

A. Qualifications:
   1. Installers:
      a. ~~Air Barrier Subcontractor: ABAA Accredited.~~ **(ADDENDUM #3)**
      b. ~~Individual Installers: Certified by Building Performance Quality Institute for the ABAA in accordance with its Site Quality Assurance Program.~~ **(ADDENDUM #3)**
   2. Testing Agencies:
      a. ~~Whole Building Testing Agencies: Firm employing individual certified by ABAA per ISO 17024.~~ **(ADDENDUM #3)**

B. Mockups: Construct field air barrier assembly mockup including backup wall, typical penetrations, and glazing assemblies.
   1. Mockup Size: 10 foot by 10 foot.
   2. Demonstrate product interfaces, intersections, and terminations.
   3. Approved mockups may remain as part of Work.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Storage and Handling Requirements:
   1. Store materials in their original undamaged packages in a clean, dry, protected location and within manufacturer recommended temperature range required.

1.9 FIELD CONDITIONS

A. Ambient Conditions: Perform Work within following limitations.
   1. Ambient and Surface Temperature: Within manufacturer acceptable range.
   2. Precipitation and Fog: None occurring.

1.10 WARRANTY

A. Installer Warranty:
   1. Air Barrier Assembly: Warrant against installation failure.

a. Failure includes product disintegration, loss of airtight seal, loss of watertight seal, and adhesion failure.
b. Warranty Period: Ten years.

PART 2 PRODUCTS

2.1 MANUFACTURERS AND PRODUCTS

A. Source Limitations: Obtain accessory products from same manufacturer as primary air barrier.

2.2 VAPOR PERMEABLE SHEET MEMBRANE AIR BARRIER

A. Air Barrier: Mechanically attached membrane.
   1. Manufacturers and Products:
      a. DuPont Tyvek CommercialWrap.
      b. Dorken Systems DELTA-VENT S.
      c. DuPont Weathermate Plus Brand Housewrap.
      d. Kingspan GreenGuard MAX.
      e. Berry Global TYPAR BuildingWrap.
      f. Or approved equal.
   2. Substitutions: Permitted.
   3. Tensile Strength: 33 psi minimum, per ASTM D882.
   4. Puncture Resistance: 40 lbf, minimum, per ASTM E154.
   5. Accessories: Air barrier membrane manufacturer approved tapes, flashing, transition membranes, and fasteners.
   6. Applications: At all exterior wall assemblies.

2.3 ACCESSORIES

A. Sealants, Tapes, and Accessories Used for Sealing Water-Resistive Barrier and Adjacent Substrates: As indicated or complying with water-resistive barrier manufacturer's installation instructions.

B. Primer: Liquid applied polymer.
   1. Products as recommended by Weather Barrier Manufact
   2. Color: Green.

C. Flexible Flashing: Self-adhesive sheet flashing complying with ASTM D1970/D1970M, except slip resistance requirement is waived if not installed on a roof.
   1. Width: 4 inches.
   2. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 180 days of weather exposure.
   3. Products:
      a. Henry Company; FortiFlash: www.henry.com/#sle.
      b. Henry Company; FortiFlash Butyl: www.henry.com/#sle.

D. Liquid Flashing: One part, fast curing, nonsag, elastomeric, gun grade, trowelable liquid flashing.
   1. Products:
      a. Products as recommended by Weather Barrier Manufacturer.

2.4 PERFORMANCE

A. Environmental Performance: Continuous weather resistive assembly acting in conjunction with adjacent materials to resist air and water leakage into the building and to function as a drainage plane for incidental moisture.
   1. Air Infiltration:
      a. Material: ASTM E2178, 0.004 cfm/sf at 1.57 lb/sq ft pressure differential, maximum.
      b. Assembly: ASTM E2357, 0.04 cfm/sf at 1.57 lb/sq ft.
   2. Vapor Permeance: ASTM E96 Desiccant Method, 30 perms, minimum.

B. Fire Resistance:
   1. NFPA 285: Tested as a component of a passing assembly.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify surfaces are sound, dry, even, and free of contaminants.

B. Sheathing: Verify corners, and edges are securely fastened, with fasteners set flush.

3.2 PREPARATION

A. Protection of In-Place Conditions: Mask and cover adjacent surfaces to protect from overspray.

B. Surface Preparation: Clean and prepare substrates.
   1. Ensure that penetrating Work is in place and complete.
   2. Remove loose mortar, dust, oil, grease, oxidation, mill scale and other contaminants.
   3. Fill cracks, joints, and gaps with air barrier manufacturer recommended products.

C. Plywood Sheathing:
   1. Fill overdriven fastener holes.
   2. Seal exposed cut edges.

D. Priming: Prime substrate.

3.3 INSTALLATION - GENERAL

A. Coordinate the installation of air barrier membrane with other building elements.
   1. Connect air barrier to roofing and below grade waterproofing systems.
   2. Connect and seal air barrier material to exterior door, louver, and storefront systems.

B. Sheet Membrane Air Barrier Installation: Fasten sheet membrane to substrate; ensure continuous air barrier configured to direct moisture to exterior.

C. Substrate Gaps and Joints: Bridge with manufacturer recommended transition membrane.
   1. Seal around penetrations with sealant.
   2. End of Day Procedure: Seal top edge of membrane with termination mastic.

3.4 FIELD QUALITY CONTROL

A. Field Tests and Inspections: Owner will engage inspectors to perform tests and inspections and prepare reports. Allow inspectors access to Work areas.
   1. Failed Test Retest Cost: Contractor responsibility.

B. Inspections: [May include the following:]
   1. Correct and complete substrate preparation and priming.
   2. Air barrier continuity.
   3. Air barrier support against substrate.
   4. Site conditions maintained within manufacturer limits.
   5. UV Exposure below manufacturer limits.
   6. Proper air barrier installation.
   7. Adjacent material compatibility.
   8. Transitions at changes in direction and structural support at gaps have been provided.
   9. Connections between assemblies completed correctly.
   10. All penetrations have been sealed.

C. Testing: [Tests may include the following:]
   1. Whole Building Air Leakage: Test per ASTM E3158 or ASTM E779.

D. ~~ABAA Installer Audits: Cooperate with ABAA testing agency. Allow access to Work areas and staging. Notify ABAA in writing of schedule for Work of this Section to allow sufficient time for testing and inspection. Do not cover Work of this Section until testing and inspection is accepted. Arrange and pay for site audits by ABAA to verify conformance with the material manufacturer instructions, the site Quality Assurance Program used by ABAA, and this section of the project specification.~~**(ADDENDUM #3)**

E. Non Conforming Work: Make corrections or replace, and retest.

3.5 CLEANING

A. Cleaning: Clean spillage from adjacent construction.

3.6 PROTECTION

A. Protection: Protect air barrier materials from damage until material is covered by permanent construction.
   1. Install cladding materials before exceeding material UV exposure limit.

END OF SECTION

SECTION 075000

MEMBRANE ROOFING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes.
1. TPO roofing.
2. *PVC roofing.* **(ADDENDUM #2)**
3. Vapor retarders.
4. Roof insulation.
5. Cover boards.

B. Related Requirements:

1.2 REFERENCES

A. Definitions:
1. Roofing Terminology: See ASTM D1079 and the NRCA Roofing and Waterproofing Manual glossary.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting Attendees and Procedures:
1. Conduct meeting one week, minimum, before starting Work of this Section.
2. Additional Agenda Items:
a. Preparation procedures.
b. Installation procedures.
c. Coordination and scheduling required with related Work.
d. Protection of construction and site.

1.4 ACTION SUBMITTALS

A. Product Data:
1. Roofing membrane and accessory products.
2. Substrate board.
3. Vapor retarders.
4. Roof insulation and cover board.
5. Initial selection color Samples.

B. Shop Drawings: Include plans, elevations, sections, details, intersections with adjacent assemblies, terminations, and attachments, including:
   1. Base flashings.
   2. Membrane terminations.
   3. Flat and tapered insulation, including cants and slopes.

C. Samples:
   1. Membrane Sheet: 6 by 6 inch sample of each type and color.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Statements:
   1. Installer: Manufacturer authorization.

B. Certificates: Manufacturer affidavit that Project design and conditions have been reviewed and the installation will be fully warrantable if correctly installed. Manufacturer authorization to Installer to proceed with installation also acceptable.

C. ICC-ES test and evaluation reports for roofing system components.

D. Product Test Reports for roofing system components, performed or witnessed by a qualified testing agency.

E. Manufacturer Reports: Field quality control reports.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: Roof system maintenance requirements.

B. Warranty Documentation: For complete roof system.

C. Project Plaque: Provide permanent sign or framed document with the following information attached to wall near primary access to main roof.
   1. Roofing installer name, address, and telephone number.
   2. Roofing system manufacturer name, address, and telephone number.
   3. Starting date of warranty and length of warranty period.

1.7 QUALITY ASSURANCE

A. Qualifications:
   1. Installer: Licensed, authorized, or approved by roofing manufacturer to install manufacturer roofing system and provide full specified warranty.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Storage and Handling Requirements: Store roofing system components protected from the elements, precipitation and standing water, freeze/thaw cycling, and protected from sunlight, if required.

1.9 FIELD CONDITIONS

A. Ambient Conditions: Perform Work within limitations recommended by manufacturer.

1.10 WARRANTY

A. Manufacturer Warranty: Warrant roofing system against failure.
   1. Total System Warranty: Include primary roof membrane and substrate boards, vapor retarder, roof insulation, cover boards, and flashings, and other components of roofing system.
      a. Warranty Period: 20 years.

PART 2 PRODUCTS

2.1 MEMBRANE ROOFING - GENERAL

A. Roofing Assembly: FM Approvals RoofNav Assembly Number .

B. *TPO or PVC roofing are acceptable membrane roofs.* **(ADDENDUM #2)**

2.2 TPO ROOFING

A. TPO Sheet: ASTM D6878, scrim or fabric internally reinforced, ~~fabric backed~~. **(ADDENDUM #3)**
   1. Manufacturers:
      a. Carlisle SynTec.
      b. Sika Group.
      c. Elevate.
      d. GAF Materials.
      e. GenFlex.
      f. Johns Manville.
      g. Versico.
   2. Membrane Thickness: 60 mils.
   3. Exposed Face Color: Gray.
   4. Exposed Ribs: Provide 1/2 inch wide by 1 1/4 inch high Decor syle ribs at 16 inches on center. Provide on all North facing roofs.

2.3 *PVC ROOFING* **(ADDENDUM #2)**

A. PVC Sheet: ASTM D4434, Type III, fabric reinforced.
1. Manufacturers and products:
a. Carlisle SynTec Sure-Flex.
b. GAF Materials EverGuard PVC.
c. Johns Manville SD Plus.
d. Sika Sarnafil S 327.
e. Versico.
f. Or approved equal.
2. Membrane Thickness: 60 mils, nominal.
3. Exposed Face Color: Gray.
4. Exposed Ribs: Provide 1/2 inch wide by 1 1/4 inch high Decor syle ribs at 16 inches on center. Provide on all North facing roofs.

2.4 COMPONENT MATERIALS

A. General: Provide components of roofing system recommended by manufacturer for a complete system.
1. Component Materials: Compatible with each other and adjacent materials.

B. Adhesive: Manufacturer standard bonding adhesive.

C. Flexible Flashing: Same material as roofing membrane, manufacturer recommended thickness.

D. Lap Joint Sealant: Manufacturer standard, color to match membrane.

E. Butyl Mastic: Manufacturer standard water stop mastic.

F. Termination Bars: Manufacturer standard stainless steel, pre-drilled for included anchors.

G. Battens: Manufacturer standard, pre punched, steel sheet, with aluminum-zinc alloy or zinc coating.

H. Fasteners: Compliant with FM Global 4470 for corrosion resistance, including metal or plastic washers, and acceptable to roof system manufacturer.

I. Flashing Accessories: Prefabricated boots, corners, cones, pipe seals, and other shapes required for complete roof system installation, compatible with primary roof membrane.
1. Colors: Match roofing membrane color.

J. Accessories: Miscellaneous reinforcing, sealants, and other items recommended by manufacturer for complete roof system installation.

2.5 SUBSTRATE BOARDS

A. Substrate Board: ASTM C1278, cellulosic fiber, water-resistant gypsum.
   1. Manufacturers and Products:
      a. USG Securock Gypsum-Fiber Roof Board.
   2. Thickness: 1/2 inch.

B. Fasteners: FM Global 4470 compliant for corrosion resistance, including metal or plastic washers.

2.6 VAPOR RETARDER

A. Standard Sheet: ASTM D4397, polyethylene.
   1. Thickness: Minimum 6 mils thick.
   2. Permeance: 0.13 perms, maximum.
   3. Tape: Manufacturer standard or recommended pressure sensitive tape.
   4. Adhesive: manufacturer standard adhesive.

2.7 ROOF INSULATION

A. General: Roof insulation, preformed boards, manufactured or approved by roof membrane manufacturer, manufacturer standard sizes, thicknesses as shown on Drawings.

B. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 2, Grade 2 or Grade 3.
   1. Manufacturers:
      a. Atlas Roofing.
      b. Carlisle SynTec.
      c. GAF Materials.
      d. Elevate.
      e. Hunter Panels.
      f. Insulfoam.
      g. Johns Manville.
      h. Rmax.
      i. Sika.
   2. Thickness: See drawings.
   3. R Value: Minimum R-5 per inch.

C. Special Shapes: Provide preformed insulation shapes to form crickets, saddles, tapers, and other shapes to facilitate drainage.

D. Adhesive: Recommended by insulation manufacturer for adhering insulation layers together and insulation to substrate.
   1. Adhesive Types: low-rise, apply in bead or full-spread as recommended by manufacturer.

2.8 COVER BOARDS

A. Polyisocyanurate Cover Board: ASTM C1289 Type II, Class 4, Grade 1, 1/2-inch thick.
   1. Compressive Strength: 80 psi, minimum.

2.9 PERFORMANCE

A. Accelerated Weathering: ASTM G152, ASTM G154 or ASTM G155; withstand 2,000 hours of testing.

B. Impact Resistance: ASTM D3746 or ASTM D4272.

C. Compatibility: Confirm roof system materials are compatible within themselves and with adjacent materials.

D. Roof System Design: Certified by testing to FM 4474, UL 580 or UL 1897 to resist uplift pressures as shown on Structural Drawings.

E. Hail Resistance Rating: MH per FM Global Property Loss Prevention Data Sheet 1-34.

F. Exterior Fire Test Exposure: ASTM E108 or UL 790 testing by a qualified testing agency, Class B, products marked as compliant by testing agency.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine and verify conditions for compliance with roof system manufacturer recommendations:
   1. Substrate.
   2. Roof openings and penetrations.
   3. Curbs, nailers, and cants.

3.2 PREPARATION

A. Clean and prepare substrate per manufacturer instructions.

B. Protect roof drainage and other equipment and surfaces from roofing materials.

3.3 INSTALLATION - GENERAL

A. Complete terminations, flashings, roofing installation, and temporary measures by end of each workday and during rain events.

3.4 INSTALLATION OF SUBSTRATE BOARD

A. Install substrate boards with long sides perpendicular to roof slopes in straight lines, stagger end joints. Install with tight butt joints.
   1. Fasten substrate board to top flanges of steel deck.
   2. Fasten substrate board to steel deck flanges per FM Global RoofNav and FM Global Loss Prevention Data Sheet 1-29 for specified Windstorm Resistance Classification.

3.5 INSTALLATION OF VAPOR RETARDER

A. Polyethylene Film: Loosely lay polyethylene film vapor retarder in place, lapping sides minimum 2 inches and ends of each sheet a minimum of 6 inches. Seal side and end laps.

B. Install vapor retarder to provide complete seal against air movement at penetrations and terminations.

3.6 INSTALLATION OF INSULATION

A. Do not allow insulation to be exposed to precipitation or left exposed at the end of the workday.

B. Install insulation to required thickness. Install in layers with joints staggered from previous layer 6 inches in each direction, minimum.

C. Install insulation with long sides in straight rows with end joints staggered between rows, butt joints at edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.
   1. Fit insulation by trimming, within 1/4 inch of nailers, obstructions, and penetrations.
   2. Trim and fit insulation at roof drains.

D. Adhered Insulation: Install each layer of insulation adhered to substrate as follows:
   1. Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly press insulation in place.
   2. Set each layer of insulation in a uniform, full spread of insulation adhesive, firmly press insulation in place.
   3. Prime surface of concrete deck with asphalt primer at rate of 3/4 gal./100 sq. ft. Allow primer to dry.
   4. Set each layer of insulation in a full coverage mopped layer of hot roofing asphalt, applied within plus or minus 25 deg F of manufacturer recommended temperature.

3.7 INSTALLATION OF COVER BOARD

A. Install cover boards over insulation with long sides in straight lines and end joints staggered between rows. Offset joints from insulation layer below a minimum of 6 inches in each direction. Loosely butt cover boards together.
   1. Fasten cover boards to resist uplift pressure at corners, perimeter, and field of roof.

3.8 INSTALLATION OF ADHERED ROOFING MEMBRANE

A. Unroll roofing membrane and allow to relax before installing.

B. Start installation of roofing in presence of roofing system manufacturer technical personnel.

C. Align roofing to an accurate layout, maintaining side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

D. Bonding Adhesive: Apply to substrate and underside of roofing as recommended by manufacturer. Do not apply adhesive at splice areas of roofing.

E. Mechanically fasten adhered roofing securely at terminations, penetrations, perimeters and other areas shown.

F. Apply roofing with uphill side laps overlapping lower layers with slope of roof deck where possible.

G. Repair tears, voids, lapped seams, or defects in roofing that do not follow requirements.

H. Spread sealant or mastic bed over deck drain flanges at roof drains, and securely seal membrane roofing in place with clamping ring.

3.9 MEMBRANE SEAMING

A. Heat Welded Seam Installation: Heat weld seams using methods and equipment recommended by membrane manufacturer.

B. Leave seams uncovered until they are inspected by manufacturer technical representative.

3.10 INSTALLATION OF BASE FLASHING

A. Adhere flashings and flashing accessories to substrates.

B. Apply adhesive to substrate and underside of sheet flashing, and allow to partially dry. Do not apply to seam area of flashing.

C. Flash penetrations and field formed inside and outside corners per roofing manufacturer recommendations.

D. Clean splice areas, apply splicing cement, and firmly roll side and end laps of overlapping sheets per manufacturer requirements. Seal exposed edges of sheet flashing terminations.

E. Terminate and seal top of sheet flashings and mechanically anchor to substrate using termination bars.

3.11 FIELD QUALITY CONTROL

A. Inspections: Continuous during application.
   1. Substrate conditions.
   2. Substrate preparation.
   3. Vapor barrier application, if required.
   4. Membrane application.
   5. Flashings.
   6. Protection components.
   7. Penetrations and drainage components.
   8. Furnish reports to Architect.

B. Final Roof Inspection: Arrange for roofing system manufacturer or testing agency to inspect completed roofing installation.

C. Repair or remove and replace roofing system components that fail tests or do not follow requirements.

3.12 PROTECTING AND CLEANING

A. Protect membrane roofing system from damage and wear during remainder of construction period.

B. Sweep roof surface; remove loose fasteners, rocks, and other items that might damage membrane.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

SECTION 096500

RESILIENT FLOORING

PART 1 GENERAL

1.1 *NOTE: ALL ITEMS IN THIS SECTION ARE OWNER FURNISHED, OWNER INSTALLED, SPECIFICATION SECTION PROVIDED FOR REFERENCE AND COORDINATION ONLY* **(ADDENDUM #03)**

1.2 SUMMARY

A. Section Includes:
   1. Resilient base and accessories.
   2. Resilient stair accessories.
   3. Resilient tile flooring.

B. Related Requirements.
   1. Section 03 3000 - Cast-in-Place Concrete: Restrictions on curing compounds for concreteslabs and floors.

1.3 REFERENCES

A. Reference Standards:
   1. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension.
   2. <Document Number>
   3. <Issue>
   4. <Document Title>

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination Procedures:
   1. Coordinate installation of resilient basewith installation of wall protection and wainscot .

B. Preinstallation Meeting Attendees and Procedures:
   1. Conduct meeting one week, minimum, before starting Work of this Section.

C. Sequencing Procedures:
   1. Complete Work results of this Section after concrete substrate has cured.

1.5 ACTION SUBMITTALS

A. Product Data:
   1. Resilient flooring products.
   2. Resilient accessories.
   3. Installation materials.
   4. Initial selection color charts.

B. Shop Drawings.
   1. Special patterns.

C. Product Schedule: Resilient flooring products.

D. Samples:
   1. Resilient Tile Flooring: Full sized Samples of each product.
   2. Stair Accessories: 12 inch lengths of tread, riser, and Stringer units.
   3. Resilient Base: 6 inch length of each product.
   4. Resilient Moldings: 6 inch length of each product.
   5. Cap Strips: 6 inch Samples.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For resilient flooring.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Extra Stock Materials:
   1. Resilient Tile Flooring: Unused full tiles plus one box per every 50 boxes installed, but not less than one box.
   2. Resilient Base: 10 linear feet minimum of each type.

1.8 QUALITY ASSURANCE

A. Mockups: Install resilient flooring on 4'-5" x 3' section of the Pedicure Venting Pedestal.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Storage and Handling Requirements:
   1. Store resilient flooring indoors and within manufacturer recommended ambient temperature range.
   2. Store resilient tile flooring on flat surfaces.

1.10 FIELD CONDITIONS

A. Ambient Conditions: Perform Work within following limitations.
   1. Building enclosed and environmental systems maintaining design conditions for Owner occupancy.
   2. Establish ambient conditions 48 hours, minimum before and maintain conditions during and 48 hours, minimum after installation.

PART 2 PRODUCTS

2.1 RESILIENT TILE FLOORING

A. (ADDENDUM #02) Luxury Vinyl Tile, RT-3: ASTM F3261, textured vinyl tile with rigid polymer core.
   1. Manufacturers and Products: See Finish Legend on Drawings.
   2. Substitutions: Permitted.
   3. Class: I.
   4. Wear Layer: Light Commercial, 12 mil.
   5. Backing: Class A.
   6. Overall Thickness: 2 mm.
   7. Size: Manufacturer standard.
   8. Features: Square Edges.
   9. Color: See Drawings.
   10. Installation: Adhered.

B. Rigid Mineral Core Resilient Tile, RT-1, RT-2: ASTM F3261, textured vinyl tile with rigid polymer core.
   1. Manufacturers and Products: See Finish Legend on Drawings.
   2. Class: I.
   3. Type: A, Smooth and B, Embossed.
   4. Backing: [Class A] and [Class B].
   5. Overall Thickness: .236 inches.
   6. Size: See Drawings.
   7. Features: Micro-beveled edges and Decorative printed layer.
   8. Color: See Drawings.
   9. Installation: Adhered.

2.2 RESILIENT BASE

A. Rubber Base, RB-1: ASTM F1861 Type TS.
   1. Manufacturers and Products: See Finish Legend on Drawings.
   2. Style: B, Cove.
   3. Height: 4 inches.
   4. Length: Coils.
   5. Inside Corners: Job formed and Provide mitered internal corners and end stops.

6. Outside Corners: Preformed.
7. Color: See Drawings.

B. Rubber Base[, RB-2]: ASTM F1861 Type TP.
1. Manufacturers and Products: See [Finish Legend] on Drawings.
2. Style: D, Sculptured.
3. Height: [4 inches].
4. Length: 8 feet.
5. Inside Corners: [Job formed] and [Provide mitered internal corners and end stops].
6. Outside Corners: [Preformed].
7. Color: [See Drawings].

2.3 RESILIENT MOLDINGS

A. Rubber Transition Strips, Rubber Reducer and T-molding (ADDENDUM #02):
1. Manufacturers and Products:
a. (ADDENDUM #02) Shaw Contract, as basis of design.
2. Color: Night 0066 (ADDENDUM #02).
3. Profiles: See Drawings.
a. (ADDENDUM #02) T-Molding: Shaw Contract 1.125" snap down T-Mold

2.4 STAIR ACCESSORIES

A. Stair Covers, RST-1: ASTM F2169; rubber.
1. Manufacturers and Products: See Finish Legend on Drawings.
2. Type: TP.
3. Class: 2.
4. Group: 2.
5. Nosing Height: 2 inches.
6. Nosing Style: Square, adjustable.
7. Thickness: 1/4 inch and tapered to back edge.
8. Size: Dimensions required to fit each stair tread and riser in one piece [or in equal lengths for treads exceeding maximum manufactured lengths].
9. Configuration: Integral risers.
10. Stringers Covers: Cut to fit.
11. Color: See Drawings.

2.5 PERFORMANCE REQUIREMENTS

A. Fire Test Response Characteristics:
1. Class I per ASTM E648 and NFPA 253, Critical Radiant Flux Classification.

2.6 INSTALLATION MATERIALS

A. Patching and Leveling Materials: Flooring manufacturer recommended products for applicable substrates.

B. Edge Strips: Metal; profiles shown on Drawings.
   1. Colors: See Drawings.

C. Adhesives: Flooring manufacturer recommended water based product.
   1. VOC Content: 50 g/L, maximum.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that concrete floors have cured 28 days, minimum.

B. Moisture and Alkalinity Testing: See Section 090561.

3.2 PREPARATION

A. Preparing Concrete Substrates: See Section 090561.

3.3 TILE FLOORING INSTALLATION

A. Mix materials from multiple containers for consistent blend of colors.

B. Lay out tiles so that units at opposite walls are equal width and more than half size.

C. Install tiles in pattern on Drawings.

D. Extend tile into recesses and under equipment.

E. Terminate tile flooring at centerline of doors where adjacent floor finish is dissimilar, unless otherwise indicated on drawings.

F. Scribe and cut tile for close fit at vertical surfaces so that cut edge will be concealed by wall base or other trim.

G. Install tile with full adhesive coverage.

H. Roll tile to eliminate entrapped air and ensure full adhesion.

I. Install edge strips where tile terminates against dissimilar flooring. Butt end seams tight.

J. Install free lay flooring securely interconnected and full seated on substrate.

3.4 BASE INSTALLATION

A. Installation:
   1. Form tight joints.
   2. Align the tops of bases with adjacent units.
   3. Ensure continuous contact between base and substrate. Fill voids between base and substrate with manufacturer recommended filler material.
   4. Do not stretch base.

B. Preformed Corners: Install formed pieces before straight pieces.

C. Job Formed Corners:
   1. Outside Corners: Form bends without discoloration in corners.
   2. Inside Corners: [Miter].

3.5 STAIR ACCESSORIES INSTALLATION

A. Resilient Stair Accessories:
   1. Use stair tread nose filler to fill nosing substrates that do not conform to tread contours.
   2. Tightly adhere to substrates throughout length of each piece.

B. For treads installed as separate, equal length units, install to produce a flush joint between units.

3.6 CLEANING AND PROTECTION

A. Remove excess adhesive.

B. Do not allow traffic on flooring until adhesives have fully set.

C. Provide surface protection during construction period.

END OF SECTION

SECTION 101400

SIGNAGE

PART 1 GENERAL

1.1 *NOTE: ALL ITEMS IN THIS SECTION ARE OWNER FURNISHED, OWNER INSTALLED, SPECIFICATION SECTION PROVIDED FOR REFERENCE AND COORDINATION ONLY* **(ADDENDUM #03)**

1.2 SUMMARY

A. Section Includes:
   1. Sign Panels.
   2. Dimensional letter signage.

B. Related Requirements:
   1. Division 22 Section "Mechanical Identification" for labels, tags, and nameplates for mechanical equipment.
   2. Division 26 Section "Electrical Identification" for labels, tags, and nameplates for electrical equipment.
   3. Division 26 Section "Interior Lighting" for illuminated Exit signs.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination Procedures:
   1. Coordinate locations of concealed blocking and support framing in walls.

B. Preinstallation Meeting Attendees and Procedures:
   1. Conduct meeting one week, minimum, before starting Work of this Section.

C. Sequencing Procedures:
   1. Install room signs after doors and wall surfaces are finished.

1.4 ACTION SUBMITTALS

A. Product Data: Material, finishes for each type of sign.
   1. Initial Selection: Sign styles, color charts, color samples, and character styles and colors.

B. Shop Drawings: Sign styles, lettering font, foreground and background colors, overall dimensions of each sign.

C. Schedule: Locations of each sign type, description of graphics, and message text.

D. Samples:
   1. Full size, each sign type. Approved Samples may be incorporated into Work.
   2. Finishes: 2 by 3 inchesin size.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance data.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Spare Parts: Manufacturer recommended parts and quantities.

B. Tools: Manufacturer recommended special tools required to maintain <Product>.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Package signs labeled in name groups.

B. Store adhesive attachment tape at ambient room temperatures.

1.8 FIELD CONDITIONS

A. Ambient Conditions: Perform Work within following limitations:
   1. Building enclosed and environmental systems maintaining design conditions for Owner occupancy.
   2. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit installation of signs in exterior locations to be performed according to manufacturers' written instructions and warranty requirements.

B. Existing Conditions: Verify field measurements before fabrication. Show field measurements on Shop Drawings.

1.9 WARRANTY

A. Manufacturer Warranty:
   1. Signs: Warrant against product failure.
      a. Failure includes loss of adhesion, fading, clouding, and yellowing.
      b. Warranty Period: 5 years.

B. Finish Warranty: Repair deteriorated finishes or replace components.
   1. Deterioration includes the following:
      a. Color Fading: More than 5 Hunter units per ASTM D2244.
      b. Chalking: More than No. 8 rating per ASTM D4214.
      c. Paint cracking, peeling or checking.
   2. Warranty Period: Five years.

PART 2 PRODUCTS

2.1 OWNER-FURNISHED AND OWNER INSTALLED PRODUCTS

A. New Products:
   1. Room Identification Signs.
   2. Wayfinding Signs

2.2 SIGN PANELS

A. Room Identification Signs, Plate Type A, B, C: Raised character acrylic signs [with changeable slide strips].
   1. **(ADDENDUM #03)** ~~Manufacturers [and Products]:~~
      ~~a. 2/90 Sign Systems.~~
      ~~b. Ace Sign Systems.~~
      ~~c. APCO Graphics.~~
      ~~d. ARK Ramos Signage Systems.~~
      ~~e. ASI Sign Systems.~~
      ~~f. Best Signs.~~
      ~~g. Gemini.~~
      ~~h. Green Dot Sign.~~
      ~~i. H. Toji & Company.~~
      ~~j. Mohawk Sign Systems.~~
      ~~k. Takeform.~~
   2. Total Thickness: 1/8 inch.
   3. Sizes, Shapes: See Drawings.
   4. Corners: Radius.
   5. Character Style: Architect selected ADA compliant characters.
   6. Braille: 1/32 inch, minimum, integral raised characters.
   7. Colors: Architect selected.
   8. Graphics: Owner will supply electronic files and color requirements for sign graphics.
   9. Mounting: Double side foam-core adhesive tape.

2.3 DIMENSIONAL LETTER SIGNAGE

A. Dimensional Letter Signage[, Interior]: Aluminum, cut characters.
   1. **(ADDENDUM #03)** ~~Manufacturers and Products:~~

~~a. 2/90 Sign Systems.~~
~~b. Ace Sign Systems.~~
~~c. Allen Industries.~~
~~d. APCO Graphics.~~
~~e. ARK Ramos Signage Systems.~~
~~f. ASI Sign Systems.~~
~~g. Best Signs.~~
~~h. Gemini.~~
~~i. H. Toji & Company.~~
~~j. Stewart Signs.~~
~~k. Takeform.~~

2. Sizes: See Drawings.
3. Character Style: Architect selected ADA compliant characters.
4. Colors: Matte Black Powder Coat.
5. Mounting: 1" diameter x 1" high metal standoffs in finish to match letters, anchored to wall

B. Dimensional Letter Signage[, Exterior]: Steel, cast characters.

~~1.~~ (ADDENDUM #03) ~~Manufacturers [and Products]:~~
~~a. <Manufacturer Product>, as basis of design.~~
~~b. 2/90 Sign Systems.~~
~~c. Ace Sign Systems.~~
~~d. Allen Industries.~~
~~e. APCO Graphics.~~
~~f. ARK Ramos Signage Systems.~~
~~g. ASI Sign Systems.~~
~~h. Best Signs.~~
~~i. Gemini.~~
~~j. H. Toji & Company.~~
~~k. Stewart Signs.~~
~~l. Takeform.~~
~~m. Or approved equal.~~

2. Substitutions: Permitted.
3. Sizes: [See Drawings].
4. Character Style: [Architect selected ADA compliant characters].
5. Colors: Architect selected.
6. Mounting: Exposed metal fasteners, anchored to wall.
   a. Mounting Height: [See Drawings].

2.4 PERFORMANCE

A. Surface Burning: ASTM E84 Class B.
1. Flame Spread Index: [75], maximum.
2. Smoke Developed Index: 450, maximum.

B. Accessibility Requirements: Applicable provisions in ICC/ANSI A117.1.

C. Environmental Performance:
   1. Expansion and Contraction: Withstand 120 degree F ambient and 180 degree F surface thermal cycling without failure.

2.5 MATERIALS

A. Acrylic Sheet: ASTM D4802, manufacturer standard, UV filtering.

B. Aluminum Sheet: ASTM B209, Alloy 6063, Temper T6.
   1. Welding Materials: AWS D1.2, types as required for materials being welded.

C. Steel Hollow Structural Sections: ASTM A500, Grade B.

D. Steel Welding Materials: AWS D1.1, types as required for materials being welded.

E. Adhesives: Recommended by signage manufacturer, VOC compliant.

F. Adhesive Tape: Double-sided, zero VOC.

G. Fasteners: Type, size, and material to suit each application.
   1. Exterior: Hot-dip galvanized.

2.6 FABRICATION

A. Factory assemble panel signs.

B. Assemble electronic signage enclosures with internal mounting brackets for anchor bolt attachment.

2.7 FINISHES

A. Anodizing: AAMA 611 Class I or AAMA 612 with electro-deposition organic seal.
   1. Color: Clear.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify substrates are ready to receive Work.

B. Verify mounting structure is ready for signage and can support the equipment weight.

3.2 PREPARATION

A. Clean substrates for adhesive mounting per manufacturer recommendations.

3.3 INSTALLATION

A. Follow accessibility requirements.

B. Sign Locations: See Drawings.
   1. Locate room identification signs on wall surfaces adjacent to strike side of door, 5 feet above finished floor to center line of sign and 3 inches from door jamb trim.
   2. Locate informational signs on wall surfaces, 5 feet above finished floor to center line of sign at scheduled locations.

C. Install signs plumb and level.

D. Install signs to lay flat against wall.

E. Adhere sign to substrate with adhesive tape.

F. Place concrete footing for sign posts per Drawings. Fasten sign to post with stainless steel bolts.

3.4 CLEANING

A. Clean signage of excess adhesive, dust, and other contaminants.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 102800

TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes.
   1. Public use toilet room accessories.
   2. Custodial accessories.

B. Related Requirements:
   1. Section 06 1000 Rough Carpentry]: Concealed supports for accessories, including in wall framing and plates.
   2. Section [05 4000 - Cold-Formed Metal Framing]: Placement of concealed anchor devices.
   3. Section 09 3000-Tiling

1.2 REFERENCES

A. Reference Standards:
   1. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   2. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service
   3. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
   4. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar
   5. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination Procedures:
   1. Coordinate size and location of wall backing for support of accessories.

B. Preinstallation Meeting Attendees and Procedures:
   1. Conduct meeting one week, minimum, before starting Work of this Section.

1.4 ACTION SUBMITTALS

A. Product Data: Each accessory type.
   1. Initial selection color charts.

B. Schedules: List product types, quantities, sizes, and installation locations. Use room numbers and accessory numbers in schedule.

1.5 CLOSEOUT SUBMITTALS

A. Warranty Documentation: For toilet accessories.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Spare Parts: Manufacturer recommended parts and quantities.
   1. <Part Name: Quantity required>.

1.7 FIELD CONDITIONS

A. Existing Conditions: Verify field measurements before fabrication. Show field measurements on Shop Drawings.

1.8 WARRANTY

A. Manufacturer Warranty:
   1. Toilet Accessories: Warrant against product failure.
      a. Warranty Period: 15 years.

PART 2 PRODUCTS

2.1 OWNER FURNISHED AND OWNER INSTALLED PRODUCTS

A. New Products:
   1. Paper Towel Dispenser.
   2. Soap Dispenser
   3. Seat Cover Dispenser
   4. Toilet Paper Dispenser
   5. *Sanitary Napkin Disposal* **(ADDENDUM #03)**
   6. *Waste Disposal* **(ADDENDUM #03)**

2.2 PUBLIC USE TOILET ROOM ACCESSORIES

A. Accessories, General: Provide accessories of each typefrom single manufacturer.
   1. Accessories with Locking Panels: Tumbler cam locks; all accessories keyed alike.
      a. Keys: Provide two, minimum.

~~B.~~ **(ADDENDUM #03)** ~~Waste Disposal[, Tag]:~~
~~1. Manufacturers and Products:~~
~~a. Bobrick, B-2260 as basis of design.~~
~~b. Or approved equal.~~
~~2. Mounting: Freestanding.~~
~~3. Receptacle Capacity: 12 gallons, minimum.~~
~~4. Material and Finish:#4 Stainless steel.~~

~~C.~~ **(ADDENDUM #03)** ~~Sanitary Napkin Disposal[, Tag]:~~
~~1. Manufacturers and Products:~~
~~a. Bobrick, B-270, as basis of design.~~
~~b. Or approved equal.~~
~~2. Mounting: Surface.~~
~~3. Material and Finish:#4 Stainless steel.~~
~~4. Receptacle: Removable.~~
~~5. Door or Cover: Self-closing disposal-opening cover and hinged face panel with tumbler lockset.~~
~~6. Provide at all toilets.~~

D. Grab Bars[, Tag]:
   1. Manufacturers and Products:
      a. Bobrick, B-6806 series, as basis of design.
      b. Or approved equal.
   2. Mounting: Flanges with concealed fasteners.
   3. Material and Finish:#4 Stainless steel, smooth.
   4. Configuration and Length: 18 inch, 36 inch, and 42 inch lengths.
   5. Diameter: 1-1/2 inches.

E. Framed Mirrors[, Tag]: Non tilt type [with fixed shelf].
   1. Manufacturers and Products:
      a. Bobrick, B165, as basis of design.
      b. Or approved equal.
   2. Frame: Stainless steel, 1/2 inch wide.
   3. Size: See Drawings.

2.3 RESIDENTIAL RESTROOM ACCESSORIES

A. Robe Hooks[, Tag]:
   1. Manufacturers and Products:
      a. Bobrick, B9542, as basis of design.

b. Or approved equal.
2. Material and Finish: Satin Stainless Steel.

2.4 CUSTODIAL ACCESSORIES

A. Mop and Broom Holders[, Tag]: Units with hooks and mop clips.
1. Length: 36 inches.
2. Mop and Broom Holders: Three, spring loaded, rubber hat, cam type.
3. Material and Finish: No. 4 Stainless steel.

2.5 PERFORMANCE

A. Accessibility Requirements: Applicable provisions in [ICC/ANSI A117.1].

2.6 MATERIALS

A. Stainless Steel Sheet: ASTM A480, Type 304, 0.031 inch minimum nominal thickness.

B. Steel Sheet: ASTM A1008, CS; cold rolled, commercial steel, 0.036 inch minimum nominal thickness.

C. Galvanized Steel Sheet: ASTM A653, G60 hot dip zinc coating.

D. Galvanized Steel Mounting Devices: ASTM A153, hot dip galvanized after fabrication.

E. Fasteners: Screws, bolts, and other devices, same material as accessory.
1. Exposed Fasteners: Tamper resistant.

F. ABS Plastic: Acrylonitrile-butadiene-styrene resin formulation.

2.7 FABRICATION

A. Accessories, General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
1. Grind welded joints smooth.
2. Fabricate sheet metal of seamless sheets with flat surfaces.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify backing supports are in place and adequate.

3.2 INSTALLATION

A. Install accessories level, plumb, and firmly anchored.

B. Install using fasteners appropriate to substrate.

C. Grab Bars: Install to withstand 250 lbf minimum load, when tested per ASTM F446.

3.3 CLEANING AND PROTECTION

A. Clean exposed surfaces of compartments, hardware, and fittings using methods acceptable to the manufacturer.

B. Touchup, repair or replace damaged products until Substantial Completion.

END OF SECTION

SECTION 105100

LOCKERS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Metal knocked down box lockers.

B. Related Requirements:
   1. Section 06 1000 Rough Carpentry: Wood backing and nailers.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting Attendees and Procedures:
   1. Conduct meeting one month, minimum, before starting Work of this Section.

B. Sequencing Procedures:
   1. Complete base framing, soffit framing, and blocking before locker installation.

1.3 ACTION SUBMITTALS

A. Product Data:
   1. Locker types, sizes, hardware, and accessories.
   2. Initial selection color charts and Samples.

B. Shop Drawings:
   1. Locker plan layout with numbering.

C. Schedules: Locker types.

D. Samples:
   1. Metal Lockers: 6 by 6 inch in size, of each color on base metal.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.
   1. Include master lock codes.

B. Warranty documentation.

1.5 QUALITY ASSURANCE

A. Qualifications:
   1. Installers: Manufacturer trained or approved.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Storage and Handling Requirements:
   1. Metal Lockers: Store inside building.

1.7 FIELD CONDITIONS

A. Ambient Conditions: Perform Work within following limitations:
   1. Building enclosed and environmental systems maintaining design conditions for Owner occupancy.

B. Existing Conditions: Verify field measurements before fabrication. Show field measurements on Shop Drawings.

1.8 WARRANTY

A. Manufacturer Warranty:
   1. Lockers: Warrant against total system failure.
      a. Failure includes Structural failures, faulty operation of latches and other door hardware. Damage from deliberate destruction and vandalism is excluded
      b. Warranty Period: Two years.

PART 2 PRODUCTS

2.1 METAL LOCKERS

A. Knocked Down Box Lockers:
   1. Manufacturers and Products:
      a. Art Metal Products Standard KD.
      b. Hadrian Emperor KD.
      c. List Industries Classic KD.
      d. Lyon Standard Metal Lockers.
      e. Republic Storage Systems Standard Lockers.
      f. Or approved equal.
   2. Substitutions: Permitted.

3. Configuration: See Drawings for locker types and sizes.
   a. Overall Height: 7~~-2" (including base and trim)~~ *See Drawings* **(ADDENDUM #03).**
   b. Width: ~~18 inches~~ *See drawings* **(ADDENDUM #03).**
   c. Depth: 18 inches.
4. Doors: 0.048 inch sheet steel; louver vents.
5. Frames: Steel sheet, 0.060 inch minimum thickness.
6. Body Components: Steel sheet, 0.024 inch minimum thickness.
7. Hinges: Continuous; welded to frames.
8. Latches: Recessed stainless steel cup design.
9. Locking: Padlock hasps.
10. Finish: Thermoset enamel or powder coating.
    a. Colors: See Drawings.
11. Number Plates: Aluminum.

B. Exterior Trim Accessories:
1. Top closure panels.
2. Filler panels.
3. Recess trim.
4. Number Plates: Aluminum.

2.2 FABRICATION

A. Complete locker fabrication before shipment to site.

B. Attach number identification plates.

C. Provide matching perimeter trim for site fitting.

D. Provide openings for electrical wiring.

2.3 FINISHES

A. Powder Coating: Thermoset polyester; AAMA 2603 but 1.5 mil minimum thickness.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify locations and sizes of anchorage framing or backing.

3.2 PREPARATION

A. Coordinate anchorage locations for anchoring new lockers.

B. Install lumber support base with 1/2 inch plywood top.

3.3 LOCKER INSTALLATION

A. Knocked Down Lockers: Assemble lockers square and without distortion.

B. Install lockers plumb, level, and aligned in plane.

C. Connect lockers into rigid, stable assemblies with flush, full contact joints.
   1. Fasten back to back locker groups together.

D. Anchor lockers to wood base and to adjacent walls.

E. Install filler panels and recess trim with concealed fasteners.

3.4 ADJUSTING

A. Adjust doors for smooth, accurate movement and secure latching.

B. Adjust drawers for movement free of binding.

3.5 CLEANING

A. Cleaning: Clean interiors and exteriors of lockers.

3.6 CLOSEOUT ACTIVITIES

A. Demonstration: Instruct Owner staff on reprogramming lock codes.

3.7 PROTECTION

A. Do not use installed lockers for storing construction materials or clothing.

END OF SECTION

SECTION 113013

RESIDENTIAL APPLIANCES

PART 1 GENERAL

1.1 *NOTE: ALL ITEMS IN THIS SECTION ARE OWNER FURNISHED, OWNER INSTALLED, SPECIFICATION SECTION PROVIDED FOR REFERENCE AND COORDINATION ONLY*
(ADDENDUM #03)

1.2 SUMMARY

A. Section Includes.
   1. Refrigerator
   2. Stacking Washer/Dryer

B. Related Requirements.
   1. Section 22 2113 - Pipe & Pipe Fittings Plumbing: Plumbing connections for appliances.
   2. Section 23 3101 - HVAC Ducts and Casing - Low Pressure for exhaust connections to residential materials.
   3. Section 23 3102 - HVAC Ducts and Casing - Medium Pressure for exhaust connections to residential materials.
   4. Section 26 2726 - Wiring Devices: Electrical connections for appliances

1.3 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting Attendees and Procedures:
   1. Conduct meeting one week, minimum, before starting Work of this Section.

1.4 ACTION SUBMITTALS

A. Product Data:
   1. Show profiles, sizes, required clearances, utility rough in sizes and locations.
   2. Show data and power requirements.
   3. Initial selection color charts.

1.5 CLOSEOUT SUBMITTALS

A. Operating and maintenance instructions.

B. Manufacturer warranties.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Spare Parts: Manufacturer recommended parts and quantities.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

B. Electric Appliances: Listed and labeled by UL (DIR) and complying with NEMA Standards (National Electrical Manufacturers Association).

1.8 FIELD CONDITIONS

A. Ambient Conditions: Perform Work within following limitations:
   1. Building enclosed and environmental systems maintaining design conditions for Owner occupancy.

PART 2 PRODUCTS

2.1 OWNER FURNISHED, ~~CONTRACTOR~~ *OWNER* **(ADDENDUM #03)** INSTALLED PRODUCTS

A. Existing Products:
   1. Refrigerator
   2. Stacking Washer/Dryer

2.2 APPLIANCES

A. Appliances, General:
   1. Conform to applicable code for UL approvals.
   2. Certification Labels:
      a. ENERGY STAR: Appliances follow EPA/DOE ENERGY STAR product labeling program.
   3. Accessibility Requirements: Accessible appliances follow FHA or ICC/ANSI A117.1.

B. Miscellaneous Materials:
   1. Supply fittings and other devices needed for installation.
   2. Supply touch up materials for exposed painted finishes.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that utility services and electrical power match appliance requirements.

3.2 INSTALLATION

A. Remove packing materials before installation.

B. Set and adjust appliances level and plumb, and with faces in alignment with adjacent surfaces.
   1. Tighten leveling nuts and other adjustment devices against loosening.

C. Freestanding Appliances: Place units in final locations after wall and floor finishes have been completed.

D. Built-In Appliances: Securely anchor units to supporting cabinets or countertops with concealed fasteners.

E. Verify loose accessory items are properly installed.

F. Connect appliances to utilities and make units operational.

G. Adjust appliances for smooth operation under loaded conditions.

H. Test each appliance to verify proper operation.

I. Clean exposed surfaces, loose accessories, and interior surfaces of compartments and doors.

END OF SECTION

SECTION 123600

COUNTERTOPS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes.
   1. Plastic laminate countertops.
   2. Solid surface countertops.
   3. Countertop hardware.

1.2 REFERENCES

A. Abbreviations and Acronyms:
   1. HPDL: High Pressure Decorative Laminate.

B. Definitions:
   1. Sheen Levels: ASTM D523.
      a. Flat: Five gloss units at 60 degrees and 10 gloss units at 85 degrees, maximum.
      b. Satin: 20 to 35 gloss units at 60 degrees and 35 gloss units minimum at 85 degrees.
      c. Semigloss: 35 to 70 gloss units at 60 degrees.
      d. Gloss: 70 gloss units at 60 degrees, minimum.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination Procedures:
   1. Coordinate locations of utilities and accessories penetrating countertops.
   2. Coordinate sizes and layouts with base cabinets.

B. Preinstallation Meeting Attendees and Procedures:
   1. Conduct meeting one month, minimum, before starting Work of this Section.

1.4 ACTION SUBMITTALS

A. Submittals, General: AWI 100.

B. Submittals, General: Woodwork Institute NAAWS.

C. Product Data:
   1. Countertop materials.
   2. Adhesives.

D. Shop Drawings:
   1. Dimensioned plans and elevations showing countertop locations.
   2. Show materials, profiles, assembly methods, joint details, fastening methods, hardware locations, cutout sizes and locations, and finishes.

E. Samples:
   1. Plastic Laminates: 2 by 3 inches, minimum.
   2. Countertop Material: 6 inches square.
   3. Grommets: Each type and color.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For solid surface countertops.

1.6 QUALITY ASSURANCE

A. Qualifications:
   1. Fabricator: AWI Quality Certification Program participant.
   2. Installer: AWI Quality Certification Program participant.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Storage and Handling Requirements: AWI 200.

B. Storage and Handling Requirements: Woodwork Institute NAAWS.

1.8 FIELD CONDITIONS

A. Ambient Conditions: Perform Work within following limitations:
   1. Building enclosed and environmental systems maintaining design conditions for Owner occupancy.

B. Existing Conditions: Verify field measurements before fabrication. Show field measurements on Shop Drawings.

PART 2 PRODUCTS

2.1 COUNTERTOP GENERAL REQUIREMENTS

A. Quality Standard: ANSI/AWI 1236 for aesthetic grades and performance.

B. Grade: Premium.

2.2 PLASTIC LAMINATE COUNTERTOPS

A. HPDL Countertops, PL-1 and PL-3: ISO 4586-3.
   1. Manufacturers and Products: See Finish Legend on Drawings.
   2. Substitutions: Permitted.
   3. Grade: HGS.
   4. Chemical resistant product where indicated on Finish Legend.
   5. Grain Direction: Parallel to countertop.
   6. Core Material: Exterior grade veneer core plywood and Marine grade plywood where countertops are within 36 inches of a water source.
   7. Edge Treatment: HPDL edge.
   8. Backer Sheet: HPDL; NEMA LD 3, Grade BKL.

B. Installation Materials:
   1. Adhesives: Laminate manufacturer recommended, VOC complaint.
   2. Fasteners: Type, size, and material to suit each application.
   3. **(ADDENDUM #03)** *J Bead termination trim: For use at full height plastic laminate backsplashes: see drawings*

2.3 SOLID SURFACE COUNTERTOPS (BID ALTERNATE)

A. Solid Surface Countertops, SS-1, SS-2, SS-3: ISFA 2-01, homogeneous resin sheets.
   1. Manufacturers and Products: See Finish Legend on Drawings.
   2. Substitutions: Permitted.
   3. Configuration: See Drawings.
      a. Fronts: Built up to 1-1/2 inch thick, slightly eased straight edges.
      b. Backsplashes and Endsplashes: Slightly eased straight edges.
      c. Endsplashes: Slightly eased straight edges.
   4. Thickness: 1/2 inch, laminated to plywood core (ADDENDUM #01).

B. Installation Materials:
   1. Adhesives: Countertop fabricator recommended, VOC compliant.
   2. Fasteners: Type, size, and material to suit each application.

2.4 COUNTERTOP HARDWARE

A. Grommets: Plastic spring loaded cover and outer ring.
   1. Color: Architect selected.

B. Countertop Supports: Steel Surface mounted T brackets, L shaped configuration.
   1. Manufacturers and Products:
      a. A&M Hardware.
   2. Finish: Powder coat.
      a. Color: Architect selected.

2.5 MATERIALS

A. Fire Retardant Treated Wood:
   1. Chemically treated and pressure impregnated.
   2. Flame Spread: 25, maximum per ASTM E84.
   3. Label or otherwise identify fire retardant treated material.
   4. Deliver fire retardant treated materials cut to required sizes. Minimize field cutting.

2.6 FABRICATION

A. Shop assemble Work for delivery to site, permitting passage through building openings.

B. When necessary to cut and fit on site, fabricate materials with ample allowance for cutting. Furnish trim for scribing and site cutting.

C. Fabrication Tolerances:
   1. Wood Based and Solid Surface Countertops: ANSI/AWI 0620, specified grade.
   2. Wood Based and Solid Surface Countertops: Woodwork Institute NAAWS, specified grade.

D. Finish exposed edges of countertops and back and end splashes.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify adequacy of countertop supporting blocking, base cabinets, and brackets.

B. Verify utility rough-in locations and sizes.

3.2 PREPARATION

A. Surface Preparation: Follow ANSI/AWI 0620.

B. Conditioning:
   1. Acclimate products to installation environment per AWI 200 and ANSI/AWI 0620.

3.3 INSTALLATION

A. Follow ANSI/AWI 0620.

B. Installation Grade: Same as item being installed.

C. Cut openings for plumbing fixtures and accessories.

D. Install countertop fasteners in concealed locations. Use Z or angle bracket anchors to base cabinets.

E. Align edge surfaces. Support to prevent deflection and lippage.

F. Interface with Adjacent Work: Seal gaps between tops, splashes, and walls with mildew resistant sealant specified in Section 079200.

G. Plastic laminate countertops: no seams are permitted within 24 inches of a water source.

3.4 CLEANING

A. Clean countertops and splashes; remove excess sealant from adjacent surfaces.

3.5 PROTECTION

A. Protect countertops from soil and damage during remainder of construction.

END OF SECTION

SECTION 210000
FIRE SUPPRESSION BASIC REQUIREMENTS

PART 1 - GENERAL

1.1 DESIGN-BUILD SUMMARY

A. Work included in this Section applies to Division 21, Fire Suppression work to provide materials, labor, tools, permits and incidentals to make fire suppression systems ready for Owner's use for proposed project.

1.2 DESIGN-BUILD INSTRUCTIONS

A. This document is issued to give Bidders a basis for preparing a proposal to design and install a complete Fire Suppression system for this project.

B. Alternates to this Document may be offered as a separate proposal.

1.3 DESIGN-BUILD APPROACH

A. Use this Specification for design/engineering requirements, workmanship and materials or construction. Utilize design-build concept throughout construction phase of project.

B. Investigate and be apprised of applicable codes, rules, and regulations as enforced by AHJ.

C. Visit the Site of the proposed construction. Verify and inspect the existing site to determine conditions that affect this work.

1.4 DESIGN-BUILD CRITERIA

A. Related Work Specified Elsewhere: Contents of Section apply to Division 21, Fire Suppression Specifications. Requirements of Section are a minimum for Division 21, Fire Suppression Sections, unless otherwise stated in each Section, in which case that Section's requirements take precedence.

B. Reference Basis of Design narrative document.

C. Fire Suppression Design Criteria: Refer to individual Division 21, Fire Suppression Sections for fire suppression system design criteria.

D. Fire Suppression Equipment: Refer to individual Division 21, Fire Suppression Sections for fire suppression equipment requirements.

1.5 SECTION INCLUDES

A. Work included in this Section in writingapplies to Division 21, Fire Suppression work to provide materials, labor, tools, permits, incidentals, and other services to provide and make ready for Owner's use of fire protection systems for proposed project.

B. Contract Documents include, but are not limited to, Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Drawings, Addenda, Owner/Architect Agreement, and Owner/Contractor Agreement. Confirm requirements before commencement of work.

C. Definitions:
   1. Provide: To furnish and install, complete and ready for intended use.
   2. Furnish: Supply and deliver to project site, ready for unpacking, assembly and installation.
   3. Install: Includes unloading, unpacking, assembling, erecting, installation, applying, finishing, protecting, cleaning and similar operations at project site as required to complete Item of work furnished.
   4. Approved or Approved Equivalent: To possess the same performance qualities and characteristics and fulfill the utilitarian function without any decrease in quality, durability or longevity. For equipment/products defined by the Contractor as "equivalent," substitution requests must be submitted to Engineer for consideration, in accordance with Division 01, General Requirements, and approved by the Engineer prior to submitting bids for substituted Item.
   5. Authority Having Jurisdiction (AHJ): Indicates reviewing authorities, including local fire marshal, Owner's insurance underwriter, Owner's Authorized Representative, and other reviewing entity whose approval is required to obtain systems acceptance.

1.6 RELATED SECTIONS

A. Content of Section applies to Division 21, Fire Suppression Contract Documents.

B. Related Work:
   1. Additional conditions apply to this Division including, but not limited to:
      a. Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements.
      b. Drawings
      c. Addenda
      d. Owner/Architect Agreement
      e. Owner/Contractor Agreement
      f. Codes, Standards, Public Ordinances and Permits

1.7 REFERENCES AND STANDARDS

A. References and Standards per Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, individual Division 21, Fire Suppression Sections and those listed in this Section.

B. Codes to include latest adopted editions, including current amendments, supplements and local jurisdiction requirements in effect as of the date of the Contract Documents, of/from:
   1. State of Oregon:
      a. OAR - Oregon Administrative Rules
      b. OESC - Oregon Electrical Specialty Code
      c. OFC - Oregon Fire Code
      d. OMSC - Oregon Mechanical Specialty Code
      e. OPSC - Oregon Plumbing Specialty Code
      f. OSSC - Oregon Structural Specialty Code
      g. OEESC - Oregon Energy Efficiency Specialty Code

C. Reference standards and guidelines include but are not limited to the latest adopted editions from:
   1. ADA - Americans with Disabilities Act
   2. AHRI - Air-Conditioning Heating & Refrigeration Institute
   3. ANSI - American National Standards Institute
   4. ASCE - American Society of Civil Engineers
   5. ASCE-7 Minimum Design Loads for Buildings and Other Structures
   6. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers
   7. ASHRAE Guideline 0, the Commissioning Process
   8. ASME - American Society of Mechanical Engineers
   9. ASPE - American Society of Plumbing Engineers
   10. ASSE - American Society of Sanitary Engineering
   11. ASTM - ASTM International
   12. AWWA - American Water Works Association
   13. CFR - Code of Federal Regulations
   14. EPA - Environmental Protection Agency
   15. ETL - Electrical Testing Laboratories
   16. FCC - Federal Communications Commission
   17. FM - FM Global
   18. FM Global - FM Global Approval Guide
   19. IAPMO - International Association of Plumbing and Mechanical Official
   20. ICC - International Code Council
   21. IEC - International Electrotechnical Commission
   22. ICC-ESR - International Code Council Evaluation Service Reports
   23. HI - Hydraulic Institute Standards
   24. ISO - International Organization for Standardization
   25. MSS - Manufacturers Standardization Society
   26. NEC - National Electric Code
   27. NEMA - National Electrical Manufacturers Association
   28. NFPA - National Fire Protection Association:
      a. NFPA 13 - Standard for the Installation of Sprinkler Systems
      b. NFPA 24 - Standard for Installation of Private Fire Service Mains and Their Appurtenances
      c. NFPA 25 - Standard for Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems
      d. NFPA 70 - National Electrical Code
      e. NFPA 72 - National Fire Alarm and Signaling Code

29. OSHA - Occupational Safety and Health Administration
30. UL - Underwriters Laboratories Inc.

D. See Division 21, Fire Suppression individual Sections for additional references.

1.8 SUBMITTALS

A. See Division 01, General Requirements for Submittal Procedures as well as specific individual Division 21, Fire Suppression sections.

B. Provide drawings in format and software release equal to the design documents. Drawings to be the same sheet size and scale as the Contract Documents.

C. "No Exception Taken" constitutes that review is for general conformance with the design concept expressed in the Contract Documents for the limited purpose of checking for conformance with information given. Any action is subject to the requirements of the Contract Documents. Contractor is responsible for the dimensions and quantity and will confirm and correlate at the job site, fabrication processes and techniques of construction, coordination of the work with that of all other trades, and the satisfactory performance of the work.

D. Provide product submittals and shop drawings in electronic format only. Electronic format must be posted to ftp site. For electronic format, provide one file per division containing one bookmarked PDF file with each bookmark corresponding to each Specification Section. Arrange bookmarks in ascending order of Specification Section number. Individual submittals sent piecemeal in a per Specification Section method will be returned without review or comment. Copy Architect on all transmissions/submissions.

E. Submit shop drawings, calculations and product data sheets as one complete stand-alone package to AHJ, Owner's insurance underwriter and Engineer.

F. Product Data: Provide Manufacturer's descriptive literature for products specified in Division 21, Fire Suppression Sections.

G. Identify/mark each submittal in detail. Note what differences, if any, exist between the submitted item and the specified item. Failure to identify the differences will be considered cause for disapproval. If differences are not identified and/or not discovered during the submittal review process, Contractor remains responsible for providing equipment and materials that meet the Specifications and Drawings.
   1. Label submittal to match numbering/references as shown in Contract Documents. Highlight and label applicable information to individual equipment or cross out/remove extraneous data not applicable to submitted model. Clearly note options and accessories to be provided, including field installed Item. Highlight connections by/to other trades.
   2. Include technical data, installation instructions and dimensioned drawings for products, equipment and devices installed, furnished or provided. Reference Division 21, Fire Suppression specification Sections for specific Item required in product data submittal outside of these requirements.
   3. Provide pump curves, operation characteristics, capacities, ambient noise criteria, etc. for equipment.

4. For vibration isolation of equipment, list make and model selected with operating load and deflection. Indicate frame type where required. Submit manufacturer's product data.
5. See Division 21, Fire Suppression Sections for additional submittal requirements outside of these requirements.

H. Maximum of two reviews provided of complete submittal package. Arrange for additional reviews and/or early review of long-lead items; bear costs of additional reviews at Engineer's hourly rates. Incomplete submittal packages/submittals will be returned to Contractor without review.

I. Resubmission Requirements: Make corrections or changes in submittals as required, and in consideration of Engineer’s comments. Identify Engineer’s comments and provide an individual response to each of the Engineer’s comments. Cloud changes in the submittals and further identify changes which are in response to Engineer’s comments.

J. Structural/Seismic: Provide weights, dimensions, mounting requirements and like information required for mounting, seismic bracing, and support. Indicate manufacturer's installation and support requirements to meet ASCE 7-16 requirements for non-structural components. Provide engineered seismic drawings and equipment seismic certification. Equipment Importance Factor as specified in Division 01 and in Structural documents.

K. Trade Coordination: Include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and connections as required per Division 21, Fire Suppression coordination documents. For equipment with electrical connections, furnish copy of approved submittal for inclusion in Division 26, Electrical and Division 28, Electronic Safety submittals.

L. Make provisions for openings in building for admittance of equipment prior to start of construction or ordering of equipment.

M. Substitutions and Variation from Basis of Design:
1. The Basis of Design designated product establishes the qualities and characteristics for the evaluation of any comparable products by other listed acceptable manufacturers if included in this Specification or included in an approved Substitution Request as judged by the Design Professional.
2. If substitutions and/or equivalent equipment/products are being proposed, it is the responsibility of parties concerned, involved in, and furnishing the substitute and/or equivalent equipment to verify and compare the characteristics and requirements of that furnished to that specified and/or shown. If greater capacity and/or more materials and/or more labor is required for the rough-in, circuitry or connections than for the item specified and provided for, then provide compensation for additional charges required for the proper rough-in, circuitry and connections for the equipment being furnished. No additional charges above the Base Bid, including resulting charges for work performed under other Divisions, will be allowed for such revisions. Coordinate with the requirements of "Submittals". For any product marked "or approved equivalent", a substitution request must be submitted to Engineer for approval prior to purchase, delivery or installation.

N. Shop Drawings:

1. Provide coordinated Shop Drawings which include physical characteristics of all systems, equipment and piping layout, pipe layout, hanger layout, sway brace layout, seismic restraints, sway brace calculations, drains, location of drain discharge, risers, valves, details, water test information, physical device layout plans, and control wiring diagrams. Reference individual Division 21, Fire Suppression Sections for additional requirements for shop drawings outside of these requirements.
2. Shop Drawings and hydraulics calculations, sway brace calculations, trapeze hanger calculations, and the like, to be prepared under the direct supervision and control of a Professional Engineer competent to do such work and licensed in the state of Oregon. Drawings and calculations to bear the seal and wet signature of the Professional Engineer.
3. Provide Shop Drawings which indicate information required by NFPA 13. Include room names and fire sprinkler occupancy hazard classifications.
4. Provide Shop Drawings illustrating information for Hydraulic Information Sign for each hydraulic remote area calculated.
5. Utilizing the Reflected Ceiling backgrounds, provide Shop Drawings illustrating locations of fire sprinklers and piping.
6. Utilizing the Structural backgrounds, provide Shop Drawings illustrating locations and types of hangers and sway braces.
7. Provide Shop Drawings illustrating each type of hanger, including fasteners to structure.
8. Provide Shop Drawings illustrating each type of branchline restraint and sway brace, including length of sway brace member, sway brace fittings, minimum and maximum angles from vertical of sway brace member, method of attachment to structure, size, length and embedment of attachment to structure and size and type of structural member to which sway brace will be attached. Number each type of restraint and sway brace. Indicate on Drawings locations of each type of numbered restraint and sway brace.
9. Provide details for any hanger, attachment, or sway brace to be attached to any I-joist, structural insulated panels (SIPs), cross laminated timber, and similar engineered structural products according to the specifications of the engineered product manufacturer.
10. Provide Shop Drawings illustrating information for Sprinkler System General Information Sign.
11. Shop Drawings to include a cross-sectional view that shows the sprinkler heads and piping in relation to the building's architectural and structural information. View to be chosen based on a location that will display the most information.
12. When required, provide Coordination Drawings.
13. Provide Shop Drawings indicating access panel locations, size and elevation for approval prior to installation.
14. Provide details of hanger, sway bracing and branch line restraint attachments to structure and to piping. Include details on the size and load capacities of fasteners. Provide verification of the structural capacity to withstand seismic load.
15. Provide sway bracing calculations on drawings showing horizontal seismic design load and requirements, with indication of zone of influence for each bracing location.
16. Provide a schedule of sway bracing type, size, and design criteria, including length, angle from vertical, and load capacities.
17. Clearly indicate the elevation of the highest sprinkler in relation to the elevation of the flow test pressure gauge monitor hydrant.

18. Provide details of flexible sprinkler hose fitting per manufacturer's schedule of equivalent feet used in hydraulic calculations, showing device length, maximum number of 90-degree bends and expected radius of bends.
19. Provide a schedule of signage to be installed at each flexible sprinkler hose fitting.
20. On the drawings, provide a list of number, model, temperature, sprinkler Identification number, manufacturer, orifice, deflector type, thermal sensitivity and pressure rating, quantity of each type to be contained in the spare sprinkler cabinet and the issue date or revision date of the list.
21. Spare sprinkler head cabinet size indicating the number of spare sprinkler head to be contained therein.

O. Samples: Provide samples when requested by individual Sections.

P. Resubmission Requirements:
1. Make any corrections or change in submittals when required. Provide submittals as specified. The Engineer will not be required to edit and/or interpret the Contractor's submittals. Indicate changes for the resubmittal in a cover letter with reference to page(s) changed and reference response to comment. Clearly indicate changes on Drawings and cloud changes in the submittals.
2. Resubmit for review until review indicates no exceptions taken or make "corrections as noted".

Q. Operation and Maintenance Manuals/Owner's Instructions:
1. Submit, at one time, electronic files (PDF format) of manufacturer's operation and maintenance instruction manuals and parts lists for equipment or Item requiring servicing. Include valve charts. Submit data when work is substantially complete and in same order format as submittals. Include name and location of source parts and service for each piece of equipment.
    a. Include copies of certificates of code authority acceptance, code-required acceptance tests; test reports and certificates.
    b. Include Warranty per Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, and individual Division 21, Fire Suppression Sections.
    c. Catalog description of each Item of equipment actually installed on job.
    d. Instructions for operation and maintenance of fire suppression systems composed of operating instructions, maintenance instructions and manufacturer's literature as follows:
        1) Testing and Maintenance Schedule Chart: Provide an 8-1/2- by 11-inch typewritten list of each item of installed equipment requiring testing inspection, lubrication or service, describing and scheduling performance of maintenance.
        2) Manufacturer's Literature: Provide copies of manufacturer's instructions for operation and maintenance of fire suppression equipment, including replacement parts list with name and address of nearest distributor. Mark each copy with equipment identification label as listed in equipment schedule, i.e. F-5 etc.
    e. Include product certificates of warranties and guarantees.
    f. Include Record Drawings.
    g. Include copy of water supply flow test used as basis for hydraulic calculations.

h. Include hydraulic calculations and sway brace calculations.
i. Include Contractor's Material and Test Certificates for Aboveground Piping/Underground Piping.
j. Include a copy of NFPA 25.
k. Include a copy of valve charts and whether normally open or normally closed.
l. Include a copy of drain, auxiliary, and low point drains charts.
m. Include a copy of the list to be included in the spare sprinkler head box.
n. Include copy of approved submittal data along with submittal review letters received from Engineer. Data to clearly indicate installed equipment model numbers. Delete or cross out data pertaining to other equipment not specific to this project.
o. Include copy of manufacturer's standard Operations and Maintenance for equipment. At front of each tab, provide routine maintenance documentation for scheduled equipment. Include manufacturer's recommended maintenance schedule and highlight maintenance required to maintain warranty. Furnish list of routine maintenance parts, including part numbers, sizes, and quantities relevant to each piece of equipment: i.e. belts, motors, lubricants, and filters.
p. Include copy of complete parts list for equipment. Include available exploded views of assemblies and sub-assemblies.
q. Include copy of startup and test reports specific to each piece of equipment.
r. Engineer will return incomplete documentation without review. Engineer will provide one set of review comments in Submittal Review format. Contractor must arrange for additional reviews; Contractor to bear costs for additional reviews at Engineer's hourly rates.

2. Thoroughly instruct Owner in proper operation of equipment and systems. Where noted in individual Sections, training will include classroom instruction with applicable training aids and systems demonstrations. Field instruction per Section 21 00 00, Fire Suppression Basic Requirements, Article titled "Demonstration".
3. Copies of certificates of code authority inspections, acceptance, code required acceptance tests, letter of conformance and other special guarantees, certificates of warranties, specified elsewhere or indicated on Drawings.

R. Record Drawings:
1. Maintain at site at least one set of Drawings for recording "As-constructed" conditions. Indicate on Drawings changes to original documents by referencing revision document, and include buried elements, location of cleanouts, and location of concealed mechanical Item. Include items changed by field orders, supplemental instructions, and constructed conditions.
2. Record Drawings are to include equipment and fixture/connection schedules that accurately reflect "as constructed or installed" for project.
3. At completion of project, input changes to original project Revit Model and make one set of black-line drawings created from Revit model in version/release equal to contract drawings. Submit Revit model and drawings upon substantial completion.
4. Invert elevations and dimensioned locations for water services and drainage piping below grade extending to 5-feet outside building line.
5. Record Drawings to include site information or reference site information for complete understanding of the fire protection system between the building and the point of connection to the water supply and location of flow test pressure hydrants.

6. See Division 21, Fire Suppression individual Sections for additional items to include in Record Drawings.

S. Calculations: Submit hydraulic and sway brace and the like calculations.
   1. Hydraulic Calculations:
      a. Include friction losses between the hydraulically most remote design area and the hydrant flow test pressure hydrant.
      b. Hydraulic calculations to be performed on a nationally recognized fire sprinkler hydraulic calculation computer program, with cover sheets in the format required by the latest edition of NFPA 13. Hydraulic calculations performed “by hand” or not on a nationally recognized fire sprinkler hydraulic calculations computer program will be returned without review by Engineer.
      c. Provide one or more hydraulic calculations for each hydraulically most remote area.
      d. Where it is not obvious which area is most hydraulically remote, perform and submit for review additional hydraulic calculations proving the hydraulically most remote area.
      e. For grid systems, either provide “peaked” hydraulic calculations, or provide two additional sets of hydraulic calculations for each hydraulically most remote area.
      f. Include pressure losses between the highest sprinkler and the elevation of the pressure gauge monitor hydrant of the flow test.
      g. Include friction loss for flexible branch line connectors per manufacturer's schedule of equivalent feet for device length, maximum number of bends and expected radius of bends.
      h. When flexible sprinkler hose fittings are added to an existing system, provide hydraulic calculations verifying the design flow rate will be achieved."
      i. For Future Tenant Improvement Spaces: Include in hydraulic calculations friction loss allowances for future installation of flexible sprinkler head connectors so that flexible connectors may be installed in the future without revisions to the overhead system.
   2. Sway Brace Calculations:
      a. Sway brace calculations utilizing a proprietary computer calculation program only used for the sway brace components supported by that manufacturer. For example, only “manufacturer X” sway brace components, and not those of another manufacturer, may be calculated on a "manufacturer X” sway brace computer calculation program.
      b. Provide seismic calculations for any sway brace to be attached to any I-joist, structural insulated panels (SIPs), cross laminated timber, and similar engineered structural products according to the specifications of the I-joist manufacturer.

1.9 QUALITY ASSURANCE

A. Regulatory Requirements: Work and materials installed to conform with all local, State and Federal codes, and other applicable laws and regulations. Where code requirements are at variance with Contract Documents, meet code requirements as a minimum requirement and include costs necessary to meet these in Contract. Machinery and equipment are to comply with OSHA requirements, as currently revised and interpreted for equipment manufacturer requirements. Install equipment provided per manufacturer recommendations.

B. Whenever this Specification calls for material, workmanship, arrangement or construction of higher quality and/or capacity than that required by governing codes, higher quality and/or capacity take precedence.

C. Drawings are intended to be diagrammatic and reflect the Basis of Design manufacturer's equipment. They are not intended to show every Item in its exact dimensions, or details of equipment or proposed systems layout. Verify actual dimensions of systems (i.e., piping) and equipment proposed to assure that systems and equipment will fit in available space. Contractor is responsible for design and construction costs incurred for equipment other than Basis of Design, including, but not limited to, architectural, structural, electrical, HVAC, fire sprinkler, and plumbing systems.

D. Manufacturer's Instructions: Follow manufacturer's written instructions. If in conflict with Contract Documents, obtain clarification. Notify Engineer/Architect in writing before starting work.

E. Items shown on Drawings are not necessarily included in Specifications or vice versa. Confirm requirements in all Contract Documents.

F. Provide products that are UL listed.

G. Piping Insulation products to contain less than 0.1 percent by weight PBDE in all insulating materials.

1.10 WARRANTY

A. Provide written warranty covering the work for a period of one year from date of Substantial Completion in accordance with Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, and individual Division 21, Fire Suppression Sections.

B. Sections under this Division can require additional and/or extended warranties that apply beyond basic warranty under Division 01, General Requirements and the General Conditions. Confirm requirements in all Contract Documents.

1.11 COORDINATION DOCUMENTS

A. Prior to construction, prepare and submit coordinated layout drawings (composite drawings), to coordinate installation and location of ductwork, grilles, diffusers, piping, fire sprinklers, fire alarm, plumbing, cable trays, lights, and electrical services. Composite Drawings show services on single sheet. Key Drawings to structural column identification system. Prior to completion of Drawings, coordinate proposed installation with architectural and structural requirements, and other trades (including plumbing, HVAC, electrical, fire alarm ceiling suspension and tile systems, etc.), and provide maintenance access requirements. Coordinate with submitted architectural systems (i.e. roofing, ceiling and finishes) and structural systems as submitted, including footings and foundation. Identify zone of influence from footings and ensure systems are not routed within the zone of influence.

B. Prepare Drawings as follows:
   1. Provide drawings in Revit model. Revit model release equal to design documents. Drawings to be same sheet size and scale as Contract Drawings and indicate location, size and elevation above finished floor of equipment and distribution systems.
   2. Review and revise, as necessary, section cuts in Contract Drawings after verification of field conditions.
   3. Indicate fire protection system piping including fittings, hangers, access panels, valves, and bottom of pipe elevations above finished floor.
   4. Indicate inverts and provision for piping that must be graded to have right-of-way over more flexible Item. Drawings also to indicate proposed ceiling grid and lighting layout as shown on electrical drawings, architectural reflected ceiling drawings and HVAC equipment, ductwork and piping. Drawings to indicate proposed and identified structural members to which hangers and sway braces will be attached as shown on structural drawings.
   5. Incorporate Addenda Item and change orders.
   6. Provide additional coordination as requested by other trades.

C. Advise Architect in event conflict occurs in location or connection of equipment. Bear costs resulting from failure to properly coordinate installation or failure to advise Architect of conflict.

D. Submit final Coordination Drawings with changes as Record Drawings at completion of project.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Articles, fixtures, and equipment of a kind to be standard product of one manufacturer, including but not limited to sprinkler heads, pipe, fittings, hangers and bracing materials.

2.2 STANDARDS OF MATERIALS AND WORKMANSHIP

A. Base contract upon furnishing materials as specified. Materials, equipment, and fixtures used for construction are to be new, latest products as listed in manufacturer's printed catalog data and are to be UL, ETL, FM, and ICC-ES listed and labeled for their intended fire protection function or be approved by State, County, and City authorities prior to procurement and installation.

B. Names and manufacturer's names denote character and quality of equipment desired and are not to be construed as limiting competition.

C. Hazardous Materials:
   1. Comply with local, State of Oregon, and Federal regulations relating to hazardous materials.

2. Comply with Division 00, Procurement and Contracting Requirements and Division 01, General Requirements for this project relating to hazardous materials.
3. Do not use any materials containing a hazardous substance. If hazardous materials are encountered, do not disturb; immediately notify Owner and Architect. Hazardous materials will be removed by Owner under separate contract.

2.3 ACCESS PANELS

A. See Division 01, General Requirements and Division 08, Openings for products and installation requirements.

B. Confirm Access Panel requirements in Division 01, General Requirements, Division 08, Openings, and individual Division 21, Fire Suppression Sections. In absence of specific requirements, provide flush mounting access panels for service of systems and individual components requiring maintenance or inspection. Where access panels are located in fire-rated assemblies of building, rate access panels accordingly.

1. **Ceiling access panels to be minimum of 24-inch by 24-inch required and approved size.**
2. **Wall access panels to be minimum of 12-inch by 12-inch required and approved size.**
3. **Provide screwdriver operated catch.**
4. **Manufacturers and Models:**
   a. **Drywall: Karp KDW.**
   b. **Plaster: Karp DSC-214PL.**
   c. **Masonry: Karp DSC-214M.**
   d. **2 hour rated: Karp KPF-350FR.**
   e. **Manufacturers: Karp, Milcor, Elmdor, Acudor or approved equivalent.**

PART 3 - EXECUTION

3.1 ACCESSIBILITY AND INSTALLATION

A. Confirm Accessibility and Installation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, and individual Division 21, Fire Suppression Sections.

B. Install equipment requiring access (i.e. drains, control operators, valves, motors, engines, pumps, controllers, air compressors, gauges, fill cups, tanks, cleanouts and the like) so that they may be serviced, reset, replaced or recalibrated by service people with normal service tools and equipment. Do not install equipment in obvious passageways, doorways, scuttles or crawlspaces which would impede or block intended usage.

C. Install equipment and products complete as directed by manufacturer's installation instructions. Obtain installation instructions from manufacturer prior to rough-in of equipment and examine instructions thoroughly. When requirements of installation instructions conflict with Contract Documents, request clarification from Architect prior to proceeding with installation. This includes proper installation methods, sequencing, and coordination with other trades and disciplines.

D. Earthwork:
   1. Confirm Earthwork requirements in Contract Documents.
   2. In absence of specific requirements, comply with the following:
      a. Perform excavation, dewatering, shoring, bedding, and backfill required for installation of work in this Division in accordance with the provisions specified. Contact utilities and locate existing utilities prior to excavation. Repair any work damaged during excavation or backfilling.
      b. Excavation: Do not excavate under footings, foundation bases, or retaining walls.
      c. Provide protection of underground systems. Review the project Geotechnical Report for references to corrosive or deleterious soils which will reduce the performance or service life of underground systems materials.

E. Firestopping:
   1. Confirm Firestopping requirements in Division 07, Thermal and Moisture Protection.
   2. In absence of specific requirements, comply with individual Division 21, Fire Suppression Sections and coordinate location and protection level of fire and/or smoke rated walls, ceilings, and floors. When these assemblies are penetrated, seal around piping, ductwork and equipment with approved firestopping material. Install firestopping material complete as directed by manufacturer's installation instructions. Meet requirements of ASTM International E814, Standard Test Method for Fire Tests of Through-Penetration Fire Stops.

F. Pipe Installation:
   1. Provide installation of piping systems coordinated to account for expansion and contraction of piping materials and building as well as anticipated settlement or shrinkage of building. Install work to prevent damage to piping, equipment, and building and its contents. Provide piping offsets, loops, expansion joints, sleeves, anchors or other means to control pipe movement and minimize forces on piping. Verify anticipated settlement and/or shrinkage of building with Project Structural Engineer. Verify construction phasing, type of building construction products and rating coordinating installation of piping systems.
   2. Include provisions for servicing and removal of equipment without dismantling piping.

G. Plenums: Provide plenum rated materials that meet the requirements to be installed in plenums. Immediately notify Architect/Engineer of discrepancy.

3.2 SEISMIC CONTROL

A. Confirm Seismic Control requirements in Division 01, General Requirements, Structural documents, and individual Division 21, Fire Suppression Sections.

B. Provide fire suppression equipment and piping, both hanging and base mounted, with mounting connection points of sufficient strength to resist lateral seismic forces equal to lateral seismic forces as determined by building code and NFPA 13 calculations, whichever is more demanding.

C. See Structural Drawings for seismic design criteria for sway bracing and seismic restraint.

D. Earthquake resistant designs for Fire Protection (Division 21) equipment and distribution, i.e. fire sprinkler systems, fire standpipe systems, fire pumps, fire pump controllers, fire tanks, clean agent fire suppression systems, etc. to conform to regulations of jurisdiction having authority.

E. Restraints which are used to prevent disruption of function of piece of equipment because of application of horizontal force to be such that forces are carried to frame of structure in such a way that frame will not be deflected when apparatus is attached to a mounting base and equipment pad, or to structure in normal way, utilizing attachments provided. Secure equipment and distribution systems to withstand a force in direction equal to value defined by jurisdiction having authority.

F. Provide stamped Shop Drawings from licensed Engineer of seismic bracing and seismic movement assemblies for piping, equipment, tanks, pumps controllers and the like. Submit shop drawings along with equipment submittals.

G. Provide stamped Shop Drawings from licensed Engineer of seismic flexible joints for piping and crossing building expansion or seismic joints. Submit Shop Drawings along with seismic bracing details.

H. Provide details of flexible drops for sprinklers in conformance with Building Code and ASCE-7 requirements of ceilings. Coordinate with Architectural and Structural Drawings and Specifications.

I. Piping: Per NFPA 13, ASCE-7 and local requirements.

J. Equipment:
   1. Per "Seismic Restraints Manual Guidelines for Mechanical Systems" latest edition published by SMACNA, ASCE 7 and local requirements.
   2. Provide means to prohibit excessive motion of fire protection equipment during an earthquake.

3.3 REVIEW AND OBSERVATION

A. Confirm Review and Observation requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, and individual Division 21, Fire Suppression Sections.

B. Notify Architect in writing at following stages of construction so that they may, at their option, visit site for review and construction observation:
   1. Underground piping installation prior to backfilling.

2. Prior to covering walls.
3. Prior to ceiling cover/installation.
4. When main systems, or portions of, are being tested and ready for inspection by AHJ.
5. When mains or branchlines are to be permanently concealed by construction or insulation systems.
6. When fire suppression systems, or portions of, are being tested and ready for inspection by AHJ.

C. Bear responsibility and cost to make piping accessible, to expose concealed lines, or to demonstrate acceptability of the system. If Contractor fails to notify Architect at times prescribed above, costs incurred by removal of such work are the responsibility of the Contractor.

D. Final Punch: Costs incurred by additional trips required due to incomplete systems will be the responsibility of the Contractor.

3.4 CUTTING AND PATCHING

A. Confirm Cutting and Patching requirements in Division 01, General Requirements.

B. In absence of specific requirements, comply with individual Division 21, Fire Suppression Sections and the following:
1. Cutting and patching performed under Division 21, Fire Suppression includes, but is not limited to:
   a. Cutting and patching of plaster or partitions.
   b. Cutting and patching of finished ceilings.
2. Perform cutting and patching by skilled craftsmen in trade of work to be performed. Fill holes which are cut oversized for completed work. Match refinished areas with existing adjacent finish in a manner acceptable to Architect.
3. When masonry to concrete construction must be penetrated, provide a steel pipe sleeve in opening and grout in place in a neat manner. Leave grout surface to match existing finish. Provide escutcheons. If sleeves are not provided, core drill penetrations.
4. Locate concealed utilities to eliminate possible service interruption or damage.
5. Additional work required by lack of proper coordination will be provided at no additional cost to the Owner.
6. Proposed floor cutting/core drilling/sleeve locations to be approved by Project Structural Engineer. Submit proposed locations to Architect/Project Structural Engineer. Where slabs are of post tension construction, perform x-ray scan of proposed penetration locations and submit scan results including proposed penetration locations to Project Structural Engineer/Architect for approval. Where slabs are of waffle type construction, show column cap extent and cell locations relative to proposed penetration(s).
7. Cutting, patching and repairing for work specified in this Division including plastering, masonry work, concrete work, carpentry work, and painting included under this Section will be performed by skilled craftspeople of each respective trade in conformance with appropriate Division of Work.
8. Additional openings required in building construction to be made by drilling or cutting. Use of jack hammer is specifically prohibited. Patch openings in and through concrete and masonry with grout.

9. Restore new or existing work that is cut and/or damaged to original condition. Patch and repair specifically where existing items have been removed. This includes repairing and painting walls, ceilings, etc. where existing conduit and devices are removed as part of this project. Where alterations disturb lawns, landscaping, paving, and walks, surfaces to be repaired, refinished and left in condition matching existing prior to commencement of work.
10. Repair mutilation of building around pipes, equipment, hangers, and braces.

3.5 EQUIPMENT SELECTION AND SERVICEABILITY

A. Replace or reposition equipment which is too large or located incorrectly to permit servicing at no additional cost to Owner.

3.6 DELIVERY, STORAGE AND HANDLING

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements.

B. In absence of specific requirements, comply with individual Division 21, Fire Suppression Sections and the following:
   1. Handle materials delivered to project site with care to avoid damage and deterioration. Store materials in original containers which identify manufacturer, name, brand and model numbers on site inside building or protected from weather, sun, dirt and construction dust. Insulation and lining that becomes wet from improper storage and handling to be replaced before installation. Products and/or materials that become damaged due to water, dirt and/or dust as a result of improper storage to be replaced before installation.
   2. Protect equipment and pipe to avoid damage. Close pipe openings with caps or plugs. Keep motors and bearings in watertight and dustproof covers during entire course of installation.
   3. Protect bright finished shafts, bearing housings and similar items until in service.

3.7 DEMONSTRATION

A. Confirm Demonstration requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, and individual Division 21, Fire Suppression Sections.

B. Upon completion of work and adjustment of equipment and test systems, demonstrate to Owner's Authorized Representative, Architect and Engineer that equipment furnished and installed or connected under provisions of these Specifications functions in manner required. Provide field instruction to Owner's Maintenance Staff as specified in Division 01, General Requirements, and individual Division 21, Fire Suppression Sections.

C. Manufacturer's Field Services: Furnish services of a qualified person at time approved by Owner to instruct maintenance personnel, correct defects or deficiencies, and demonstrate to satisfaction of Owner that entire system is operating in satisfactory manner and complies with requirements of other trades that may be required to complete work. Complete instruction and demonstration prior to final job site observations.

D. Prior to acceptance of work and during time designated by Architect, provide necessary qualified personnel to operate system for a period of two hours.

E. Instruct the Owner in the operation of the sprinkler system, including main valve position (open or closed) recognition, system drainage, system testing, dry pipe valve reset and the relation to the fire alarm system.

F. Upon completion of work and adjustment of equipment, test systems to demonstrate to Owner's Authorized Representative and Architect that equipment is furnished and installed or connected under provisions of these Specifications.

3.8 CLEANING

A. Confirm Cleaning requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, and individual Division 21, Fire Suppression Sections.

B. Upon completion of installation, except for sprinklers, thoroughly clean exposed portions of equipment, removing temporary labels and traces of foreign substances. Throughout work, remove construction debris and surplus materials accumulated during work.

C. Sprinklers may not be cleaned except for vacuuming in a manner in which no part of the sprinkler is touched by the vacuuming equipment. Replace sprinklers which bear traces of foreign substances with sprinklers of same model, temperature, K-factor, orifice, finish, style, orientation, and the like.

3.9 INSTALLATION

A. Confirm Installation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, and individual Division 21, Fire Suppression Sections.

B. Install equipment in accordance with manufacturer's installation instructions, plumb and level and firmly anchored to vibration isolators. Maintain manufacturer's recommended clearances.

C. Start-up equipment, in accordance with manufacturer's start-up instructions, in the presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment. Provide pump impellers to obtain Basis of Design design capacities.

D. Provide miscellaneous supports/metals required for installation of equipment and piping.

3.10 PAINTING

A. Confirm requirements in Division 01, General Requirements and Division 09, Finishes.

B. In absence of specific requirements, comply with individual Division 21, Fire Suppression Sections and the following:
   1. Ferrous Metal: After completion of fire protection work, thoroughly clean and paint exposed supports constructed of ferrous metal surfaces, i.e., hangers, hanger rods, equipment stands, with one coat of black asphalt varnish for exterior or black enamel for interior, suitable for hot surfaces.
   2. After acceptance by Authority Having Jurisdiction (AHJ), in a mechanical room, on roof or other exposed areas, machinery and equipment not painted with enamel to receive two coats of primer and one coat of rustproof enamel, colors as selected by Architect.
   3. Structural Steel: Repair damage to structural steel finishes or finishes of other materials damaged by cutting, welding or patching to match original.
   4. Piping: Clean, primer coat and paint exposed piping on roof or at other exterior locations with two coats paint suitable for metallic surfaces and exterior exposures. Color selected by Architect.
   5. Covers: Covers such as vault covers and the like will be furnished with finishes which resist corrosion and rust.

3.11 ACCESS PANELS

A. Confirm Access Panel requirements in Division 01, General Requirements.

B. In absence of specific requirements, comply with individual Division 21, Fire Suppression Sections and coordinate locations/sizes of access panels with Architect prior to work. Label access panels with engraved nameplates indicating function of panel.

~~3.11~~**3.12** ACCEPTANCE

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements.

B. In absence of specific requirements, comply with individual Sections in Division 21, Fire Suppression. System cannot be considered for acceptance until work is completed and demonstrated to Architect that installation is in strict compliance with Specifications, Drawings and manufacturer's installation instructions, particularly in reference to following:
   1. Testing reports including Contractor's Material and Test Certificate for Underground Piping, Contractor's Material and Test Certificate for Aboveground Piping, Contractor's Material and Test Certificate for Private Fire Service Mains, Fire pump acceptance test data report, and the like.
   2. Cleaning
   3. Operation and Maintenance Manuals
   4. Training of Operating Personnel
   5. Record Drawings
   6. Warranty and Guaranty Certificates

7. Start-up/Test Document and Commissioning Reports
8. Letter of Conformance

~~3.12~~3.13 FIELD QUALITY CONTROL

A. Confirm Field Quality Control requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, and individual Division 21, Fire Suppression Sections.

B. Upon completion of installation of equipment, sprinklers, hose valves and piping and after units are water pressurized, test system to demonstrate capability and compliance with requirements. When possible, correct malfunctioning items at site, then retest to demonstrate compliance; otherwise remove and replace with new Item and proceed with retesting.

C. Inspect each installed Item for damage to finish. If feasible, restore and match finish to original, except fire sprinklers, at site; otherwise, remove Item and replace with new Item. Feasibility and match to be judged by Architect. Remove cracked or dented Item and replace with new Item.

D. Fire sprinklers may not be reused, or cleaned, except for dusting. Replace damaged, field painted, oversprayed, overcoated or field coated sprinklers with new sprinklers of same manufacturer, model, finish, K-factor and performance characteristics.

E. Where identical replacement sprinklers are not available, provide sprinklers of similar finish, style, K-factor and performance characteristics.

~~3.13~~3.14 LETTER OF CONFORMANCE

A. Provide Letter of Conformance and copies of manufacturers' warranties and extended warranties with a statement that fire suppression items were installed in accordance with manufacturer's recommendations, UL listings and FM Global approvals.

B. Include Letter of Conformance, copies of manufacturers' warranties and extended warranties in Operation and Maintenance Manuals.

~~3.14~~3.15 ELECTRICAL INTERLOCKS

A. Where equipment motors are to be electrically interlocked with other equipment for simultaneous operation, utilize fire protection equipment wiring diagrams to coordinate with electrical systems so that proper wiring of equipment involved is affected.

END OF SECTION

SECTION 220000
PLUMBING BASIC REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Work included in 22 00 00, Plumbing Basic Requirements applies to Division 22, Plumbing work to provide materials, labor, tools, permits, incidentals, and other services to provide and make ready for Owner's use of plumbing systems for proposed project.

B. Contract Documents include, but are not limited to, Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Drawings, Addenda, Owner/Architect Agreement, and Owner/Contractor Agreement. Confirm requirements before commencement of work.

C. Definitions:
1. Provide: To furnish and install, complete and ready for intended use.
2. Furnish: Supply and deliver to project site, ready for unpacking, assembly and installation.
3. Install: Includes unloading, unpacking, assembling, erecting, installation, applying, finishing, protecting, cleaning and similar operations at project site as required to complete items of work furnished.
4. Approved or Approved Equivalent: To possess the same performance qualities and characteristics and fulfill the utilitarian function without any decrease in quality, durability or longevity. For equipment/products defined by the Contractor as "equivalent", substitution requests must be submitted to Engineer for consideration, in accordance with Division 01, General Requirements, and approved by the Engineer prior to submitting bids for substituted items.
5. Authority Having Jurisdiction (AHJ): Indicates reviewing authorities, including local fire marshal, Owner's insurance underwriter, Owner's Authorized Representative, and other reviewing entity whose approval is required to obtain systems acceptance.

1.2 RELATED SECTIONS

A. Contents of Section applies to Division 22, Plumbing Contract Documents.

B. Related Work:
1. Additional conditions apply to this Division including, but not limited to:
a. Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements.
b. Drawings
c. Addenda
d. Owner/Architect Agreement

e. Owner/Contractor Agreement
f. Codes, Standards, Public Ordinances and Permits

2. Section 23 11 23, Facility Fuel - Natural Gas Piping and Systems

1.3 REFERENCES AND STANDARDS

A. References and Standards per Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, individual Division 22, Plumbing Sections and those listed in this Section.

B. Codes to include latest adopted editions, including current amendments, supplements and local jurisdiction requirements in effect as of the date of the Contract Documents, of/from:
1. State of Oregon:
a. OAR - Oregon Administrative Rules
b. OESC - Oregon Electrical Specialty Code
c. OFC - Oregon Fire Code
d. OMSC - Oregon Mechanical Specialty Code
e. OPSC - Oregon Plumbing Specialty Code
f. OSSC - Oregon Structural Specialty Code
g. OEESC - Oregon Energy Efficiency Specialty Code

C. Reference standards and guidelines include but are not limited to the latest adopted editions from:
1. ADA - Americans with Disabilities Act
2. AHRI - Air-Conditioning Heating & Refrigeration Institute
3. ANSI - American National Standards Institute
4. ASCE - American Society of Civil Engineers
5. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers
6. ASHRAE Guideline 0, the Commissioning Process
7. ASME - American Society of Mechanical Engineers
8. ASPE - American Society of Plumbing Engineers
9. ASSE - American Society of Sanitary Engineering
10. ASTM - ASTM International
11. AWWA - American Water Works Association
12. CFR - Code of Federal Regulations
13. CGA - Compressed Gas Association
14. CISPI - Cast Iron Soil Pipe Institute
15. ETL - Electrical Testing Laboratories
16. EPA - Environmental Protection Agency
17. FM - FM Global
18. IAPMO - International Association of Plumbing and Mechanical Officials
19. GAMA - Gas Appliance Manufacturers Association
20. HI - Hydraulic Institute Standards
21. ISO - International Organization for Standardization
22. MSS - Manufacturers Standardization Society
23. NEC - National Electric Code
24. NEMA - National Electrical Manufacturers Association

25. NFGC - National Fuel Gas Code
26. NFPA - National Fire Protection Association
27. NRCA - National Roofing Contractors Association
28. NSF - National Sanitation Foundation
29. OSHA - Occupational Safety and Health Administration
30. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association, Inc.
31. TEMA - Tubular Exchanger Manufacturers Association
32. TIMA - Thermal Insulation Manufacturers Association
33. UL - Underwriters Laboratories Inc.

D. See Division 22, Plumbing individual Sections for additional references.

1.4 SUBMITTALS

A. See Division 01, General Requirements for Submittal Procedures as well as specific individual Division 22, Plumbing Sections.

B. Provide drawings in format and software release equal to the design documents. Drawings to be the same sheet size and scale as the Contract Documents.

C. In addition:
1. "No Exception Taken" constitutes that review is for general conformance with the design concept expressed in the Contract Documents for the limited purpose of checking for conformance with information given. Any action is subject to the requirements of the Contract Documents. Contractor is responsible for the dimensions and quantity and will confirm and correlate at the job site, fabrication processes and techniques of construction, coordination of the work with that of all other trades, and the satisfactory performance of the work.
2. Provide product submittals and shop drawings in electronic format only. Electronic format must be posted to ftp site. For electronic format, provide one file per division containing one bookmarked PDF file with each bookmark corresponding to each Specification Section. Arrange bookmarks in ascending order of Specification Section number. Individual submittals sent piecemeal in a per Specification Section method will be returned without review or comment. All transmissions/submissions to be submitted to Architect. At Contractor’s option, two separate submittals may be provided, consisting of underground work and building work. Deviations will be returned without review.
3. Product Data: Provide Manufacturer's descriptive literature for products specified in Division 22, Plumbing Sections.
4. Identify/mark each submittal in detail. Note what differences, if any, exist between the submitted item and the specified item. Failure to identify the differences will be considered cause for disapproval. If differences are not identified and/or not discovered during the submittal review process, Contractor remains responsible for providing equipment and materials that meet the Specifications and Drawings.
    a. Label submittal to match numbering/references as shown in Contract Documents and schedules. Highlight and label applicable information to individual equipment or cross out/remove extraneous data not applicable to submitted model. Clearly note options and accessories to be provided, including field installed items. Highlight connections by/to other trades.

b. Include technical data, installation instructions and dimensioned drawings for products, fixtures, equipment and devices installed, furnished or provided. Reference Division 22, Plumbing Sections for specific items required in product data submittal outside of these requirements.
c. Provide pump curves, operation characteristics, capacities, ambient noise criteria, etc. for equipment.
d. For vibration isolation of equipment, list make and model selected with operating load and deflection. Indicate frame type where required. Submit manufacturer's product data.
e. See Division 22, Plumbing Sections for additional submittal requirements outside of these requirements.

5. Maximum of two reviews of complete submittal package. Arrange for additional reviews and/or early review of long-lead items; bear costs of additional reviews at Engineer's hourly rates. Incomplete submittal packages/submittals will be returned to Contractor without review.
6. Structural/Seismic: Provide weights, dimensions, mounting requirements and like information required for mounting, seismic bracing, and support. Indicate manufacturer's installation and support requirements to meet Section 22 05 48, Vibration and Seismic Controls for Plumbing Piping and Equipment. Provide engineered seismic drawings and equipment seismic certification. Equipment Importance Factor as specified in Division 01 and in Structural documents.
7. Trade Coordination: Include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and connections as required per Division 22, Plumbing Coordination Documents. For equipment with electrical connections, furnish copy of approved submittal for inclusion in Division 26, Electrical submittals.
8. Make provisions for openings in building for admittance of equipment prior to start of construction or ordering of equipment.
9. Substitutions and Variation from Basis of Design:
    a. The Basis of Design designated product establishes the qualities and characteristics for the evaluation of any comparable products by other listed acceptable manufacturers if included in this Specification or included in an approved Substitution Request as judged by the Design Professional.
    b. If substitutions and/or equivalent equipment/products are being proposed, it is the responsibility of parties concerned, involved in, and furnishing the substitute and/or equivalent equipment to verify and compare the characteristics and requirements of that furnished to that specified and/or shown. If greater capacity and/or more materials and/or more labor is required for the rough-in, circuitry or connections than for the item specified and provided for, then provide compensation for additional charges required for the proper rough-in, circuitry and connections for the equipment being furnished. No additional charges above the Base Bid, including resulting charges for work performed under other Divisions, will be allowed for such revisions. Coordinate with the requirements of "Submittals." For any product marked "or approved equivalent," a substitution request must be submitted to Engineer for approval prior to purchase, delivery or installation.
10. Shop Drawings: Provide coordinated Shop Drawings which include physical characteristics of all systems, equipment and piping layout plans, and control wiring diagrams. Reference individual Division 22, Plumbing Sections for additional requirements for Shop Drawings outside of these requirements.

a. Provide Shop Drawings indicating sanitary and storm cleanout locations and type to Architect for approval prior to installation.
b. Provide Shop Drawings indicating access panel locations, size and elevation for approval prior to installation.

11. Samples: Provide samples when requested by individual Sections.
12. Resubmission Requirements:
    a. Make corrections or changes in submittals as required in response to Engineer's comments. Provide a cover letter with resubmittal that includes responses to each of the Engineer's submittal review comments and identifies changes in the resubmittal. Cloud changes in the submittals.
        1) Resubmit for review until review indicates "no exception taken" or "make corrections noted."
        2) When submitting drawings for Engineer's re-review, clearly indicate changes on drawings and cloud any revisions. Submit a list describing each change.
13. Operation and Maintenance Manuals, Owner's Instructions:
    a. Submit, at one time, electronic files (PDF format) of manufacturer's operation and maintenance instruction manuals and parts lists for equipment or items requiring servicing. Include valve charts. Submit data when work is substantially complete and in same order format as submittals. Include name and location of source parts and service for each piece of equipment.
        1) Include copy of approved submittal data along with submittal review letters received from Engineer. Data to clearly indicate installed equipment model numbers. Delete or cross out data pertaining to other equipment not specific to this project.
        2) Include copy of manufacturer's standard Operations and Maintenance for equipment. At front of each tab, provide routine maintenance documentation for scheduled equipment. Include manufacturer's recommended maintenance schedule and highlight maintenance required to maintain warranty. Furnish list of routine maintenance parts, including part numbers, sizes, quantities, relevant to each piece of equipment: belts, motors, lubricants, and filters.
        3) Include copy of complete parts list for equipment. Include available exploded views of assemblies and sub assemblies.
        4) Include copy of startup and test reports specific to each piece of equipment.
        5) Include copy of final water systems balancing log along with pump operating data.
        6) Include commissioning reports.
        7) Include copy of pressure, flow, leakage and purity test data and air and water systems test data, as applicable. Include copy of third-party and state and local jurisdiction inspection reports.
        8) Include copy of valve charts/schedules.
        9) Include Warranty per Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 22 00 00, Plumbing Basic Requirements and individual Division 22, Plumbing Sections.
        10) Include product certificates of warranties and guarantees.
        11) Engineer will return incomplete documentation without review. Engineer will provide one set of review comments in Submittal Review format. Contractor must arrange for additional reviews; Contractor to bear costs for additional reviews at Engineer's hourly rates.

b. Thoroughly instruct Owner in proper operation of equipment and systems. Where noted in individual Sections, training will include classroom instruction with applicable training aids and systems demonstrations. Field instruction per Section 22 00 00, Plumbing Basic Requirements article titled "Demonstration."
c. Copies of certificates of code authority inspections, acceptance, code required acceptance tests, letter of conformance and other special guarantees, certificates of warranties, specified elsewhere or indicated on Drawings.

14. Record Drawings:
    a. Maintain at site at least one set of drawings for recording “As-constructed” conditions. Indicate on Drawings changes to original documents by referencing revision document, and include buried elements, location of cleanouts, and location of concealed mechanical items. Include items changed by field orders, supplemental instructions, and constructed conditions.
    b. Record Drawings are to include equipment and fixture/connection schedules that accurately reflect "as constructed or installed" for Project.
    c. At completion of project, input changes to original project Revit Model and make one set of black-line drawings created from Revit model in version/release equal to contract drawings. Submit Revit model and drawings upon substantial completion.
    d. Provide Invert elevations and dimensioned locations for water services, building waste, and storm drainage piping below grade extending to 5-feet outside building line.
    e. See Division 22, Plumbing individual Sections for additional items to include in record drawings.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Work and materials installed to conform with all local, State and Federal codes, and other applicable laws and regulations. Where code requirements are at variance with Contract Documents, meet code requirements as a minimum requirement and include costs necessary to meet these in Contract. Machinery and equipment are to comply with OSHA requirements, as currently revised and interpreted for equipment manufacturer requirements. Install equipment provided per manufacturer recommendations.

B. Whenever this Specification calls for material, workmanship, arrangement or construction of higher quality and/or capacity than that required by governing codes, higher quality and/or capacity take precedence.

C. Drawings are intended to be diagrammatic and reflect the Basis of Design manufacturers equipment. They are not intended to show every item in its exact dimensions, or details of equipment or proposed systems layout. Verify actual dimensions of systems (i.e., piping) and equipment proposed to assure that systems and equipment will fit in available space. Contractor is responsible for design and construction costs incurred for equipment other than Basis of Design, including, but not limited to, architectural, structural, electrical, HVAC, fire sprinkler, and plumbing systems.

D. Manufacturer's Instructions: Follow manufacturer's written instructions. If in conflict with Contract Documents, obtain clarification. Notify Engineer/Architect, in writing, before starting work.

E. Items shown on Drawings are not necessarily included in Specifications or vice versa. Confirm requirements in all Contract Documents.

F. Provide products that are UL listed.

G. Piping Insulation products to contain less than 0.1 percent by weight PBDE in all insulating materials.

H. All potable water system components, devices, material, or equipment containing a weighted average of greater than 0.25 percent lead are prohibited, and shall be certified in accordance with current editions of the Safe Drinking Water Act (SDWA), NSF 61 & NSF 372. Endpoint devices used to dispense water for drinking shall meet the requirements of NSF 61.

I. ASME Compliance: ASME listed water heaters and boilers with an input of 200,000 BTUH and higher, hot water storage tanks which exceed 120 gallons, and hot water expansion tanks which are connected to ASME rated equipment or required by code or local jurisdiction.

J. Provide safety controls required by National Boiler Code (ASME CSD 1) for boilers and water heaters with an input of 400,000 BTUH and higher.

K. Unless specifically noted otherwise in the contract documents, all valves, devices, appurtenances, and sundries are to match connection size of piping in which they are installed. Where equipment/devices from manufacturer vary from the adjoining pipe size, transition fittings are to be used.

1.6 WARRANTY

A. Provide written warranty covering the work for a period of one year from date of Substantial Completion in accordance with Division 00, Contracting and Procurement Requirements, Division 01, General Requirements, Section 22 00 00, Plumbing Basic Requirements and individual Division 22, Plumbing Sections.

B. Sections under this Division can require additional and/or extended warranties that apply beyond basic warranty in Division 01, General Requirements and the General Conditions. Confirm requirements in all Contract Documents.

1.7 COORDINATION DOCUMENTS

A. Prior to construction, prepare and submit coordinated layout drawings (composite drawings) to coordinate installation and location of ductwork, grilles, diffusers, piping, fire sprinklers, plumbing, lights, and electrical services. Composite Drawings show services on single sheet. Key Drawings to structural column identification system. Prior to completion of Drawings, coordinate proposed installation with architectural and structural requirements, and other trades (including plumbing, HVAC, fire protection, electrical, ceiling suspension, and ceiling tile systems, etc.), and provide maintenance access requirements. Coordinate with submitted architectural systems (i.e. roofing, ceiling, finishes) and structural systems as submitted, including footings and foundation. Identify zone of influence from footings and ensure systems are not routed within the zone of influence.

B. Prepare Drawings as follows:
   1. Drawings in Revit model. Revit model release equal to design documents. Drawings to be same sheet size and scale as Contract Drawings and indicate location, size and elevation above finished floor of equipment and distribution systems.
   2. Review and revise, as necessary, section cuts in Contract Drawings after verification of field conditions.
   3. Indicate plumbing system piping including fittings, hangers, access panels, valves, and bottom of pipe elevations above finished floor.
   4. Indicate inverts and provision for piping that must be graded to have right-of-way over more flexible items. Drawings also to indicate proposed ceiling grid and lighting layout as shown on electrical drawings and architectural reflected ceiling drawings and HVAC equipment, ductwork and piping.
   5. Incorporate Addenda items and change orders.
   6. Distribute drawings to trades and provide additional coordination as requested by other trades.

C. Advise Architect in the event a conflict occurs in location or connection of equipment. Bear costs resulting from failure to properly coordinate installation or failure to advise Architect of conflict.

D. Submit final Coordination Drawings with changes as Record Drawings at completion of project.

1.8 WORK INCLUDED

A. Furnish and install sleeves, inserts and anchorage required for the installation, which are embedded in work of other trades. Sleeve, wrap and seal piping in concrete.

B. Electrical: For plumbing trim/devices/equipment, provide, from the line voltage connection by Division 26, the low voltage electrical connections and wiring as required for complete and operable system. Includes, but is not limited to: Low voltage electrical raceway, wiring and accessories, such as step-down transformers as necessary for function of sensors and automatic valve and faucet controls. Supply step-down transformers and size wiring as recommended by manufacturer of plumbing trim/faucets requiring electrical low voltage connection.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Articles, fixtures, and equipment of a kind to be standard product of one manufacturer, including but not limited to fixtures, pumps, drains and equipment.

2.2 STANDARDS OF MATERIALS AND WORKMANSHIP

A. Base contract upon furnishing materials as specified. Materials, equipment, and fixtures used for construction are to be new, latest products as listed in manufacturer's printed catalog data and are to be UL or ETL listed and labeled or be approved by State, County, and City authorities prior to procurement and installation.

B. Names and manufacturer's names denote character and quality of equipment desired and are not to be construed as limiting competition.

C. Hazardous Materials:
1. Comply with local, State of Oregon, and Federal regulations relating to hazardous materials.
2. Comply with Division 00, Procurement and Contracting Requirements and Division 01, General Requirements for this project relating to hazardous materials.
3. Do not use any materials containing a hazardous substance. If hazardous materials are encountered, do not disturb; immediately notify Owner and Architect. Hazardous materials will be removed by Owner under separate contract.

2.3 ACCESS PANELS

A. See Division 01, General Requirements and Division 08, Openings for products and installation requirements.

B. Confirm Access Panel requirements in Division 01, General Requirements, Division 08, Openings and individual Division 22, Plumbing Sections. In the absence of specific requirements, comply with the following:
1. Provide flush mounting access panels for service of systems and individual components requiring maintenance or inspection. Where access panels are located in fire-rated assemblies of building, rate access panels accordingly.
a. Ceiling access panels to be minimum 24-inch by 24-inch required and approved size.
b. Wall access panels to be minimum of 12-inch by 12-inch required and approved size.
c. Provide screwdriver operated catch.
d. Manufacturers and Models:
1) Drywall: Karp KDW.
2) Plaster: Karp DSC-214PL.
3) Masonry: Karp DSC-214M.

4) 2 hour rated: Karp KPF-350FR.
5) Milcor, Elmdor, Acudor, or approved equivalent.

PART 3 - EXECUTION

3.1 ACCESSIBILITY AND INSTALLATION

A. Confirm Accessibility and Installation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 22 00 00, Plumbing Basic Requirements and individual Division 22, Plumbing Sections.

B. Install equipment requiring access (i.e., drain pans, drains, control operators, valves, motors, cleanouts and water heaters) so that they may be serviced, reset, replaced or recalibrated by service people with normal service tools and equipment. Do not install equipment in obvious passageways, doorways, scuttles or crawlspaces which would impede or block intended usage.

C. Install equipment and products complete as directed by manufacturer's installation instructions. Obtain installation instructions from manufacturer prior to rough-in of equipment and examine instructions thoroughly. When requirements of installation instructions conflict with Contract Documents, request clarification from Architect prior to proceeding with installation. This includes proper installation methods, sequencing, and coordination with other trades and disciplines.

D. Earthwork:
1. Confirm Earthwork requirements in Contract Documents. In absence of specific requirements, comply with individual Division 22, Plumbing Sections and the following:
   a. Perform excavation, dewatering, shoring, bedding, and backfill required for installation of work in this Division in accordance with the provisions of related earthwork Sections/divisions. Contact utilities and locate existing utilities prior to excavation. Repair any work damaged during excavation or backfilling.
   b. Excavation: Do not excavate under footings, foundation bases, or retaining walls.
   c. Provide protection of underground systems. Review the project Geotechnical Report for references to corrosive or deleterious soils which will reduce the performance or service life of underground systems materials.

E. Firestopping:
1. Confirm Firestopping requirements in Division 07, Thermal and Moisture Protection. In absence of specific requirements, comply with individual Division 22, Plumbing Sections and the following:
   a. Coordinate location and protection level of fire and/or smoke rated walls, ceilings, and floors. When these assemblies are penetrated, seal around piping, ductwork and equipment with approved firestopping material. Install firestopping material complete as directed by manufacturer's installation instructions. Meet requirements of ASTM E814, Standard Test Method for Fire Tests of Through-Penetration Fire Stops.

F. Pipe Installation:

1. Provide installation of piping systems coordinated to account for expansion and contraction of piping materials and building as well as anticipated settlement or shrinkage of building. Install work to prevent damage to piping, equipment, and building and its contents. Provide piping offsets, loops, expansion joints, sleeves, anchors or other means to control pipe movement and minimize forces on piping. Verify anticipated settlement and/or shrinkage of building with Project Structural Engineer. Verify construction phasing, type of building construction products and rating for coordinating installation of piping systems.
2. Include provisions for servicing and removal of equipment without dismantling piping.

G. Plenums:
1. Provide plenum rated materials that meet the requirements to be installed in plenums. Immediately notify Architect/Engineer of discrepancy.

3.2 SEISMIC CONTROL

A. Confirm Seismic Control requirements in Division 01, General Requirements, Structural documents, Section 22 05 48, Vibration and Seismic Controls for Plumbing Piping and Equipment, and individual Division 22 Plumbing Sections.

B. Piping:
1. Per "Seismic Restraints Manual Guidelines for Mechanical Systems" latest edition published by SMACNA or local requirements.

C. Provide means to prohibit excessive motion of plumbing equipment during earthquake.

3.3 REVIEW AND OBSERVATION

A. Confirm Review and Observation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 22 00 00, Plumbing Basic Requirements and individual Division 22, Plumbing Sections.

B. Notify Architect, in writing, at following stages of construction so that they may, at their option, visit site for review and construction observation:
1. Underground piping installation prior to backfilling.
2. Prior to covering walls.
3. Prior to ceiling cover/installation.
4. When main systems, or portions of, are being tested and ready for inspection by AHJ.

C. Bear responsibility and cost to make piping accessible, to expose concealed lines, or to demonstrate acceptability of the system. If Contractor fails to notify Architect at times prescribed above, costs incurred by removal of such work are the responsibility of the Contractor.

D. Final Punch:

1. Prior to requesting a final punch visit from the Engineer, request from Engineer the Plumbing Precloseout Checklist, complete the checklist confirming completion of systems' installation, and return to Engineer. Request a final punch visit from the Engineer, upon Engineer's acceptance that the plumbing systems are ready for final punch.
2. Costs incurred by additional trips required due to incomplete systems will be the responsibility of the Contractor.

3.4 CUTTING AND PATCHING

A. Confirm Cutting and Patching requirements in Division 01, General Requirements. In absence of specific requirements, comply with individual Division 22, Plumbing Sections and the following:
   1. Proposed floor cutting/core drilling/sleeve locations to be approved by Project Structural Engineer. Submit proposed locations to Architect/Project Structural Engineer. Where slabs are of post tension construction, perform x-ray scan of proposed penetration locations and submit scan results including proposed penetration locations to Project Structural Engineer/Architect for approval. Where slabs are of waffle type construction, show column cap extent and cell locations relative to proposed penetration(s).
   2. Cutting, patching and repairing for work specified in this Division including plastering, masonry work, concrete work, carpentry work, and painting included under this Section will be performed by skilled craftspeople of each respective trade in conformance with appropriate Division of Work.
   3. Additional openings required in building construction to be made by drilling or cutting. Use of jack hammer is specifically prohibited. Patch openings in and through concrete and masonry with grout.
   4. Restore new or existing work that is cut and/or damaged to original condition. Patch and repair specifically where existing items have been removed. This includes repairing and painting walls, ceilings, etc. where existing piping and devices are removed as part of this project. Where alterations disturb lawns, paving, and walks, surfaces to be repaired, refinished and left in condition matching existing prior to commencement of work.
   5. Additional work required by lack of proper coordination will be provided at no additional cost to the Owner.

3.5 EQUIPMENT SELECTION AND SERVICEABILITY

A. Replace or reposition equipment which is too large or located incorrectly to permit servicing, at no additional cost to Owner.

3.6 DELIVERY, STORAGE AND HANDLING

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In absence of specific requirements, comply with individual Division 22, Plumbing Sections and the following:

1. Handle materials delivered to project site with care to avoid damage. Store materials on site inside building or protected from weather, dirt and construction dust. Insulation and lining that becomes wet from improper storage and handling to be replaced before installation. Products and/or materials that become damaged due to water, dirt and/or dust as a result of improper storage to be replaced before installation.
2. Protect equipment and pipe to avoid damage. Close pipe openings with caps or plugs. Keep motors and bearings in watertight and dustproof covers during entire course of installation.
3. Protect bright finished shafts, bearing housings and similar items until in service.

3.7 DEMONSTRATION

A. Confirm Demonstration requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 22 00 00, Plumbing Basic Requirements and individual Division 22, Plumbing Sections.

B. Upon completion of work and adjustment of equipment and test systems, demonstrate to Owner's Authorized Representative, Architect and Engineer that equipment furnished and installed or connected under provisions of these Specifications functions in manner required. Provide field instruction to Owner's Maintenance Staff as specified in Division 01, General Requirements, Section 22 00 00, Plumbing Basic Requirements and individual Division 22, Plumbing Sections.

C. Manufacturer's Field Services: Furnish services of a qualified person at time approved by Owner, to instruct maintenance personnel, correct defects or deficiencies, and demonstrate to satisfaction of Owner that entire system is operating in satisfactory manner and complies with requirements of other trades that may be required to complete work. Complete instruction and demonstration prior to final job site observations.

3.8 CLEANING

A. Confirm cleaning requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 22 00 00, Plumbing Basic Requirements and individual Division 22, Plumbing Sections.

B. Upon completion of installation, thoroughly clean exposed portions of equipment, removing temporary labels and traces of foreign substances. Throughout work, remove construction debris and surplus materials accumulated during work.

3.9 INSTALLATION

A. Confirm installation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 22 00 00, Plumbing Basic Requirements and individual Division 22, Plumbing Sections.

B. Install equipment and fixtures in accordance with manufacturer's installation instructions, plumb and level and firmly anchored to vibration isolators. Maintain manufacturer's recommended clearances.

C. Start up equipment, in accordance with manufacturer's start-up instructions, and in presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.
   1. Do not place equipment in sustained operation prior to initial balancing of plumbing systems.
   2. Provide pump impellers to obtain Basis of Design design capacities.

D. Provide miscellaneous supports/metals required for installation of equipment and piping.

3.10 PAINTING

A. Confirm requirements in Division 01, General Requirements and Division 09, Finishes. In absence of specific requirements, comply with individual Division 22, Plumbing Sections and the following:
   1. Ferrous Metal: After completion of plumbing work, thoroughly clean and paint exposed supports constructed of ferrous metal surfaces, i.e., hangers, hanger rods, equipment stands, with one coat of black asphalt for exterior or black enamel for interior, suitable for hot surfaces.
   2. In a mechanical room, on roof or other exposed areas, machinery and equipment not painted with enamel to receive two coats of primer and one coat of rustproof enamel, colors as selected by Architect.
   3. See individual equipment Specifications for other painting.
   4. Structural Steel: Repair damage to structural steel finishes or finishes of other materials damaged by cutting, welding or patching to match original.
   5. Piping: Clean, primer coat and paint exposed piping on roof or at other exterior locations with two coats paint suitable for metallic surfaces and exterior exposures. Color selected by Architect.
   6. Covers: Covers such as manholes, cleanouts and the like will be furnished with finishes which resist corrosion and rust.

3.11 ACCESS PANELS

A. Confirm Access Panel requirements in Division 01, General Requirements. In absence of specific requirements in Division 01, General Requirements, comply with individual Division 22, Plumbing Sections and the following:
   1. Coordinate locations/sizes of access panels with Architect prior to work. Label access panels with engraved nameplates indicating function of panel.

~~3.11~~3.12 ACCEPTANCE

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In absence of specific requirements, comply with individual Sections in Division 22, Plumbing and the following:
   1. System cannot be considered for acceptance until work is completed and demonstrated to Architect that installation is in strict compliance with Specifications, Drawings and manufacturer's installation instructions, particularly in reference to following:
      a. Testing and Balancing Reports
      b. Cleaning
      c. Operation and Maintenance Manuals
      d. Training of Operating Personnel
      e. Record Drawings
      f. Warranty and Guaranty Certificates
      g. Start-up/Test Document and Commissioning Reports

~~3.12~~3.13 FIELD QUALITY CONTROL

A. Confirm Field Quality Control requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 22 00 00, Plumbing Basic Requirements and individual Division 22, Plumbing Sections.

B. Tests:
   1. Conduct tests of equipment and systems to demonstrate compliance with requirements specified. Reference individual Specification Sections for required tests. Document tests and include in operation and maintenance manuals.
   2. During site evaluations by Architect or Engineer, provide appropriate personnel with tools to remove and replace trims, covers, and devices so that proper evaluation of installation can be performed.

~~3.13~~3.14 LETTER OF CONFORMANCE

A. Provide Letter of Conformance, copies of manufacturers' warranties and extended warranties with a statement that plumbing items were installed in accordance with manufacturer's recommendations, UL listings and FM Global approvals. Include Letter of Conformance, copies of manufacturers' warranties and extended warranties in Operation and Maintenance Manuals.

~~3.14~~3.15 ELECTRICAL INTERLOCKS

A. Where equipment motors are to be electrically interlocked with other equipment for simultaneous operation, utilize plumbing equipment wiring diagrams to coordinate with electrical systems so that proper wiring of equipment involved is affected.

END OF SECTION

SECTION 230000
HEATING, VENTILATING AND AIR CONDITIONING (HVAC) BASIC REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Work included in 23 00 00, HVAC Basic Requirements applies to Division 23, HVAC work to provide materials, labor, tools, permits, incidentals, and other services to provide and make ready for Owner's use of heating, ventilating and air conditioning systems for proposed project.

B. Contract Documents include, but are not limited to, Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Drawings, Addenda, Owner/Architect Agreement, and Owner/Contractor Agreement. Confirm requirements before commencement of work.

C. Definitions:
1. Provide: To furnish and install, complete and ready for intended use.
2. Furnish: Supply and deliver to project site, ready for unpacking, assembly and installation.
3. Install: Includes unloading, unpacking, assembling, erecting, installation, applying, finishing, protecting, cleaning and similar operations at project site as required to complete items of work provided.
4. Approved or Approved Equivalent: To possess the same performance qualities and characteristics and fulfill the utilitarian function without any decrease in quality, durability or longevity. For equipment/products defined by the Contractor as "equivalent", substitution requests must be submitted to Engineer for consideration, in accordance with Division 01, General Requirements, and approved by the Engineer prior to submitting bids for substituted items.
5. Authority Having Jurisdiction (AHJ): Indicates reviewing authorities, including local fire marshal, Owner's insurance underwriter, Owner's Authorized Representative, and other reviewing entity whose approval is required to obtain systems acceptance.

1.2 RELATED SECTIONS

A. Contents of Section applies to Division 23, HVAC Contract Documents.

B. Related Work:
1. Additional conditions apply to this Division including, but not limited to:
a. Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements.
b. Drawings

c. Addenda
d. Owner/Architect Agreement
e. Owner/Contractor Agreement
f. Codes, Standards, Public Ordinances and Permits

1.3 REFERENCES AND STANDARDS

A. References and Standards per Division 01, General Requirements, individual Division 23, HVAC Sections and those listed in this Section.

B. Codes to include latest adopted editions, including current amendments, supplements and local jurisdiction requirements in effect as of the date of the Contract Documents, of/from:
1. State of Oregon:
a. OAR - Oregon Administrative Rules
b. OESC - Oregon Electrical Specialty Code
c. OFC - Oregon Fire Code
d. OMSC - Oregon Mechanical Specialty Code
e. OPSC - Oregon Plumbing Specialty Code
f. OSSC - Oregon Structural Specialty Code
g. OEESC - Oregon Energy Efficiency Specialty Code

C. Reference standards and guidelines include but are not limited to the latest adopted editions from:
1. ABMA - American Bearing Manufacturers Association
2. ADA - Americans with Disabilities Act
3. AHRI - Air-Conditioning Heating & Refrigeration Institute
4. AMCA - Air Movement and Control Association
5. ANSI - American National Standards Institute
6. ASCE - American Society of Civil Engineers
7. ASHRAE - American Society of Heating, Refrigeration and Air-Conditioning Engineers
8. ASHRAE Guideline 0, The Commissioning Process
9. ASME - American Society of Mechanical Engineers
10. ASPE - American Society of Plumbing Engineers
11. ASSE - American Society of Sanitary Engineering
12. ASTM - ASTM International
13. AWWA - American Water Works Association
14. CFR - Code of Federal Regulations
15. CGA - Compressed Gas Association
16. CISPI - Cast Iron Soil Pipe Institute
17. EPA - Environmental Protection Agency
18. ETL - Electrical Testing Laboratories
19. FM - FM Global
20. GAMA - Gas Appliance Manufacturers Association
21. HI - Hydraulic Institute Standards
22. IAPMO - International Association of Plumbing & Mechanical Officials
23. IFGC - International Fuel Gas Code

24. ISO - International Organization for Standardization
25. MSS - Manufacturers Standardization Society
26. NEC - National Electric Code
27. NEMA - National Electrical Manufacturers Association
28. NFPA - National Fire Protection Association
29. NFGC - National Fuel Gas Code
30. NRCA - National Roofing Contractors Association
31. NSF - National Sanitation Foundation
32. OSHA - Occupational Safety and Health Administration
33. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association, Inc.
34. TEMA - Tubular Exchanger Manufacturers Association
35. TIMA - Thermal Insulation Manufacturers Association
36. UL - Underwriters Laboratories, Inc.

D. See Division 23, HVAC individual Sections for additional references.

1.4 SUBMITTALS

A. See Division 01, General Requirements for Submittal Procedures as well as specific individual Division 23, HVAC Sections.

B. Provide drawings in format and software release equal to the design documents. Drawings to be the same sheet size and scale as the Contract Documents.

C. In addition:
1. "No Exception Taken" constitutes that review is for general conformance with the design concept expressed in the Contract Documents for the limited purpose of checking for conformance with information given. Any action is subject to the requirements of the Contract Documents. Contractor is responsible for the dimensions and quantity and will confirm and correlate at the job site, fabrication processes and techniques of construction, coordination of the work with that of all other trades, and the satisfactory performance of the work.
2. Provide product submittals and shop drawings in electronic format only. Electronic format must be posted to ftp site and be native/searchable PDF format. Scanned copies are not acceptable. For electronic format, provide one file per division containing one bookmarked PDF file with each bookmark corresponding to each Specification Section. Arrange bookmarks in ascending order of Specification Section number. Individual submittals sent piecemeal in a per Specification Section method will be returned without review or comment. All transmissions/submissions to be submitted to Architect. At Contractor’s option, four separate submittals may be provided, consisting of long lead items, underground/site work, building work, and building automation system. Deviations will be returned without review.
3. Product Data: Provide Manufacturer's descriptive literature for products specified in Division 23, HVAC Sections.

4. Identify/mark each submittal in detail. Note what differences, if any, exist between the submitted item and the specified item. Failure to identify the differences will be considered cause for disapproval. If differences are not identified and/or not discovered during the submittal review process, Contractor remains responsible for providing equipment and materials that meet the Specifications and Drawings.
    a. Label submittal to match numbering/references as shown in Contract Documents. Highlight and label applicable information to individual equipment or cross out/remove extraneous data not applicable to submitted model. Clearly note options and accessories to be provided, including field installed items. Highlight connections by/to other trades.
    b. Include technical data, installation instructions and dimensioned drawings for products, fixtures, equipment and devices installed, furnished or provided. Reference individual Division 23, HVAC Specification Sections for specific items required in product data submittal outside of these requirements.
    c. Provide pump curves, operation characteristics, capacities, ambient noise criteria, etc. for equipment.
    d. For vibration isolation of equipment, list make and model selected with operating load and deflection.
    e. See Division 23, HVAC individual Sections for additional submittal requirements outside of these requirements.
5. Maximum of two reviews of submittal package. Arrange for additional reviews and/or early review of long-lead items; bear costs of these additional reviews at Engineer's hourly rates. Incomplete submittal packages/submittals will be returned to contractor without review.
6. Structural/Seismic: Provide weights, dimensions, mounting requirements and like information required for mounting, seismic bracing, and support. Indicate manufacturer's installation and support requirements to meet Section 23 05 48, Vibration and Seismic Controls for HVAC Equipment. Provide engineered seismic drawings and equipment seismic certification. Equipment Importance Factor as specified in Division 01 and in Structural documents.
7. Trade Coordination: Include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and connections as required by Division 23, HVAC Coordination Documents. For equipment with electrical connections, furnish copy of approved submittal for inclusion in Division 26, Electrical submittals.
8. Make provisions for openings in building for admittance of equipment prior to start of construction or ordering of equipment.
9. Substitutions and Variation from Basis of Design:
    a. The Basis of Design designated product establishes the qualities and characteristics for the evaluation of any comparable products by other listed acceptable manufacturers if included in this Specification or included in an approved Substitution Request as judged by the Design Professional.

b. If substitutions and/or equivalent equipment/products are being proposed, it is the responsibility of parties proposing the substitute and/or equivalent equipment to verify and compare the characteristics and requirements of that furnished to that specified and/or shown. If greater capacity and/or more materials and/or more labor is required for the rough-in, circuitry or connections than for the item specified and provided for, then provide compensation for additional charges required for the proper rough-in, circuitry and connections for the equipment being furnished. No additional charges above the Base Bid, including resulting charges for work performed under other Divisions, will be allowed for such revisions. Coordinate with the requirements of "Submittals." For any product marked "or approved equivalent," a substitution request must be submitted to Engineer for approval prior to bid.

10. Shop Drawings: Provide coordinated shop drawings which include physical characteristics of all systems, equipment, ductwork and piping layout plans, and control wiring diagrams. Reference individual Division 23, HVAC Specification Sections for additional requirements for shop drawings outside of these requirements.
    a. Provide Shop Drawings indicating access panel locations for items that require Code or maintenance access, size and elevation for approval prior to installation.
11. Samples: Provide samples when requested by individual Sections.
12. Resubmission Requirements:
    a. Make corrections or changes in submittals as required in response to Engineer’s comments. Provide a cover letter with resubmittal that includes responses to each of the Engineer’s submittal review comments and identifies changes in the resubmittal. Cloud changes in the submittals.
        1) Resubmit for review until review indicates “no exception taken” or “make corrections noted.”
        2) When submitting drawings for Engineer's re-review, clearly indicate changes on drawings and cloud any revisions. Submit a list describing each change.
13. Operation and Maintenance Manuals, Owner's Instructions:
    a. Submit, at one time, electronic files (PDF format) of manufacturer's operation and maintenance instruction manuals and parts lists for equipment or items requiring servicing. Submit data when work is substantially complete and in same order format as submittals. Include name and location of source parts and service for each piece of equipment.
        1) Include copy of approved submittal data along with submittal review letters received from Engineer. Data to clearly indicate installed equipment model numbers. Delete or cross out data pertaining to other equipment not specific to this project.
        2) Include copy of manufacturer's standard Operations and Maintenance for equipment. At front of each tab, provide routine maintenance documentation for scheduled equipment. Include manufacturer's recommended maintenance schedule and highlight maintenance required to maintain warranty. Furnish list of routine maintenance parts, including part numbers, sizes, quantities, relevant to each piece of equipment: belts, motors, lubricants, and filters.
        3) Include Warranty per Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 23 00 00, HVAC Basic Requirements and individual Sections.

4) Include product certificates of warranties and guarantees.
5) Include copy of complete parts list for equipment. Include available exploded views of assemblies and sub assemblies.
6) Include copy of startup and test reports specific to each piece of equipment.
7) Include copy of final air and water systems balancing log along with pump, fan and distribution system operating data.
8) Include commissioning reports.
9) Include copy of valve charts/schedules.
10) Engineer will return incomplete documentation without review. Engineer will provide one set of review comments in Submittal Review format. Contractor must arrange for additional reviews; Contractor to bear costs for additional reviews at Engineer's hourly rates.

b. Thoroughly instruct Owner in proper operation of equipment and systems. Where noted in individual Sections, training will include classroom instruction with applicable training aids and systems demonstrations. Field instruction per Section 23 00 00, HVAC Basic Requirements Article titled "Demonstration."
c. Copies of certificates of code authority inspections, acceptance, code required acceptance tests, letter of conformance and other special guarantees, certificates of warranties, specified elsewhere or indicated on Drawings.

14. Record Drawings:
a. Maintain at site at least one set of drawings for recording “As-constructed” conditions. Indicate on drawings changes to original documents by referencing revision document, and include buried elements, location of cleanouts, and location of concealed mechanical items. Include items changed by field orders, supplemental instructions, and constructed conditions.
b. Record Drawings are to include equipment and fixture/connection schedules, control dampers, fire smoke dampers, fire dampers, valves, bottom of pipe, duct and equipment elevations and dimensioned locations for all distribution systems (hydronic and air). Invert elevations and dimensioned locations for underground systems below grade to 5-feet outside building that accurately reflect "as constructed or installed" for project.
c. At completion of project, input changes to original project Revit Model and make one set of black-line drawings created from Revit model in version/release equal to contract drawings. Submit Revit model and drawings upon substantial completion.
d. See Division 23, HVAC individual Sections for additional items to include in record drawings.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Work and materials installed to conform with all local, State and Federal codes, and other applicable laws and regulations. Where code requirements are at variance with Contract Documents, meet code requirements as a minimum requirement and include costs necessary to meet these in Contract. Machinery and equipment are to comply with OSHA requirements, as currently revised and interpreted for equipment manufacturer requirements. Install equipment provided per manufacturer recommendations.

B. Whenever this Specification calls for material, workmanship, arrangement or construction of higher quality and/or capacity than that required by governing codes, higher quality and/or capacity take precedence.

C. Drawings are intended to be diagrammatic and reflect the Basis of Design manufacturer's equipment. They are not intended to show every item in its exact dimensions, or details of equipment or proposed systems layout. Verify actual dimensions of systems (i.e., piping) and equipment proposed to assure that systems and equipment will fit in available space. Contractor is responsible for design and construction costs incurred for equipment other than Basis of Design, including, but not limited to, architectural, structural, electrical, HVAC, fire sprinkler, and plumbing systems.

D. Manufacturer's Instructions: Follow manufacturers' written instructions. If in conflict with Contract Documents, obtain clarification. Notify Engineer/Architect, in writing, before starting work.

E. Items shown on Drawings are not necessarily included in Specifications or vice versa. Confirm requirements in all Contract Documents.

F. Provide products that are UL listed.

G. Piping and duct insulation products to contain less than 0.1 percent by weight PBDE in all insulating materials.

H. ASME Compliance: ASME listed water heaters and boilers with an input of 200,000 BTUH and higher, hot water storage tanks which exceed 120 gallons, and hot water expansion tanks which are connected to ASME rated equipment or required by code or local jurisdiction.

I. Provide safety controls required by National Boiler Code (ASME CSD 1) for boilers and water heaters with an input of 400,000 BTUH and higher.

1.6 WARRANTY

A. Provide written warranty covering the work for a period of one year from date of Substantial Completion in accordance with Division 00, Contracting and Procurement Requirements, Division 01, General Requirements, Section 23 00 00, HVAC Basic Requirements and individual Division 23, HVAC Sections.

B. Sections under this Division can require additional and/or extended warranties that apply beyond basic warranty under Division 01, General Requirements and the General Conditions. Confirm requirements in all Contract Documents.

1.7 COORDINATION DOCUMENTS

A. Prior to construction, prepare and submit coordinated layout drawings (composite drawings), to coordinate installation and location of ductwork, grilles, diffusers, piping, fire sprinklers, plumbing, lights, and electrical services. Composite Drawings show services on single sheet. Key Drawings to structural column identification system. Prior to completion of Drawings, coordinate proposed installation with architectural and structural requirements, and other trades (including plumbing, HVAC, fire protection, electrical, ceiling suspension, and ceiling tile systems, etc.), and provide maintenance access requirements. Coordinate with submitted architectural systems (i.e. roofing, ceiling, finishes) and structural systems as submitted, including footings and foundation. Identify zone of influence from footings and ensure systems are not routed within the zone of influence.

B. Prepare Drawings as follows:
   1. Drawings in Revit model. Revit model release equal to design documents. Drawings to be same sheet size and scale as Contract Drawings and indicate location, size, and elevation above finished floor of equipment and distribution systems.
   2. Review and revise, as necessary, section cuts in Contract Drawings after verification of field conditions.
   3. Indicate hydronic and air distribution system piping including fittings, hangers, access panels, valves, and bottom of pipe and duct elevations above finished floor.
   4. Indicate inverts and provision for piping that must be graded to have right-of-way over more flexible items. Drawings also to indicate proposed ceiling grid and lighting layout as shown on electrical drawings and architectural reflected ceiling drawings and HVAC equipment, ductwork and piping.
   5. Incorporate Addenda items and change orders.
   6. Distribute drawings to trades and provide additional coordination as requested by other trades.

C. Advise Architect in event conflict occurs in location or connection of equipment. Bear costs resulting from failure to properly coordinate installation or failure to advise Architect of conflict.

D. Submit final Coordination Drawings with changes as Record Drawings at completion of project.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Articles, fixtures, and equipment of a kind to be standard product of one manufacturer, including but not limited to pumps, fans, valves, control devices, air handlers, vibration isolation devices, etc.

2.2 STANDARDS OF MATERIALS AND WORKMANSHIP

A. Base contract upon furnishing materials as specified. Materials, equipment, and fixtures used for construction are to be new, latest products as listed in manufacturer's printed catalog data and are to be UL or ETL listed and labeled or be approved by State, County, and City authorities prior to procurement and installation.

B. Names and manufacturer's names denote character and quality of equipment desired and are not to be construed as limiting competition.

C. Hazardous Materials:
   1. Comply with local, State of Oregon, and Federal regulations relating to hazardous materials.
   2. Comply with Division 00, Procurement and Contracting Requirements and Division 01, General Requirements for this project relating to hazardous materials.
   3. Do not use any materials containing a hazardous substance. If hazardous materials are encountered, do not disturb; immediately notify Owner and Architect. Hazardous materials will be removed by Owner under separate contract.

2.3 ACCESS PANELS

A. See Division 01, General Requirements and Division 08, Openings for products and installation requirements.

B. Confirm Access Panel requirements in Division 01, General Requirements, Division 08, Openings and individual Division 23, HVAC Sections. In absence of specific requirements in Division 01, General Requirements, comply with the following:
   1. Provide flush mounting access panels for service of systems and individual components requiring maintenance or inspection. Where access panels are located in fire-rated assemblies of building, rate access panels accordingly.
      a. Ceiling access panels to be minimum 24-inch by 24-inch required and approved size.
      b. Wall access panels to be minimum of 12-inch by 12-inch required and approved size.
      c. Provide screwdriver operated catch.
      d. Manufacturers and Models:
         1) Drywall: Karp KDW.
         2) Plaster: Karp DSC-214PL.
         3) Masonry: Karp DSC-214M.
         4) 2 hour rated: Karp KPF-350FR.
         5) Manufacturers: Milcor, Elmdor, Acudor or approved equivalent.

PART 3 - EXECUTION

3.1 ACCESSIBILITY AND INSTALLATION

A. Confirm Accessibility and Installation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 23 00 00, HVAC Basic Requirements and individual Division 23, HVAC Sections.

B. Install equipment having components requiring access (i.e., drain pans, drains, control operators, valves, motors and vibration isolation devices) so that they may be serviced, reset, replaced or recalibrated by service people with normal service tools and equipment. Do not install equipment in obvious passageways, doorways, scuttles or crawlspaces which would impede or block intended usage.

C. Install equipment and products complete as directed by manufacturer's installation instructions including all appurtenances recommended in manufacturer's installation instructions, at no additional charge to Owner. Obtain installation instructions from manufacturer prior to rough-in of equipment and examine instructions thoroughly. When requirements of installation instructions conflict with Contract Documents, request clarification from Architect prior to proceeding with installation. This includes proper installation methods, sequencing and coordination with other trades and disciplines.

D. Earthwork:
   1. Confirm Earthwork requirements in Contract Documents. In absence of specific requirements, comply with individual Division 23, HVAC Sections and the following:
      a. Perform excavation, dewatering, shoring, bedding, and backfill required for installation of work in this Division in accordance with related earthwork Sections. Contact utilities and locate existing utilities prior to excavation. Repair any work damaged during excavation or backfilling.
      b. Excavation: Do not excavate under footings, foundation bases, or retaining walls.
      c. Provide protection of underground systems. Review the project Geotechnical Report for references to corrosive or deleterious soils which will reduce the performance or service life of underground systems materials.

E. Firestopping:
   1. Confirm Firestopping requirements in Division 07, Thermal and Moisture Protection. In absence of specific requirements, comply with individual Division 23, HVAC Sections and the following:
      a. Coordinate location and protection level of fire and/or smoke rated walls, ceilings, and floors. When these assemblies are penetrated, seal around piping, ductwork and equipment with approved firestopping material. Install firestopping material complete as directed by manufacturer's installation instructions. Meet requirements of ASTM E814, Standard Test Method for Fire Tests of Through-Penetration Fire Stops.

F. Pipe Installation:

1. Provide installation of piping systems coordinated to account for expansion and contraction of piping materials and building, as well as anticipated settlement or shrinkage of building. Install work to prevent damage to piping, equipment, and building and its contents. Provide piping offsets, loops, seismic flexible joints, expansion joints, sleeves, anchors or other means to control pipe movement and minimize forces on piping. Verify anticipated settlement and/or shrinkage of building with Project Structural Engineer. Verify construction phasing, type of building construction products and rating for coordinating installation of piping systems.
2. Include provisions for servicing and removal of equipment without dismantling piping.

G. Plenums:
1. Plenums: Materials within plenums shall be noncombustible or shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723. Immediately notify Architect/Engineer of any discrepancy.

H. Provide miscellaneous supports/metals required for installation of equipment, piping, and ductwork.

3.2 SEISMIC CONTROL

A. Confirm Seismic Control requirements in Division 01, General Requirements, Structural documents, Section 23 0548, Vibration and Seismic Controls for HVAC Equipment, and individual Division 23 HVAC Sections.

B. Piping and Ductwork:
1. Per "Seismic Restraints Manual Guidelines for Mechanical Systems" latest edition published by SMACNA or local requirements.

C. Provide means to prohibit excessive motion of mechanical equipment during earthquake.

3.3 REVIEW AND OBSERVATION

A. Confirm Review and Observation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 23 00 00, HVAC Basic Requirements and individual Division 23, HVAC Sections.

B. Notify Architect, in writing, at following stages of construction so that they may, at their option, visit site for review and construction observation:
1. Underground system installation prior to backfilling.
2. Prior to covering walls.
3. Prior to ceiling cover/installation.
4. After major equipment is installed.
5. When main systems, or portions of, are being tested and ready for inspection by AHJ.

C. Final Punch:

1. Prior to requesting a final punch visit from the Engineer, request from Engineer the Mechanical Precloseout Checklist, complete the checklist confirming completion of systems' installation, and return to Engineer. Request a final punch visit from the Engineer, upon Engineer's acceptance that the mechanical systems are ready for final punch.
2. Costs incurred by additional trips required due to incomplete systems will be the responsibility of the Contractor.

3.4 CUTTING AND PATCHING

A. Confirm Cutting and Patching requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In absence of specific requirements, comply with individual Division 23, HVAC Sections and the following:
   1. Proposed floor cutting/core drilling/sleeve locations to be approved by Project Structural Engineer. Submit proposed locations to Architect/Project Structural Engineer. Where slabs are of post tension construction, perform x-ray scan of proposed penetration locations and submit scan results including proposed penetration locations to Project Structural Engineer/Architect for approval. Where slabs are of waffle type construction, show column cap extent and cell locations relative to proposed penetration(s).
   2. Cutting, patching and repairing for work specified in this Division including plastering, masonry work, concrete work, carpentry work, and painting included under this Section will be performed by skilled craftspeople of each respective trade in conformance with appropriate Division of Work.
   3. Additional openings required in building construction to be made by drilling or cutting. Use of jack hammer is specifically prohibited. Patch openings in and through concrete and masonry with grout.
   4. Restore new or existing work that is cut and/or damaged to original condition. Patch and repair specifically where existing items have been removed. This includes repairing and painting walls, ceilings, etc. where existing conduit and devices are removed as part of this project. Where alterations disturb lawns, paving, and walks, surfaces to be repaired, refinished and left in condition matching existing prior to commencement of work.
   5. Additional work required by lack of proper coordination will be provided at no additional cost to the Owner.

3.5 EQUIPMENT SELECTION AND SERVICEABILITY

A. Replace or reposition equipment which is too large or located incorrectly to permit servicing, at no additional cost to Owner.

B. Maintain design intent where equipment other than as shown as Basis of Design in Contract Documents is provided. Where equipment requires ductwork or piping arrangement, controls/control diagrams, or sequencing different from that indicated in Contract Documents, provide at no additional cost to Owner.

3.6 DELIVERY, STORAGE AND HANDLING

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In absence of specific requirements, comply with individual Division 23, HVAC Sections and the following:
   1. Handle materials delivered to project site with care to avoid damage. Store materials on site inside building or protected from weather, dirt and construction dust. Insulation and lining that becomes wet from improper storage and handling to be replaced before installation. Products and/or materials that become damaged due to water, dirt, and/or dust as a result of improper storage to be replaced before installation.
   2. Protect equipment and pipe to avoid damage. Close pipe openings with caps or plugs. Keep motors and bearings in watertight and dustproof covers during entire course of installation.
   3. Protect bright finished shafts, bearing housings and similar items until in service.

3.7 DEMONSTRATION

A. Confirm Demonstration requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 23 00 00, HVAC Basic Requirements and individual Division 23, HVAC Sections.

B. Upon completion of work and adjustment of equipment and test systems, demonstrate to Owner's Authorized Representative, Architect and Engineer and Commissioning Agent that equipment furnished and installed or connected under provisions of these Specifications functions in manner required. Provide field instruction to Owner's Maintenance Staff as specified in Division 01, General Requirements, Section 23 00 00, HVAC Basic Requirements and individual Division 23, HVAC Sections.

C. Manufacturer's Field Services: Furnish services of a qualified person at time approved by Owner, to instruct maintenance personnel, correct defects or deficiencies, and demonstrate to satisfaction of Owner that entire system is operating in satisfactory manner and complies with requirements of other trades that may be required to complete work. Complete instruction and demonstration prior to final job site observations.

3.8 CLEANING

A. Confirm Cleaning requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 23 00 00, HVAC Basic Requirements and individual Division 23, HVAC Sections.

B. Upon completion of installation, thoroughly clean exposed portions of equipment, removing temporary labels and traces of foreign substances. Throughout work, remove construction debris and surplus materials accumulated during work.

3.9 START UP

A. Start up equipment, in accordance with manufacturer's start-up instructions and in presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.
   1. Do not place equipment in sustained operation prior to initial balancing of HVAC systems.

3.10 PAINTING

A. Confirm Painting requirements in Division 01, General Requirements and Division 09, Finishes. In absence of specific requirements, comply with individual Division 23, HVAC Sections and the following:
   1. Ferrous Metal: After completion of work, thoroughly clean and paint exposed supports constructed of ferrous metal surfaces in mechanical rooms, i.e., hangers, hanger rods, equipment stands, with one coat of black asphalt varnish for exterior or black enamel for interior, suitable for hot surfaces.
   2. After acceptance by Authority Having Jurisdiction (AHJ), In a mechanical room, on roof or other exposed areas, machinery and equipment not painted with enamel to receive two coats of primer and one coat of rustproof enamel, colors as selected by Architect.
   3. See individual equipment Specifications for other painting.
   4. Structural Steel: Repair damage to structural steel finishes or finishes of other materials damaged by cutting, welding or patching to match original.
   5. Piping and Ductwork: Clean, primer coat and paint exposed piping and ductwork on roof or at other exterior locations with two coats paint suitable for metallic surfaces and exterior exposures. Color selected by Architect.
   6. Covers: Covers such as manholes, cleanouts and the like will be furnished with finishes which resist corrosion and rust.

3.11 ACCESS PANELS

A. Confirm Access Panel requirements in Division 01, General Requirements. In absence of specific requirements, comply with individual Division 23, HVAC Sections and the following:
   1. Coordinate locations/sizes of access panels with Architect prior to work.

~~3.11~~3.12 ACCEPTANCE

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In absence of specific requirements, comply with individual Division 23, HVAC Sections and the following:
   1. System cannot be considered for acceptance until work is completed and demonstrated to Architect that installation is in strict compliance with Specifications, Drawings and manufacturer's installation instructions, particularly in reference to following:
      a. Testing and Balancing Reports

b. Cleaning
c. Operation and Maintenance Manuals
d. Training of Operating Personnel
e. Record Drawings
f. Warranty and Guaranty Certificates
g. Start-up/Test Document
h. Commissioning Reports

~~3.12~~3.13 FIELD QUALITY CONTROL

A. Confirm Field Quality Control requirements in Division 01, General Requirements, Section 23 00 00, HVAC Basic Requirements and individual Division 23, HVAC Sections.

B. Tests:
1. Conduct tests of equipment and systems to demonstrate compliance with requirements specified. Reference individual Specification Sections for required tests. Document tests and include in Operation and Maintenance Manuals.
2. During site evaluations by Architect or Engineer, provide appropriate personnel with tools to remove and replace trims, covers, and devices so that proper evaluation of installation can be performed.

~~3.13~~3.14 LETTER OF CONFORMANCE

A. Provide Letter of Conformance, copies of manufacturers' warranties and extended warranties with a statement that HVAC items were installed in accordance with manufacturer's recommendations, UL listings and FM Global approvals. Include Letter of Conformance, copies of manufacturers' warranties and extended warranties in Operation and Maintenance Manuals.

~~3.14~~3.15 ELECTRICAL INTERLOCKS

A. Where equipment motors are to be electrically interlocked with other equipment for simultaneous operation, utilize equipment wiring diagrams to coordinate with electrical systems so that proper wiring of equipment involved is affected.

~~3.15~~3.16 TEMPORARY HEATING, COOLING AND HUMIDITY CONTROL

A. Provide temporary heating, cooling, controls, humidification and dehumidification as required to facilitate the construction of the project. Size and select temporary system based on the requirements of the various trades during construction. This includes, but is not limited to, drywall, case work, wood flooring and wood finishes that are subject to warping. Size and install system to prevent mold growth. Coordinate the location of the temporary system. The house system can be used. Develop a procedure for how the house system will be used including a sketch depicting the house system, how filtration will be used to prevent construction debris from entering the system and how often the filters will be changed, how the ductwork will be cleaned after use to ensure a clean system is turned over to the Owner and how the units are sized. Submit this procedure to the Mechanical Engineer for review. Follow National Air Duct Cleaners Association (NADCA) duct cleaning procedures and guidelines. Warranties for the house system, if new, to commence when the Owner moves in if house system is used as the means to maintain the climate within the building during construction. Include this warranty requirement in the original bid or proposal amount. Coordinate and provide any temporary power, controls, ductwork, piping, plumbing anchorage, miscellaneous steel and structural supports required to support the temporary system. Installation of the system to comply with all applicable codes and be acceptable to the Authority Having Jurisdiction (AHJ).

END OF SECTION

SECTION 230900
INSTRUMENTATION AND CONTROL PERFORMANCE SPECIFICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. The campus has an existing building automation system, provided and/or maintained by Niagara Operating System, by Tridium. Expand the existing building automation system to control new equipment associated with this project.

B. Work Included:
1. Communications
2. Operator Interface
3. Controller Software
4. Web Based Access
5. BAS Graphics
6. Building Controllers
7. Application Specific Controllers
8. Application Specific Controller - Terminal Unit Controllers
9. Input/Output Interface
10. Power Supplies and Line Filtering
11. Control Panels
12. Auxiliary Control Devices
13. Wiring and Raceways
14. Smoke Detection for Projects with a Building Fire Alarm System

C. This is a performance specification and Contractor is responsible for design tasks and engineering.

1.2 RELATED SECTIONS

A. Contents of Division 23, HVAC and Division 01, General Requirements apply to this Section.

1.3 REFERENCES AND STANDARDS

A. References and Standards as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

B. In addition, meet the following:
1. Current edition of ANSI/ASHRAE Standard 135 and addendum, BACnet.

2. Current edition of UL 916 Underwriters Laboratories Standard for Energy Management Equipment, Canada and the US.
3. Current edition of FCC Part 15, Subpart J, Class A.
4. Current edition of BACnet Testing Laboratories (BTL).

1.4 SUBMITTALS

A. Submittals as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

B. In addition, provide:
   1. Prepare and submit a detailed schedule of work. Schedule to identify milestones such as equipment submittals, control panel diagrams, color graphic panel displays, Interlock.
   2. Wiring diagrams, control program sequence software flow chart diagrams, conduit layout diagrams, device location diagrams, equipment and component deliveries, installation sequencing, controller startup, point to point startup, control programming, sequence testing, commissioning/acceptance testing and training.
   3. Submit design drawings, sequences of operation, program listings, software flow charts and details for each typical piece of equipment and system being controlled. No work to be initiated or fabrication of any equipment started prior to the Owner's Authorized Representatives return of REVIEWED submittals.
      a. Sequence of Operation: The sequence of operation included in the design documents is intended only to communicate the Engineers' general control intent and is not to be used as a direct reference for programming of the EMS system. Verbatim duplication of the Engineer's Sequence of Operation on the submittals is discouraged and may result in non-approval of the submittal. Sequence of operation on submittals to accurately detail the system's intended programming, and include details of enhancements, adjustments, or deviations from the Engineer's sequence of operation. Submitted sequence of operation to be written with a logical and organized format and flow. Provide detailed, clear and unambiguous sequence of operation language. Point descriptors and point nomenclature referenced in the submitted sequence of operation to match those (to be) actually programmed. As-built submittal Sequence of Operation to include modifications to the programming made as a result of any addendum, bulletins, RFI's, change orders, and commissioning.
   4. Format: Make each submittal in one complete and contiguous package. Partial or unmarked submittals will be rejected without review.
   5. Submit Manufacturers Data as Follows:
      a. Complete materials list of items proposed to be furnished and installed. A complete Bill of Materials, listing materials, components, devices, wire and equipment are required for this work. The Bill of Materials to be separate for each controller on its own page(s) and to contain the following information for each item listed:
         1) Manufacturer's Name and Model number with furnished options highlighted.
         2) Quantity of each by controller location.
         3) Description of product (generic).
         4) Specified item.

5) Operating range or span.
6) Operating point or setpoint.

b. Manufacturer's specifications and other data required demonstrating compliance with the specified requirements, including but not limited to: Catalog cuts, technical data and descriptive literature on hardware, software, and system components to be furnished.
c. The data to be clearly marked and noted to identify specific ranges, model numbers, sizes, and other pertinent data. Submit printed manufacturer's technical product data for each control device furnished, indicating dimensions, capacities, performance characteristics, electrical characteristics, finishes of materials and including printed installation instructions and start-up instructions.
d. Unless specifically called for otherwise, provide bound copies of catalog cuts for standard products, not requiring specifically prepared Shop Drawings, for the following:
   1) Wire and Cable, Class II
   2) Face Plates for Devices
   3) Disconnect Switches for Power Control
e. Where more than one item, size, rating or other variations appear on a catalog cut sheet, clearly identify items to be provided. These items to be properly indexed and referenced to identification numbers, designations and/or details on the Drawings.

6. Shop Drawings: Submit shop drawings for each controlled system, depicting the following information:
   a. Schematic flow diagram of system showing fans, pumps, coils, dampers, valves and other control/monitoring devices.
   b. Label each control device with initial setting or adjustable range of control. Label points in schematic diagrams with termination at corresponding controller.
   c. Electrical Wiring: Clearly differentiate between portions of wiring that are factory installed and portions of be field-installed.
   d. Details of control panel faces, including controls, instruments, and labeling.
   e. Interfaces to equipment furnished under other Specification Sections identifying numbers of wires, termination location, voltages and pertinent details. Responsibility for each end of the interfaces to be noted on these drawings whether or not they are a part of this Section.
   f. System architecture diagram showing the global connectivity of new controllers and any existing systems that will be connected to.
7. Equipment locations, wiring and piping schematics, details, panel configurations, sizes, damper motor mounting details, valve schedules, and a points list keyed to specific hardware submittals. Control wiring depicted as fully annotated ladder diagrams with terminations identified, completely configured as to the exact panel, wiring, relay, switch, and component configuration.
8. Tag Number Lists: Develop instruments tag number system and submit list for approval. Coordinate methods and number block with the Owner's Authorized Representative.
9. Format the Shop and Field Drawings to Include:
   a. A Title Sheet containing a drawing list, abbreviations list, symbols list, site and vicinity maps for project location and schedules.
   b. Floor Plans showing proposed device locations and device nomenclatures.

c. A Riser Diagram illustrating conduit relationships between devices shown on the Floor Plans. Show device nomenclatures.
d. A Single-Line Diagram for each system showing signal relationships of devices within the system. Show device nomenclatures.
e. A Wiring Diagram for each assembly, enclosure or free standing device, showing:
    1) The Devices Within
    2) Wiring Connections
    3) Wire Identification
    4) Voltage Levels
    5) Fuse Ratings
f. Operations and Maintenance Manuals:
    1) Following approval of Shop Drawings of control equipment and prior to acceptance of control work, prepare Operating and Maintenance manuals describing operating, servicing, and maintenance requirements of control systems and equipment installed under this Section, in accordance with the General and Special Conditions of these Specifications.
    2) Information contained in the manual for the above equipment to include the following:
        (a) Manufacturer's catalog cuts and printed descriptive bulletins.
        (b) Manufacturer's installation, operating, and maintenance instruction booklets. Complete instructions regarding the operation and maintenance of equipment involved.
        (c) Instrument calibration certificates.
        (d) Parts list and costs.
        (e) Complete nomenclature of replaceable parts, list of recommended spare parts for 12 months operation, their part numbers, current cost and name and address of the nearest vendor of replacement parts.
        (f) Name, address and telephone number for closest source of spare parts.
        (g) Wiring and schematic diagrams.
        (h) Include final record copies of shop drawings.
        (i) Copy of guarantees and warranties issued for the various items of equipment, showing dates of expiration.
        (j) Reduced plans, diagrams, and control schematics.
        (k) Copies of test results.
        (l) Control System Operating Manual including: point of summary and point data base; complete printout of program listings; magnetic tape CD or DVD backup of Field Control Cabinet programs; cabinet layout; hard copy of graphic screens; hard copy of specified reports.
g. A final Bill of Quantities including a separate schedule for portable equipment, if delivered as part of this work.
h. Performance, Test and Adjustment Data: Comprehensive documentation of performance verification according to parameters specified in these specifications.
i. Record Drawings: Comply with Division 01, General Requirements and Section 23 00 00, HVAC Basic Requirements. Provide complete as-built submittals including "as-programmed" sequence of operation as well as final occupancy schedules.

1.5 QUALITY ASSURANCE

A. Quality assurance as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

B. In addition, meet the following:
   1. Installer Qualifications: Company specializing in performing work of the type specified in this Section with minimum five years' experience in the local area. Installers required to have successfully completed manufacturer's control system factory training.

1.6 WARRANTY

A. Warranty of materials and workmanship as required by Section 23 00 00, HVAC Basic Requirements and Division 01, General Requirements.

1.7 SYSTEM DESCRIPTION

A. Control system referenced throughout specifications and drawings as Building Automation System (BAS), Building Management System (BMS), or Energy Management System (EMS) interchangeably consists of high-speed, peer-to-peer network of DDC controllers, control system server, and operator workstation.

B. System software based on server/thin-client architecture, designed around open standards of web technology. Control system server accessed using a web browser over control system network, Owner's local area network, and remotely over Internet (through Owner's LAN). Intent of thin-client architecture is to provide operators complete access to control system via web browser. No special software other than web browser required to access graphics, point displays, and trends.

C. Local Area Network (LAN) either 10 or 100 Mpbs Ethernet network.

D. System will consist of open architecture that is capable of:
   1. High speed Ethernet communication using TCP/IP protocol.
   2. Native BACnet communications according to ANSI / ASHRAE Standard 135, latest edition. Provide necessary BACnet-compliant hardware and software to meet the system's functional specifications. Controller devices must be BTL tested and listed by an official BACnet Testing Laboratory and have the BTL mark issued.

E. Complete temperature control system to be DDC with electronic sensors and electronic/electric actuation valves and dampers.

F. Prepare individual hardware layouts, interconnection drawings, building riser/architecture diagram and sequence of control from the project design data. Any architecture diagrams on design drawings have been included as schematics only and are not meant to portray quantity of devices or power/data requirements.

G. Design, furnish, and install equipment cabinets, panels, data communication network infrastructure (including cables, conduits, outlets, connections, etc.) needed, and associated hardware.

H. Provide complete manufacturer's specifications for items that are supplied. Include vendor name and model number of every item supplied.

I. Provide a comprehensive operator and technician training program as described in these Specifications.

J. Provide as-built documentation, operator's terminal software, diagrams, and other associated project operational documentation (such as technical manuals) on approved media, the sum total of which accurately represents the final system.

K. Provide 120V power, low voltage power, transformers, etc. for control panels, transformer panels, and BAS devices. Install per Division 26, Electrical Specifications. Power for devices within this Specification Section is solely the responsibility of the BAS Contractor.

L. Conduit and raceway systems. Provide per Division 26, Electrical Specifications.

M. Devices, components, controllers, and software to be manufacturer's most current version at the time of installation.

1.8 SYSTEM PERFORMANCE

A. Performance Standards - System conforms to following minimum standards over network connections:
   1. Graphic Display: Graphic with 20 dynamic points display with current data within 10 seconds.
   2. Graphic Refresh: Graphic with 20 dynamic points update with current data within 8 seconds.
   3. Object Command: Devices react to command of binary object within 2 seconds. Devices begin reacting to command of analog object within 2 seconds.
   4. Object Scan: Data used or displayed at controller or workstation have been current within previous 6 seconds.
   5. Alarm Response Time: Object that goes into alarm is annunciated at workstation within 45 seconds.
   6. Program Execution Frequency: Custom and standard applications are capable of running as often as once every 5 seconds. Select execution times consistent with mechanical process under control.
   7. Performance: Programmable controllers are able to completely execute DDC PID control loops at frequency adjustable down to once per second. Select execution times consistent with mechanical process under control.
   8. Multiple Alarm Annunciation: Each workstation on network receive alarms within 5 seconds of other workstations.

B. Reporting Accuracy: System reports values with minimum end-to-end accuracy listed in Reporting Accuracy Table below.
   1. Reporting Accuracy Table:

Measure Variable	Reported Accuracy
Space Temperature	Plus or Minus 1 degree F
Ducted Air	Plus or Minus 1 degrees F
Outside Air	Plus or Minus 2 degrees F
Dew Point	Plus or Minus 3 degrees F
Delta-T	Plus or Minus 0.25 degree F
Relative Humidity	Plus or Minus 5 percent RH

   2. Note 1: Accuracy applies to 10 percent-100 percent of scale
   3. Note 2: For both absolute and differential pressure
   4. Note 3: Not including utility-supplied meters

C. Control Stability and Accuracy. Control loops maintain measured variable at setpoint within tolerances listed in Control Stability and Accuracy Table below.
   1. Control Stability and Accuracy Table:

Controlled Variable	Control Accuracy	Range of Medium
Air Pressure	Plus or minus 0.2 inch wg	0-6 inch wg
	Plus or minus 0.01 inch wg	-0.1 to 0.1 inch wg
Airflow	Plus or minus 10 percent of full scale	
Space Temperature	Plus or minus 2.00 degrees F	
Duct Temperature	Plus or minus 3.0 degrees F	
Humidity	Plus or minus 5 percent RH	

PART 2 - PRODUCTS

2.1 OREGON/WASHINGTON MANUFACTURERS

A. Niagara Operating System, by Tridium

B. Duct/Spot-Type Smoke Detectors (Project with Fire Alarm System):
   1. See Division 28 for Products.

2.2 COMMUNICATIONS

A. Each controller to have communication port for connection to operator interface.
   1. Internetwork operator interface and value passing to be transparent to internetwork architecture.

2. Operator interface connected to controller to allow operator to interface with each internetwork controller as if directly connected. Controller information such as data, status, reports, system software, and custom programs to be viewable and editable from each internetwork controller.

B. Inputs, outputs, and control variables used to integrate control strategies across multiple controllers to be readable by each controller on internetwork.

C. Operator Workstation to be capable of simultaneous direct connection and communication with BACnet/IP, OPC and TCP/IP networks without use of interposing devices such as PC or gateway with hard drive.

D. Workstations, Building Control Panels and Controllers with real-time clocks use time synchronization service. System automatically synchronizes system clocks daily from operator-designated device via internetwork. System automatically adjusts for daylight saving and standard time as applicable.

E. Wireless Network Communications:
1. Wireless communications take place using modular wireless transceivers at each device, which eliminates need for communication cabling.
2. Wireless transceiver utilizes 2.4 GHz in license free global Industrial Scientific and Medical (ISM) band.
3. Wireless transceiver is encased in plenum-rated enclosure. If application dictates, wireless transceiver is able to be installed in metal enclosure utilizing remote mounted antenna.
4. Wireless transceiver channel is factory set and capable of being field set to different channel if interference with IEEE 802.11 devices or other 2.4 GHz products is encountered.
5. Wireless transceiver is 24 VAC powered.
6. Wireless transceiver gives a visual indication that it is powered and communicating.
7. Wireless transceiver has a field-settable network identifier that allows multiple networks to occupy same channel for maximum scalability.

2.3 OPERATOR INTERFACE

A. Operator Interface: PC-based workstations reside on high-speed network with building controllers. Each workstation or each standard browser connected to server is able to access system information.

B. Hardware: Each operator workstation or web server consists of the following:
1. Computer: Hardware meets or exceeds DDC system manufacturer's recommended specifications and meet response times specified elsewhere in this document. Following hardware requirements also apply:
a. Hard disk have sufficient memory to store:
1) Required operator workstation software.
2) One year of trend data based on points specified to be trended at specified trend intervals.

b. Minimum hardware configuration includes:
    1) Intel i7 Processor
    2) 22-in LCD Monitor with at least 1024 x 768 Resolution
    3) 8 GB of RAM
    4) 48x CD-RW/DVD Optical Drive
    5) 1 TB Hard Disk Drive Providing Data at 3 GB/sec
    6) Ethernet 10/100 Network Interface Card
    7) High Performance Graphics Card
    8) Keyboard and Mouse
    9) Color Inkjet Printer
    10) UPS (uninterruptible power supply) installed at server, sized with sufficient capacity to allow full operation for 10 minutes or more.

C. System Software:
1. Operating System: Furnish concurrent multi-tasking operating system. Operating system also supports use of and includes other common software applications such as Microsoft Excel, Word, Microsoft Access and Adobe Acrobat. Acceptable operating systems are Windows 10 and Windows 11.
2. Dynamic Color Graphics:
    a. Real-time color graphic displays dynamic and able to update displays.
    b. Provide operator ability to change values (setpoints) and states in system controlled equipment directly from graphic display.
    c. Custom Graphics. Provide custom graphics generation package.
    d. Graphics Library. Furnish library of standard HVAC equipment graphics and include standard symbols for fans, pumps, coils, valves, piping, dampers, and ductwork.
3. Software to be manufacturer's most current version at the time of installation.

D. System Applications: Each workstation provides operator interface and offline storage of system information. Provide following applications at each workstation:
1. Automatic System Database Save and Restore: Each workstation stores on hard disk copy of current database of each Building Controller. This database automatically updated whenever change is made in any system panel.
2. Manual Database Save and Restore: System operator able to manually save or clear database and initiate download of specified database from/to any panel.
3. System Configuration: Workstation software provides method of configuring system to allow for changes or additions by users and performs following tasks:
    a. Create, delete or modify control strategies.
    b. Add/delete objects to system.
    c. Tune control loops through adjustment of control loop parameters.
    d. Enable or disable control strategies.
    e. Generate hard copy records of control strategies on printer.
    f. Select points to be alarmed and define alarm state.
    g. Select points to be trended and initiate automatic recording of values.
    h. Start/Stop binary objects and adjust analog objects.
4. Security: Operator required to log on to system with user name and password in order to view, edit, add, or delete data. System security selectable for each operator.

5. System Diagnostics: System automatically monitor operation of workstations, printers, modems, network connections, building management panels, and controllers. Failure of any device to be annunciated.
6. Alarm Indication and Handling:
    a. Workstation provides visual means of alarm indication. Alarm indication becomes highest priority regardless of application(s) running.
    b. System provides and archive log of alarm messages to hard drive. Alarm messages to include description of event-initiating object, source, location and time/date of alarm.
7. Trend Logs: Operator able to define custom trend log for any data object and include interval, start time, and stop time. Trend data sampled and stored on building controller panel, is archived on hard disk, and is retrievable for use in spreadsheets and standard database programs.
    a. System server to periodically gather historically recorded data stored in the building controllers and archive the information. Archived files to be appended with new sample data, allowing samples to be accumulated.
    b. Software to be included that is capable of graphing the trend logged object data. Software capable of creating two-axis (x,y) graphs that display object values relative to time.
    c. Operator able to change trend log setup information. This includes the information to be logged as well as the interval at which it is to be logged. Input, output, and value object types in the system may be logged. Provide operations password protected. Setup and viewing may be accessed directly from any graphics on which object is displayed.
    d. BAS Contractor to enable trending for any system points (physical or virtual) as directed by the Engineer, Owner or Cx Authority (Commissioning Authority). There will be no limit on the number of trended points the BAS Contractor is to set up. BAS Contractor will modify trend setup parameters as directed by the Commissioning Authority during testing. BAS Contractor to be proactive and enable trending for major system points during system startup/programming. BAS Contractor is not to wait for direction to begin trending points. Trend data for each point to be archived on the main server for a minimum of one year. Trend data archiving to be enabled immediately upon trend setup, or as soon as communication between the field panel and sever is established. Trend data uploads from field panel to server set up to be automatically performed with sufficient frequency to ensure no data gaps or loss of trend data.
    e. Trend points as identified in the points list. Provide system specific trend data in two-axis (x,y) graphs that display object values relative to time to Engineer, Owner, or Commissioning Authority.
8. Standard Reports: Standard system reports provided for this project. Provide ability for Owner to readily customize these reports for this project:
    a. Objects: System (or subsystem) objects and their current values.
    b. Logs:
        1) Alarm History
        2) System Messages
        3) System Events
        4) Trends

E. Interfaces to Third Party Systems: BAS connects to third party systems (VFDs, chillers, emergency generators, rooftop AC units, etc). Communication protocol specified for third party system, and BAS provides compatible protocol to assure proper two way communication. Points, alarms, and commands displayed on BAS as indicated.

F. Workstation Applications Editors: Each PC workstation supports editing of system applications, which downloaded and executed at one or more controller panels.

2.4 CONTROLLER SOFTWARE

A. Furnish following applications software for building and energy management. Software applications reside and operate in system controllers. Software to be manufacturer's most current version at the time of installation. Software and associated functions (scheduling, optimum start/stop, etc.) noted in this specification are to be configured and enabled for this project. Incorporate into sequence of operation submittals for review prior to installation.

B. System Security:
   1. User access secured using individual security passwords and user names.
   2. Restrict user passwords to objects, applications, and system functions as assigned by system manager. Provide monitoring only access to Engineer of Record and Commissioning Authority for period of one year for trouble shooting purposes.
   3. Record user Log On/Log Off attempts.
   4. Provide passwords, user names, and access assignments adjustable at the operator's terminal. Each user to have a set security level, which defines access to displays and individual objects the user may control. System to include ten separate and distinct security levels for assignment to users.
   5. System to include an Auto Logout Feature that will automatically logout user when there has been no keyboard or mouse activity for a set period of time. Time period to be adjustable by System Administrator. Auto Logout may be enabled and disabled by System Administrator. Operator terminal to display message on screen that user is logged out after Auto Logout occurs.

C. Scheduling: Provide capability to schedule each object or group of objects in system. Coordinate schedule with Owner and program accordingly. Each schedule consists of:
   1. Operator's workstation to show information in easy-to-read daily format. Priority for scheduling: Events, holidays and daily with events being the highest.
   2. Holiday and special event schedules to display data in calendar format. Operator able to schedule holidays and special events directly from these calendars.
   3. Operator able to change information for a given weekly or exception schedule if logged on with the appropriate security access.

D. Optimum Start/Stop: Provide software and program system to start equipment on sliding schedule based upon indoor and outdoor conditions. Determine minimum time of HVAC system operation needed to satisfy space environmental requirements and also determine earliest possible time to stop mechanical systems (i.e. shut down cooling/heating and only provide ventilation one hour prior to scheduled unoccupied period). Optimum start/stop program operates in conjunction with scheduled start/stop and night setback programs.

E. Alarms:
   1. Operator's workstation to provide visual means of alarm indication. The alarm dialog box to always become the top dialog box regardless of the application(s), currently running.
   2. System to provide log of alarm messages. Alarm log to be archived to the hard disk of the system operator's terminal. Each entry to include a description of the event-initiating object generating the alarm. Entry to include time and date of alarm occurrence.
   3. Alarm messages in user-definable text and entered either at the operator's terminal or via remote communication.
   4. Each binary object set to alarm based on operator-specified state.
   5. Each analog object is to have both high and low alarm limits.
   6. Alarms must be able to be automatically and manually disabled.
   7. Alarms are routed to appropriate workstations based on time and other conditions. An alarm is able to start programs, print, be logged in event log, generate custom messages, and display graphics.
   8. System have ability to dial out in event of alarm.
   9. Alarm Levels:
      a. Provide 5 levels of alarm as follows, and program alarm levels for every required and specified alarm:
         1) Level 1: Critical/life safety.
         2) Level 2: Significant equipment failure.
         3) Level 3: Non-critical equipment failure/operation.
         4) Level 4: Energy conservation monitor.
         5) Level 5: Maintenance indication, notification.
      b. Prior to training of Owner’s Authorized Representative, submit the complete Points List and suggested Alarm Levels to the Owner.
      c. During training of Owner’s Authorized Representative(s):
         1) Discuss Alarm Levels and the alarms currently included in the BAS.
         2) Provide additional alarms without addition of new hardware points, as required by Owner’s Authorized Representative.
         3) Agree with the Owner’s Authorized Representative on action(s) to be taken for each alarm level and implement same for each alarm. Said action to include visual and/or audible alarm(s) at the Operator workstation including whether Operator acknowledgement is required or not, email messages, and text messages.

F. Demand Limiting:

1. System to include demand limiting program that includes two types of load shedding. One type of load shedding to shed/restore equipment in binary fashion based on energy usage when compared to shed and restore settings. The other type of shedding to adjust operator selected control setpoints in an analog fashion based on energy usage when compared to shed and restore settings. Shedding may be implemented independently on each and every zone or piece of equipment connected to system.
2. Status of each and every load shed program capable of being displayed on every operator terminal connected to system. Status of each load assigned to an individual shed program displayed along with the description of each load.
3. Demand-limiting program monitor building power consumption from signals generated by pulse generator (provided by BAS contractor) mounted at building power meter or from watt transducer or current transformer attached to building feeder lines.
4. Demand-limiting program predicts probable power demand so that when demand exceeds demand limit, action will be taken to reduce loads in predetermined manner. When demand limit will not be exceeded, action will be taken to restore loads in predetermined manner.

G. Maintenance Management: System monitors equipment status and generate maintenance messages based upon user-designated run-time, starts, and/or calendar date limits. Coordinate settings with Owner.

H. Sequencing: Provide application software based upon sequences of operation specified to properly sequence designated systems. Provide points to achieve specified sequences.

I. Staggered Start: This application prevents controlled equipment from simultaneously restarting after a power outage. Order in which equipment (or groups of equipment) is started, along with time delay between starts to be user-selectable.

J. Energy Calculations: Provide software to allow instantaneous power (e.g. kW) or flow rates (e.g. L/s (gpm)) to be accumulated and converted to energy usage data.

K. Anti-Short Cycling: Binary output objects protected from short cycling by allowing minimum on-time and off-time to be selected.

L. On/Off Control with Differential: Provide algorithm that allows binary output to be cycled based on controlled variable and setpoint. Algorithm direct-acting or reverse-acting and incorporate adjustable differential.

M. Run-Time Totalization: Provide software to totalize run-times for binary input objects.

2.5 WEB BASED ACCESS

A. General Description: BAS supplier to provide web-based access to the system as part of standard installation. Provide access to user of displays of real-time data that are part of the BAS via a standard web browser. Web browser to tie into the network via Ethernet network connection. Provide web-page host that resides on the BAS network. Web page software not to require a per user licensing fee or annual fees. The web page host must be able to support at least 50 simultaneous users with the ability to expand the system to accommodate an unlimited number of users. Software to be manufacturer's most current version at time of installation.

B. Browser Technology: Browser to be standard version of Microsoft Edge (latest edition). No special vendor-supplied software needed on computers running browser. Displays viewable and the web page host to directly access real-time data from the BAS network. Data displayed in real time and update automatically without user interaction. User able to change data on displays if logged in with the appropriate user name and password.

C. Display of Data: Webpage graphics shown on browser to be replicas of the BAS displays. User is to need no additional training to understand information presented on Web pages when compared to what is shown on BAS displays. Web page displays to include animation just as BAS displays. Fans to turn, pilot lights to blink, and coils to change colors, and so on. Real-time data shown on browser web pages. This data must be directly gathered via the BACnet network and automatically updated on browser webpage displays without any user action. Data on the browser to automatically refresh as changes are detected without re-drawing the complete display. User to be able to change data from browser web page to if the user is logged on with the appropriate password. Clicking on a button or typing in a new value to change digital data. Using pull-down menus or typing in a new value to change analog data. Data displays navigated using pushbuttons on the displays that are simply clicked on with the mouse to select a new display. Alternatively, the standard back and forward buttons of the browser can be used for display navigation.

D. Web Page Generation: Web pages generated automatically from the BAS displays that reside on the BAS server. User to access web page host via the network and initiate a web page generation utility that automatically takes the BAS displays and turns them into web pages. The web pages generated are automatically installed on the web page host for access via any computer's standard browser. Any system that requires use of an HTML editor for generation of web pages will not be considered.

E. Password Security and Activity Log: Access via web browser to utilize the same hierarchical security scheme as BAS system. User asked to log in once the browser makes connection to web page host. Once the user logs in, any changes that are made are to be tracked by the BAS system. User shall be able to change only those items that the user has authority to change. A user activity report to show any activity of the users that have logged in to the system regardless of whether those changes were made using a browser or via the BAS workstation.

F. Communication: Web-page host to communicate using the specified protocol standard to devices on the BAS network.

2.6 BAS GRAPHICS

A. Develop customized graphics showing the project building(s) and their floor plans, mechanical and electrical equipment, flow and control diagrams, and other relevant features on Workstation graphic screens. Associated input, output, and virtual objects (e.g., temperature and pressure setpoints) listed in the Sequence of Operation, and shown on the Input/Output Objects List included in the graphic screens and bound to the database. Real-time value of objects updated on the display of each graphic automatically. For projects where existing campus and/or building controls systems exist, replicate graphics used in the existing BAS graphics screens.

B. Graphics to have links to the Print function and to display a Standard Legend in the corner of the graphic. Graphics, except pop-ups, to have the date and time displayed in the upper corner of the graphic. Each graphic titled.

C. Weather: Graphics, except pop-ups, to have the outdoor temperature and humidity in the upper corner of the graphic.

D. Alarms: System and component summary alarms located near the top of each relevant graphic screen. Provide links to the associated system/component as part of these tags to assist trouble shooting. Other alarms placed near the associated system/device as depicted in the graphic. Provide text and color of information tags that describe each object and alarm value consistent with a graphics color legend.

E. The following graphics provided as a minimum:
   1. A building graphic, typically a photograph of the building, with links to each floor plan and other links as defined below.
   2. A central plant graphic with equipment (chillers, boilers, pumps, heat exchangers, storage tanks, etc.), temperature sensors, pressure sensors, flow sensors and refrigeration leak detectors. The central plant graphic to have links to each building on the campus.
   3. Central equipment such as air handler, package rooftop equipment, supply fans, exhaust fans, and smoke control systems.
   4. Floor plans of each floor, with temperature sensors, pressure sensors, temperature control zones, heating/cooling zones, ventilation zones, and supply air zones identified. Rooms grouped on a graphic only to the extent that detailed and complete sensing information can be comfortably viewed by an operator and the bound points updated in less than 10 seconds. Each zone to have a temperature symbol that changes color over the range from low (blue) through normal (green) to high (red) and indicate an alarm (flashing red). The zone temperature and or pressure symbol(s) to be a link to a zone control pop-up graphic. Individual floor plan graphics to provide links to related mechanical systems. The mechanical room plan graphics to show the relative location of, and provide links to, either the equipment pop-up or flow and control graphic for mechanical equipment monitored or controlled by the BAS.
   5. Pop-up graphics provided for each zone control system showing a flow diagram and related monitoring and control points and system parameters. Pop-up graphics provided for each piece of equipment that is not shown on a flow and control graphic.

6. Flow and control diagrams for each system including but not limited to fan coils, packaged equipment, smoke damper status, combination fire and smoke damper status, and ventilation systems. The flow and control graphics to have parameters grouped in the lower portion of the graphics. Standard equipment graphics used. Pumps, fans, dampers and other elements to dynamically indicate their state (i.e. pumps and fans to rotate when on and damper positions to dynamically adjust and be shown in their current position, etc.). System flow and control graphics displayed in a general left to right flow or loop arrangement. Return and exhaust air flow shown on top and return water shown on the bottom of the graphic.
7. Individual equipment/component screens showing sensing and control information available for each device provided.

F. Penetration: The graphic interface to consistently apply a convention whereby a left-click to always penetrate to more detailed information. The text windows to represent the deepest level of penetration. A right-click to always produce a menu of options that are specific to the item selected.

G. Navigation: Graphics organized to provide a "branching structure" that allows an operator to move from a "macro view" to a "micro view" and return. These links to other associated graphics, or allow a return to a previous macro view, provided and arranged horizontally along the bottom of each graphic screen. From left to right, the graphic links as follows: site/building map, building/trailer floor plans, and major mechanical systems at each building. Pop-up right click menus provided as needed on the lower button bar to allow for uncluttered navigation.

H. Clutter Minimization: Each graphic to have separate check boxes in the lower right corner that show/hide setpoints, alarms/safeties, and devices/equipment.

I. Templates: To the maximum extent possible, use standard graphics as templates to provide a consistent look throughout the interface.

J. Color Scheme: The graphics to use dynamic color changes to communicate equipment type, or object status consistent with the graphics color legend.

K. Symbols and Animations: Fans, pumps, dampers, coils, and generation equipment to be dynamic symbols indicating rotation, state, or position, movement, flow, etc.

L. Macros: When macros are used to add functionality to the graphics, detailed documentation provided.

M. Configure Mode: Access to “Configure Mode” for editing of the graphics password protected to prevent unauthorized changes to the graphics. This password supplied to the appropriate personnel.

N. Graphics Version: Graphics provided in the most current format available at time of control system programming.

O. Points and graphics checked for the proper binding and graphic programming, settings to ensure that the correct system, location, point values and dynamics are shown in the proper location and rotate in the proper directions.

P. After graphics have been accepted, provide, on a CD ROM in an agreed upon file structure. If the graphics have active-x controls or other files that must be placed outside the graphics folder structure a set-up program provided on the disk to place the files in the correct locations.

2.7 BUILDING CONTROLLERS

A. General: Provide adequate number of building controllers to achieve performance specified. Panels to meet the following requirements.
   1. Building Automation System (BAS) to be composed of one or more independent, stand-alone, microprocessor-based building controllers to manage global strategies described in Controller Software article.
   2. Provide sufficient memory to support operating system, database, and programming requirements.
   3. Share data between networked building controllers.
   4. Distributed controllers to share real and virtual object information and allow for central monitoring and alarms.
   5. Controllers that perform scheduling have real-time clock.
   6. Continually check status of its processor and memory circuits and if abnormal operation is detected, controller:
      a. Assume predetermined failure mode.
      b. Generate alarm notification.
   7. Building Controller communicates with other devices on internetwork including BACnet communications according to specified protocol.

B. Communication:
   1. Each building controller resides on network using ISO 8802-3 (Ethernet) Data Link/Physical layer protocol and performs routing to network of custom application and application specific controllers.
   2. Controller provides a service communication port for connection to a portable operator's terminal.

C. Environment:
   1. Controllers used outdoors and/or in wet ambient conditions mounted within NEMA waterproof enclosures and rated for operation at 0 degrees F to 150 degrees F.
   2. Controllers used in conditioned space are mounted in NEMA dust-proof enclosures and rated for operation at 32 degrees F to 120 degrees F.

D. Keypad: Local keypad and display to be provided for each controller. Security password to be available to prevent unauthorized use of keypad and display.

E. Serviceability: Provide diagnostic LEDs for power, communication, and processor. Wiring connections are made to modular terminal strips or to termination card connected by ribbon cable.

F. Memory: Building controller maintains BIOS and programming information in event of power loss for at least 72 hours.

G. Immunity to power and noise: Controller able to operate at 90 percent to 110 percent of nominal voltage rating and performs an orderly shutdown below 80 percent nominal voltage. Operation protected against electrical noise of 5 to 120 Hz and from keyed radios up to 5 W at 3-feet.

H. Controller to have a battery to provide power for orderly shutdown of controller and storage of data in nonvolatile flash memory. Battery backup to maintain real-time clock functions for a minimum of 10 days.

2.8 APPLICATION SPECIFIC CONTROLLERS

A. Application specific controllers (ASCs) are microprocessor-based DDC controllers, which through hardware or firmware design, are dedicated to control a specific piece of equipment. Controllers to be fully programmable using graphical programming blocks.
   1. ASC controllers communicate with other devices on internetwork.
   2. Each ASC capable of stand-alone operation without being connected to network.
   3. Each ASC will contain sufficient I/O capacity to control target system.
   4. Application controllers to include universal inputs with minimum 10-bit resolution that accept thermistors, 0-10VDC, 0-5 VDC, 4-20 mA and dry contact signals. Any input on a controller may be either analog or digital with at least 1 input that accepts pulses. Controller to also include support and modifiable programming for interface to intelligent room sensor with digital display. Controller to include binary and analog outputs on board. Provide analog outputs switch selectable as either 0-10VDC or 0-20mA. Software to include scaling features for analog outputs. Application controller to include 24VDC voltage supply for use as power supply to external sensors.
   5. Program sequences stored on board application controller in EEPROM. No batteries needed to retain logic program. Program sequences executed by controller 10 times per second and capable of multiple PI and PID loops for control of multiple devices. Calculations completed using floating-point math and system to support display of information in floating-point nomenclature at operator's terminal. Programming of application controller completely modifiable in the field over installed BAS LANs or remotely via modem interface. Operator to program logic sequences by graphically moving function blocks on screen and tying blocks together on screen.
   6. Application controller to include support for room sensor. Display on room sensor programmable at application controller and include an operating mode and a field service mode. Provide button functions and display data programmable to show specific controller data in each mode based on which button is pressed on the sensor. See sequence of operation for specific display requirements at intelligent room sensor.

B. Communication:
   1. Controller resides on network using MS/TP Data Link/Physical layer protocol.
   2. Each controller connected to building controller.
   3. Each controller capable of connection to laptop computer or portable operator's tool.

C. Environment:
   1. Controllers used outdoors and/or in wet ambient conditions mounted within NEMA waterproof enclosures and rated for operation at 0 degrees F to 150 degrees F.
   2. Controllers used in conditioned space mounted in NEMA dust-proof enclosures and rated for operation at 32 degrees F to 120 degrees F.

D. Serviceability: Provide diagnostic LEDs for power, communication, and processor.

E. Memory: ASC use nonvolatile memory and maintains BIOS and programming information in event of power loss.

2.9 APPLICATION SPECIFIC CONTROLLER - TERMINAL UNIT CONTROLLERS

A. Provide one application controller for each terminal unit that adequately covers objects listed in object list for unit. Controllers to interface to building controller via LAN using specified protocol. Controllers to include on board flow sensor, inputs, outputs and programmable, self-contained logic program as needed for control of units.

B. Application controllers to include universal inputs with 10-bit resolution that can accept thermistors, 0-5 VDC, and dry contact signals. Inputs on controller may be either analog or digital. Controller to also include support and modifiable programming for interface to intelligent room sensor with digital display (digital display to indicate setpoint only). Controller to also include binary outputs on board. For applications using variable speed parallel fans, provide a single analog output selectable for 0-10 V or 0-20 mA control signals. Application controller to include microprocessor driven, self calibrating flow sensor for use in pressure independent control logic. Terminal units controlled using pressure independent control algorithms and flow readings to be in CFM. Flow sensor and controller to have control range of 0.004 in.wc. to 1.5 in.wc. with an accuracy of +5 percent at 1 in.wc.

C. Program sequences stored on board application controller in EEPROM. No batteries needed to retain logic program. Program sequences executed by controller 10 times per second and capable of multiple PI loops for control of multiple devices. Provide programming of application controller completely modifiable in the field over installed specified protocol LANs or remotely via modem interface. Operator to program logic sequences by graphically moving function blocks on screen and tying blocks together on screen. Application controller programmed using the same programming tool as Building Controller and as described in Operator Workstation article.

D. Application controller to include support for intelligent room sensor. Display on room sensor programmable at application controller and include an operating mode and a field service mode. Button functions and display data programmable to show specific controller data in each mode based on which button is pressed on the sensor. See sequence for specific display requirements for intelligent room sensor.

E. Provide duct temperature sensor at discharge of each terminal unit that is connected to controller for reporting back to operator workstation. Provide analog inputs for the duct temperatures.

2.10 INPUT/OUTPUT INTERFACE

A. Input/output points protected such that shorting of point to itself, to another point, or to ground will cause no damage to controller. Input and output points protected from voltage up to 24 V.

B. Binary inputs (BI or DI) allow monitoring of On/Off signals from remote devices. Binary inputs sense “dry contact” closure without external power (other than that provided by controller) being applied.

C. Pulse accumulation input objects accept up to 10 pulses per second for pulse accumulation.

D. Analog inputs (AI) allow monitoring of low-voltage (0 to 10 VDC), current (4 to 20 mA), or resistance signals (thermistor, RTD).

E. Binary outputs (BO or DO) provide for On/Off operation or pulsed low-voltage signal for pulse width modulation control. Binary outputs on building and custom application controllers have three-position (On/Off/Auto) override switches and status lights. Outputs selectable for either normally open or normally closed operation.

F. Analog outputs (AO) provide a modulating signal for control of end devices. Outputs provide either a 0 to 10 VDC or a 4 to 20 mA signal as required to provide proper control of the output device. Analog outputs on building controllers have status lights and two-position (AUTO/MANUAL) switch and adjustable potentiometer for manual override. Analog outputs not exhibit drift of greater than 0.4 percent of range per year.

G. Tri-State Outputs. Provide tri-state outputs (two coordinated binary outputs) for control of three-point floating type electronic actuators without feedback. Use of three-point floating devices limited to zone control and terminal unit control applications (VAV terminal units, duct-mounted heating coils, zone dampers, radiation, etc.). Control algorithms run zone actuator to one end of its stroke once every 24 hours for verification of operator tracking.

2.11 POWER SUPPLIES AND LINE FILTERING

A. Control transformers UL listed. Furnish Class 2 current-limiting type or furnish over-current protection in both primary and secondary circuits. Limit connected loads to 80 percent of rated capacity.

B. DC power supply output match output current and voltage requirements. Unit operates between 32 degrees F and 120 degrees F.

C. Line voltage units UL listed and CSA approved.

D. Power line filtering. Provide transient voltage and surge suppression for workstations and controllers.

2.12 CONTROL PANELS

A. Control Panels:
   1. Enclosures may be NEMA 1 when located in a clean, dry, indoor environment. Indoor enclosures to be NEMA 12 when installed in other than a clean environment. Outdoor enclosures must be NEMA 3R. Provide (hinged door) key-lock latch and removable subpanels. Single key common to field panels and subpanels. In existing campus or building settings, key lock to match existing keys.
   2. Interconnections between internal and face-mounted devices prewired with color-coded stranded conductors neatly installed in plastic troughs and/or tie-wrapped. Terminals for field connections UL listed for 600 volt service, individually identified per control/ interlock drawings, with adequate clearance for field wiring. Control terminations for field connection individually identified per control drawings.
   3. Provide ON/OFF power switch with overcurrent protection for control power sources to each local panel.
   4. Provide laminated plastic nameplates for enclosures in any mechanical room or electrical room labeled with TCP number. Laminated plastic to be 1/8-inch thick sized appropriately to make label easy to read.

2.13 AUXILIARY CONTROL DEVICES

A. Temperature Instruments:
   1. Room Temperature Sensor: Thermistor or platinum RTD type with accuracy of plus or minus 0.5 degrees F at 70 degrees F; operating range 30-120 degrees F; linear signal; single point sensing element in wall-mounted ventilated enclosure with insulating back plate if mounted on exterior wall; push button for occupancy override; digital setpoint adjustment plus or minus 2 degrees F in both directions; LCD temperature display indicating setpoint only. Setpoint adjustment to revert to building programmed standard temperature upon next building occupancy schedule change (user adjustable). Room temperature sensor may have integral space carbon dioxide sensor with minimum performance characteristics identified within this specification.
   2. Outside Air Temperature Sensor: Thermistor or platinum RTD element with accuracy of plus or minus 0.5 degrees F at 32 degrees F; Range -58 to 120 degrees F, single element, linear, with weather and sun shield for exterior mounting.
   3. Low Temperature Limit Thermostat: Minimum 20-foot capillary sensing element, triggering on low temperature as sensed by any 12-inch segment; snap acting, normally open contacts, manual reset, line voltage.

B. Pressure Transmitters and Transducers:
   1. Transducer have linear output signal; field adjustable zero and span. Sensing elements withstand continuous operating conditions of positive or negative pressure 50 percent greater than calibrated span without damage.
   2. Filter Differential Pressure Switch: Setpoint adjustable with operating range of 0.1- to 5-inch WG; auto reset. Contactor to close when pressure differential setting is met or exceeded. Provide mounting bracket, metallic tubing and appropriate fittings for connection to duct or air-handling unit.
   3. Duct Static Differential Pressure Transducer: Operating range 0- to 5-inch WC for duct mounted transmitter; ceramic capacitive sensing element with probe securely mounted in duct; digital input terminal and push button to zero output. Accuracy plus or minus 1 percent of full scale; maximum response time 2 seconds.
   4. Building Static Pressure Transducer: Operating range of -0.1- to 0.1-inch WC, linear signal. Sensing tubes located inside and outside building use shielding and/or surge tanks to minimize effects of wind. Accuracy plus or minus 1 percent of full scale.

C. Motorized Control Dampers:
   1. Performance: Maximum leakage of 3 CFM/SF at 1-inch WG differential pressure, AMCA Class 1A, maximum pressure rating of 13-inch WG differential pressure, maximum velocity of 6,000 fpm, -72 degrees F to 275 degrees F temperature rating.
   2. Multi-blade type, except where either dimension is less than 10-inch single blade may be used. Maximum blade length to be 48-inch.
   3. Provide parallel blades for modulating mixing service and opposed blades for throttling service.
   4. Blades to be interlocking; minimum 16 gauge galvanized steel; compression type edge seals and side seating stops. In copper, aluminum and stainless steel duct work, damper material matches duct work material.
   5. Damper blades are reinforced, have continuous full length axle shafts, axle to axle linkage, and/or operating “jackshafts” as required to provide coordinated tracking of blades.
   6. Bearings: Self-lubricating stainless steel sleeve or Celcon bearing.
   7. Dampers over 25 SF in area to be in two or more sections, with interconnected blades.
   8. Provide remote damper blade position status with binary input.
   9. Tested in accordance with AMCA Standard No. 500.

D. Electric Damper/Valve Actuators:
   1. Provide mechanical or electronic stall protection for each actuator.
   2. Where indicated provide internal mechanical, spring-return mechanism or provide uninterruptible power supply (UPS). Non-spring-return actuators have external manual gear release to position damper/valve when actuator is not powered.
   3. Proportional actuators accepts 0 to 10 VDC or 0 to 20 mA control signal and provide 2 to 10 VDC or 4 to 20 mA operating range.
   4. Actuator sized for torque required plus 25 percent; UL or CSA listed; electronic current overload protection.
   5. For system differential pressure control valves, provide fast acting valve actuator with valve open or close time of 30 to 60 seconds.

6. VAV Actuators: Actuators proportional 24 VAC actuators using a 4 to 20 mA range of control signals; stops automatically at end of travel; include permanently lubricated gear train.

E. Air Flow Meters:
   1. Duct Mounted Air Flow Station: Self-supporting aluminum alloy tube with stainless steel mounting brackets. Probe and sensor density quantity as recommended by manufacturer. Sensor use thermal dispersion technology with two "bead in glass," hermetically sealed thermistor probes at each measuring point. Provide electronic flow transmitter with CFM readout display and capable of 4-20 mA output signal. Ebtron GTA116-PC.

F. Room Pressure Monitor: Active room pressure monitor and alarm which provides local audio alarm and analog and alarm signals to DDC system. Wall mounted panel with LED differential pressure readout; audible and visual alarm; mute button; range of -0.05 to +0.05-inch WC; accurate to 1 percent of full scale; repeatability plus or minus 1.0 percent of full scale per year, alarm delay ability between 0-30 seconds. Provide door switch to deactivate alarm when space door(s) are open. Input status from BAS to deactivate alarm in unoccupied or shutdown modes. Phoenix Controls APM100.

G. Wall Mounted Space Carbon Dioxide Sensor:
   1. Sensor to employ non-dispersive infrared technology (N.D.I.R.).
   2. Sensor Repeatability: Plus or minus 20 ppm. 0-2000.
   3. Sensor Accuracy: Less than or equal to 75 ppm over 0-1500 ppm range.
   4. Sensor Response Time: Less than 1 minute.
   5. Sensor to employ reference channel design for long-term stability.
   6. Sensor to have field selectable 0-10VDC, or 4-20mA outputs.
   7. Sensor power requirement less than 3W.
   8. Sensor Input Voltage: 20 to 30VAC/DC.
   9. Sensor Operating Temperature Range: 0 degrees C to 50 degrees C.
   10. Sensor to have models for wall mounting or duct mounting.
   11. Sensor to provide at least a 1-year factory warranty from date of purchase.
   12. Sensor to match cover in color and look to temperature sensor.
   13. Sensor to have display.
   14. Manufacturers:
       a. Telaire
       b. Vaisala
       c. Veris

H. Relays:
   1. Control relays UL listed plug-in type with dust cover and LED "energized" indicator. Contact rating, configuration, and coil voltage to be suitable for application.
   2. Time delay relays UL listed solid-state plug-in type with adjustable time delay. Delay adjustable plus or minus 200 percent (minimum) from setpoint or as indicated. Contact rating, configuration, and coil voltage to be suitable for application. Provide NEMA 1 enclosure when not installed in local control panel.

I. Override Timers: Override timers spring-wound line voltage, UL Listed, with contact rating and configuration as required by application. Provide 0-to-6-hour calibrated dial unless otherwise specified. Timer suitable for flush mounting on control panel face and located on local control panels or where shown.

J. Current Transmitters:
   1. AC current transmitters are self-powered, combination split-core current transformer type with built-in rectifier and high-gain servo amplifier with 4 to 20 mA two-wire output. Unit range compatible with actual applied span of current value, with internal zero and span adjustment and plus or minus 1 percent full-scale accuracy at 500 ohm maximum burden.
   2. Transmitter meets or exceeds ANSI/ISA S50.1 requirements and UL/CSA recognized.
   3. Unit split-core type for clamp-on installation on existing wiring.

K. Current Transformers: AC current transformers UL/CSA recognized and completely encased (except for terminals) in approved plastic material; plus or minus 1 percent accuracy at 5 A full-scale.

L. Voltage Transmitters: AC voltage; self-powered single-loop (two-wire) type; 4 to 20 mA output with zero and span adjustment; UL/CSA recognized at 600 VAC rating and meet or exceed ANSI/ISA S50.1. Ranges include 100 to 130 VAC, 200 to 250 VAC, 250 to 330 VAC, and 400 to 600 VAC full-scale, adjustable, with plus or minus 1 percent full-scale accuracy with 500 ohm maximum burden.

M. Voltage Transformers: AC voltage transformers UL/CSA recognized, 600 VAC rated; built-in fuse protection; suitable for ambient temperatures of 40 degrees F to 130 degrees F; plus or minus 0.5 percent accuracy at 24 VAC and a 5 VA load.

N. Power Monitors: Selectable rate pulse output for kWh reading; 4-20 mA output for kW reading; N.O. alarm contact; ability to operate with 5.0 amp current inputs or 0-0.33 volt inputs; plus 1.0 percent full-scale true RMS power accuracy; plus 0.5 Hz, voltage input range 120-600 V, and auto range select; NEMA 1 enclosure. Current transformers having a 0.5 percent FS accuracy, 600 VAC isolation voltage with 0-0.33 V output. If 0-5 A current transformers are provided, a three-phase disconnect/shorting switch assembly is required.

O. Overflow Switch: Insertion flow sensor, brass, impeller flow design with analog transmitter unit. Data Industrial Model 220BR.

P. End Switches: Turret head Type SPDT. Schneider Electric/Square D Class 9007, Type C54B2, or approved equivalent.

2.14 WIRING AND RACEWAYS

A. General: Provide copper wiring, plenum cable, and raceways as specified in applicable Sections of Division 26, Electrical.

B. Insulated wire to be copper conductors, UL labeled for 90 degrees C minimum service.

C. Run control wiring as follows:
   1. Mechanical Rooms: In conduit.
   2. Exposed in Building Spaces: In conduit.
   3. Concealed in Building Walls and Ceilings: Plenum rated cable.
   4. Concealed in Building Ceilings: Plenum rated cable in cable tray.

D. Field and Subfield Panels: Voltage in panels not-to-exceed 120 volts.

E. Motor Control Centers: Responsibility for correct voltage of holding coils and starter wiring in pre-wired motor control centers interfacing with automatic controls is included hereunder.

F. Wiring for BAS systems communications buses two conductor minimum 18 gauge foil-shielded, stranded twisted pair cable rated at 300 VDC or more than 80 degrees C.

2.15 SMOKE DETECTION FOR PROJECTS WITH A BUILDING FIRE ALARM SYSTEM

A. See Division 28 for Products.

PART 3 - EXECUTION

3.1 EXAMINATION

A. 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.

B. Notify the Owner's Authorized Representative in writing of conditions detrimental to the proper and timely completion of the work.

C. Do not begin work until unsatisfactory conditions are resolved.

3.2 CONTROL SYSTEM CHECKOUT AND TESTING

A. Testing completed before Owner's Authorized Representative is notified of system demonstration.

B. Calibrate and prepare for service of instruments, controls, and accessory equipment furnished under this specification.

C. Verify that control wiring is properly connected and free of shorts and ground faults.

D. Enable control systems and verify calibration and operation of input and output devices.

E. Verify that system operation adheres to sequences of operation.

F. Commissioning and Verification: In addition to commissioning requirements specified elsewhere, provide the following commissioning on the HVAC instrumentation and controls system:
   1. Control systems completely commissioned to ensure aspects of the system are operating as intended and at optimum tuning.
   2. Wiring connections verified and traced from field device to panel to ensure proper connections.
   3. Measured values verified by a hand held calibrated device to validate that value indicated by the control system is in fact the actual measured value.
   4. Loops properly tuned to obtain the desired control value. Each loop to be "upset" and put back in control to demonstrate its ability to stabilize quickly.
   5. Provide a final point-by-point report submitted that indicates the date of each verification, the results, and initialed on each page by the person performing the reading.

3.3 ACCEPTANCE TESTING AND TRAINING

A. Site Testing:
   1. Contractor provides personnel, equipment, instrumentation, and supplies necessary to perform testing. Owner or Owner's Authorized Representative will witness and sign off on acceptance testing.
   2. Contractor demonstrates compliance of completed control system with Contract Documents. Using approved test plan, physical and functional requirements of project demonstrated.

B. Training:
   1. General: Contractor conducts training courses for up to three other designated personnel in operation and maintenance of system. Training manuals provided for each trainee, with two additional copies provided for archival at project site. Manuals include detailed description of subject matter for each lesson. Copies of audiovisuals delivered to Owner. Training day is defined as 8 hours of classroom instruction, including two 15-minute breaks and excluding lunch time, Monday through Friday, during normal first shift in effect at training facility. Notification of any planned training given to Owner's Authorized Representative at least 15 days prior to training.
   2. Operator's Training I: First course taught at supplier's facility for period of one training day. Upon completion, each student should be able to perform elementary operations with guidance and describe general hardware architecture and functionality of system.
   3. Operator's Training II: Second course taught at project site for a period of one training day after completion of contractor's field testing. Course includes instruction on specific hardware configuration of installed system and specific instructions for operating installed system. Upon completion, each student should be able to start system, operate the system, recover system after failure, and describe specific hardware architecture and operation of system.

4. Operator's Training III: Third course taught at project site for period of one training day no later than six months after completion of the acceptance test. Course will be structured to address specific topics that students need to discuss and to answer questions concerning operation of system. Upon completion, students should be fully proficient in system operation and have no unanswered questions regarding operation of installed system.

3.4 COMMUNICATION WIRING

A. Follow manufacturer's installation recommendations for communication cabling.

B. Verify integrity of network following cable installation.

C. Communication wiring unspliced length when that length is commercially available; labeled to indicate origination and destination data.

D. Grounding of coaxial cable in accordance with NEC regulations article on “Communications Circuits, Cable, and Protector Grounding.”

3.5 WIRING AND RACEWAYS

A. Provide electrical wiring required to control systems specified in this Section. Control and interlock wiring complies with national, state and local electrical codes and Division 26, Electrical of this specification.

B. Power wiring required for building control panel(s) to be dedicated circuit(s).

C. Verify location of operator work station with Owner prior to installation.

D. NEC Class 1 (line voltage) wiring UL Listed in approved raceway according to NEC and Division 26, Electrical requirements.

E. Low-voltage wiring meets NEC Class 2 requirements. (Low-voltage power circuits subfused when required to meet Class 2 current limit.)

F. Where NEC Class 2 (current-limited) wires are in concealed and accessible locations, including ceiling return air plenums, approved cables not in raceway may be used provided that cables are UL listed for intended application.

G. Do not install Class 2 wiring in raceway containing Class 1 wiring. Boxes and panels containing high-voltage wiring and equipment may not be used for low-voltage wiring except for purpose of interfacing (e.g., relays and transformers).

H. Where Class 2 wiring is run exposed, wiring run parallel along surface or perpendicular to it and tied at 10 foot intervals.

I. Where plenum cables are used without raceway, support from structural members. Do not support cables with ductwork, electrical raceways, piping, or ceiling suspension systems.

J. Make wire-to-device connections at terminal block or terminal strip. Make wire-to-wire connections at terminal block.

K. Maximum allowable voltage for control wiring 24 V. If only higher voltages are available, provide step-down transformers.

L. Wiring installed as continuous lengths, with no splices permitted between termination points.

M. Install plenum wiring in sleeves where it passes through walls and floors. Maintain fire rating at penetrations.

N. Include one pull string in each raceway 1-inch or larger.

O. Control and status relays are to be located in designated enclosures. Enclosures include packaged equipment control panels unless they also contain Class 1 starters.

P. Install raceway to maintain a minimum clearance of 6-inches from high-temperature equipment (e.g., steam pipes or flues).

Q. Secure raceways with raceway clamps fastened to structure and spaced according to code requirements. Raceways and pull boxes may not be hung on flexible duct strap or tie rods. Raceways may not be run on or attached to ductwork.

R. Install insulated bushings on raceway ends and openings to enclosures. Seal top end of vertical raceways.

S. Flexible metal raceways and liquid-tight, flexible metal raceways not-to-exceed 3-feet in length and be supported at each end. In areas exposed to moisture, including chiller and boiler rooms, liquid-tight, flexible metal raceways to be used.

T. Raceway must be rigidly installed, adequately supported, properly reamed at both ends, and left clean and free of obstructions. Raceway sections joined with couplings. Terminations made with fittings at boxes.

U. Input and output terminations to be labeled at the controller to identify if they are AI, DI, AO, DO, and function (i.e. pump start, OM Sensor).

3.6 INSTALLATION OF AUXILIARY CONTROL DEVICES

A. General:
   1. Install sensors and thermostats in accordance with manufacturer's recommendations.
   2. Room sensors and thermostats installed at 48-inches AFF to top of sensor on concealed junction boxes properly supported by wall framing at the locations shown on the Drawings.

3. Low-limit sensors used in mixing plenums installed in a serpentine manner horizontally across duct.
4. Install outdoor air temperature sensors on north facing wall or screen, complete with sun shield at designated location.

B. Actuators:
   1. General:
      a. Mount and link control damper actuators according to manufacturer's instructions.
      b. Check operation of damper/actuator combination to confirm that actuator modulates damper smoothly throughout stroke to both open and closed positions.
   2. Actuator Mounting for Damper and Valve Arrangements to Comply with the Following:
      a. Damper Actuators: Do not install in the air stream.
      b. Use a weather proof enclosure (clear and see through) if actuators are located outside.
      c. Damper or valve actuator ambient temperature not-to-exceed 122 degrees F through any combination of medium temperature or surrounding air. Provide appropriate air gaps, thermal isolation washers or spacers, standoff legs, or insulation as necessary. Mount per manufacturer's recommendations.
      d. Actuator cords or conduit to incorporate a drip leg if condensation is possible. Do not allow water to contact actuator or internal parts. Location of conduits in temperatures dropping below dew point to be avoided to prevent water from condensing in conduit and running into actuator.
      e. Damper mounting arrangements to comply with the following:
         1) Furnish and install damper channel supports and sheet metal collars.
         2) Jack shafting of damper sections not allowed.
         3) Multi-section dampers arranged so that each damper section operates individually. Provide one electronic actuator direct shaft mounted per section.
      f. Size damper sections based on actuator manufacturers specific recommendations for face velocity, differential pressure and damper type. In general: Damper section not-to-exceed 24 ft-sq. with face velocity 1500 FPM.
      g. Multiple section dampers of two or more arranged to allow actuators to be direct shaft mounted on the outside of the duct.
      h. Multiple section dampers of three or more sections wide arranged with a 3-sided vertical channel (8-inch wide by 6-inch deep) within the duct or fan housing and between adjacent damper sections. Vertical channel anchored at the top and bottom to the fan housing or building structure for support. Connect sides of each damper frame to the channels. Holes in the channel to allow damper drive blade shafts to pass through channel for direct shaft mounting of actuators. Face open side of channel downstream of the airflow, except for exhaust air dampers.
      i. Multiple section dampers to be mounted flush within a wall or housing opening to receive either vertical channel supports as described above or sheet metal standout collars. Sheet metal collars (12-inch minimum) to bring each damper section out of the wall to allow direct shaft mounting of the actuator on the side of the collar.

C. Control Damper:

1. Dampers installed in accordance with manufacturer's instructions. Unless specifically designed for vertical blade application, dampers must be mounted with blade axis horizontal.
2. After installation of low-leakage dampers with seals, caulk between frame and duct or opening to prevent leakage around perimeter of damper.

D. Air Flow Station: Install where indicated in ductwork and/or equipment with manufacturer's recommended straight ductwork upstream and downstream of air flow station or as shown on Drawings, whichever is greater. Where equipment manufacturer's standard airflow measuring station cannot read airflows at required design velocities, provide appropriate air flow measuring station to provide accurate reading throughout system design operations range.

3.7 SMOKE DETECTION FOR PROJECTS WITH A BUILDING FIRE ALARM SYSTEM

A. Smoke detector furnished and powered/wired under Division 28, Electronic Safety and Security. Coordinate with fire alarm equipment supplier. Installation of duct smoke detector housing and sampling tube under Division 23, HVAC.

B. Install smoke detectors in return air systems greater than 2000 CFM.

C. Install smoke detectors at each story prior to connection to return air riser in systems greater than 15,000 CFM and serving more than one story.

3.8 SEQUENCES OF OPERATION AND POINTS LISTS

A. Where local energy code dictates certain sequences (such as night setback, night flush, pressure and temperature reset, terminal unit sequences, etc.), the sequences are not necessarily repeated in the documents. It is not the intent of this specification or documentation to reiterate the energy code. Provide energy code mandated sequences and document in sequence of operations submittals at no additional cost to the Owner. Provide required points to achieve the appropriate sequences.

B. Variable Frequency Drives: For a VFD dependent on an external input for its output setting (e.g., the VFD gets “Frequency” as an input), loss of that external input to result in the VFD holding its last value. If the VFD is running its own PID loop and the external input to the VFD is a setpoint (e.g. duct static pressure setpoint), the VFD to hold the last setpoint. If the VFD loses its process variable (e.g. duct static pressure), the VFD to go to its minimum speed setting.

C. Except as specified otherwise, throttling ranges, proportional bands, and cycle differentials to be centered on the associated setpoint. Modulating feedback control loops to include the capability of having proportional, integral, and derivative action. Unless the loop is specified “proportional only” or “P+I”, Contractor to apply appropriate elements of integral and derivative gain to each control loop to result in stable operation, minimum settling time and maintain the primary variable within the specified maximum allowable variance.

D. Provide a real time clock and schedule controller with sufficient scheduling capability to schedule required controllers and sequences. Schedule functionality may reside in a controller. If a controller is used, document scheduling functionality including names and types on controller points list submittal. Set up initial schedules in coordination with Owner.

E. Scheduling Terminology: When air handlers are scheduled throughout the day, the following defines the terminology used:
   1. Occupied Period: Period of time when the building is in use and occupied. Confirm schedule with Owner. Exclude all national holidays. Generally systems will be fully operational throughout this period and ventilation air to be continuously introduced. Space temperature setpoints will generally be in the "normal" range of 68 degrees to 78 degrees F.
   2. Unoccupied period: Period of time when the building or zone is not in use and unoccupied. Ventilation air not to be introduced.
   3. Preoccupancy Period: Time prior to the Occupied period when the systems are returning the space temperatures from setback to "normal" or occupied setpoints (warm-up and cool-down). Ventilation air shall not be introduced unless outside air conditions permit free-cooling or to support a pre-occupancy purge sequence. Time period to be determined by an optimum start strategy unless otherwise specified.
   4. Setback Period: Setback will typically start with the end of the occupied period and end with the start of the preoccupancy period, however it shall be provided with its own schedule. Generally systems will be off except to maintain a "setback" temperature, economization may be enabled to maintain "setback" cooling setpoint when applicable.

F. Where any sequence or occupancy schedule calls for more than one motorized unit to start simultaneously, the BAS start commands to be staggered by 5 second (adj.) intervals to minimize inrush current.

G. Wherever a value is indicated as adjustable (adj.), it shall be modifiable, with the proper password level. For these points, it is unacceptable to have to modify programming statements to change the setpoint.

H. When a power failure is detected in any phase, the BAS start commands to be retracted immediately from electrically powered units served by the failed power source. If the associated controller is powered by normal or emergency power, it may monitor its own power source as an indication of power status. If the controller is powered by uninterruptible power supply (UPS), or if it is not capable of monitoring its own power for use in sequences, provide at least one voltage monitor (three phase when applicable) per building. When the BAS detects that normal or emergency power has been restored, all equipment for which the BAS start command had been retracted to be automatically restarted in an orderly manner on staggered 5 second intervals to minimize inrush current.

I. Where reset action is specified in a sequence of operation, but a reset schedule is not indicated on the drawings, employ one of the following methods:
   1. Determine a fixed reset schedule to result in stable operation and maintain the primary variable within the specified maximum allowable variance.

2. Use a floating reset algorithm which increments the secondary variable setpoint (setpoint of control loop being reset) on a periodic basis to maintain primary variable setpoint. The recalculation time and reset increment to be chosen to maintain the primary variable within the specified maximum allowable variance.
3. Primary variable to control the devices directly using a PID feedback control loop without resetting the secondary variable. However, the control devices to still modulate as necessary to maintain upper and lower limits on the secondary variable. Proportional band, integral gain, and derivative term to be selected to maintain the primary variable within the specified maximum allowable tolerance while minimizing overshoot and settling time. Gain prior approval for implementing this method of reset.

J. Where a supply air temperature or duct pressure setpoint is specified to be reset by the space temperature of the zones calling for the most cooling/heating, employ the following method:
1. Use a floating reset algorithm which increments the secondary variable (e.g., supply air temperature or duct pressure) setpoint on a periodic basis to maintain primary variable (e.g., space temperature) setpoint. The reset increment to be determined by the quantity of “need heat” or “need cool” requests from individual SCU's. A SCU's “need heat” virtual point to activate whenever the zone's space temperature falls below the currently applicable (occupied or unoccupied) heating setpoint throttling range. A SCU's “need cool” virtual point to activate whenever the zone's space temperature rises above the currently applicable (occupied, unoccupied, or economy) cooling setpoint throttling range. The recalculation time and reset increment to be chosen to maintain the primary variable within the specified maximum allowable variance while minimizing overshoot and settling time. Reset range maximum and minimum values to limit the setpoint range.

K. Where a supply air temperature, duct pressure, or differential water pressure setpoint is specified to be reset by valve or damper position of the zone or zones calling for the most cooling/heating, the following method to be employed:
1. A floating reset algorithm to be used which increments the secondary variable (e.g., supply air temperature, pipe or duct pressure) setpoint on a periodic basis to maintain primary variable (e.g., cooling valve, heating valve, damper position) setpoint of 85 percent open. The reset increment to be calculated based on the average position of the quantity of the worst (most open valve/damper) zone(s) as specified. The recalculation time, reset increment and control device position influence to be chosen to maintain the primal variable within the specified maximum allowable variance while overshoot and settling time. The BAS analog output value to be acceptable as indicating the position of the control device.
2. Alternatively to continuously calculating the average of the quantity of worst valve/damper positions, a method similar to the one described above may be employed whereby the “need heat” or “need cool” virtual point to increment by one unit each time a zone's valve/damper position rises to greater than 95 percent. The quantity of “need heat” or “need cool” points to then be the basis for reset.

L. Where “prove operation” of a device (generally controlled by a digital output) is indicated in the sequence, it shall require that the BAS, after an adjustable time delay after the device is commanded to operate (feedback delay), confirm that the device is operational via the status input. If the status point does not confirm operation after the time delay or anytime thereafter for an adjustable time delay (debounce delay) while the device is commanded to run, an alarm to be enunciated audibly. Upon failure, run command to be removed and the device to be locked out until the alarm is manually acknowledged unless specified otherwise.

M. BAS to provide for adjustable maximum rates of change for increasing and decreasing output from the following analog output points:
1. Speed control of variable speed drives
2. Control Reset Loop
3. Valve Travel Limit

N. Wherever a value is indicated to be dependent on another value (i.e., setpoint plus 5 degrees F) BAS to use that equation to determine the value. Simply providing a virtual point that the operator must set is unacceptable. In this case three virtual points to be provided. One to store the parameter (5 degrees F), one to store the setpoint, and one to store the value which is the result of the equation.

O. Trend points as identified in the points list. Trends to be grouped system specific and setup in two-axis (x,y) graphical format that display object values relative to time. Setup trends to record data in 5 minute increments.

3.9 SEQUENCES OF OPERATION AND POINTS LISTS

A. Heat Pump Split System Fan Coil Unit/Condensing Unit (FCU-X/HP-X):
1. General: Unit to operate under following modes: Occupied, Shutdown and Unoccupied. H-O-A switches on graphics screens or text dialog boxes may override on/off equipment.
2. Equipment:
   a. Fan Coil Units: FCU-X
   b. Heat Pump Condensing Units: HP-X
3. Occupied Mode:
   a. Supply fan runs continuously.
   b. Space temperature sensor signals controller which sequence DX condensing unit operation and heat pump heating to maintain space temperature setpoint. Stage auxiliary electric heating as required to maintain space temperature setpoint when heat pump heating is insufficient.
   c. In addition to the factory supplied temperature sensor, provide BMS temperature sensor for monitoring.
   d. Demand Controlled Ventilation (DCV) mode: During normal operation (CO2 sensor satisfied), return air motorized damper is at 100% open position and associated ERV fan speed is at the minimum setting. Upon signal from associated CO2 sensor (space is occupied), Fan Coil Unit return air motorized damper is at minimum OSA CFM position (see Fan Coil Unit Schedule) and associated ERV fan speed is at full speed setting.

4. Shutdown Mode:
   a. Supply fan off.
   b. DX condensing unit off.
5. Alarms/Safeties:
   a. Current transformer located in fan power circuit signals controller in event of fan/control failure or if auxiliary electric heat is not enabled when called for. An alarm generated.
6. Heat Pump Split System Fan Coil Unit/Condensing Unit (FCU-X/HP-X) Points List:

Points List	Analog In	Analog Out	Digital In	Digital Out	Alarms	Trend
Supply Fan Start/Stop				X		
Supply Fan Status (Current Transformer)			X		Fail	X
Zone Temp	X					X
Heat Pump Condensing Unit Staging		X				X
Auxiliary Electric Heat Staging		X			Fail	X

B. ~~Dedicated~~**Nail Station** Constant Volume Exhaust Fan (EF-X):
   1. Fan controller receives signal from ~~building controller,~~**a manual wall switch (see Division 26 and Electrical Power Plans),** which initiates occupied or unoccupied mode. During occupied mode open isolation damper and run fan continuously. During unoccupied mode close isolation damper and fan off.
   2. Current transformer signals controller which generates alarm when fan/controller fails to operate.
   3. Dedicated Constant Volume Exhaust Fan (EF-X) Points List:

Points List	Analog In	Analog Out	Digital In	Digital Out	Alarms	Trend
Exhaust Fan Start/Stop				X		
Exhaust Fan Status (Current Transformer)			X		Fail	X
Damper Open/Close				X		

C. Variable Frequency Drives (VFD):

1. Variable speed drives monitored by controller though LAN communications port on each drive. Reference Section 23 09 13, Variable Frequency Drives. Status, start/stop, speed output, and fault to be hard-wired to the VFD. As a minimum, monitor the following points:
    a. Frequency output - Hz
    b. Speed - RPM
    c. Current - Amps
    d. Power - Percentage
    e. Runtime - Hours
    f. System Fault
    g. Input speed setpoint - RPM

D. Energy Recovery Ventilator (ERV-X):
1. Supply and Exhaust Fan controller receives signal from building controller, which initiates occupied or unoccupied mode.
2. During occupied mode open isolation dampers and run fans continuously. Associated electric duct heater stages on to maintain discharge air temperature set point.
    a. Demand Controlled Ventilation (DCV) mode: ERV includes EC motor for variable speed control. During occupied mode, fan runs on low speed continuously and motorized damper is at minimum position (see Energy Recovery Ventilator Schedule). Associated Fan Coil Unit (FCU-X) motorized return air damper is at 100% open position. When any associated CO2 sensor calls for DCV mode (space is occupied and CO2 concentration, PPM, is above acceptable levels) ramp ERV fan speed to maximum scheduled airflow and open motorized damper to 100% open position. Associated Fan Coil Unit (FCU-X) motorized return air damper is at minimum position.
3. During unoccupied mode close isolation dampers and fans off. Associated electric duct heater off.
    a. Poor Outdoor Air Quality: Unit to shut-down when outdoor air quality IAQ is above threshold (user adjustable)
4. Current transformer signals controller which generates alarm when fan/heat controllers fail to operate.
5. Energy Recovery Ventilator (ERV-X) Points List:

Points List	Analog In	Analog Out	Digital In	Digital Out	Alarms	Trend
Supply Fan Start/Stop				X		
Supply Fan Status (Current Transformer)			X		Fail	X
Exhaust Fan Start/Stop				X		
Exhaust Fan Status (Current Transformer)			X		Fail	X

Supply Damper Open/Close				X		
Exhaust Damper Open/Close				X		
Duct Heater Enable/Disable				X		
Discharge Air Temp	X					X
CO2 Sensor	**X**					**X**
Motorized Damper				**X**		**X**

E. Recirculating Domestic Hot Water Pump (RHWP):
   1. Pump controller receives signal from building controller, which initiates occupied or unoccupied mode. During occupied mode pump will run continuously. During unoccupied mode pump will be off.
   2. Current transformer signals controller which generates alarm when pump/controller fails to operate.
   3. Recirculating Domestic Hot Water Pump (RHWP) Points List:

Points List	Analog In	Analog Out	Digital In	Digital Out	Alarms	Trend
Pump Start/Stop	X			X		
Pump Status (current transformer)			X		Fail	X

F. Electric Snowmelt System:
   1. Summary: Snowmelt system operates by DDC/BAS programmed optimized operation for building system control and monitoring. Control start/stop sequence.
   2. Provide snow melt zone, as defined on Architectural and Electrical drawings, with slab sensors. Activate snow melt system when any slab sensor indicates conditions for snow accumulation based on slab temperature (adj.) and air temperature/relative humidity (dew-point). Snowmelt system heating setpoint to be set by snow melt system manufacturer and installer.
   3. Maintain system in idle mode for a period of 5 minutes (adj.) before deactivating snow melt system. System deactivates when outdoor temperature/relative humidity exceed freezing by 10 degrees F (adj.).
   4. Track and log low, high, and average temperatures of slabs.
   5. Generate alarm in event of system activation failure.
   6. Meter and data log the heat usage in kilowatts. Generate graphic bar or line graph of totals.
   7. Electric Snowmelt System Points List:

Points List	Analog In	Analog Out	Digital In	Digital Out	Alarms	Trend
Snowmelt System Start/Stop				X		
Snowmelt System Status (Current Transformer)			X		Fail	X
Snowmelt System Error/Failure			X		Fail	
System Heat Setpoint Temp	X					
Outside Air Temp	X					
Outside Humidity	X					
Slab Temp	X					

END OF SECTION

SECTION 260000
ELECTRICAL BASIC REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Work included in 26 00 00, Electrical Basic Requirements applies to Division 26, Electrical work to provide materials, labor, tools, permits, incidentals, and other services to provide and make ready for Owner's use of electrical systems for proposed project.

B. Contract Documents include, but are not limited to, Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Drawings, Addenda, Owner/Architect Agreement, and Owner/Contractor Agreement. Confirm requirements before commencement of work.

C. Definitions:
1. Provide: To furnish and install, complete and ready for intended use.
2. Furnish: Supply and deliver to project site, ready for unpacking, assembly and installation.
3. Install: Includes unloading, unpacking, assembling, erecting, installation, applying, finishing, protecting, cleaning and similar operations at project site as required to complete items of work furnished.
4. Approved or Approved Equivalent: To possess the same performance qualities and characteristics and fulfill the utilitarian function without any decrease in quality, durability or longevity. For equipment/products defined by the Contractor as "equivalent", substitution requests must be submitted to Engineer for consideration, in accordance with Division 01, General Requirements, and approved by the Engineer prior to submitting bids for substituted items.
5. Authority Having Jurisdiction (AHJ): Indicates reviewing authorities, including local fire marshal, Owner's insurance underwriter, Owner's Authorized Representative, and other reviewing entity whose approval is required to obtain systems acceptance.

1.2 RELATED SECTIONS

A. Contents of Section applies to Division 26, Electrical Contract Documents.

B. Related Work:
1. Additional conditions apply to this Division including, but not limited to:
a. Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements.
b. Drawings
c. Addenda
d. Owner/Architect Agreement

e. Owner/Contractor Agreement
f. Codes, Standards, Public Ordinances and Permits

1.3 REFERENCES AND STANDARDS

A. References and Standards per Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, individual Division 26, Electrical Sections and those listed in this Section.

B. Codes to include latest adopted editions, including current amendments, supplements and local jurisdiction requirements in effect as of the date of the Contract Documents, of/from:
   1. State of Oregon:
      a. OAR - Oregon Administrative Rules
      b. OESC - Oregon Electrical Specialty Code
      c. OFC - Oregon Fire Code
      d. OMSC - Oregon Mechanical Specialty Code
      e. OPSC - Oregon Plumbing Specialty Code
      f. OSSC - Oregon Structural Specialty Code
      g. OEESC - Oregon Energy Efficiency Specialty Code

C. Reference standards and guidelines include but are not limited to the latest adopted editions from:
   1. ADA - Americans with Disabilities Act
   2. ANSI - American National Standards Institute
   3. APWA - American Public Works Association
   4. ASCE - American Society of Civil Engineers
   5. ASHRAE Guideline 0, the Commissioning Process
   6. ASTM - ASTM International
   7. CFR - Code of Federal Regulations
   8. EPA - Environmental Protection Agency
   9. ETL - Electrical Testing Laboratories
   10. FCC - Federal Communications Commission
   11. FM - FM Global
   12. IBC - International Building Code
   13. IEC - International Electrotechnical Commission
   14. IEEE - Institute of Electrical and Electronics Engineers
   15. IES - Illuminating Engineering Society
   16. ISO - International Organization for Standardization
   17. MSS - Manufacturers Standardization Society
   18. NEC - National Electric Code
   19. NECA - National Electrical Contractors Association
   20. NEMA - National Electrical Manufacturers Association
   21. NETA - National Electrical Testing Association
   22. NFPA - National Fire Protection Association
   23. OSHA - Occupational Safety and Health Administration
   24. UL - Underwriters Laboratories Inc.

D. See Division 26, Electrical individual Sections for additional references.

1.4 SUBMITTALS

A. See Division 01, General Requirements for Submittal Procedures as well as individual Division 26, Electrical Sections.

B. Provide drawings in format and software release equal to the design documents. Drawings to be the same sheet size and scale as the Contract Documents.

C. In addition:
   1. "No Exception Taken" constitutes that review is for general conformance with the design concept expressed in the Contract Documents for the limited purpose of checking for conformance with information given. Any action is subject to the requirements of the Contract Documents. Contractor is responsible for the dimensions and quantity and will confirm and correlate at the job site, fabrication processes and techniques of construction, coordination of the work with that of all other trades, and the satisfactory performance of the work.
   2. Provide product submittals and shop drawings in electronic format only. Electronic format must be posted to ftp site. For electronic format, provide one file per division containing one bookmarked PDF file with each bookmark corresponding to each Specification Section. Provide a table of contents identifying the products being submitted for each specification section. Arrange bookmarks in ascending order of Specification Section number. Individual submittals sent piecemeal in a per Specification Section method will be returned without review or comment. All transmissions/submissions to be submitted to Architect. Deviations will be returned without review.
      a. Provide separate submittals for lighting control cutsheets, and for lighting control shop drawings.
   3. Product Data: Provide manufacturer's descriptive literature for products specified in Division 26, Electrical Sections.
   4. Identify/mark each submittal in detail. Note what differences, if any, exist between the submitted item and the specified item. Failure to identify the differences will be considered cause for disapproval. If differences are not identified and/or not discovered during the submittal review process, Contractor remains responsible for providing equipment and materials that meet the Specifications and Drawings.
      a. Label submittal to match numbering/references as shown in Contract Documents. Highlight and label applicable information to individual equipment or cross out/remove extraneous data not applicable to submitted model. Clearly note options and accessories to be provided, including field installed items. Highlight connections by/to other trades.
      b. Include technical data, installation instructions and dimensioned drawings for products, fixtures, equipment and devices installed, furnished or provided. Reference individual Division 26, Electrical specification Sections for specific items required in product data submittal outside of these requirements.
      c. See Division 26, Electrical individual Sections for additional submittal requirements outside of these requirements.

5. Maximum of two reviews of complete submittal package. Arrange for additional reviews and/or early review of long-lead items; bear costs of these additional reviews at Engineer's hourly rates. Incomplete submittal packages/submittals will be returned to contractor without review.
6. Structural/Seismic: Provide weights, dimensions, mounting requirements and like information required for mounting, seismic bracing, and support. Indicate manufacturer's installation and support requirements to meet ASCE 7-16 requirements for non-structural components. Provide engineered seismic drawings and equipment seismic certification. Equipment Importance Factor as specified in Division 01 and in Structural documents.
7. Trade Coordination: Include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and connections as required per Division 26, Electrical Coordination Documents. For equipment with electrical connections, furnish copy of approved submittal for inclusion in Division 26, Electrical submittals. Electric motors are supplied and installed by Division 23 unless otherwise specified. During shop drawing stage of the project, verify correct disconnect sizes, conductor sizes, etc., and bring any discrepancies to the attention of the Mechanical trade. Be responsible for any modifications to electrical equipment or installations as a result of equipment incompatibility discovered after shop drawing review.
8. Make provisions for openings in building for admittance of equipment prior to start of construction or ordering of equipment.
9. Substitutions and Variation from Basis of Design:
    a. The Basis of Design designated product establishes the qualities and characteristics for the evaluation of any comparable products by other listed acceptable manufacturers if included in this Specification or included in an approved Substitution Request as judged by the Design Professional.
    b. If substitutions and/or equivalent equipment/products are being proposed, it is the responsibility of parties concerned, involved in, and furnishing the substitute and/or equivalent equipment to verify and compare the characteristics and requirements of that furnished to that specified and/or shown. If greater capacity and/or more materials and/or more labor is required for the rough-in, circuitry or connections than for the item specified and provided for, then provide compensation for additional charges required for the proper rough-in, circuitry and connections for the equipment being furnished. No additional charges above the Base Bid, including resulting charges for work performed under other Divisions, will be allowed for such revisions. Coordinate with the requirements of "Submittals." For any product marked "or approved equivalent," a substitution request must be submitted to Engineer for approval prior to purchase, delivery or installation.
10. Shop Drawings: Provide coordinated shop drawings which include physical characteristics of all systems, device layout plans, and control wiring diagrams. Reference individual Division 26, Electrical specification Sections for additional requirements for shop drawings outside of these requirements.
    a. Provide Shop Drawings indicating access panel locations, size and elevation for approval prior to installation.
11. Samples: Provide samples when requested by individual Sections.
12. Resubmission Requirements:

a. Make corrections or changes in submittals as required in response to Engineer's comments. Provide a cover letter with resubmittal that includes responses to each of the Engineer's submittal review comments and identifies changes in the resubmittal. Cloud changes in the submittals.
    1) Resubmit for review until review indicates "no exception taken" or "make corrections noted."
    2) When submitting drawings for Engineer's re-review, clearly indicate changes on drawings and cloud any revisions. Submit a list describing each change.

13. Operation and Maintenance Manuals, Owner's Instructions:
    a. Submit, at one time, electronic files (PDF format) of manufacturer's operation and maintenance instruction manuals and parts lists for equipment or items requiring servicing. Submit data when work is substantially complete and in same order format as submittals. Include name and location of source parts and service for each piece of equipment.
        1) Include copy of approved submittal data along with submittal review letters received from Engineer. Data to clearly indicate installed equipment model numbers. Delete or cross out data pertaining to other equipment not specific to this project.
        2) Include copy of manufacturer's standard Operations and Maintenance for equipment. At front of each tab, provide routine maintenance documentation for scheduled equipment. Include manufacturer's recommended maintenance schedule and highlight maintenance required to maintain warranty. Furnish list of routine maintenance parts, including part numbers, sizes, quantities, relevant to each piece of equipment.
        3) Include Warranty per Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical Sections.
        4) Include product certificates of warranties and guarantees.
        5) Include copy of complete parts list for equipment. Include available exploded views of assemblies and sub assemblies.
        6) Include commissioning reports.
        7) Include copy of startup and test reports specific to each piece of equipment.
        8) Engineer will return incomplete documentation without review. Engineer will provide one set of review comments in Submittal Review format. Contractor must arrange for additional reviews; Contractor to bear costs for additional reviews at Engineer's hourly rates.
    b. Thoroughly instruct Owner in proper operation of equipment and systems. Where noted in individual Sections, training will include classroom instruction with applicable training aids and systems demonstrations. Field instruction per Section 26 00 00, Electrical Basic Requirements, Demonstration.
    c. Copies of certificates of code authority inspections, acceptance, code required acceptance tests, letter of conformance and other special guarantees, certificates of warranties, specified elsewhere or indicated on Drawings.
14. Record Drawings:

a. Maintain at site at least one set of drawings for recording “As-constructed” conditions. Indicate on drawings changes to original documents by referencing revision document, and include buried elements, location of conduit, and location of concealed electrical items. Include items changed by field orders, supplemental instructions, and constructed conditions.
b. Record Drawings are to include equipment and fixture/connection schedules that accurately reflect "as constructed or installed" for project.
c. At completion of project, input changes to original project Revit Model and make one set of black-line drawings created from Revit model in version/release equal to contract drawings. Submit Revit model and drawings upon substantial completion.
d. Record drawings solely referencing field orders, supplemental instructions, etc. without any revision markups based on the change responses are not acceptable.
e. See Division 26, Electrical individual Sections for additional items to include in record drawings.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Work and materials installed to conform with all local, State and Federal codes, and other applicable laws and regulations. Where code requirements are at variance with Contract Documents, meet code requirements as a minimum requirement and include costs necessary to meet these in Contract. Machinery and equipment are to comply with OSHA requirements, as currently revised and interpreted for equipment manufacturer requirements. Install equipment provided per manufacturer recommendations.

B. Whenever this Specification calls for material, workmanship, arrangement or construction of higher quality and/or capacity than that required by governing codes, higher quality and/or capacity take precedence.

C. Drawings are intended to be diagrammatic and reflect the Basis of Design manufacturer's equipment. They are not intended to show every item in its exact dimensions, or details of equipment or proposed systems layout. Verify actual dimensions of systems (i.e. distribution equipment, duct banks, light fixtures, etc.) and equipment proposed to assure that systems and equipment will fit in available space. Contractor is responsible for design and construction costs incurred for equipment other than Basis of Design, including, but not limited to, architectural, structural, electrical, HVAC, fire sprinkler, and plumbing systems.

D. Manufacturer's Instructions: Follow manufacturer's written instructions. If in conflict with Contract Documents, obtain clarification. Notify Engineer/Architect, in writing, before starting work.

E. Items shown on Drawings are not necessarily included in Specifications or vice versa. Confirm requirements in all Contract Documents.

F. Making, supervising, or directing the making of an electrical installation which does not meet minimum safety standards is not allowed.

G. Except as authorized by the Authority Having Jurisdiction, do not remove, transfer, alter or otherwise tamper with an inspection permit, label, tag or other indicia of inspection placed on or at an electrical job site, electrical installation or electrical product.

1.6 WARRANTY

A. Provide written warranty covering the work for a period of one year from date of Substantial Completion in accordance with Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical Sections.

B. Sections under this Division can require additional and/or extended warranties that apply beyond basic warranty under Division 01, General Requirements and the General Conditions. Confirm requirements in all Contract Documents.

1.7 COORDINATION DOCUMENTS

A. Prior to construction, prepare and submit coordinated layout drawings (composite drawings), to coordinate installation and location of HVAC equipment, ductwork, grilles, diffusers, piping, plumbing equipment/fixtures, fire sprinklers, plumbing, lights, cable tray and electrical services with architectural and structural requirements, and other trades (including plumbing, fire protection, electrical, ceiling suspension, and tile systems), and provide maintenance access requirements. Coordinate with submitted architectural systems (i.e roofing, ceiling, finishes) and structural systems as submitted, including footings and foundation. Identify zone of influence from footings and ensure systems are not routed within the zone of influence.

B. Coordination drawings to be provided for the following systems, at a minimum, for review and approval:
   1. Routing of Raceways and Boxes
   2. Transformers
   3. Switchgear/Switchboards
   4. Panelboards
   5. Lighting

C. Prepare Drawings as follows:
   1. Drawings in Revit model. Revit model release equal to design documents. Drawings to be same sheet size and scale as Contract Drawings and indicate location, size and elevation above finished floor of equipment and distribution systems.
   2. Review and revise, as necessary, section cuts in Contract Drawings after verification of field conditions.
   3. Incorporate Addenda items and change orders.
   4. Provide additional coordination as requested by other trades.

D. Advise Architect in event conflict occurs in location or connection of equipment. Bear costs resulting from failure to properly coordinate installation or failure to advise Architect of conflict.

E. Submit final Coordination Drawings with changes as Record Drawings at completion of project.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Articles, fixtures, and equipment of a kind to be standard product of one manufacturer.

2.2 STANDARDS OF MATERIALS AND WORKMANSHIP

A. Base contract upon furnishing materials as specified. Materials, equipment, and fixtures used for construction are to be new, latest products as listed in manufacturer's printed catalog data and are to be UL or ETL listed and labeled or be approved by State, County, and City authorities prior to procurement and installation.

B. Names and manufacturer's names denote character and quality of equipment desired and are not to be construed as limiting competition.

C. Hazardous Materials:
1. Comply with local, State of Oregon, and Federal regulations relating to hazardous materials.
2. Comply with Division 00, Procurement and Contracting Requirements and Division 01, General Requirements for this project relating to hazardous materials.
3. Do not use any materials containing a hazardous substance. If hazardous materials are encountered, do not disturb; immediately notify Owner and Architect. Hazardous materials will be removed by Owner under separate contract.

2.3 ACCESS PANELS

A. See Division 01, General Requirements and Division 08, Openings for products and installation requirements.

B. Confirm Access Panel requirements in Division 01, General Requirements, Division 08, Openings and individual Division 26, Electrical Sections. In the absence of specific requirements, comply with the following:
1. Provide flush mounting access panels for service of systems and individual components requiring maintenance or inspection. Where access panels are located in fire-rated assemblies of building, rate access panels accordingly.
a. Ceiling access panels to be minimum of 24-inch by 24-inch.
b. Wall access panels to be minimum of 12-inch by 12-inch.
c. Provide screwdriver operated catch.
d. Manufacturers and Models:
1) Drywall: Karp KDW.
2) Plaster: Karp DSC-214PL.

3) Masonry: Karp DSC-214M.
4) 2 hour rated: Karp KPF-350FR.
5) Manufacturers: Milcor, Elmdor, Acudor, or approved equivalent.

PART 3 - EXECUTION

3.1 ACCESSIBILITY AND INSTALLATION

A. Confirm Accessibility and Installation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical Sections.

B. Install equipment requiring access (i.e., junction boxes, light fixtures, power supplies, motors, etc.) so that they may be serviced, reset, replaced or recalibrated by service people with normal service tools and equipment. Do not install equipment in passageways, doorways, scuttles or crawlspaces which would impede or block the intended usage.

C. Install equipment and products complete as directed by manufacturer's installation instructions. Obtain installation instructions from manufacturer prior to rough-in of equipment and examine instructions thoroughly. When requirements of installation instructions conflict with Contract Documents, request clarification from Architect prior to proceeding with installation. This includes proper installation methods, sequencing, and coordination with other trades and disciplines.

D. Temporary Power:
1. Design of temporary power for construction is the responsibility of the Contractor. Remove temporary power prior to completion of Project.

E. Earthwork:
1. Confirm Earthwork requirements in Contract Documents. In the absence of specific requirements, comply with individual Division 26, Electrical Sections and the following:
    a. Perform excavation, dewatering, shoring, bedding, and backfill required for installation of work in this Division in accordance with related earthwork Sections. Contact utilities and locate existing utilities prior to excavation. Repair any work damaged during excavation or backfilling.
    b. Excavation: Do not excavate under footings, foundation bases, or retaining walls.
    c. Provide protection of underground systems. Review the project Geotechnical Report for references to corrosive or deleterious soils which will reduce the performance or service life of underground systems materials.

F. Firestopping:
1. Confirm requirements in Division 07, Thermal and Moisture Protection. In the absence of specific requirements, comply with individual Division 26, Electrical Sections and the following:

a. Coordinate location and protection level of fire and/or smoke rated walls, ceilings, and floors. When these assemblies are penetrated, seal around piping and equipment with approved firestopping material. Install firestopping material complete as directed by manufacturer's installation instructions. Meet requirements of ASTM E814, Standard Test Method for Fire Tests of Through-Penetration Fire Stops.

G. Plenums:
1. In plenums, provide plenum rated materials that meet the requirements to be installed in plenums. Immediately notify Architect/Engineer of discrepancy.

H. Start up equipment, in accordance with manufacturer's start-up instructions, and in presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.

I. Provide miscellaneous supports/metals required for installation of equipment and conduit.

3.2 SEISMIC CONTROL

A. Confirm Seismic Control requirements in Division 01, General Requirements, Structural documents, and individual Division 26 Electrical Sections.

B. General:
1. Earthquake resistant designs for Electrical (Division 26) equipment and distribution, i.e. power distribution equipment, generators, UPS, etc. to conform to regulations of jurisdiction having authority.
2. Restraints which are used to prevent disruption of function of piece of equipment because of application of horizontal force to be such that forces are carried to frame of structure in such a way that frame will not be deflected when apparatus is attached to a mounting base and equipment pad, or to structure in normal way, utilizing attachments provided. Secure equipment and distribution systems to withstand a force in direction equal to value defined by jurisdiction having authority.
3. Provide stamped shop drawings from licensed Structural Engineer of seismic bracing and seismic movement assemblies for conduit and equipment. Submit shop drawings along with equipment submittals.
4. Provide stamped shop drawings from licensed Structural Engineer of seismic flexible joints for conduit crossing building expansion or seismic joints. Submit shop drawings along with seismic bracing details.
5. Provide means to prohibit excessive motion of electrical equipment during earthquake.

3.3 REVIEW AND OBSERVATION

A. Confirm Review and Observation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical Sections.

B. Notify Architect, in writing, at following stages of construction so that they may, at their option, visit site for review and construction observation:

1. Underground conduit installation prior to backfilling.
2. Prior to covering walls.
3. Prior to ceiling cover/installation.
4. When main systems, or portions of, are being tested and ready for inspection by AHJ.

C. Final Punch:
1. Prior to requesting a final punch visit from the Engineer, request from Engineer the Electrical Precloseout Checklist, complete the checklist confirming completion of systems' installation, and return to Engineer. Request a final punch visit from the Engineer, upon Engineer's acceptance that the electrical systems are ready for final punch.
2. Costs incurred by additional trips required due to incomplete systems will be the responsibility of the Contractor.

3.4 CUTTING AND PATCHING

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In the absence of specific requirements in Division 01, General Requirements, comply with individual Division 26, Electrical Sections and the following:
1. Proposed floor cutting/core drilling/sleeve locations to be approved by Project Structural Engineer. Submit proposed locations to Architect/Project Structural Engineer. Where slabs are of post tension construction, perform x-ray scan of proposed penetration locations and submit scan results including proposed penetration locations to Project Structural Engineer/Architect for approval. Where slabs are of waffle type construction, show column cap extent and cell locations relative to proposed penetration(s).
2. Cutting, patching and repairing for work specified in this Division including plastering, masonry work, concrete work, carpentry work, and painting included under this Section will be performed by skilled craftspeople of each respective trade in conformance with appropriate Division of Work.
3. Additional openings required in building construction to be made by drilling or cutting. Use of jack hammer is specifically prohibited. Patch openings in and through concrete and masonry with grout.
4. Restore new or existing work that is cut and/or damaged to original condition. Patch and repair specifically where existing items have been removed. This includes repairing and painting walls, ceilings, etc. where existing conduit and devices are removed as part of this project. Where alterations disturb lawns, paving, and/or walks, surfaces to be repaired, refinished and left in condition matching existing prior to commencement of work.
5. Additional work required by lack of proper coordination will be provided at no additional cost to the Owner.

3.5 EQUIPMENT SELECTION AND SERVICEABILITY

A. Replace or reposition equipment which is too large or located incorrectly to permit servicing, at no additional cost to Owner.

3.6 DELIVERY, STORAGE AND HANDLING

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In the absence of specific requirements, comply with individual Division 26, Electrical Sections and the following:
   1. Handle materials delivered to project site with care to avoid damage. Store materials on site inside building or protected from weather, dirt and construction dust. Products and/or materials that become damaged due to water, dirt, and/or dust as a result of improper storage and handling to be replaced before installation.
   2. Protect equipment to avoid damage. Close conduit openings with caps or plugs. Keep motors and bearings in watertight and dustproof covers during entire course of installation.
   3. Protect bus duct and similar items until in service.

3.7 DEMONSTRATION

A. Confirm Demonstration requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, and individual Division 26, Electrical Sections.

B. Upon completion of work and adjustment of equipment, test systems and demonstrate to Owner's Authorized Representative, Architect, and Engineer that equipment furnished and installed or connected under provisions of these Specifications functions in manner required. Provide field instruction to Owner's Maintenance Staff as specified in Division 01, General Requirements, Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical Sections.

C. Manufacturer's Field Services: Furnish services of a qualified person at time approved by Owner, to instruct maintenance personnel, correct defects or deficiencies, and demonstrate to satisfaction of Owner that entire system is operating in satisfactory manner and complies with requirements of other trades that may be required to complete work. Complete instruction and demonstration prior to final job site observations.

3.8 CLEANING

A. Confirm Cleaning requirements in Division 01, General Requirements, Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical Sections.

B. Upon completion of installation, thoroughly clean electrical equipment, removing dirt, debris, dust, temporary labels and traces of foreign substances. Throughout work, remove construction debris and surplus materials accumulated during work.

3.9 INSTALLATION

A. Confirm Installation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical Sections.

B. Install equipment and fixtures in accordance with manufacturers' installation instructions, plumb and level and firmly anchored to vibration isolators. Maintain manufacturer's recommended clearances.

C. Start up equipment, in accordance with manufacturer's start-up instructions, and in presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.

D. Provide miscellaneous supports/metals required for installation of equipment.

3.10 PAINTING

A. Confirm requirements in Division 01, General Requirements and Division 09, Finishes. In the absence of specific requirements, comply with individual Division 26, Electrical Sections and the following:
   1. Ferrous Metal: After completion of work, thoroughly clean and paint exposed supports constructed of ferrous metal surfaces (i.e., hangers, hanger rods, equipment stands, etc.) with one coat of black asphalt varnish for exterior or black enamel for interior, suitable for hot surfaces.
   2. In Electrical Room, on roof or other exposed areas, equipment not painted with enamel to receive two coats of primer and one coat of rustproof enamel, colors as selected by Architect.
   3. See individual equipment Specifications for other painting.
   4. Structural Steel: Repair damage to structural steel finishes or finishes of other materials damaged by cutting, welding or patching to match original.
   5. Conduit: Clean, primer coat and paint interior/exterior conduit exposed in public areas with two coats paint suitable for metallic surfaces. Color selected by Architect.
   6. Covers: Covers such as manholes, vaults and the like will be furnished with finishes which resist corrosion and rust.

3.11 ACCESS PANELS

A. Confirm Access Panel requirements in Division 01, General Requirements. In the absence of specific requirements in Division 01, General Requirements, comply with individual Division 26, Electrical Sections and the following:
   1. Coordinate locations/sizes of access panels with Architect prior to work.

~~3.11~~3.12 ACCEPTANCE

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In the absence of specific requirements, comply with individual Division 26, Electrical Sections and the following:
   1. System cannot be considered for acceptance until work is completed and demonstrated to Architect that installation is in strict compliance with Specifications, Drawings and manufacturer's installation instructions, particularly in reference to following:
      a. Cleaning
      b. Operation and Maintenance Manuals
      c. Training of Operating Personnel
      d. Record Drawings
      e. Warranty and Guaranty Certificates
      f. Start-up/Test Document and Commissioning Reports

~~3.12~~3.13 FIELD QUALITY CONTROL

A. Confirm Field Quality Control requirements in Division 01, General Requirements, Section 26 00 00, Electrical Basic Requirements and individual Division 26, Electrical Sections.

B. Tests:
   1. Conduct tests of equipment and systems to demonstrate compliance with requirements specified. Reference individual Specification Sections for required tests. Document tests and include in operation and maintenance manuals.
   2. During site evaluations by Architect or Engineer, provide appropriate personnel with tools to remove and replace trims, covers, and devices so that proper evaluation of installation can be performed.

~~3.13~~3.14 LETTER OF CONFORMANCE

A. Provide Letter of Conformance, copies of manufacturers' warranties and extended warranties with a statement that Electrical items were installed in accordance with manufacturers' recommendations, UL listings and FM Global approvals. Include Letter of Conformance, copies of manufacturers' warranties and extended warranties in Operation and Maintenance Manuals.

END OF SECTION

SECTION 260519
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Work Included:
   1. Lugs and Pads
   2. Wires and Cables
   3. Connectors

1.2 RELATED SECTIONS

A. Contents of Division 26, Electrical and Division 01, General Requirements apply to this Section.

1.3 REFERENCES AND STANDARDS

A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

1.4 SUBMITTALS

A. Submittals as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

B. In addition, provide:
   1. Cable insulation test reports in project closeout documentation.

1.5 QUALITY ASSURANCE

A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

1.6 WARRANTY

A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Lugs and Pads:
   1. Anderson
   2. Ilsco
   3. Panduit
   4. Thomas & Betts
   5. 3M
   6. Or approved equivalent.

B. Wires and Cables:
   1. General:
      a. General Cable
      b. Okonite
      c. Southwire
      d. Encore Wire
      e. Alcan/Stabiloy
      f. Nexans/Energex 8000
      ~~e.~~**g.** Or approved equivalent.
   2. Metal Clad Cable - Type MC:
      a. Alflex
      b. AFC
      c. General Cable
      d. Southwire
      e. Encore Wire
      f. Or approved equivalent.

C. Feeder Splices:
   1. Not allowed.

~~C.~~**D.** Connectors:
   1. Anderson Power Products
   2. Burndy
   3. Ilsco
   4. 3M
   5. Thomas & Betts
   6. Or approved equivalent.

2.2 LUGS AND PADS

A. Ampacity: Cross-sectional area of pad for multiple conductor terminations to match ampere rating of panelboard bus or equipment line terminals.

B. Copper Pads: Drilled and tapped for multiple conductor terminals.

C. Lugs: Compression type for use with stranded branch circuit or control conductors; mechanical type for use with solid branch and feeder circuit conductors.

2.3 WIRES AND CABLES

A. Building Wires:
1. Copper: Soft-drawn with conductivity of not less than 98 percent IACS at 20 degrees C (68 degrees F). 600 volt rated throughout. Conductors 12 AWG and 10 AWG, solid or stranded. Conductors 8 AWG and larger, stranded. 12 AWG minimum conductor size. Minimum insulation rating of 90 degrees C. Insulation Type: THHN/THWN-2.

B. Aluminum, 600 volt rated throughout. Conductors #1/0 AWG and larger, compact stranded. Aluminum Association 8000 (AA-8000) Series alloy conductor material built to ASTM B801 specifications. Connectors and terminations to be those listed by Underwriters Laboratories Standard 486-B and marked "AL7CU" for 60C and 75C rated circuits. Connections and terminations to be installed strictly in accordance with manufacturers recommendations.

~~B.~~**C.** Phase color to be consistent at feeder terminations; A-B-C, top to bottom, left to right, front to back.

~~C.~~**D.** Color Code Conductors as Follows:

PHASE	208 VOLT WYE	240 VOLT DELTA	480 VOLT
A	Black	Black	Brown
B	Red	Orange (High Leg)	Orange
C	Blue	Blue	Yellow
Neutral	White	White	Gray or White w/colored strip
Ground	Green	Green	Green
Isolated Ground	Green w/yellow trace	N/A	N/A

~~D.~~**E.** MC Cable:
1. Standard: High strength galvanized steel flexible armor. Full length minimum size No. 12 copper ground wire, copper dual rated THHN/THWN-2, full length tape marker phase/circuit identification on cable armor. Short circuit throat insulators, mechanical compression termination.

~~E.~~**F.** AC Cable (Armored Cable): Not allowed.

~~F.~~**G.** NMB Cable: Not allowed.

2.4 CONNECTORS

A. Split bolt connectors not allowed.

B. Aluminum Cable Compression Connections (If Permitted):

1. **Provide UL-listed compression lugs that are marked AL7CU or AL9CU and have passed UL 486B or UL 486C testing procedures.**
2. **Construction: Electro tin plated high conductivity aluminum. Connector marked with wire size, die index, color-coded and the proper number and location of crimps. Factory pre-filled with oxide inhibiting compound.**
3. **Aluminum cable connection to aluminum bus bar: Use 2-hole aluminum compression lug and aluminum hardware.**
4. **Aluminum cable connection to copper bus bar: Use 2-hole aluminum compression lug, plated steel hardware and Belleville washer.**
5. **Aluminum cable connection to mechanical lugs and equipment identified as not suitable for aluminum conductor termination: Provide aluminum compression lug with stranded copper wire/cable pigtail. Equip lug compression body with insulating cover.**
6. **Aluminum Termination Hardware:**
   a. **Bolts: Anodized alloy 2023-T4 and conforming to ANSI B18.2.1 and to ASTM B211 or B221 chemical and mechanical property limits.**
   b. **Nuts: Aluminum alloy 6061-T6 or 6262-T9 and conforming to ANSI B18.2.2.**
   c. **Washers: Flat aluminum alloy Alclad 2024-T4, Type A plain, standard wide series conforming to ANSI B27.2. SAE or narrow series washers are not permitted.**

~~B.~~**C.** Conductor Branch Circuits: Wire nuts with integral spring connectors for conductors 12 AWG through 8 AWG. Push-in type connectors where conductors are not required to be twisted together are not acceptable.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

A. Install per manufacturer instructions and OESC.

B. Field Quality Control:
   1. Test conductor insulation on feeders of 100 amp and greater for conformity with 1000 volt megohmmeter. Use Insulated Cable Engineers Association testing procedures. Minimum insulation resistance acceptable is 1 megohm for systems 600 volts and below. Notify Architect if insulation resistance is less than 1 megohm.
   2. Test Report: Prepare a typed tabular report indicating the testing instrument, the feeder tested, amperage rating of the feeder, insulation type, voltage, the approximate length of the feeder, conduit type, and the measured resistance of the megohmmeter test. Submit test reports with project closeout documents.
   3. Inspect and test in accordance with NETA Standard ATS, except Section 4.
   4. Perform inspections and tests listed in NETA Standard ATS, Section 7.3.2.

3.2 LUGS AND PADS

A. Thoroughly clean surfaces to remove all dirt, oil, grease, or paint.

B. Use torque wrench to tighten per manufacturer's directions.

3.3 WIRES AND CABLES

A. General:
1. Do not install or handle thermoplastic insulated wire and cable in temperatures below -10 degrees C (14 degrees F). Do not handle thermoset insulated wire and cable in temperatures below -40 degrees C (-40 degrees F). All wire and cable must be acclimated to temperatures above freezing for no less than 24 hours prior to installation.
2. Install conductors in raceways having adequate, code size cross-sectional area for wires indicated.
3. Install conductors with care to avoid damage to insulation.
4. Do not apply greater tension on conductors than recommended by manufacturer during installation.
5. Use of pulling compounds is permitted. Clean residue from exposed conductors and raceway entrances after conductor installation. Do not use pulling compounds for installation of conductors connected to GFCI circuit breakers or GFCI receptacles.
6. **Additional Requirements for Aluminum Conductors (If Permitted):**
   a. **Equipment connected to aluminum conductors to be specifically approved for the purpose, and marked as such. Pay particular attention to refrigeration and similar equipment. Do not use aluminum wire to make connections to mechanical equipment.**
   b. **Make connection of aluminum conductors to wiring devices having wire-binding terminal screws, around which conductors can be looped under the head of the screw, by forming the conductor in a clockwise direction around the screw into three-fourths of a complete loop. Only one conductor connected to any one screw.**
6.7. Conductor Size and Quantity:
   a. Install no conductors smaller than 12 AWG unless otherwise shown.
   b. Provide required conductors for a fully operable system.
   c. Power Circuits: No. 12 AWG minimum, except as follows:
      1) No. 10 AWG for 20A, 120V circuits longer than 60-feet but not exceeding 89-feet.
      2) No. 8 AWG for 20A, 120V circuits longer than 90-feet but not exceeding 139-feet.
      3) Notify Engineer of 20A, 120V circuits exceeding 140-feet if not shown on Drawings.
   d. When exact run lengths are determined for all branch circuits, and prior to installation of the conductors, ensure that the maximum voltage drop, based on 80 percent of the circuit protective device, does not exceed 3 percent. Increase wire size from No. 12 AWG, if necessary, to ensure that the 3 percent voltage drop is not exceeded.

~~7.~~**8.** Provide dedicated neutrals (one neutral conductor for each phase conductor) in all 120V circuits.

B. Conductors in Cabinets:
   1. Conductors and cables within panels and cabinets are to be made up in a clean and workmanlike manner.
   2. Cable and tree wires in panels and cabinets for power and control. Use plastic ties in panels and cabinets.
   3. Tie and bundle feeder conductors in wireways of panelboards.
   4. Hold conductors away from sharp metal edges.

C. Homeruns:
   1. Do not change intent of branch circuit homeruns without approval. Homeruns for 20A branch circuits may be combined to a maximum of six current carrying conductors including neutral conductors in homeruns. Apply derating factors as required per NEC. Increase conductor size as needed.
   2. MC cable homeruns are not allowed.

D. Identify wire and cable under the provisions of Section 26 05 53, Identification for Electrical Systems. Identify each conductor with its panel and circuit number as indicated.

E. Exposed cable is not allowed.

F. All cable must be run parallel or perpendicular to building lines and hidden from view when possible. Where installed in tray each power cable is to be identified with Lamacoid nametag engraved with identification of equipment being fed. Tag to be fastened to cable using tie-wraps. Provide nametag at each floor level.

G. Do not install PVC jacketed cables in return air plenums, unless they are specially rated plenum cables.

H. Use of MC Cable is limited to the following conditions. Installations that do not comply with the following conditions are to be removed and replaced with no additional expense to the Owner.
   1. 20 amp branch wiring where following conditions apply:
      a. Where there is a suspended ceiling with accessible space above (example: suspended acoustic ceiling tile).
      ~~a.~~**b.** Use MC cable for final flexible connections from junction or outlet boxes to recessed fixtures. Do not use MC cables to loop between fixtures, except where it is not practical to provide conduit connections between boxes or where existing inaccessible ceilings prevent installation of conduit runs. Each individual luminaire is to be serviced by an individual cable drop from the associated junction box in the ceiling space. Maximum length 6-feet of MC cable. Luminaire drops secured to, and supported by, the building structure with nylon tie wraps. The use of the ceiling suspension system for support of any type of cabling is not permitted.

~~b.~~**c.** MC cable may be routed in the void space above hard lid ceilings, and routed within wall cavities, including below glazing, provided OESC requirements are otherwise met, and a minimum one 3/4-inch conduit is routed from nearest accessible ceiling space to inaccessible location, terminating in a j-box with blank faceplate, for future circuits.

~~c.~~**d.** Do not use in walls in areas where MC cable cannot be fished into the walls after construction is completed. For example, walls with glazing or solid beams overhead, partial height walls, etc.

3.4 CONNECTORS

A. Install to assure a solid and safe connection.

B. Select hand twist connectors for wire size and install tightly on conductors.

C. Install compression connectors using methods and tools recommended by the manufacturer.

D. Do not install stranded conductors under screw terminals unless compression lugs are installed.

E. Do not connect wiring without UL listed connectors that are listed for the purposes.

F. Additional requirements for aluminum connectors (if permitted):

1. Use adequate precaution for the termination or splicing of aluminum conductors, including removal of insulation and separators, cleaning (wire brushing) of stranded conductors, and compatibility and installation of fittings.

2. Use a UL listed joint compound, capable of penetrating the oxide film and preventing its reforming, for terminating or splicing all sizes of stranded aluminum conductors, unless the termination or splice is approved for use without compound and is so marked.

3. Do not terminate or splice aluminum conductors in wet locations unless the termination or splice is adequately protected against corrosion.

END OF SECTION

SECTION 260534
BOXES

PART 1 - GENERAL

1.1 SUMMARY

A. Work Included:
   1. Outlet Boxes
   2. Floor Boxes
   3. Pull and Junction Boxes
   4. Box Extension Adapter
   5. Weatherproof Outlet Boxes

B. Provide electrical boxes and fittings for a complete installation. Include but not limited to outlet boxes, junction boxes, pull boxes, bushings, locknuts and other necessary components.

1.2 RELATED SECTIONS

A. Contents of Division 26, Electrical and Division 01, General Requirements apply to this Section.

B. In addition, reference the following:
   1. Section 26 05 33, Raceways
   2. Section 26 05 53, Identification for Electrical Systems

1.3 REFERENCES AND STANDARDS

A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

1.4 SUBMITTALS

A. Submittals as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

1.5 QUALITY ASSURANCE

A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

1.6 WARRANTY

A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Outlet Boxes:
   1. Hubbell
   2. Thomas & Betts
   3. Eaton/Crouse-Hinds
   4. Or approved equivalent.

B. Floor Boxes:
   1. Legrand (Wiremold)
   2. FSR
   3. Hubbell
   4. Thomas & Betts
   5. MonoSystems
   6. Eaton/Crouse-Hinds
   7. Or approved equivalent.

C. Pull and Junction Boxes:
   1. Eaton/Crouse-Hinds
   2. Hoffman
   3. Or approved equivalent.

D. Box Extension Adapter:
   1. Hubbell
   2. Thomas & Betts
   3. Eaton/Crouse-Hinds
   4. Or approved equivalent.

E. Weatherproof Outlet Boxes:
   1. Legrand (Pass & Seymour)
   2. Hubbell
   3. Thomas & Betts
   4. Eaton/Crouse-Hinds
   5. Intermatic
   6. Or approved equivalent.

2.2 OUTLET BOXES

A. Luminaire Outlet: 4-inch octagonal box, 1-1/2-inches deep with 3/8-inch luminaire stud if required. Provide raised covers on bracket outlets and on ceiling outlets.

B. Device Outlet: Installation of one or two devices at common location, minimum 4-inches square, minimum 1-1/2-inches deep for non-USB type devices. Installation of one or two devices at common locations, minimum 4-inches square, minimum 2-inches deep for USB type devices. Single- or two-gang flush device raised covers.

C. Telecom Outlet: Provide 5-inches square, minimum 2-7/8-inch deep box with two-gang plaster ring.

D. Multiple Devices: Three or more devices at common location. Install one-piece gang boxes with one-piece device cover. Install one device per gang.

E. Masonry Boxes: Outlets in concrete.

F. Construction: For interior locations, provide galvanized steel outlet wiring boxes, of the type, shape and size, including depth of box, to suit each respective location and installation; constructed with stamped knockouts in back and sides, and with threaded holes with screws for securing box covers or wiring devices. All surface mounted outlet boxes are to be drawn. Welded boxes are not acceptable.

G. Accessories: Provide outlet box accessories for each installation, including mounting brackets, wallboard hangers, extension rings, luminaire studs, cable clamps and metal straps for supporting outlet boxes, compatible with outlet boxes being used and meeting requirements of individual wiring situations.

H. Noise Control: Provide acoustic putty pad to back side of each outlet box installed in acoustic rated walls.

2.3 FLOOR BOXES

A. Basis of Design: Floor boxes are based on Legrand/Wiremold as the manufacturer. Manufacturers are approved for use on this project on condition of meeting or exceeding basis of design for conditions of use, box capacity, total allowed connecting conduit capacity, and available finishes. Products ordered or installed not meeting basis of design are subject to removal and replacement at no cost to Owner. **Note: See drawings for specific Basis of Design floor boxes used throughout the building.**

B. Floor Boxes:
   1. Multi-Gang Box, Slab on Grade: Cast iron housing rated for slab on grade application, fully adjustable, accepts up to 1.25-inch conduits. Rubber gasket protects interior from water and debris. 2-gang. Provide with ____ duplex receptacle(s) and activations for ____ telecom/AV outlets. Rectangular activation, flanged, for use with matching carpet or tile insert. Finish: aluminum. Legrand/Wiremold RFB2-OG or approved.

2. Multi-Gang Box, Slab above Grade: Steel housing rated for fire rated slab above grade application, fully adjustable, accepts up to 1.25-inch conduits, fire rated for 2-hours. Rubber gasket protects interior from water and debris. 2-gang. Provide with ____ duplex receptacle(s) and activations for ____ telecom/AV outlets. Rectangular activation, flanged, for use with matching carpet or tile insert. Finish: aluminum. Legrand/Wiremold EFB45-FC or approved.
3. Face-Up Floor Box, Slab on Grade: Cast-iron housing rated for slab on grade application, fully adjustable, accepts up to 1.25-inch for power and 2-inch for telecom. Rubber gasket protects interior from water and debris. 1-gang. Provide with ____ duplex receptacle(s) and activations for ____ telecom/AV outlets. Rectangular activation, flanged with Decora style flip cover. Finish: aluminum. Legrand/Wiremold 880CM series or approved.
4. Face-Up Floor Box, Slab above Grade: Steel housing rated for fire rated slab above grade application, fully adjustable, accepts up to 1.25-inch for power and 2-inch for telecom, fire rated for 2-hours. Rubber gasket protects interior from water and debris. 1-gang. Provide with ____ duplex receptacle(s) and activations for ____ telecom/AV outlets. Rectangular activation, flanged with Decora style flip cover. Finish: aluminum. Legrand/Wiremold 8801S-FC series or approved.

2.4 PULL AND JUNCTION BOXES

A. Construction: Provide ANSI 61 gray polyester powder painted sheet steel junction and pull boxes, with screw-on covers; of type shape and size, to suit each respective location and installation; with welded seams and equipped with stainless steel nuts, bolts, screws and washers.

B. Location:
1. Provide junction boxes above accessible ceilings for drops into walls for receptacle outlets from overhead.
2. Provide junction boxes and pull boxes to facilitate installation of conductors and limiting accumulated angular sum of bends between boxes, cabinets and appliances to 270 degrees.

C. In-Ground Cast Metal Box: NEMA 250, Type 6, outside flanged, recessed cover box for flush mounting.
1. Construction: Galvanized cast iron.
2. Cover: Smooth cover with neoprene gasket and stainless steel cover screws.
3. Cover Legend: ELECTRIC.

D. Fiberglass Handholes: Die molded glass fiber hand holes:
1. Cable Entrance: Pre-cut 6- by 6-inch cable entrance at center bottom of each side.
2. Cover: Fiberglass weatherproof cover with nonskid finish.
3. Cover Legend: ELECTRIC.

2.5 BOX EXTENSION ADAPTER

A. Construction: Diecast aluminum.

B. Location: Install over flush wall outlet boxes to permit flexible raceway extension from flush outlet to fixed or movable equipment.

2.6 WEATHERPROOF OUTLET BOXES

A. Construction: Provide corrosion-resistant cast metal weatherproof outlet wiring boxes, of the type, shape and size, including depth of box, with threaded conduit ends, cast metal faceplate with spring-hinged waterproof cap suitably configured for each application, including faceplate, gasket, blank plugs and corrosion proof fasteners. Weatherproof boxes to be constructed to have smooth sides, gray finish.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

A. Coordinate locations of floor boxes and wall mounted wiring device boxes with architectural and structural floor plans prior to rough-in.

B. Install boxes securely, in a neat and workmanlike manner, as specified in NECA 1, Standard Practice of Good Workmanship in Electrical Construction.

C. Secure boxes rigidly to substrate upon which they are being mounted, or solidly embed boxes in concrete or masonry.

D. Install in locations as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and as required by NEC. Locate boxes and conduit bodies so as to ensure accessibility of electrical wiring.

E. Set wall mounted boxes at elevations to accommodate mounting heights shown on Architectural Elevations.

F. Electrical boxes are shown on drawings in approximate locations unless dimensioned.
   1. Adjust box locations up to 10-feet if required to accommodate intended purpose.

G. Install boxes to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Division 07, Thermal and Moisture Protection.

H. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.

I. Install flush mounting box without damaging wall insulation or reducing its effectiveness.

J. Support boxes independently of conduit, except cast box that is connected to two rigid metal conduits both supported within 12-inches of box.

K. Box Color Coding and Marking: Reference Section 26 05 53, Identification for Electrical Systems.

L. Adjust boxes to be parallel with building lines. Boxes not plumb to building lines are not acceptable.

M. Install knockout closures in unused box openings.

N. Clean interior of boxes to remove dust, debris, and other material.

O. Clean exposed surfaces and restore finish.

3.2 OUTLET BOXES INSTALLATION

A. Mount outlet boxes, unless otherwise required by ADA, or noted on Drawings, following distances above finished floor:
   1. Control Switches:
      a. 48-inches to the top of outlet box.
      b. 4-inches above top of backsplash at countertops/workstations, not to exceed 44-inches above finished floor to the top of outlet box, per ADA requirements.
   2. Receptacles:
      a. 15-inches to the bottom of outlet box.
      b. 4-inches above top of backsplash at countertops/workstations, not to exceed 44-inches above finished floor to the top of outlet box, per ADA requirements.
   3. Telecom Outlets:
      a. Match height of adjacent receptacle.
      b. 15-inches to the bottom of outlet box.
      c. 4-inches above top of backsplash at countertops/workstations, not to exceed 44-inches above finished floor to the top of outlet box, per ADA standards.
   4. Other Outlets: As indicated in other sections of Specifications or as detailed on Drawings.

B. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6-inches from ceiling access panel or from removable recessed luminaire.

C. Flush Outlets in Insulated Spaces: Maintain integrity of insulation and vapor barrier.

D. Coordinate electrical device locations and elevations (switches and receptacles) with architectural drawings to prevent mounting devices in mirrors, back splashes, and behind cabinets.

E. Locate outlet boxes to allow luminaires positioned as shown on reflected ceiling plan.

F. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices. Adjacent boxes not aligned vertically to be adjusted at no additional cost to Owner.

G. Use flush mounting outlet box in finished areas.

H. Do not install flush mounting box back-to-back in walls; provide minimum 6-inches separation. Provide minimum 24-inches in acoustic rated walls.

I. In acoustical walls, apply acoustic putty pad on outlet box prior to installation of acoustical blanket.

J. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.

K. Use stamped steel bridges to fasten flush mounting outlet box between studs.

L. Use adjustable steel channel fasteners for hung ceiling outlet box.

M. Use gang box where more than one device is mounted together. Do not use sectional box.

N. Use gang box with plaster ring for single device outlets.

O. Adjust flush-mounting outlets to make front flush with finished wall material.

3.3 FLOOR BOXES INSTALLATION

A. Use cast floor boxes for installations in slab on grade.

B. Use steel boxes matching fire-rating of floor slab for slab above grade.

C. Set floor boxes level.

D. Adjust floor boxes flush with finish flooring material.

E. Provide sufficient concrete cover around floor box to maintain fire rating of floor slab for slab above grade, and meet manufacturer installation directions for floor box on grade.

3.4 PULL AND JUNCTION BOXES INSTALLATION

A. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.

B. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6-inches from ceiling access panel or from removable recessed luminaire.

C. Do not fasten boxes to ceiling support wires.

D. Large Pull Boxes: Use hinged enclosure in interior dry locations, surface-mounted cast metal box in other locations.

3.5 BOX EXTENSION ADAPTER INSTALLATION

A. Match material to box.

B. Install gaskets at exterior and wet locations.

3.6 WEATHERPROOF OUTLET BOXES INSTALLATION

A. Use cast outlet box in exterior locations exposed to weather and wet locations.

B. Install gaskets.

END OF SECTION

SECTION 260925
DIGITAL LIGHTING CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Work Included:
1. General Performance
2. Distributed Digital Lighting Control System
3. Wired Digital Load Controllers (Room, Plug Load and Fixture)
4. Wired Digital Wall or Ceiling Mounted Occupancy Sensor
5. Wired Digital Wall Switch Occupancy Sensors
6. Wired Digital Wall Switches
7. **Wired Digital Wall Switch and Timer for Correlated Color Temperature (CCT)**
~~7.~~**8.** Wired Digital Daylighting Sensors
~~8.~~**9.** Wired Digital Input and Output Low Voltage Control Modules
~~9.~~**10.** Wired or Hybrid Room Configuration Tool
~~10.~~**11.** DLM Segment Network Types
~~11.~~**12.** Wired Network Bridge
~~12.~~**13.** LMCP-10V On/Off/0-10V Lighting Control Panels and LMZC Zone Controller
~~13.~~**14.** Front End Network Controller with Segment Manager Station
~~14.~~**15.** Programming, Configuration, and Documentation Software
~~15.~~**16.** Emergency Lighting Control Devices
~~16.~~**17.** Source Quality Control

B. System Description and Operation:
1. The Lighting Control and Automation system as defined under this section covers the following equipment:
a. Digital Room Controllers: Self-configuring, digitally addressable one, two, or three relays controllers with 0-10 volt control for LED drivers (if applicable) and single relay application-specific plug load controllers.
b. Digital Occupancy Sensors: Self-configuring, digitally addressable and calibrated occupancy sensors with LCD display and two-way active infrared (IR) communications.
c. Digital Switches: Self-configuring, digitally addressable pushbutton switches, dimmers, and scene switches with two-way active infrared (IR) communications.
d. Digital Photosensors: Single-zone closed loop and multi-zone open loop daylighting sensors with two-way active infrared (IR) communications can provide switching or dimming control for daylighting harvesting.

e. Configuration Tools: Handheld remote for room configuration provides two way infrared (IR) communications to digital devices and allows complete configuration and reconfiguration of the device/room from up to 30 feet away. Unit to have Organic LED display, simple pushbutton interface, and allow send and receive of room variables and store of occupancy sensor settings. Computer software also customizes room settings.
f. Room Network - Digital Lighting Management (DLM) Local Network: Free topology, plug-in wiring system (Cat 5e) for power and data to room devices.
g. Network Bridge: Provides BACnet MS/TP-compliant digital networked communication between rooms, panels, and the Segment Management or building automation system (BAS).
h. Segment Manager: Provides web browser-based user interface for system control, scheduling, power monitoring, room device parameter administration and reporting.
i. Emergency Lighting Control Unit (ELCU): Allows a standard lighting control device to control emergency lighting in conjunction with normal lighting in any area within a building.

C. Lighting Control Applications:
1. Unless relevant provisions of the applicable local Energy Codes are more stringent, provide a minimum application of lighting controls as follows:
a. Space Control Requirements: Provide occupancy/vacancy sensors with Manual-ON functionality in all spaces except toilet rooms, storerooms, library stacks, or other applications where hands-free operation is desirable and Automatic-ON occupancy sensors are more appropriate. Provide Manual-ON occupancy/vacancy sensors for any enclosed office, conference room, meeting room, open plan system and training room. For spaces with multiple occupants, or where line-of-sight may be obscured, provide ceiling-or corner-mounted sensors and Manual-ON switches.
b. Daylit areas: All luminaires within 15-feet of windows or within 7-feet of skylights (the daylit zones) will be controlled separately from luminaires outside of daylit zones. Luminaires closest to the daylight aperture will be controlled separately from luminaires farther from the daylight aperture, within the daylight zone.
c. Daytime setpoints for total ambient illumination (combined daylight and electric light) level that initiate dimming will be programmed to be not less than 125 percent of the maintained designed illumination levels without outside influence.
d. Multiple-leveled switched daylight harvesting controls may be utilized for areas marked on Drawings.
e. Provide smooth and continuous daylight dimming for areas marked on Drawings. Daylighting control system may be designed to turn off electric lighting when daylight is at or above required lighting levels, only if system functions to turn lamps back on at dimmed level, rather than turning full-on prior to dimming.

1.2 RELATED SECTIONS

A. Contents of Division 26, Electrical and Division 01, General Requirements apply to this Section.

1.3 REFERENCES AND STANDARDS

A. References and Standards per Division 01, General Requirements and Section 26 00 00, Electrical Basic Requirements.

1.4 SUBMITTALS

A. Submittals as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

B. In addition, provide:
   1. Layout of sensors indicating their sensing distribution on reproducible Architectural Floor Plans.
   2. Shop Drawings: Wiring diagrams for the various components of the System specified including:
      a. Show location of devices, including at minimum load controllers, sensors, and switches/dimmers on reflected ceiling plans. Identify controlled circuits.
      b. Provide room/area typical wiring and/or installation details including products and sequence of operation for each room or area. Illustrate recommended room/area connection topologies.
      c. Network riser single line diagram including floor and building level details. Include network cable specification. Illustrate connections to any integrated systems. Coordinate integration with mechanical and/or other trades.
   3. Closeout Submittals:
      a. Sustainable Design Closeout Documentation: Lighting Control System Manufacturer to provide Enhanced Start-up documentation that details the start-up procedure being performed including a process to follow, details on tests performed and an area that documents any test results.

1.5 QUALITY ASSURANCE

A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

B. In addition, meet the following:
   1. Manufacturer: Minimum 10 years experience in manufacture of architectural lighting controls.
   2. Manufacturer’s Quality System: Registered to ISO 9001:2000 Quality Standard, including in-house engineering for product design activities.
   3. Lighting Control System Components: Listed by UL specifically for the required loads. Provide evidence of compliance upon request.
   4. Prior to adjusting and calibrating daylighting control system and local photocell field adjustable settings, contact local manufacturer representative and arrange for representative to visit site to educate both field installer and Owner's Authorized Representative on the operation of the controls.
   5. Use manufacturer's published testing and adjusting procedures to adjust sensors time delay, daylight sensitivity, and passive infrared sensitivity to satisfaction of Owner.

6. Training: Provide minimum 4-hour training session to Owner's Authorized Representatives at a time approved by Owner after Owner has received approved operation and maintenance manuals. Training to include discussion of operation, adjustment, and replacement of sensors, photocells and control.
7. Prepare and complete report of test procedures and results. Submit these test procedures and results to Owner.

1.6 WARRANTY

A. Warranty of materials and workmanship as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Wattstopper DLM Series

B. Lutron Athena Series

C. Acuity nLight

D. Leviton Lighting Controls

E. Current NX Lighting Controls (Hubbell Lighting)

F. Or approved equivalent.

G. Basis of Design: Daylighting and occupancy sensor layout on Drawings are designed based on Wattstopper product line. Approved manufacturers listed below are allowed on condition of meeting specified conditions including complete sensor coverage of area controlled and switching of luminaires in area controlled. Provide additional sensors and room controllers as needed to provide same level of functionality as shown on Drawings. Remove and replace electrical equipment installed not meeting these conditions at no cost to Owner.

2.2 GENERAL PERFORMANCE

A. Daylight Harvesting and Occupant Detection to control lighting with the following hierarchy:
   1. Emergency (Highest Priority): Ignores all other inputs.
   2. Programming: During system programming, sensor inputs are ignored.
   3. Occupant Sensor: Allows lights to be on/off.
   4. Daylight Sensor: Imposes a high end limit for light output.
   5. Personal Control: Fine tune light levels up to the daylight sensor limit.

B. Response to a single sensor can be unique on luminaire by luminaire basis.

C. Power failure recovery - All devices return to their previous light level prior to power loss.

D. All programmable devices with integral power failure memory to maintain settings for a minimum of 10 hours during power loss.

E. Wall station and sensor replacement accomplished without programming.

2.3 DISTRIBUTED DIGITAL LIGHTING CONTROL SYSTEM

A. System General: Provide a networked lighting control system complete with all necessary enclosures, wiring, and system components to ensure a complete and properly functioning system as indicated on the Drawings and specified herein. If a conflict is identified between the Drawings and this Specification contact the Architect for clarification prior to proceeding.
   1. Default to project's determined Energy Code requirements and specifier's Sequence of Operation (SoO).

B. Local Room Communication Network: DLM communications in room can either be over a wireless IPv6 network, a wired Cat 5e network referred to as local network or In Room Bus (IRB), or a hybrid with wired Room Controllers, a wireless bridge, and additional wired and/or wireless accessory devices.
   1. Wired Room Network with LMRJ Cat 5e cables: DLM local or In Room Bus (IRB) network is a free topology lighting control physical connection and communication protocol designed to control a room or small area of building.
      a. Features of the wired DLM local network include:
         1) Plug n Go automatic configuration and binding of occupancy sensors, switches, and lighting loads to the most energy-efficient sequence of operation based upon the device attached.
         2) Simple replacement of any device in the local DLM network with a standard off the shelf unit without requiring significant commissioning, configuration, or setup.
         3) Push n' Learn configuration to change the automatic configuration, including binding and load parameters without tools, using only the buttons on the digital devices in the local network.
         4) Two-way infrared communications for control by handheld remotes, and configuration by a handheld tool including adjusting load parameters, sensor configuration and binding, within a line of sight of up to 30 feet from a sensor, wall switch or IR receiver.
      b. Digital room devices connect to the local network using pre-terminated Cat 5e cables with RJ-45 connectors provide both data and power to room devices. Systems that utilize RJ-45 patch cords but do not provide digital communication from individual end devices are not acceptable.
      c. If manufacturer's pre-terminated Cat5e cables are not used for the installation, each contractor terminated cable must be individually tested and logged provided to any authorized service representative following installation.

2.4 WIRED DIGITAL LOAD CONTROLLERS (ROOM, PLUG LOAD AND FIXTURE)

A. Digital Load Controllers: Digital controllers for lighting zones, fixtures and/or plug loads automatically bind room loads to the connected control devices in the space without commissioning or the use of any tools. Provide controllers to match the room lighting and plug load control requirements. Controllers are simple to install, and do not have dip switches/potentiometers or require special configuration for standard applications. Control units include the following features:
   1. Automatic room configuration to the most energy-efficient sequence of operation based upon the devices in the room.
   2. Simple replacement using the default automatic configuration capabilities, a room controller may be replaced with an off-the-shelf device.
   3. Multiple wired load controllers connected in a local wired IRB network must automatically arbitrate with each other, without requiring any configuration or setup, so that individual load numbers are assigned starting with load 1 to a maximum of 64, assigned based on each controller's device serial number from highest to lowest.
   4. Device Status LEDs to indicate:
      a. Data transmission
      b. Device has power
      c. Status for each load
      d. Configuration status
   5. Quick installation features including:
      a. Standard junction box mounting
      b. Quick low voltage connections using standard RJ-45 patch cable
   6. Based on individual configuration, each load shall be capable of the following behavior on power up following the loss of normal power:
      a. Turn on to 100 percent
      b. Turn off
      c. Turn on to last level
   7. Each load be configurable to operate in the following sequences based on occupancy:
      a. Auto-on/Auto-off (Follow on and off)
      b. Manual-on/Auto-off (Follow off only)
   8. Polarity of each load output shall be reversible, via digital configuration, so that an on command turns load off and an off command turns a load on.
   9. BACnet object information shall be available for the following objects:
      a. Load status
      b. Schedule state, normal or after-hours
      c. Demand Response enable and disable
      d. Room occupancy status
      e. Total room lighting and plug loads watts
   10. UL 2043 plenum rated
   11. LED On/Off status indication for each load
   12. Zero cross circuitry for each load
   13. All digital parameter data programmed into an individual room controller or plug load controller shall be retained in non-volatile FLASH memory within the controller itself. Memory shall have an expected life of no less than 10 years.
   14. Dimming Room Controllers shall share the following features:

a. Each load shall have an independently configurable preset on level for Normal Hours and After Hours to allow different dimmed levels to be established.
b. Fade rates for dimming loads shall be specific to bound switch buttons, and the load shall maintain a default value for any bound buttons that do not specify a unique value.
c. The following dimming attributes may be changed or selected using a wireless configuration tool:
    1) Establish preset level for each load from 0-100 percent
    2) Set high and low trim for each load
    3) Initiate lamp burn in for each load of either 0, 12 or 100 hours
d. Override button for each load provides the following functions:
    1) Tap for on/off control
    2) Press and hold for dimming control (lighting only)
e. Each dimming output channel shall have an independently configurable minimum and maximum calibration trim level to set the dimming range to match the true dynamic range of the connected driver. LED level indicators on bound dimming switches shall utilize this new maximum and minimum trim.
f. Each dimming output channel shall have an independently configurable minimum and maximum trim level to set the dynamic range of the output within the new 0-100 percent dimming range defined by the minimum and maximum calibration trim.
g. Calibration and trim levels must be set per output channel. Devices that set calibration or trim levels per controller (as opposed to per load) are not acceptable.

15. All configurations shall be digital. Devices that set calibration or trim levels per output channel via trim pots or dipswitches are not acceptable.

B. Wired On/Off Room Controllers shall include:
1. Dual voltage (120/277 VAC, 50/60 Hz) capable rated for 20A total load.
2. One or two relay configurations.
3. Simple 150 mA switching power supply - Only 4 100 series line voltage powered devices on a Cat 5e local network.
4. Three RJ-45 DLM local network ports with integral strain relief and dust cover.

C. Wired On/Off/0-10V KO Mount Dimming Room Controllers shall include:
1. Dual voltage (120/277 VAC, 50/60 Hz) capable rated for 10A total load, or 16A total load depending on product.
2. Optional real time current and voltage metering (with –M Monitoring option).
3. One or two relay configurations (10A) or one relay configuration (16A).
4. Smart 150 mA switching power supply.
5. Two RJ-45 DLM local network ports. Provide molded strain relief ring.
6. One dimming output per relay.
    a. 0-10V Dimming - Where indicated, 0-10 volt analog outputs per relay for control of compatible LED drivers. Units shall include a complimentary UL 924 rating for the ability of the 0-10 volt output to automatically open upon loss of power to the Room Controller to assure full light output from lighting connected to the 0-10V signal and powered by a live line voltage circuit.
7. Units capable of providing both Class 1 and/or Class 2 wiring for the 0-10V output.

D. Wired On/Off/0-10V Dimming Enhanced Room Controllers shall include:

1. Dual voltage (120/277 VAC, 50/60 Hz) capable or 347 VAC, 50/60 Hz. 120/277 volt models rated for 20A total load; 347 volt models rated for 15A total load.
2. Built in real time current monitoring via transducer.
3. One, two or three relay configurations.
4. Smart 250 mA switching power supply.
5. Conduit adaptor available for applications where all wiring must be in conduit.
6. Four RJ-45 DLM local network ports. Provide integral strain relief.
7. One dimming output per relay.
    a. 0-10V Dimming - Where indicated, 0-10 volt analog outputs per relay for control of compatible LED drivers. Units shall include a complimentary UL 924 rating for the ability of the 0-10 volt output to automatically open upon loss of power to the Room Controller to assure full light output from lighting connected to the 0-10V signal and powered by a live line voltage circuit.

E. Wired On/Off/ Forward Phase Dimming Room Controllers shall include:
1. Dual voltage (120/277 VAC, 50/60 Hz) rated for 20A total load, with forward phase dimmed loads derating to 16A for some load types.
2. Built in real time current monitoring via transducer.
3. One or two relay configurations.
4. Smart 250 mA switching power supply.
5. Conduit adaptor available for applications where all wiring must be in conduit.
6. Four RJ-45 DLM local network ports. Provide integral strain relief.
7. One dimming output per relay.
    a. Line Voltage, Forward Phase Dimming - Where indicated, one forward phase control line voltage dimming output per relay for control of compatible two-wire LED drivers, MLV, forward phase compatible ELV, neon/cold cathode and incandescent loads.

F. Wired Plug Load Controllers shall include:
1. 120 VAC, 50/60 Hz rated for 20A total load. Some Controllers carry application-specific UL 20 rating for receptacle control.
2. One relay configuration with additional connection for unswitched switchleg.
3. Factory default operation is Auto-on/Auto-off, based on occupancy, and loads not bound automatically to any switches in room.
4. Optional real time current, or current and voltage metering depending on unit. Metering shall provide a single total wattage measurement of both switched and unswitched switchleg wires in plug in loads.
5. Switching power supply.
    a. Simple 150mA - Only 4 100 series devices on a Cat 5e local network Limit devices to 24 total.
    b. Smart 150mA
    c. Smart 250mA
6. RJ-45 DLM local network ports.
    a. Two RJ-45 ports
    b. Three RJ-45 ports
    c. Four RJ-45 ports
7. Plug Load Controllers.

G. Fixture Controllers shall include:
   1. Product rating and form factor allows OEM fixture manufacturers to mount the device inside the interior cavity of standard-sized fluorescent or LED general lighting fixtures.
   2. One 3A 120/277V rated mechanically held relay.
   3. Require 7 mA of 24VDC operating power from the DLM local network.
   4. Fixture Controller does not require a connection to a neutral conductor to operate, and unlike other types of Load Controllers it does not contribute power to the DLM local network to drive accessory devices.
   5. Power to drive the Fixture Controller electronics can come from any wired Load Controller, Power Booster and/or Zone Controller (described later in the LMCP LIGHTING CONTROL PANELS specification section).
   6. 0-10V dimming capability via a single 0-10 volt analog output from the device for control of compatible LED drivers. The 0-10 volt output shall automatically open upon loss of power to the Fixture Controller to assure full light output from lighting connected to the 0-10V signal and powered by a separate live line voltage circuit.
   7. Connect to a single or dual RJ-45 adaptor with 24 inch leads. Single adaptor mounts in a 1/2 inch KO and dual adaptor mounts in a 2.2- by 1.32-inch rectangular hole for connection to the DLM local network.
   8. Adaptor leads are insulated for use in a fixture cavity, and the lead length allows the OEM fixture manufacturer flexibility to position the Fixture Controller and the RJ45 jack in the best locations on each fixture.
   9. A complete set of dimming features described above in the paragraph detailing On/Off/Dimming Enhanced Room Controllers.

2.5 WIRED DIGITAL WALL OR CEILING MOUNTED OCCUPANCY SENSOR

A. Wired Digital Occupancy Sensors with two way digital communications to Lighting Control system. Provide sensors of quantity and type to meet specific room applications. Features include the following:
   1. Digital communication and pushbutton configuration of the following variables:
      a. Sensitivity, 0-100 percent in 10 percent increments
      b. Time delay, 1-30 minutes in 1 minute increments
      c. Test mode, Five second time delay
      d. Detection technology, PIR, Ultrasonic or Dual Technology activation and/or re-activation.
      e. Walk-through mode
   2. Load parameters settings include Auto or Manual-ON and blink warning.
   3. Programmable control functionality including:
      a. Each sensor may be programmed to control specific loads within a local network.
      b. Sensor shall be capable of activating one of 16 user-definable lighting scenes or implementing a Partial On or Partial Off Sequence of Operation.
      c. Adjustable retrigger time period for manual-on loads. Load will retrigger (turn on) automatically within a configurable period (default 10 seconds) after turning off.
      d. On dual technology sensors, independently configurable trigger modes available for both Normal (NH) and After Hours (AH) time periods. The trigger and retrigger modes can be programmed to use the following technologies options:
         1) Ultrasonic and Passive Infrared

2) Ultrasonic or Passive Infrared
3) Ultrasonic only
4) Passive Infrared only

e. Independently configurable sensitivity settings for passive infrared and ultrasonic technologies (on dual technology sensors) for both Normal and After Hour time periods.

4. One or two RJ-45 port(s) for connection to DLM local network.
5. Two-way infrared (IR) transceiver to allow remote programming through handheld commissioning tool and control by remote personal controls.
6. Device Status LEDs, which may be disabled for selected applications, including:
   a. PIR detection
   b. Ultrasonic detection
   c. Configuration mode
   d. Load binding
7. Optional lens configurations for the PIR only Wall and Ceiling sensors to allow coverage of longer ranges, 1 way or 2 way aisles, higher density coverage in smaller areas, or mounting up to 40 foot heights.
8. Assignment of occupancy sensor to a specific load within the room without wiring or special tools.
9. Manual override of controlled loads is permitted.
10. All digital parameter data programmed into an individual occupancy sensor shall be retained in non-volatile FLASH memory within the sensor itself. Memory shall have an expected life of no less than 10 years.

B. BACnet object information shall be available for the following objects:
   1. Detection state for each sensor
   2. Detection state for all sensors in room (Room status)
   3. Occupancy sensor time delay
   4. Occupancy sensor sensitivity, PIR and Ultrasonic

C. Units shall not have any dip switches or potentiometers for field settings.

D. Multiple occupancy sensors may be installed in a room by simply connecting them to the free topology DLM local network. No additional configuration will be required.

2.6 WIRED DIGITAL WALL SWITCH OCCUPANCY SENSORS

A. Wired Digital Wall Switch Occupancy Sensors with two way digital communications to Lighting Control system. Provide sensors of quantity and type to meet specific room applications. Features include the following:
   1. Digital Occupancy Sensors shall provide scrolling LCD display for digital calibration and verification.
   2. Digital calibration and pushbutton configuration for the following variables:
      a. Sensitivity: 0-100 percent in 10 percent increments
      b. Time delay: 1-30 minutes in 1 minute increments
      c. Test mode: Five second time delay
      d. Detection technology: PIR only or Dual Technology with PIR and Ultrasonic.
      e. Walk-through mode

f. Load parameters including Auto/Manual-ON, blink warning, and daylight enable/disable when photosensors are included in the DLM local network.

3. Programmable control functionality including:
   a. Each sensor may be programmed to control specific loads within a local network.
   b. Sensor shall be capable of activating one of 16 user-definable lighting scenes.
   c. Adjustable retrigger time period for manual-on loads. Load will retrigger (turn on) automatically during the configurable period (default 10 seconds) after turning off.
   d. On dual technology sensors, independently configurable trigger modes are available for both Normal and After Hours time periods. The trigger and retrigger modes can be programmed to use the following technologies options:
      1) Ultrasonic and Passive Infrared
      2) Ultrasonic or Passive Infrared
      3) Ultrasonic only
      4) Passive Infrared only
4. Independently configurable sensitivity settings for passive infrared and ultrasonic technologies (on dual technology sensors) for both Normal and After Hour time periods.
5. Two RJ-45 ports for connection to DLM local network.
6. Two-way infrared (IR) transceiver to allow remote programming through handheld configuration tool and control by remote personal controls.
7. Device Status LEDs including
   a. PIR detection
   b. Ultrasonic detection
   c. Configuration mode
   d. Load binding
8. Assignment of any occupancy sensor to a specific load within the room without wiring or special tools.
9. Assignment of integral buttons on the device to specific loads or scenes within the room without wiring or special tools.
10. Manual override of controlled loads.
11. All digital parameter data programmed into an individual wall switch sensor shall be retained in non-volatile FLASH memory within the wall switch sensor itself. Memory shall have an expected life of no less than 10 years.

B. BACnet object information shall be available for the following objects:
   1. Detection state
   2. Occupancy sensor time delay
   3. Occupancy sensor sensitivity, PIR and Ultrasonic
   4. Button state
   5. Switch lock control
   6. Switch lock status

C. Units shall not have any dip switches or potentiometers for field settings.

D. Multiple wall switch occupancy sensors may be installed in a room by simply connecting them to the free topology DLM local network. No additional configuration will be required.

E. Two-button wall switch occupancy sensors, when connected to a single relay dimming room or fixture controller, shall operate in the following sequence as a factory default:

1. Left button, Tap - Turn load on: Press and hold - Raise dimming load.
2. Right button, Tap - Turn load off: Press and hold - Lower dimming load

F. Low voltage momentary pushbuttons shall include the following features:
   1. Load/Scene Status LED on each switch button with the following characteristics:
      a. Bi-level LED
      b. Dim locator level indicates power to switch
      c. Bright status level indicates that load or scene is active
   2. The following button attributes may be changed or selected using a wireless configuration tool:
      a. Load and Scene button function may be reconfigured for individual buttons (from Load to Scene, and vice versa).
      b. Individual button function may be configured to Toggle, On only, Off only, or Toggle Dim (toggles between press and hold to raise, release, then press and hold to lower).
      c. Individual scene buttons may be locked to prevent unauthorized change.
      d. Fade Up and Fade Down times for individual scenes may be adjusted from 0 seconds to 18 hours in preset increments.
      e. Ramp rate may be adjusted for each dimmer switch.
      f. Switch buttons may be bound to any load on any load controller or relay panel and are not load type dependent; each button may be bound to multiple loads.
      g. Pre-engraved versions with most requested text available in white, light almond, ivory, grey, red, and black; compatible with wall plates with decorator opening.

2.7 WIRED DIGITAL WALL SWITCHES

A. Low voltage momentary pushbutton switches in 1, 2, 3, 4, 5 and 8 button configurations. Wall switches shall include the following features:
   1. Two-way infrared (IR) transceiver for use with personal and configuration remote controls.
   2. Removable buttons for field replacement with engraved and/or alternate color buttons. Button replacement may be completed without removing the switch from the wall.
   3. Configuration LED on each switch that blinks to indicate data transmission.
   4. Load/Scene Status LED on each switch button with the following characteristics:
      a. Bi-level LED
      b. Dim locator level indicates power to switch
      c. Bright status level indicates that load or scene is active
      d. Dimming switches shall include seven bi-level LEDs to indicate load levels using 14 steps.
   5. Programmable control functionality including:
      a. Button priority may be configured to any BACnet priority level, from 1-16, corresponding to networked operation allowing local actions to utilize life safety priority
      b. Scene patterns may be saved to any button other than dimming rockers. Once set, buttons may be digitally locked to prevent overwriting of the preset levels.

6. All digital parameter data programmed into an individual wall switch shall be retained in non-volatile FLASH memory within the wall switch itself. Memory shall have an expected life of no less than 10 years.

B. BACnet object information shall be available for the following objects:
   1. Button state
   2. Switch lock control
   3. Switch lock status

C. Two RJ-45 ports for connection to DLM local network.

D. Multiple digital wall switches may be installed in a room by simply connecting them to the free topology DLM local network. No additional configuration shall be required to achieve multi-way switching.

E. Load and Scene button function may be reconfigured for individual buttons from Load to Scene, and vice versa.
   1. Individual button function may be configured to Toggle, On only, Off only, or Toggle Dim (toggles between press and hold to raise, release, then press and hold to lower).
   2. Individual scene buttons may be locked to prevent unauthorized change.
   3. Fade Up and Fade Down times for individual scenes may be adjusted from 0 seconds to 18 hours in preset intervals.
   4. Ramp rate may be adjusted for each dimmer.
   5. Switch buttons may be bound to any load on any load controller or relay panel and are not load type dependent; each button may be bound to multiple loads.
   6. Manufacturer shall offer Pre-Engraved devices with the most requested text engravings that can be readily shipped direct from inventory and shall be designated with an "ENG#" suffix before the color descriptor.
   7. Pre-engraved versions with most requested text available by adding a "-ENG#" before the final color suffix. Available in white, light almond, ivory, grey, red, and black; compatible with wall plates with decorator opening.

2.8 WIRED DIGITAL WALL SWITCH AND TIMER FOR CORRELATED COLOR TEMPERATURE (CCT)

A. Digital CCT Preset Switch and CCT Timer Wall Switch for control of Correlated Color Temperature (CCT) in a room require fixtures with below listed CCT capable Logic Module with DLM Control Card – 1 per each independent lighting orientation (e.g. direct and indirect), and circuit feed, up to a maximum 8 foot linear LED array. Logic Module characteristics are determined by the specific module installed and the LED array. Adjustment of CCT shall precisely trace the Black Body Curve across the LED array's tunable range to replicate natural daylight within the built environment. Only white LEDs shall be used for maximum efficacy. Lighting Fixtures, Lamps, are specified in Section 26 51 00, Lighting.

1. **Each Logic Module with a DLM Control Card to be individually addressable by the system. All other DLM hardware and software products will treat the combo Logic Module/DLM Control Card as a single DLM load and a single DLM device, with the capability of controlling them individual or as part of a group with other DLM load devices in the space, or over the room-to-room network.**
2. **CCT functionality to be implemented as an additional channel of information for any DLM load device. DLM's standard system capabilities to apply without reduction - either a max of 24, 48, or 96 DLM devices on the local network based on the power device, and a max of 64 loads. Loads that are not CCT capable will ignore any CCT command, so that CCT loads can be added to any existing DLM network without problem to existing programming and devices.**
3. **CCT and minimum CCT level determined by specific version of logic module used:**
   a. **2 Channel CCT and dimming to 0.1 percent minimum. CCT range from 3000 – 5000K unless specified differently in the fixture schedule.**
   b. **3 Channel CCT and 0.1 percent minimum dimming level. CCT range from 2700 – 6500K.**
4. **CRI shall not be less than 90 throughout the entire CCT range.**
5. **Color consistency of ≤2 MacAdam ellipses over the life of the source for 3 channel CCT.**
6. **Closed loop thermal feedback to compensate for thermally induced output variation and lumen depreciation over time.**
7. **Integrated driver and LED array assemblies to address inherent LED variability and complex non-linear relationships between system components.**
8. **A unique, programmable color model for each color tunable-white light source enabled by in-line dynamic spectral capture of each LED array and custom color model generation.**

B. Low voltage CCT Preset Switch and CCT Wall Switch Timer shall include the same hardware features specified in the preceding paragraph Digital Wall Switches and be connected to the room's DLM Cat 5e local network cable.

C. 5 Button CCT Preset Switch to control CCT capable loads via its 4 buttons and rocker.
1. **Default behavior will be that the Preset Switch will bind to all CCT capable loads in the room on connection. Individual loads can be added or removed via normal Push n' Learn programming either manually, via handheld commissioning tool, or LMCS software.**
2. **The four preset buttons provide default settings of 100 percent, 75 percent, 50 percent and 25 percent of available CCT range. Buttons can be programmed to a user's preferred presets by specifying a specific Kelvin temperature, or DLM percentage of controlled fixtures' CCT range (0-100 percent). Pressing and holding preset button for 5 seconds to record new preset level to that button based on last changed fixture's current setting.**
3. **CCT Present Switch shall also include a single rocker that provides full range control of all bound load's CCT level.**

~~2.8~~**2.9** WIRED DIGITAL DAYLIGHTING SENSORS

A. Digital daylighting sensors shall work with load controllers and relay panels to provide automatic switching, bi-level, tri-level or dimming daylight harvesting capabilities for any load type connected to the controller or panel. Daylighting sensors shall be interchangeable without the need for rewiring.
   1. Closed loop sensors measure the ambient light in the space and control a single lighting zone.
   2. Open loop sensors measure incoming daylight in the space and can control up to three lighting zones.

B. Digital daylighting sensors shall include the following features:
   1. Sensor's internal photodiode shall only measure light within the visible spectrum. The photodiode's spectral response curve shall closely match the photopic curve. Photodiode shall not measure energy in either the ultraviolet or infrared spectrums. Photocell shall have a sensitivity of less than 5 percent for any wavelengths less than 400 or greater than 700 nanometers.
   2. Sensor light level range shall be from 1 to 1,533 foot-candles (fc).
   3. Capability of ON/OFF, bi-level, tri-level, or dimming for each controlled zone, depending on the selection of load controller(s) and load binding to controller(s).
   4. For switching daylight harvesting, the photosensor shall provide a field-selectable deadband (separation, between the "ON Setpoint" and the "OFF Setpoint") to prevent the lights from cycling on and off excessively.
   5. For dimming daylight harvesting, the photosensor shall provide the option, when the daylight contribution is sufficient, of turning lights off or dimming lights to a field-selectable minimum level.
   6. Photosensors shall have a digital, independently configurable fade rate for both increasing and decreasing light level in units of percent per second.
   7. Photosensors shall provide adjustable cut-off time. Cut-off time defined as the number of selected minutes the load is at the minimum output before the load turns off. Selectable range of 0-240 minutes including option for no cut-off.
   8. Wall switch functions so occupants may always reduce lighting level to increase energy savings or, if permitted by facility engineer, optionally raise lighting levels for a selectable period or cycle of occupancy above daylight cap level.
   9. Integral infrared (IR) transceiver for configuration and/or commissioning with a handheld configuration tool, to transmit detected light level to wireless configuration tool.
   10. Configuration LED status light on device blinks to indicate data transmission.
   11. Status LED indicates test mode, override mode and load binding.
   12. Recessed switch on device to turn controlled load(s) ON and OFF.
   13. BACnet object information shall be available for the following daylighting sensor objects, based on the specific photocell's settings:
      a. Light level
      b. Day and night setpoints
      c. Off time delay
      d. On and off setpoints
      e. Up to three zone setpoints
      f. Operating mode – on/off, bi-level, tri-level or dimming
   14. One RJ-45 port for connection to DLM local network.

15. A choice of accessories to accommodate multiple mounting methods and building materials. Photosensors may be mounted on a ceiling tile, skylight light well, suspended lighting fixture or backbox. Standard tube photosensors accommodate mounting materials from 0 to 0.62-inch thick. Extended tube photosensors accommodate mounting materials from 0.62- to 1.25-inches thick. Mounting brackets are compatible with J boxes and wall mounting.
16. Any load or group of loads in the room can be assigned to a daylighting zone.
17. Each load within a daylighting zone can be individually enabled or disabled for discrete control (load independence).
18. All digital parameter data programmed into a photosensor shall be retained in non-volatile FLASH memory within the photosensor itself. Memory shall have an expected life of no less than 10 years.

C. Closed loop digital photosensors shall include the following additional features:
1. An internal photodiode that measures light in a 100-degree angle, cutting off the unwanted light from bright sources outside of this cone.
2. Automatic self-calibration, initiated from the photosensor, a wireless configuration tool or a PC with appropriate software.
3. Automatically establishes application-specific setpoints following self-calibration. For switching operation, an adequate deadband between the ON and OFF setpoints shall prevent the lights from cycling; for dimming operation a sliding setpoint control algorithm with separate Day and Night setpoints shall prevent abrupt ramping of loads.

D. Open loop digital photosensors shall include the following additional features:
1. An internal photodiode that measures light in a 60-degree angle (cutting off the unwanted light from the interior of the room).
2. Automatically establishes application-specific setpoints following manual calibration using a wireless configuration tool or a PC with appropriate software. For switching operation, an adequate deadband between the ON and OFF setpoints for each zone shall prevent the lights from cycling; for dimming operation, a proportional control algorithm shall maintain the design lighting level in each zone.
3. Each of the three discrete daylight zones can include any non-overlapping selection of loads in the room.

~~2.9~~2.10 WIRED DIGITAL INPUT AND OUTPUT LOW VOLTAGE CONTROL MODULES

A. Wired DLM input and output low voltage modules allow control of DLM loads by other devices and systems or allow the DLM system to send signals to other devices and systems for integration. Interfacing with other systems can either be a dry (unpowered/with no voltage) contact closure, or via RS-232.

B. Modules shall be plastic with a clamshell hinged lid, two Cat 5e wiring terminals for connection to a DLM wired Cat 5e IRB network and come with an accessory DIN mounting bracket. LEDs on the unit shall provide information on the status of the inputs or outputs, and a configuration button shall be provided to allow easy entry into programming sequence. Devices shall include a removable terminal block for ease of wiring, and label identifying each terminal contact.

C. Wired Low Voltage Room Occupancy Status Isolated Relay Interface:
   1. Module provides a single Form C contact relay rated for 24VAC/DC.
   2. Relay module will provide a contact closure on the Normally Open side of the relay (and contact open on the Normally Closed side) when any occupancy sensor on the local Cat 5e IRB network is in the occupied mode. This function is non-programmable and works automatically via the unit's internal circuitry.
   3. LED on the device to provide status of the relay.
   4. This device is ideally suited to connect to HVAC controls in the space that are looking for a dry contact whenever the space is occupied to enhance their specific sequence of operation.

D. Wired Low Voltage Output Module features shall include:
   1. Two individual Form C contact relays rated from 0-24VAC/DC.
   2. Module relays shall act like line voltage relays in DLM Load Controllers; they can be assigned (bound) to any DLM system input including switch buttons, occupancy sensors, photocells, timeclocks, and/or low voltage input modules.
   3. In addition to providing a maintained contact, relays can be set to a "pulse" mode so that when turning on they stay on only for a short duration and then they automatically return to their normally Open state, allowing the module to interact with other devices that require momentary inputs from 0.1 to 25.4 or 1-254 seconds.
   4. Unit shall have two override buttons so each relay can be manually overridden On and Off to verify wiring and operation.
   5. LEDs on the device to identify status of the device's two relays.

E. Wired Low Voltage Input Module features shall include:
   1. Ability to switch the module between three operating modes, allowing it to be used as a load control device (Normal use), a partition interface device, or an input for skylight or exterior photocells.
   2. When set in normal usage, the DLM Input Module shall accept up to 4 separate inputs, either 2-wire maintained, 2-wire momentary, or 24VDC signal inputs. Additionally, a pair of 2-wire inputs can be used as a 3-wire input to emulate up and down presses on a DLM switch rocker.
   3. In normal usage, the 4 inputs can be used to control loads, trigger a scene, send a network group command, or emulate an occupancy action so an occupied/unoccupied message is sent to loads.
   4. Input modules can trigger special load scenarios, taking advantage of DLM system's priority-based functions such as Force On, Force Off, Shed, Cleaning, Normal/After Hours, and Key Switch functions.
   5. Inputs can trigger different load and scene modes for controlled outputs, so loads can toggle status, go on, go off, or toggle dim. Scenes can be set to Recall, Recall/Off, or Scene Off.
   6. In partition mode, unit will send appropriate command to indicate whether movable partitions (up to 4) in the space are in the extended or retracked state and then changing the profile settings of the room allowing different bindings of switches, dimmers, and occupancy sensors.

7. In exterior photocell mode, will provide an input for an external photocell to provide the system with a sensed footcandle (fc) level. This fc level can be used by DLM scheduling devices to determine when a group of loads should be turned on or off based on daylight level instead of dusk/dawn settings.
8. All listed functionality to be accessible from IR handheld remote or from front end system software. Products that require functions to be set at the device, or that incorporate dip switches to select functions, shall not be allowed.

F. Wired RS-232 Interface Module features shall include:
1. Ability to communicate with other devices and systems via standard RS-232 wiring and protocol.
2. Via a standardized set of host commands, other systems can send messages to a RS-232 Interface Module in a DLM room, allowing loads to be overridden on, off or sent to a specific level (taking advantage of optional message parameters to dim over time), set scene, execute button lockout, changing room profiles, or sending a Normal Hours/After Hours command.
3. By using the "Status" host command the RS-232 interface module can be instructed to share information with connected systems whenever changes occur in the room. Examples of message alerts include relay status chance, occupancy status change (by room or by sensor), scene status change, buttons are pressed, or profile's chance based on partitions, or daylight level.

~~2.10~~**2.11** WIRED OR HYBRID ROOM CONFIGURATION TOOL

A. Provide handheld configuration tool to facilitate customization of Wired DLM devices using two-way infrared communications. Can be used with or without PC software that connects to each local network via a USB interface.

B. Features and functionality of the handheld configuration tool shall include:
1. Two-way infrared (IR) communication with DLM IR-enabled devices within a range of approximately 30 feet.
2. High visibility organic LED (OLED) display, pushbutton user interface and menu-driven operation.
3. Must be able to read and modify parameters for load controllers and relay panels, occupancy sensors, wall switches, daylighting sensors, network bridges, and identify DLM devices by type and serial number.
4. Save up to eight occupancy sensor setting profiles and apply profiles to selected sensors in same room or other rooms.
5. Adjust current light level of any load(s) on the local network and capture those levels in scene setting.
6. Set room mode for testing of Normal Hours (NH) and After Hours (AH) parameter settings, enable or disable load shed status, and identify all IRB connected devices by their part number, and hardware/firmware versions.
7. Adjust or fine-tune daylighting settings established during auto-configuration, and input light level data to complete configuration of open loop daylighting controls.
8. Verify status of Bridge Devices connected to Wired or Wireless Segment networks.

~~2.11~~2.12 DLM SEGMENT NETWORK TYPES

A. DLM shall allow for three separate types of Room-to-Room ("Segment") communication so that information may be shared between them and any front-end hardware. The system shall allow either Wired, Wireless, or both Wired and Wireless (Hybrid) Room-to-Room Segment Networks communication types to be used.

B. For a wired Segment Network, provide a linear topology, BACnet-based MS/TP conductor to connect local IRB networks (rooms) and relay panels to allow for centralized control.
   1. Each connected local room network shall include a single network bridge. The network bridge is the only room-based device that is connected to the segment network.
   2. Network bridges, relay panels or network controllers with integral network bridges, shall include a terminal block with provisions for separate "in" and "out" terminations, for wired segment network wire connections.
   3. Wired segment network utilizes 1.5 twisted pair, shielded, cable ordered from the lighting control manufacturer. Maximum cable run for each segment is 4,000 feet. Conductor-to-conductor capacitance of the twisted pair shall be less than 30 pf/ft and have a characteristic impedance of 120 Ohms.
   4. Network wire jacket for interior applications is available in high visibility green, white, or black. A black version for direct burial is also available.
   5. Substitution of manufacturer-supplied cable is not permitted and may void the warranty if non-approved cable is installed, and if terminations are not completed according to manufacturer's specific requirements.
   6. Network signal integrity requires that each conductor, ground wire and shield be correctly prepared and terminated at every connected device. Use of crimp on ferrules are highly recommended for each individual wire termination.
   7. Wired Segment networks shall be capable of connecting to any of the following: BACnet-compliant BAS (provided by others) directly via MS/TP, or BACnet/IP via an NB-ROUTER, or Segment Manager (which can also accept BACnet/IP). Systems whose room-connected network infrastructure require gateway devices to provide BACnet data to a BAS are unacceptable.

~~2.12~~2.13 WIRED NETWORK BRIDGE

A. Network bridge module connects a local network to a BACnet-compliant segment network for communication between rooms, relay panels and a front end network controller or BAS. Each local network shall include a network bridge component to provide a connection to the local network room devices. Network bridge shall use industry standard BACnet MS/TP network communication and an optically isolated EIA/TIA RS-485 transceiver.
   1. Network bridge shall be provided as a separate module connected on the local network through an available RJ-45 port.
   2. Provide Plug n Go operation to automatically discover room devices connected to the local network and make all device parameters visible to the Network Controller via the segment network. No commissioning shall be required for set up of the network bridge on the local network.

3. Network bridge shall support digital communications to facilitate the control of all devices in its local Cat 5e network to provide interoperation with building automation systems and other intelligent field devices. Digital communications shall be RS485 MS/TP-based using the BACnet protocol.
    a. Bridge shall have provision for an individual BACnet device ID and shall support the full 2^22 range (0 to 4,193,304). The device ID description property shall be writable via the network to allow unique identification of the lighting control panel on the network.
    b. Bridge shall support MS/TP MAC addresses in the range of 0 to 127 and baud rates of 9600k, 38400k, 76800k, and 115.2k bits per second.
    c. Setup and commissioning of panel shall not require manufacturer-specific software or a computer. All configuration of the lighting control panel shall be performed using standard BACnet objects or via the handheld IR programming remote.
    d. Description property for all objects shall be writable via the network and shall be saved in non-volatile memory within the panel.
    e. BO and BV 1 to 99 objects shall support BACnet priority array with a relinquish default of off and afterhours, respectively. Prioritized writes to the channel BV objects shall propagate prioritized control to each member relay in a way analogous to the BACnet Channel object described in addendum aa. (http://www.bacnet.org/Addenda/Add-135-2010aa.pdf).
4. Network bridge shall automatically create standard BACnet objects for selected DLM devices to allow any BACnet-compliant BAS to include lighting control and power monitoring features as provided by the DLM devices on each local network. BACnet objects will be created for the addition or replacement of any given DLM device for the installed life of the system. Products requiring that an application-specific point database be loaded to create or map BACnet objects are not acceptable. Systems not capable of providing BACnet data for control devices via a dedicated BACnet Device ID and physical MS/TP termination per room are not acceptable. Standard BACnet objects shall be provided as follows:
    a. Read/write the normal or after hours schedule state for the room
    b. Read the detection state of each occupancy sensor
    c. Read the aggregate occupancy state of the room
    d. Read/write the On/Off state of loads
    e. Read/write the dimmed light level of loads
    f. Read the button states of switches
    g. Read total current in amps, and total power in watts through the load controller
    h. Read/write occupancy sensor time delay, PIR sensitivity and ultrasonic sensitivity settings
    i. Activate a preset scene for the room
    j. Read/write daylight sensor fade time and day and night setpoints
    k. Read the current light level, in foot-candles, from interior and exterior photosensors and photocells
    l. Set daylight sensor operating mode
    m. Read/write wall switch lock status
    n. Read watts per square foot for the entire controlled room
    o. Write maximum light level per load for demand response mode
    p. Read/write activation of demand response mode for the room
    q. Activate/restore demand response mode for the room

~~2.13~~**2.14** LMCP-10V ON/OFF/0-10V LIGHTING CONTROL PANELS AND LMZC ZONE CONTROLLER

A. Hardware: Provide LMCP lighting control panels with On/Off relays and 0-10V terminals in the locations and capacities as indicated on the Drawing and schedules. Each panel shall be of modular construction with the following components:
   1. Enclosure/Tub shall be NEMA 1, sized to accept an interior with 1 to 8, 1 to 24, or 1 to 48 relays and 0-10V dimming outputs. 24 and 48 size panels shall also have space for up to 6 four-pole contactors at the bottom of the panel.
   2. Cover shall be configured for surface or flush wall mounting of the panel as indicated on the plans. LMCP panel cover shall have a hinged and lockable door to restrict access to line voltage section of the panel.
   3. Interior assembly shall be supplied as a factory assembled component specifically designed and listed for field installation. Interior construction shall provide isolation of high voltage (Class 1) wiring from low voltage (Class 2) wiring within the assembled panel. Interior assembly shall include intelligence boards, power supply, DIN rails for mounting optional Class 2 control devices, and individually replaceable latching type relays. For each relay a 0-10V output shall be available on the relay driver board. Panel interiors shall include the following features:
      a. Removable, plug-in terminal blocks with connections for all 0-10V wiring terminations.
      b. Override pushbutton (providing On/Off and Dimming capability) and LED ON/OFF status for each relay.
      c. Digital inputs (two pairs of RJ-45 jacks) shall support all wired digital switches, dimmers, input and/or output modules, daylighting sensors, occupancy sensors, and additional load controllers. Inputs are divided into two separate digital networks (A and B), each capable of supplying 250mA to connected devices.
      d. Relay and 0-10V output states shall be available to external control devices and systems via BACnet.
      e. Automatically sequenced operation of relays to reduce impact on the electrical power input when large load groups are controlled together.
      f. Group control of relays shall be provided through an interface to the handheld configuration tool. Each relay and 0-10V output can be associated with a group for direct on/off or dimming control or scene control via a simple programming sequence using the relay override pushbuttons for groups 1-8 or via LMCT for groups 1-99.
      g. Relay group status for shall be provided through LED indicators for groups 1-8 and via BACnet for groups 1-99. A solid LED indicates that the last group action called for an ON state and relays in the group are on or in a mixed state.
   4. Single-pole latching relays with modular plug-in design. Relays shall provide the following ratings and features:
      a. Electrical:
         ~~1) 30 amp ballast at 277V, 20 amp ballast at 347V.~~
         ~~2) 16 amp E-Ballast at 120V, 10 amp E-Ballast at 277V.~~
         ~~3) 20 amp tungsten at 120V.~~
         ~~4) 30 amp resistive at 347V.~~
         ~~5)~~**1)** 1.5 HP motor at 120V.
         ~~6)~~**2)** 20 amp at 120V for Receptacle Loads.

~~7) 14,000 amp short circuit current rating (SCCR) at 347V.~~

~~8)~~**3)** Relays shall be UL 20 listed for control of plug loads.

b. Mechanical:
   1) Replaceable, 1/2 inch KO mount with Class 2 wire harness and single 5-pin phenolic connector.
   2) Actuator on relay housing provides manual override and visual status indication, accessible from Class 2 section of panel.
   3) Dual line and load terminals each support two #12 - #14 solid or stranded conductors.
   4) Capable of to 300,000 mechanical on/off cycles.
   5) Internal ferrite to prevent electrical noise on low voltage wires.
   6) Isolated low voltage contacts provide for relay status feedback and pilot light indication.

5. A 0-10V output shall be provided per relay. This output is linked to its individual relay, so they're controlled together automatically. The 0-10V signal from the panel shall meet requirements of NEMA ANSI C82.11-2011 - Annex A allowing it to control any fixtures providing a 0-10V control signal such that 10V or higher will drive the light to maximum, and 1V or less will drive the light to minimum output. A linear dimming curve is used between these levels.
6. Power supply shall be a multi-voltage transformer assembly with rated power to supply all electronics, occupancy sensors, switches, pilot lights, and photocells as needed to meet the project requirements. Power supply to have internal over-current protection with automatic reset and MOV protection.
7. Where indicated, lighting control panels designated for control of emergency lighting shall be provided with factory installed provision for automatic bypass of relays controlling emergency circuits upon loss of normal power. Panels shall be properly listed and labeled for use on emergency lighting circuits and shall meet the requirements of UL924 and NFPA 70 - Article 700. Relay Driver Cards providing 0-10V control shall automatically open their 0-10V single on loss of normal power, ensuring connected fixtures powered by a different source shall go full on.
8. Integral system clock shall provide scheduling capabilities for panel-only projects without DLM segment networks or BAS control.
   a. Each panel shall include digital clock capability able to issue system wide automation commands to up to 11 other panels for a total of 12 networked lighting control panels. Clock shall provide capability for up to 254 independent schedule events per panel for each of the ninety-nine system wide channel groups.
   b. Clock capability of each panel shall support the time-based energy saving requirements of applicable local energy codes.
   c. Clock module shall provide astronomic capabilities, time delays, blink warning, daylight savings, and holiday functions and will include a battery backup for clock function and program retention in non-volatile FLASH memory. Clocks that require multiple events to meet local code lighting shut off requirements shall not be allowed.
   d. Clock capability of each panel shall operate on a basis of ON/OFF or Normal Hours/After Hours messages to automation groups that implement pre-configured control scenarios. Scenarios shall include:
      1) Scheduled ON (or Goto Level) / OFF
      2) Manual ON / Scheduled OFF

3) Astro ON / OFF (or Photo ON / OFF)
4) Astro and Schedule ON / OFF (or Photo and Schedule ON / OFF)

e. User interface shall be a portable IR handheld configuration tool for any panel in the system or Front End System Software.
f. Clock capability of each panel shall employ non-volatile memory and shall retain user programming and time for a minimum of 10 years.
g. Schedules programmed into the clock of any one panel shall be capable of executing panel local schedule or Dark/Light (photocell or Astro) events for that panel should segment network communication be lost. Lighting control panels that are not capable of executing events independently of the global network shall not be acceptable.

9. Lighting control panel can operate as a stand-alone device supporting schedule, group, and photocell functions or as a networked device via a Wired room-to-room segment network.
10. Lighting control panel shall support digital communications to facilitate interoperability with building automation systems and other intelligent field devices through an integral digital Wired Network Bridge on the panel's intelligence board. All features associated with the Wired Network Bridge shall extend to the panel and its controlled loads, and all devices connected to the panel by Cat 5e local IRB network. Digital communications shall be RS485 MS/TP-based using the BACnet protocol.
11. In addition to the LMCP Relay Panels, an LMZC Zone Controller panel shall be available. This panel is designed for applications where LMFC Fixture Controllers or other distributed load controllers are used to switch and/or dim the controlled loads. Key similarities to and differences from the LMCP panel design shall include:
    a. Use the same intelligence board as the LMCP relay panel.
    b. Shall not include relay driver boards or relays, or 0-10V outputs.
    c. Have a removable interior section to facilitate installation, and a Tub/Cover. Cover is for surface mounting applications only.
    d. Tub shall have two interior KOs to allow installation of Power Boosters. Each installed Power Booster can provide an additional 150 mA for either of two available DLM local IRB networks.
    e. All programming and networking (whether DLM Local Network and/or Segment Network) capabilities in the LMZC Zone Controller shall be similar to capabilities for LMCP relay panels, except for functions designed for panel-mounted HDR relays and 0-10V outputs.
12. For retrofit applications, or where direct low voltage override switches and pilot contacts are required, an LMCP panel with only On/Off capability can be provided using On/Off relay driver cards. These cards are NOT capable of providing 0-10V outputs but will include a removable terminal that provides a direct wired switch inputs associated with each relay (2-wire momentary switches only) and a pilot output.

B. User Interface: Each system of lighting control panels shall be supplied with at least one handheld configuration tool. As a remote programming interface, the configuration tool shall allow setup, configuration, and diagnostics of the panel without the need for software or connection of a computer. User interface shall have the following panel-specific functions as a minimum:
    1. Set network parameters including panel device ID, MS/TP MAC address, baud rate and max master range.

2. Relay Group creation of up to 99 groups. Group creation shall be capable of programming of seven key relay parameters for member relays. The seven parameters are: After-hours Override Time Delay, Normal Hours Override Time Delay, Action on Transition to Normal Hours, Action on Transition to After Hours, Sensor Action During Normal Hours, Sensor Action During After Hours, Blink-Warn Time for After Hours.
3. Program up to 254 separate scheduled events. Events shall occur on seven day intervals with each day selectable as active or inactive and shall be configurable as to whether the event is active on holidays. Holidays can also be defined through the user interface.
4. Program up to 32 separate Dark/Light events. Events shall have a selectable source as either calculated Astro with delay, or a digital IO module with an integral 0-5V or 0-10V analog photocell. Dark/Light events shall occur on seven day intervals with each day selectable as active or inactive and shall be configurable as to whether the event is active on holidays.
5. Button binding of digital switches to groups shall be accessible via the handheld IR remote and accomplished from the digital switch station.
6. Programming of panel location information shall be accomplished by the handheld IR remote and include at a minimum LAT, LON, DST zone, and an approximate city/state location.

~~2.14~~2.15 FRONT END NETWORK CONTROLLER WITH SEGMENT MANAGER STATION

A. For networked applications, the Digital Lighting Management system can include one or more Front End Network Controllers with Segment Manager Interface (referred to as a Network Controller below) to manage network communication. It shall be capable of serving up a user interface to a standard web browser.

B. Each Network Controller shall have integral support for two wired MS/TP segment networks. Segment networks may alternately be connected to the Network Controller via external BACnet/IP interface routers or Wireless Border Routers and network switches using Ethernet structured wiring. Each router shall accommodate one “segment” – respectively a wired MS/TP run or Wireless Mesh Segment Network. Provide the quantity of routers and switches as shown on the Drawings.

C. Operational features of the Network Controller shall include the following:
1. Connection to PC or LAN via standard Ethernet TCP/IP via standard Ethernet TCP/IP with the option to use SSL encrypted connections for all traffic.
2. Easy to use graphical user interface, compatible with current Chrome or equivalent browser. The Network Controller shall not require installation of any lighting control software on an end-user PC, but if Manufacturer’s Lighting Control Software is installed, it shall be able to work in tandem with the Network Controller without issue.
3. Log in security capable of restricting some users to view-only or other limited operations.
4. Network Controller with N4 operating systems shall include two main sets of interface screens – those used to initially configure the unit (referred to as the config screens), and those used to allow users to dynamic monitor the performance of their system and provide a centralized scheduling interface. Capabilities using the Config Screens shall include:

a. Automatic discovery of DLM devices and relay panels on the segment network(s). Discovery function shall provide communication, monitoring or control of all local devices and lighting control panels.
b. Allow information for all discovered devices to be imported into the Network Controller via a single XML based site file from the LMCS Software, reducing the time needed to make a system usable by the end user. Importable information can include text descriptions of every component and individual loads, and automatic creation of room location information and overall structure of network. Info entered in LMCS should not have to be re-entered manually via keystrokes into the Network Controller
c. After discovery, all rooms and panels shall be presented in a standard navigation tree format. User selection of a device in the tree will allow its settings and operational parameters to be viewed and changed.
d. Ability to view and modify DLM device operational parameters. It shall be possible to set device parameters independently for normal hours and after-hours operation including sensor time delays and sensitivities, and load response to sensor of Manual-On or Auto-On.
e. Provide capabilities for integration with a BAS via BACnet protocol. Depending on project hardware, previously mentioned BACnet points shall be available to the BAS via BACnet/IP connection to the Network Controller: room occupancy state; room schedule mode; room switch lock control; individual occupancy sensor state; room lighting power; room plug load power; load dimming level. BACnet items shall be capable of being moved into an "Export Table" that will provide any integrator with only the data they need, and by using the Export Table effectively create a firewall between the integrator's request for info and the overall system performance.

5. Capabilities using the Network Controller with N4 operating system's Dashboard Screens shall include:
   a. Ability to set up schedules for local networks (rooms) and panels. Schedules shall be capable of controlling individual rooms or groups of loads with either on/off or normal hours/afterhours commands. Support for annual schedules, holiday schedules and unique date-bound schedules, as well as Astro On or Astro Off events with offsets. Schedules shall be viable graphically as time bars in a screen set up to automatically show scheduled events by day, week, or month.
   b. For fixtures that have CCT capability as specified under paragraph "Digital Wall Switch and Timer for Correlated Color Temperature", the Network Controller will provide schedule functionality similar to the CCT Wall Timer.
6. If indicated by the Drawings, Network Controllers shall be integrated into a larger overall network by the addition of a Network Supervisor package. The Supervisor is a server level computer running a version of the Network Controller software with dedicated communication and networking capability, able to pull information automatically from each individual Network Controller. Using a Supervisor, information from individual Network Controllers can be accessed and stored on the Supervisor's hard drive, eliminating the risk of data being overwritten due to Network Controller memory limits.

~~2.15~~2.16 PROGRAMMING, CONFIGURATION, AND DOCUMENTATION SOFTWARE

A. PC-native application for optional programming of detailed technician-level parameter information for all products, including parameters not accessible via BACnet and the handled IR configuration tool. Software must be capable of accessing room-level parameter information locally within the room when connected via the optional USB programming adapter, or all products over a wired or wireless segment network utilizing standard BACnet/IP communication.

B. Additional parameters exposed through this method include but are not limited to:
   1. Occupancy sensor detection LED disable for performance and other aesthetic spaces where blinking LEDs present a distraction.
   2. Six occupancy sensor action behaviors for each controlled load, separately configurable for normal hours and after hours modes. Modes include: No Action, Follow Off Only, Follow On Only, Follow On and Off, Follow On Only with Override Time Delay, Follow Off Only with Blink Warn Grace Time, Follow On and Off with Blink Warn Grace Time.
   3. Separate fade time adjustments per load for both normal and after hours from 0 - 4 hours.
   4. Configurable occupancy sensor re-trigger grace period from 0 - 4 minutes separate for both normal hours and after hours.
   5. Separate normal hours and after hours per-load button mode with modes including Do nothing, on only, off only, on and off.
   6. Load control polarity reversal so that on events turn loads off and vice versa.
   7. Per-load DR (demand response) shed level in units of percent.
   8. Load output pulse mode in 254 steps either 0.1 seconds or 1 second.
   9. Fade trip point for each load for normal hours and after hours that establishes the dimmer command level at which a switched load closes its relay to allow for staggered On functionality of switched loads in response to a dimmer.

C. Generation of reports at the whole file, partial file, or room level. Reports include but are not limited to:
   1. Device list report: All devices in a project listed by type.
   2. Load binding report: All load controller bindings showing interaction with sensors, switches, and daylighting.
   3. BACnet points report: Per room Device ID report of the valid BACnet points for a given site's BOM.
   4. Room summary report: Device manifest for each room, aggregated by common BOM, showing basic sequence of operations.
   5. Device parameter report: Per-room lists of all configured parameters accessible via handheld IR programmer for use with O&M documentation.
   6. Scene report: All project scene pattern values not left at defaults (i.e. 1 = all loads 100 percent, 2 = all loads 75 percent, 3 = all loads 50 percent, 4 = all loads 25 percent, 5-16 = same as scene 1).
   7. Occupancy sensor report: Basic settings including time delay and sensitivities for all occupancy sensors.

D. Network-wide programming of parameter data in a spreadsheet-like Network Grid programming environment including but not limited to the following operations:
   1. Set, copy/paste an entire project site of sensor time delays.

2. Set, copy/paste an entire project site of sensor sensitivity settings.
3. Search based on room name and text labels.
4. Filter by product type to allow parameter set by product.
5. Filter by parameter value to search for product with specific configurations.

E. Network-wide firmware upgrading remotely via the BACnet/IP network.
1. Mass firmware update of entire rooms.
2. Mass firmware update of specifically selected rooms or areas.
3. Mass firmware upgrade of specific products

~~2.16~~2.17 EMERGENCY LIGHTING CONTROL DEVICES

A. Emergency Lighting Control Unit – A UL 924 listed device that monitors a switched circuit providing normal lighting to an area. The unit provides ON/OFF control of emergency lighting based on status of associated normal lighting. Upon normal power failure the emergency lighting relay will close, forcing the emergency lighting ON until normal power is restored. Features include:
1. 120/277 volts, 50/60 Hz, 20 amp driver rating.
2. Push to test button.
3. Auxiliary contact for remote test or fire alarm system interface.

~~2.17~~2.18 SOURCE QUALITY CONTROL

A. Perform full-function testing on all completed assemblies at end of line.

B. Diagnostics and Service - Tiered control scheme for dealing with component failure that minimizes loss of control for occupant.
1. Bus Failure: Lights go to emergency level for safety.
2. Failure of One Sensor Type: Driver still controllable via other sensors.
3. Driver Failure: Only impacts one fixture - remainder of system operates as programmed.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install equipment in accordance with manufacturer’s installation instructions approved system shop drawings and Contract Documents.

B. Provide equipment at locations and in quantities indicated on Drawings. Provide any additional equipment required to provide control intent.

C. Install all room/area devices using manufacturer’s factory-tested Cat 5e cable with pre-terminated RJ-45 connectors.

1. If pre-terminated cable is not used for room/area wiring, each field-terminated cable shall be tested following installation and testing results submitted to the Manufacturer's Representative for approval prior to proceeding with the Work.
2. If fixtures have internal Wired Fixture Control Modules, ensure that they are also connected with Cat 5e cable. (Fixtures with Wireless Fixture Sensors do not require Cat 5e cables.)
3. Install all Wired room-to-room network devices using manufacturer-sourced network wire or wireless devices. Network wire substitution is not permitted and may result in loss of product warranty.
4. Low voltage wiring topology for each type of connector must comply with manufacturer's specifications.
5. Route network wiring as indicated on the Drawings as closely as possible. Document final wiring location, routing, and topology in as built drawings.

D. All line voltage connections shall be tagged to indicate circuit and switchleg designations. Junction box covers should also provide circuit and switchleg info.

E. Test all devices to ensure they are powered and communicate properly with each other.

F. Following manufacturer's recommendations, calibrate all sensor sensitivities and adjust mounting/locations to ensure proper detection of occupants and energy savings. Adjust time delay so that controlled area remains lighted while occupied.

G. Provide written or computer-generated documentation on the configuration of the system including room by room description including:
1. Sequence of Operation (e.g., Auto On, Partial ON, Partial Off, etc.)
2. Load parameters (e.g., blink warning, group integrations, etc.)
3. Sensor parameters, time delays, sensitivities, and daylighting setpoints.

H. Post start-up tuning – Adjust sensor time delays and sensitivities to meet the Owner's requirements 30 days from beneficial occupancy. Provide a detailed report to the Architect / Owner of post start-up activity.
1. Tighten Class 1 conductors at circuit breaker and termination point to torque ratings marked on enclosure or device's UL label or installation instructions.

I. Class 2 cabling shall enter enclosures from within low-voltage wiring areas and shall remain within those areas. No Class 1 conductors shall enter a low-voltage area.

J. Run separate neutrals for any phase dimmed branch load circuit. Different types of dimming loads require separate neutrals and should not be mixed within any individual room controller.

K. Verify all lighting loads to be free from short circuits prior to connection to room controllers or relays inside panels.

L. Install photocells as directed by manufacturer's instructions. Complete connections to control circuits, photocells, control modules, power supply pack and low voltage wiring.

M. Verify with manufacturer's representative that sensors and photocells are laid out in compliance to manufacturer's published sensing distribution. Provide additional sensors for complete coverage of space being sensed.

N. Photocell Placement and Wiring:
   1. Drawings are schematic and show photocell quantities together with the daylighting zones that they control.
   2. Reference manufacturer installation instructions for the recommended location and orientation of photocell with respect to exterior glazing and both interior and exterior lighting.
   3. Ensure that daylight sensor placement minimizes sensors view of electric light sources; ceiling mounted and fixture-mounted daylight sensors are not to have direct view of luminaries.
   4. Reposition sensor at no additional cost to Owner to avoid conflict between sensor and object obscuring its view, and between sensor and both interior and exterior lighting that causes daylighting controls to repeatedly increase and decrease in brightness (i.e., "cycling").
   5. Field wire photocell for correct footcandle range.

O. Do not install equipment until following conditions can be maintained in spaces to receive equipment:
   1. Ambient temperature: 32 degrees F to 104 degrees F.
   2. Relative Humidity: Maximum 90 percent, non-condensing.

P. Lighting control system must be protected from dust during installation.

Q. Prior to applying continuous dimming daylighting controls, maintain LED lighting at full output for a minimum of 100 hours. If this is not done, replace lamps and drivers of affected luminaires at no cost to Owner.

R. Use manufacturer’s published testing and adjusting procedures to adjust sensor time delay, daylight sensitivity, and passive infrared sensitivity to satisfaction of Owner.

S. Systems Integration:
   1. Equipment Integration Meeting Visit: Owner's Authorized Representative to coordinate meeting with Lighting Control System Manufacturer and other related equipment manufacturers to discuss equipment and integration procedures.

3.2 STARTUP AND PROGRAMMING

A. Provide factory-certified field service engineer to ensure proper system installation and operation under following parameters:
   1. Qualifications for Factory-Certified Field Service Engineer:
      a. Minimum experience of two years training in the electrical/electronic field.
      b. Certified by the equipment manufacturer on the system installed.
   2. Site Visit Activities:
      a. Verify connection of power feeds and load circuits.
      b. Verify connection of controls.

c. Verify system operation control by control, circuit by circuit.
d. Obtain sign-off on system functions.
e. Demonstrate and educate Owner's Authorized Representative on system capabilities, operation and maintenance.

3. Tech Support: Provide factory direct technical support hotline 24 hours per day, seven days per week.

3.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Services: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing. Notify Architect and Manufacturer in writing a minimum of 3 weeks prior to system start-up and testing.

B. Tests and Inspections: Manufacturer's service representative shall perform the following inspections and prepare reports.
1. Verify Class 1 and 2 wiring connections are terminated properly by validating system performance.
2. Set IP addresses and other network settings of system front end hardware per facilities IT instructions.
3. Verify/complete task programming for all switches, dimmers, time clocks, occupancy sensors, daylighting controls, and input/output modules.
4. Verify the control of each space complies with the Sequence of Operation.
5. Correct any system issues and retest.

C. Provide a report in table format with drawings or using a software file that can be opened in the manufacturer's system software including each room or space that has lighting control installed. Include the following:
1. Date of test or inspection.
2. Loads per space, or Fixture or Wireless Device Address identification.
3. Quantity and Type of each device installed.
4. Reports providing each device's settings.

3.4 CLOSEOUT ACTIVITIES

A. Training Visit: Lighting Control System Manufacturer to provide one day additional on-site system training to site personnel no less than two months after Substantial Completion, separate from start-up and programming visit. Training is to be performed after third-party commissioning of the network lighting control system is complete.

B. On-Site Walk Through: Lighting Control System Manufacturer to provide a factory certified Field Service Engineer to demonstrate system functionality to the Commissioning Agent.

C. Test lighting controls to ensure that control devices, components, equipment and systems are calibrated, adjusted and operate in accordance with Drawings and Specifications. Provide functional testing of sequences of operation to ensure operation in accordance with Drawings and Specifications. Provide complete report of test procedures and results to Engineer and insert approved copy into project closeout documents.

D. Complete contractor commissioning checklists and pre-verification tests as developed by the commissioning authority.

E. Testing and commissioning of the occupancy/vacancy sensors must be performed when the building is completely unoccupied. Coordinate this testing to be performed prior to or after normal business hours.

F. Testing Includes:
   1. Daylight automatic controls.
   2. Occupant sensing automatic controls.
   3. Automatic time and override controls for interior lighting.
   4. Automatic time and photo controls for exterior lighting.

G. Contractor to demonstrate programming, operation, and control of the network lighting control system to the commissioning authority. Coordinate lighting controls programmer to be onsite with the commissioning authority after startup and after all contractor commissioning checklists and pre-verification tests are complete.

3.5 PRODUCT SUPPORT AND SERVICE

A. Factory telephone support shall be available at no cost to the Owner following acceptance. Factory assistance shall consist of assistance in solving application issues pertaining to the control equipment.

END OF SECTION

SECTION 263323
CENTRAL BATTERY EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Work Included:
   1. Components
   2. Accessories

1.2 RELATED SECTIONS

A. Contents of Division 26, Electrical and Division 01, General Requirements apply to this Section.

1.3 REFERENCES AND STANDARDS

A. References and Standards as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

1.4 SUBMITTALS

A. Submittals as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

B. In addition, provide:
   1. Include battery product data.
   2. Shop drawings to include battery interconnection schematic diagrams, block diagrams of interconnection of internal elements, input terminals and output circuit breakers.

1.5 QUALITY ASSURANCE

A. Quality assurance as required by Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

B. In addition, meet the following:
   1. Manufacturer qualifications: Company specializing in manufacturing the products specified in this Section with minimum three years documented experience with service facilities within 100 miles of project.

1.6 WARRANTY

A. Warranty of materials and workmanship as outlined in Section 26 00 00, Electrical Basic Requirements and Division 01, General Requirements.

1.7 SYSTEM DESCRIPTION

A. Modular battery source inverter system complete with charger, transfer mechanism, integral maintenance bypass and output circuit breakers for purpose as emergency egress lighting backup power sources.

B. IGBT-based, PWM inverter, 16 kHz switch speed. Suitable for HID, fluorescent and incandescent loads. Recombinant VRLA batteries.

C. Provide two classes of output, one continuously energized, one energized only upon failure of input source.

D. Meets UL 924, NFPA 101 and NFPA 111. Materials and installation compliant with state and local adopted Fire Code.

1.8 PERFORMANCE

A. Environmental Conditions Required: 68 to 85 degrees F for batteries.

B. Minimum throughput efficiency: 86 percent.

C. Maximum Audible Noise: 52dBA.

D. Maximum THD: less than 10 percent at full resistive load.

E. Unit Power Capacity: ~~1~~**3**.0 KW.

F. Unit Input Voltage: ~~120~~**208** volts, single-phase, 2-wire.

G. Inverter output frequency: 60 Hz plus 1 percent.

H. Unit Output Voltage: 120 volts, single-phase, 2-wire.

I. Maximum recharge time: 12 hours following 1.5 hour discharge.

J. Physical Size: Maximum 36-inches wide by 72-inches high by 24-inches deep per cabinet. Two cabinets for unit power capacity cited above.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Single Phase:
1. **Myers Emergency Power Systems - Illuminator Series**
~~1.~~**2.** Chloride - Synthesis Series
~~2.~~**3.** Dual-Lite - Spectron LSN Series
~~3.~~**4.** On-Line Power - Power Wave Series
~~4.~~**5.** Sure-Lites - Lifeway Series
~~5.~~**6.** Trystar - UltraLITE Series
~~6.~~**7.** Trystar - eLITE Series
~~7. Myers Emergency Power Systems - Illuminator Series~~
8. Perfect Power Systems - Power Ride Series

~~B. Three Phase:~~
~~1. Dual-lite - Trident TRF Series~~
~~2. On-Line Power - Power Wave Series~~
~~3. Sure-Lites - Lifeway Series~~
~~4. Trystar - EON Series~~
~~5. Trystar - TrueLITE Series~~
~~6. Myers Emergency Power Systems - Illuminator Series~~
~~7. Perfect Power Systems - Power Ride Series~~

~~C.~~**B.** Basis of Design: Battery source inverter system on Drawings is designed based on Myers **Illuminator IE** product line. Approved manufacturers are allowed on condition of meeting specified conditions including available space for equipment (including Code required working clearances). Remove and replace electrical equipment installed not meeting these conditions at no cost to Owner.

2.2 COMPONENTS

A. Cabinet:
1. Welded steel, 12 gauge, constructed to NEMA-1 Specifications. Front and back accessibility. Convection cooling vents in enclosure.
2. Corrosion resistant paint finish.
3. Hinged, lockable doors.

B. Inverter:
1. Pulse-width modulated power supply based on IGBT transistors. Dual-conversion with no interruption to load.
2. Internal maintenance bypass switch, make-before-break.
3. Overload protection by static bypass switch; system rated to 42,000A symmetric short circuit.
4. Visual indicator (LED) to indicate inverter operation.
5. Each module protected against reverse battery polarity.
6. Each module includes an encapsulated ferroresonant transformer, UL Class H insulation.

C. Charger:
   1. Dual rate design. Constant current voltage limited high rate charge followed by precision float voltage charge for maximum battery capability and life. Charger is temperature compensating to prevent thermal runaway condition with batteries.
   2. Capable of fully recharging batteries within 12 hours following any rated discharge.
   3. Reverse polarity protected.
   4. Provide fuse protection for system DC input and charger AC input and DC output.

D. Monitor:
   1. Monitor AC input for brownout or failure condition. Transfer to battery source when AC input voltage drops below 80 percent of nominal voltage.
   2. Transfer time 30 to 80 milliseconds.
   3. Low battery voltage shutdown set at 87.5 percent of nominal voltage.

E. Return to Normal Source: Two-minute time delay return to normal source once normal source has been reestablished.

F. Recombinant VRLA Batteries: Sufficient capacity to output voltage of the inverter for a period of at least 90 minutes at a rated load, without dropping below 87.5 percent nominal battery voltage. 10-year, sealed, lead-calcium. Requires no addition of water over life of battery. Construct case and cover of polypropylene, contain low-pressure safety release vents, and be non-gassing in normal use. 10-year design life expectancy at 77 degrees F. VRLA batteries to include self-resealing flame-arresting caps.

G. Output Regulation:
   1. 60 Hz plus or minus 1 Hz.
   2. Voltage regulation, plus or minus 6 percent or less from 0 percent to 100 percent of rated load.

2.3 ACCESSORIES

A. Status and Alarm Condition Monitor:
   1. LCD Display to Include:
      a. AC input voltage.
      b. DC charger current.
      c. Output power VA.
      d. AC output amps.
      e. DC battery voltage.
      f. System temperature.
      g. Output frequency.
   2. Test switch to allow manual test of system without interrupting power to load.
   3. Audible alarm and silence switch to monitor charger and inverter malfunctions and battery electrolyte level.
   ~~4. Remote annunciator as indicated on Drawings.~~

B. Output circuit breakers, including normally on circuit breakers, as indicated on Drawings.

C. Self-Diagnostics:

1. System to test for 5 minutes every 30 days and for 30 minutes every 6 months. An audible and visible alarm to activate upon:
    a. Utility failure.
    b. High temperature.
    c. Inverter failure.
    d. Charger failure.
    e. System overload.
    f. Output trip alarm.
2. Output to e-mail for notices to Owner during alarm and trouble conditions.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

A. Install in accordance with manufacturer's instructions.

B. Provide a level dry protected area with stable temperature conditions. Install units plumb and level.

C. Batteries: Install batteries with acid neutralization pillow installed under each battery housing (comply with IFC 608.5.2 or local adopted Fire Code, whichever is more stringent). Enviroguard VRLA Pads or approved equal.

D. Room installation: Provide room containing central battery system with signage, automatic smoke detection tied to central system (see Division 28) as required by IFC Section 608 or local adopted Fire Code, whichever is more stringent.

E. Schedules:
    1. Provide output circuit schedule indicating loads connected to each output circuit breaker.

F. Training:
    1. Provide Owner with minimum 4-hour training session, presented by factory technician, on use and maintenance of battery power system. Videotape training session for future use by Owner.
    2. Verify operation of each unit by simulating outage.

G. Verify operation of each unit by simulating outage.

3.2 COMPONENTS

A. Install per manufacturer's written instructions and requirements.

B. See General Installation Requirements above.

C. Provide interconnection between cabinets. Secure cabinets with seismic restraint in accordance with IBC seismic zone classification of area. Confirm requirements with Architect.

D. Comply with manufacturer's recommendations prior to start-up to prevent physical and electrical damage to components.

3.3 ACCESSORIES

A. Install per manufacturer's written instructions and requirements.

B. See General Installation Requirements above.

C. Connect ~~pager, cell phone, fax~~**e-mail** to ~~dial phone number as directed by~~ Owner **designated address**, printing out status report during alarm or trouble condition.
1. Utility power is lost.
2. Fire alarm system goes into alarm.
3. Security system goes into alarm.

END OF SECTION

SECTION 280001
ELECTRONIC SAFETY BASIC REQUIREMENTS

PART 1 - GENERAL

1.1 DESIGN-BUILD SUMMARY

A. Work included in this Section applies to Division 28, Electronic Safety work to provide materials, labor, tools, permits and incidentals to make electronic safety systems ready for Owner's use for proposed project.

1.2 DESIGN-BUILD INSTRUCTIONS

A. This document is issued to give Bidders a basis for preparing a proposal to design and install a complete Electronic Safety system for this project.

B. Alternates to this Document may be offered as a separate proposal.

1.3 DESIGN-BUILD APPROACH

A. Use this Specification for design/engineering requirements, workmanship and materials or construction. Utilize design-build concept throughout construction phase of project.

B. Investigate and be apprised of applicable codes, rules, and regulations as enforced by AHJ.

C. Visit the Site of the proposed construction. Verify and inspect the existing site to determine conditions that affect this work.

1.4 DESIGN-BUILD CRITERIA

A. Related Work Specified Elsewhere: Contents of Section apply to Division 28, Electronic Safety Specifications. Requirements of Section are a minimum for Division 28, Electronic Safety Sections, unless otherwise stated in each Section, in which case that Section's requirements take precedence.

B. Fire Alarm Design Criteria: Refer to Section 28 46 00, Fire Detection and Alarm, for fire alarm system design criteria.

C. Fire Alarm Equipment: Refer to Section 28 46 00, Fire Detection and Alarm, for fire alarm equipment requirements.

1.5 SECTION INCLUDES

A. Work included in this Section applies to Division 28, Electronic Safety work to provide materials, labor, tools, permits, incidentals, and other services to provide and make ready for Owner's use of electronic safety systems for proposed project.

B. Contract Documents include, but are not limited to, Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Drawings, Addenda, Owner/Architect Agreement, and Owner/Contractor Agreement. Confirm requirements before commencement of work.

C. Definitions:
   1. Provide: To furnish and install, complete and ready for intended use.
   2. Furnish: Supply and deliver to project site, ready for unpacking, assembly and installation.
   3. Install: Includes unloading, unpacking, assembling, erecting, installing, applying, finishing, protecting, cleaning and similar operations at project site as required to complete items of work furnished.
   4. Approved or Approved Equivalent: To possess the same performance qualities and characteristics and fulfill the utilitarian function without any decrease in quality, durability or longevity. For equipment/products defined by the Contractor as "equivalent," substitution requests must be submitted to Engineer for consideration, in accordance with Division 01, General Requirements, and approved by the Engineer prior to submitting bids for substituted items.
   5. Authority Having Jurisdiction (AHJ): Indicates reviewing authorities having jurisdiction, including local fire marshal, Owner's insurance underwriter, Owner's Authorized Representative, and other reviewing entity whose approval is required to obtain systems acceptance.

1.6 RELATED SECTIONS

A. Contents of Section apply to Division 28, Electronic Safety Contract Documents.

B. Related Work:
   1. Additional conditions apply to this Division including, but not limited to:
      a. Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements.
      b. Drawings
      c. Addenda
      d. Owner/Architect Agreement
      e. Owner/Contractor Agreement
      f. Codes, Standards, Public Ordinances and Permits

C. Contents of Division 26, Electrical apply to this Section.

1.7 REFERENCES AND STANDARDS

A. References and Standards per Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, individual Division 28, Electronic Safety Sections and those listed in this Section.

B. Codes to include latest adopted editions, including current amendments, supplements and local jurisdiction requirements in effect as of the date of the Contract Documents, of/from:
   1. State of Oregon:
      a. OAR - Oregon Administrative Rules
      b. OESC - Oregon Electrical Specialty Code
      c. OFC - Oregon Fire Code
      d. OMSC - Oregon Mechanical Specialty Code
      e. OPSC - Oregon Plumbing Specialty Code
      f. OSSC - Oregon Structural Specialty Code
      g. OEESC - Oregon Energy Efficiency Specialty Code

C. Reference standards and guidelines include but are not limited to the latest adopted editions from:
   1. ADA - Americans with Disabilities Act
   2. ANSI - American National Standards Institute
   3. ASCE - American Society of Civil Engineers
   4. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers
   5. ASHRAE Guideline 0, the Commissioning Process
   6. ASME - American Society of Mechanical Engineers
   7. ASTM - ASTM International
   8. CFR - Code of Federal Regulations
   9. EPA - Environmental Protection Agency
   10. ETL - Electrical Testing Laboratories
   11. FM - FM Global
   12. ISO - International Organization for Standardization
   13. NEC - National Electric Code
   14. NEMA - National Electrical Manufacturers Association
   15. NFPA - National Fire Protection Association
   16. OSHA - Occupational Safety and Health Administration
   17. UL - Underwriters Laboratories Inc.

D. See Division 28, Electronic Safety individual Sections for additional references.

1.8 SUBMITTALS

A. See Division 01, General Requirements for Submittal Procedures.

B. Provide drawings in format and software release equal to the design documents. Drawings to be the same sheet size and scale as the Contract Documents.

C. "No Exception Taken" constitutes that review is for general conformance with the design concept expressed in the Contract Documents for the limited purpose of checking for conformance with information given. Any action is subject to the requirements of the Contract Documents. Contractor is responsible for the dimensions and quantity and will confirm and correlate at the job site, fabrication processes and techniques of construction, coordination of the work with that of all other trades, and the satisfactory performance of the work.

D. Provide product submittals and shop drawings in electronic format only. Electronic format must be posted to ftp site. For electronic format, provide one file per division containing one bookmarked PDF file with each bookmark corresponding to each Specification Section. Arrange bookmarks in ascending order of Specification Section number. Individual submittals sent piecemeal in a per Specification Section method will be returned without review or comment. Copy Architect on all transmissions/submissions.

E. Product Data: Provide manufacturer's descriptive literature for products specified in Division 28, Electronic Safety Sections.

F. Identify/mark each submittal in detail. Note what difference, if any, exist between the submitted item and the specified item. Failure to identify the differences will be considered cause for disapproval. If differences are not identified and/or not discovered during the submittal review process, Contractor remains responsible for providing equipment and materials that meet the specifications and drawings.
   1. Label submittal to match numbering/references as shown in Contract Documents. Highlight and label applicable information to individual equipment or cross out/remove extraneous data not applicable to submitted model. Clearly note options and accessories to be provided, including field installed items. Highlight connections by/to other trades.
   2. Include technical data, installation instructions and dimensioned drawings for products, equipment and devices installed, furnished or provided. Reference individual Division 28, Electronic Safety specification Sections for specific items required in product data submittal outside of these requirements.
   3. See Division 28, Electronic Safety individual Sections for additional submittal requirements outside of these requirements.

G. Maximum of two reviews of complete submittal package. Arrange for additional reviews and/or early review of long-lead items; bear costs of additional reviews at Engineer's hourly rates. Incomplete submittal packages/submittals will be returned to contractor without review.

H. Resubmission Requirements: Make corrections or changes in submittals as required, and in consideration of Engineer’s comments. Identify Engineer’s comments and provide an individual response to each of the Engineer’s comments. Cloud changes in the submittals and further identify changes which are in response to Engineer’s comments.

I. Structural/Seismic: Provide weights, dimensions, mounting requirements and like information required for mounting, seismic bracing, and support. Indicate manufacturer's installation and support requirements to meet ASCE 7-16 requirements for non-structural components. Provide engineered seismic drawings and equipment seismic certification. Equipment Importance Factor as specified in Division 01 and in Structural documents.

J. Trade Coordination: Include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and connections as required per Division 28, Electronic Safety Coordination Documents. For equipment with electrical connections, furnish copy of approved submittal for inclusion in Division 26, Electrical and Division 28, Electronic Safety submittals.

K. Make provisions for openings in building for admittance of equipment prior to start of construction or ordering of equipment.

L. Substitutions and Variation from Basis of Design:
   1. The Basis of Design designated product establishes the qualities and characteristics for the evaluation of any comparable products by other listed acceptable manufacturers if included in this Specification or included in an approved Substitution Request as judged by the Design Professional.
   2. If substitutions and/or equivalent equipment/products are being proposed, it is the responsibility of parties concerned, involved in, and furnishing the substitute and/or equivalent equipment to verify and compare the characteristics and requirements of that furnished to that specified and/or shown. If greater capacity and/or more materials and/or more labor are required for the rough-in, circuitry or connections than for the item specified and provided for, then provide compensation for additional charges required for the proper rough-in, circuitry and connections for the equipment being furnished. No additional charges above the Base Bid, including resulting charges for work performed under other Divisions, will be allowed for such revisions. Coordinate with the requirements of "Submittals." For any product marked "or approved equivalent," a substitution request must be submitted to Engineer for approval prior to purchase, delivery or installation.
   3. Where manufacturer equipment or model numbers are indicated with no exceptions, substitutions will be rejected.

M. Shop Drawings:
   1. Provide coordinated shop drawings which include physical characteristics of all systems, device layout plans, and control wiring diagrams. Reference individual Division 28, Electronic Safety specification Sections for additional requirements for shop drawings outside of these requirements.
   2. Provide Shop Drawings indicating access panel locations, size and elevation for approval prior to installation.

N. Samples: Provide samples when requested by individual Sections.

O. Resubmission Requirements:
   1. Make any corrections or change in submittals when required by Architect/Engineer review comments. Provide submittals as specified. The engineer will not be required to edit and/or interpret the Contractor's submittals. Indicate changes for the resubmittal in a cover letter with reference to page(s) changed and reference response to comment. Cloud changes in the submittals.
   2. Resubmit for review until review indicates no exception taken or "make corrections noted."

3. When submitting drawings for Engineer's re-review, clearly indicate changes on drawings and "cloud" any revisions. Submit a list describing each change.

P. Operation and Maintenance Manuals, Owner's Instructions:
   1. Reference individual Division 28, Electronic Safety Specification Sections for additional requirements for operations and maintenance manuals.
   2. Submit, at one time, electronic files (PDF format) of manufacturer's operation and maintenance instruction manuals and parts lists for equipment or items requiring servicing. Submit data when work is substantially complete and in same order format as submittals. Include name and location of source parts and service for each piece of equipment.
      a. Include copy of approved submittal data along with submittal review letters received from Engineer. Data to clearly indicate installed equipment model numbers. Delete or cross out data pertaining to other equipment not specific to this project.
      b. Include copy of manufacturer's standard Operations and Maintenance for equipment. At front of each tab, provide routine maintenance documentation for scheduled equipment. Include manufacturer's recommended maintenance schedule and highlight maintenance required to maintain warranty. Furnish list of routine maintenance parts, including part numbers, sizes and quantities relevant to each piece of equipment.
      c. Include copy of complete parts list for equipment. Include available exploded views of assemblies and sub-assemblies.
      d. Include Warranty per Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, and individual DIvision 28, Electronic Safety Sections.
      e. Include product certificates of warranties and guarantees.
      f. Include copy of start-up and test reports specific to each piece of equipment.
      g. Include commissioning reports.
      h. Engineer will return incomplete documentation without review.
      i. Engineer will provide one set of review comments in Submittal Review format. Arrange for additional reviews; bear costs for additional reviews at Engineer's hourly rates.
   3. Thoroughly instruct Owner in proper operation of equipment and systems. Where noted in individual Sections, training will include classroom instruction with applicable training aids and systems demonstrations. Field instruction per Section 28 00 01, Electronic Safety Basic Requirements Article titled "Demonstration."
   4. Copies of certificates of code authority inspections, acceptance, code required acceptance tests, letter of conformance and other special guarantees, certificates of warranties, specified elsewhere or indicated on Drawings.

Q. Record Drawings:
   1. Maintain at site at least one set of drawings for recording “as-constructed” conditions. Indicate on drawings changes to original documents by referencing revision document, and include buried elements and location of concealed items. Include items changed by addenda, field orders, supplemental instructions, and constructed conditions.
   2. Record Drawings are to include equipment locations, calculations, and schedules that accurately reflect "as constructed or installed" for project.

3. At completion of project, input changes to original project Revit Model and make one set of black-line drawings created from Revit model in version/release equal to contract drawings. Submit Revit model and drawings upon substantial completion.
4. See Division 28, Electronic Safety individual Sections for additional items to include in Record Drawings.

1.9 QUALITY ASSURANCE

A. Regulatory Requirements: Work and materials installed to conform with all local, State and Federal codes, and other applicable laws and regulations. Where code requirements are at variance with Contract Documents, meet code requirements as a minimum requirement and include costs necessary to meet these in Contract. Machinery and equipment are to comply with OSHA requirements, as currently revised and interpreted for equipment manufacturer requirements. Install equipment provided per manufacturer recommendations.

B. Whenever this Specification calls for material, workmanship, arrangement or construction of higher quality and/or capacity than that required by governing codes, higher quality and/or capacity take precedence.

C. Drawings are intended to be diagrammatic and reflect the Basis of Design manufacturer's equipment. They are not intended to show every item in its exact dimensions, or details of equipment or proposed systems layout. Verify actual dimensions of systems (e.g. cable tray, panels, etc.) and equipment proposed to assure that systems and equipment will fit in available space. Contractor is responsible for design and construction costs incurred for equipment other than Basis of Design, including, but not limited to, architectural, structural, electrical, HVAC, fire sprinkler, and plumbing systems.

D. Manufacturer's Instructions: Follow manufacturer's written instructions. If in conflict with Contract Documents, obtain clarification. Notify Engineer/Architect in writing before starting work.

E. Items shown on Drawings are not necessarily included in Specifications or vice versa. Confirm requirements in all Contract Documents.

F. Provide products that are UL listed.

1.10 WARRANTY

A. Provide written warranty covering the work for a period of one year from date of Substantial Completion in accordance with Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, and individual Division 28, Electronic Safety Sections.

B. Sections under this Division can require additional and/or extended warranties that apply beyond basic warranty under Division 01, General Requirements and the General Conditions. Confirm requirements in all Contract Documents.

1.11 COORDINATION DOCUMENTS

A. Prior to construction, prepare and submit coordinated layout drawings (composite drawings), to coordinate installation and location of ductwork, grilles, diffusers, piping, fire sprinklers, plumbing, lights, and electrical services. Composite Drawings show services on single sheet. Key Drawings to structural column identification system. Prior to completion of Drawings, coordinate proposed installation with architectural and structural requirements, and other trades (including plumbing, HVAC, fire protection, electrical, ceiling suspension, and ceiling tile systems, etc.), and provide maintenance access requirements. Coordinate with submitted architectural systems (i.e. roofing, ceiling, finishes) and structural systems as submitted, including footings and foundation. Identify zone of influence from footings and ensure systems are not routed within the zone of influence.

B. Prepare Drawings as follows:
   1. Drawings in Revit model. Revit model release equal to design documents. Drawings to be same sheet size and scale as Contract Drawings and indicate location, size and elevation above finished floor of equipment and distribution systems.
   2. Review and revise, as necessary, section cuts in Contract Drawings after verification of field conditions.
   3. Indicate fittings, hangers, access panels, and elevation of bottom of cable tray above finished floor.
   4. Drawings to indicate proposed ceiling grid and lighting layout as shown on electrical drawings and architectural reflected ceiling drawings and HVAC equipment, ductwork.
   5. Incorporate Addenda items and change orders.
   6. Provide additional coordination as requested by other trades.

C. Advise Architect in event conflict occurs in location or connection of equipment. Bear costs resulting from failure to properly coordinate installation or failure to advise Architect of conflict.

D. Submit final Coordination Drawings with changes as Record Drawings at completion of project.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Articles, fixtures, and equipment of a kind to be standard product of one manufacture, including but not limited to panels, devices and equipment unless otherwise specified in individual Division 28, Electronic Safety Sections.

2.2 STANDARDS OF MATERIALS AND WORKMANSHIP

A. Base contract upon furnishing materials as specified. Materials, equipment, and fixtures used for construction are to be new, latest products as listed in manufacturer's printed catalog data and are to be UL, ETL, or FM listed and labeled or be approved by State, County, and City authorities prior to procurement and installation.

B. Names and manufacturer's names denote character and quality of equipment desired and are not to be construed as limiting competition.

C. Hazardous Materials:
   1. Comply with local, State of Oregon, and Federal regulations relating to hazardous materials.
   2. Comply with Division 00, Procurement and Contracting Requirements and Division 01, General Requirements for this project relating to hazardous materials.
   3. Do not use any materials containing a hazardous substance. If hazardous materials are encountered, do not disturb; immediately notify Owner and Architect. Hazardous materials will be removed by Owner under separate contract.

2.3 ACCESS PANELS

A. See Division 01, General Requirements and Division 08, Openings for products and installation requirements.

B. Confirm Access Panel requirements in Division 01, General Requirements, Division 08, Openings, and individual Division 28, Electronic Safety Sections. In absence of specific requirements, provide flush mounting access panels for systems and individual components, service of electronic safety systems equipment and junction boxes requiring maintenance, inspection or servicing. Where access panels are located in fire-rated assemblies of building, rate access panels accordingly.
   1. Ceiling access panels to be minimum of 24-inch by 24-inch required and approved size.
   2. Wall access panels to be minimum of 12-inch by 12-inch required and approved size.
   3. Provide screwdriver operated catch.
   4. Manufacturers and Model:
      a. Drywall: Karp KDW.
      b. Plaster: Karp DSC-214PL.
      c. Masonry: Karp DSC-214M.
      d. 2 hour rated: Karp KPF-350FR.
      e. Manufacturers: Karp, Milco, Elmdor, Acudor, or approved equivalent.

PART 3 - EXECUTION

3.1 ACCESSIBILITY AND INSTALLATION

A. Confirm Accessibility and Installation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, and individual Division 28, Electronic Safety Sections.

B. Install equipment having components requiring access (i.e., devices, equipment, electrical boxes, panels, etc.) so that they may be serviced, reset, replaced or recalibrated by service people with normal service tools and equipment. Do not install equipment in obvious passageways, doorways, scuttles or crawlspaces which would impede or block intended usage.

C. Install equipment and products complete as directed by manufacturer's installation instructions. Obtain installation instructions from manufacturer prior to rough-in of equipment and examine instructions thoroughly. When requirements of installation instructions conflict with Contract Documents, request clarification from Architect prior to proceeding with installation. This includes proper installation methods, sequencing and coordination with other trades and disciplines.

D. Earthwork:
   1. Confirm Earthwork requirements in Contract Documents.
   2. In absence of specific requirements, comply with individual Division 28, Electronic Safety Sections and the following:
      a. Perform excavation, dewatering, shoring, bedding, and backfill required for installation of work in this Division in accordance with related earthwork divisions. Contact utilities and locate existing utilities prior to excavation. Repair any work damaged during excavation or backfilling.
      b. Excavation: Do not excavate under footings, foundation bases, or retaining walls.
      c. Provide protection of underground systems. Review the project Geotechnical Report for references to corrosive or deleterious soils which will reduce the performance or service life of underground systems materials.

E. Firestopping:
   1. Confirm Firestopping requirements in Division 07, Thermal and Moisture Protection.
   2. In absence of specific requirements, comply with individual Division 28, Electronic Safety Sections and coordinate location and protection level of fire and/or smoke rated walls, ceilings, and floors. When these assemblies are penetrated, seal around conduit, raceway and equipment with approved firestopping material. Install firestopping material complete as directed by manufacturer's installation instructions. Meet requirements of ASTM E814, Standard Test Method for Fire Tests of Through-Penetration Fire Stops.

F. Plenums: In plenums, provide plenum rated materials that meet the requirements to be installed in plenums.

3.2 SEISMIC CONTROL

A. Confirm Seismic Control requirements in Division 01, General Requirements, Structural documents, and individual Division 28 Electronic Safety Sections.

B. Earthquake resistant designs for Electronic Safety (Division 28) systems and equipment to conform to regulations of jurisdiction having authority.

C. Restraints which are used to prevent disruption of function of piece of equipment because of application of horizontal force to be such that forces are carried to frame of structure in such a way that frame will not be deflected when apparatus is attached to a mounting base and equipment pad, or to structure in normal way, utilizing attachments provided. Secure equipment and distribution systems to withstand a force in direction equal to value defined by jurisdiction having authority.

D. Provide means to prohibit excessive motion of safety equipment during earthquake.

3.3 REVIEW AND OBSERVATION

A. Confirm Review and Observation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, and individual Division 28, Electronic Safety Sections.

B. Notify Architect in writing at following stages of construction so that they may, at their option, visit site for review and construction observation:
   1. Underground conduit and wire installation prior to backfilling.
   2. Prior to covering walls when electronic safety systems installation is started.
   3. Prior to ceiling cover/installation.
   4. When main systems, or portions of, are being tested and ready for inspection by AHJ.

C. Final Punch: Costs incurred by additional trips required due to incomplete systems will be the responsibility of the Contractor.

3.4 CUTTING AND PATCHING

A. Confirm Cutting and Patching Requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements.

B. In absence of specific requirements, comply with individual Division 28, Electronic Safety Sections and the following:
   1. Proposed floor cutting/core drilling/sleeve locations to be approved by Project Structural Engineer. Submit proposed locations to Architect/Project Structural Engineer. Where slabs are of post tension construction, perform x-ray scan of proposed penetration locations and submit scan results including proposed penetration locations to Project Structural Engineer/Architect for approval. Where slabs are of waffle type construction, show column cap extent and cell locations relative to proposed penetration(s).

2. Cutting, patching and repairing for work specified in this Division including plastering, masonry work, concrete work, carpentry work, and painting included under this Section will be performed by skilled craftsmen of each respective trade in conformance with appropriate Division of Work.
3. Additional openings required in building construction to be made by drilling or cutting. Use of jack hammer is specifically prohibited. Patch openings in and through concrete and masonry with grout.
4. Restore new or existing work that is cut and/or damaged to original condition. Patch and repair specifically where existing items have been removed. This includes repairing and painting walls, ceilings, etc. where existing conduit and devices are removed as part of this project. Where alterations disturb lawns, paving, and walks, repair, refinish and leave in condition matching existing prior to commencement of work.
5. Additional work required by lack of proper coordination will be provided at no additional cost to the Owner.

3.5 EQUIPMENT SELECTION AND SERVICEABILITY

A. Replace or reposition equipment which is too large or located incorrectly to permit servicing, at no additional cost to Owner.

3.6 DELIVERY, STORAGE AND HANDLING

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements.

B. In absence of specific requirements, comply with the individual Division 28, Electronic Safety Sections and the following:
1. Handle materials delivered to project site with care to avoid damage. Store materials on site inside building or protected from weather, dirt and construction dust.
2. Protect equipment and pipe to avoid damage. Close conduit openings with caps or plugs. Keep motors and bearings in watertight and dustproof covers during entire course of installation.
3. Protect devices, panels and similar items until in service.
4. Products and/or materials that become damaged due to water, dirt and/or dust as a result of improper storage to be replaced before installation.

3.7 DEMONSTRATION

A. Confirm Demonstration requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, and individual Division 28, Electronic Safety Sections.

B. Upon completion of work and adjustment of equipment, test systems, demonstrate to Owner's Authorized Representative, Architect and Engineer that equipment furnished and installed or connected under provisions of these Specifications functions in manner required. Provide field instruction to Owner's Staff as specified in Division 01, General Requirements, and individual Division 28, Electronic Safety Sections.

C. Manufacturer's Field Services: Furnish services of a qualified factory certified instructor at time approved by Owner, to instruct maintenance personnel, correct defects or deficiencies, and demonstrate to satisfaction of Owner that entire system is operating in satisfactory manner and complies with requirements of other trades that may be required to complete work. Complete instruction and demonstration prior to final job site observations.

3.8 CLEANING

A. Confirm cleaning requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, and individual Division 28 Sections.

B. Upon completion of installation, thoroughly clean exposed portions of equipment, removing temporary labels and traces of foreign substances. Throughout work, remove construction debris and surplus materials accumulated during work.

3.9 INSTALLATION

A. Confirm Installation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, and individual Division 28, Electronic Safety Sections.

B. Install equipment in accordance with manufacturer's installation instructions, plumb and level and firmly anchored to building structure. Maintain manufacturer's recommended clearances.

C. Start up equipment, in accordance with manufacturer's start-up instructions, and in presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.

D. Provide miscellaneous supports required for installation of equipment, conduit and wiring.

3.10 PAINTING

A. Confirm Painting requirements in Division 01, General Requirements and Division 09, Finishes.

B. In absence of specific requirements, comply with individual Division 28, Electronic Safety Sections and the following:
   1. Ferrous Metal: After completion of work, thoroughly clean and paint exposed supports constructed of ferrous metal surfaces, i.e. hangers, hanger rods, equipment stands, with one coat of black asphalt varnish for exterior or black enamel for interior, suitable for hot surfaces.

2. In electrical and mechanical room, on roof or other exposed areas, equipment not painted with enamel to receive two coats of primer and one coat of rustproof enamel, colors as selected by Architect.
3. See individual equipment Specifications for other painting.
4. Structural Steel: Repair damage to structural steel finishes or finishes of other materials damaged by cutting, welding or patching to match original.
5. Conduit: Clean, primer coat and paint interior conduit exposed in finished areas with two coats paint suitable for metallic surfaces. Color selected by Architect.

3.11 ACCESS PANELS

A. Confirm Access Panel requirements in Division 01, General Requirements.

B. In absence of specific requirements, comply with individual Division 28, Electronic Safety Sections and coordinate locations/sizes of access panels with Architect prior to work.

~~3.11~~3.12 ACCEPTANCE

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements.

B. In absence of specific requirements, comply with individual Division 28, Electronic Safety Sections. System cannot be considered for acceptance until work is completed and demonstrated to Architect that installation is in strict compliance with Specifications, Drawings and manufacturer's installation instructions, particularly in reference to following:
1. Cleaning
2. Operation and Maintenance Manuals
3. Training of Operating Personnel
4. Record Drawings
5. Warranty and Guaranty Certificates
6. Start-up/Test Documents and Commissioning Reports

~~3.12~~3.13 FIELD QUALITY CONTROL

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements.

B. In absence of specific requirements, comply with individual Division 28, Electronic Safety Sections and conduct the following tests:
1. Conduct tests of equipment and systems to demonstrate compliance with requirements specified. Reference individual Specification Sections for required tests. Document tests and include in Closeout Documents.
2. During site evaluations by Architect or Engineer, provide appropriate personnel with tools to remove and replace trims, covers, and devices so that proper evaluation of installation can be performed.

~~3.13~~3.14 LETTER OF CONFORMANCE

A. Provide Letter of Conformance, copies of manufacturers' warranties and extended warranties with a statement in letter that electronic safety systems were installed in accordance with manufacturer's recommendations, UL listings and FM Global approvals.

B. Include Letter of Conformance, copies of manufacturers' warranties and extended warranties in operating and maintenance manuals.

END OF SECTION

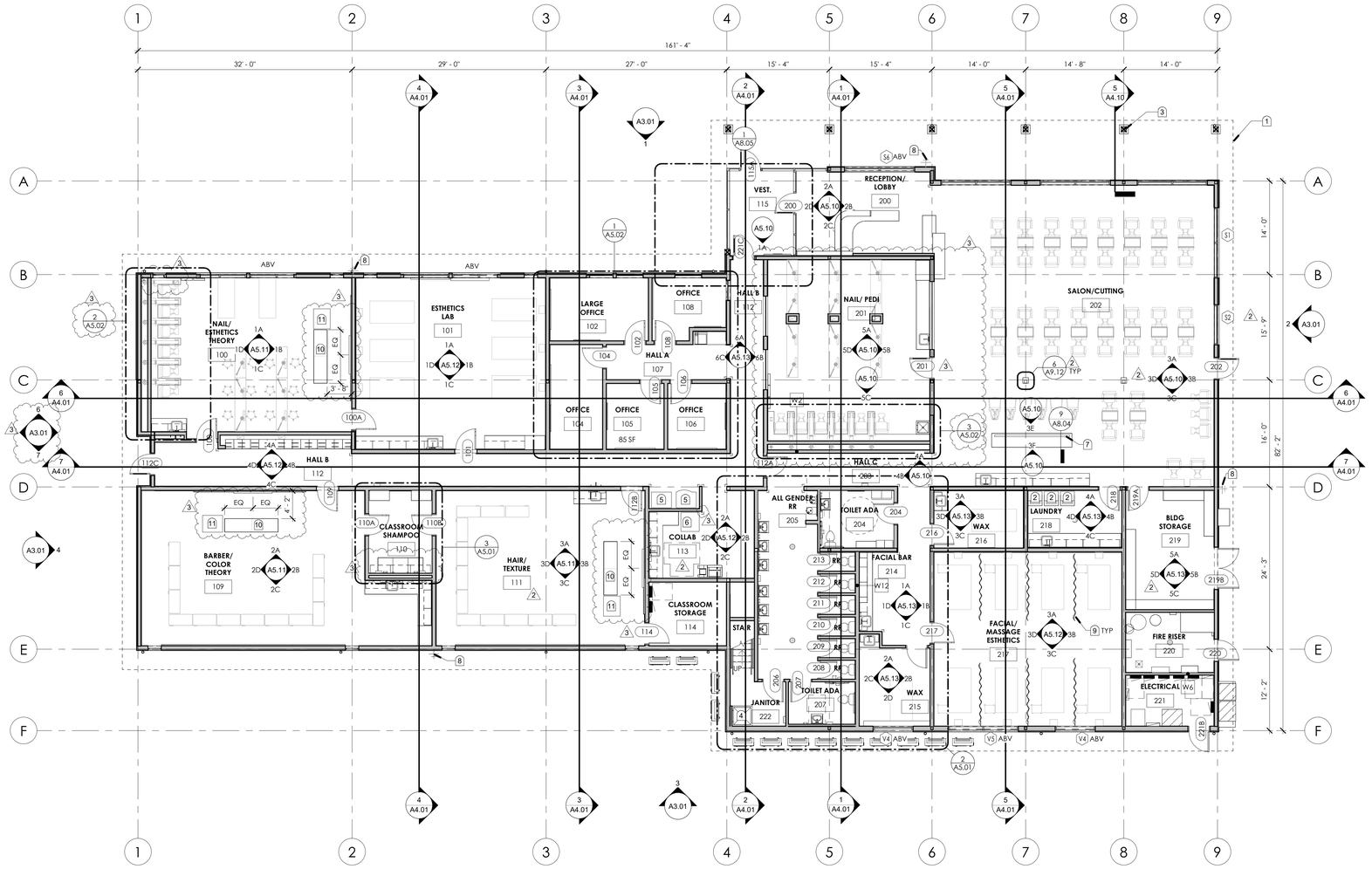
PART 2
REVISIONS TO THE WORKING DRAWINGS

GENERAL NOTES

A. SEE SHEET G0.01 FOR ARCHITECTURAL ABBREVIATIONS AND SYMBOLS
B. SEE SHEET G0.04 FOR WALL TYPES
C. SEE SHEET A8.01 FOR DOOR SCHEDULE
D. PLAN DIMENSIONS ARE MEASURED FROM THE OUTSIDE FACE OF STUDS.
E. GRID LINES AT EXTERIOR WALLS LOCATED AT FACE OF STUD AND AT CENTER LINE OF STEEL U.N.O.

FLOOR PLAN KEYNOTES

1 ROOF OVERHANG
2 STACKED WASHER DRYER
2A 3 CONCRETE PEDESTAL, TYP.
4 MOP SINK
5 VENDING MACHINE
6 REFRIGERATOR
7 TROUGH IN COUNTERTOP
8 HOSE BIBB
9 RETRACTABLE CURTAIN SYSTEM
10 TYPICAL TEACHING CASEWORK ISLAND - SEE A5.11 FOR ELEVATION AND CABINET TYPES
3 11 OFOI A/V LECTERN



1 A1.00 **OVERALL FLOOR PLAN - LEVEL 1**
SCALE: 1/8" = 1'-0"

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REGISTERED ARCHITECT
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12047
STATE OF OREGON

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7390 S 6TH STREET
KLAMATH FALLS, OR
97603

No.	Description	Date
2	Addendum #2	4/9/26
3	Addendum #3	4/23/26

Project Number 2507
Date 3/16/2026

PERMIT / BID SET

OVERALL FLOOR PLAN - LEVEL 1

A1.00

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GENERAL NOTES

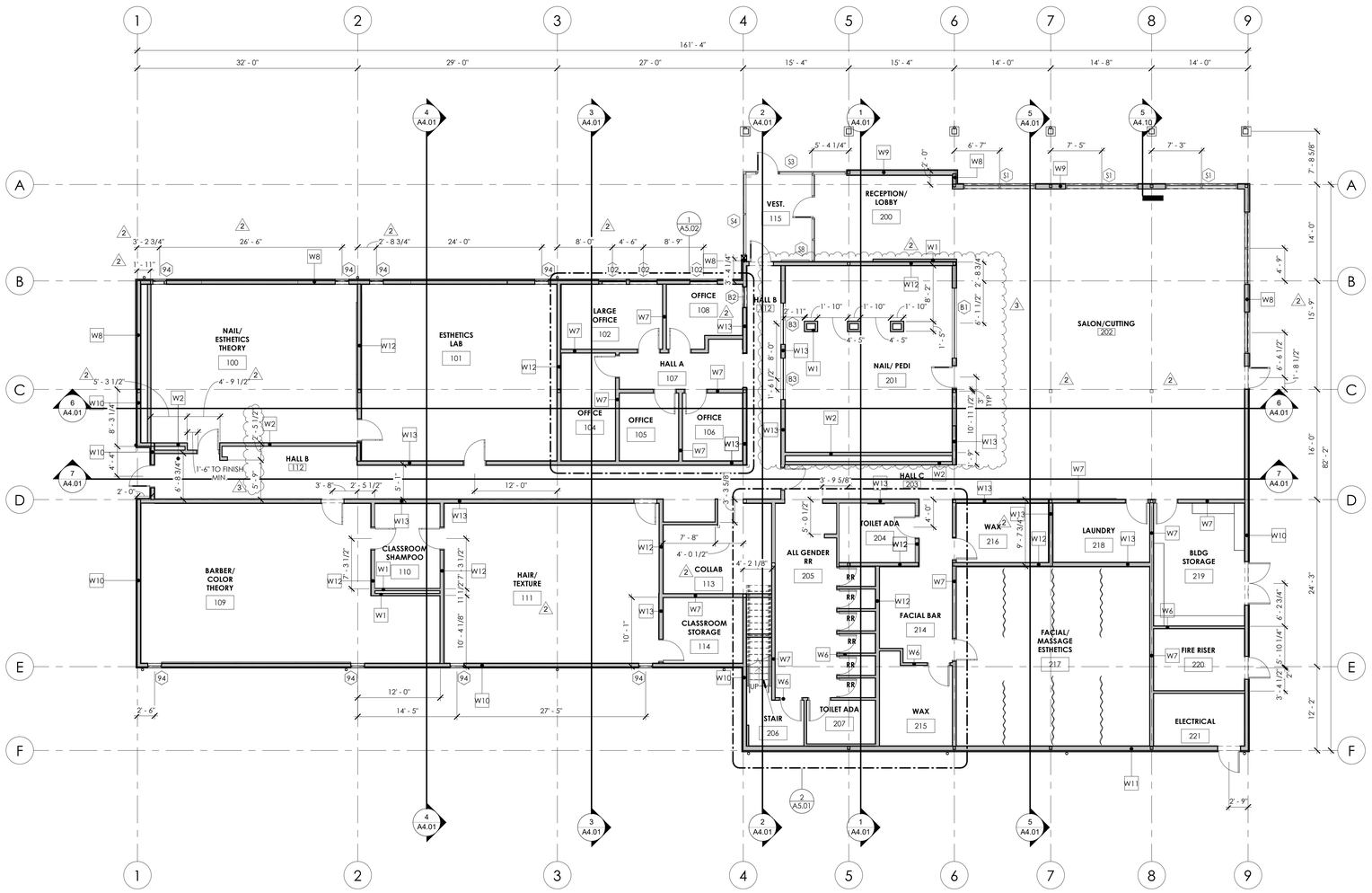
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E. GRID LINES AT EXTERIOR WALLS LOCATED AT FACE OF STUD AND AT CENTER LINE OF STEEL U.N.O.

WALL TAG LEGEND

DIMENSION SHEET DESIGNATION:

WX — PARTITION STRUCTURE: W - WOOD STUD; WALL DESIGNATION; PARTITION TO BE FULL HEIGHT U.N.O.

WX # — PARTITION STRUCTURE: W - WOOD STUD; WALL DESIGNATION; PARTITION TO TERMINATE AT 6" ABOVE FINISHED CEILING UNO SEE STRUCTURAL FOR TYPICAL BRACING AT NON-FULL HEIGHT WALLS



1 A1.10 **FLOOR PLAN - DIMENSION PLAN**
SCALE: 1/8" = 1'-0"

N

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Date 3/16/2026

PERMIT / BID SET

OVERALL DIMENSION PLAN

A1.10

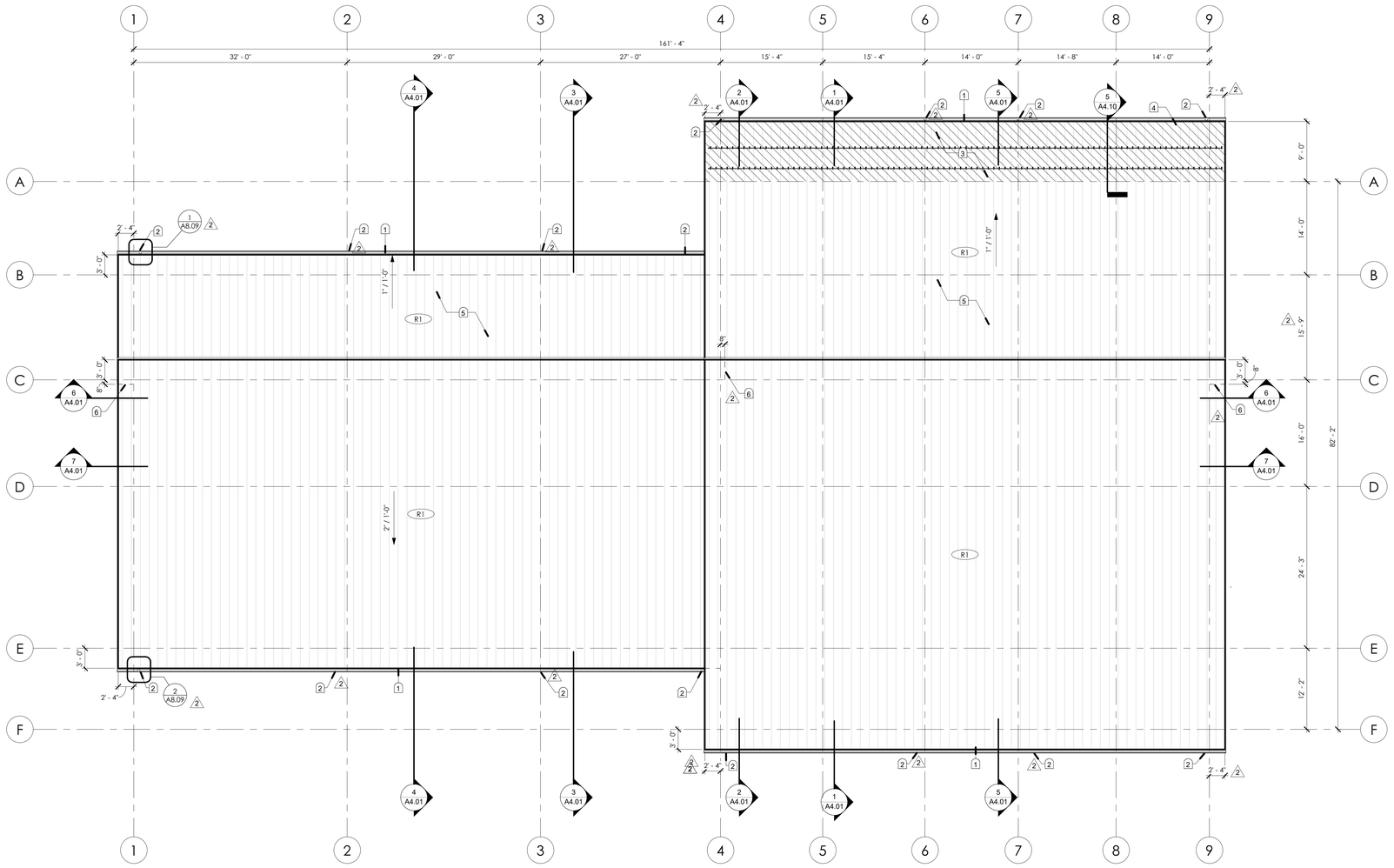
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GENERAL NOTES

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E. GRID LINES AT EXTERIOR WALLS LOCATED AT FACE OF STUD AND AT CENTER LINE OF STEEL U.N.O.

ROOF KEYNOTES

1 GUTTER
2 DOWNSPOUT - 3" ROUND
3 SNOW RETENTION SYSTEM IN DIAGONAL HATCH REGION
4 SNOW RAILS
5 APPLIED DECOR STRIPS ON NORTH FACING ROOFS ONLY.
6 OVERHANG AT LOW ROOF BELOW



N

1 A2.01 **Roof Plan**
SCALE: 1/8" = 1'-0"

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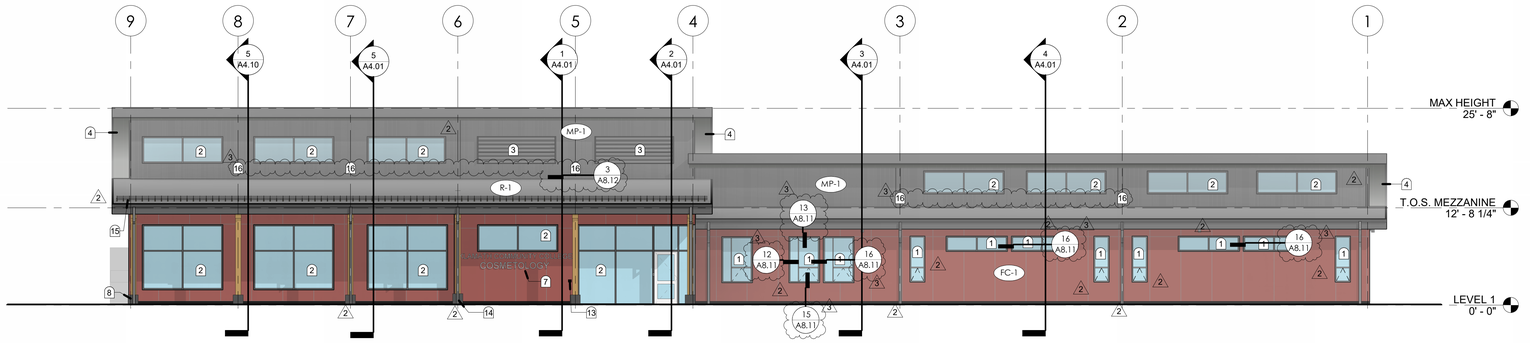
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Date 3/16/2026

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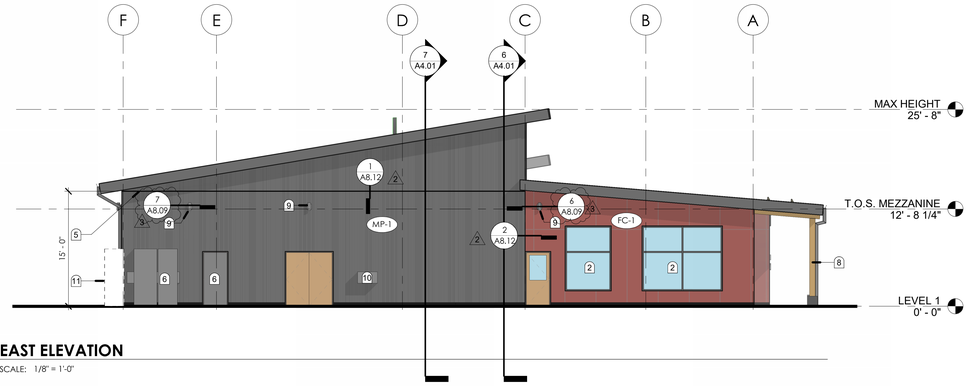
OVERALL ROOF PLAN

A2.01

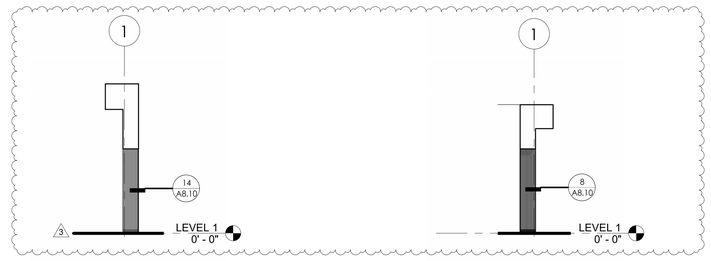
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1 A3.01 **NORTH ELEVATION**
SCALE: 1/8" = 1'-0"

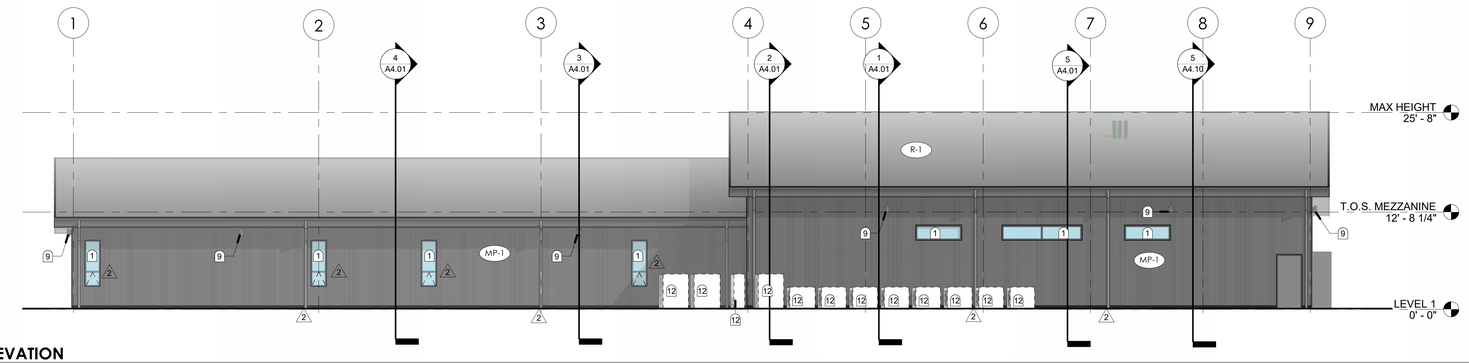


2 A3.01 **EAST ELEVATION**
SCALE: 1/8" = 1'-0"

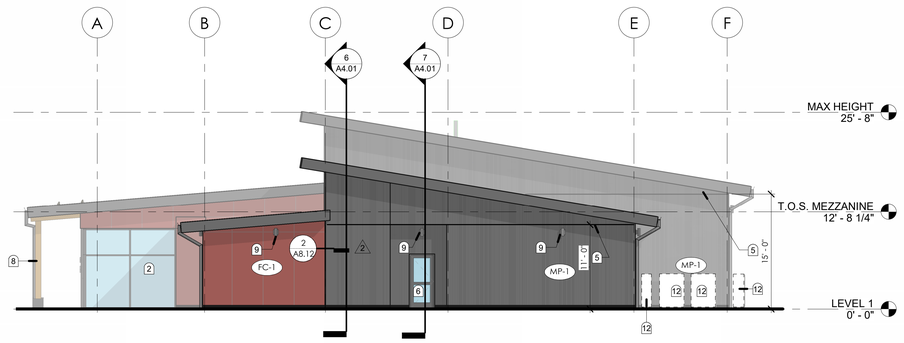


6 A3.01 **NORTH ELEVATION ALCOVE**
SCALE: 1/8" = 1'-0"

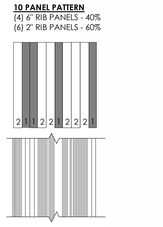
7 A3.01 **SOUTH ELEVATION ALCOVE**
SCALE: 1/8" = 1'-0"



3 A3.01 **SOUTH ELEVATION**
SCALE: 1/8" = 1'-0"



4 A3.01 **WEST ELEVATION**
SCALE: 1/8" = 1'-0"



5 A3.01 **MP-1 PANEL PATTERN**
SCALE: 1/8" = 1'-0"

GENERAL NOTES

A. SEE SHEET G0.01 FOR ARCHITECTURAL ABBREVIATIONS AND SYMBOLS
B. SEE SHEET G0.04 FOR WALL TYPES
C. SEE SHEET A8.01 FOR DOOR SCHEDULE
D. PLAN DIMENSIONS ARE MEASURED FROM THE OUTSIDE FACE OF STUDS / FACE OF CONCRETE ON EXTERIOR WALLS TO THE CENTER LINES OF INTERIOR WALLS AND OPENINGS U.N.O.
E. GRID LINES ALIGN WITH FACE OF STUD U.N.O.
F. ALL EXTERIOR WALLS ARE TYPE xx U.N.O.
G. ALL INTERIOR WALLS ARE TYPE xx U.N.O.
H. SHEET IS INTENDED TO BE PRINTED AND VIEWED IN COLOR

EXTERIOR KEYNOTES

1 VINYL WINDOW, TYP.
2 STOREFRONT
3 MECHANICAL LOUVER
4 MP-2 SOFFIT, TYP
5 METAL PANEL BREAK
6 HOLLOW METAL DOOR
7 RAISED METAL SIGNAGE
8 GLULAM COLUMNS, TYP
9 EXTERIOR LIGHT FIXTURE
10 GAS METER
11 ELECTRICAL EQUIPMENT
12 HEAT PUMP, TYP
13 RECESSED KNOX-BOX 3200 SERIES. VERIFY FINAL LOCATION WITH ARCHITECT AND AHJ.
14 CONCRETE PEDESTAL COLUMN BASE, TYP.
15 SNOW RAILS
3 | 16 FALL PROTECTION ANCHOR

EXTERIOR FINISH LEGEND

SPEC SECTION	MATERIAL	ABBREVIATION	MANUFACTURER	MODEL NAME/ #	FINISH/COLOR	COMMENTS
04 4200	**UNIT MASONRY**					
		CMU-1	WILLAMETTE GREYSTONE	STRUCTURAL	GRAY (NATURAL)	SMOOTH FACE
07 4213	**METAL WALL AND SOFFIT PANELS**					
	METAL WALL PANEL	MP-1	AEP SPAN	FLEX SERIES	FACTORY FINISH; COLOR TBD	
	METAL SOFFIT PANEL	MP-2	AEP SPAN	FLUSH PANEL	FACTORY FINISH; COLOR TBD	NON-VENTED, INCLUDE 2 PENCIL RIBS
07 4646	**FIBER CEMENT SIDING**					
	FIBER CEMENT WALL PANEL	FC-1	SWISSPEARL	ZENOR	THROUGH COLORED: 33106	
	FIBER CEMENT WALL PANEL (ALT #6)	FC-1	HARDIE ARCHITECTURAL PANEL		FACTORY PRIMED AND FIELD PAINTED	SEE COVER PAGE FOR DEDUCT ALT #6 DESCRIPTION
07 5419	**MEMBRANE ROOFING**					
	TPO OR PVC ROOFING	R-1			EXPOSED FACE COLOR: GRAY	WITH DECORATIVE STANDING SEAM STRIPS
07 6200	**SHEET METAL FLASHING & TRIM**					
	SHEET METAL FASCIA	--			PREFINISHED - MATCH BACKGROUND COLOR OF ADJACENT MATERIALS	
	SHEET METAL OPENING TRIM				PREFINISHED - MATCH BACKGROUND COLOR OF ADJACENT MATERIALS	
	GUTTER & DOWNSPOUTS				PREFINISHED - MATCH BACKGROUND COLOR OF ADJACENT MATERIALS	
08 1113	**HOLLOW METAL DOORS AND FRAMES**					
	HOLLOW METAL DOOR	--			PAINTED - COLOR TBD	
	HOLLOW METAL FRAME	--			PAINTED - COLOR TBD	
09 9000	**PAINTING**					
	EXTERIOR COLORS	P-8	BENJAMIN MOORE		SW7069 IRON ORE	

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Bend, Oregon 97702
t 541.382.5535 | f 541.389.8033

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12047
STATE OF OREGON

KLAMATH COMMUNITY COLLEGE - COSMETOLOGY CENTER

7390 S 6TH STREET
KLAMATH FALLS, OR
97603

No.	Description	Date
2	Addendum #2	4/9/26
3	Addendum #3	4/23/26

Project Number 2507
Date 3/16/2026

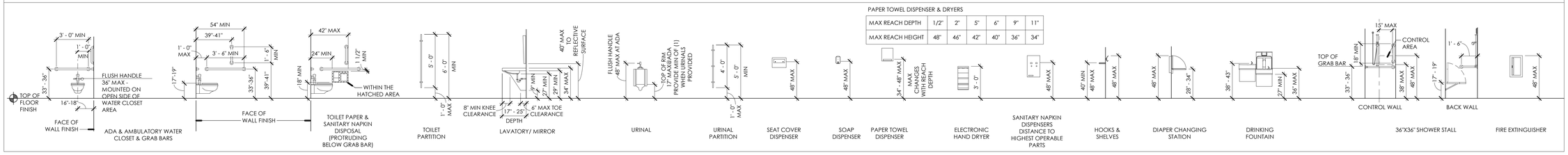
PERMIT / BID SET

EXTERIOR ELEVATIONS

A3.01

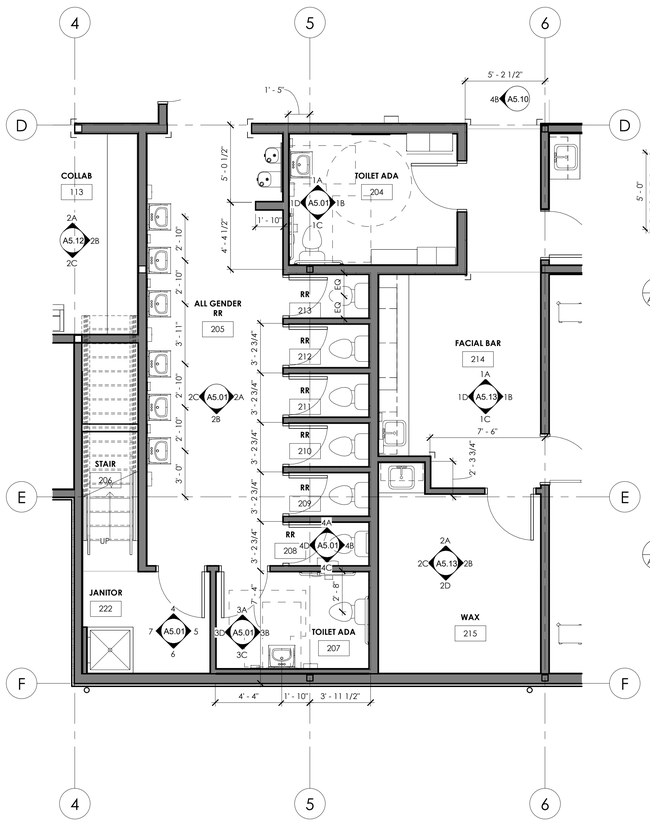
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ADA STANDARDS: GENERAL REQUIREMENTS FOR RESTROOM FIXTURES AND ACCESSORIES



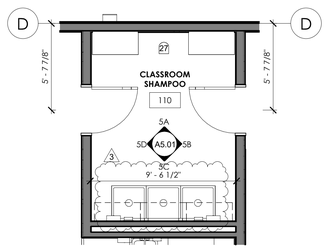
1 A5.01 ADA STANDARDS

SCALE: 1/4" = 1'-0"



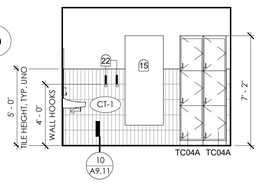
2 A5.01 ENLARGED RESTROOM PLAN

SCALE: 1/4" = 1'-0"



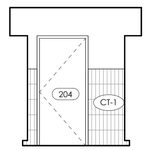
3 A5.01 ENLARGED CLASSROOM SHAMPOO 110 PLAN

SCALE: 1/4" = 1'-0"



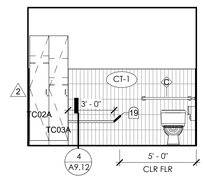
1A A5.01 TOILET ADA 204

SCALE: 1/4" = 1'-0"



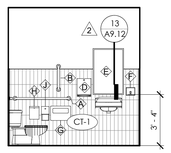
1B A5.01 TOILET ADA 204

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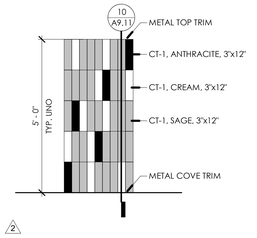
1C A5.01 TOILET ADA 204

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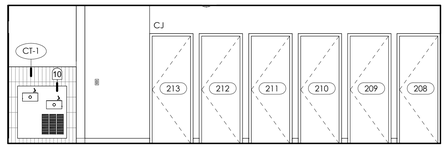
1D A5.01 TOILET ADA 204

SCALE: 1/4" = 1'-0"



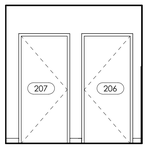
2 A5.01 CERAMIC TILE REPEAT PATTERN, TYP

SCALE: 1/2" = 1'-0"



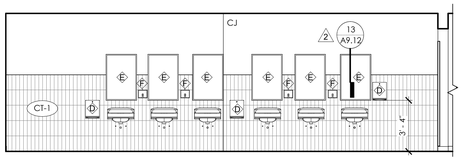
2A A5.01 ALL GENDER RR 205

SCALE: 1/4" = 1'-0"



2B A5.01 ALL GENDER RR 205

SCALE: 1/4" = 1'-0"



2C A5.01 ALL GENDER RR 205

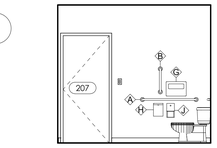
SCALE: 1/4" = 1'-0"

INTERIOR KEYNOTES

1	SMART TV, OFOI. CONTRACTOR TO PROVIDE BLOCKING
2	PEDICURE SOURCE-CAPTURE VENTILATION
3	MIRROR 50" x 42"
4	MIRROR 50" x 32"
5	CONCEALED BRACKET DISPLAY SHELVES, 8" DEPTH
6	SS-2 COUNTERTOP
7	RAISED METAL SIGNAGE, OFOI. CONTRACTOR TO PROVIDE BLOCKING
8	DOUBLE SIDED CASEWORK ISLAND
9	PL-1 COUNTERTOP, SS-3 BID ALTERNATE
10	DRINKING FOUNTAIN
11	COUNTER BRACKETS @ 24" O.C.
12	PRINTER, OFOI
13	STUDENT LOCKERS
14	SHELVING, OFOI. CONTRACTOR TO CONFIRM FINAL MOUNTING LOCATION WITH OWNER AND PROVIDE BLOCKING
15	MIRROR 70" X 30"
16	CURTAIN
17	STYLING CHAIRS, SEE A8.01 FOR SPECIALTY EQUIPMENT SCHEDULE
18	LAUNDRY BINS, OFOI
19	COMPACT LAMINATE BENCH W/ STUD MOUNTED SUPPORTS
20	ADJUSTABLE P-LAM SHELVES, PL-2, 18" DEEP, ON ADJUSTABLE SHELF STANDARDS, CFCI. CONTRACTOR TO PROVIDE BLOCKING
21	PAINT WALL ACCENT COLOR, P-3
22	WALL MOUNTED COAT HOOKS, MOUNT AT 4'-0" MAX.
23	TACK/MARKER BOARD, OFOI. CONTRACTOR TO PROVIDE BLOCKING
24	FIRE EXTINGUISHER CABINET
25	PAINT WALL ACCENT COLOR, P-6
26	VENDING MACHINE, OFOI
27	SEE A8.01 FOR SPECIALTY EQUIPMENT SCHEDULE. CONTRACTOR TO PROVIDE BLOCKING FOR WALL-MOUNTED EQUIPMENT
28	THIS PORTION OF WALL TO BE PAINTED P-7
29	PAINT ACCENT WALL ABOVE WALL PANEL, P-6
30	REFRIGERATOR, OFOI
31	PAINT WALL ACCENT COLOR, P-5
32	MONITOR, OFOI. CONTRACTOR TO PROVIDE BLOCKING
33	MOP SINK
34	PL-3 COUNTERTOP, SS-1 BID ALTERNATE
35	CONCEALED BRACKET DISPLAY SHELF, 6" DEPTH
36	STACK WASHER/DRYER, OFCI
37	FULL-HEIGHT BACKSPLASH, MATCH COUNTERTOP FINISH & COLOR
38	PROVIDE GROMMET IN COUNTER FOR POWER ACCESS
39	PEDICURE FILL SINK
40	ALIGN
41	COORDINATE OUTLET LOCATION WITHIN SIDE OF CASEWORK, TYP AT TEACHING CASEWORK ISLANDS.

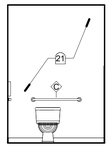
TOILET ACCESSORIES

A	GRAB BAR 42"	CFCI
B	GRAB BAR 18"	CFCI
C	GRAB BAR 36"	CFCI
D	PAPER TOWEL DISPENSER	OFOI
E	MIRROR - 24" x 36"	CFCI
F	SOAP DISPENSER	OFOI
G	SEAT COVER DISPENSER	OFOI
H	SANITARY NAPKIN DISPOSAL	CFCI
J	TOILET PAPER DISPENSER	OFOI



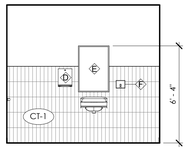
3A A5.01 TOILET ADA 207

SCALE: 1/4" = 1'-0"



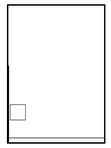
3B A5.01 TOILET ADA 207

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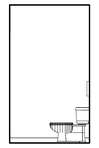
3C A5.01 TOILET ADA 207

SCALE: 1/4" = 1'-0"



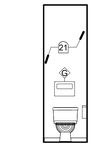
3D A5.01 TOILET ADA 207

SCALE: 1/4" = 1'-0"



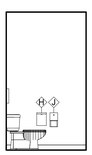
4A A5.01 RR STALL, TYP

SCALE: 1/4" = 1'-0"



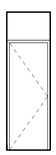
4B A5.01 RR STALL, TYP

SCALE: 1/4" = 1'-0"



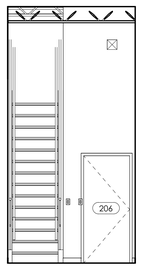
4C A5.01 RR STALL, TYP

SCALE: 1/4" = 1'-0"



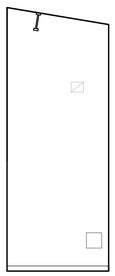
4D A5.01 RR STALL, TYP

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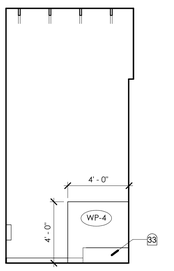
4 A5.01 JANITOR 222

SCALE: 1/4" = 1'-0"



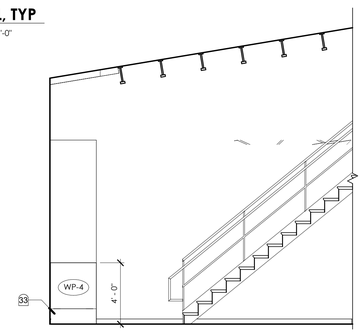
5 A5.01 JANITOR 222

SCALE: 1/4" = 1'-0"



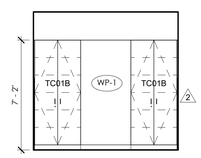
6 A5.01 JANITOR 222

SCALE: 1/4" = 1'-0"



7 A5.01 JANITOR 222

SCALE: 1/4" = 1'-0"



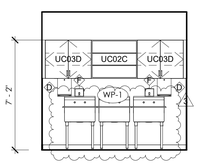
5A A5.01 CLASSROOM SHAMPOO 110

SCALE: 1/4" = 1'-0"



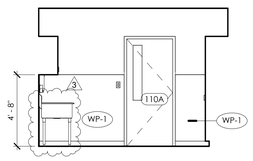
5B A5.01 CLASSROOM SHAMPOO 110

SCALE: 1/4" = 1'-0"



5C A5.01 CLASSROOM SHAMPOO 110

SCALE: 1/4" = 1'-0"



5D A5.01 CLASSROOM SHAMPOO 110

SCALE: 1/4" = 1'-0"

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KLAMATH FALLS, OR 97603

No.	Description	Date
2	Addendum #2	4/9/26
3	Addendum #3	4/23/26

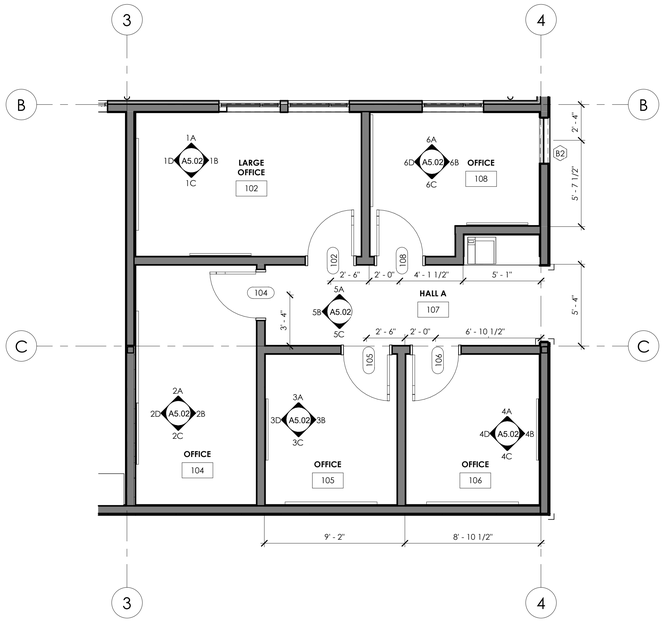
Project Number 2507
Date 3/16/2026

PERMIT / BID SET

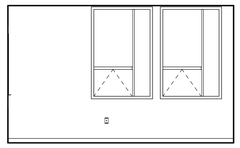
ENLARGED PLANS & ELEVATIONS

A5.01

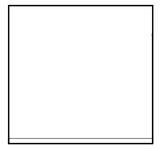
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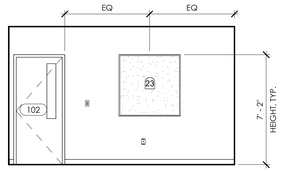
1 A5.02 **ENLARGED PLAN - OFFICES**
SCALE: 1/4" = 1'-0"



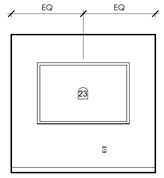
1A A5.02 **LARGE OFFICE 102**
SCALE: 1/4" = 1'-0"



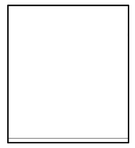
1B A5.02 **LARGE OFFICE 102**
SCALE: 1/4" = 1'-0"



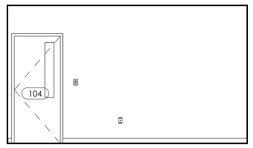
1C A5.02 **LARGE OFFICE 102**
SCALE: 1/4" = 1'-0"



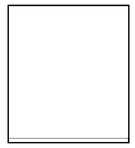
1D A5.02 **LARGE OFFICE 102**
SCALE: 1/4" = 1'-0"



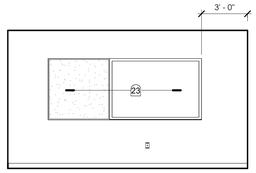
2A A5.02 **OFFICE 104**
SCALE: 1/4" = 1'-0"



2B A5.02 **OFFICE 104**
SCALE: 1/4" = 1'-0"



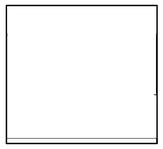
2C A5.02 **OFFICE 104**
SCALE: 1/4" = 1'-0"



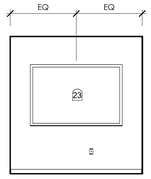
2D A5.02 **OFFICE 104**
SCALE: 1/4" = 1'-0"



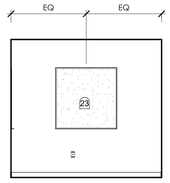
3A A5.02 **OFFICE 105**
SCALE: 1/4" = 1'-0"



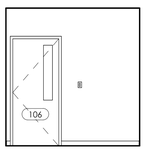
3B A5.02 **OFFICE 105**
SCALE: 1/4" = 1'-0"



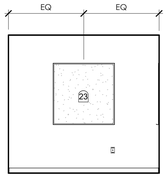
3C A5.02 **OFFICE 105**
SCALE: 1/4" = 1'-0"



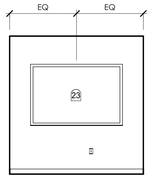
3D A5.02 **OFFICE 105**
SCALE: 1/4" = 1'-0"



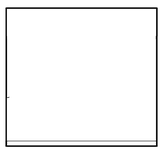
4A A5.02 **OFFICE 106**
SCALE: 1/4" = 1'-0"



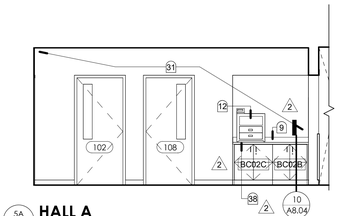
4B A5.02 **OFFICE 106**
SCALE: 1/4" = 1'-0"



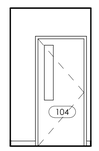
4C A5.02 **OFFICE 106**
SCALE: 1/4" = 1'-0"



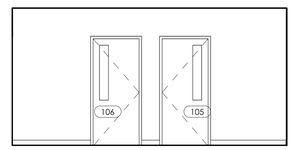
4D A5.02 **OFFICE 106**
SCALE: 1/4" = 1'-0"



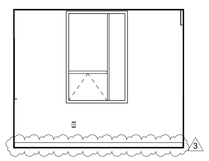
5A A5.02 **HALL A**
SCALE: 1/4" = 1'-0"



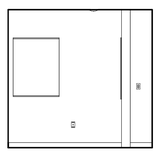
5B A5.02 **HALL A**
SCALE: 1/4" = 1'-0"



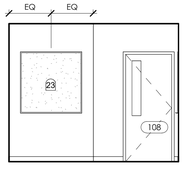
5C A5.02 **HALL A**
SCALE: 1/4" = 1'-0"



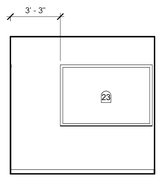
6A A5.02 **OFFICE 108**
SCALE: 1/4" = 1'-0"



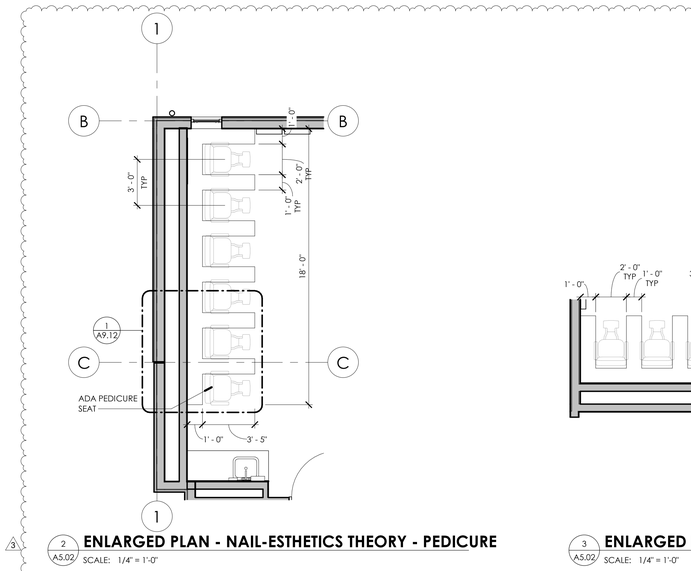
6B A5.02 **OFFICE 108**
SCALE: 1/4" = 1'-0"



6C A5.02 **OFFICE 108**
SCALE: 1/4" = 1'-0"



6D A5.02 **OFFICE 108**
SCALE: 1/4" = 1'-0"



2 A5.02 **ENLARGED PLAN - NAIL-ESTHETICS THEORY - PEDICURE**
SCALE: 1/4" = 1'-0"

3 A5.02 **ENLARGED PLANS - PEDICURE - NAIL/PEDI 201**
SCALE: 1/4" = 1'-0"

INTERIOR KEYNOTES

1	SMART TV, OFOI. CONTRACTOR TO PROVIDE BLOCKING
2	PEDICURE SOURCE-CAPTURE VENTILATION
3	MIRROR 50" x 42"
4	MIRROR 50" x 32"
5	CONCEALED BRACKET DISPLAY SHELVES, 8" DEPTH
6	SS-2 COUNTERTOP
7	RAISED METAL SIGNAGE, OFOI. CONTRACTOR TO PROVIDE BLOCKING
8	DOUBLE SIDED CASEWORK ISLAND
9	PL-1 COUNTERTOP, SS-3 BID ALTERNATE
10	DRINKING FOUNTAIN
11	COUNTER BRACKETS @ 24" O.C.
12	PRINTER, OFOI
13	STUDENT LOCKERS
14	SHELVING, OFOI. CONTRACTOR TO CONFIRM FINAL MOUNTING LOCATION WITH OWNER AND PROVIDE BLOCKING
15	MIRROR 70" X 30"
16	CURTAIN
17	STYLING CHAIRS, SEE A8.01 FOR SPECIALTY EQUIPMENT SCHEDULE
18	LAUNDRY BINS, OFOI
19	COMPACT LAMINATE BENCH W/ STUD MOUNTED SUPPORTS
20	ADJUSTABLE P-LAM SHELVES, PL-2, 18" DEEP, ON ADJUSTABLE SHELF STANDARDS, CFCI. CONTRACTOR TO PROVIDE BLOCKING
21	PAINT WALL ACCENT COLOR, P-3
22	WALL MOUNTED COAT HOOKS, MOUNT AT 4'-0" MAX.
23	TACK/MARKER BOARD, OFOI. CONTRACTOR TO PROVIDE BLOCKING
24	FIRE EXTINGUISHER CABINET
25	PAINT WALL ACCENT COLOR, P-6
26	VENDING MACHINE, OFOI
27	SEE A8.01 FOR SPECIALTY EQUIPMENT SCHEDULE. CONTRACTOR TO PROVIDE BLOCKING FOR WALL-MOUNTED EQUIPMENT
28	THIS PORTION OF WALL TO BE PAINTED P-7
29	PAINT ACCENT WALL ABOVE WALL PANEL, P-6
30	REFRIGERATOR, OFOI
31	PAINT WALL ACCENT COLOR, P-5
32	MONITOR, OFOI. CONTRACTOR TO PROVIDE BLOCKING
33	MOP SINK
34	PL-3 COUNTERTOP, SS-1 BID ALTERNATE
35	CONCEALED BRACKET DISPLAY SHELF, 6" DEPTH
36	STACK WASHER/DRYER, OFCI
37	FULL-HEIGHT BACKSPLASH, MATCH COUNTERTOP FINISH & COLOR
38	PROVIDE GROMMET IN COUNTER FOR POWER ACCESS
39	PEDICURE FILL SINK
40	ALIGN
41	COORDINATE OUTLET LOCATION WITHIN SIDE OF CASEWORK. TYP AT TEACHING CASEWORK ISLANDS.

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REGISTERED ARCHITECT
Kyle Burke
Bend, OR
12047
STATE OF OREGON

KLAMATH COMMUNITY COLLEGE - COSMETOLOGY CENTER

7390 S 6TH STREET
KLAMATH FALLS, OR
97603

No.	Description	Date
2	Addendum #2	4/9/26
3	Addendum #3	4/23/26

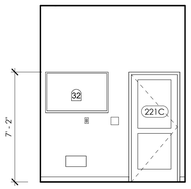
Project Number 2507
Date 3/16/2026

PERMIT / BID SET

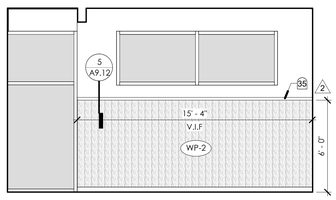
ENLARGED PLANS & ELEVATIONS

A5.02

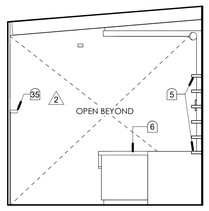
COPYRIGHT © 4/23/2026 11:01:49 AM BBT ARCHITECTS



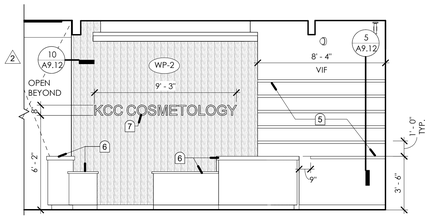
1A A5.10 **VESTIBULE - C**
SCALE: 1/4" = 1'-0"



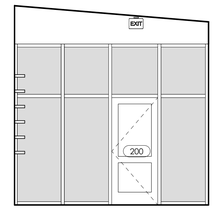
2A A5.10 **RECEPTION/LOBBY 200**
SCALE: 1/4" = 1'-0"



2B A5.10 **RECEPTION/LOBBY 200**
SCALE: 1/4" = 1'-0"



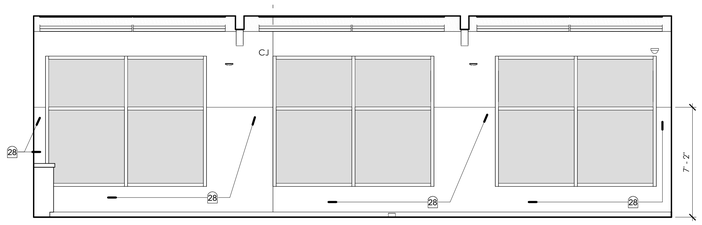
2C A5.10 **RECEPTION/LOBBY 200**
SCALE: 1/4" = 1'-0"



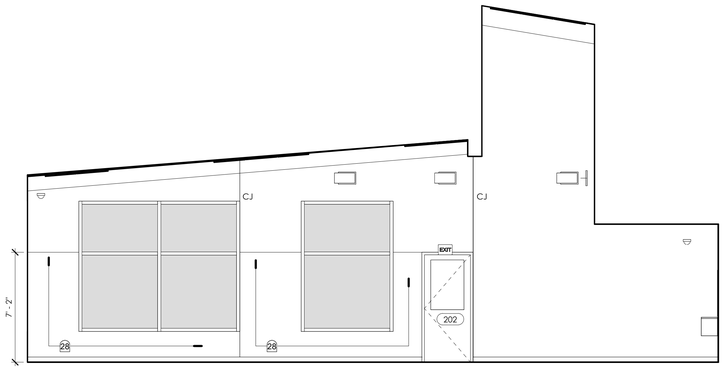
2D A5.10 **RECEPTION/LOBBY 200**
SCALE: 1/4" = 1'-0"

INTERIOR KEYNOTES

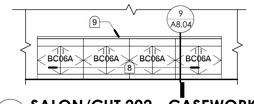
#	
	1 SMART TV, OFOI. CONTRACTOR TO PROVIDE BLOCKING
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	3 MIRROR 50" x 42"
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	9 PL-1 COUNTERTOP, SS-3 BID ALTERNATE
	10 DRINKING FOUNTAIN
	11 COUNTER BRACKETS @ 24" O.C.
	12 PRINTER, OFOI
	13 STUDENT LOCKERS
3 2.14	SHELVING, OFOI. CONTRACTOR TO CONFIRM FINAL MOUNTING LOCATION WITH OWNER AND PROVIDE BLOCKING
	15 MIRROR 70" X 30"
	16 CURTAIN
	17 STYLING CHAIRS, SEE A8.01 FOR SPECIALTY EQUIPMENT SCHEDULE
	18 LAUNDRY BINS, OFOI
	19 COMPACT LAMINATE BENCH W/ STUD MOUNTED SUPPORTS
	20 ADJUSTABLE P-LAM SHELVES, PL-2, 18" DEEP, ON ADJUSTABLE SHELF STANDARDS, CFCI. CONTRACTOR TO PROVIDE BLOCKING
	21 PAINT WALL ACCENT COLOR, P-3
	22 WALL MOUNTED COAT HOOKS, MOUNT AT 4'-0" MAX.
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	24 FIRE EXTINGUISHER CABINET
	25 PAINT WALL ACCENT COLOR, P-6
	26 VENDING MACHINE, OFOI
	27 SEE A8.01 FOR SPECIALTY EQUIPMENT SCHEDULE. CONTRACTOR TO PROVIDE BLOCKING FOR WALL-MOUNTED EQUIPMENT
2	28 THIS PORTION OF WALL TO BE PAINTED P-7
	29 PAINT ACCENT WALL ABOVE WALL PANEL, P-6
	30 REFRIGERATOR, OFOI
	31 PAINT WALL ACCENT COLOR, P-5
	32 MONITOR, OFOI. CONTRACTOR TO PROVIDE BLOCKING
	33 MOP SINK
2	34 PL-3 COUNTERTOP, SS-1 BID ALTERNATE
	35 CONCEALED BRACKET DISPLAY SHELF, 6" DEPTH
2	36 STACK WASHER/DRYER, OFCI
2	37 FULL-HEIGHT BACKSPLASH, MATCH COUNTERTOP FINISH & COLOR
	38 PROVIDE GROMMET IN COUNTER FOR POWER ACCESS
3	39 PEDICURE FILL SINK
	40 ALIGN
	41 COORDINATE OUTLET LOCATION WITHIN SIDE OF CASEWORK. TYP AT TEACHING CASEWORK ISLANDS.



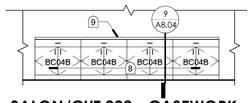
3A A5.10 **SALON/CUT 202**
SCALE: 1/4" = 1'-0"



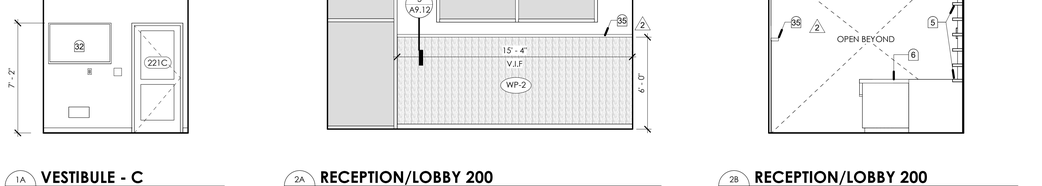
3B A5.10 **SALON/CUT 202**
SCALE: 1/4" = 1'-0"



3E A5.10 **SALON/CUT 202 - CASEWORK**
SCALE: 1/4" = 1'-0"

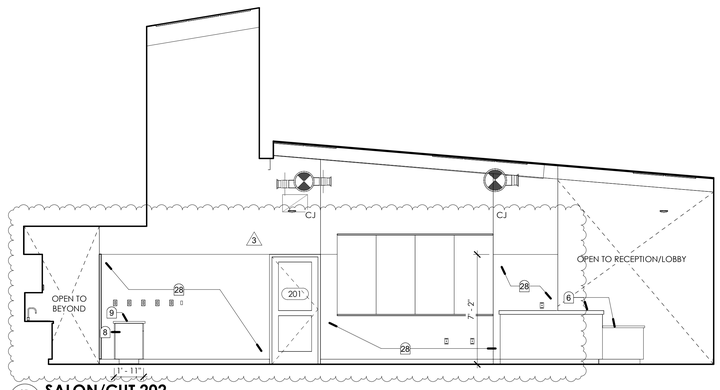


3F A5.10 **SALON/CUT 202 - CASEWORK**
SCALE: 1/4" = 1'-0"

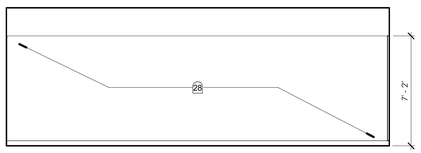


HALL C

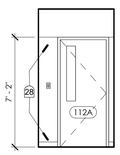
3C A5.10 **SALON/CUT 202 / HALL C 203**
SCALE: 1/4" = 1'-0"



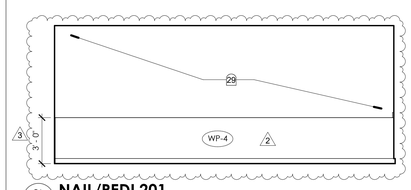
3D A5.10 **SALON/CUT 202**
SCALE: 1/4" = 1'-0"



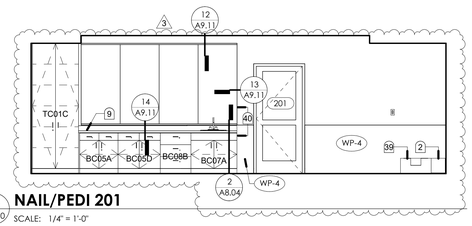
4A A5.10 **HALL C 203 - A**
SCALE: 1/4" = 1'-0"



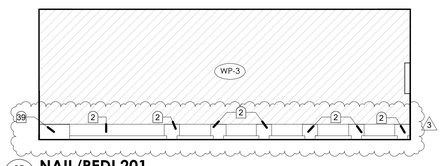
4B A5.10 **HALL C 203**
SCALE: 1/4" = 1'-0"



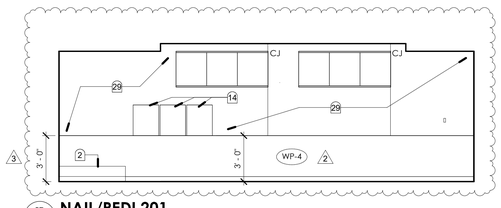
5A A5.10 **NAIL/PEDI 201**
SCALE: 1/4" = 1'-0"



5B A5.10 **NAIL/PEDI 201**
SCALE: 1/4" = 1'-0"



5C A5.10 **NAIL/PEDI 201**
SCALE: 1/4" = 1'-0"



5D A5.10 **NAIL/PEDI 201**
SCALE: 1/4" = 1'-0"

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REGISTERED ARCHITECT
Kyle Burke
Bend, OR
12047
STATE OF OREGON

KLAMATH COMMUNITY COLLEGE - COSMETOLOGY CENTER

7390 S 6TH STREET
KLAMATH FALLS, OR
97603

No.	Description	Date
2	Addendum #2	4/9/26
3	Addendum #3	4/23/26

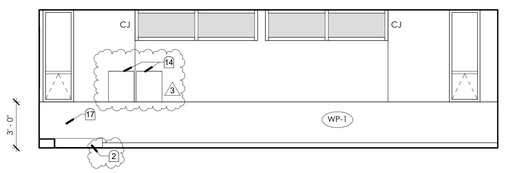
Project Number 2507
Date 3/16/2026

PERMIT / BID SET

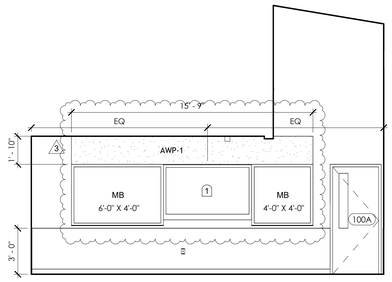
INTERIOR ELEVATIONS

A5.10

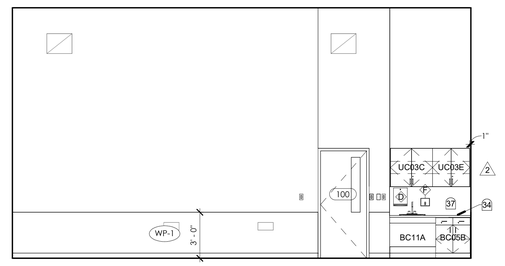
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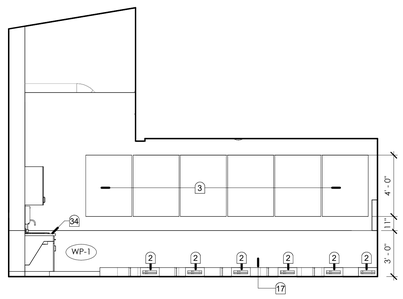
1A A5.11 **NAIL/ESTHETICS THEORY 100**
SCALE: 1/4" = 1'-0"



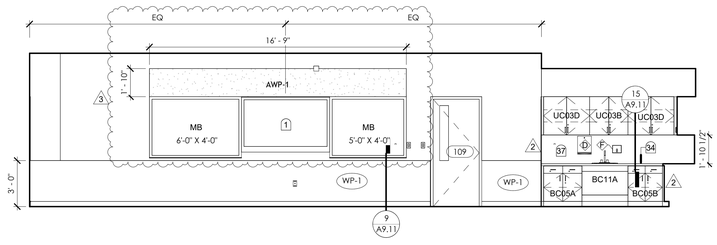
1B A5.11 **NAIL/ESTHETICS THEORY 100**
SCALE: 1/4" = 1'-0"



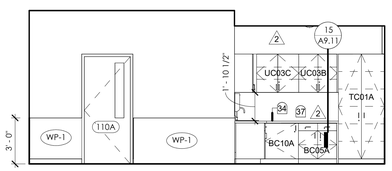
1C A5.11 **NAIL/ESTHETICS THEORY 100**
SCALE: 1/4" = 1'-0"



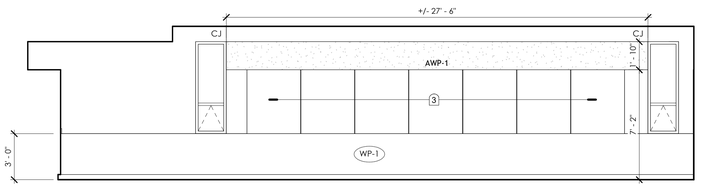
1D A5.11 **NAIL/ESTHETICS THEORY 100**
SCALE: 1/4" = 1'-0"



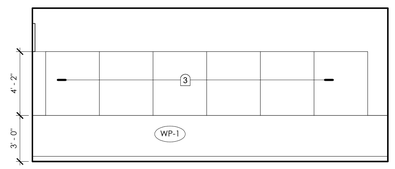
2A A5.11 **BARBER/COLOR THEORY 109**
SCALE: 1/4" = 1'-0"



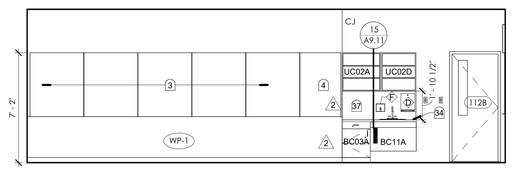
2B A5.11 **BARBER/COLOR THEORY 109**
SCALE: 1/4" = 1'-0"



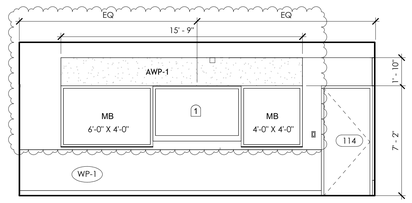
2C A5.11 **BARBER/COLOR THEORY 109**
SCALE: 1/4" = 1'-0"



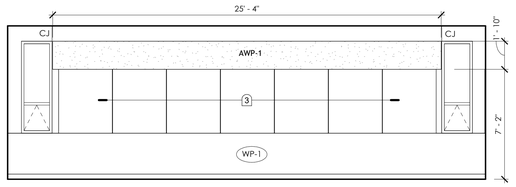
2D A5.11 **BARBER/COLOR THEORY 109**
SCALE: 1/4" = 1'-0"



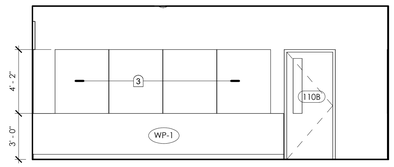
3A A5.11 **HAIR/TEXTURE 111**
SCALE: 1/4" = 1'-0"



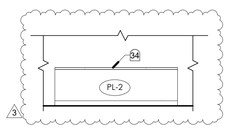
3B A5.11 **HAIR/TEXTURE 111**
SCALE: 1/4" = 1'-0"



3C A5.11 **HAIR/TEXTURE 111**
SCALE: 1/4" = 1'-0"

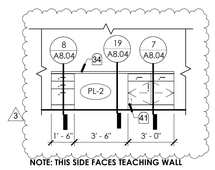


3D A5.11 **HAIR/TEXTURE 111**
SCALE: 1/4" = 1'-0"



NOTE: THIS SIDE FACES CLASSROOM

4A A5.11 **TYPICAL TEACHING CASEWORK ISLAND - BACK**
SCALE: 1/4" = 1'-0"



NOTE: THIS SIDE FACES TEACHING WALL

4B A5.11 **TYPICAL TEACHING CASEWORK ISLAND - FRONT**
SCALE: 1/4" = 1'-0"

INTERIOR KEYNOTES

1	SMART TV, OFOI. CONTRACTOR TO PROVIDE BLOCKING
2	PEDICURE SOURCE-CAPTURE VENTILATION
3	MIRROR 50" x 42"
4	MIRROR 50" x 32"
5	CONCEALED BRACKET DISPLAY SHELVES, 8" DEPTH
6	SS-2 COUNTERTOP
7	RAISED METAL SIGNAGE, OFOI. CONTRACTOR TO PROVIDE BLOCKING
8	DOUBLE SIDED CASEWORK ISLAND
9	PL-1 COUNTERTOP, SS-3 BID ALTERNATE
10	DRINKING FOUNTAIN
11	COUNTER BRACKETS @ 24" O.C.
12	PRINTER, OFOI
13	STUDENT LOCKERS
14	SHELVING, OFOI. CONTRACTOR TO CONFIRM FINAL MOUNTING LOCATION WITH OWNER AND PROVIDE BLOCKING
15	MIRROR 70" X 30"
16	CURTAIN
17	STYLING CHAIRS, SEE A8.01 FOR SPECIALTY EQUIPMENT SCHEDULE
18	LAUNDRY BINS, OFOI
19	COMPACT LAMINATE BENCH W/ STUD MOUNTED SUPPORTS
20	ADJUSTABLE P-LAM SHELVES, PL-2, 18" DEEP, ON ADJUSTABLE SHELF STANDARDS, CFCI. CONTRACTOR TO PROVIDE BLOCKING
21	PAINT WALL ACCENT COLOR, P-3
22	WALL MOUNTED COAT HOOKS, MOUNT AT 4'-0" MAX.
23	TACK/MARKER BOARD, OFOI. CONTRACTOR TO PROVIDE BLOCKING
24	FIRE EXTINGUISHER CABINET
25	PAINT WALL ACCENT COLOR, P-6
26	VENDING MACHINE, OFOI
27	SEE A8.01 FOR SPECIALTY EQUIPMENT SCHEDULE. CONTRACTOR TO PROVIDE BLOCKING FOR WALL-MOUNTED EQUIPMENT
28	THIS PORTION OF WALL TO BE PAINTED P-7
29	PAINT ACCENT WALL ABOVE WALL PANEL, P-6
30	REFRIGERATOR, OFOI
31	PAINT WALL ACCENT COLOR, P-5
32	MONITOR, OFOI. CONTRACTOR TO PROVIDE BLOCKING
33	MOP SINK
34	PL-3 COUNTERTOP, SS-1 BID ALTERNATE
35	CONCEALED BRACKET DISPLAY SHELF, 6" DEPTH
36	STACK WASHER/DRYER, OFCI
37	FULL-HEIGHT BACKSPLASH, MATCH COUNTERTOP FINISH & COLOR
38	PROVIDE GROMMET IN COUNTER FOR POWER ACCESS
39	PEDICURE FILL SINK
40	ALIGN
41	COORDINATE OUTLET LOCATION WITHIN SIDE OF CASEWORK. TYP AT TEACHING CASEWORK ISLANDS.

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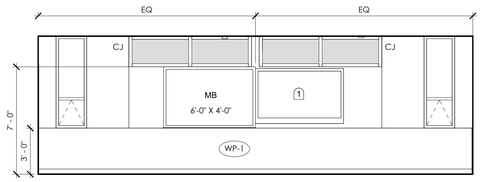
Project Number 2507
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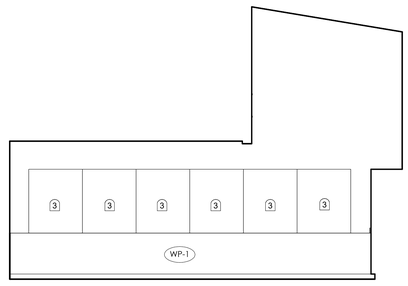
INTERIOR ELEVATIONS

A5.11

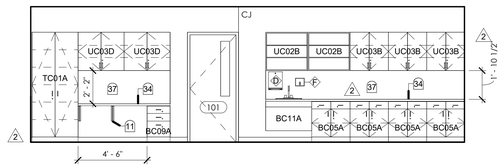
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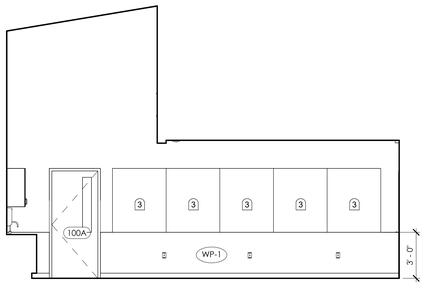
1A A5.12 **ESTHETICS LAB 101**
SCALE: 1/4" = 1'-0"



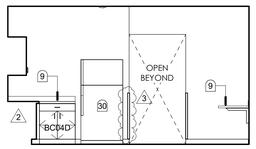
1B A5.12 **ESTHETICS LAB 101**
SCALE: 1/4" = 1'-0"



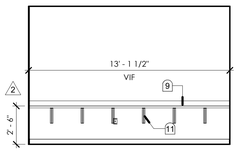
1C A5.12 **ESTHETICS LAB 101**
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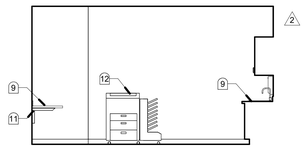
1D A5.12 **ESTHETICS LAB 101**
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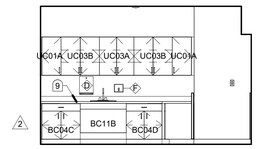
2A A5.12 **COLLAB 113**
SCALE: 1/4" = 1'-0"



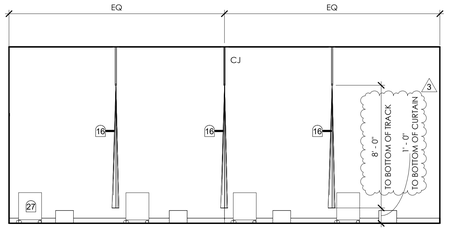
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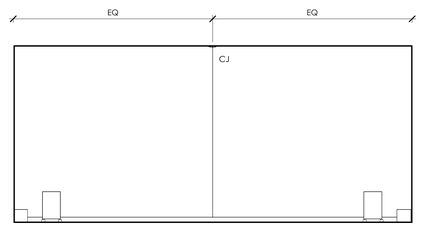
2C A5.12 **COLLAB 113**
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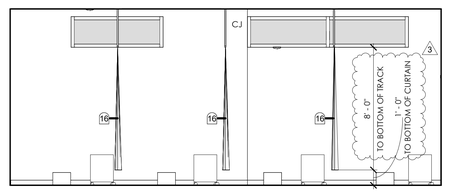
2D A5.12 **COLLAB 113**
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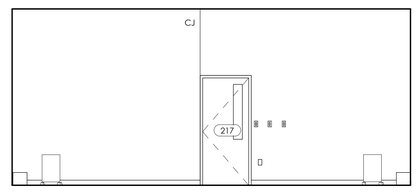
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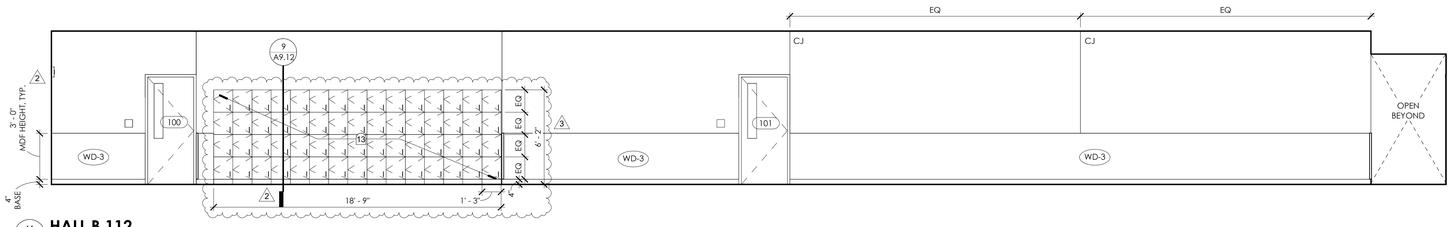
3B A5.12 **FACIAL/MASSAGE ESTHETICS 217**
SCALE: 1/4" = 1'-0"



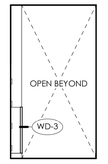
3C A5.12 **FACIAL/MASSAGE ESTHETICS 217**
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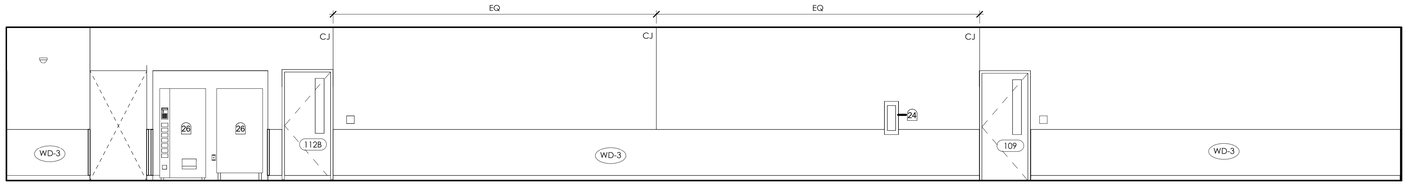
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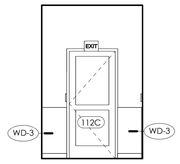
4A A5.12 **HALL B 112**
SCALE: 1/4" = 1'-0"



4B A5.12 **HALL B 112**
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4C A5.12 **HALL B 112**
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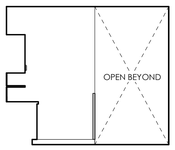
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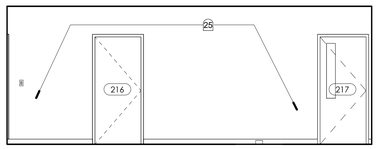
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A5.12

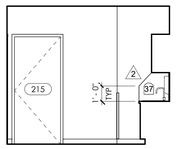
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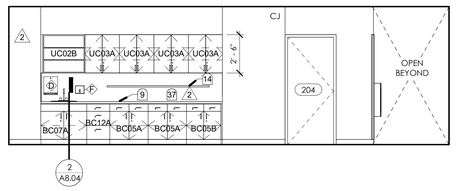
1A A5.13 **FACIAL BAR 214**
SCALE: 1/4" = 1'-0"



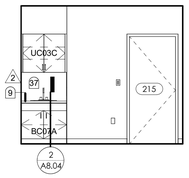
1B A5.13 **FACIAL BAR 214**
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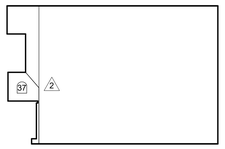
1C A5.13 **FACIAL BAR 214**
SCALE: 1/4" = 1'-0"



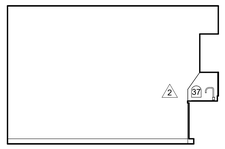
1D A5.13 **FACIAL BAR 214**
SCALE: 1/4" = 1'-0"



2A A5.13 **WAX 215**
SCALE: 1/4" = 1'-0"



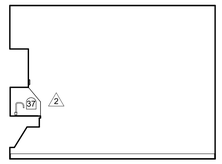
2B A5.13 **WAX 215**
SCALE: 1/4" = 1'-0"



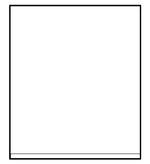
2C A5.13 **WAX 215**
SCALE: 1/4" = 1'-0"



2D A5.13 **WAX 215**
SCALE: 1/4" = 1'-0"



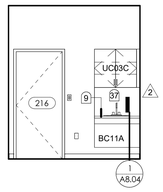
3A A5.13 **WAX 216**
SCALE: 1/4" = 1'-0"



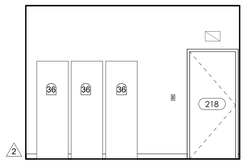
3B A5.13 **WAX 216**
SCALE: 1/4" = 1'-0"



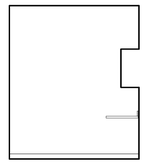
3C A5.13 **WAX 216**
SCALE: 1/4" = 1'-0"



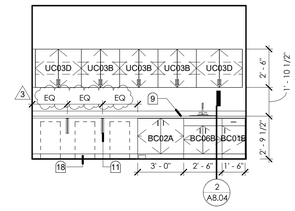
3D A5.13 **WAX 216**
SCALE: 1/4" = 1'-0"



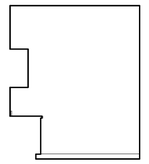
4A A5.13 **LAUNDRY 218**
SCALE: 1/4" = 1'-0"



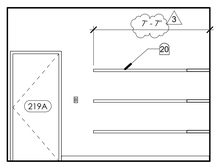
4B A5.13 **LAUNDRY 218**
SCALE: 1/4" = 1'-0"



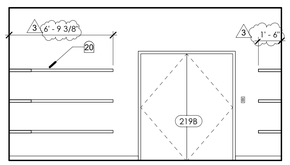
4C A5.13 **LAUNDRY 218**
SCALE: 1/4" = 1'-0"



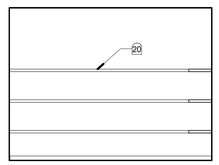
4D A5.13 **LAUNDRY 218**
SCALE: 1/4" = 1'-0"



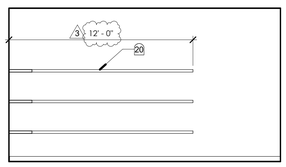
5A A5.13 **BUILDING STORAGE 219**
SCALE: 1/4" = 1'-0"



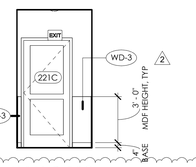
5B A5.13 **BUILDING STORAGE 219**
SCALE: 1/4" = 1'-0"



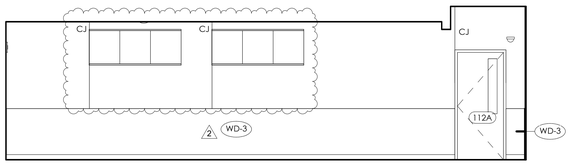
5C A5.13 **BUILDING STORAGE 219**
SCALE: 1/4" = 1'-0"



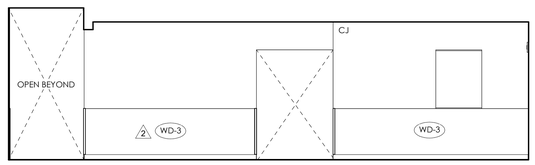
5D A5.13 **BUILDING STORAGE 219**
SCALE: 1/4" = 1'-0"



6A A5.13 **HALL B 112**
SCALE: 1/4" = 1'-0"



6B A5.13 **HALL B 112**
SCALE: 1/4" = 1'-0"



6C A5.13 **HALL B 112**
SCALE: 1/4" = 1'-0"

INTERIOR KEYNOTES

1	SMART TV, OFOI. CONTRACTOR TO PROVIDE BLOCKING
2	PEDICURE SOURCE-CAPTURE VENTILATION
3	MIRROR 50" x 42"
4	MIRROR 50" x 32"
5	CONCEALED BRACKET DISPLAY SHELVES, 8" DEPTH
6	SS-2 COUNTERTOP
7	RAISED METAL SIGNAGE, OFOI. CONTRACTOR TO PROVIDE BLOCKING
8	DOUBLE SIDED CASEWORK ISLAND
9	PL-1 COUNTERTOP, SS-3 BID ALTERNATE
10	DRINKING FOUNTAIN
11	COUNTER BRACKETS @ 24" O.C.
12	PRINTER, OFOI
13	STUDENT LOCKERS
14	SHELVING, OFOI. CONTRACTOR TO CONFIRM FINAL MOUNTING LOCATION WITH OWNER AND PROVIDE BLOCKING
15	MIRROR 70" X 30"
16	CURTAIN
17	STYLING CHAIRS, SEE A8.01 FOR SPECIALTY EQUIPMENT SCHEDULE
18	LAUNDRY BINS, OFOI
19	COMPACT LAMINATE BENCH W/ STUD MOUNTED SUPPORTS
3 20	ADJUSTABLE P-LAM SHELVES, PL-2, 18" DEEP, ON ADJUSTABLE SHELF STANDARDS, CFCI. CONTRACTOR TO PROVIDE BLOCKING
21	PAINT WALL ACCENT COLOR, P-3
22	WALL MOUNTED COAT HOOKS, MOUNT AT 4'-0" MAX.
23	TACK/MARKER BOARD, OFOI. CONTRACTOR TO PROVIDE BLOCKING
24	FIRE EXTINGUISHER CABINET
25	PAINT WALL ACCENT COLOR, P-6
26	VENDING MACHINE, OFOI
27	SEE A8.01 FOR SPECIALTY EQUIPMENT SCHEDULE. CONTRACTOR TO PROVIDE BLOCKING FOR WALL-MOUNTED EQUIPMENT
28	THIS PORTION OF WALL TO BE PAINTED P-7
29	PAINT ACCENT WALL ABOVE WALL PANEL, P-6
30	REFRIGERATOR, OFOI
31	PAINT WALL ACCENT COLOR, P-5
32	MONITOR, OFOI. CONTRACTOR TO PROVIDE BLOCKING
33	MOP SINK
34	PL-3 COUNTERTOP, SS-1 BID ALTERNATE
2 35	CONCEALED BRACKET DISPLAY SHELF, 6" DEPTH
36	STACK WASHER/DRYER, OFCI
37	FULL-HEIGHT BACKSPLASH, MATCH COUNTERTOP FINISH & COLOR
38	PROVIDE GROMMET IN COUNTER FOR POWER ACCESS
39	PEDICURE FILL SINK
40	ALIGH
41	COORDINATE OUTLET LOCATION WITHIN SIDE OF CASEWORK. TYP AT TEACHING CASEWORK ISLANDS.

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REGISTERED ARCHITECT
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12047
STATE OF OREGON

KLAMATH COMMUNITY COLLEGE - COSMETOLOGY CENTER

7390 S 6TH STREET
KLAMATH FALLS, OR
97603

No.	Description	Date
2	Addendum #2	4/9/26
3	Addendum #3	4/23/26

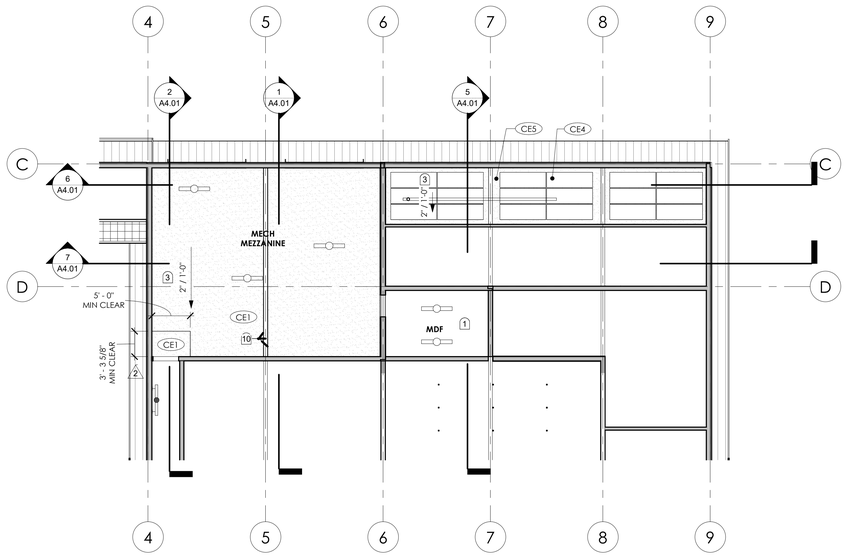
Project Number 2507
Date 3/16/2026

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INTERIOR ELEVATIONS

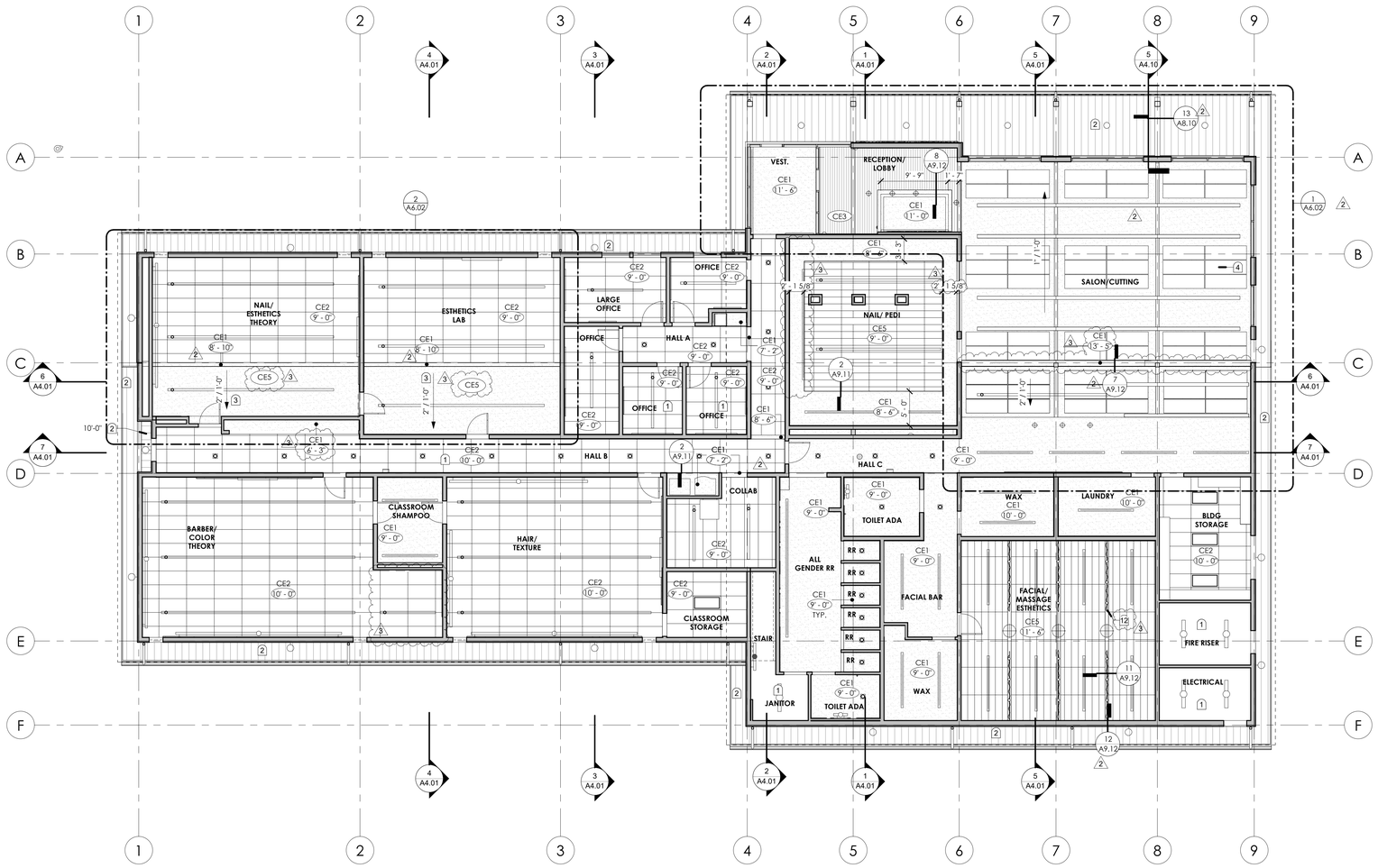
A5.13

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2 A6.01 MECHANICAL MEZZANINE RCP

SCALE: 1/8" = 1'-0"



1 A6.01 REFLECTED CEILING PLAN - LEVEL 1

SCALE: 1/8" = 1'-0"

GENERAL NOTES - RCP

A. SEE SHEET G0.01 FOR ARCHITECTURAL ABBREVIATIONS AND SYMBOLS
B. SEE SHEET G0.04 FOR WALL TYPES
C. SEE SHEET A8.01 FOR DOOR SCHEDULE
D. PAINT ALL EXPOSED CONDUIT AND FIRE SPRINKLER LINES TO MATCH ADJACENT WALL OR CEILING, VERIFY W/ ARCHITECT.
E. PAINT GYP. BOARD CEILINGS P-1, U.N.O.
F. SHEET A6.02 INTENDED TO BE PRINTED AND VIEWED IN COLOR
2 G. PAINT EXPOSED STRUCTURAL STEEL AT CEILING LEVEL TO MATCH ADJACENT WALL OR CEILING, U.N.O.

REFLECTED CEILING KEYNOTES

1 OPEN TO STRUCTURE
2 SHEET METAL SOFFIT - MP-2
3 SLOPED CEILING, TIGHT TO STRUCTURE. COORDINATE W/ SECTIONS
4 PAINT EXPOSED DUCTWORK P-1, TYP.
5 CLERESTORY OPENING DESIGNATED WITH DIAGONAL HATCH TO BE FIRE SPRINKLER NO-FLY ZONE. SPRINKLER LINES TO BE ROUTED AROUND TO AVOID RUNNING THROUGH OPENING
6 FIRE PROTECTION BRANCHLINE LOCATED IN EXPOSED STRUCTURE AREA. PROVIDE EXTENDED COVERAGE SIDEWALL SPRINKLERS, ROUTE TIGHT ALONG EXPOSED GLULAM BEAMS AND CEILING. BRANCH LINES AND SPRINKLER DEFLECTORS SHALL BE SLOPED WITH THE BEAMS/CEILING. SPRINKLER SHALL BE BLACK IN COLOR. COORDINATE WITH ARCHITECT FOR EXACT COLOR AND PIPE.
7 FIRE PROTECTION MAIN IN SALON/CUTTING 202 AND RECEPTION/LOBBY 200 LOCATED IN EXPOSED STRUCTURE AREA TO BE ROUTED TIGHT TO WALL ALONG GRIDLINE A. FIRE PROTECTION MAINS ARE TO BE PAINTED P-1, COORDINATE WITH ARCHITECT FOR EXACT COLOR AND PIPE
8 EXTENDED CANOPY AREA TO BE PROTECTED BY DRY BARREL SIDEWALL FIRE SPRINKLERS FROM MAIN LOCATED ALONG GRIDLINE A
9 FIRE PROTECTION MAIN CROSSING CLERESTORY OPENING TO BE ROUTED TIGHT TO WALL. FIRE PROTECTION MAINS ARE TO BE PAINTED P-1, COORDINATE WITH ARCHITECT FOR EXACT COLOR AND PIPE
10 EXPOSED BEAM WRAPPED WITH GYP BOARD, ALL EXPOSED SIDES
2 11 PAINT EXPOSED STRUCTURAL STEEL AT BEAMS P-5
3 12 SEE A5 DRAWING FOR CURTAIN AND TRACK HEIGHTS. COORDINATE PLANNED HEIGHTS WITH FIRE SPRINKLER LOCATIONS, TYP.

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7390 S 6TH STREET
KLAMATH FALLS, OR 97603

No.	Description	Date
2	Addendum #2	4/9/26
3	Addendum #3	4/23/26

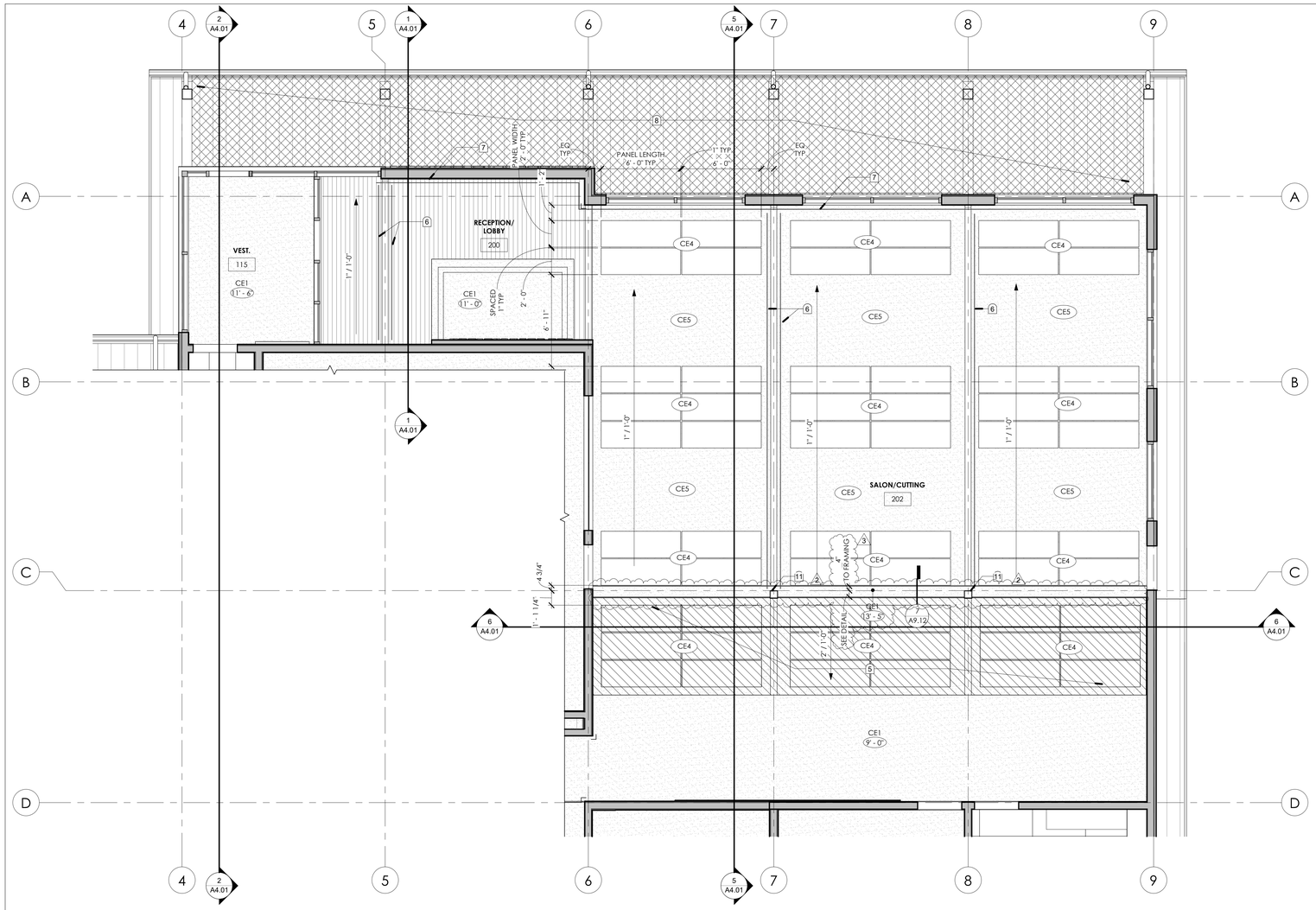
Project Number 2507
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REFLECTED CEILING PLAN

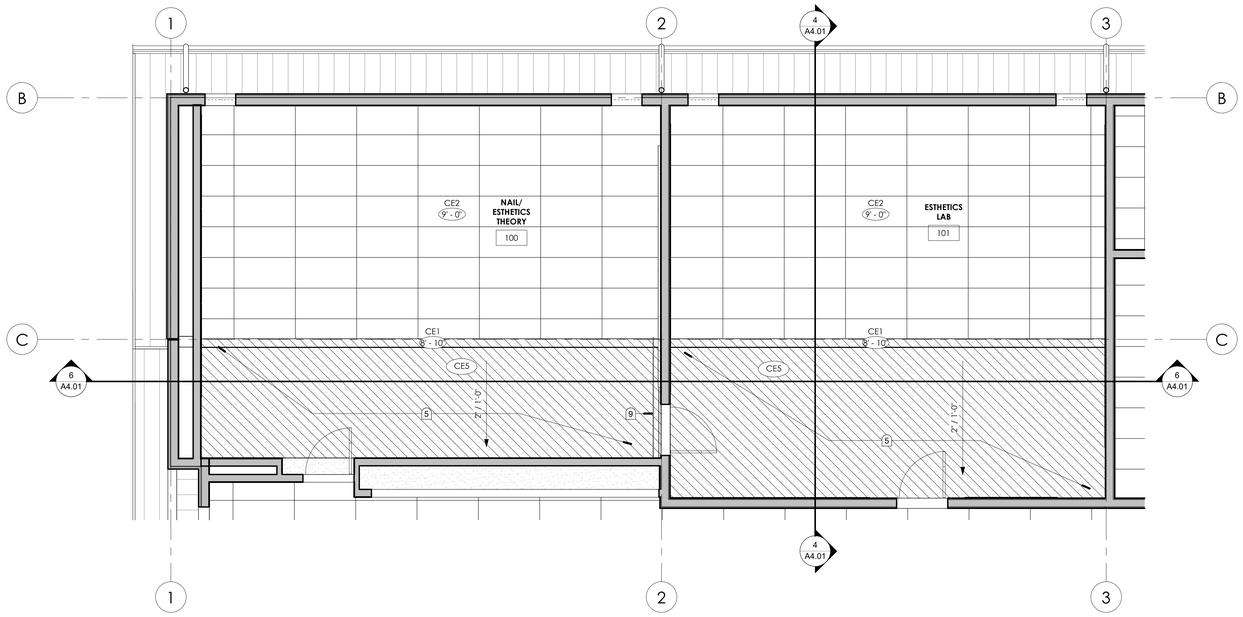
A6.01

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1 A6.02 ENLARGED REFLECTED CEILING PLAN - SALON/CUTTING

SCALE: 1/4" = 1'-0"



2 A6.02 ENLARGED REFLECTED CEILING PLAN - CLASSROOMS

SCALE: 1/4" = 1'-0"

GENERAL NOTES - RCP

A. SEE SHEET G0.01 FOR ARCHITECTURAL ABBREVIATIONS AND SYMBOLS
B. SEE SHEET G0.04 FOR WALL TYPES
C. SEE SHEET A8.01 FOR DOOR SCHEDULE
D. PAINT ALL EXPOSED CONDUIT AND FIRE SPRINKLER LINES TO MATCH ADJACENT WALL OR CEILING. VERIFY W/ ARCHITECT.
E. PAINT GYP. BOARD CEILINGS P-1, U.N.O.
F. SHEET A6.02 INTENDED TO BE PRINTED AND VIEWED IN COLOR
2 G. PAINT EXPOSED STRUCTURAL STEEL AT CEILING LEVEL TO MATCH ADJACENT WALL OR CEILING, U.N.O.

REFLECTED CEILING KEYNOTES

1 OPEN TO STRUCTURE
2 SHEET METAL SOFFIT - MP-2
3 SLOPED CEILING, TIGHT TO STRUCTURE. COORDINATE W/ SECTIONS
4 PAINT EXPOSED DUCTWORK P-1, TYP.
5 CLERESTORY OPENING DESIGNATED WITH DIAGONAL HATCH TO BE FIRE SPRINKLER NO-FLY ZONE. SPRINKLER LINES TO BE ROUTED AROUND TO AVOID RUNNING THROUGH OPENING
6 FIRE PROTECTION BRANCHLINE LOCATED IN EXPOSED STRUCTURE AREA. PROVIDE EXTENDED COVERAGE SIDEWALL SPRINKLERS. ROUTE TIGHT ALONG EXPOSED GLULAM BEAMS AND CEILING. BRANCH LINES AND SPRINKLER DEFLECTORS SHALL BE SLOPED WITH THE BEAMS/CEILING. SPRINKLER SHALL BE BLACK IN COLOR. COORDINATE WITH ARCHITECT FOR EXACT COLOR AND PIPE.
7 FIRE PROTECTION MAIN IN SALON/CUTTING 202 AND RECEPTION/LOBBY 200 LOCATED IN EXPOSED STRUCTURE AREA TO BE ROUTED TIGHT TO WALL ALONG GRIDLINE A. FIRE PROTECTION MAINS ARE TO BE PAINTED P-1, COORDINATE WITH ARCHITECT FOR EXACT COLOR AND PIPE
8 EXTENDED CANOPY AREA TO BE PROTECTED BY DRY BARREL SIDEWALL FIRE SPRINKLERS FROM MAIN LOCATED ALONG GRIDLINE A
9 FIRE PROTECTION MAIN CROSSING CLERESTORY OPENING TO BE ROUTED TIGHT TO WALL. FIRE PROTECTION MAINS ARE TO BE PAINTED P-1, COORDINATE WITH ARCHITECT FOR EXACT COLOR AND PIPE
10 EXPOSED BEAM WRAPPED WITH GYP BOARD, ALL EXPOSED SIDES
11 PAINT EXPOSED STRUCTURAL STEEL AT BEAMS P-5
12 SEE A5 DRAWING FOR CURTAIN AND TRACK HEIGHTS, COORDINATE PLANNED HEIGHTS WITH FIRE SPRINKLER LOCATIONS, TYP.

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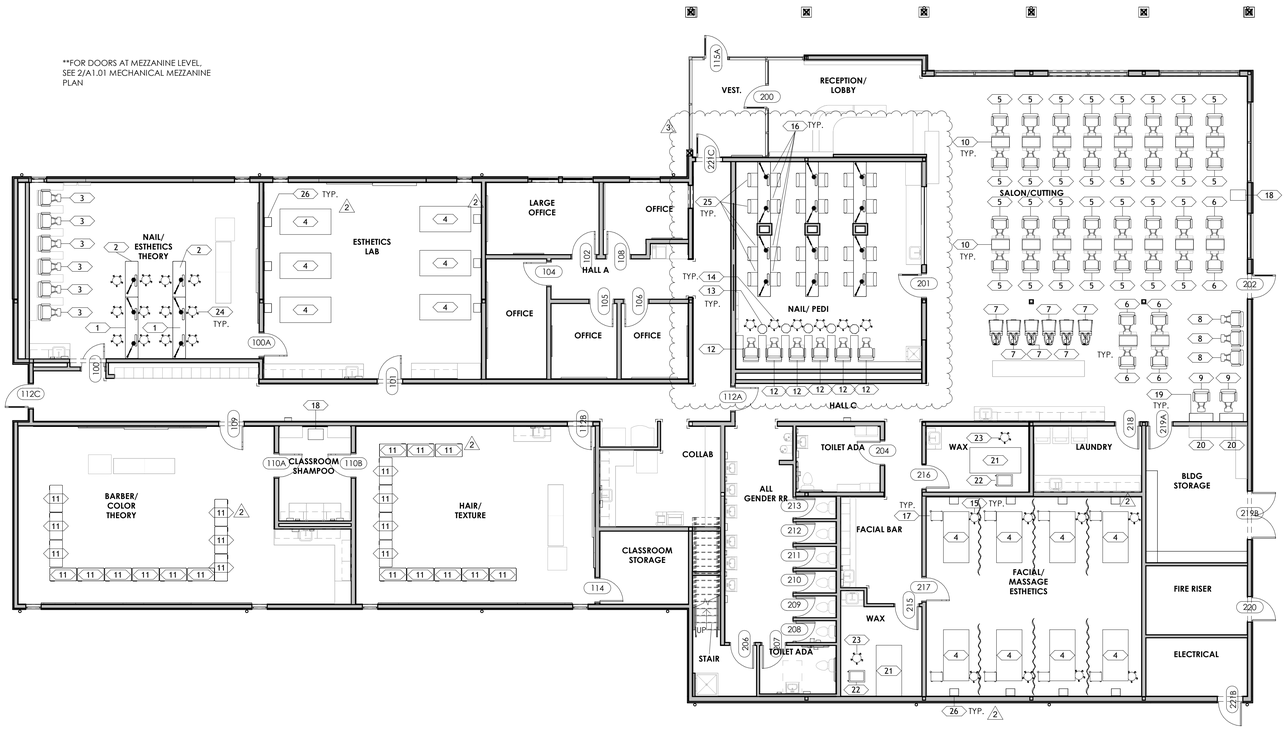
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2 ENLARGED REFLECTED CEILING PLAN

A6.02

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SPECIALTY EQUIPMENT & FURNITURE PLAN

1 / A8.01 SCALE: 1/8" = 1'-0"

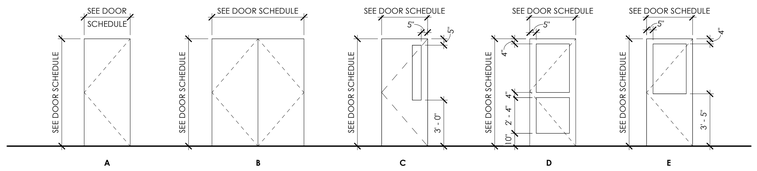
SPECIALTY EQUIPMENT & FURNITURE SCHEDULE

	Type Mark	Model/ID	Manufacturer	Count	Unit Cost	Mechanical Reqs.	Electrical Reqs.	Plumbing Reqs.	Product URL	Procurement Method
NAIL/ESTHETICS CLASSROOM & NAIL/PEDI (SALON)	1	Custom Double Vented Nail Table (EV-75)	Kaemark	8		Yes	Yes, 20A, 120V Circuit - Plug Provided.			OFCI
NAIL/ESTHETICS CLASSROOM	2	Custom Single Vented Nail table (EV-75)	Kaemark	2		Yes	Yes, 20A, 120V Circuit - Plug Provided.			OFCI
NAIL/ESTHETICS CLASSROOM	3	Murano Styling Chair	Minerva Beauty	6	474				https://www.minervabeauty.com/product/minerva-murano-styling-chair/	OFOI
ESTHETICS LAB (CLASSROOM) & FACIAL/MASSAGE ESTHETICS (SALON)	4	Violin Power Tilt (Sondi Treatment Table)	Touch America	14	1280				https://www.touchamerica.com/collections/spa-tables/products/sondi-treatment-table?variant=42750997659779	OFCI
SALON/CUTTING	5	Lambada Styling Chair - 4306	Pibbs Industries	30	599				https://www.buyritebeauty.com/pibbs-4306-lambada-styling-chair/	OFOI
SALON/CUTTING	6	Lambada Threading Chair - 4347	Pibbs Industries	6	799				https://www.buyritebeauty.com/pibbs-4347-lambada-threading-chair/	OFOI
SALON/CUTTING	7	Cayman Shampoo System (w/Black Bowl)	Minerva Beauty	6	869			Yes, Hot/Cold /Vent	https://www.minervabeauty.com/product/cayman-shampoo-system-with-black-bowl https://www.minervabeauty.com/product/cayman-shampoo-system-with-black-bowl	OFCI
SALON/CUTTING	8	Clinique II Dryer Chair	Minerva Industries	3	714		Yes, 20A, 120V Circuit - Plug Provided.		https://www.minervabeauty.com/product/cinque-ii-salon-dryer-chair/	OFOI
MAKEUP (SALON)	9	Chita Swivel Counter Height Barstools	Chita	2	190				https://www.amazon.com/dp/B0D91XSHXR	OFOI
SALON/CUTTING	10	Enclosed Formula Island (Double Sided)	Collins	18	3950		Yes		https://collins.co/products/enclosed-formula-island	OFCI
BARBER/COLOR THEORY CLASSROOM & HAIR/TEXTURE CLASSROOM	11	Custom Mannequin Station	Kaemark	24			Yes, (2)20A 120V Circuits - Plug Provided.			OFOI
NAIL/PEDI (SALON)	12	Murano Styling Chair	Minerva Beauty	6	474				https://www.minervabeauty.com/product/minerva-murano-styling-chair/	OFOI
NAIL/PEDI (SALON)	13	Pedi Roll-Up Copper Bowl	Living Earth Crafts	5	695				https://www.livingearthcrafts.com/pedi-roll-up-midnight-black-copper-bowl-set.html	OFOI
NAIL/PEDI (SALON)	14	Levitate Pedicure Task Chair	Living Earth Crafts	6	189				https://www.livingearthcrafts.com/levitate-stool-pedi-nt-black.html	OFOI
FACIAL/MASSAGE ESTHETICS (SALON)	15	Esthetics Stool (ProStool)	Touch America	8	240				https://www.touchamerica.com/collections/room-accessories/products/prostool?variant=45655204036739	OFOI
NAIL/PEDI (SALON)	16	Client Chair	Unspecified	12	240					OFOI
FACIAL/MASSAGE ESTHETICS (SALON)	17	Alpha 2 Trolley	Living Earth Crafts	8	595				https://www.livingearthcrafts.com/alpha-2-trolley.html	OFOI
SALON/CUTTING & CLASSROOM SHAMPOO	18	TM-3	Equipro	2	425				https://www.minervabeauty.com/product/equipro-tm-3-standard-skin-care-mobile-cart-with-trio-rack/	OFOI
MAKEUP (SALON)	19	KALLI KA126 - Wall Hung Vanity with Drawers	Belvedere	2	621				https://www.buyritebeauty.com/belvedere-ka126-kalli-wall-vanity/	OFCI
MAKEUP (SALON)	20	LED Lighted Mirror	WISSMIELS	2	150		Yes, 20A, 120V Circuit - Hardwired		https://www.amazon.com/dp/B0FBR6CXJ7?th=1	OFCI
WAX (SALON)	21	Amelia Electric Massage Table (Tilting Back)	Minerva Beauty	2	1200		Yes, 20A, 120V Circuit - Plug Provided		https://www.minervabeauty.com/product/amelia-electric-massage-table-with-tilting-back-in-beige/	OFCI

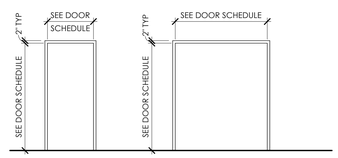
DOOR SCHEDULE

MARK	WIDTH	HEIGHT	PANEL TYPE	PANEL MATERIAL	PANEL FINISH	DOOR GLAZING	FRAME TYPE	FRAME MATERIAL	FRAME FINISH	HARDWARE GROUP	FIRE RATING	COMMENTS
100	3' - 0"	7' - 0"	C	WD	FS	T	1	HM	PT	1	-	1
100A	3' - 0"	7' - 0"	C	WD	PT	-	1	HM	PT	3	-	
101	3' - 0"	7' - 0"	C	WD	FS	T	1	HM	PT	1	-	1
102	3' - 0"	7' - 0"	C	WD	FS	T	1	HM	PT	2	-	
104	3' - 0"	7' - 0"	C	WD	FS	T	1	HM	PT	2	-	
105	3' - 0"	7' - 0"	C	WD	FS	T	1	HM	PT	2	-	
106	3' - 0"	7' - 0"	C	WD	FS	T	1	HM	PT	2	-	
108	3' - 0"	7' - 0"	C	WD	FS	T	1	HM	PT	2	-	
109	3' - 0"	7' - 0"	C	WD	FS	T	1	HM	PT	1	-	1
110A	3' - 0"	7' - 0"	C	WD	FS	T	1	HM	PT	17	-	
110B	3' - 0"	7' - 0"	C	WD	FS	T	1	HM	PT	17	-	
112A	3' - 0"	7' - 0"	C	WD	FS	T	1	HM	PT	5	-	
112B	3' - 0"	7' - 0"	E	WD	FS	T	1	HM	PT	1	-	1
112C	3' - 0"	7' - 0"	D	AL	-	T, I	1	HM	-	6A	-	2
114	3' - 0"	7' - 0"	A	WD	FS	-	1	HM	PT	4	-	
115A	3' - 0"	7' - 0"	D	AL	-	T, I	6	AL	-	7	-	1, 2
200	3' - 0"	7' - 0"	D	AL	-	T, I	7	AL	-	7	-	1,2
201	3' - 0"	7' - 0"	D	AL	-	T	1	HM	-	8	-	
202	3' - 0"	7' - 0"	D	AL	-	T, I	1	HM	-	6B	-	2
204	3' - 0"	7' - 0"	A	WD	FS	-	1	HM	PT	9	-	
206	3' - 0"	7' - 0"	A	WD	PT	-	1	HM	PT	10A	-	
207	3' - 0"	7' - 0"	A	WD	PT	-	1	HM	PT	9	-	
208	2' - 6"	7' - 0"	A	WD	PT	-	1	HM	PT	11A	-	
209	2' - 6"	7' - 0"	A	WD	PT	-	1	HM	PT	11A	-	
210	2' - 6"	7' - 0"	A	WD	PT	-	1	HM	PT	11A	-	
211	2' - 6"	7' - 0"	A	WD	PT	-	1	HM	PT	11A	-	
212	2' - 6"	7' - 0"	A	WD	PT	-	1	HM	PT	11A	-	
213	2' - 6"	7' - 0"	A	WD	PT	-	1	HM	PT	11A	-	
215	3' - 0"	7' - 0"	A	WD	FS	-	1	HM	PT	11B	-	
216	3' - 0"	7' - 0"	A	WD	FS	-	1	HM	PT	11B	-	
217	3' - 0"	7' - 0"	C	WD	FS	T	1	HM	PT	11B	-	
218	3' - 0"	7' - 0"	A	WD	FS	-	1	HM	PT	12	-	
219A	3' - 0"	7' - 0"	A	WD	FS	-	1	HM	PT	10B	-	
219B	6' - 0"	7' - 0"	B	HM	PT	-	2	HM	PT	13	-	
220	3' - 0"	7' - 0"	A	HM	PT	-	1	HM	PT	14	-	
221B	3' - 0"	7' - 0"	A	HM	PT	-	1	HM	PT	15	-	
221C	3' - 0"	7' - 0"	D	AL	-	-	1	HM	PT	16	-	1, 2
300	3' - 0"	6' - 6"	A	HM	PT	-	1	HM	PT	18	-	AT MECHANICAL MEZZ. LEVEL - SEE 2/A1.01
301	2' - 6"	7' - 0"	A	HM	PT	-	1	HM	PT	19	-	AT MECHANICAL MEZZ. LEVEL - SEE 2/A1.01
304	16' - 0"	7' - 8"	-	-	-	-	-	-	-	-	-	TRASH ENCLOSURE GATE - SEE A0.10

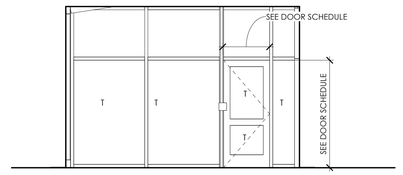
GENERAL NOTES	ABBREVIATIONS	COMMENTS
1. SEE A8.01 FOR DOOR FRAME AND TYPES 2. CONTRACTOR TO VERIFY HM THROAT SIZE BASED ON WALL ASSEMBLY. 3. SEE A8.11 AND A9.11 FOR TYPICAL (2) U.N.O. HM DOOR HEAD AND JAMB DETAILS.	-- - EXISTING TO REMAIN AL - ALUMINUM FF - FACTORY FINISH FS - FACTORY STAIN PT - PAINT WD - WOOD HM - HOLLOW METAL L - LAMINATED GLAZING I - INSULATED GLAZING T - TEMPERED GLAZING (2)	1. ACCESS CONTROL 2. PANIC HARDWARE



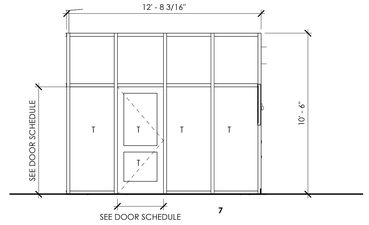
DOOR PANEL TYPES



HOLLOW METAL DOOR FRAME TYPES



STOREFRONT DOOR FRAME TYPES



STOREFRONT DOOR FRAME TYPES

DOOR LEGEND

SCALE: 1/4" = 1'-0"

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KLAMATH COMMUNITY COLLEGE - COSMETOLOGY CENTER

7390 S 6TH STREET
KLAMATH FALLS, OR
97603

No.	Description	Date
2	Addendum #2	4/9/26
3	Addendum #3	4/23/26

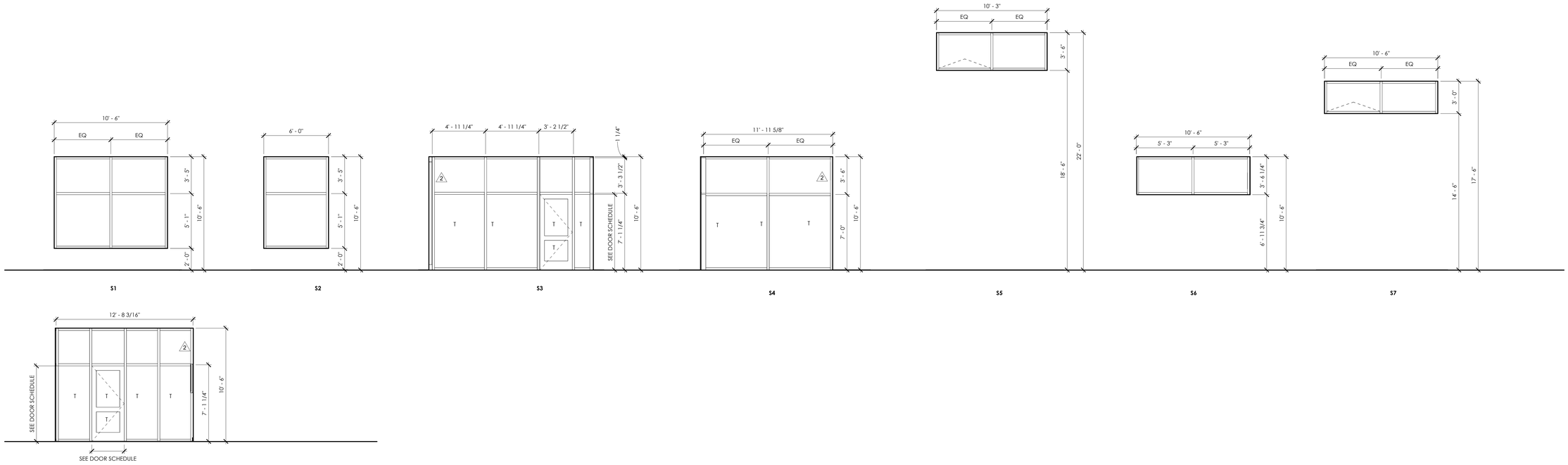
Project Number 2507
Date 3/16/2026

PERMIT / BID SET

SPECIALTY EQUIPMENT PLAN AND DOOR SCHEDULE

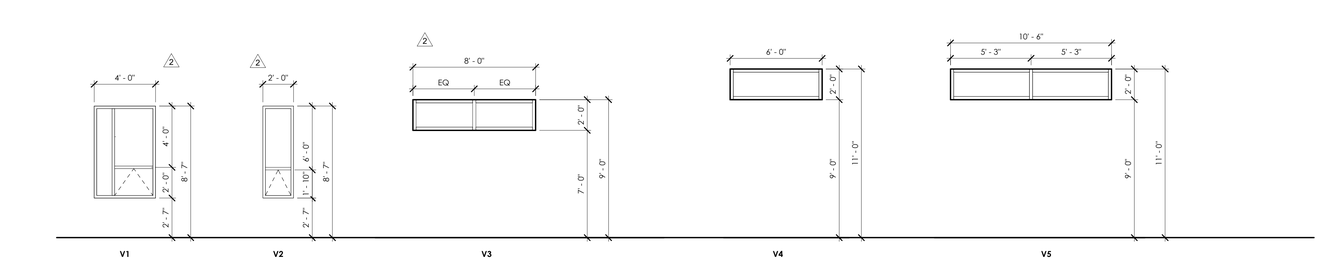
A8.01

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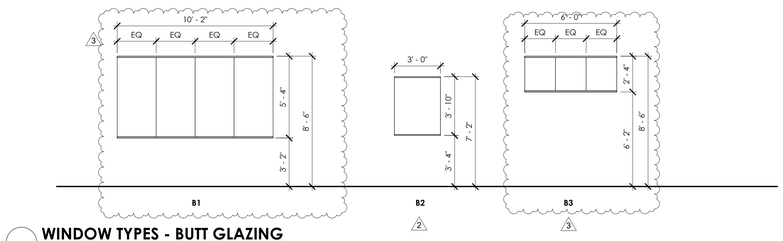
WINDOW TYPES - STOREFRONT

SCALE: 1/4" = 1'-0"



WINDOW TYPES - VINYL

SCALE: 1/4" = 1'-0"



WINDOW TYPES - BUTT GLAZING

SCALE: 1/4" = 1'-0"

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97603

No.	Description	Date
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Project Number 2507
Date 3/16/2026

PERMIT / BID SET

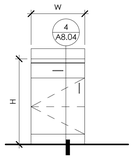
WINDOW SCHEDULES

A8.02

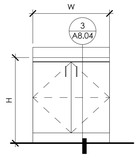
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GENERAL NOTES

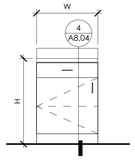
A. PROVIDE CASEWORK LOCKS WHERE SHOWN ON INTERIOR ELEVATIONS, TYP.



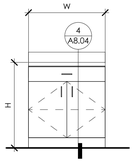
TYPE	WIDTH	COUNTER HEIGHT	DEPTH
BC01B	1' - 6"	2' - 9 1/2"	1' - 11"



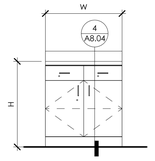
TYPE	WIDTH	COUNTER HEIGHT	DEPTH
BC02A	3' - 0"	2' - 9 1/2"	1' - 11"
BC02B	2' - 3"	2' - 9 1/2"	1' - 11"
BC02C	2' - 6"	2' - 9 1/2"	1' - 11"



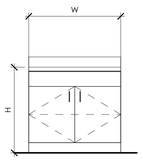
TYPE	WIDTH	COUNTER HEIGHT	DEPTH
BC03A	1' - 10"	2' - 10"	1' - 11"



TYPE	WIDTH	COUNTER HEIGHT	DEPTH
BC04A	3' - 0"	2' - 9 1/2"	1' - 11"
BC04B	3' - 0"	2' - 9 1/2"	1' - 0"
BC04C	2' - 6"	2' - 9 1/2"	1' - 11"
BC04D	2' - 4"	2' - 9 1/2"	1' - 11"



TYPE	WIDTH	COUNTER HEIGHT	DEPTH
BC05A	2' - 6"	2' - 9 1/2"	1' - 11"
BC05B	2' - 3"	2' - 9 1/2"	1' - 11"
BC05C	3' - 0"	2' - 6"	1' - 11"
BC05D	2' - 9"	2' - 9 1/2"	1' - 11"



*SEE INTERIOR ELEVATIONS FOR DETAIL TAGS

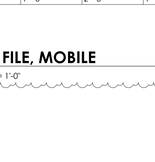
TYPE	WIDTH	COUNTER HEIGHT	DEPTH
BC06A	3' - 0"	2' - 9 1/2"	1' - 0"
BC06B	2' - 6"	2' - 9 1/2"	1' - 11"

BC01 - 1 DOOR 1 DWR
SCALE: 1/2" = 1'-0"



TYPE	WIDTH	COUNTER HEIGHT	DEPTH
BC07A	3' - 0"	2' - 9 1/2"	1' - 11"

BC02 - 2 DOOR
SCALE: 1/2" = 1'-0"



TYPE	WIDTH	COUNTER HEIGHT	DEPTH
BC08B	2' - 0"	2' - 9 1/2"	1' - 11"

BC03 - 1 DOOR 1 DWR
SCALE: 1/2" = 1'-0"

TYPE	WIDTH	COUNTER HEIGHT	DEPTH
BC09A	1' - 6"	2' - 6"	1' - 11"

BC04 - 2 DOOR 1 DWR
SCALE: 1/2" = 1'-0"

TYPE	WIDTH	COUNTER HEIGHT	DEPTH
BC10A	2' - 0"	2' - 9 1/2"	1' - 11"

BC05 - 2 DOOR 2 DWR
SCALE: 1/2" = 1'-0"

TYPE	WIDTH	COUNTER HEIGHT	DEPTH
BC11A	3' - 0"		1' - 11"
BC11B	2' - 10 3/4"		1' - 11"

BC06 - 2 DOOR W/ BLANK APRON PANEL
SCALE: 1/2" = 1'-0"

TYPE	WIDTH	COUNTER HEIGHT	DEPTH
BC12A	1' - 6"	2' - 9 1/2"	1' - 11"

BC07 - 2 DOOR SINK
SCALE: 1/2" = 1'-0"

TYPE	WIDTH	HEIGHT	DEPTH
UC01A	1' - 3"	2' - 6"	1' - 2"

UC01 - 1 DOOR
SCALE: 1/2" = 1'-0"

BC08 - 3 DWR
SCALE: 1/2" = 1'-0"

TYPE	WIDTH	HEIGHT	DEPTH
UC02A	2' - 6"	2' - 6"	1' - 2"
UC02B	2' - 9"	2' - 6"	1' - 2"
UC02C	3' - 0"	2' - 6"	1' - 2"
UC02D	2' - 3"	2' - 6"	1' - 2"

UC02 - OPEN SHELVES
SCALE: 1/2" = 1'-0"

BC09 - 3 DWR FILE
SCALE: 1/2" = 1'-0"

TYPE	WIDTH	HEIGHT	DEPTH
UC03A	2' - 3"	2' - 6"	1' - 2"
UC03B	2' - 6"	2' - 6"	1' - 2"
UC03C	2' - 9"	2' - 6"	1' - 2"
UC03D	3' - 0"	2' - 6"	1' - 2"
UC03E	2' - 5"	2' - 6"	1' - 2"

UC03 - 2 DOOR
SCALE: 1/2" = 1'-0"

BC10 - CORNER CABINET - RIGHT
SCALE: 1/2" = 1'-0"

TYPE	WIDTH	HEIGHT	DEPTH
TC01A	3' - 0"	7' - 2"	2' - 1"
TC01B	3' - 0"	7' - 2"	1' - 6"
TC01C	3' - 0"	8' - 6"	2' - 1"

TC01 - TEACHERS CABINET
SCALE: 1/2" = 1'-0"

BC11 - FRONT APPROACH SINK APRON
SCALE: 1/2" = 1'-0"

TYPE	WIDTH	HEIGHT	DEPTH
TC02A	1' - 3"	7' - 2"	1' - 2"

TC02 - TALL CABINET
SCALE: 1/2" = 1'-0"

BC12 - 3 DWR ADJUSTED APRON
SCALE: 1/2" = 1'-0"

TYPE	WIDTH	HEIGHT	DEPTH
TC03A	1' - 3"	7' - 2"	1' - 2"

TC03 - TALL CABINET
SCALE: 1/2" = 1'-0"

TYPE	WIDTH	HEIGHT	DEPTH
TC04A	1' - 6"	7' - 2"	1' - 2"

TC04 - 3 DOOR STACKED
SCALE: 1/2" = 1'-0"

TYPE	WIDTH	HEIGHT	DEPTH
BC13A	1' - 6"	2' - 3"	1' - 5"

BC13 - FILE, MOBILE
SCALE: 1/2" = 1'-0"

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97603

No.	Description	Date
2	Addendum #2	4/9/26
3	Addendum #3	4/23/26

Project Number 2507
Date 3/16/2026

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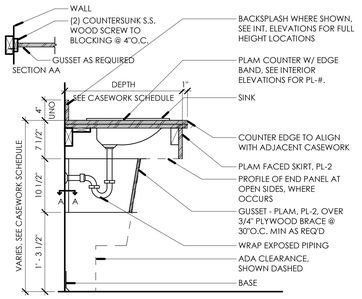
CASEWORK DETAILS AND SCHEDULE

A8.03

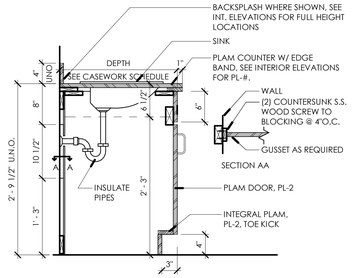
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GENERAL NOTES

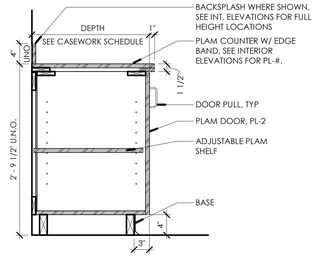
2 A. PROVIDE CASEWORK LOCKS WHERE SHOWN ON INTERIOR ELEVATIONS, TYP.



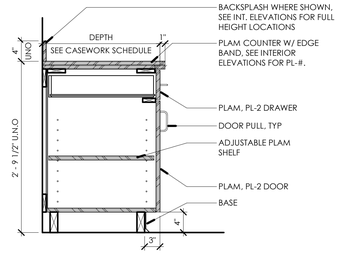
1 A8.04 **CASEWORK - BASE SINK, FRONT APPROACH**
SCALE: 1" = 1'-0"



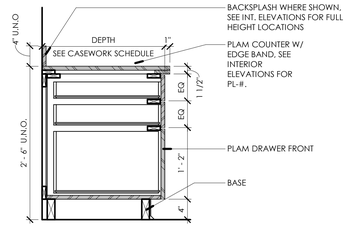
2 A8.04 **BASE CABINET - SINK INTEGRAL**
SCALE: 1" = 1'-0"



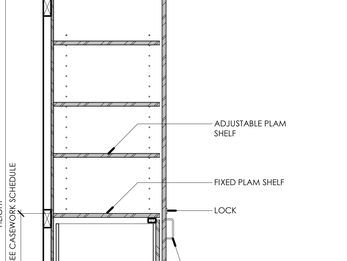
3 A8.04 **BASE CABINET - DOORS**
SCALE: 1" = 1'-0"



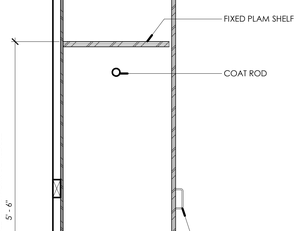
4 A8.04 **BASE CABINET - DOOR, 1 DRAWER**
SCALE: 1" = 1'-0"



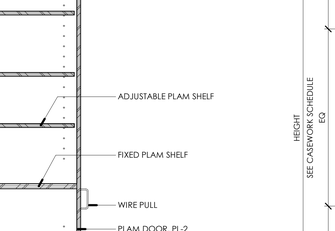
5 A8.04 **BASE CABINET - 3 DWR, FILE**
SCALE: 1" = 1'-0"



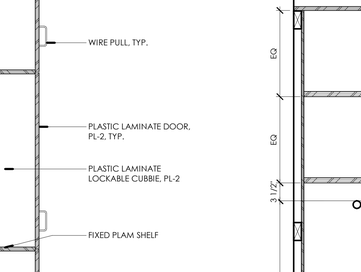
6 A8.04 **CASEWORK - BASE, 3 DRAWER**
SCALE: 1" = 1'-0"



7 A8.04 **TEACHING ISLAND CABINET - DOOR, 1 DRAWER**
SCALE: 1" = 1'-0"



8 A8.04 **TEACHING ISLAND CABINET - 3 DRAWER FILE**
SCALE: 1" = 1'-0"



9 A8.04 **SALON/CUT ISLAND CABINET - DOOR, TROUGH**
SCALE: 1" = 1'-0"



2 19 A8.04 **TEACHING ISLAND - OPENING**
SCALE: 1" = 1'-0"

10 A8.04 **COUNTERTOP - PLAM**
SCALE: 1" = 1'-0"

11 A8.04 **COUNTERTOP - SOLID SURFACE (BID ALT.)**
SCALE: 1" = 1'-0"

12 A8.04 **UPPER CABINETS, TYP.**
SCALE: 1" = 1'-0"

13 A8.04 **UPPER CABINET, OPEN**
SCALE: 1" = 1'-0"

20 A8.04 **MOBILE CABINET - 3 DRAWER FILE**
SCALE: 1" = 1'-0"

14 A8.04 **CASEWORK - TEACHER'S CAB A**
SCALE: 1" = 1'-0"

15 A8.04 **CASEWORK - TEACHER'S CAB B**
SCALE: 1" = 1'-0"

16 A8.04 **TALL CABINET**
SCALE: 1" = 1'-0"

17 A8.04 **TALL CABINET - 3-DOOR STACKED**
SCALE: 1" = 1'-0"

18 A8.04 **CASEWORK - ADA COAT CAB**
SCALE: 1" = 1'-0"

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Bend, OR 12047
STATE OF OREGON

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KLAMATH FALLS, OR 97603

No.	Description	Date
2	Addendum #2	4/9/26
3	Addendum #3	4/23/26

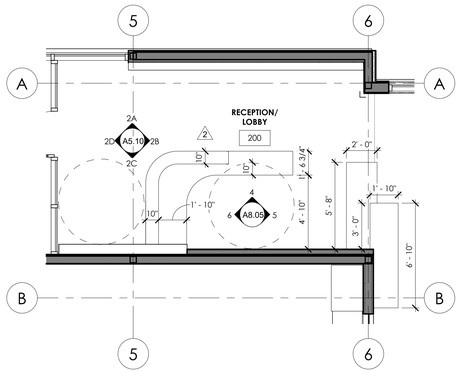
Project Number 2507
Date 3/16/2026

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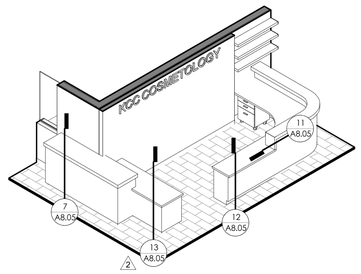
CASEWORK DETAILS AND SCHEDULE

A8.04

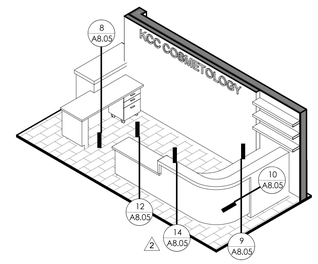
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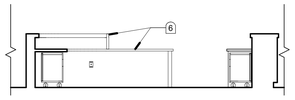
1 A8.05 **RECEPTION DESK ENLARGED PLAN**
SCALE: 1/4" = 1'-0"



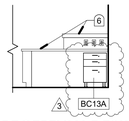
2 A8.05 **RECEPTION DESK - 3D**
SCALE:



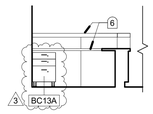
3 A8.05 **RECEPTION DESK - 3D**
SCALE:



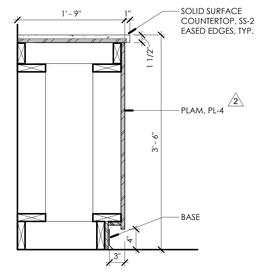
4 A8.05 **RECEPTION DESK**
SCALE: 1/4" = 1'-0"



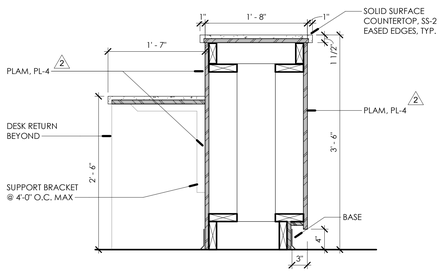
5 A8.05 **RECEPTION DESK**
SCALE: 1/4" = 1'-0"



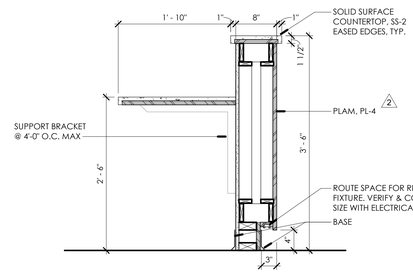
6 A8.05 **RECEPTION DESK**
SCALE: 1/4" = 1'-0"



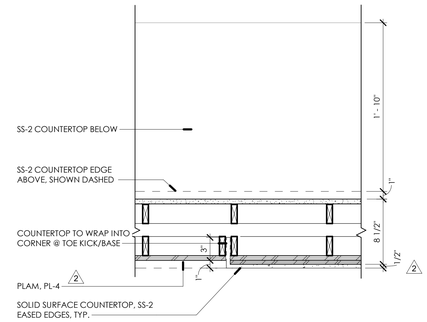
7 A8.05 **RECEPTION - STANDING COUNTER**
SCALE: 1" = 1'-0"



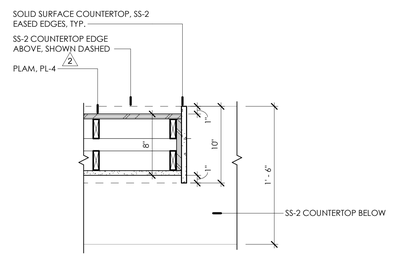
8 A8.05 **RECEPTION - STANDING COUNTER TO DESK**
SCALE: 1" = 1'-0"



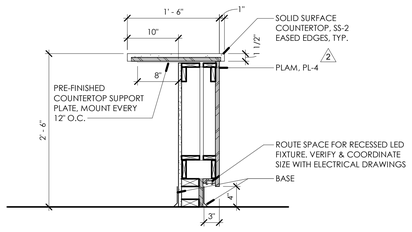
9 A8.05 **RECEPTION - MAIN DESK**
SCALE: 1" = 1'-0"



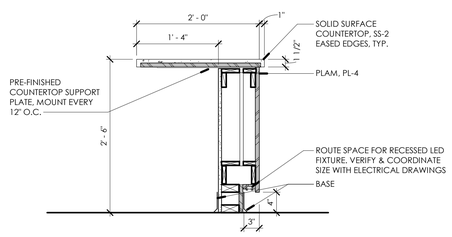
10 A8.05 **DESK - SS TRANSITION - PLAN**
SCALE: 1 1/2" = 1'-0"



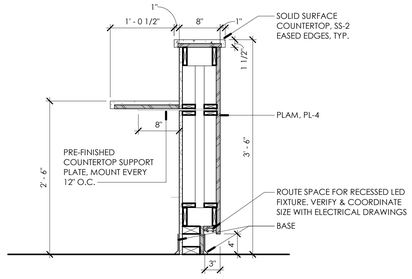
11 A8.05 **DESK - SS TRANSITION - PLAN - WATERFALL EDGE**
SCALE: 1 1/2" = 1'-0"



12 A8.05 **RECEPTION - MAIN DESK - ADA**
SCALE: 1" = 1'-0"



2 13 A8.05 **RECEPTION - DESK - ADA**
SCALE: 1" = 1'-0"



2 14 A8.05 **RECEPTION - MAIN DESK - UPPER**
SCALE: 1" = 1'-0"

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Date 3/16/2026

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CASEWORK DETAILS - RECEPTION DESK

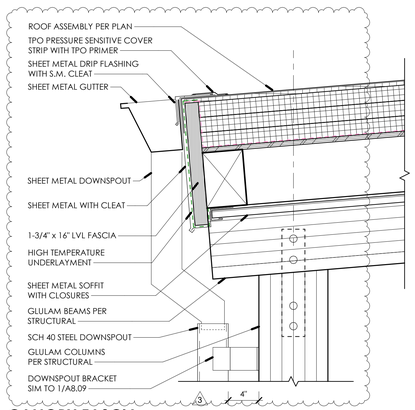
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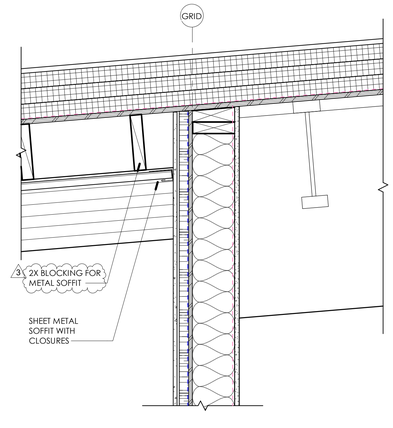
EPOXY PRIMER
FLUID APPLIED WATERPROOFING
PROTECTION MAT

FLUID APPLIED WRB (WRB-FA)
2 WRB (WRB)
VAPOR BARRIER

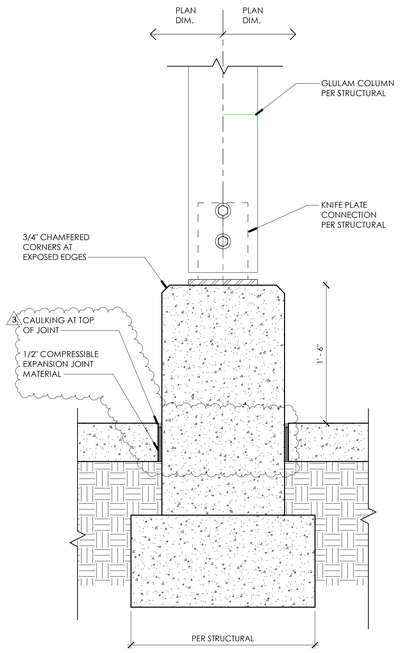
FLUID APPLIED FLASHING (F-AF)
SELF-ADHERED MEMBRANE FLASHING (SAMF)
FOIL-FACED SELF-ADHERED MEMBRANE FLASHING (SAMF-FF)
SELF-ADHERED MEMBRANE THRU-WALL FLASHING (SAMF-TW)
SHEET METAL (SM) FLASHING

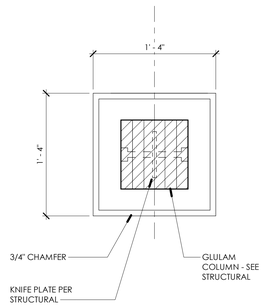


1 A8.08 **CANOPY FASCIA**
SCALE: 1 1/2" = 1'-0"



2 A8.08 **CANOPY @ GRID**
SCALE: 1 1/2" = 1'-0"





3 A8.08 **EXTERIOR - COLUMN BASE**
SCALE: 1 1/2" = 1'-0"

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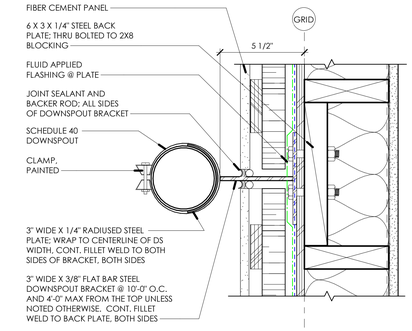
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EXTERIOR DETAILS - CANOPY

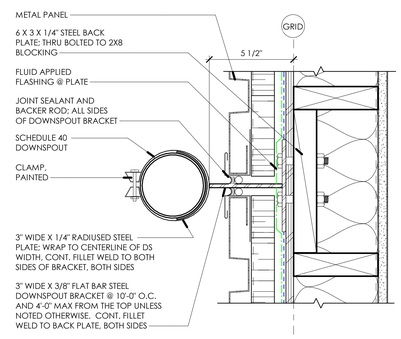
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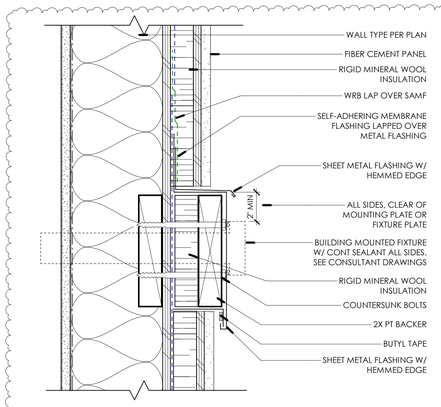
1 A8.09 **DOWNSPOUT @ FIBER CEMENT**

SCALE: 3" = 1'-0"



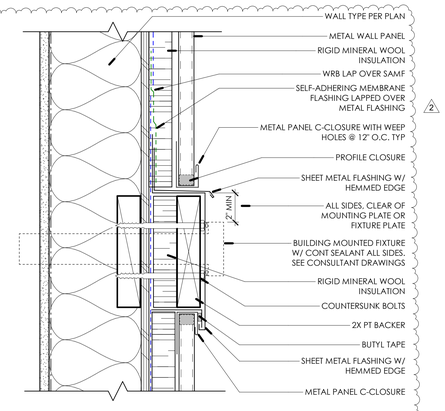
2 A8.09 **DOWNSPOUT @ METAL PANEL**

SCALE: 3" = 1'-0"



6 A8.09 **EXTERIOR - MOUNTING BLOCK @ FIBER CEMENT**

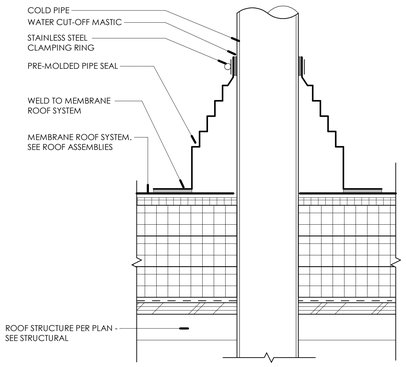
SCALE: 3" = 1'-0"



7 A8.09 **EXTERIOR - MOUNTING BLOCK @ METAL PANEL**

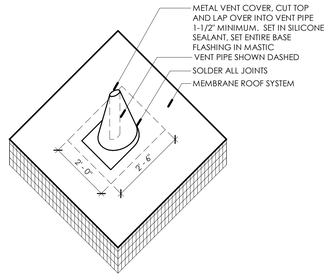
SCALE: 3" = 1'-0"

EPOXY PRIMER
FLUID APPLIED WATERPROOFING
PROTECTION MAT
FLUID APPLIED WRB (WRB-FA)
WRB (WRB)
VAPOR BARRIER
FLUID APPLIED FLASHING (FAF)
SELF-ADHERED MEMBRANE FLASHING (SAMF)
FOIL-FACED SELF-ADHERED MEMBRANE FLASHING (SAMF-FF)
SELF-ADHERED MEMBRANE THRU-WALL FLASHING (SAMF-TW)
SHEET METAL (SM) FLASHING



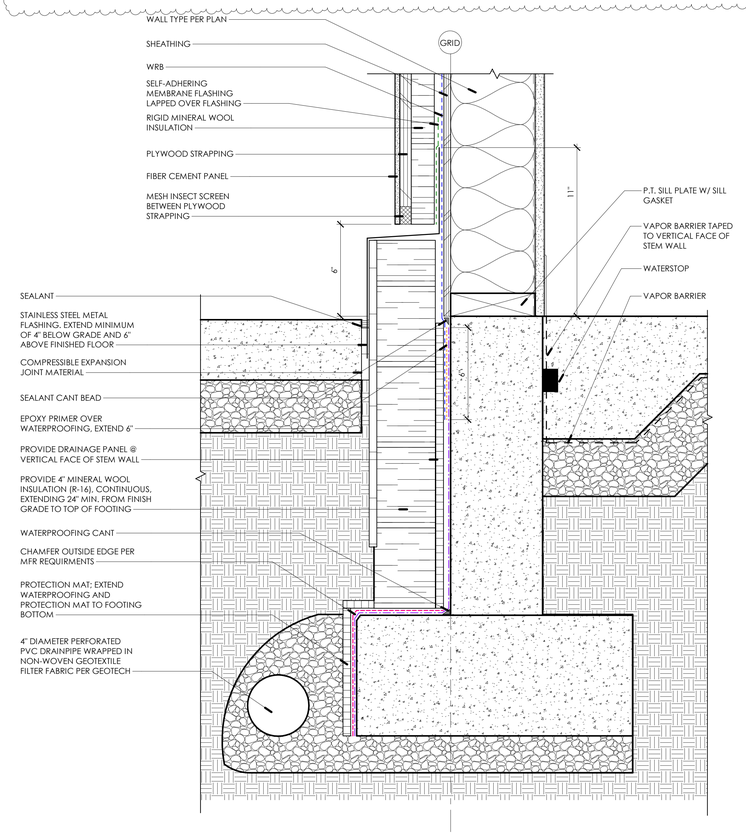
8 A8.09 **PIPE PENETRATION @ ROOF**

SCALE: 3" = 1'-0"



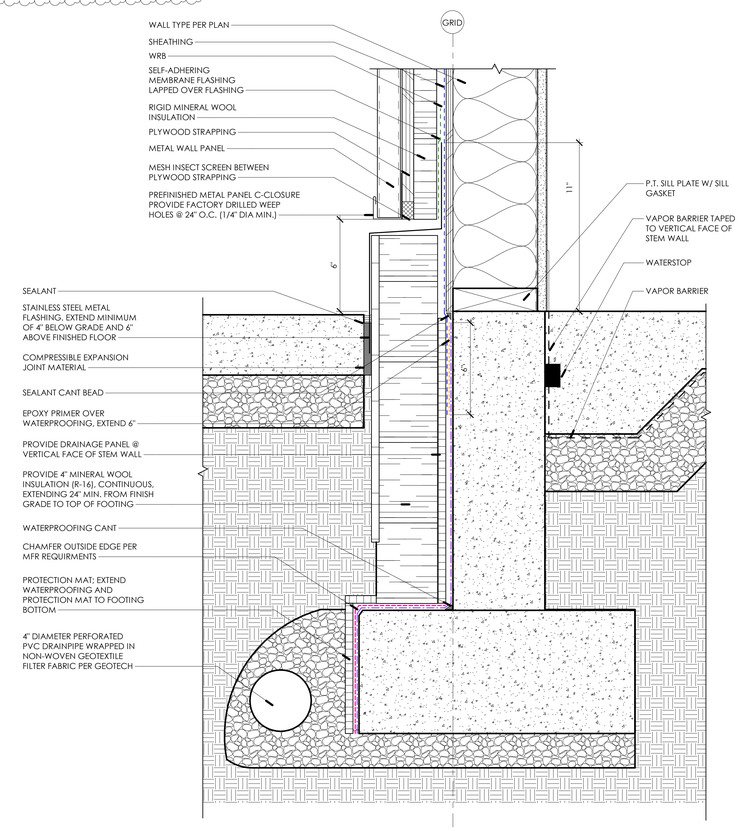
9 A8.09 **ROOF - VENT PENETRATION**

SCALE: 1/2" = 1'-0"



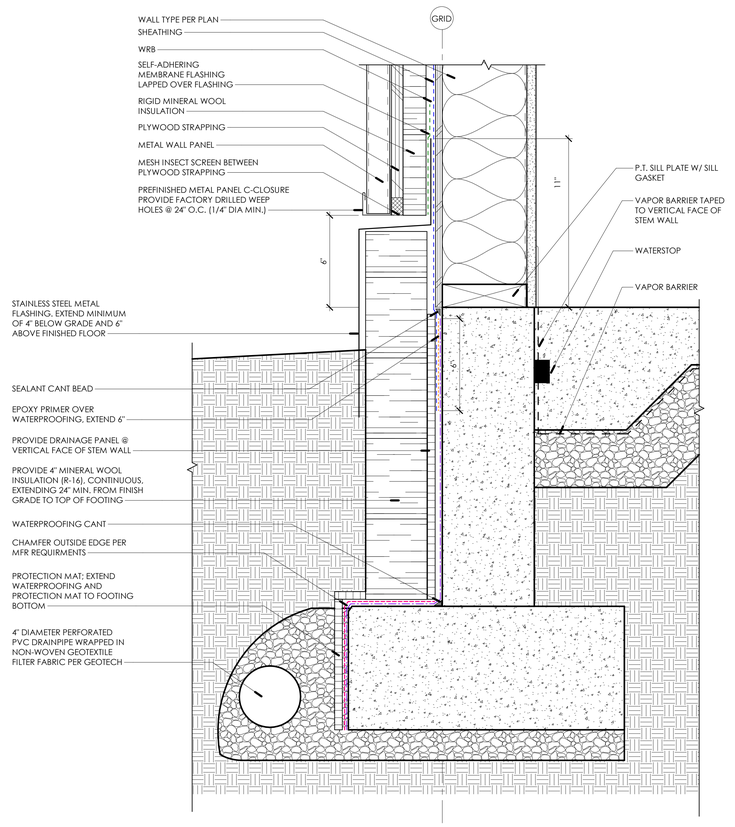
3 A8.09 **FOOTING @ FIBER CEMENT W/ SIDEWALK**

SCALE: 3" = 1'-0"



4 A8.09 **FOOTING @ METAL PANEL W/ SIDEWALK**

SCALE: 3" = 1'-0"



5 A8.09 **FOOTING @ METAL PANEL**

SCALE: 3" = 1'-0"

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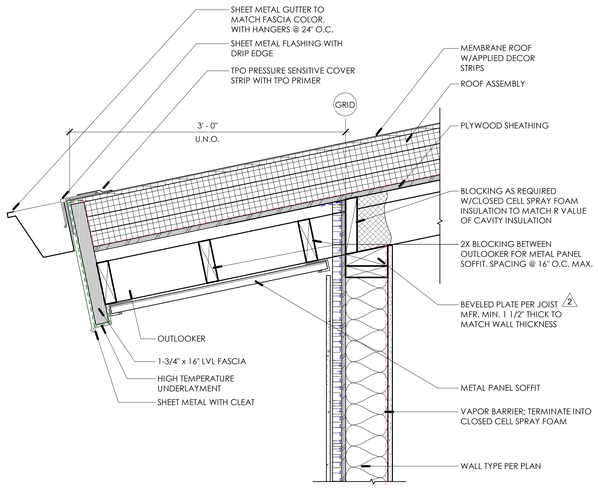
Project Number 2507
Date 3/16/2026

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EXTERIOR DETAILS

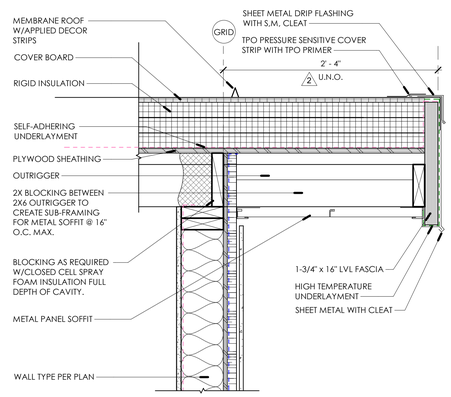
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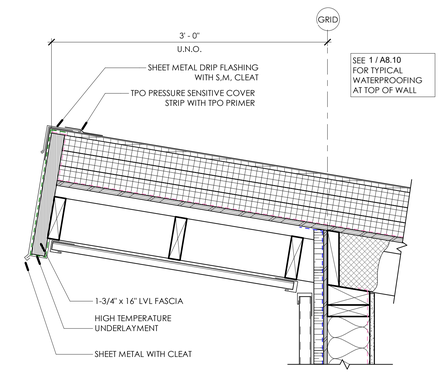
1 / A8.10 LOW EAVE, TYP.

SCALE: 1 1/2" = 1'-0"



2 / A8.10 RAKE, TYP.

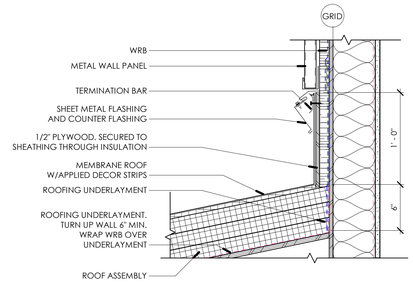
SCALE: 1 1/2" = 1'-0"



3 / A8.10 HIGH EAVE, TYP

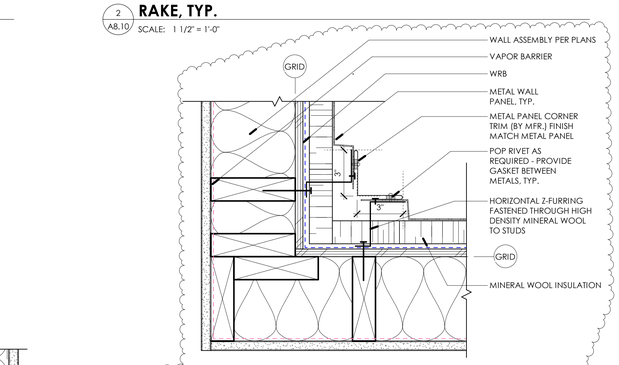
SCALE: 1 1/2" = 1'-0"

EPOXY PRIMER
FLUID APPLIED WATERPROOFING
PROTECTION MAT
FLUID APPLIED WRB (WRB-FA)
2 WRB (WRB)
VAPOR BARRIER
FLUID APPLIED FLASHING (FAF)
SELF-ADHERED MEMBRANE FLASHING (SAMF)
FOIL-FACED SELF-ADHERED MEMBRANE FLASHING (SAMF-FF)
SELF-ADHERED MEMBRANE THRU-WALL FLASHING (SAMF-TW)
SHEET METAL (SM) FLASHING



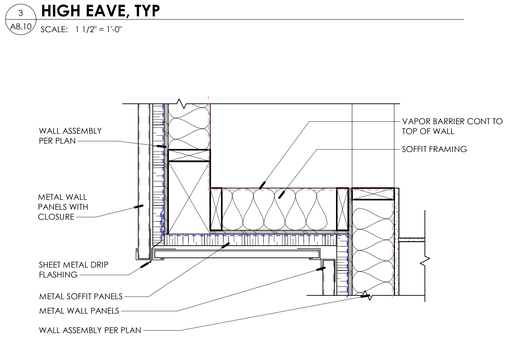
4 / A8.10 ROOF TO WALL

SCALE: 1 1/2" = 1'-0"



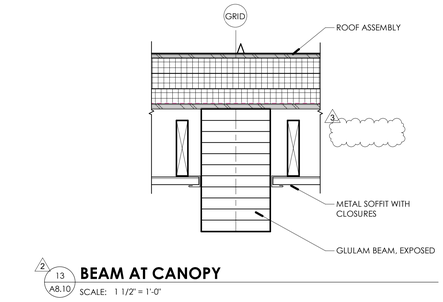
3 / 14 / A8.10 EXTERIOR INSIDE CORNER @ METAL PANEL

SCALE: 3" = 1'-0"



5 / A8.10 SOFFIT AT ALCOVE

SCALE: 1 1/2" = 1'-0"

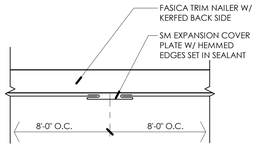


2 / 13 / A8.10 BEAM AT CANOPY

SCALE: 1 1/2" = 1'-0"

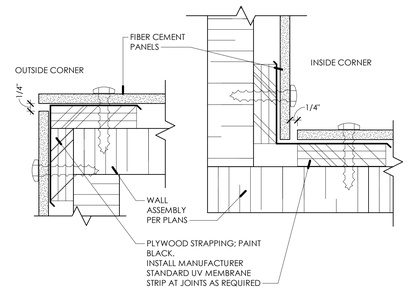
9 / A8.10 FOUNDATION @ FIBER CEMENT

SCALE: 3" = 1'-0"



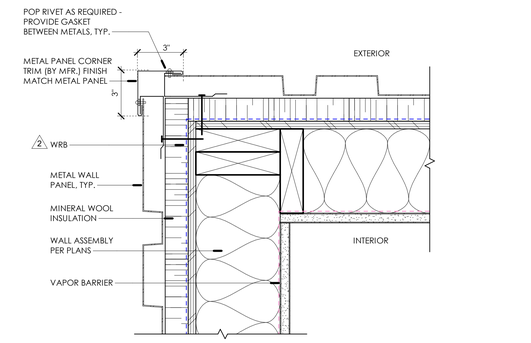
6 / A8.10 SM FASCIA EXPANSION SECTION

SCALE: 3" = 1'-0"



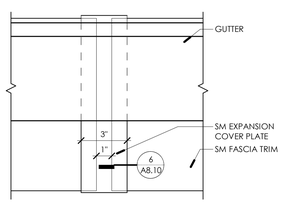
2 / 7 / A8.10 FIBER CEMENT - INSIDE & OUTSIDE CORNERS

SCALE: 6" = 1'-0"



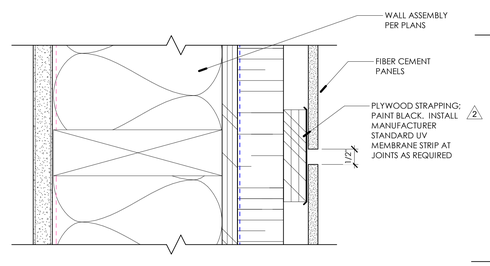
8 / A8.10 EXTERIOR OUTSIDE CORNER @ METAL PANEL

SCALE: 3" = 1'-0"



10 / A8.10 SM FASCIA EXPANSION

SCALE: 3" = 1'-0"



11 / A8.10 VERTICAL FIBER CEMENT REVEAL

SCALE: 6" = 1'-0"

12 / A8.10 HORIZONTAL FIBER CEMENT REVEAL

SCALE: 6" = 1'-0"

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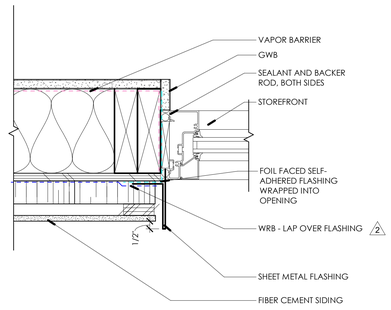
Project Number 2507
Date 3/16/2026

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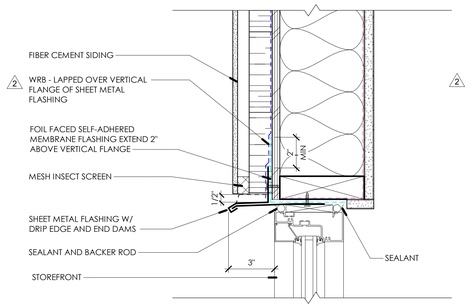
EXTERIOR DETAILS

A8.10

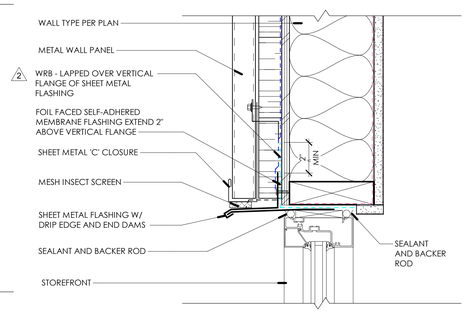
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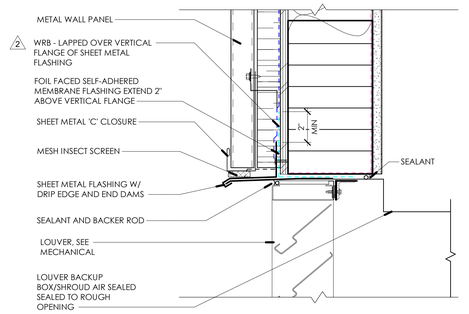
1 A8.11 **STOREFRONT - JAMB @ FIBER CEMENT**
SCALE: 3" = 1'-0"



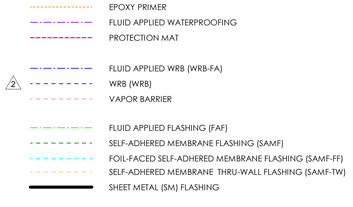
2 A8.11 **STOREFRONT - HEAD @ FIBER CEMENT**
SCALE: 3" = 1'-0"

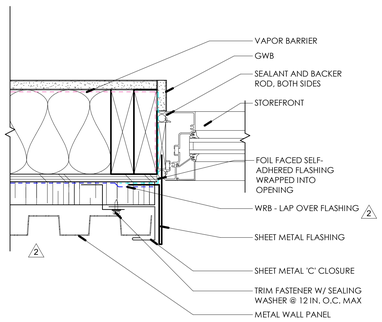


3 A8.11 **STOREFRONT - HEAD @ METAL PANEL**
SCALE: 3" = 1'-0"

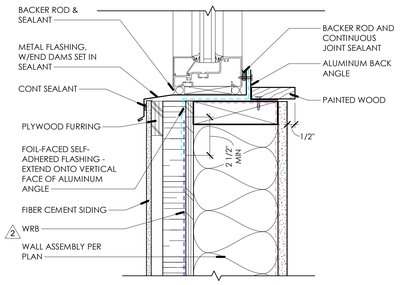


4 A8.11 **LOUVER - HEAD @ METAL PANEL**
SCALE: 3" = 1'-0"

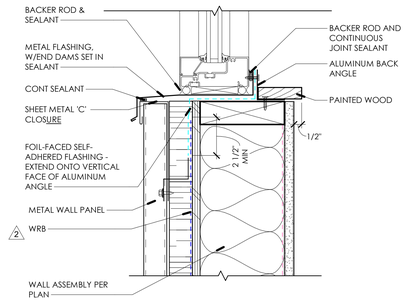




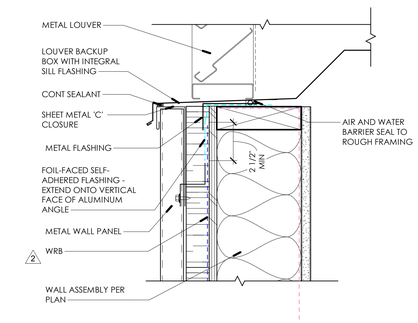
5 A8.11 **STOREFRONT - JAMB @ METAL PANEL**
SCALE: 3" = 1'-0"



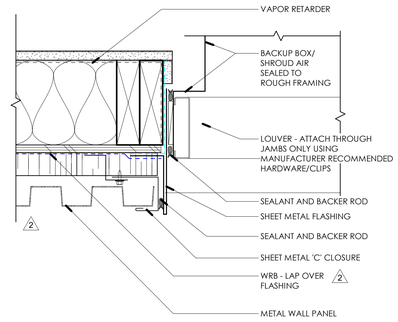
6 A8.11 **STOREFRONT - SILL @ FIBER CEMENT**
SCALE: 3" = 1'-0"



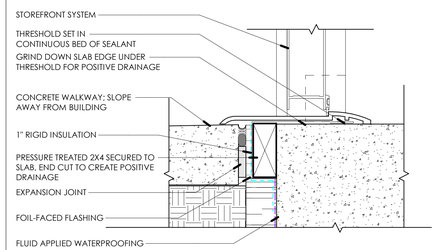
7 A8.11 **STOREFRONT - SILL @ METAL PANEL**
SCALE: 3" = 1'-0"



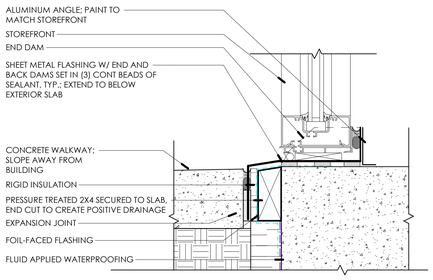
8 A8.11 **LOUVER - SILL @ METAL PANEL**
SCALE: 3" = 1'-0"



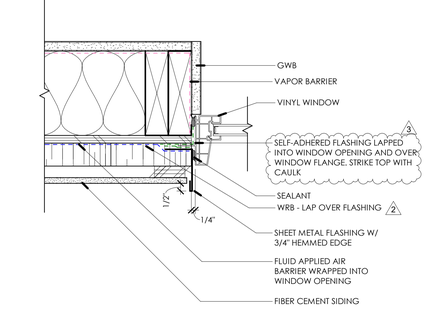
9 A8.11 **LOUVER - JAMB AT METAL PANEL**
SCALE: 3" = 1'-0"



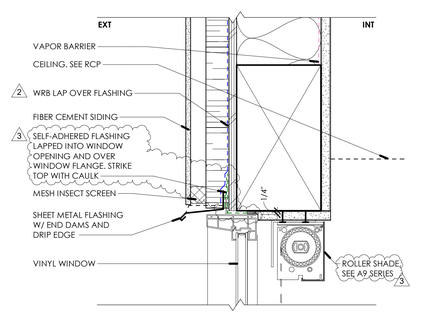
10 A8.11 **STOREFRONT - DOOR THRESHOLD**
SCALE: 3" = 1'-0"



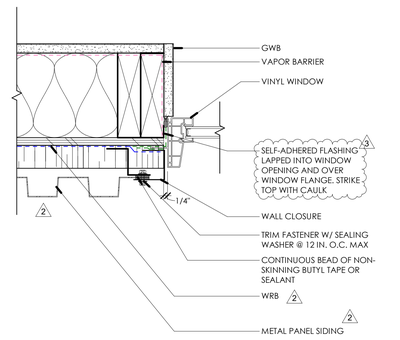
11a A8.11 **STOREFRONT - SILL @ SLAB**
SCALE: 3" = 1'-0"



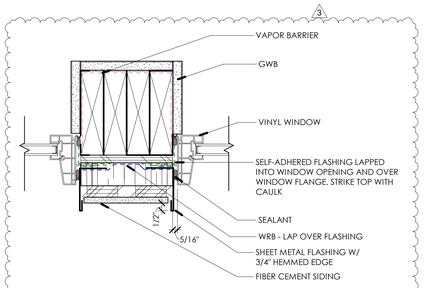
12 A8.11 **VINYL WINDOW - JAMB @ FIBER CEMENT**
SCALE: 3" = 1'-0"



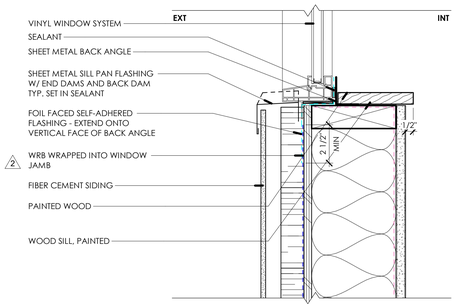
13 A8.11 **VINYL WINDOW - HEAD @ FIBER CEMENT**
SCALE: 3" = 1'-0"



14 A8.11 **VINYL WINDOW - JAMB @ METAL PANEL**
SCALE: 3" = 1'-0"



16 A8.11 **VINYL WINDOW - INFILL POST AT FIBER CEMENT**
SCALE: 3" = 1'-0"



15 A8.11 **VINYL WINDOW - SILL @ FIBER CEMENT**
SCALE: 3" = 1'-0"

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REGISTERED ARCHITECT
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Bend, OR 12047
STATE OF OREGON

KLAMATH COMMUNITY COLLEGE - COSMETOLOGY CENTER

7390 S 6TH STREET
KLAMATH FALLS, OR 97603

No.	Description	Date
2	Addendum #2	4/9/26
3	Addendum #3	4/23/26

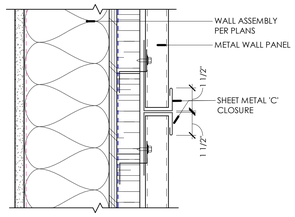
Project Number 2507
Date 3/16/2026

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EXTERIOR DETAILS - OPENINGS

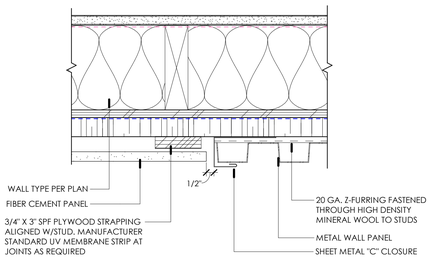
A8.11

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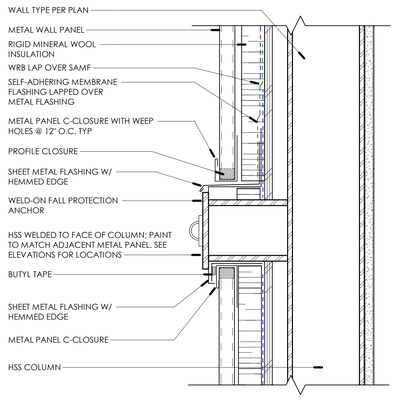
1 A8.12 **HORIZONTAL METAL PANEL REVEAL**

SCALE: 3" = 1'-0"



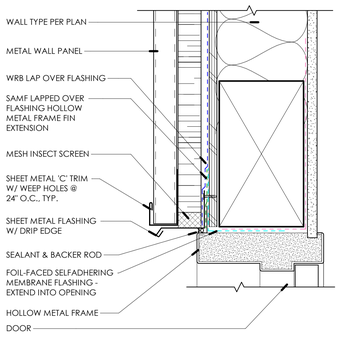
2 A8.12 **TRANSITION - FIBER CEMENT TO METAL PANEL**

SCALE: 3" = 1'-0"



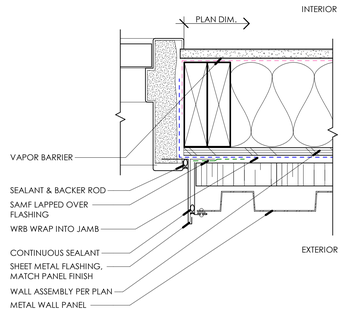
3 A8.12 **WALL - FALL PROTECTION ANCHOR @ STEEL**

SCALE: 3" = 1'-0"



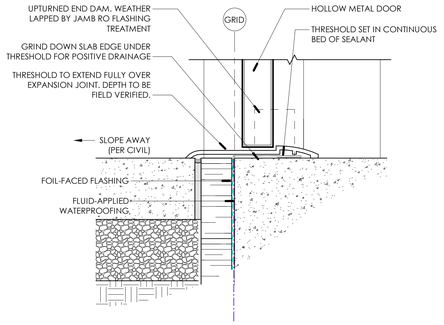
3 4 A8.12 **HM - HEAD @ METAL WALL PANEL**

SCALE: 3" = 1'-0"



5 A8.12 **HM - JAMB @ METAL WALL PANEL**

SCALE: 3" = 1'-0"



6 A8.12 **EXTERIOR HM DOOR THRESHOLD**

SCALE: 3" = 1'-0"

EPOXY PRIMER
FLUID APPLIED WATERPROOFING
PROTECTION MAT

FLUID APPLIED WRB (WRB-FA)
2 WRB (WRB)
VAPOR BARRIER

FLUID APPLIED FLASHING (FAF)
SELF-ADHERED MEMBRANE FLASHING (SAMF)
FOIL-FACED SELF-ADHERED MEMBRANE FLASHING (SAMF-FF)
SELF-ADHERED MEMBRANE THRU-WALL FLASHING (SAMF-TW)
SHEET METAL (SM) FLASHING

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	RFI-ASI-APR	Date 7

Project Number 2507
Date 3/16/2026

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EXTERIOR DETAILS

2 A8.12

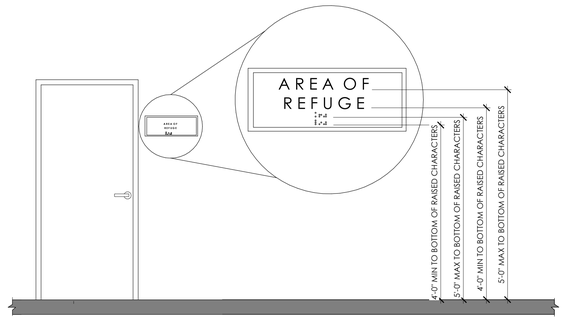
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INTERIOR FINISH LEGEND

SPEC SECTION	MATERIAL	ABBREVIATION	MANUFACTURER	MODEL NAME/ #	FINISH/COLOR	COMMENTS
03 3511	**CONCRETE FLOOR FINISHES**					
	SEALED CONCRETE	SC	N/A			
	POLISHED CONCRETE	PC	N/A			
06 2000	**FINISH CARPENTRY**					
	WOOD SILLS	WD-1			WOOD, PAINTED P-2	
	WOOD TRIM	WD-2			HEMLOCK, CLEAR MIXED GRAIN, CLEAR SATIN FINISH	
	WAINSCOT	WD-3			MDF, PAINTED P-2	
06 4100	**ARCHITECTURAL WOOD CASEWORK**					
	PLASTIC LAMINATE	PL-1	WILSONART	N/A	OILED SOAPSTONE, #4882-60	COUNTERTOPS; CHEMICAL RESISTANT LAMINATE
		PL-2	WILSONART	N/A	FAWN CYPRESS, #8208K-60	CABINET; CHEMICAL RESISTANT LAMINATE
		PL-3	WILSONART	N/A	PEARL SOAPSTONE, #4886-60	COUNTERTOPS; CHEMICAL RESISTANT LAMINATE
		PL-4	WILSONART	N/A	SOLANO WALNUT #17018-K-67	RECEPTION DESK
	COMPACT LAMINATE (2)	PL-5	WILSONART	COMPACT LAMINATE, DOUBLE FACED, 1" THICK	BLACK #1595-60	RESTROOM BENCH
08 1416	**FLUSH WOOD DOORS**					
	WOOD DOOR	DR-1	VT INDUSTRIES		(3) CVG DOUG FIR, STAIN: MATCH TO MINWAX WHITEWASH MW423	
09 3000	**TILING**					
	CERAMIC TILE	CT-1	VITL SURFACES	MIDTOWN UNGLAZED PORCELAIN 3"x12"	(2) SEE 8/A5.01 FOR PATTERN REPEAT. COLORS: ANTHRACITE, SAGE, CREAM	LONG LEAD TIME ITEM, PLAN SUFFICIENT TIME FOR ORDERING
	GROUT	GRT-1	LATICRETE	SEE SPECS	45 RAVEN (3)	EPOXY GROUT
09 5100	**ACOUSTICAL CEILINGS**					
	ACOUSTICAL CEILING TILE	ACT-1	ARMSTRONG	ULTIMA TEGULAR, 2'X4', 1944	WHITE	
	ACOUSTICAL CEILING TILE	ACT-2	ARMSTRONG	LYRA TEGULAR PB, 1'X4', 8377PB	WHITE	
	ACOUSTICAL CEILING PANEL	ACP-1	ARMSTRONG	LYRA DIRECT APPLY, 2'X6'	WHITE	
09 6500	**RESILIENT FLOORING - (OWNER FURNISHED, OWNER INSTALLED)** (3)					
	RESILIENT TILES	RT-1	SHAW CONTRACT	MINERAL FLOOR	BASIS, ELABORATE, 4339V-39504	
		RT-2	SHAW CONTRACT	MINERAL FLOOR	ORIGIN_THEORY, 4338V-38140	
	(2)	RT-3	SHAW CONTRACT	RESIDE 12 MIL LUXURY VINYL PLANK	(3) ABODE 94506	
	RUBBER STAIR FLOORING	RST-1	TARKETT/JOHNSONITE	STAIR TREAD/RISER, STRINGER, AND LANDING TILES	VL2 WHISPERING MIST WITH BLACK RUBBER INSERT STRIP AT NOSING	RAISED ROUND TEXTURE
	RUBBER BASE	RB-1	TARKETT/JOHNSONITE	4" COVE BASE	VL2 WHISPERING MIST	
		RB-2	TARKETT/JOHNSONITE	"MILLWORK" RUBBER WALL BASE	MONUMENT 4", COLOR: VL2 WHISPERING MIST, #MW-VL2-S4	.25" THICK
09 6813	**TILE CARPETING - (OWNER FURNISHED, OWNER INSTALLED)** (3)					
	CARPET TILES	CPT	SHAW CONTRACT	SUBTEXT TILE, 9" X 36" TILE	5T409, VERSE 05375	INSTALLATION: ASHLAR
	WALK OFF MAT	WOM	SHAW CONTRACT	PORTAL TILE, 24" X 24" TILE	5T035, LAVA 34549	INSTALLATION: ASHLAR
09 7200	**WALLCOVERINGS**					
		WP-2	MOMENTUM TEXTILES	VANTAGE III, PVC FREE TYPE III WALLCOVERING	LUZON, AFP02-04 KAOLIN	
		WP-3	MDC INTERIORS	TYPE III WALLCOVERING, DS LINEN WITH PROTECTIVE TOP COAT	CUSTOM DIGITAL PRINT, MDC TO PURCHASE IMAGE	IMAGE: SHUTTERSTOCK.COM, ASSET ID: 334521233, "ABSTRACT BACKGROUND IN AGAVE LEAVES...
09 8414	**ACOUSTIC FABRIC WALL SYSTEMS**					
	ACOUSTICAL WALL PANELS	AWP-1	FABRITRAK	1" THICK FABRIC-WRAPPED ACOUSTICAL PANEL	FABRIC: SAHARA MATTE 6089-603	WITH GEOTRACK SQUARE PROFILE, TERRACORE POLY PERFORMANCE INFILL
09 9000	**PAINTING**					
	PAINT	P-1	SHERWIN WILLIAMS	SEE SPECIFICATIONS	SW7636, ORIGAMI WHITE	FIELD
		P-2	SHERWIN WILLIAMS	SEE SPECIFICATIONS	SW7044 AMAZING GRAY	HM FRAMES & PANELS, WOOD TRIM
		P-3	SHERWIN WILLIAMS	SEE SPECIFICATIONS	SW9133 JASPER STONE	ACCENT
	(2)	P-4	NOT USED			
		P-5	SHERWIN WILLIAMS	SEE SPECIFICATIONS	SW7625 MT ETNA	ACCENT
	(2)	P-6	SCUFFMASTER	SCRUBTOUGH	MATCH TO SHERWIN WILLIAMS PAINT COLOR	SW6215 ROCKY RIVER
		P-7	SCUFFMASTER	SCRUBTOUGH	MATCH TO SHERWIN WILLIAMS PAINT COLOR	MATCH TO P-1
10 1101	**VISUAL DISPLAY BOARDS**					
	MARKER BOARD	MB	CLARIDGE	PORCELAIN ENAMEL MARKER BOARD		
10 2123	**CUBICLE CURTAINS**					
	CURTAIN TRACK	(2)	SAMPSON MILLS	F120 HAND OPERATED SUSPENDED TRACK SYSTEM	ANODIZED ALUMINUM FINISH	
	CURTAIN FABRIC		MOMENTUM	SOLACE	4852 3	HOLD CURTAINS 1'-0" ABOVE FINISHED FLOOR
10 2601	**WALL AND CORNER GUARDS**					
	CORNER GUARDS (2)	CG-1			1.5" STAINLESS STEEL, 3'-4" HIGH	
		CG-2			1.5" STAINLESS STEEL, 7'-2" HIGH	
		CG-3			1.5" STAINLESS STEEL, 6' HIGH	
	WALL PROTECTION	WP-1	CS ACROVYN	PVC FREE SHEET, .040" THICK, SUEDE TEXTURE	BLUE SILK #930	SHAMPOO AREA, CLASSROOMS, LAUNDRY
	WALL PROTECTION	WP-4	CS ACROVYN	PVC FREE SHEET, .040" THICK, SUEDE TEXTURE	OZARK #314	NAIL SALON, JANITOR CLOSET
10 5100	**METAL LOCKERS**					
	(2)	LOCKERS	SUPERIOR LIST INDUSTRIES	#738 CHARCOAL	HALLWAY	
12 2400	**WINDOW SHADES**					
	ROLLER SHADES	RS-1	MECHOSHADE	FABRIC: ECOVEIL, 3% OPEN	#1569 SILVER BIRCH	
		RS-2	MECHOSHADE	FABRIC: CHELSEA BLACKOUT	#2806 SILVER BIRCH	
12 3600	**COUNTERTOPS**					
	(2)	SS-1	CORIAN		ASH CONCRETE	COUNTERTOP BID ALTERNATE FOR PL-3
		SS-2	FORMICA		742 BLANCO TERRAZZO	RECEPTION DESK TOP/FACE
		SS-3	CORIAN		CARBON CONCRETE	COUNTERTOP BID ALTERNATE FOR PL-1

ROOM FINISH SCHEDULE

ROOM NAME	ROOM NUMBER	WALL FINISH				WALL PAINT SYSTEM	CEILING FINISH	CEILING PAINT SYSTEM	BASE FINISH	COMMENTS
		NORTH WALL	EAST WALL	SOUTH WALL	WEST WALL					
NAIL/ ESTHETICS THEORY	100	P-1/WP-1	P-1/WP-1	P-1/WP-1	P-1/WP-1	PS-1B	P-1		RB-1	P-1 ON SOFFIT, SEE SPECS FOR PRIMER INFORMATION FOR WP-1 (3)
ESTHETICS LAB	101	P-1/WP-1	P-1/WP-1	P-1/WP-1	P-1/WP-1	PS-1B	P-1		RB-1	P-1 ON SOFFIT, SEE SPECS FOR PRIMER INFORMATION FOR WP-1
LARGE OFFICE	102	P-1	P-1	P-1	P-1	PS-1B			RB-1	
OFFICE	104	P-1	P-1	P-1	P-1	PS-1B			RB-1	
OFFICE	105	P-1	P-1	P-1	P-1	PS-1B			RB-1	
OFFICE	106	P-1	P-1	P-1	P-1	PS-1B			RB-1	
HALL A	107	P-5	P-1	P-1	P-1	PS-1B			RB-1	
OFFICE	108	P-1	P-1	P-1	P-1	PS-1B			RB-1	
BARBER/ COLOR THEORY	109	P-1/WP-1	P-1/WP-1	P-1/WP-1	P-1/WP-1	PS-1B			RB-1	SEE SPECS FOR PRIMER INFORMATION FOR WP-1 (3)
CLASSROOM SHAMPOO	110	P-1/WP-1	P-1/WP-1	P-1/WP-1	P-1/WP-1	PS-1A	P-1		RB-1	SEE SPECS FOR PRIMER INFORMATION FOR WP-1
(2) HAIR/ TEXTURE	111	P-1/WP-1	P-1/WP-1	P-1/WP-1	P-1/WP-1	PS-1B			RB-1	SEE SPECS FOR PRIMER INFORMATION FOR WP-1
HALL B	112	P-1/WD-3	P-1/WD-3	P-1/WD-3	P-1/WD-3	PS-1B/PS-4			RB-1	
COLLAB	113	P-3	P-3	P-3	P-3	PS-1B			RB-1	
CLASSROOM STORAGE	114	P-1	P-1	P-1	P-1	PS-1B			RB-1	
VEST.	115	P-1	P-1	P-1	P-1	PS-1B	P-1		RB-2	
MECH MEZZANINE	181	P-1	P-1	P-1	P-1	PS-1B	P-1		RB-1	
RECEPTION/ LOBBY	200	P-1/WP-2		P-1/WP-2	P-1	PS-1B	P-1/WD-2	PS-1B/PS-5	RB-2	P-1 ON SOFFIT, SEE SPECS FOR PRIMER INFORMATION FOR WP-2
NAIL/ PEDI	201 (2)	P-6/WP-4 (3)	P-1/WP-4	WP-3	(3) P-6/WP-4 (2)	PS-1B/PS-6	P-1	PS-1B	RB-2	P-1 ON SOFFIT, SEE SPECS FOR PRIMER INFORMATION FOR WP-3/WP-4 (3)
SALON/CUTTING	202	P-1/P-7	P-1/P-7	P-6	P-1/P-7	PS-1B/PS-6	P-1/ACP-1	PS-1B	RB-2	P-1 ON EXPOSED DRYWALL
HALL C	203	P-1/P-7		P-6	P-1/P-7	PS-1B/PS-6	P-1	PS-1B	RB-2	
TOILET ADA	204	P-1/CT-1	P-1/CT-1	P-1/CT-1	P-1/CT-1	PS-1A	P-1	PS-1B		TILE TO FLOOR WITH METAL COVE
ALL GENDER RR	205		P-1/CT-1	P-1	P-1/CT-1	PS-1A	P-1	PS-1B	RB-1	OMIT RB-1 AT TILED WALL, TILE TO FLOOR WITH METAL COVE
STAIR	206	P-1	P-1	P-1	P-1	PS-1B			RB-1	
TOILET ADA	207	P-1	P-3	P-1	P-1	PS-1A	P-1	PS-1B	RB-1	
RR	208	P-1	P-3	P-1	P-1	PS-1A	P-1	PS-1B	RB-1	
RR	209	P-1	P-3	P-1	P-1	PS-1A	P-1	PS-1B	RB-1	
RR	210	P-1	P-3	P-1	P-1	PS-1A	P-1	PS-1B	RB-1	
RR	211	P-1	P-3	P-1	P-1	PS-1A	P-1	PS-1B	RB-1	
RR	212	P-1	P-3	P-1	P-1	PS-1A	P-1	PS-1B	RB-1	
RR	213	P-1	P-3	P-1	P-1	PS-1A	P-1	PS-1B	RB-1	
FACIAL BAR	214	(2)	P-6	P-1	P-6 (2)	PS-1B/PS-6	P-1	PS-1B	RB-2	
WAX	215	P-3	P-3	P-3	P-3	PS-1B	P-1		RB-2	
WAX	216	P-3	P-3	P-3	P-3	PS-1B	P-1		RB-2	
FACIAL/ MASSAGE ESTHETICS	217	P-5	P-5	P-5	P-5	PS-1B			RB-2	
LAUNDRY	218	P-1	P-1	P-1	P-1	PS-1B			RB-1	
BLDG STORAGE	219	P-1	P-1	P-1	P-1	PS-1B			RB-1	
FIRE RISER	220	P-1	P-1	P-1	P-1	PS-1B	P-1	PS-1B	RB-1	
ELECTRICAL	221	P-1	P-1	P-1	P-1	PS-1B	P-1	PS-1B	RB-1	
JANITOR	222	P-1	P-1	P-1	P-1	PS-1B			RB-1	WP-4 AT MOP SINK, SEE INTERIOR ELEVATIONS; SEE SPECS FOR PRIMER INFORMATION FOR WP-4 (3)
MDF (2)	223	P-1	P-1	P-1	P-1	PS-1B	P-1	PS-1B	RB-1	



(1) A9.01 **SIGNAGE - ADA HEIGHTS**
SCALE: 1/2" = 1'-0"

GENERAL NOTES

A. SEE SHEET G0.01 FOR ARCHITECTURAL ABBREVIATIONS AND SYMBOLS
B. SEE SHEET G0.04 FOR WALL TYPES
C. SEE SHEET A8.01 FOR DOOR SCHEDULE
D. PLAN DIMENSIONS ARE MEASURED FROM THE OUTSIDE FACE OF STUDS / FACE OF CONCRETE ON EXTERIOR WALLS TO THE CENTER LINES OF INTERIOR WALLS AND OPENINGS U.N.O.
E. GRID LINES ALIGN WITH FACE OF STUD U.N.O.
F. SEE FINISH MATERIAL LEGEND TO IDENTIFY FINISH MATERIAL PRODUCT INFORMATION
G. SEE A5.0 SERIES FOR ADDITIONAL WALL FINISHES NOT NOTED ON THIS PLAN
H. ALL GYP. BOARD WALLS AND CEILINGS TO BE PAINTED P-1 U.N.O
I. EXTEND FLOOR FINISHES UNDER APPLIANCES, BUILT-IN COUNTERTOPS, AND CASEWORK
J. FLOORING TRANSITIONS THAT OCCUR AT DOOR OPENINGS TO BE CENTERED IN OPENING U.N.O.
(3) K. SEE FINISH MATERIAL LEGEND ON A9.01 FOR OWNER FURNISHED, OWNER INSTALLED FLOORING PRODUCTS

INTERIOR ROOM SIGNAGE

- ROOM NAMES SHOWN FOR EXAMPLE ONLY
- SEE SPECIFICATIONS, SECTION 10 1400 FOR FURTHER DETAILS

PLATE TYPE A
6" W x 4" H
"EXIT" TEXT & BRAILLE

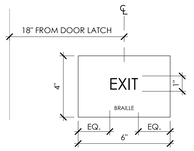


PLATE TYPE B
REGULATORY SIZE
BRAILLE IN ENGLISH



PLATE TYPE C
REFER TO CODE SHEET

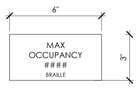


PLATE TYPE D

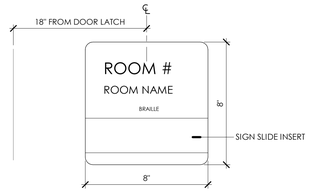
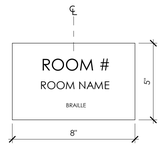


PLATE TYPE E
8" W x 5" H
BRAILLE IN ENGLISH



(2) A9.01 **SIGNAGE - INTERIOR TYPES**
SCALE: 3" = 1'-0"

SIGN SCHEDULE

ROOM NAME	ROOM NUMBER	SIGN TYPE	SIGNAGE NOTES
NAIL/ ESTHETICS THEORY	100	E	1
ESTHETICS LAB	101	E	1
LARGE OFFICE	102	D	1
OFFICE	104	D	1
OFFICE	105	D	1
OFFICE	106	D	1
HALL A	107		
OFFICE	108	D	1
BARBER/ COLOR THEORY	109	E	1
CLASSROOM SHAMPOO	110	E	1
HAIR/ TEXTURE	111	E	1
HALL B	112		
COLLAB	113	E	1
CLASSROOM STORAGE	114	E	1
VEST.	115		
MECH MEZZANINE	181	E	2
RECEPTION/ LOBBY	200		
NAIL/ PEDI	201	E	1
SALON/CUTTING	202	E	1
HALL C	203		
TOILET ADA	204	B	1
ALL GENDER RR	205	B	1
TOILET ADA	207	B	1
RR	208		
RR	209		
RR	210		
RR	211		
RR	212		
RR	213		
FACIAL BAR	214	E	1
WAX	215	E	1
WAX	216	E	1
FACIAL/ MASSAGE ESTHETICS	217	E	1
LAUNDRY	218	E	1
BLDG STORAGE	219	E	1
FIRE RISER	220	E	2
ELECTRICAL	221	E	2
JANITOR	222	E	1
MDF	223	E	2

SIGNAGE NOTES

1. OFOI, FINAL DESIGNATED NAME AND ROOM NUMBER TO BE VERIFIED WITH OWNER
2. CFCI, PAINTED ON DOOR
3. SEE SPECIFICATIONS, SECTION 10 1400 FOR FURTHER DETAILS

(2)

BBT ARCHITECTS
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t 541.382.5535 | f 541.389.8033

REGISTERED ARCHITECT Kyle Burke Bend, OR 12047 STATE OF OREGON

KLAMATH COMMUNITY COLLEGE - COSMETOLOGY CENTER

7390 S 6TH STREET
KLAMATH FALLS, OR 97603

No.	Description	Date
2	Addendum #2	4/9/26
3	Addendum #3	4/23/26

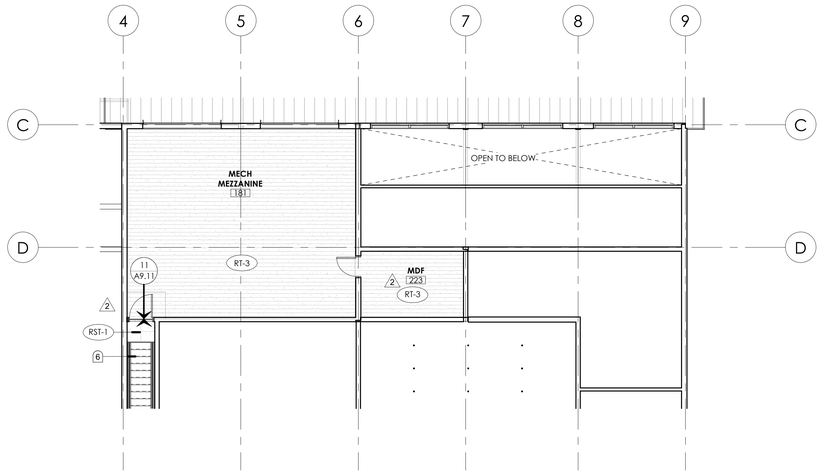
Project Number 2507
Date 3/16/2026

PERMIT / BID SET

FINISH LEGEND & SCHEDULES

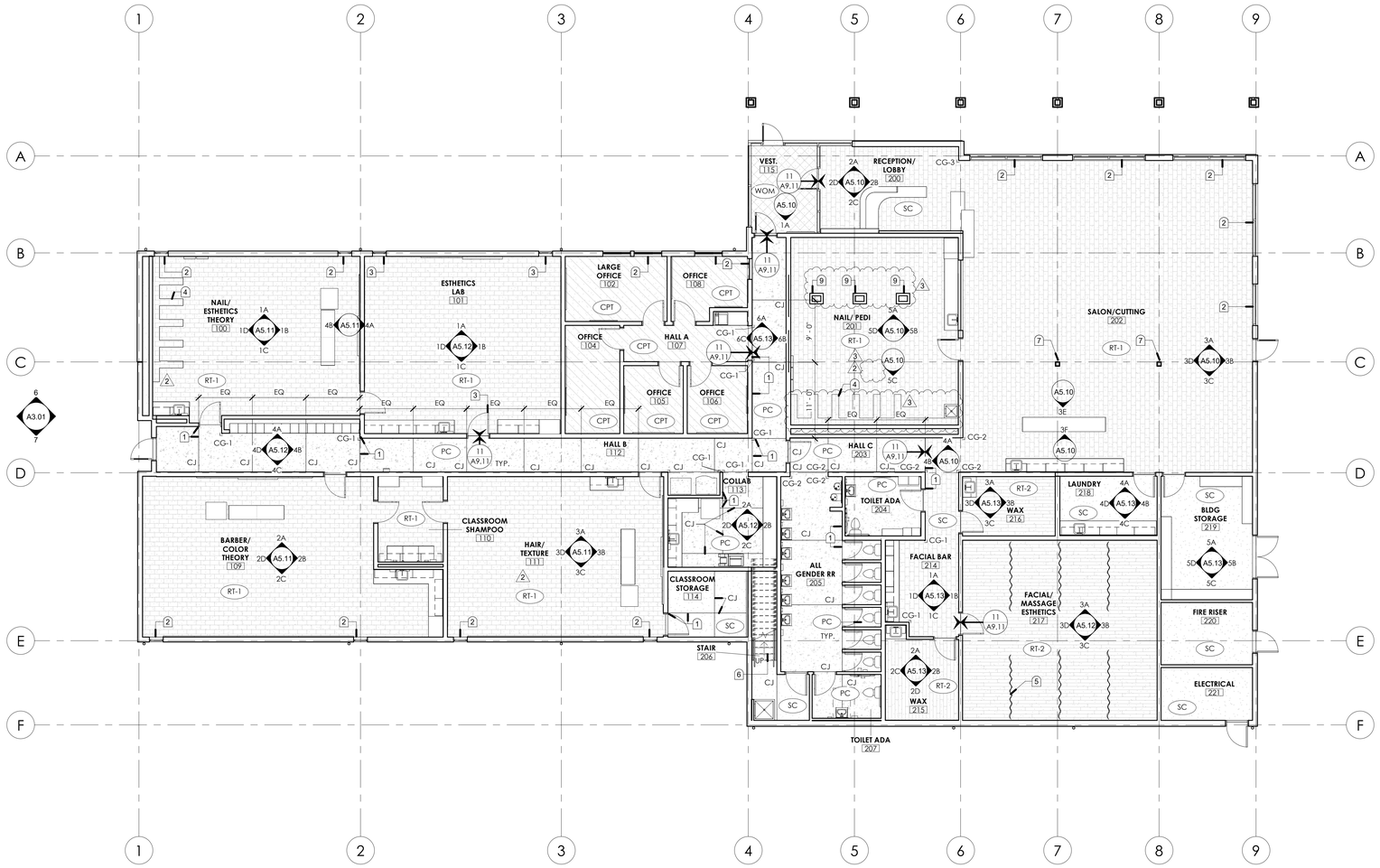
A9.01

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MECHANICAL MEZZANINE

2 / A9.10 SCALE: 1/8" = 1'-0"



FINISH FLOOR PLAN

2 / 1 / A9.10 SCALE: 1/8" = 1'-0"

GENERAL NOTES

A. SEE SHEET G0.01 FOR ARCHITECTURAL ABBREVIATIONS AND SYMBOLS
B. SEE SHEET G0.04 FOR WALL TYPES
C. SEE SHEET A8.01 FOR DOOR SCHEDULE
D. PLAN DIMENSIONS ARE MEASURED FROM THE OUTSIDE FACE OF STUDS / FACE OF CONCRETE ON EXTERIOR WALLS TO THE CENTER LINES OF INTERIOR WALLS AND OPENINGS U.N.O.
E. GRID LINES ALIGN WITH FACE OF STUD U.N.O.
F. SEE FINISH MATERIAL LEGEND TO IDENTIFY FINISH MATERIAL PRODUCT INFORMATION
G. SEE A5.0 SERIES FOR ADDITIONAL WALL FINISHES NOT NOTED ON THIS PLAN
H. ALL GYP. BOARD WALLS AND CEILINGS TO BE PAINTED P-1 U.N.O
I. EXTEND FLOOR FINISHES UNDER APPLIANCES, BUILT-IN COUNTERTOPS, AND CASEWORK
J. FLOORING TRANSITIONS THAT OCCUR AT DOOR OPENINGS TO BE CENTERED IN OPENING U.N.O.
3 / K. SEE FINISH MATERIAL LEGEND ON A9.01 FOR OWNER FURNISHED, OWNER INSTALLED FLOORING PRODUCTS

FINISH PLAN KEYNOTES

1 ALIGN
2 RS-1 WINDOW SHADE
3 RS-2 BLACKOUT SHADE ON WINDOW
4 RT-1 FLOORING ON VENTING PEDESTALS, TYP.
5 DIVIDER CURTAIN ON TRACK, TYP.
6 RST-1 RUBBER TREADS AND ACCESSORIES ON STAIR
2 / 3 / 9 PAINT EXPOSED STEEL PORTION OF COLUMN P-5
PAINT ALL SIDES OF COLUMN P-6

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7390 S 6TH STREET
KLAMATH FALLS, OR
97603

No.	Description	Date
2	Addendum #2	4/9/26
3	Addendum #3	4/23/26

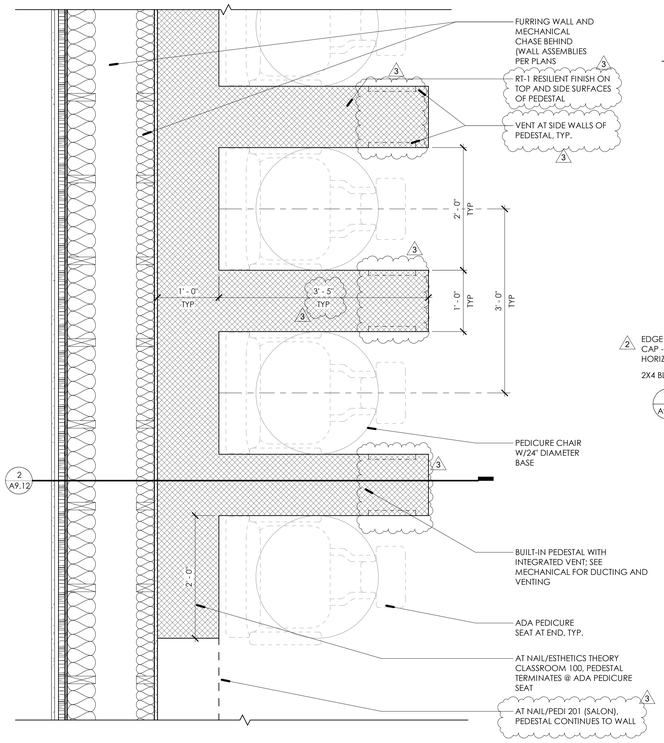
Project Number 2507
Date 3/16/2026

PERMIT / BID SET

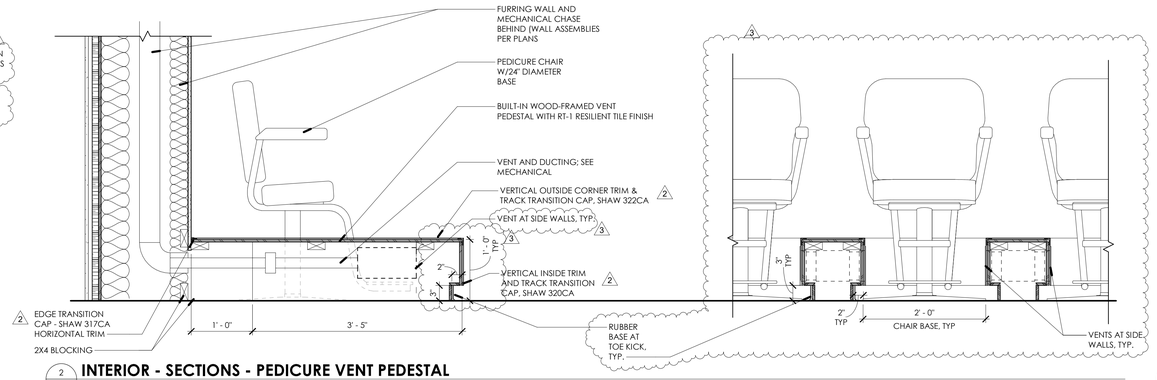
FINISH PLAN - LEVEL 1

A9.10

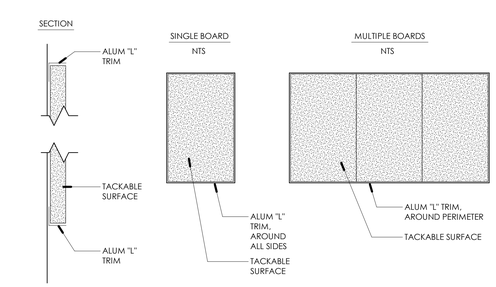
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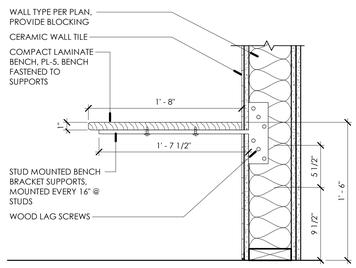
1 A9.12 **INTERIOR - FLOOR PLAN - PEDICURE VENT PEDESTAL, TYP.**
SCALE: 1" = 1'-0"



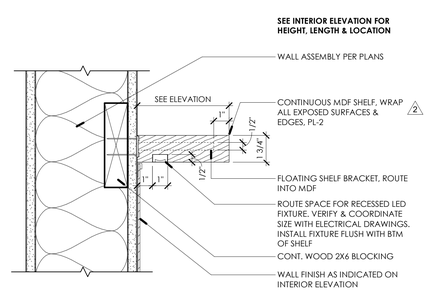
2 A9.12 **INTERIOR - SECTIONS - PEDICURE VENT PEDESTAL**
SCALE: 1" = 1'-0"



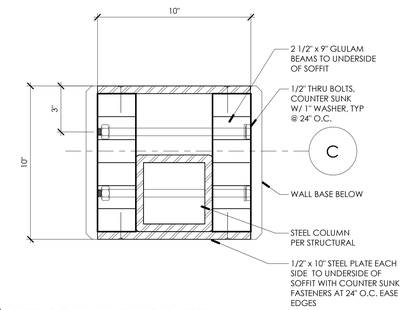
3 A9.12 **INTERIOR - TACKABLE WALL SURFACE**
SCALE: 1'2" = 1'-0"



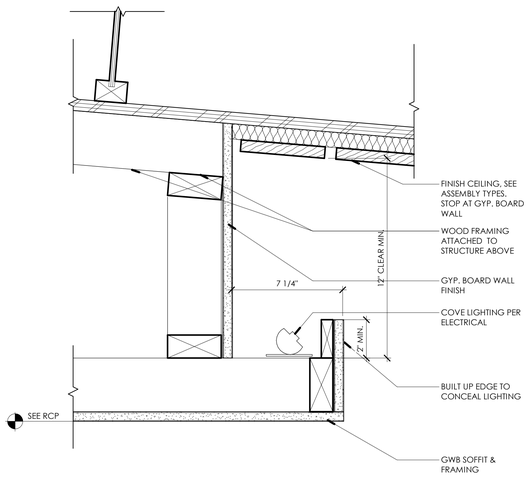
4 A9.12 **BENCH @ WALL**
SCALE: 1 1/2" = 1'-0"



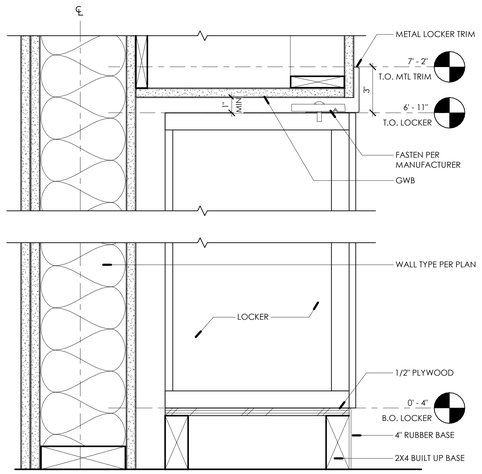
5 A9.12 **FLOATING SHELF - RECEPTION**
SCALE: 3" = 1'-0"



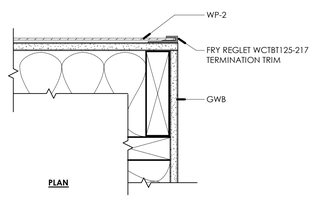
2 6 A9.12 **INT. COLUMN W/ GLB, TYP.**
SCALE: 3" = 1'-0"



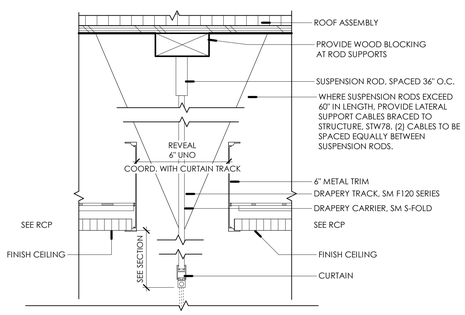
8 A9.12 **GYPSUM WALLBOARD SOFFIT - COVE**
SCALE: 3" = 1'-0"



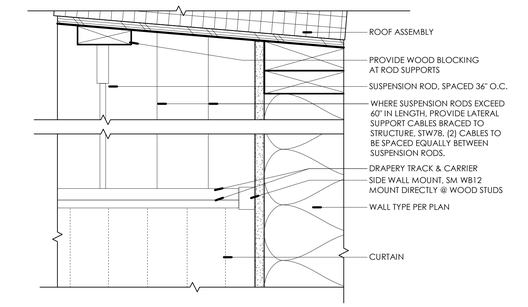
2 9 A9.12 **INTERIOR - FRAMED BASE & HEAD DETAIL @ LOCKERS**
SCALE: 3" = 1'-0"



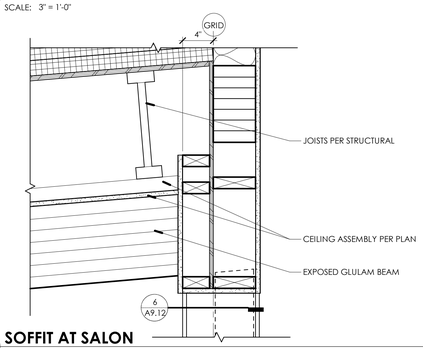
2 10 A9.12 **WP-2 EDGE TRIM**
SCALE: 3" = 1'-0"



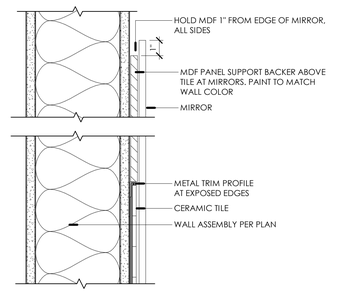
2 11 A9.12 **ACT CLOUD - TRIM AT SUSPENDED TRACK**
SCALE: 3" = 1'-0"



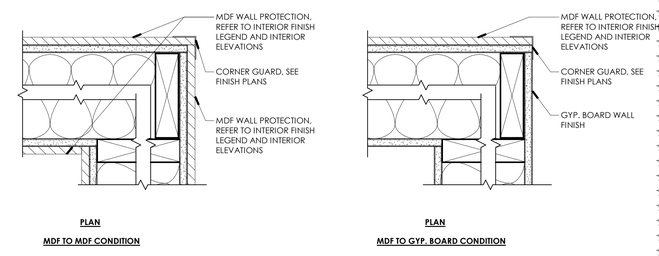
2 12 A9.12 **ACT CLOUD - TRIM AND CURTAIN TRACK AT WALL**
SCALE: 3" = 1'-0"



2 7 A9.12 **SOFFIT AT SALON**
SCALE: 1 1/2" = 1'-0"



2 13 A9.12 **MIRROR MOUNTED ABOVE CERAMIC WALL TILE**
SCALE: 3" = 1'-0"



3 14 A9.12 **MDF WAINSCOT - CORNERGUARD**
SCALE: 3" = 1'-0"

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KLAMATH FALLS, OR 97603

No.	Description	Date
2	Addendum #2	4/9/26
3	Addendum #3	4/23/26

Project Number 2507
Date 3/16/2026

PERMIT / BID SET

INTERIOR DETAILS

A9.12

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FOUNDATION SCHEDULE				
MARK	WIDTH	LENGTH	DEPTH	REINFORCEMENT
F-1	1' - 6"	CONT.	1' - 0"	(2) #4 LONG. BAR BOTTOM
F-2	2' - 0"	2' - 0"	1' - 0"	(4) #4 BAR EACH WAY BOTTOM
F-3	3' - 0"	3' - 0"	1' - 0"	(4) #4 BAR EACH WAY BOTTOM
F-4	4' - 6"	4' - 6"	1' - 0"	(6) #4 BAR EACH WAY TOP AND BOTTOM
F-5	4' - 6"	9' - 0"	1' - 6"	(5) #4 LONG. BAR AND (9) #4 TRANS. BARS TOP AND BOTTOM
F-6	6' - 0"	6' - 0"	1' - 6"	(8) #5 BAR EACH WAY TOP AND BOTTOM

1. UNLESS NOTED OTHERWISE, REINFORCEMENT TO BE SPACED EVENLY IN FOOTING WITH CORRECT SIDE AND BOTTOM CLEARANCES.

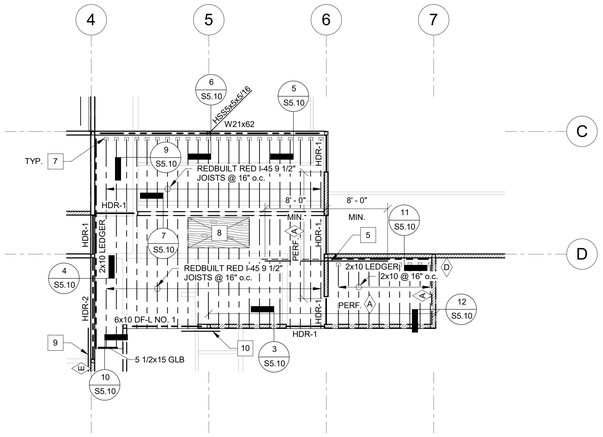
HEADER SCHEDULE			
MARK	BEAM SIZE	KING STUD	TRIMMER STUD
HDR-1	6x10 DF-L NO. 2	(2) 2x6 DF-L NO. 2	2x6 DF-L NO. 2
HDR-2	5 1/2x12 24F-V4 GLB	(2) 2x6 DF-L NO. 2	(2) 2x6 DF-L NO. 2

HOLDOWN SCHEDULE					
(#)	SIMPSON MODEL	POST THICKNESS	FASTENER	ANCHOR	REMARKS
1	HDUE3-SDS3	(2) 2x OR 4x	(7) 1/4 x 2 1/2" SDS	5/8"	PL1/4x3x0'-3" w/ DBL NUT AT BOT OF THREADED ROD
2	HDUE5-SDS3	6x10	(10) 1/4 x 2 1/2" SDS	5/8"	PL1/4x3x0'-3" w/ DBL NUT AT BOT OF THREADED ROD
3	HDUE9-SDS3.5	(3) 2x OR 6x	(16) 1/4 x 3 1/2" SDS	5/8"	PL1/4x3x0'-3" w/ DBL NUT AT BOT OF THREADED ROD

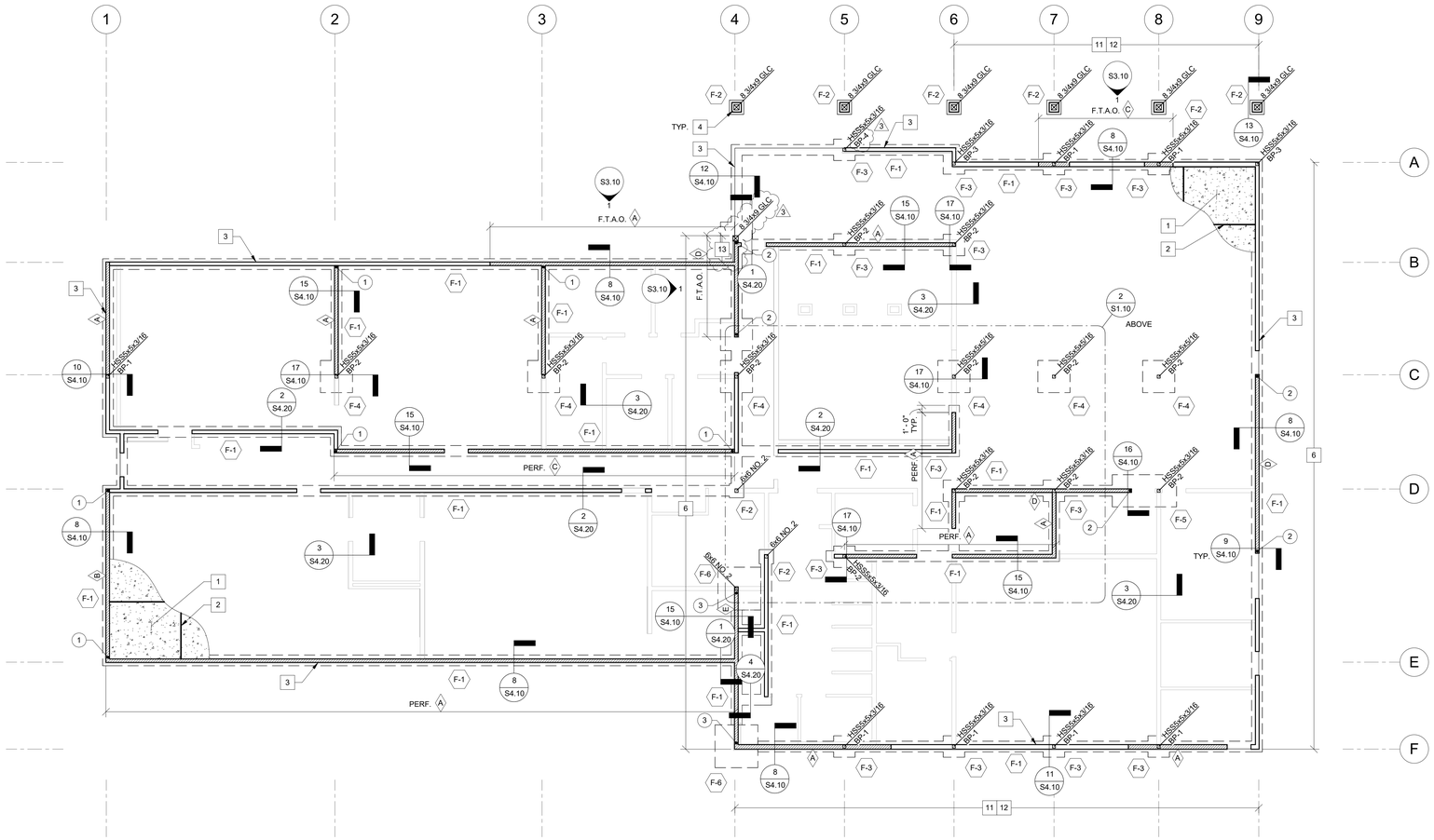
1. NAILS ARE TO BE COMMON WIRE NAILS, U.N.O.
2. HARDWARE IS TO BE SIMPSON, U.N.O.
3. HOLDOWN HARDWARE CAN BE EXTENDED WITH A307 THREADED ROD AND COUPLER.
4. ALL HARDWARE TO BE INSTALLED PER MANUFACTURE'S SPECIFICATIONS.
5. HOLDOWN ANCHOR BOLTS ARE IN ADDITION TO TYPICAL SILL PLATE ANCHOR BOLTS.
6. EXTEND THREADED ROD TO WITHIN 3" CLEAR OF BOTTOM OF FOOTING.
7. SISTER STUDS w/ 3 1/2"x0.162"ø NAILS @ 24" o.c. STAGGERED FULL HEIGHT WHERE SCHEDULE INDICATES (2) 2x STUDS.

SHEAR WALL SCHEDULE									
(X)	SHEATHING	NAIL SIZE (LENGTH, SHANK DIA., HEAD DIA.)	EDGE NAILING (o.c.)	FIELD NAILING (o.c.)	PANEL EDGE STUDS	BOTTOM PLATE DIMENSION	MIN. END STUD SIZE	SILL PLATE ANCHORAGE (o.c.)	REMARKS
A	7/16" APA RATED	2 1/2"x0.131"x0.281"	6"	12"	2x	2x	(2) 2x	5/8" DIA. A.B. @ 4'-0"	--
B	7/16" APA RATED	2 1/2"x0.131"x0.281"	4"	12"	2x	2x	(2) 2x	5/8" DIA. A.B. @ 4'-0"	--
C	7/16" APA RATED	2 1/2"x0.131"x0.281"	3"	12"	(2) 2x	2x	(3) 2x	5/8" DIA. A.B. @ 4'-0"	STAGGER EDGE NAILING AND PANEL BREAKS
D	7/16" APA RATED	2 1/2"x0.131"x0.281"	2"	12"	(2) 2x	2x	6x10	5/8" DIA. A.B. @ 4'-0"	STAGGER EDGE NAILING AND PANEL BREAKS
E	(2) 7/16" APA RATED	2 1/2"x0.131"x0.281"	3"	12"	(2) 2x	2x	(3) 2x	5/8" DIA. A.B. @ 4'-0"	STAGGER PANEL JOINTS EACH SIDE OF WALL

1. ALL PLYWOOD TO BE APA RATED EXPOSURE 1 SHEATHING.
2. ALL NAILS TO BE COMMON OR GALVANIZED BOX TYPE.
3. ALL WALL SHEATHING TO EXTEND FULL HEIGHT OF WALL, TOP PLATE TO BOTTOM PLATE.
4. ALL SHEAR WALLS AND HOLDOWNS MUST HAVE CONTINUOUS LOAD PATH TO FOUNDATION.
5. USE WASHER PL1/4x3x0'-3" TYPICAL AT ALL ANCHOR BOLTS.
6. ALL SHEAR WALLS TO BE FULLY BLOCKED U.N.O. BLOCKING TO MATCH REQUIREMENTS FOR PANEL EDGE STUDS.
7. SISTER STUDS w/ 3 1/2"x0.162"ø NAILS @ 24" o.c. STAGGERED FULL HEIGHT WHERE SCHEDULE INDICATES (2) OR MORE END STUDS.
8. FASTEN END STUD TO HSS COLUMN w/ TFG1475S SCREW @ 12" o.c. CENTERED ON HSS COLUMN. MINIMUM (12) SCREWS PER HSS COLUMN.
9. 5/8"ø SIMPSON TITEN ANCHOR CAN BE SUBSTITUTED FOR SILL PLATE ANCHOR SPECIFIED IN TABLE. 5 1/4" MIN. EMBED.



2 S1.10 MEZZANINE FLOOR FRAMING PLAN
1/8" = 1'-0"



1 S1.10 FOUNDATION PLAN
1/8" = 1'-0"

FOUNDATION AND FRAMING PLAN NOTES

A. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY, CONFIRM WITH ARCHITECTURAL PLAN AND DETAILS.

B. BOTTOM OF FOOTINGS TO BE PLACED BELOW FROST DEPTH OR AS NOTED IN THE GEOTECHNICAL REPORT, WHICHEVER IS GREATER.

C. COORDINATE PENETRATIONS OF SITE UTILITIES, MECHANICAL DUCTS, PIPING, AND ELECTRICAL CONDUIT/PANELS TO MINIMIZE IMPACT TO STRUCTURAL FRAMING. PLUMBING FIXTURES SHOWN ON FLOOR FOR REFERENCE AND POSSIBLE FRAMING CONFLICTS ONLY.

D. ALL FOOTINGS ARE TO BE CENTERED UNDER COLUMNS, U.N.O.

E. ALL FOOTINGS TO BEAR OVER GRADE OVER FIRM, UNDISTURBED, NON-ORGANIC, NON-EXPANSIVE NATIVE MATERIAL, OR STRUCTURAL FILL AS REQUIRED PER GEOTECHNICAL REPORT.

F. SEE SHEET S0.10 FOR ADDITIONAL NOTES.

G. INDICATES BEARING WALLS TO BE 2x6 @ 16" o.c. w/ 2x6 DOUBLE TOP PLATE AND SINGLE P.T. BOTTOM PLATE U.N.O.

H. (X) INDICATES SHEAR WALL TYPE. SEE SHEAR WALL SCHEDULE FOR ADDITIONAL INFORMATION.

I. INDICATES SHEAR WALL LOCATION ABOVE FOUNDATION. SEE SHEAR WALL SCHEDULE FOR ADDITIONAL INFORMATION.

J. PERF. (X) ALL SHEAR WALLS INDICATED AS "PERFORATED" THE CONTRACTOR SHALL PROVIDE NAILING PATTERN AROUND ALL WALL PENETRATIONS AS CALLED OUT ON FRAMING PLANS IN CORRESPONDENCE WITH THE SHEAR WALL SCHEDULE.

K. F.T.A.O. (X) INDICATES FORCE TRANSFER AROUND OPENING IN WALL. PROVIDE PANEL EDGE NAILING AROUND ALL WALL PENETRATIONS PER SHEAR WALL SCHEDULE AND STRAPPING AS INDICATED ON SHEET S3.10. SEE ELEVATION ON SHEET S3.10 FOR ADDITIONAL INFORMATION.

L. HDR-X INDICATES HEADER SIZE. SEE HEADER SCHEDULE FOR ADDITIONAL INFORMATION.

M. (#) INDICATES HOLDOWN TYPE AND LOCATION. SEE HOLDOWN SCHEDULE FOR ADDITIONAL INFORMATION.

N. F-XX INDICATES FOOTING TYPE PER FOUNDATION SCHEDULE.

O. BP-X INDICATES BASE PLATE TYP. SEE DETAIL 18/S4.10.

P. DOUBLE ALL FLOOR JOISTS BELOW MECHANICAL EQUIPMENT ON MEZZANINE FLOOR.

FOUNDATION AND FRAMING PLAN KEYNOTES

1. 4" SLAB ON GRADE w/ #4 BARS @ 18" o.c. EACH WAY.
2. CONTROL JOINTS AT MAX. SPACING OF 10'-0" o.c. SEE DETAILS 1 AND 3/S4.10 FOR ADDITIONAL INFORMATION.
3. 6" WIDE REINFORCED CONCRETE STEM WALL w/ #4 HORIZ. BARS @ 12" o.c. AND #4 VERT. BARS @ 18" o.c. (3) MIN. HORIZ. BARS.
4. 1'-4"x1'-4" CONCRETE PEDESTAL w/ (12) #4 VERT. BARS AND #3 HOOPS @ 4" o.c.
5. BACK TO BACK SIMPSON HDUE3-SDS3 FROM MEZZANINE FLOOR TO GRID D SHEAR WALL PER DETAIL 13/S5.10.
6. 1 1/2x5 1/2 VERSA-STUD LVL 1.7E 2400 @ 16" o.c. STUD WALL w/ DOUBLE TOP PLATE AND SINGLE P.T. BOTTOM PLATE.
7. SIMPSON ITS1.81/9.5 HANGER.
8. 3/4" T&G PLYWOOD SHEATHING w/ 3"x0.148"ø NAILS @ 6" o.c. AT BOUNDARY AND PANEL EDGE AND 12" o.c. FIELD NAILING. APPLY 1/4"ø CONT. BEAD OF GLUE TO TOPS OF WOOD FRAMED FLOOR JOISTS, BLOCKING AND PLATES IMMEDIATELY PRIOR TO PLACEMENT OF FLOOR SHEATHING.
9. SIMPSON CS14 STRAP FROM HDR-2 TO GRID 4 UPPER ROOF SHEAR WALL. PROVIDE 4x FULL DEPTH BLOCKING IN WALL. EXTEND 4'-0" INTO SHEAR WALL.
10. 36" LONG SIMPSON CS14 STRAP w/ 2 1/2"x0.148"ø NAILS FROM DOUBLE TOP PLATE TO BEAM CENTERED ON BREAK.
11. 2x8 STUD WALL @ 16" o.c. w/ DOUBLE TOP PLATE AND SINGLE P.T. BOTTOM PLATE.
12. 8" REINFORCED CONCRETE STEM WALL w/ #4 HORIZ. BARS @ 12" o.c. AND #4 VERT. BARS @ 16" o.c. (3) MIN. HORIZ. BARS.
13. 9" REINFORCED CONCRETE STEM WALL w/ #4 HORIZ. BARS @ 10" o.c. AND #4 VERT. BARS @ 16" o.c. (3) MIN. HORIZ. BARS.

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No.	Description	Date
2	ADDENDUM #2	04/09/26
3	ADDENDUM #3	04/23/26

Project Number K-6433-25
Date 03/16/2026

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FOUNDATION AND MEZZANINE FLOOR FRAMING PLAN

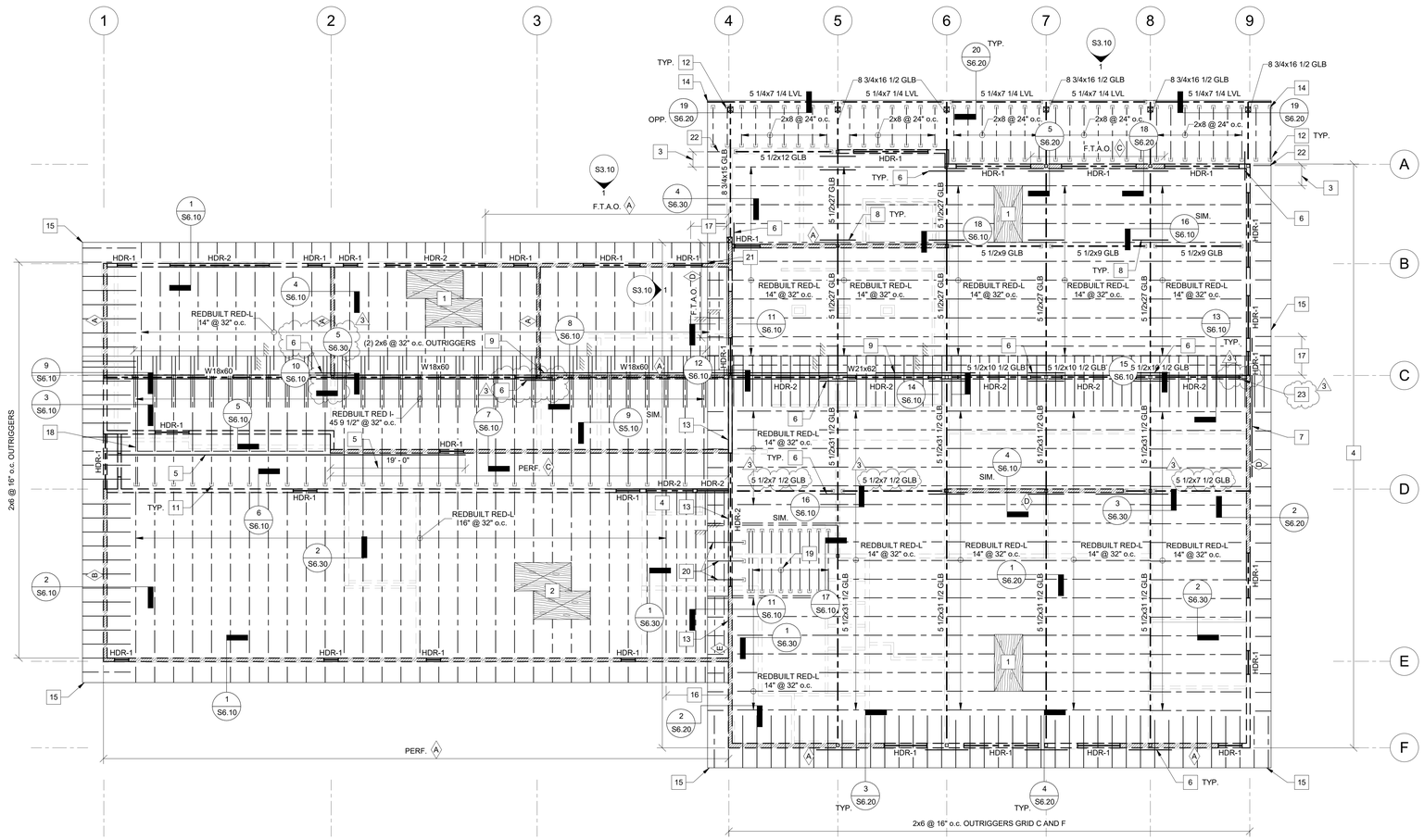
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SHEAR WALL SCHEDULE									
◇X	SHEATHING	NAIL SIZE (LENGTH, SHANK DIA., HEAD DIA.)	EDGE NAILING (o.c.)	FIELD NAILING (o.c.)	PANEL EDGE STUDS	BOTTOM PLATE DIMENSION	MIN. END STUD SIZE	SILL PLATE ANCHORAGE (o.c.)	REMARKS
A	7/16" APA RATED	2 1/2"x0.131"x0.281"	6"	12"	2x	2x	(2) 2x	5/8" DIA. A.B. @ 4'-0"	--
B	7/16" APA RATED	2 1/2"x0.131"x0.281"	4"	12"	2x	2x	(2) 2x	5/8" DIA. A.B. @ 4'-0"	--
C	7/16" APA RATED	2 1/2"x0.131"x0.281"	3"	12"	(2) 2x	2x	(3) 2x	5/8" DIA. A.B. @ 4'-0"	STAGGER EDGE NAILING AND PANEL BREAKS
D	7/16" APA RATED	2 1/2"x0.131"x0.281"	2"	12"	(2) 2x	2x	6x10	5/8" DIA. A.B. @ 4'-0"	STAGGER EDGE NAILING AND PANEL BREAKS
E	(2) 7/16" APA RATED	2 1/2"x0.131"x0.281"	3"	12"	(2) 2x	2x	(3) 2x	5/8" DIA. A.B. @ 4'-0"	STAGGER PANEL JOINTS EACH SIDE OF WALL

1. ALL PLYWOOD TO BE APA RATED EXPOSURE 1 SHEATHING.
2. ALL NAILS TO BE COMMON OR GALVANIZED BOX TYPE.
3. ALL WALL SHEATHING TO EXTEND FULL HEIGHT OF WALL, TOP PLATE TO BOTTOM PLATE.
4. ALL SHEAR WALLS AND HOLDOWNS MUST HAVE CONTINUOUS LOAD PATH TO FOUNDATION.
5. USE WASHER PL1/4x3x0'-3" TYPICAL AT ALL ANCHOR BOLTS.
6. ALL SHEAR WALLS TO BE FULLY BLOCKED U.N.O. BLOCKING TO MATCH REQUIREMENTS FOR PANEL EDGE STUDS.
7. SISTER STUDS w/ 3 1/2"x0.162"ø NAILS @ 24" o.c. STAGGERED FULL HEIGHT WHERE SCHEDULE INDICATES (2) OR MORE END STUDS.
8. FASTEN END STUD TO HSS COLUMN w/ TFG147SS SCREW @ 12" o.c. CENTERED ON HSS COLUMN. MINIMUM (12) SCREWS PER HSS COLUMN.
9. 5/8"ø SIMPSON TITEN ANCHOR CAN BE SUBSTITUTED FOR SILL PLATE ANCHOR SPECIFIED IN TABLE. 5 1/4" MIN. EMBED.

HEADER SCHEDULE			
MARK	BEAM SIZE	KING STUD	TRIMMER STUD
HDR-1	6x10 DF-L NO. 2	(2) 2x6 DF-L NO. 2	2x6 DF-L NO. 2
HDR-2	5 1/2x12 24F-V4 GLB	(2) 2x6 DF-L NO. 2	(2) 2x6 DF-L NO. 2



ROOF FRAMING PLAN NOTES

A. COORDINATE ALL DIMENSIONS AND FEATURES NOT SHOWN WITH ARCHITECT.

B. SEE SHEET S0.10 FOR ADDITIONAL NOTES.

C. INDICATES ROOF STEP TYP. SEE ARCHITECTURAL PLANS FOR ADDITIONAL INFORMATION.

D. BEAMS ARE EQUALLY SPACED IN BAYS, U.N.O.

E. BEAMS ARE CENTERED ON COLUMNS, WALLS, AND/OR GRID LINES, U.N.O.

F. INDICATES BEARING WALLS BELOW FRAMING TO BE 2x6 @ 16" o.c. w/ 2x6 DOUBLE TOP PLATE AND SINGLE BOTTOM PLATE U.N.O.

G. ◇X INDICATES SHEAR WALL TYPE. SEE SHEAR WALL SCHEDULE FOR ADDITIONAL INFORMATION.

H. INDICATES SHEAR WALL LOCATION BELOW FRAMING. SEE SHEAR WALL SCHEDULE FOR ADDITIONAL INFORMATION.

I. PERF. ◇X ALL SHEAR WALLS INDICATED AS "PERFORATED" THE CONTRACTOR SHALL PROVIDE NAILING PATTERN AROUND ALL WALL PENETRATIONS AS CALLED OUT ON FRAMING PLANS IN CORRESPONDENCE WITH THE SHEAR WALL SCHEDULE.

J. F.T.A.O. ◇X INDICATES FORCE TRANSFER AROUND OPENING IN WALL. PROVIDE PANEL EDGE NAILING AROUND ALL WALL PENETRATIONS PER SHEAR WALL SCHEDULE AND STRAPPING AS INDICATED ON SHEET S3.10. SEE ELEVATION ON SHEET S3.10 FOR ADDITIONAL INFORMATION.

K. HDR-X INDICATES HEADER SIZE. SEE HEADER SCHEDULE FOR ADDITIONAL INFORMATION.

ROOF FRAMING PLAN KEYNOTES

1. 5/8" PLYWOOD SHEATHING w/ 3"x0.148"ø NAILS @ 6" o.c. AT BOUNDARY AND PANEL EDGES AND 12" o.c. FIELD NAILING.
2. BLOCKED 5/8" PLYWOOD SHEATHING w/ 3"x0.148"ø NAILS @ 4" o.c. AT BOUNDARY AND CONTINUOUS PANEL EDGES, 6" o.c. AT ALL OTHER PANEL EDGES AND 12" o.c. FIELD NAILING.
3. PROVIDE ADDITIONAL OPEN WEB WOOD JOIST TO BE LOCATED NO MORE THAN 16" FROM GRID A EXTERIOR WALL.
4. 1 1/2x5 1/2 VERSA-LAM LVL 2.1E 2800 @ 16" o.c. STUD WALL w/ DOUBLE TOP PLATE AND SINGLE P.T. BOTTOM PLATE.
5. FULL DEPTH 4x BLOCKING w/ SIMPSON CMST12 STRAP w/ (86) 2 1/2"x0.148"ø NAILS TO EXTEND ALONG WALL TOP PLATES FOR LENGTH PER PLAN.
6. 60" LONG SIMPSON CMST14 STRAP CENTERED ON BREAK w/ (66) 2 1/2"x0.148"ø NAILS EACH SIDE.
7. SIMPSON CMST14 STRAP FROM LOW ROOF DOUBLE TOP PLATES TO SHEAR WALL SOUTH OF GRID C. PROVIDE FULL DEPTH BLOCKING IN SHEAR WALL TO EXTEND 14'-0" MIN.
8. 36" LONG SIMPSON CS14 STRAP CENTERED ON BREAK w/ (26) 2 1/2"x0.148"ø NAILS EACH SIDE.
9. FULL DEPTH 4x BLOCKING w/ SIMPSON CS14 STRAP w/ (26) 2 1/2"x0.148"ø NAILS AND 15" END LENGTH. BLOCKING AND STRAPPING LINE TO EXTEND AS SHOWN FROM GRID 3 TO 4'-0" PAST GRID 6.
10. NOT USED.
11. SIMPSON BA1.81/9.5 HANGER.
12. SIMPSON LUC28 HANGER.
13. 2x10 DF-L NO. 2 ROOF LEDGER ON GRID 4 NOT SHOWN. SEE DETAIL 11/S6.10 FOR REQUIREMENTS. PROVIDE (2) CS14 STRAPS ACROSS ALL BREAKS IN LEDGER.
14. IN THE N/S DIRECTION OF THE ROOF CORNER PROVIDE 1 1/2x16 LVL STRUCTURAL FASCIA FASTENED TO OUTRIGGERS w/ SIMPSON A34 CLIP. STRUCTURAL FASCIA TO BE FASTENED TO MIN. (4) OUTRIGGERS OR 8'-0" WHICHEVER DISTANCE IS GREATER.
15. EACH SIDE OF ROOF CORNER PROVIDE 1 1/2x16 LVL STRUCTURAL FASCIA FASTENED TO OUTRIGGERS w/ SIMPSON A34 CLIP. STRUCTURAL FASCIA TO BE FASTENED TO MIN. (4) OUTRIGGERS OR 8'-0" WHICHEVER DISTANCE IS GREATER.
16. ROOF RAFTER PER PLAN @ 16" o.c. FOR 8'-0" FROM GRID 4.
17. ROOF RAFTER PER PLAN @ 16" o.c. FOR MIN. 48" FROM ROOF STEP. TYP. ALL ROOF RAFTERS AT GRID 4 AND GRID C ROOF STEPS.
18. DOUBLE ROOF RAFTER PER DETAIL 3/S6.10.
19. 1 1/2x5 1/2 VERSA-LAM LVL 2.1E 2800 ROOF RAFTERS @ 16" o.c. w/ SIMPSON JB26 HANGER EACH SIDE TO DOUBLE RAFTER.
20. 1 1/2x5 1/2 VERSA-LAM LVL 2.1E 2800 OUTLOOKERS @ 16" o.c. w/ SIMPSON LUS26 HANGER.
21. STANDARD BEAM POCKET WITH FOR STRUCTURAL FASCIA PER PLAN.
22. 4x6 DF-L NO. 2 STRONGBACK w/ VERSALOK SCREWS SIM. TO DETAIL 19/S6.20. PROVIDE (2) SIMPSON A34 CLIPS w/ SD SCREWS TO THE FASCIA.
23. SIMPSON HUC610 FACE MOUNT HANGER

1 S2.10 ROOF FRAMING PLAN
1/8" = 1'-0"

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No.	Description	Date
2	ADDENDUM #2	04/09/26
3	ADDENDUM #3	04/23/26

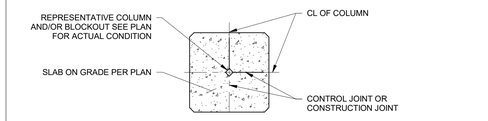
Project Number K-6433-25
Date 03/16/2026

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ROOF FRAMING PLAN

S2.10

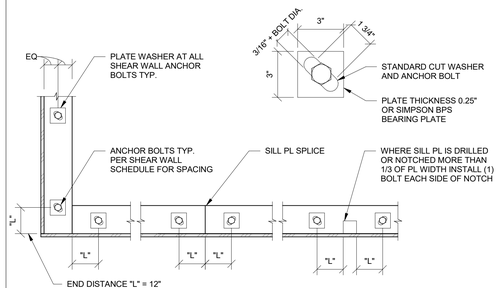
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NOTES:

1. SEE PLAN FOR SLAB ON GRADE THICKNESS AND REINFORCEMENT.
2. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SHOWING JOINT LAYOUT FOR REVIEW AND APPROVAL BY ARCHITECT AND STRUCTURAL ENGINEER.
3. PROVIDE JOINT AS SHOWN ON 3/S3.10.
4. SAWED JOINTS SHALL BE MADE AS SOON AS THE JOINT CAN BE CUT WITHOUT EDGES RAVELING AND WITHIN 12 HOURS OF SLAB PLACEMENT.

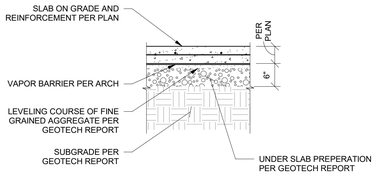
1 JOINTS AT SLAB ON GRADE
S4.10 3/4" = 1'-0"



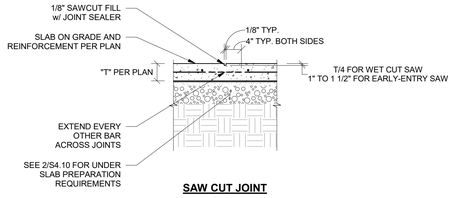
NOTES:

1. ALL SILL PLATES SHALL BE P.T. D.F. OF WIDTH EQUAL TO DEPTH OF STUDS.
2. ALL OVERSIZED BOLT HOLES (HOLES > 1/16" + A.B. Ø) SHALL BE FILLED w/ EPOXY FOR TIGHT FIT.
3. LOCATE BOLTS CLEAR OF STUDS AND POSTS.
4. PROVIDE A MIN. OF (2) BOLTS PER SILL PIECE.

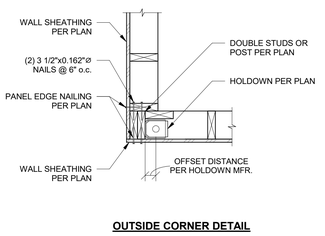
2 UNDER SLAB PREPERATION AT SLAB ON GRADE
S4.10 3/4" = 1'-0"



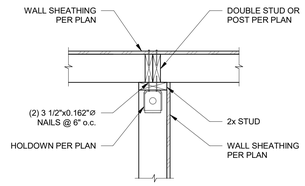
3 CONTROL JOINTS IN SLAB ON GRADE
S4.10 3/4" = 1'-0"



SAW CUT JOINT

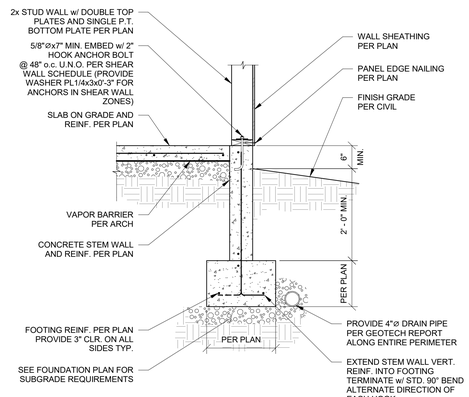


OUTSIDE CORNER DETAIL

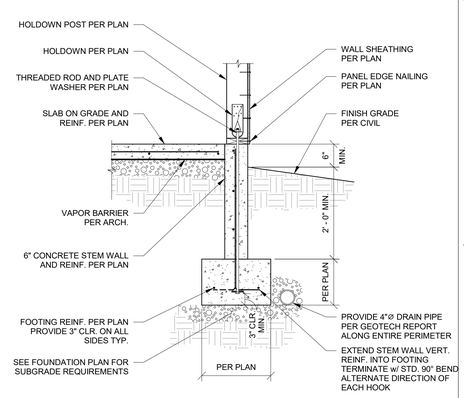


WALL INTERSECTION

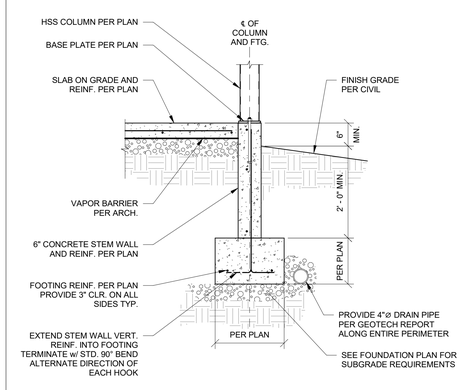
4 ISOLATION JOINT AT COLUMN
S4.10 3/4" = 1'-0"



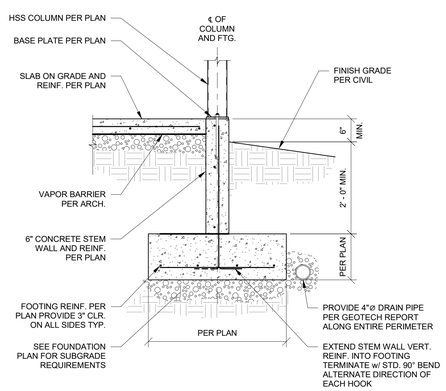
5 STEM WALL CORNER DETAIL
S4.10 3/4" = 1'-0"

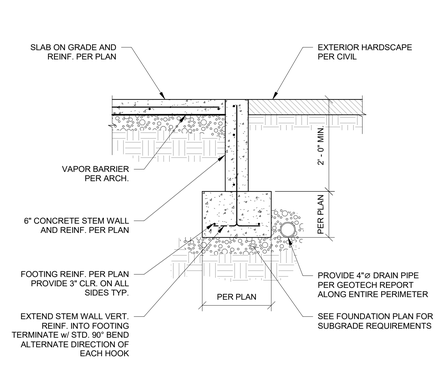


6 SILL PLATE BOLTING AT SHEAR WALLS
S4.10 1" = 1'-0"

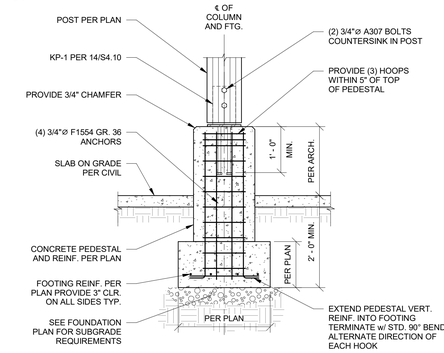


7 SHEAR WALL CORNER AND INTERSECTION DETAIL
S4.10 1" = 1'-0"

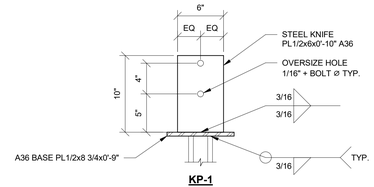




8 TYP. PERIMETER FOOTING
S4.10 3/4" = 1'-0"

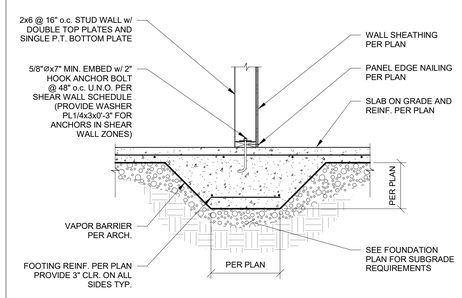


9 TYP. PERIMETER SHEAR WALL HOLDOWN
S4.10 3/4" = 1'-0"

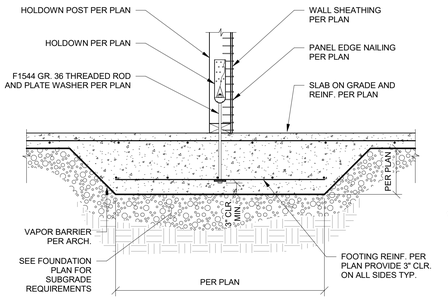


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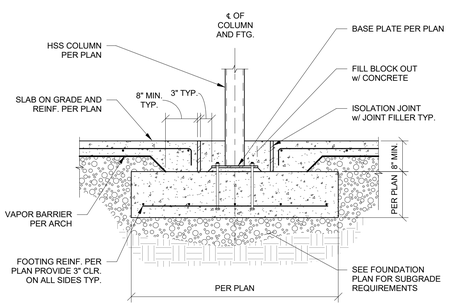
10 HSS AT PERIMETER FOOTING
S4.10 3/4" = 1'-0"



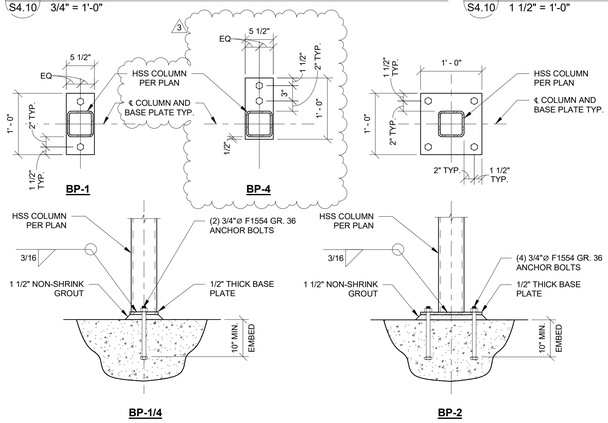
11 HSS AT EXTERIOR SPREAD FOOTING
S4.10 3/4" = 1'-0"



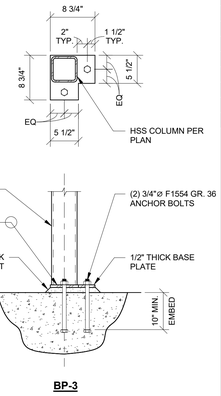
12 TYP. PERIMETER FOOTING AT OPENING
S4.10 3/4" = 1'-0"



13 TYP. SPREAD FOOTING AT CANOPY
S4.10 3/4" = 1'-0"



14 KP-1
S4.10 1 1/2" = 1'-0"



15 TYP. THICKENED SLAB FOOTING AT SHEAR WALL
S4.10 3/4" = 1'-0"

16 TYP. INTERIOR SPREAD FOOTING AT SHEAR WALL
S4.10 3/4" = 1'-0"

17 TYP. HSS INTERIOR SPREAD FOOTING
S4.10 3/4" = 1'-0"

18 TYP. COLUMN BASE PLATE
S4.10 1" = 1'-0"

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REGISTERED PROFESSIONAL ENGINEER
70987
MATTHEW R. SMITH
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KLAMATH FALLS, OR 97603

No.	Description	Date
2	ADDENDUM #2	04/09/26
3	ADDENDUM #3	04/23/26

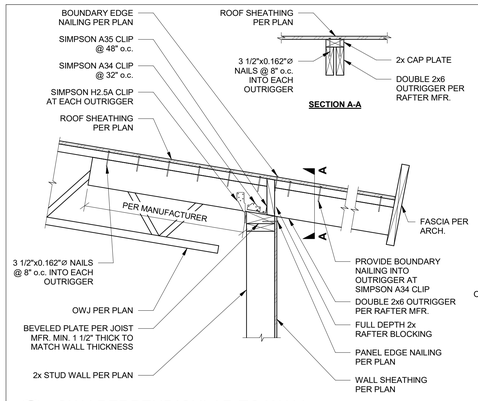
Project Number K-6433-25
Date 03/16/2026

PERMIT / BID SET

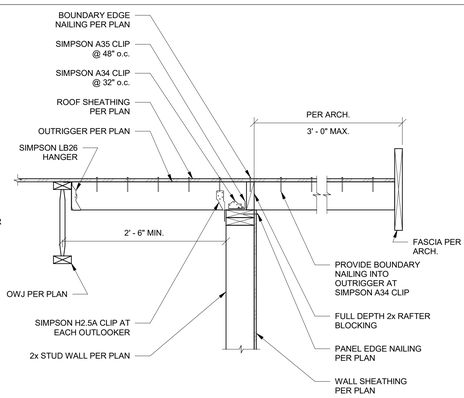
FOUNDATION DETAILS

S4.10

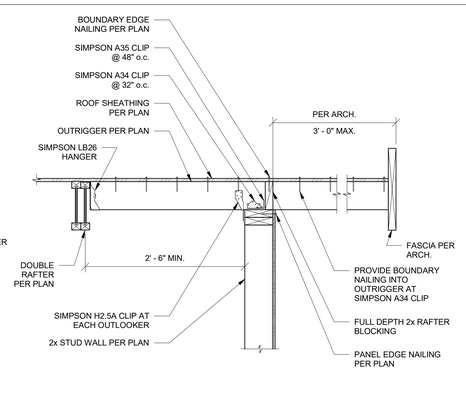
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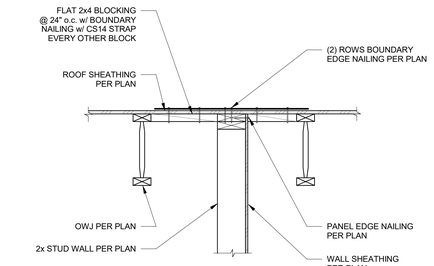
1 S6.10 OWJ PERPENDICULAR TO WALL
1" = 1'-0"



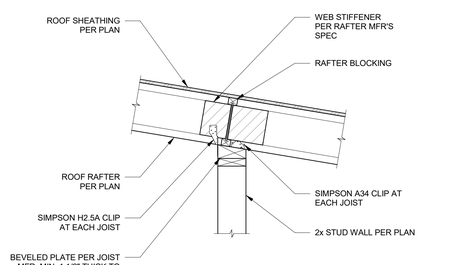
2 S6.10 OWJ PARALLEL TO WALL
1" = 1'-0"



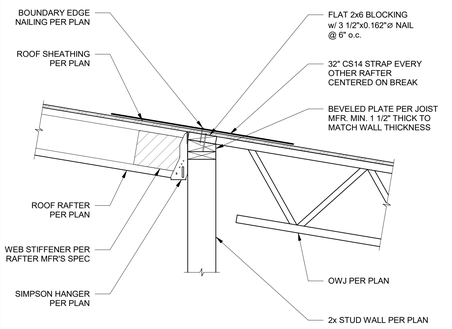
3 S6.10 RAFTER PARALLEL TO WALL
1" = 1'-0"



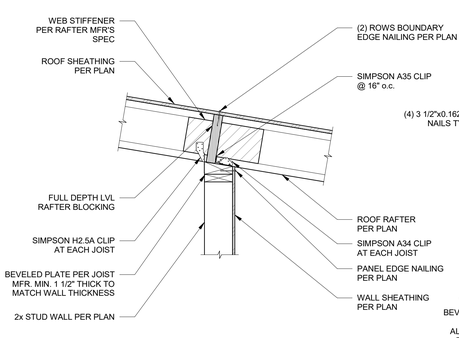
4 S6.10 OWJ PARALLEL TO INTERIOR SHEAR WALL
1" = 1'-0"



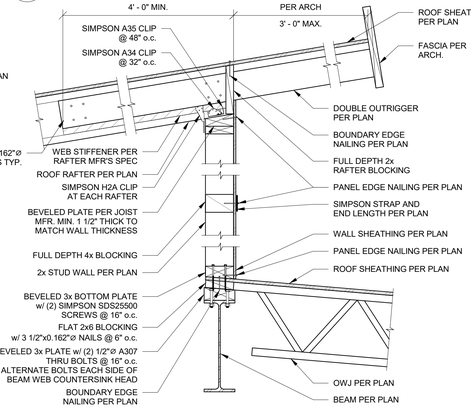
5 S6.10 RAFTER TO BEARING WALL
1" = 1'-0"



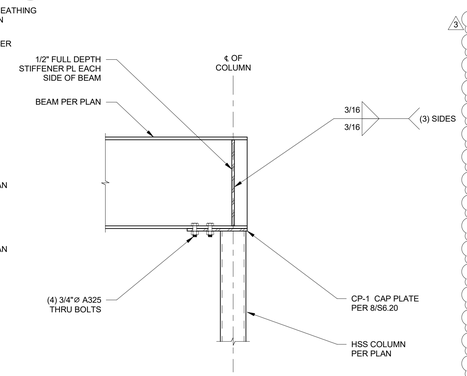
6 S6.10 OWJ TO RAFTER AT BEARING WALL
1" = 1'-0"



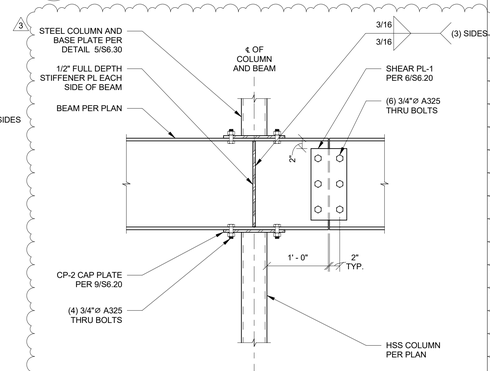
7 S6.10 RAFTER TO INTERIOR SHEAR WALL
1" = 1'-0"



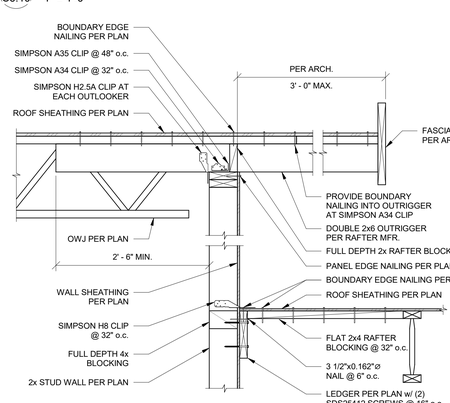
8 S6.10 CLERESTORY AT WEST BUILDING
1" = 1'-0"



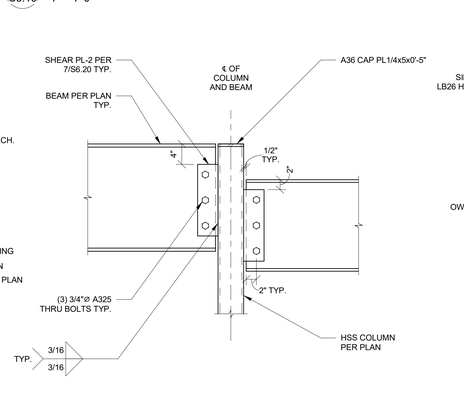
9 S6.10 BEAM TO EXT. HSS COLUMN CONNECTION
1" = 1'-0"



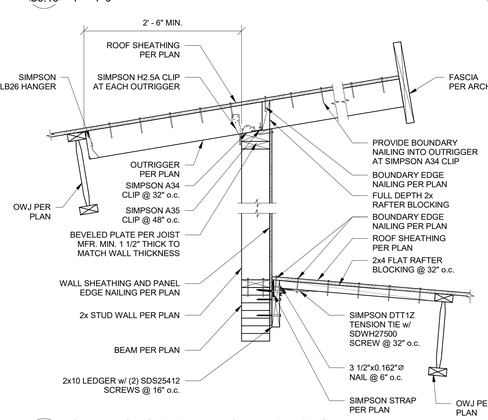
10 S6.10 TYP. BEAM TO INT. HSS COLUMN CONNECTION
1" = 1'-0"



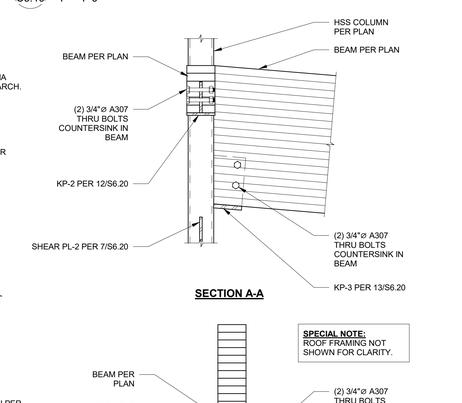
11 S6.10 UPPER ROOF TO LOWER ROOF CONNECTION
1" = 1'-0"



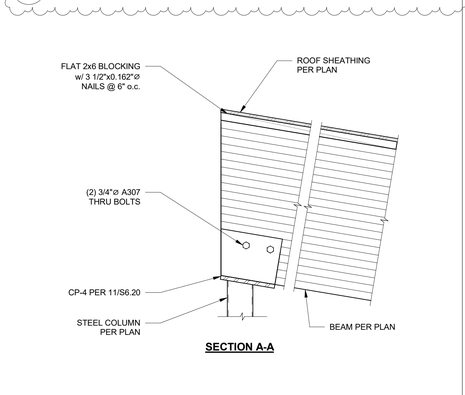
12 S6.10 BEAM TO COLUMN CONNECTION AT GRID C AND 4
1" = 1'-0"



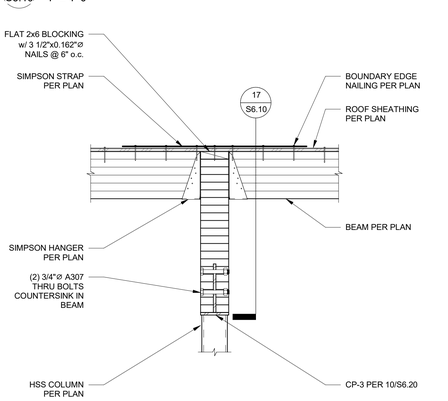
13 S6.10 CLERESTORY AT EAST BUILDING
1" = 1'-0"



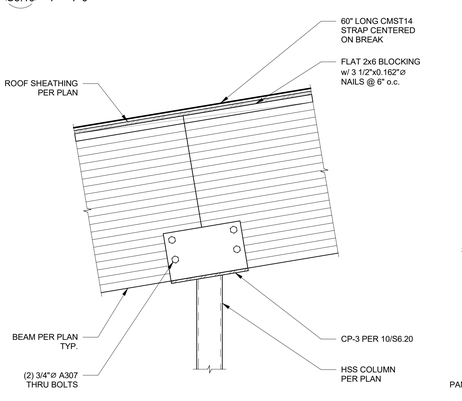
14 S6.10 HSS COLUMN AT GRID 6 & C
1" = 1'-0"



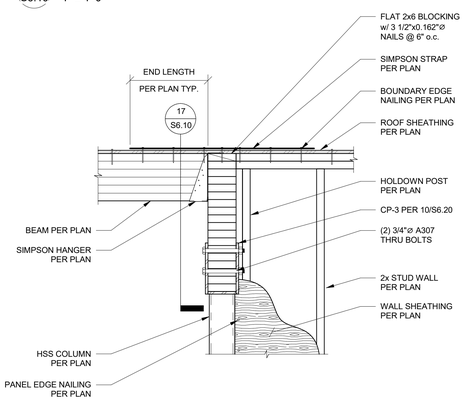
15 S6.10 GLB TO HSS COLUMN CONNECTION
1" = 1'-0"



16 S6.10 TYP. DRAG BEAM CONNECTION
1" = 1'-0"



17 S6.10 GLB TO GLB CONNECTION AT HSS COLUMN
1" = 1'-0"



18 S6.10 DRAG BEAM TO SHEAR WALL CONNECTION
1" = 1'-0"

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KLAMATH FALLS, OR 97603

No.	Description	Date
2	ADDENDUM #2	04/09/26
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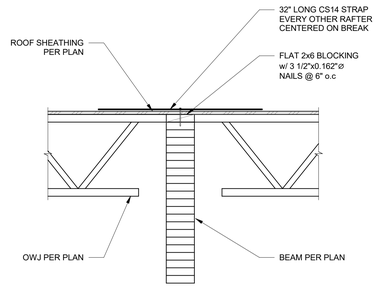
Project Number K-6433-25
Date 03/16/2026

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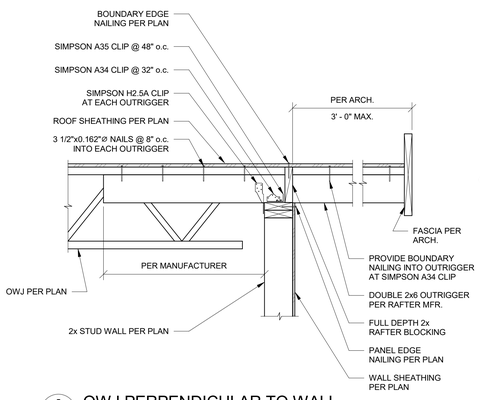
ROOF FRAMING DETAILS

S6.10

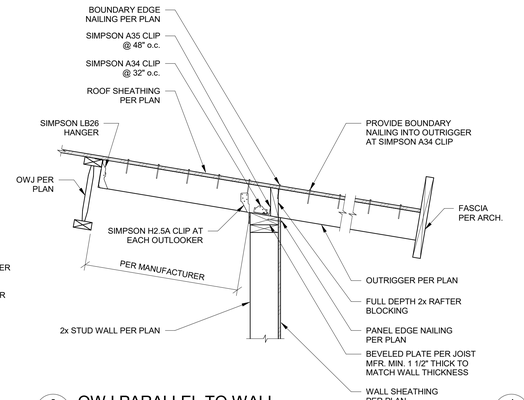
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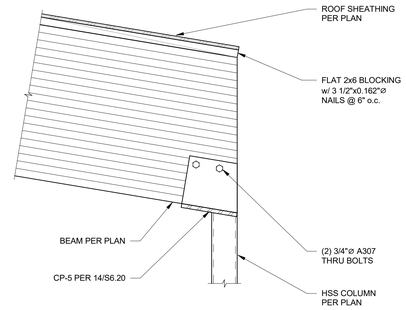
1 S6.20 OWJ PERPENDICULAR TO BEAM
1" = 1'-0"



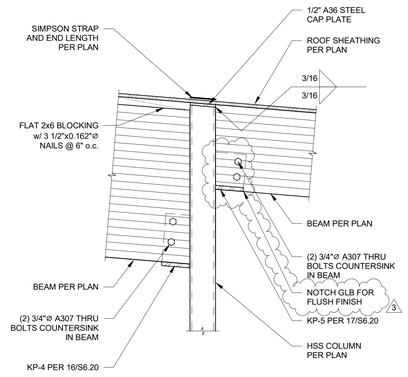
2 S6.20 OWJ PERPENDICULAR TO WALL
1" = 1'-0"



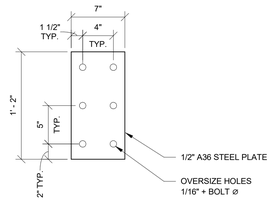
3 S6.20 OWJ PARALLEL TO WALL
1" = 1'-0"



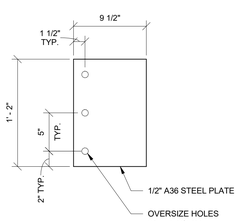
4 S6.20 TYP. GLB TO EXT. HSS COLUMN CONNECTION
1" = 1'-0"



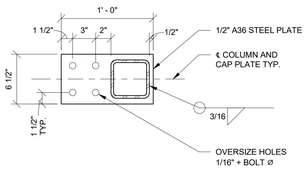
5 S6.20 GLB TO HSS COLUMN CONNECTION AT CANOPY
1" = 1'-0"



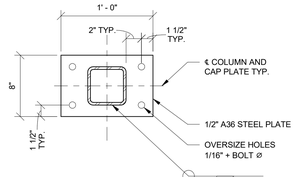
6 S6.20 SHEAR PL-1
1 1/2" = 1'-0"



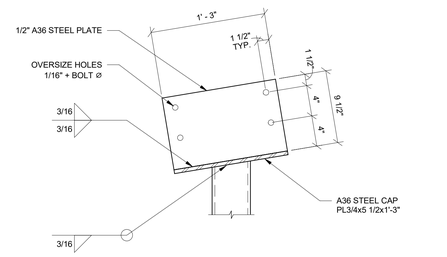
7 S6.20 SHEAR PL-2
1 1/2" = 1'-0"



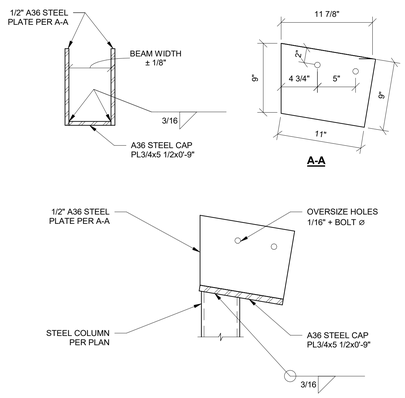
8 S6.20 CP-1
1 1/2" = 1'-0"



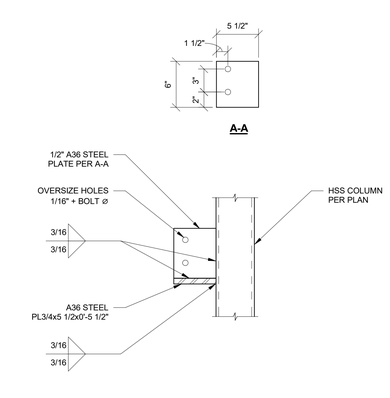
9 S6.20 CP-2
1 1/2" = 1'-0"



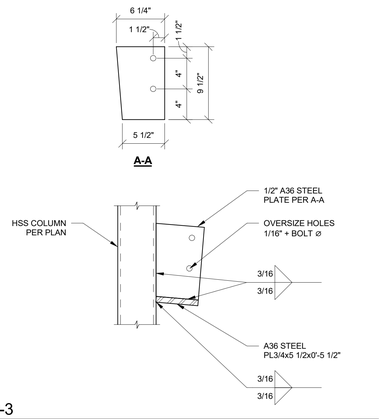
10 S6.20 CP-3
1 1/2" = 1'-0"



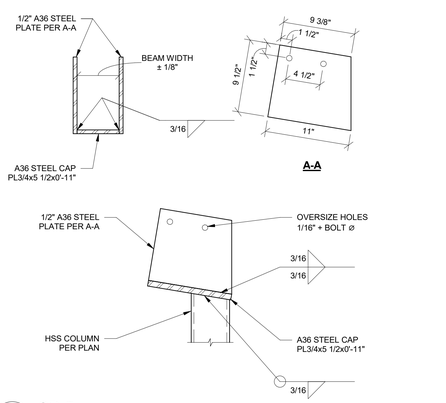
11 S6.20 CP-4
1 1/2" = 1'-0"



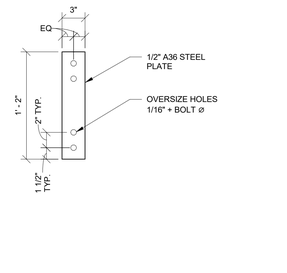
12 S6.20 KP-2
1 1/2" = 1'-0"



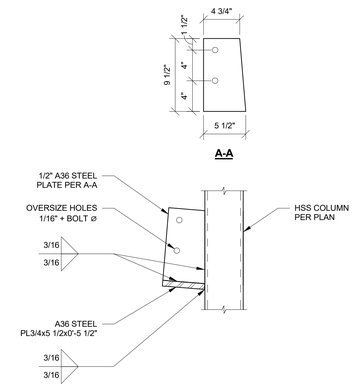
13 S6.20 KP-3
1 1/2" = 1'-0"



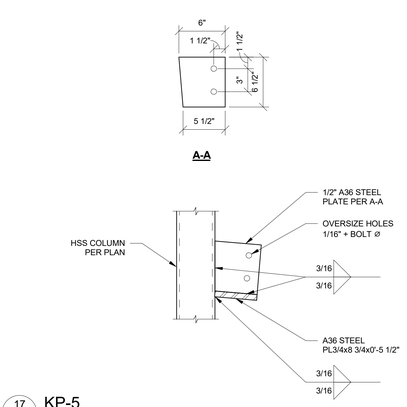
14 S6.20 CP-5
1 1/2" = 1'-0"



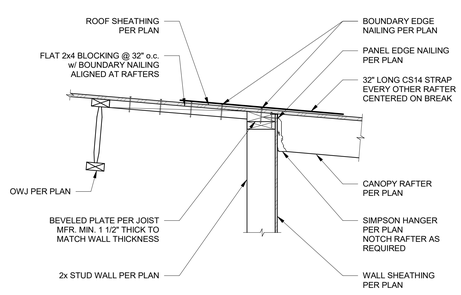
15 S6.20 CP-6
1 1/2" = 1'-0"



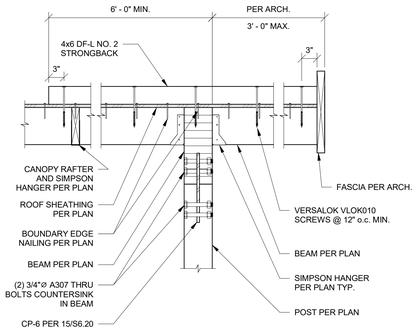
16 S6.20 KP-4
1 1/2" = 1'-0"



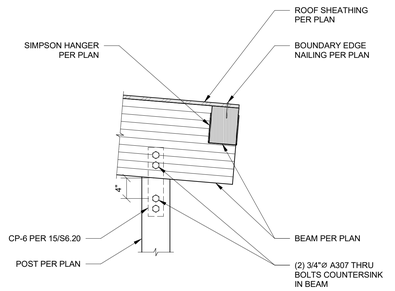
17 S6.20 KP-5
1 1/2" = 1'-0"



18 S6.20 CANOPY RAFTER TO PERPENDICULAR WALL
1" = 1'-0"



19 S6.20 HSS FASCIA TO BEAM CONNECTION
1" = 1'-0"



20 S6.20 CANOPY BEAM TO BEAM CONNECTION
1" = 1'-0"

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REGISTERED PROFESSIONAL ENGINEER
OREGON JULY 29, 2014
MATTHEW R. SMITH
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EXPIRES: 06-30-26

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KCC COSMETOLOGY CENTER

7390 S 6TH STREET
KLAMATH FALLS, OR
97603

No.	Description	Date
2	ADDENDUM #2	04/09/26
3	ADDENDUM #3	04/23/26

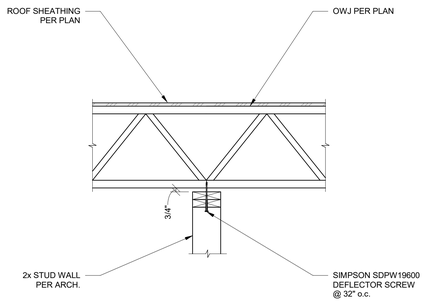
Project Number K-6433-25
Date 03/16/2026

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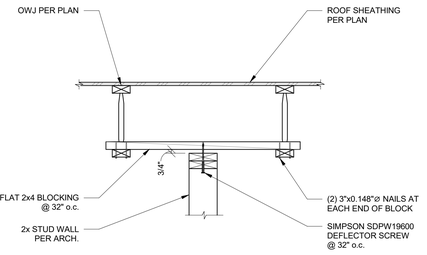
ROOF FRAMING DETAILS

S6.20

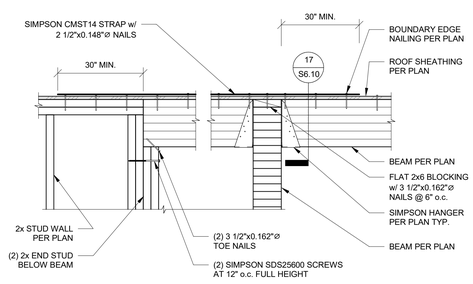
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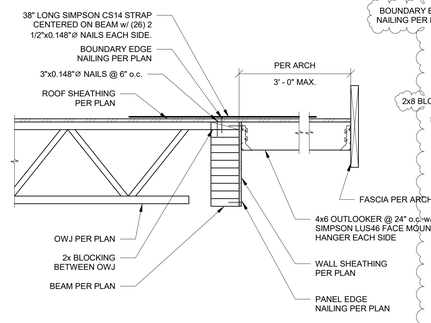
1 S6.30 RAFTER PERPENDICULAR TO PARTITION
1" = 1'-0"



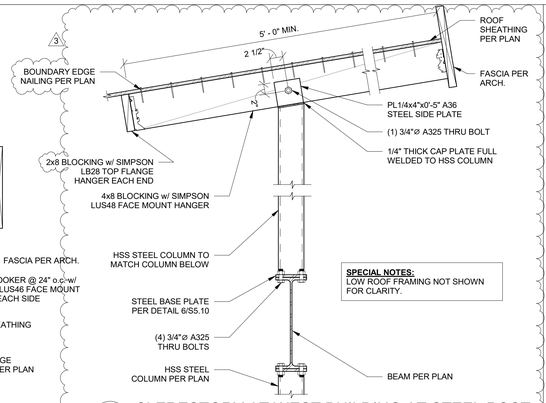
2 S6.30 RAFTER PARALLEL TO PARTITION
1" = 1'-0"



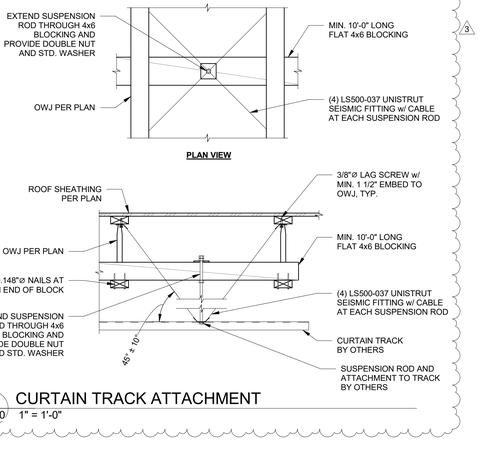
3 S6.30 TYP. DRAG BEAM CONNECTION
1" = 1'-0"



4 S6.30 OWJ PERPENDICULAR TO WALL
1" = 1'-0"



5 S6.30 CLERESTORY AT WEST BUILDING AT STEEL POST
1" = 1'-0"



6 S6.30 CURTAIN TRACK ATTACHMENT
1" = 1'-0"

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No.	Description	Date
2	ADDENDUM #2	04/09/26
3	ADDENDUM #3	04/23/26

Project Number K-6433-25
Date 03/16/2026

PERMIT / BID SET

ROOF FRAMING DETAILS

S6.30

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PUMP SCHEDULE

SYMBOL	EQUIPMENT TYPE	LOCATION / SERVING	BASIS OF DESIGN		FLOW RATE (GPM)	HEAD (FT H2O)	RPM	ELECTRICAL					COMMENTS
			MFR	MODEL				VOLTS	PH	AMPS	WATTS	HP	
BP-1	BOOSTER PUMP (DUPLEX)	FIRE RISER 148 / DOMESTIC WATER SYSTEM	DAB	EASYBOX MAX 45/120	---	---		208	1	(2) 9.4	(2)2000	(2)2.6	PACKAGED PUMP SYSTEM. DUPLEX CONTROL PANEL. SYSTEM INCLUDES HYDROPNEUMATIC TANK.
CP-1	DOMESTIC HOT WATER CIRCULATING PUMP	FIRE RISER 148 / DOMESTIC HOT WATER SYSTEM	TACO	007e-SF4	1	10	1590-4830	120	1	0.54	44	___	STAINLESS STEEL BODY, IN-LINE PUMP.

NOTES:

MISCELLANEOUS EQUIPMENT SCHEDULE

SYMBOL	EQUIPMENT TYPE	LOCATION / SERVING	BASIS OF DESIGN		CAPACITY	GAS DATA	ELECTRICAL					COMMENTS
			MFR	MODEL		INPUT (MBH)	VOLTS	PH	AMPS	WATTS	HP	
EWC-1	ELECTRIC WATER COOLER	HALLWAY 112	---	---	---	---	115	1	3.2	---	---	SEE PLUMBING FIXTURE CONNECTION SCHEDULE
MMV-1 2	MASTER MIXING VALVE	FIRE RISER 148 / DOMESTIC WATER SYSTEM	---	---	---	---	120	1	3.2	---	---	SEE PLUMBING DEVICE SCHEDULE; PROVIDE OUTLET FOR VLAVE TO PLUG IN TO
TP-1 TP-2 TP-3	TRAP PRIMER	JC 167 / FLOOR DRAINS	PRECISION PLUMBING PRODUCTS	MP-500	---	---	120	1	2	6.3	---	CONTROLLER INCLUDES CIRCUIT BREAKER, MANUAL SWITCH, AND TIME CLOCK. SERVES 1 TO 4 DRAINS.

NOTES:

GAS CALCULATIONS

FIXTURE	DESCRIPTION	NO. OF FIXT.	BTU/HR INPUT	TOTAL BTU/HR
WH-1	DOMESTIC WATER HEATER	1	199,000	199,000
WM-1	WASHING MACHINE	3	16,000	48,000
	TOTAL DEMAND (BTU)			247,000
	TOTAL DEMAND (CFH)			247

GAS: NATURAL GAS
PIPING: SCH 40 STEEL
SIZING BASED ON: OREGON MECHANICAL SPECIALTY CODE
LESS THAN 2 PSI SUPPLY PRESSURE WITH 0.5 IN. WC. PRESSURE DROP
100 FEET DEVELOPED LENGTH

1 1/4"	400 CFH
1"	195 CFH
3/4"	104 CFH
1/2"	50 CFH

WATER & WASTE SERVICE CALCULATIONS

(BASED ON APPENDIX 'A' AND TABLE 702.1/703.2 OF THE 2023 OPSC)

FIXTURE QUANTITY		APPENDIX 'A'	TOTAL FIXTURE UNITS		TABLE 7-3	
PUBLIC GENERAL USE	DESCRIPTION	PUBLIC GENERAL USE	COLD WATER	(.75) HOT WATER	PUBLIC GENERAL USE	TOTAL FIXTURE UNITS
3	CLOTHESWASHER	4.00	12.00	9.00	3.00	9.00
1	DISHWASHER	1.50	1.50	1.50	1.00	1.00
1	DRINKING FOUNTAIN	0.50	0.50	---	1.00	1.00
1	HOSE BIBB	2.50	2.50	---	---	---
4	HOSE BIBB, EACH ADDITIONAL	1.00	4.00	---	---	---
12	LAVATORY	1.00	12.00	9.00	1.00	12.00
8	SINK	1.50	12.00	9.00	2.00	16.00
6	SERVICE SINK/MOP BASIN/SHAMPOO BOWL	3.00	18.00	13.50	3.00	18.00
8	WATER CLOSET, 1.6 GPF, FLUSH VALVE	5.00	40.00	---	4.00	32.00
	TOTAL		102.50	42.00		89.00
	FLOW IN GPM		70	25		
a.	MINIMUM DAILY SERVICE PRESSURE		48	psi		
b.	WATER METER PRESSURE DROP		5	psi		
c.	BACKFLOW PREVENTER		10	psi		
d.	STATIC HEAD LOSS (0.434 /FT X) 10		4.34	psi		
e.	PRESSURE REQUIRED AT FIXTURE		35	psi		
f.	BOOSTED PRESSURE		20	psi		
	PRESSURE AVAILABLE FOR					
	FRICTION LOSS		13.66	psi		
	TOTAL EQUIVALENT PIPE LENGTH					
200	LENGTH X 1.25		250	ft		
.						
	MAXIMUM FRICTION LOSS					
	PRESS. AVAIL. X 100'/EQUIV. LENGTH		5.464	psi		
	SERVICE SIZE TO BUILDING		2"			4"

PLUMBING FIXTURE SCHEDULE

SYMBOL	FIXTURE TYPE	DESCRIPTION	BASIS OF DESIGN		ACCESSORIES	CONNECTION				ELECTRICAL	NOTES
			MFR	MODEL		W	V	CW	HW		
EWC-1	ELECTRIC WATER COOLER	ELECTRIC WATER COOLER - DOUBLE STATION, SURFACE MOUNTED, FILTERED, BOTTLE FILLER,STAINLESS STEEL FINISH, VANDAL RESISTANT, MECHANICALLY ACTIVATED, MOUNTING FRAME	ELKAY	LZSG8WSSK	IN-WALL CARRIER SYSTEM - ELKAY MODEL MLP100	1-1/2"	1-1/2"	1/2"	--	115V, 60HZ, 6 AMPS	SEE ARCHITECTURAL PLANS FOR MOUNTING HEIGHT. COORDINATE ELECTRICAL REQUIREMENTS WITH DIVISION 26.
FD-1	FLOOR DRAIN	CAST IRON BODY, FLASHING COLLAR, 6-INCH ADJUSTABLE NICKEL BRONZE STRAINER HEAD, TRAP PRIMER, VANDAL PROOF SCREWS	JR SMITH	2005Y-A-06-P050-U-NB		SEE PLANS	SEE PLANS	PRIMER CONN.	--	--	
FS-1	FLOOR SINK	12-1/2" TOP, CAST IRON FLANGED RECEPTOR, SEEPAGE HOLES, ACID RESISTANT COATED INTERIOR, NICKEL BRONZE RIM, LESS GRATE, ALUMINUM DOME BOTTOM STRAINER, 10-INCH DEEP, NO-HUB OUTLET	JR SMITH	3160Y		SEE PLANS	SEE PLANS	PRIMER CONN.	--	--	SEE DRAWINGS FOR GRATE
IM-1	OUTLET BOX	ICE MAKER OUTLET BOX (FIRE RATED) - NSF-372 COMPLIANT, ABS BOX/FRAME, NO-LEAD BRASS VALVE, ASSE 1010 WATER HAMMER ARRESTOR, 1/4" OUTLET CONNECTION 2	SIOUX CHIEF	696RG1010		--	--	1/2"	--	--	SUPPLY CONNECTION TYPE PER PIPING MATERIAL. INSTALL WITH BOTTOM OF BOX AT 18" A.F.F. UNLESS NOTED OTHERWISE.
L-1	LAVATORY	WALL HUNG, ADA COMPLIANT, VITREOUS CHINA, SINGLE-HOLE PUNCH, REAR OVERFLOW, VITREOUS CHINA SHROUD/KNEE CONTACT GUARD	AMERICAN STANDARD	0955001EC	DECK MOUNTED, METERING FAUCET, SINGLE HOLE, SINGLE-SUPPLY, 0.20 MAX. GALLON/CYCLE, VANDAL RESISTANT; CHICAGO FAUCETS MODEL 3500-E2805ABCP; ASSE 1070 COMPLIANT MIXING VALVE, INTEGRAL CHECK VALVES, WATTS MODEL LFMMV (SET DISCHARGE TEMPERATURE AT 110 DEG. F.)	1-1/2"	1-1/2"	1/2"	1/2"	--	MOUNT LAVATORY AT ADA COMPLIANT HEIGHT, SEE ARCHITECTURAL PLANS FOR HEIGHT AND LOCATION. SEE SPECIFICATION SECTION 224000 FOR FLOOR MOUNTED CARRIER, TRAP COVERS, SUPPLY STOPS AND ADDITIONAL ACCESSORIES
MS-1	MOP SINK	FLOOR MOUNTED, TERRAZZO, 24-INCHES X 24-INCHES X 10-INCHES, WITH OPTIONAL (A-20) ALUMINUM BUMPER GUARDS AND (BP) SPLASH PANELS	STERN WILLIAMS	MTB-2424	WALL HUNG, MOP SINK FAUCET, 8-INCH CENTERS, LEVER HANDLES, PAIL HOOK, CHROME PLATED, ATMOSPHERIC VACUUM BREAKER, 3/4" THREADED HOSE OUTLET AND WALL FLANGE; CHICAGO FAUCETS MODEL 540-LD897SWXFABCP, 3/8" OFFSET INLET SUPPLY ARM WITH INTEGRAL CHECK; CHICAGO FAUCETS MODEL GCJKABCP	3"	2"	1/2"	1/2"	--	
MS-2	MOP SINK	FLOOR MOUNTED, TERRAZZO, 24-INCHES X 24-INCHES X 6-INCHES, WITH OPTIONAL (A-20) ALUMINUM BUMPER GUARDS AND (BP) SPLASH PANELS	STERN WILLIAMS	SB2424	WALL MOUNT 8-INCH MIXING FAUCET, CHROME PLATED BRASS BODY, VACUUM BREAKER, 36-INCH FLEXIBLE STAINLESS STEEL HOSE, SPRAY VALVE WITH HOOK NOZZLE, COMPRESSION CARTRIDGES WITH SPRING CHECKS, LEVER HANDLES; T&S BRASS B-0610-36H 2	3"	2"	1/2"	1/2"	--	
S-1	SINK	DROP-IN, SINGLE BOWL, 18 GAUGE STAINLESS STEEL, 19-1/2-INCHES X 19-INCHES X 6-1/2-INCHES DEEP, 30-INCH MINIMUM CABINET SIZE, 1-HOLE PUNCH, BARRIER FREE	ELKAY	LRAD191965 2	DECK MOUNTED FAUCET, GOOSENECK WITH PULL DOWN SPOUT, SINGLE LEVER, 1.5 GPM AERATED FLOW RATE; CHICAGO FAUCETS MODEL 434-ABCP	2"	1-1/2"	1/2"	1/2"	--	SEE SPECIFICATION SECTION 224000 FOR SUPPLY STOPS AND ADDITIONAL ACCESSORIES.
S-2	SHAMPOO SINK	BY OTHERS, CONTRACTOR INSTALLED.				2"	1-1/2"	1/2"	1/2"	--	SEE SPECIFICATION SECTION 224000 FOR SUPPLY STOPS AND ADDITIONAL ACCESSORIES.
S-3	SINK	DROP-IN, SINGLE BOWL, 18 GAUGE STAINLESS STEEL, 25-INCHES X 19-1/2-INCHES X 12-1/8-INCHES DEEP, 30-INCH MINIMUM CABINET SIZE, 1-HOLE PUNCH	ELKAY	DLFR251912	DECK MOUNTED FAUCET, GOOSENECK WITH PULL DOWN SPOUT, SINGLE LEVER, 1.5 GPM AERATED FLOW RATE; CHICAGO FAUCETS MODEL 434-ABCP	2"	1-1/2"	1/2"	1/2"	--	SEE SPECIFICATION SECTION 224000 FOR SUPPLY STOPS AND ADDITIONAL ACCESSORIES.
S-4 2	LAUNDRY SINK	FLOOR MOUNTED, 14 GAUGE 304 STAINLESS STEEL, CENTER DRAIN, 27-INCHES X 27-1/2-INCHES X 14-INCHES, 16 GAUGE STAINLESS STEEL LEGS	ELKAY	SS8124	8-INCH WALL MOUNT MIXING FAUCET, POLISHED CHROME, 8-INCH SWING NOZZLE, 8-INCH RISER, 9-FEET COILED HOSE, 1.15 GPM SPRAY VALVE; T&S PG-8WESV08ZCJZF	2"	1-1/2"	1/2"	1/2"	--	SEE SPECIFICATION SECTION 224000 FOR SUPPLY STOPS AND ADDITIONAL ACCESSORIES.
WC-1	WATER CLOSET	FLOOR MOUNTED, FLOOR OUTLET, GRAVITY TANK TYPE, VITREOUS CHINA, STANDARD HEIGHT, ELONGATED, 1.28 GPF, 12" ROUGH-IN	AMERICAN STANDARD	3451.001	FLUSH VALVE - MANUAL OPERATION, 1.28 GPF, POLISHED CHROME FINISH, TOP SPUD; SLOAN MODEL ROYAL 111-1.28; SEAT - ELONGATED, PLASTIC, SELF-SUSTAINING CHECK HINGES WITH NON-CORRODING STAINLESS STEEL POSTS; BEMIS MODEL 1955SSCT	3"	2"	1/2"	--	--	SEE ARCHITECTURAL PLANS FOR LOCATION. SEE SPECIFICATION SECTION 224000 FOR ADDITIONAL ACCESSORIES.
WC-2	WATER CLOSET	FLOOR MOUNTED, FLOOR OUTLET, GRAVITY TANK TYPE, VITREOUS CHINA, ADA HEIGHT, ELONGATED, 1.28 GPF, 10" ROUGH-IN	AMERICAN STANDARD	3461.001	FLUSH VALVE - MANUAL OPERATION, 1.28 GPF, POLISHED CHROME FINISH, TOP SPUD; SLOAN MODEL ROYAL 111-1.28; SEAT - ELONGATED, PLASTIC, SELF-SUSTAINING CHECK HINGES WITH NON-CORRODING STAINLESS STEEL POSTS; BEMIS MODEL 1955SSCT	3"	2"	1/2"	--	--	SEE ARCHITECTURAL PLANS FOR LOCATION. SEE SPECIFICATION SECTION 224000 FOR ADDITIONAL ACCESSORIES.
WH-1	WALL HYDRANT	ENCASED (RECTANGULAR BOX), NON-FREEZE, ANTI-SIPHON, AUTOMATIC DRAINING, CHROME PLATED BOX/DOOR ASSEMBLY, DOUBLE CHECK BACKFLOW PREVENTER, LOOSE TEE KEY OPERATION	WOODFORD	B67		--	--	3/4"	--	--	
WM-1	OUTLET BOX	WASHING MACHINE OUTLET BOX (FIRE RATED) - NSF-372 COMPLIANT, ABS BOX/FRAME, NO-LEAD BRASS VALVES, ASSE 1010 WATER HAMMER ARRESTORS, 3/4" OUTLET CONNECTIONS, 2" DRAIN CONNECTION, INDIVIDUAL DRAIN AND SUPPLY BOXES	SIOUX CHIEF	696RG2313		2"	1-1/2"	1/2"	1/2"	--	SUPPLY CONNECTION TYPE PER PIPING MATERIAL. INSTALL WITH BOTTOM OF BOX AT 34" A.F.F. UNLESS NOTED OTHERWISE.

NOTES:
1 SEE ARCHITECTURAL DRAWINGS FOR ALL FIXTURE MOUNTING HEIGHTS AND LOCATIONS.
* UNLESS NOTED OTHERWISE ON DRAWINGS

PLUMBING DEVICES SCHEDULE

SYMBOL	FIXTURE TYPE	DESCRIPTION	BASIS OF DESIGN		ACCESSORIES	CONNECTION				NOTES
			MFR	MODEL		W	V	CW	HW	
CNT-1	CONDENSATE NEUTRALIZING TUBE	UP TO 1.7 GPH, PVC TUBING FILLED WITH 3/8" AGGREGATE AND 100% CALCIUM CARBONATE, SUPPORT BRACKETS, INLET AND OUTLET HOSE BARB FITTING.	AO SMITH	CN2-300		3/4"	---	---	---	0 TO 225,000 BTU/H
DET-1	DOMESTIC WATER EXPANSION TANK - IAPMO	4.4 GALLON CAPACITY, WELDED STEEL CONSTRUCTION, DIAPHRAGM TYPE, SEPARATE WATER RESERVOIR, PRE-PRESSURIZED, IAPMO CERTIFIED.	AMTROL THERM-X-TROL	ST-12		---	---	3/4"	---	
LMV-1	LAVATORY MIXING VALVE	THERMOSTATIC MIXING VALVE, ASSE 1070 COMPLIANT, INTEGRAL CHECK VALVES, LEAD FREE: WATTS LFMMV	CASH ACME	HG135		---	---	1/2"	1/2"	
MMV-1	MASTER MIXING VALVE	FULL PACKAGE SYSTEM WITH HIGH/LOW FLOW MIXING VALVES, GAUGES, PRV(S), VALVES, UNIONS AND OTHER CONNECTIONS, EXPOSED. SYSTEM PEAK = 15 GPM AT 5 PSI FALLOFF.	LEONARD	PNV-100-LF		---	---	3/4"	3/4"	1" OUTLET

NOTES:

GAS WATER HEATER SCHEDULE - TANK TYPE

SYMBOL	EQUIPMENT TYPE	LOCATION / SERVING	BASIS OF DESIGN		GAS			CAPACITY			ELECTRICAL			COMMENTS
			MFR	MODEL	TYPE	INPUT (BTU/H)	PRESSURE - MIN/MAX (IN. W.C.) MIN/MAX (IN. W.C.)	TANK CAPACITY (GALLONS) CAPACITY (GALLONS)	RECOVERY RATE @ 100F RISE (GPH)	EFFICIENCY (%)	VOLTS	PH	AMPS	
WH-1	WATER HEATER - GAS FIRED	FIRE RISER 148 / DOMESTIC HOT WATER SYSTEM	AO SMITH	BTH-199	GAS	199,000	3.5 - 14	100	256	96	120	1	5	

NOTES:

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No.	Description	Date
2	Addendum #2	4/9/2026
3	Addendum #3	4/21/2026

Project Number 2507
Date 3/16/2026

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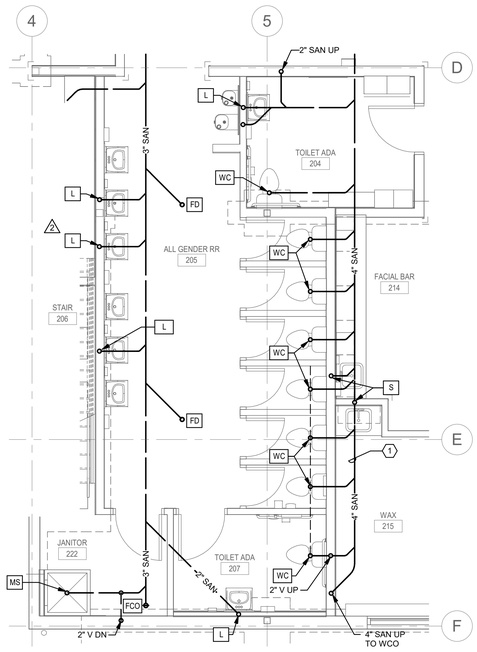
SCHEDULES - PLUMBING

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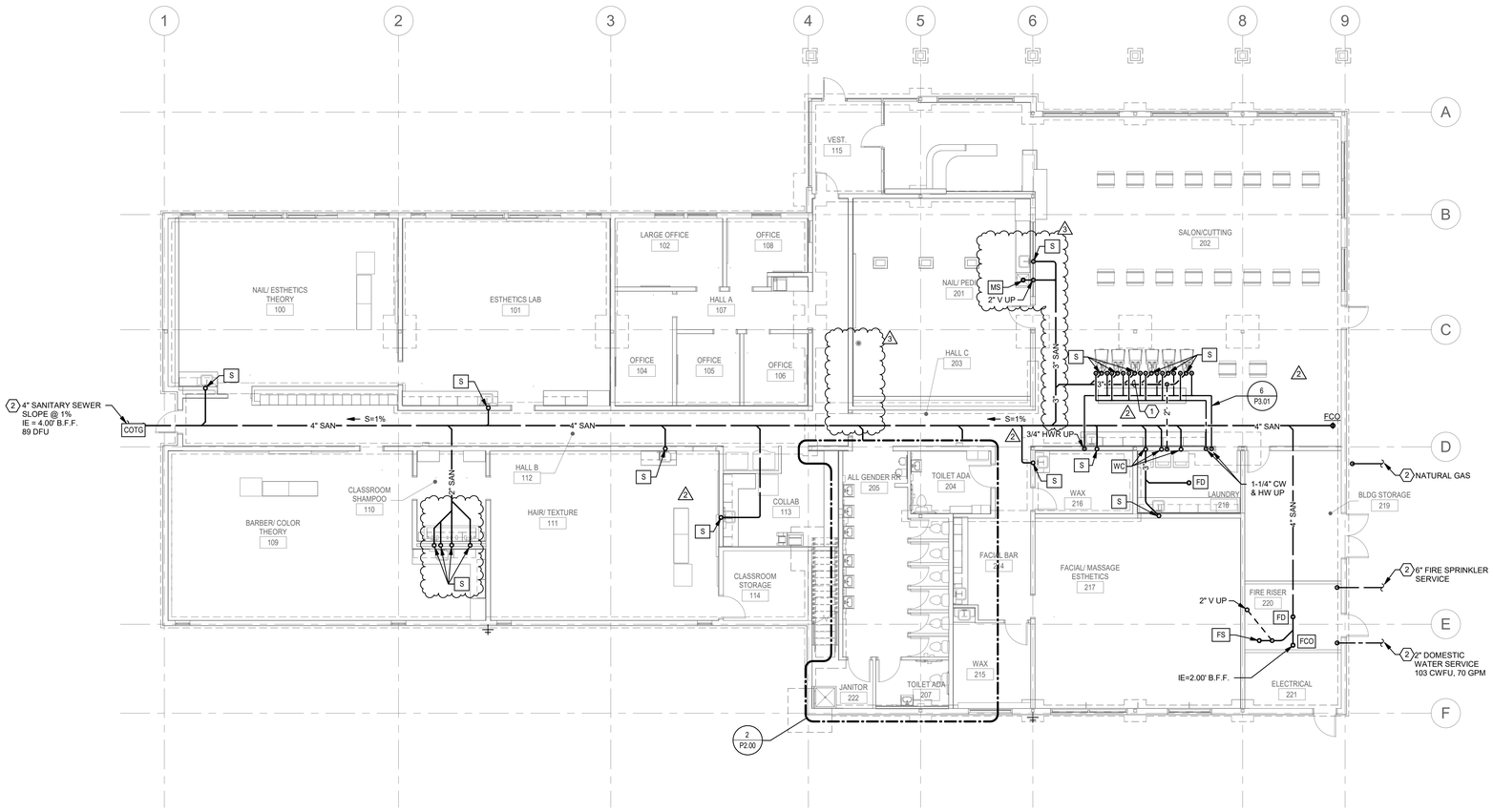
SHEET KEYNOTES

1. PIPING SERVING FIXTURES IS DESIGNED AS A CIRCUIT VENT SYSTEM PER OPSC.
2. SEE CIVIL DRAWINGS FOR CONTINUATION. COORDINATE CONNECTION POINTS PRIOR TO INSTALLATION.



2 ENLARGED PARTIAL PLAN - PLUMBING

0' 2' 4' 8'
1/4" = 1'-0"



1 UNDERFLOOR PLAN - PLUMBING

0' 4' 8' 16'
1/8" = 1'-0"

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No.	Description	Date
2	Addendum #2	4/9/2026
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Project Number 2507
Date 3/16/2026

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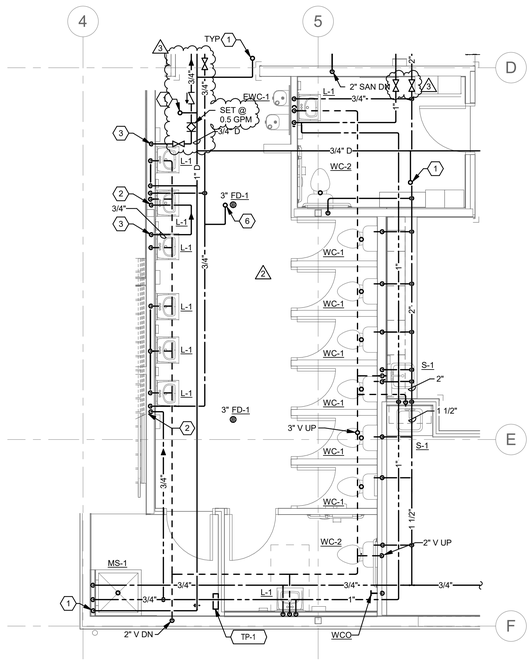
UNDERFLOOR PLAN - PLUMBING

P2.00

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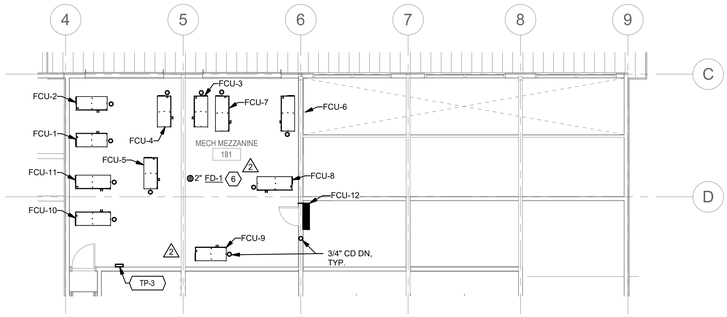
SHEET KEYNOTES

1. ROUTE CONDENSATE PIPING FROM FAN COIL DOWN THROUGH FLOOR AND DISCHARGE TO MOP SINK WITH AIR GAP. COORDINATE EXACT LOCATION WITH EQUIPMENT PRIOR TO INSTALLATION.
2. ROUTE HW PIPING DN IN WALL TO SERVE LAVATORIES. (2)
3. ROUTE HW PIPING UP TO CEILING SPACE AFTER SERVING LAST LAVATORIES. (2)
4. ROUTE CW/HW PIPING IN WALL SO SERVE WASHING MACHINES.
5. INSTALL FAUCET ON WALL OVER MOP SINK. COORDINATE MOUNTING HEIGHT WITH OWNER.
6. (2) PROVIDE ELECTRONIC TRAP PRIMER, TP-3 TO SERVE MEZZANINE FLOOR DRAIN. EXTEND 3/4" CW UP TO MEZZANINE .
7. ALL UTILITIES SERVING SHAMPOO BOWLS TO COME FROM BELOW THE FLOOR. PROVIDE SUPPORTS AS NEEDED TO SECURE WATER AND WASTE PIPING. COORDINATE INSTALLATION WITH EQUIPMENT REQUIREMENTS.
8. (2) 3/4" G DN IN WALL. ROUTE FULL SIZE HEADER IN WALL TO SERVE (3) DRYERS. PROVIDE SAME SIZE CONNECTION AS DRYER CONNECTION SIZE.
9. 3/4" CW/HW DOWN IN WALL. ROUTE LOW IN WALL BELOW WINDOW TO SINK AND MOP SINK.
10. 2" VENT DOWN IN WALL. ROUTE AS HIGH AS POSSIBLE IN WALL BELOW WINDOW AND CONNECT TO SINK AND MOP SINK.
11. 1" CW AND HW DN IN WALL TO SERVE (3)S-4 AND S-1. LOOP HW IN WALL AND BACK UP TO CEILING SPACE.



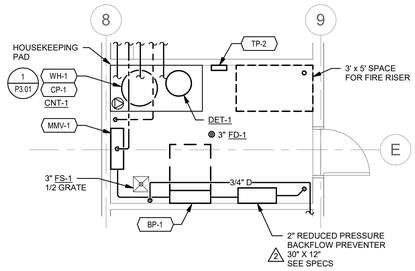
2 ENLARGED PARTIAL PLAN - PLUMBING

1/4" = 1'-0"



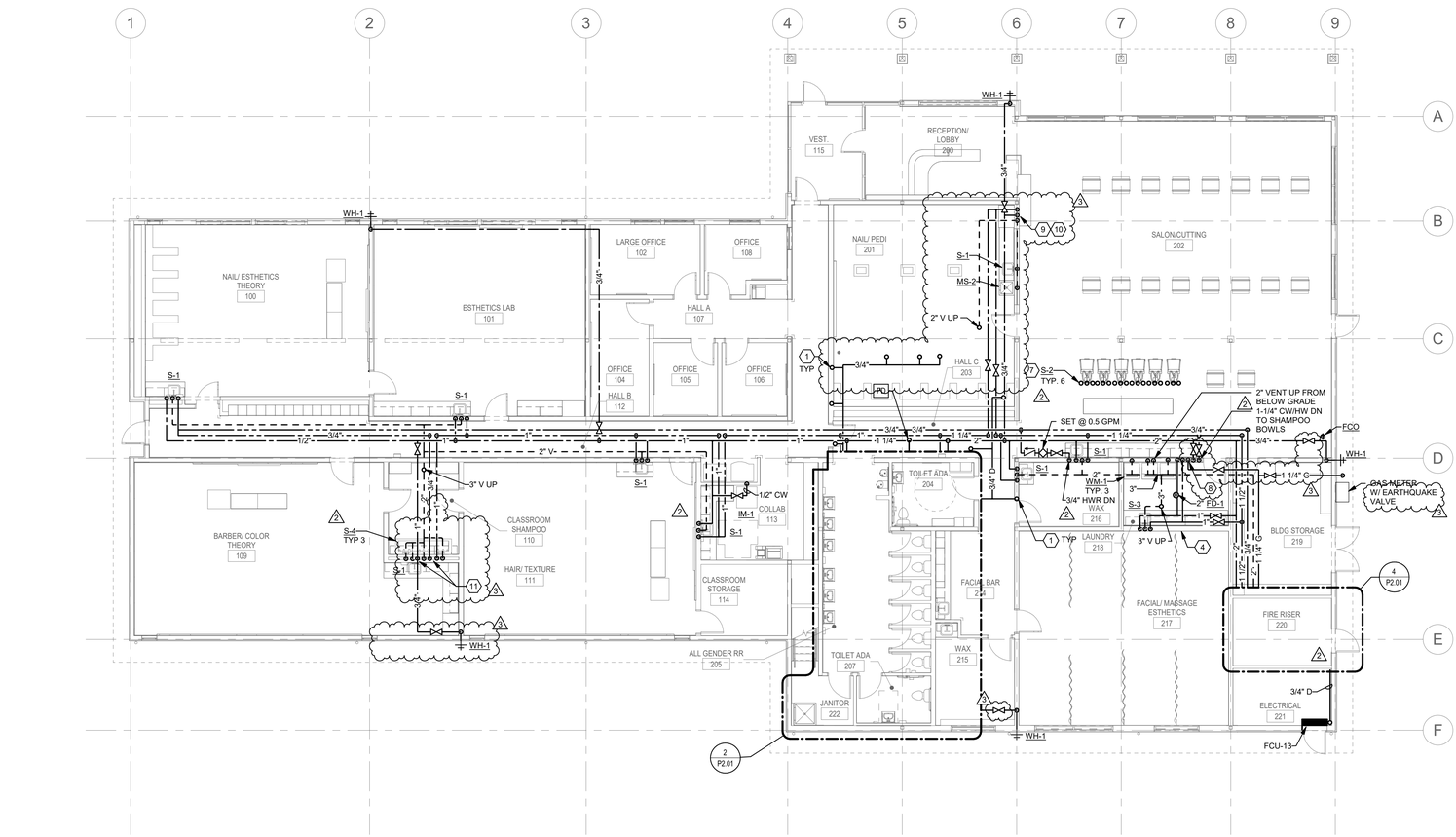
3 MECHANICAL MEZZANINE PLAN - PLUMBING

1/8" = 1'-0"



4 ENLARGED FIRE RISER ROOM - PLUMBING

1/4" = 1'-0"



1 OVERALL FLOOR PLAN - PLUMBING

1/8" = 1'-0"

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No.	Description	Date
2	Addendum #2	4/9/2026
3	Addendum #3	4/21/2026

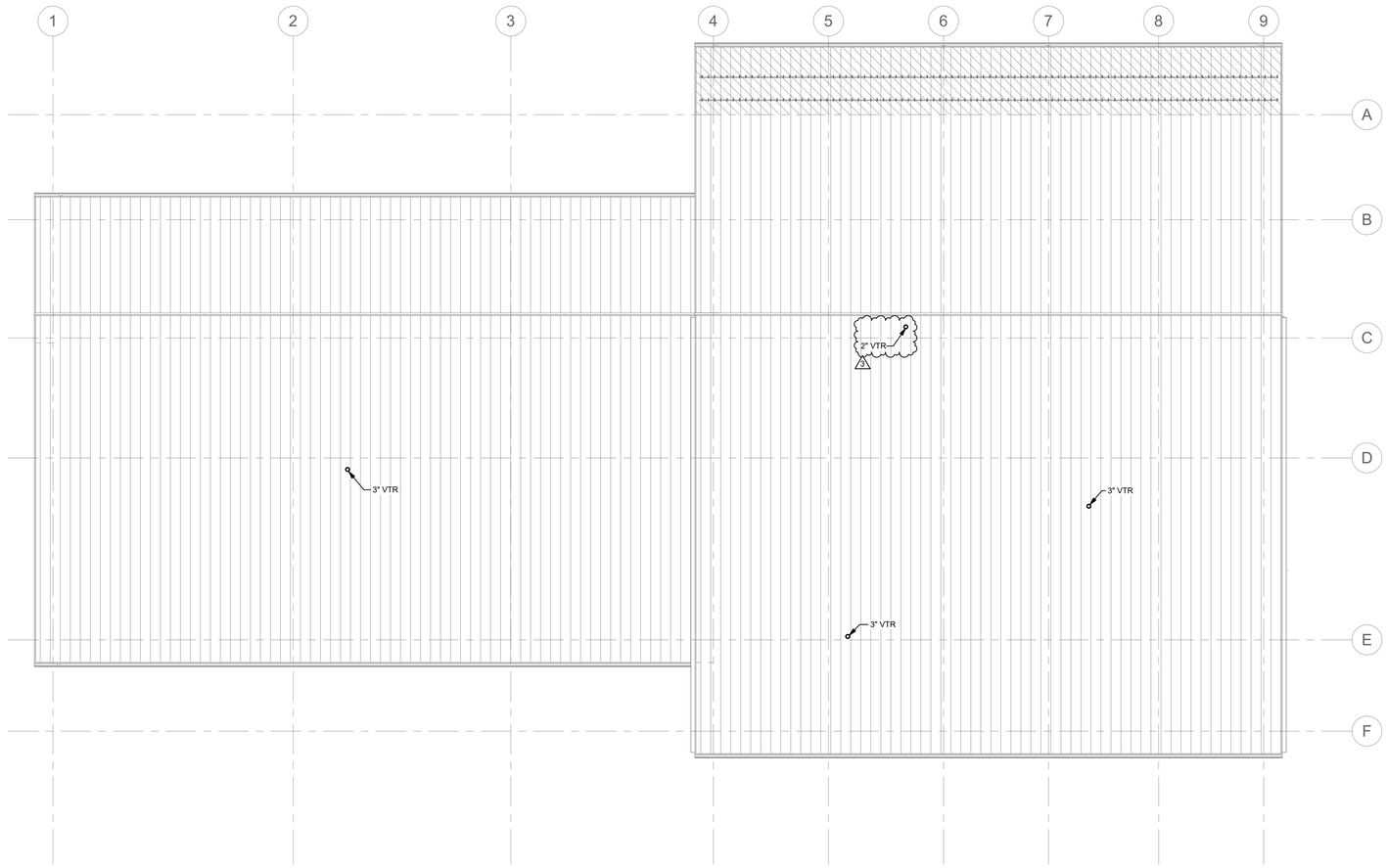
Project Number 2507
Date 3/16/2026

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OVERALL FLOOR PLAN - PLUMBING

P2.01

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1 OVERALL ROOF PLAN - PLUMBING

0' 4' 8' 16'

1/8" = 1'-0"

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OREGON
MAY 10, 2005
ANDREW LASSE

EXPIRES: 12/31/26

INTERFACE ENGINEERING

PROJECT 2025-1011
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Klamath Community College, Cosmetology Center Project

7390 S 6TH STREET
KLAMATH FALLS, OR
97603

No.	Description	Date
3	Addendum #3	4/21/2026

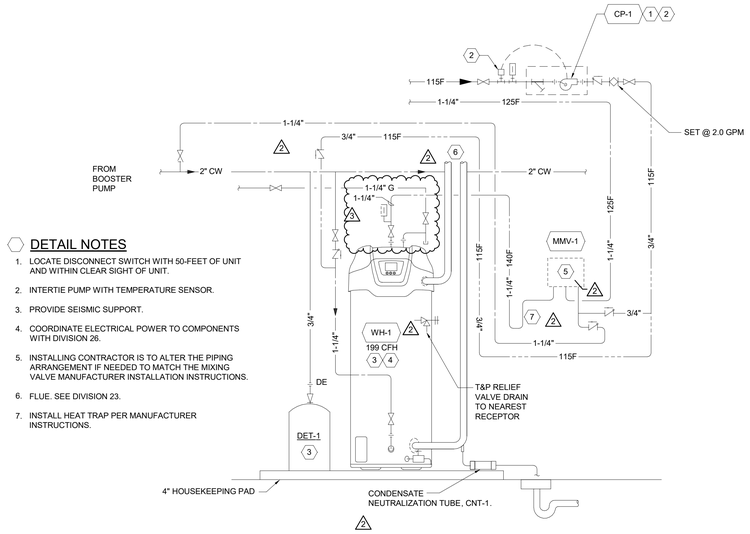
Project Number 2507
Date 3/16/2026

PERMIT / BID SET

OVERALL ROOF PLAN - PLUMBING

P2.02

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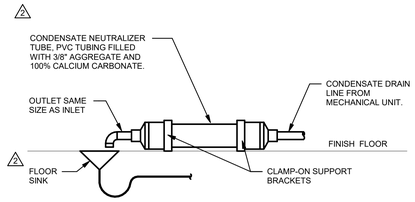


DETAIL NOTES

1. LOCATE DISCONNECT SWITCH WITH 50-FEET OF UNIT AND WITHIN CLEAR SIGHT OF UNIT.
2. INTERTIE PUMP WITH TEMPERATURE SENSOR.
3. PROVIDE SEISMIC SUPPORT.
4. COORDINATE ELECTRICAL POWER TO COMPONENTS WITH DIVISION 26.
5. INSTALLING CONTRACTOR IS TO ALTER THE PIPING ARRANGEMENT IF NEEDED TO MATCH THE MIXING VALVE MANUFACTURER INSTALLATION INSTRUCTIONS.
6. FLUE. SEE DIVISION 23.
7. INSTALL HEAT TRAP PER MANUFACTURER INSTRUCTIONS.

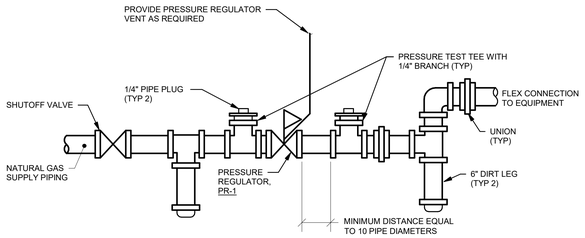
1 WATER HEATER

NO SCALE



2 CONDENSATE NEUTRALIZATION

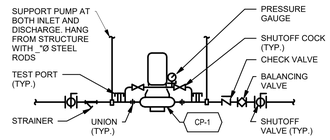
NO SCALE



NOTE: PIPING DOWNSTREAM OF REGULATOR TO BE SAME SIZE OR GREATER AS EQUIPMENT CONNECTION.

3 GAS REGULATOR

NO SCALE

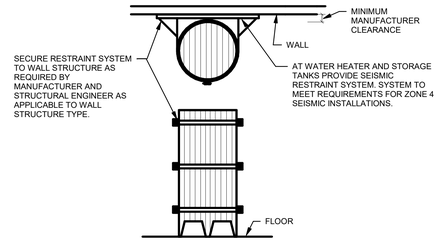


4 CIRCULATION PUMP

NO SCALE

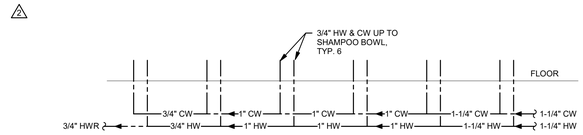
SIZE	TANK HGT ABOVE FLOOR	NO. OF STRAPS	LOCATION
66 GAL OR LESS	12" OR LESS	1	BETWEEN TOP 1/3 AND 1/2 OF TANK
66 GAL OR LESS	MORE THAN 12"	2	TOP-IN TOP 1/3 OF TANK BOTTOM-3" ABOVE OR BELOW ACCESS PANEL
66 GAL OR 100	12" OR LESS	2	TOP-IN TOP 1/3 OF TANK BOTTOM-3" ABOVE OR BELOW ACCESS PANEL
66 GAL OR 100	MORE THAN 12"	3	TOP-IN TOP 1/3 OF TANK BOTTOM-3" ABOVE OR BELOW ACCESS PANEL MIDDLE-CENTER OF TANK

NOTE: MAINTAIN CLEARANCES TO COMBUSTIBLES AS REQUIRED BY MANUFACTURER.
UTILIZE NON COMBUSTIBLE MATERIAL AS SPACER.



5 SEISMIC BRACING

NO SCALE



6 SHAMPOO BOWL PIPING DIAGRAM

NO SCALE

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MAY 10, 2005
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No.	Description	Date
2	Addendum #2	4/9/2026
3	Addendum #3	4/21/2026

Project Number 2507
Date 3/16/2026

PERMIT / BID SET

DETAILS - PLUMBING

P3.01

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MECHANICAL SYMBOL LIST

NOTE: This is a standard symbol list and not all items listed may be used.

Abbreviations

AFF	ABOVE FINISHED FLOOR
AD	ACCESS DOOR
A/C	AIR CONDITION(ED)
BDD	BACKDRAFT DAMPER
BFP	BACKFLOW PREVENTER
BFF	BELOW FINISHED FLOOR
BHP	BRAKE HORSEPOWER
CD	CEILING DIFFUSER
CV	CHECK VALVE
COP	COEFFICIENT OF PERFORMANCE
CW	COLD WATER
CD	CONDENSATE DRAIN
CU	CONDENSING UNIT
CONT.	CONTINUATION
DB	DECIBEL
DIA	DIAMETER
DX	DIRECT EXPANSION
D	DROP
DB	DRY BULB
EFF	EFFICIENT
ELECT	ELECTRICAL
EER	ENERGY EFFICIENCY RATING
EAT	ENTERING AIR TEMPERATURE
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
EF	EXHAUST FAN
F	FAHRENHEIT
FT	FEET
FD	FIRE DAMPER
FLA	FULL LOAD AMPS
GAL	GALLONS
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HD	HEAD
HTR	HEATER
HTG	HEATING
HP	HORSEPOWER
HWC	HOT WATER COIL
IN	INCHES
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
KW	KILOWATT
LH	LATENT HEAT
LAT	LEAVING AIR TEMPERATURE
MAX	MAXIMUM
MIN	MINIMUM
MA	MIXED AIR
MD	MOTORIZED DAMPER
N/A	NOT APPLICABLE
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
NO.	NUMBER
OC	ON CENTER
OBD	OPPOSED BLADE DAMPER
OA	OUTSIDE AIR
OD	OUTSIDE DIAMETER
PH	PHASE
LBS.	POUNDS
PSI	POUNDS PER SQUARE INCH
PD	PRESSURE DROP
PRV	PRESSURE REDUCING VALVE
QTY	QUANTITY
RET	RETURN
RA	RETURN AIR
RPM	REVOLUTIONS PER MINUTE
R	RISE
SEER	SEASONAL ENERGY EFFICIENCY RATING
SH	SENSIBLE HEAT
SOV	SHUT OFF VALVE
SF	SQUARE FEET
SP	STATIC PRESSURE
SA	SUPPLY AIR
T, TEMP	TEMPERATURE
TD	TEMPERATURE DIFFERENCE
MBH	THOUSAND BTU'S PER HOUR
TH	TOTAL HEAT
TP	TOTAL PRESSURE
V	VOLT
WC	WATER COLUMN
W	WATT
WB	WET BULB
W/	WITH

Control Symbols

- CARBON DIOXIDE SENSOR
- AC-1 — SPACE TEMPERATURE SENSOR/THERMOSTAT

Dampers

- FIRE DAMPER
- FIRE/SMOKE DAMPER
- MOTORIZED DAMPER
- SMOKE DAMPER
- VOLUME DAMPER

Diffusers and Grilles

- NECK SIZE / TAG / CFM — DIFFUSER OR GRILLE IDENTIFICATION
- EXHAUST AIR
- RETURN AIR
- SUPPLY AIR

Ductwork Fittings

- ACOUSTICALLY LINED DUCT (SIZES SHOWN ARE NET INSIDE)
- BELLMOUTH
- CONCENTRIC SQUARE TO ROUND
- CONCENTRIC TRANSITION, RECTANGULAR OR ROUND
- ECCENTRIC TRANSITION, RECTANGULAR OR ROUND
- FLEXIBLE CONNECTION
- NON-SYMMETRICAL WYE
- RECTANGULAR DUCT DROP
- RECTANGULAR DUCT RISER
- RECTANGULAR MAIN WITH RECTANGULAR BRANCH
- RECTANGULAR MAIN WITH ROUND BRANCH
- RECTANGULAR OFFSET LESS THAN 15%%d
- RECTANGULAR OFFSET MORE THAN 15%%d
- ROUND DUCT DROP
- ROUND DUCT RISER
- ROUND DUCT WITH ROUND BRANCH
- ROUND WYE
- SYMMETRICAL WYE
- MITERED ELBOW WITH TURNING VANES
- RADIUSED ELBOW

General

- CONTINUATION
- X / X — DETAIL NUMBER AND SHEET LOCATION
- XX-X — EQUIPMENT IDENTIFICATION
- X — KEYED NOTE
- POINT OF CONNECTION
- X / XXX — SECTION NUMBER AND SHEET LOCATION
- 30X16 — RECTANGULAR DUCT SIZING
- 30"Ø — ROUND DUCT SIZING

Piping Fittings, Appurtenances and Equipment

- AIR SEPARATOR
- AUTOMATIC AIR VENT
- BACKFLOW PREVENTER
- CAP
- CONTINUATION
- EXPANSION JOINT
- EXPANSION LOOP
- EXPANSION TANK
- FLOW SWITCH
- HEAT EXCHANGER
- HOSE BIBB
- MANUAL AIR VENT
- PIPE DROP
- PIPE RISE
- PIPE TO DRAIN
- PRESSURE GAUGE WITH COCK
- PRESSURE RELIEF VALVE
- PRESSURE SENSOR
- SHOCK ABSORBER
- T&P RELIEF VALVE WITH PIPE TO DRAIN
- TEE DOWN ON PIPE
- TEE UP ON PIPE
- TEMPERATURE SENSOR
- TEST PORT (PETE'S PLUG OR EQUAL)
- THERMOMETER
- VENT TO ATMOSPHERE
- WATER METER

Piping Systems

- RL — REFRIGERANT LIQUID
- RS — REFRIGERANT SUCTION

Piping Valves

- CHECK VALVE
- GLOBE VALVE
- QUARTER TURN VALVE
- VALVE, GENERAL

GENERAL MECHANICAL NOTES

A. WHERE CEILINGS ARE PROVIDED, CENTER HVAC CEILING-MOUNTED GRILLES BETWEEN LUMINAIRES AND CEILING DEVICES AND WITHIN CEILING TILES/GRID WHERE THEY OCCUR. EVENLY SPACE SIDEWALL DIFFUSERS/GRILLES ALONG A GIVEN WALL ELEVATION. SEE ARCHITECTURAL ELEVATIONS FOR SPECIFIC LOCATIONS AND DIMENSIONS. WHERE DIFFUSERS/GRILLES ARE SHOWN ABOVE A DOOR, CENTER DEVICE ABOVE THE DOOR. COORDINATE ALL WALL LOCATIONS WITH ARCHITECTURAL ELEVATION DETAILS, PRIOR TO INSTALLATION.

B. ALL SUPPLY AND RETURN AIR DUCTWORK SHALL BE INTERNALLY LINED FOR THE FIRST 5'-0" (MINIMUM), FROM THE UNIT CONNECTION.

C. PROVIDE ACCESS PANELS FOR ACCESS TO CONCEALED EQUIPMENT, JUNCTION BOXES, AND CONTROLS. QUANTITY AND LOCATION OF ACCESS PANELS IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH AS-BUILT CONDITIONS AND MAY NOT BE INDICATED ON THE DRAWINGS. SUBMIT PROPOSED ACCESS PANEL LAYOUT TO ARCHITECT, PRIOR TO INSTALLATION, FOR CONFIRMATION OF DESIGN INTENT.

D. INSTALL ALL EQUIPMENT SUCH THAT CODE AND MANUFACTURER REQUIRED CLEARANCES ARE MAINTAINED.

E. MAINTAIN A MINIMUM 36-INCH CLEARANCE IN FRONT OF ALL ELECTRICAL PANELS FOR HVAC EQUIPMENT, PER NEC REQUIREMENTS.

F. COORDINATE EXACT LOCATION OF AIR DISTRIBUTION GRILLES WITH ARCHITECTURAL AND REFLECTED CEILING PLANS, PRIOR TO INSTALLATION.

G. PROVIDE A MANUAL BALANCING DAMPER AT BRANCH TAKE-OFF LOCATIONS FOR ALL DUCTS REQUIRING AIR BALANCING INSTALLED ABOVE ACCESSIBLE, OR OPEN, CEILINGS.

H. PROVIDE REMOTE, CABLE-OPERATED BALANCING DAMPER FOR DUCTS SERVING GRILLES/DEVICES LOCATED IN INACCESSIBLE CEILING LOCATIONS.

I. RUNOUTS TO DIFFUSERS AND GRILLES SHALL BE THE SAME SIZE AS THE NECK DIMENSIONS SHOWN ON THE FLOORPLANS, UNLESS OTHERWISE NOTED.

J. MAINTAIN 10'-0" MINIMUM SEPARATION BETWEEN ROOF-MOUNTED EQUIPMENT AND ROOF EDGE, EXCEPT WHERE THE ARCHITECT IS SHOWING FALL PROTECTION.

K. MAINTAIN 10'-0" MINIMUM SEPARATION BETWEEN EXHAUST OUTLETS AND MECHANICAL AIR INTAKES.

L. PROVIDE FIRE DAMPERS AT ALL CEILING AND WALL PENETRATIONS AS REQUIRED AND AS SHOWN/ DETERMINED BY THE ARCHITECT

M. ALL EXISTING DUCTWORK TO REMAIN SHALL BE INTERNALLY CLEANED.

N. CONTRACTOR TO USE ONLY DUCT FITTINGS PER DETAIL 4 AND 5/M4.02 FPR MEDIUM PRESSURE DUCT.

SHEET INDEX

M0.01	SYMBOL LIST AND GENERAL NOTES - MECHANICAL
M0.02	SCHEDULES - MECHANICAL
M1.01	OVERALL FLOOR PLAN - ZONING PLAN
M2.01	OVERALL FLOOR PLAN - MECHANICAL
M2.02	OVERALL ROOF PLAN - MECHANICAL
M3.01	DETAILS - MECHANICAL

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SYMBOL LIST AND GENERAL NOTES - MECHANICAL

M0.01

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FAN COIL SCHEDULE (DX)

SYMBOL	AREA SERVED	BASIS OF DESIGN MFR	BASIS OF DESIGN MODEL	ASSOC HP	SUPPLY FAN TOTAL CFM	SUPPLY FAN MIN OSA CFM	SUPPLY FAN DCV OSA CFM	SUPPLY FAN ESP (IN H2O)	DX COOLING COIL NOM TONS	DX COOLING COIL TOTAL CAP (MBH)	DX COOLING COIL SENS CAP (MBH)	HEAT PUMP HTG (MBH)	AUX HTG (KW)	STAGES	ELECTRICAL VOLTS	ELECTRICAL PH	ELECTRICAL MCA	ELECTRICAL MOCP	MAX WT (LBS)	NOTES
FCU-1	NAIL/ESTHETICS THEORY - 100	LG	KNSLB241A	HP-1	800	120	430	0.5	2	21.9	16.8	14.6	3	1	208	1	NOTE #2		150	1,2,3,4,7
FCU-2	ESTHETICS LAB - 101	LG	KNSLB241A	HP-2	800	120	430	0.5	2	21.9	16.8	14.6	3	1	208	1	NOTE #2		150	1,2,3,4,7
FCU-3	OFFICE/RECEPTION	LG	KNSLB181A	HP-3	600	105	N/A	0.5	1.5	16.5	12.8	9.8	3	1	208	1	NOTE #2		150	1,2,3,4,7
FCU-4	OFFICE - 104. 105, 106	LG	KNSLB181A	HP-4	600	60	N/A	0.5	1.5	16.5	12.8	9.8	3	1	208	1	NOTE #2		150	1,2,3,4,7
FCU-5	NAIL/PEDI - 201	LG	KNSLB181A	HP-5	600	100	500	0.5	1.5	16.5	12.8	9.8	3	1	208	1	NOTE #2		150	1,2,3,4,7
FCU-6	HAIR CUTTING PERIMETER	LG	KNSLB601A	HP-6	1750	210	1085	1	5	54.9	35.9	35.6	8	1	208	1	NOTE #2		175	1,2,3,6,7
FCU-7	HAIR CUTTING INTERIOR	LG	KNSLB481A	HP-7	1400	N/A	N/A	1	4	43.9	32.1	26.6	5	1	208	1	NOTE #2		175	1,2,3,5,7
FCU-8	FACIAL/MASSAGE ESTHETICS - 217	LG	KNSLB601A	HP-8	1750	125	425	1	5	54.9	35.9	35.6	8	1	208	1	NOTE #2		175	1,2,3,6,7
FCU-9	HALLWAY - 112	LG	KNSLB421A	HP-9	1225	105	370	0.5	3	38.5	29.9	23.9	5	1	208	1	NOTE #2		175	1,2,3,5,7
FCU-10	HAIR/TEXTURE - 112	LG	KNSLB421A	HP-10	1225	130	445	1	3.5	38.5	29.9	23.9	5	1	208	1	NOTE #2		175	1,2,3,5,7
FCU-11	BARBER/COLOR THEORY - 109	LG	KNSLB481A	HP-11	1400	130	475	1	4	43.9	32.1	26.6	5	1	208	1	NOTE #2		175	1,2,3,5,7
FCU-12	MDF - 204	LG	KNSAE181A	HP-12	560	N/A	N/A	N/A	1.5	18	14.4	21.6	N/A	N/A	208	1	NOTE #2		50	1,2,8
FCU-13	ELECTRICAL - 221	LG	KNSAE181A	HP-13	560	N/A	N/A	N/A	1.5	18	14.4	21.6	N/A	N/A	208	1	NOTE #2		50	1,2,8,9

NOTES:
1. R-32 REFRIGERANT
2. OUTDOOR HEAT PUMP CONDENSING UNIT SUPPLIES POWER TO THE INDOOR FAN COIL UNIT
3. PROVIDE WITH MERV 13 (MIN.) FILTER
4. 3kW ELECTRIC HEAT REQUIRES A SEPARATE CIRCUIT. 208V/1PH, MCA: 16.3, MOCP: 20
5. 5kW ELECTRIC HEAT REQUIRES A SEPARATE CIRCUIT. 208V/1PH, MCA: 27.2, MOCP: 30
6. 8kW ELECTRIC HEAT REQUIRES A SEPARATE CIRCUIT. 208V/1PH, MCA:43.5, MOCP: 50
7. MULTI-POSITION AIR HANDLER MOUNTED IN HORIZONTAL ORIENTATION.
8. DIVISION 23 TO PROVIDE CONDENSATE PUMP. SEE PLUMBING PLANS FOR CONDENSATE DRAIN ROUTING.
9. PROVIDE WITH DOOR SENSOR TO DEACTIVATE SYSTEM WHEN DOOR IS OPEN. PROVIDE TIME-DELAY OF 5 MINUTES (ADJ.) BEFORE REACTIVATING SYSTEM WHEN DOOR IS CLOSED.

HEAT PUMP CONDENSING UNIT SCHEDULE

SYMBOL	AREA SERVED	BASIS OF DESIGN MFR	BASIS OF DESIGN MODEL	ASSOC FAN	AIR SOURCE HEAT PUMP CONDENSER NOM TONS	COMPRESSOR TYPE	COOLING CAP (MBH)	COOLING AMBIENT DB (°F)	SEER2	HEATING CAP (MBH)	HEATING AMBIENT WB (°F)	HSPF2	ELECTRICAL VOLTS	PH	MCA	MOCP	MAX WT (LBS)	NOTES
HP-1	NAIL/ESTHETICS THEORY - 103	LG	KUSXB241A	FCU-1	2	INVERTER, VARIABLE SPEED	21.9	92	17.5	14.6	8	9.7	208	1	16	25	150	ALL
HP-2	ESTHETICS LAB - 104	LG	KUSXB241A	FCU-2	2	INVERTER, VARIABLE SPEED	21.9	92	17.5	14.6	8	9.7	208	1	16	25	150	ALL
HP-3	OFFICE/RECEPTION	LG	KUSXB181A	FCU-3	1.5	INVERTER, VARIABLE SPEED	16.5	92	17.5	9.8	8	10	208	1	16	25	150	ALL
HP-4	OFFICE - 124, 125, 127	LG	KUSXB181A	FCU-4	1.5	INVERTER, VARIABLE SPEED	16.5	92	17.5	9.8	8	10	208	1	16	25	150	ALL
HP-5	NAIL/PEDI - 110	LG	KUSXB181A	FCU-5	1.5	INVERTER, VARIABLE SPEED	16.5	92	17.5	9.8	8	10	208	1	16	25	150	ALL
HP-6	HAIR CUTTING PERIMETER	LG	KUSXB601A	FCU-6	5	INVERTER, VARIABLE SPEED	54.9	92	17.5	35.6	8	9.4	208	1	32	40	250	ALL
HP-7	HAIR CUTTING INTERIOR	LG	KUSXB481A	FCU-7	4	INVERTER, VARIABLE SPEED	43.9	92	18	26.6	8	9.4	208	1	32	40	225	ALL
HP-8	FACIAL/MASSAGE ESTHETICS - 129	LG	KUSXB601A	FCU-8	5	INVERTER, VARIABLE SPEED	54.9	92	17.5	35.6	8	9.4	208	1	32	40	250	ALL
HP-9	HALLWAY - 112	LG	KUSXB421A	FCU-9	3	INVERTER, VARIABLE SPEED	38.5	92	17.5	23.9	8	9.7	208	1	32	40	225	ALL
HP-10	HAIR/TEXTURE - 106	LG	KUSXB421A	FCU-10	3.5	INVERTER, VARIABLE SPEED	38.5	92	18	23.9	8	9.5	208	1	32	40	225	ALL
HP-11	BARBER/COLOR THEORY - 105	LG	KUSXB481A	FCU-11	4	INVERTER, VARIABLE SPEED	43.9	92	18	26.6	8	9.4	208	1	32	40	225	ALL
HP-12	MDF - 204	LG	KUSAE181A	FCU-12	1.5	INVERTER, VARIABLE SPEED	18	92	18	21.6	8	8.9	208	1	15	20	100	ALL
HP-13	ELECTRICAL - 178	LG	KUSAE181A	FCU-13	1.5	INVERTER, VARIABLE SPEED	18	92	18	21.6	8	8.9	208	1	15	20	100	ALL

NOTES:
1. OUTDOOR HEAT PUMP CONDENSING UNIT SUPPLIES POWER TO INDOOR FAN COIL UNIT

FAN SCHEDULE

SYMBOL	AREA SERVED	BASIS OF DESIGN MFR	BASIS OF DESIGN MODEL	TYPE	DRIVE	AIR FLOW (CFM)	TSP (IN H2O)	FAN RPM	SOUND (SONES)	ELECTRICAL VOLTS	ELECTRICAL PH	ELECTRICAL MOTOR HP (OR WATTS)	VFD (Y/N)	MAX WT (LBS)	NOTES
EF-1	NAIL/PEDI - 110	GREENHECK	CSP-A390-VG	INLINE	DIRECT	90	0.5	1230	1.9	120	1	(26 W)	N	50	1
EF-2	NAIL/PEDI - 110	GREENHECK	CSP-A390-VG	INLINE	DIRECT	120	0.5	1230	1.9	120	1	(26 W)	N	50	1
EF-3	NAIL/PEDI - 110	GREENHECK	CSP-A390-VG	INLINE	DIRECT	140	0.5	1222	2	120	1	(32 W)	N	50	1
EF-4	NAIL/PEDI - 110	GREENHECK	CSP-A390-VG	INLINE	DIRECT	200	0.75	1485	3.2	120	1	(57 W)	N	50	1
EF-5	NAIL/PEDI - 110	GREENHECK	CSP-A390-VG	INLINE	DIRECT	200	0.75	1485	3.2	120	1	(57 W)	N	50	1
EF-6	NAIL/PEDI - 110	GREENHECK	CSP-A390-VG	INLINE	DIRECT	200	0.75	1485	3.2	120	1	(57 W)	N	50	1
EF-7	NAIL/ESTHETICS THEORY - 103	GREENHECK	CSP-A700-VG	INLINE	DIRECT	650	0.75	1377	2.9	208	1	(184 W)	Y	100	1,2

NOTES:
1. PROVIDE WALL SWITCH FOR MANUAL FAN CONTROL. COORDINATE WALL SWITCH WITH DIVISION 26.
2. PROVIDE WITH MOTORIZED DAMPER FOR FAN AIRFLOW OVER 300 CFM.

ENERGY RECOVERY UNIT SCHEDULE

SYMBOL	ZONES SERVED	BASIS OF DESIGN MFR	BASIS OF DESIGN MODEL	SUPPLY / EXHAUST FAN DCV CFM	SUPPLY / EXHAUST FAN MINIMUM CFM	# OF FANS	VFD/ ECM	ELECTRICAL VOLTS	PH	FLA	MCA	MOCP	MAX WT (LBS)	NOTES
ERV-1	FCU-5, 8, & 9	ALDES	E1100L-Fi-EC-N	1100	300	2	ECM	208	1	5.6	6	15	275	ALL
ERV-2	FCU-3, 4, 6, & 7	ALDES	E1800L-Fi-EC-N	1800	500	2	ECM	208	1	8.8	9.4	15	275	ALL
ERV-3	FCU-1, 2, 10, & 11	ALDES	E1800L-Fi-EC-N	1800	500	2	ECM	208	1	8.8	9.4	15	275	ALL

NOTES:
1. ERV TO RUN CONTINUOUSLY
2. MERV-13 FILTER
3. PROVIDE 2-SPEED OPERATION. WHEN ANY ASSOCIATED CO2 SENSOR INITIATES DEMAND CONTROLLED VENTILATION (DCV) MODE, RAMP FAN UP TO HIGH SPEED.
4. PROVIDE 8 KW AUXILIARY ELECTRIC HEATER ACCESSORY

ELECTRIC HEATER SCHEDULE

SYMBOL	AREA SERVED	BASIS OF DESIGN MFR	BASIS OF DESIGN MODEL	TYPE	ELECTRICAL VOLTS	PH	HEAT KW	MAX WT (LBS)	NOTES
EWH-1	VESTIBULE - 115	QMARK	CWH1101DSF	RECESSED WALL MOUNTED	120	1	1	30	2,3
EWH-2	FIRE RISER - 220	QMARK	CWH1101DSF	RECESSED WALL MOUNTED	120	1	1	30	2,3
EUH-1	MECH MEZZANINE - 181	QMARK	MWUH7504	CEILING SUSPENDED UNIT HEATER	208	1	5.63	50	1,3

NOTES:
1. WIRED, WALL-MOUNTED THERMOSTAT
2. PROVIDE WITH INTEGRAL THERMOSTAT
3. HEATING SET POINT TEMPERATURE TO BE 60 DEG. F (MAX.)

DIFFUSER, REGISTER AND GRILLE SCHEDULE

SYMBOL	TYPE	FACE	FRAME	DAMPER	FINISH	BASIS OF DESIGN	NOTES
CD-1	CEILING DIFFUSER	PERFORATED	LAY-IN	NONE	NOTE #1	TITUS PCS	2
CD-2	CEILING DIFFUSER	PERFORATED	SURFACE	OBD	NOTE #1	TITUS PCS	2
CEG-1	CEILING EXHAUST GRILLE	PERFORATED	LAY-IN	NONE	NOTE #1	TITUS PAR	2
CEG-2	CEILING EXHAUST GRILLE	PERFORATED	SURFACE	NONE	NOTE #1	TITUS PAR	2
CRG-1	CEILING RETURN GRILLE	PERFORATED	SURFACE	NONE	NOTE #1	TITUS PAR	2
CRG-2	CEILING RETURN GRILLE	PERFORATED	LAY-IN	NONE	NOTE #1	TITUS PAR	2
EG-1	EXHAUST GRILLE	FIXED BAR	1/4" BORDER	NONE	NOTE #1	TITUS 350R	2
RG-1	RETURN GRILLE	FIXED BAR 35 DEG. DEFL.	1/4" BORDER	NONE	NOTE #1	TITUS 350R	2
SG-1	SUPPLY GRILLE	DOUBLE DEFL.	1/4" BORDER	NONE	NOTE #1	TITUS 300R	2

NOTES:
1. COORDINATE COLOR/FINISH WITH ARCHITECTURAL DETAILS AND ADJACENT WALL/CEILING FINISH.
2. COORDINATE EXACT QUANTITY, DIMENSIONS, FRAME & DAMPER REQUIREMENTS WITH MECHANICAL AND ARCHITECTURAL CEILING PLANS

OUTSIDE AIR VENTILATION SCHEDULE

HVAC UNIT	ROOM	Az NET OCCUPIABLE FLOOR AREA (SF)	Rp PEOPLE OUTDOOR AIR RATE (CFM / PERSON)	Ra AREA OUTDOOR AIR FLOW RATE (CFM/SQ FT)	DEFAULT OCCUPANT DENSITY (#/1000SF)	DEFAULT ZONE POPULATION	Pz ACTUAL ZONE POPULATION	Vbz BREATHING ZONE OUTDOOR AIRFLOW (CFM)	EZ ZONE AIR DISTRIBUTION EFFECTIVENESS	Voz ZONE OUTDOOR AIRFLOW (CFM)	OSA PROVIDED (CFM)
ERV-1	NAIL/PEDI - 201	635	20	0.12	25	16	16	396	0.8	495	500
	WAX - 216	118	8	0.06	25	3	3	30	0.8	37	40
	WAX - 215	129	8	0.06	25	4	4	38	0.8	47	50
	FACIAL MASSAGE / ESTHETICS - 217	733	8	0.06	25	19	19	186	0.8	233	235
	FACIAL BAR - 214	190	8	0.06	25	5	5	49	0.8	61	65
	BUILDING STORAGE - 219	235	0	0.12	0	0	0	28	0.8	35	35
	HALL B - 112	928	0	0.06	0	0	0	56	0.8	70	70
	COLLAB - 113	150	5	0.06	50	8	8	49	0.8	61	65
				TOTAL							1,060
ERV-2	RECEPTION LOBBY - 109	267	5	0.06	30	9	8	56	0.8	70	70
	LARGE OFFICE - 102	142	5	0.06	5	1	1	14	0.8	17	20
	OFFICE - 108	87	5	0.06	5	1	1	10	0.8	13	15
	OFFICE - 104	127	5	0.06	5	1	1	13	0.8	16	20
	OFFICE - 105	106	5	0.06	5	1	1	11	0.8	14	15
	OFFICE - 106	88	5	0.06	5	1	1	10	0.8	13	15
	HALL A - 107	96	0	0.06	0	0	0	6	0.8	7	10
	LAUNDRY - 218	124	5	0.12	10	2	2	25	0.8	31	35
	SALON	1,375	20	0.12	25	35	35	865	0.8	1,081	1,085
	SHAMPOO - 122	218	20	0.12	25	6	6	146	0.8	183	185
	MAKEUP - 114	67	20	0.12	25	2	2	48	0.8	60	60
	DISP - 115	362	20	0.12	25	10	7	183	0.8	229	230
				TOTAL							1,760
ERV-3	CLASSROOM STORAGE - 141	112	0	0.12	0	0	0	13	0.8	17	20
	HAIR / TEXTURE - 112	728	10	0.12	35	26	25	340	0.8	425	430
	CLASSROOM STORAGE - 114	94	0	0.12	0	0	0	11	0.8	14	15
	CLASSROOM SHAMPOO - 110	119	8	0.06	25	3	3	30	0.8	37	40
	BARBER / COOR THEORY - 109	778	10	0.12	35	28	25	346	0.8	433	435
	NAIL / ESTHETICS THEORY - 100	727	10	0.12	35	26	25	340	0.8	425	430
	ESTHETICS LAB - 101	730	10	0.12	35	26	25	340	0.8	425	430
				TOTAL							1,800

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OREGON
MAY 10, 2005
ANDREW LASSE
EXPIRES: 12/31/26

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97603

No.	Description	Date
3	Addendum #3	4/21/2026

Project Number 2507
Date 3/16/2026

PERMIT / BID SET

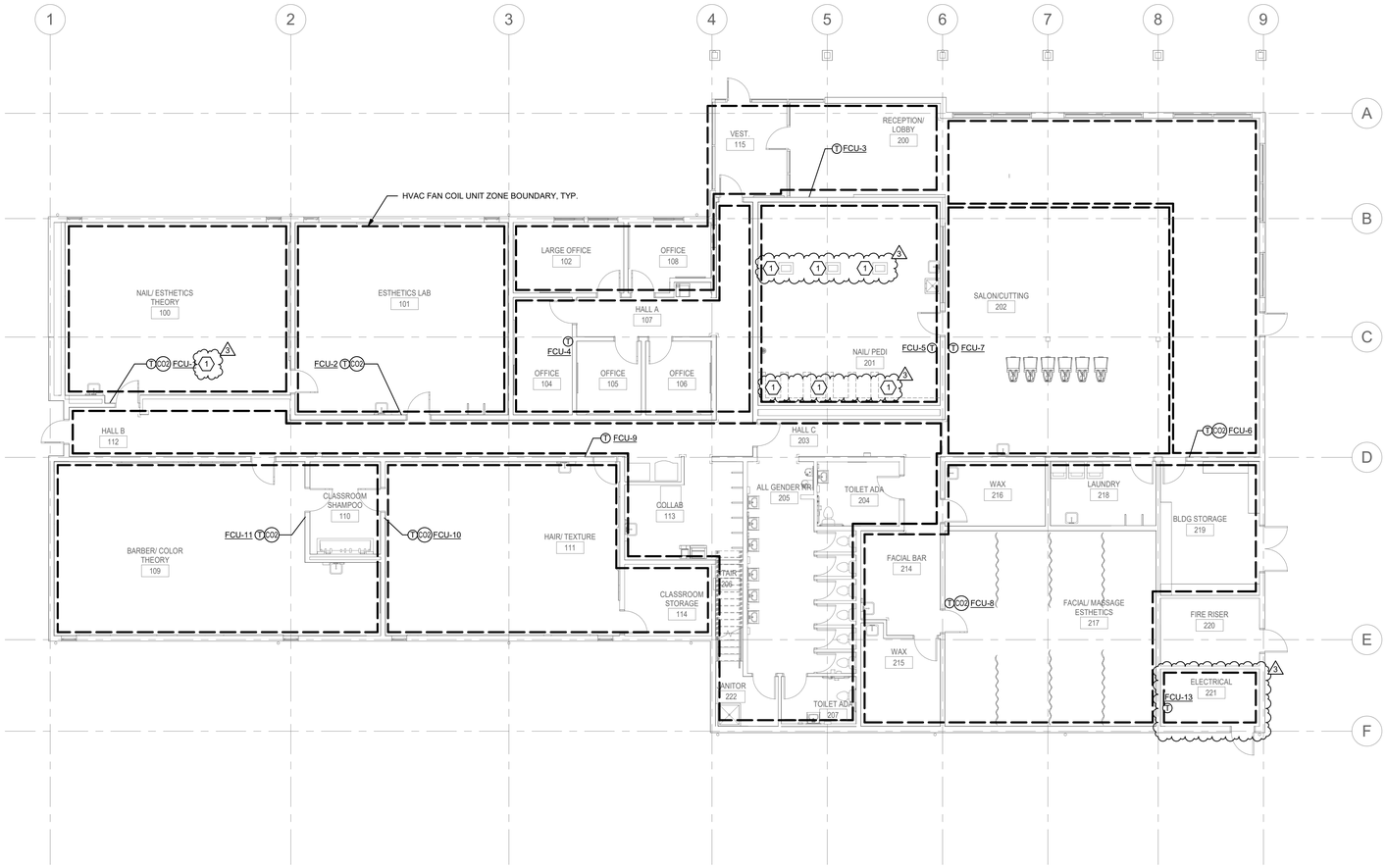
SCHEDULES - MECHANICAL

M0.02

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SHEET KEYNOTES

1. COORDINATE WALL SWITCH LOCATIONS FOR NAIL/PEDI EXHAUST FANS WITH DIV. 26



1 OVERALL FLOOR PLAN - ZONING PLAN

0' 4' 8' 16'

1/8" = 1'-0"

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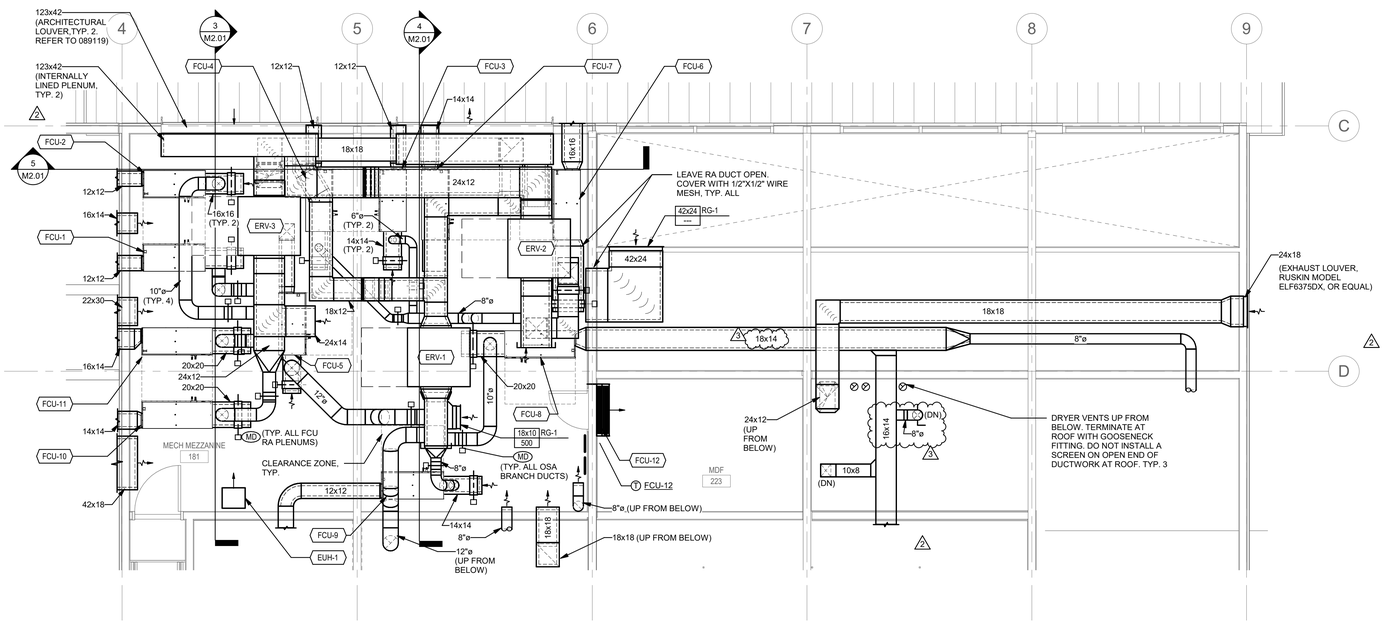
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Date 3/16/2026

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OVERALL FLOOR PLAN - ZONING PLAN

M1.01

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2 MECHANICAL MEZZANINE PLAN - MECHANICAL

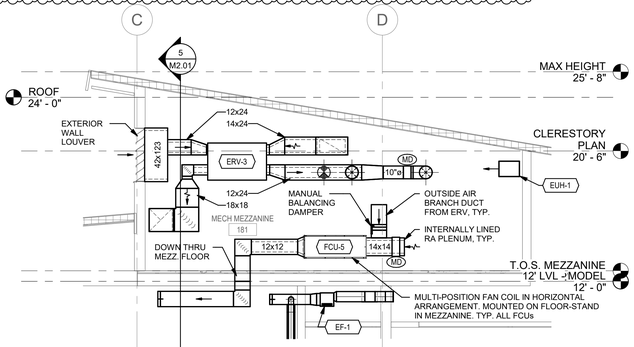
0' 4' 8' 16'
1/4" = 1'-0"

GENERAL SHEET NOTES

A. SEE M1.01 FOR FAN COIL UNIT ZONE BOUNDARIES AND ASSOCIATED THERMOSTAT AND SENSOR LOCATIONS

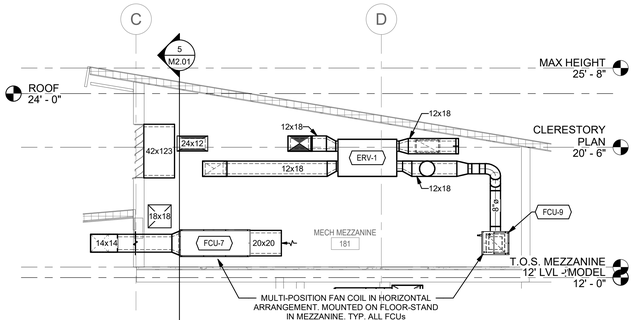
SHEET KEYNOTES

1. ROUTE BRANCH DUCT DOWN IN CHASE. MOUNT EXHAUST GRILLE IN TOE-KICK OF PEDICURE PEDESTAL. SEE ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION. WHERE EXHAUST BRANCH DUCTWORK SERVES TWO 30 CFM EXHAUST GRILLES, BALANCE MAIN BRANCH DUCT TO 60 CFM.
2. BALANCE BRANCH DUCT TO 80 CFM.
3. ROUTE EXHAUST BRANCH DUCT DOWN IN CHASE TO SERVE MANICURE STATION. CONNECT LOW HORIZONTAL EXHAUST BRANCH DUCT TO INTEGRAL EXHAUST CONNECTION IN MANICURE FURNITURE. MATCH SIZE OF FURNITURE DUCT CONNECTION. SEE ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.



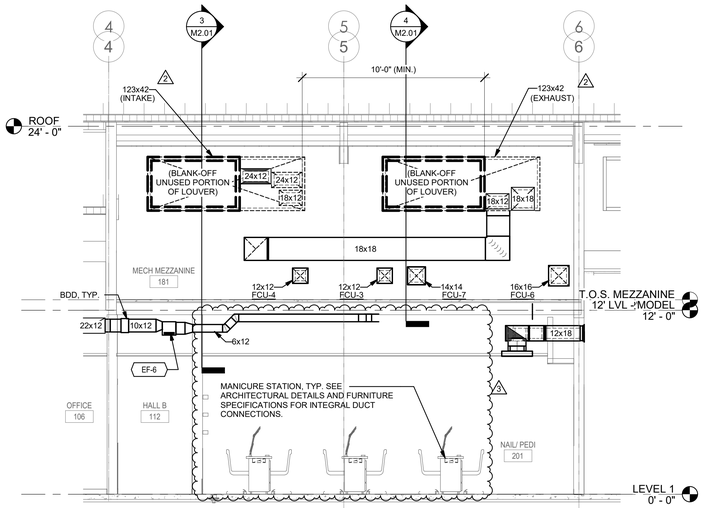
3 MEZZANINE HVAC SECTION 1

0' 4' 8' 16'
1/4" = 1'-0"



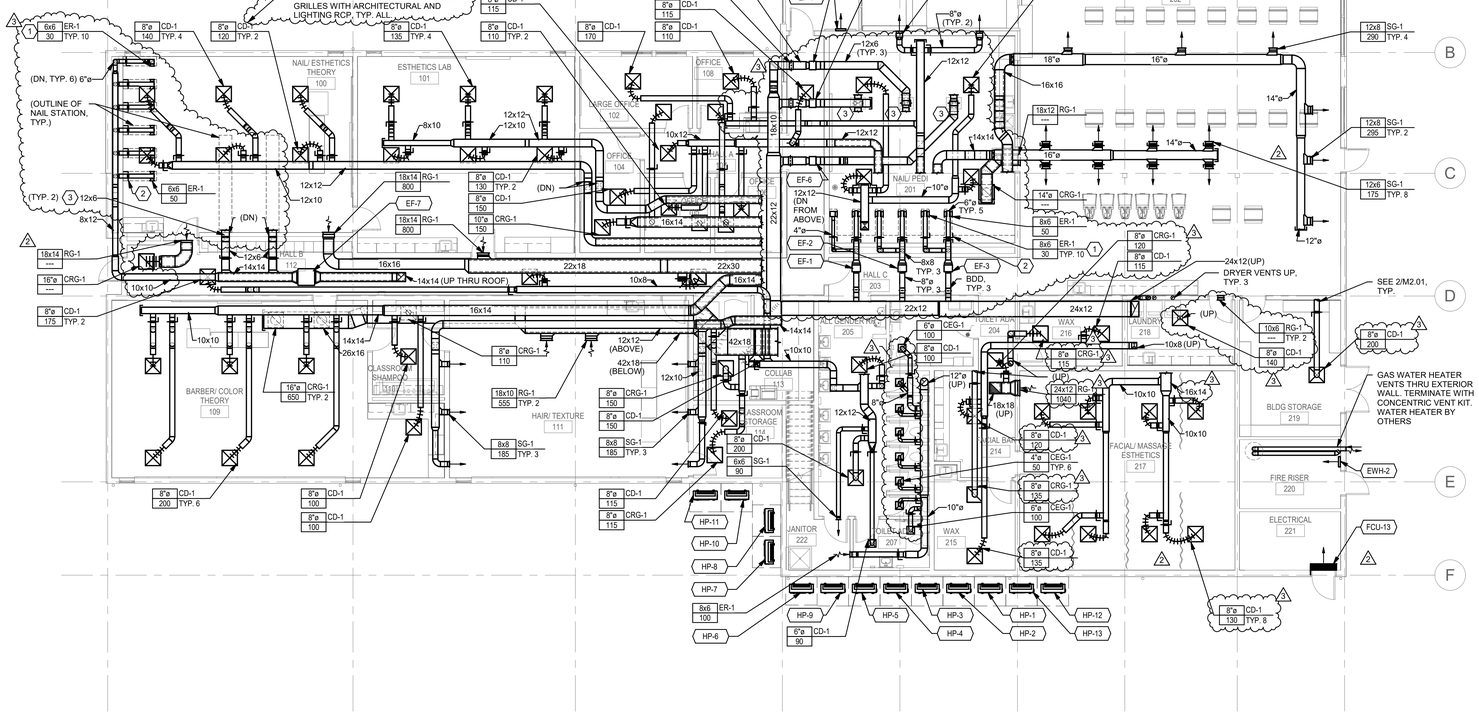
4 MEZZANINE HVAC SECTION 2

0' 4' 8' 16'
1/4" = 1'-0"



5 MEZZANINE HVAC SECTION 3

0' 4' 8' 16'
1/4" = 1'-0"



1 OVERALL FLOOR PLAN - MECHANICAL

0' 4' 8' 16'
1/8" = 1'-0"

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No.	Description	Date
2	Addendum #2	4/9/2026
3	Addendum #3	4/21/2026

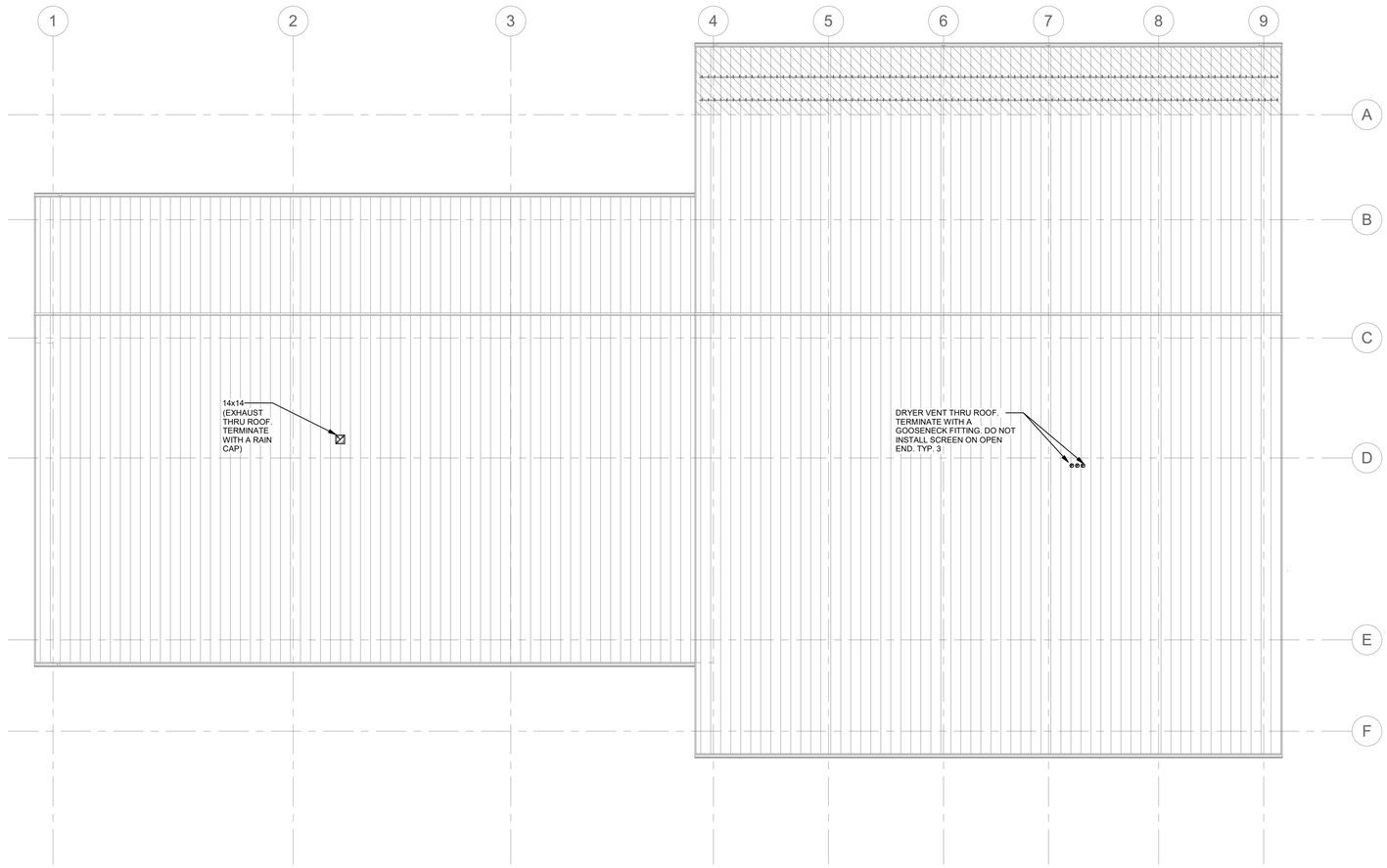
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Date 3/16/2026

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OVERALL FLOOR PLAN - MECHANICAL

M2.01

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1 OVERALL ROOF PLAN - MECHANICAL

0' 4' 8' 16'

1/8" = 1'-0"

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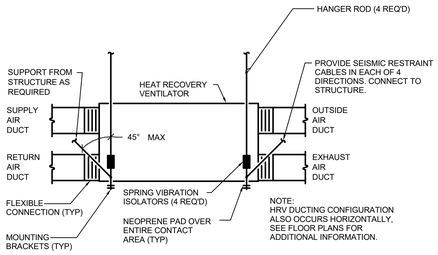
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OVERALL ROOF PLAN - MECHANICAL

M2.02

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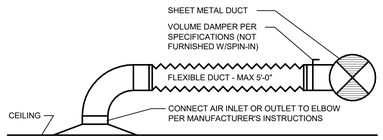


1 ENERGY RECOVERY VENTILATOR

NO SCALE

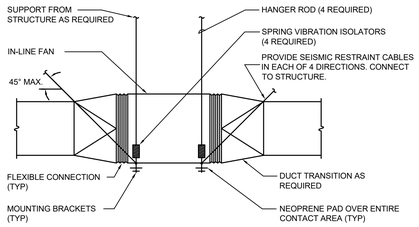
2 AIR INLET OR OUTLET SQUARE NECK

NO SCALE



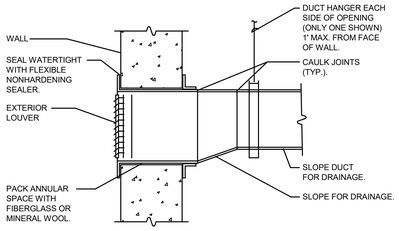
3 AIR INLET OR OUTLET ROUND NECK

NO SCALE



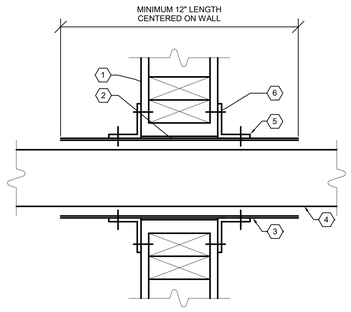
4 IN-LINE FAN

NO SCALE



5 LOUVERED WALL PENETRATION

NO SCALE



6 FIRE PARTITION DUCT PENETRATION

NO SCALE

KEYNOTES THIS DETAIL

1 FIRE RATED PARTITION. COORDINATE WITH ARCHITECTURAL FOR FRAMING AND FIRE RATED LINING REQUIREMENTS.

2 COORDINATE PARTITION OPENING, 1/8" LARGER THAN FIRE DAMPER SLEEVE PER FOOT OF WIDTH OR HEIGHT.

3 STEEL SLEEVE, MINIMUM 0.060 INCH THICK.

4 STEEL DUCT AS SHOWN ON PLANS MINIM 0.0217 INCH THICK. DUCT NOT TO EXCEED 100 SQUARE INCHES.

5 STEEL RETAINING ANGELS MINIMUM 1-1/2 INCH BY 1-1/2 INCH BY 0.060 INCH BOTH SIDES OF THE WALL AND ALL FOUR SIDES OF THE SLEEVE. SECURE RETAINING ANGLES TO THE SLEEVE AND THE WALL WITH NO. 10 (M5) SCREWS. FILL ANNULAR SPACE WITH MINERAL WOOL.

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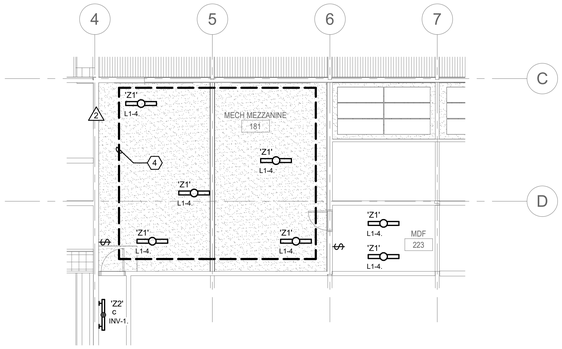
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DETAILS - MECHANICAL

M3.01

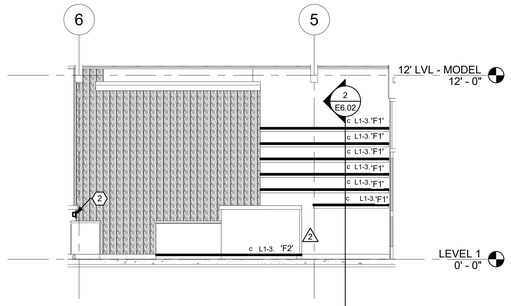
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2 MECHANICAL MEZZANINE PLAN - LIGHTING

0' 4' 8' 16'

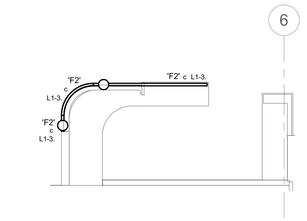
1/8" = 1'-0"



4 ELEVATION NORTH - RECEPTION 200 - LIGHTING

0' 2' 4' 8'

1/4" = 1'-0"



6 ENLARGED FLOOR PLAN - RECEPTION 200 - LIGHTING

0' 2' 4' 8'

1/4" = 1'-0"

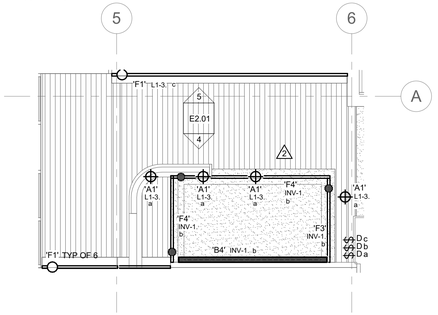
GENERAL SHEET NOTES

A. CIRCUIT EXIT SIGNS TO UNSWITCHED EMERGENCY CIRCUIT IN SPACE.

B. REFER TO LIGHTING CONTROL MATRIX ON DRAWING E0.02 FOR DESCRIPTION OF CONTROL PER SPACE, OCCUPANCY SENSOR AND SWITCH TYPES, AND ADDITIONAL LIGHTING CONTROL REQUIREMENTS.

SHEET KEYNOTES

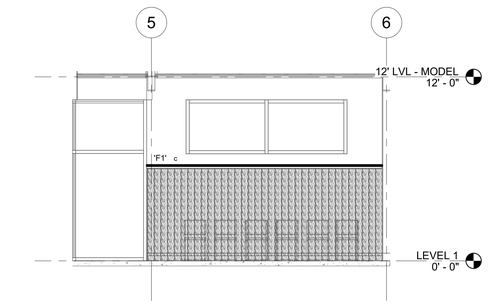
1. OVERRIDE SWITCH FOR EXTERIOR LIGHTING. SEE LIGHTING CONTROL PANEL DETAIL 2 ON E6.01.
2. COORDINATE SWITCHES LOCATION WITH ARCHITECT PRIOR TO ROUGH-IN.
3. ROUTE TRACK CIRCUITS THROUGH A TRACK CURRENT LIMITING PANEL. PROVIDE (6) 2-AMP RATED OUTPUT BREAKERS (ONE PER TRACK CIRCUIT). BASIS-OF-DESIGN: LEVITON TLLP 16-CIRCUIT SURFACE MOUNT OPTION WITH (6) 2-AMP OUTPUT BREAKERS.
4. SURFACE MOUNT LUMINAIRES TYPE 'Z1' TO CEILING. LOCATE LUMINAIRES TO AVOID OTHER MEP SYSTEMS WITHIN THE SPACE.
5. PROVIDE CCT CONTROLLED SWITCH WITH PRESET CCT LEVELS AND RAISE/LOWER BUTTON. REFER TO LIGHTING CONTROL MATRIX ON DRAWING E0.02 FOR CCT LEVELS.



3 ENLARGED RCP - RECEPTION 200 - LIGHTING

0' 2' 4' 8'

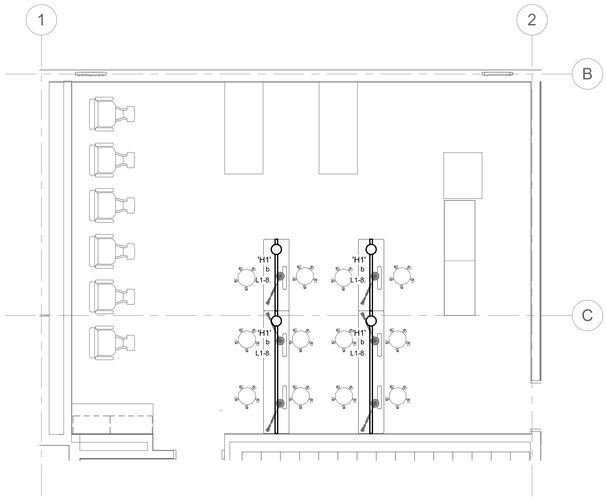
1/4" = 1'-0"



5 ELEVATION SOUTH - RECEPTION 200 - LIGHTING

0' 2' 4' 8'

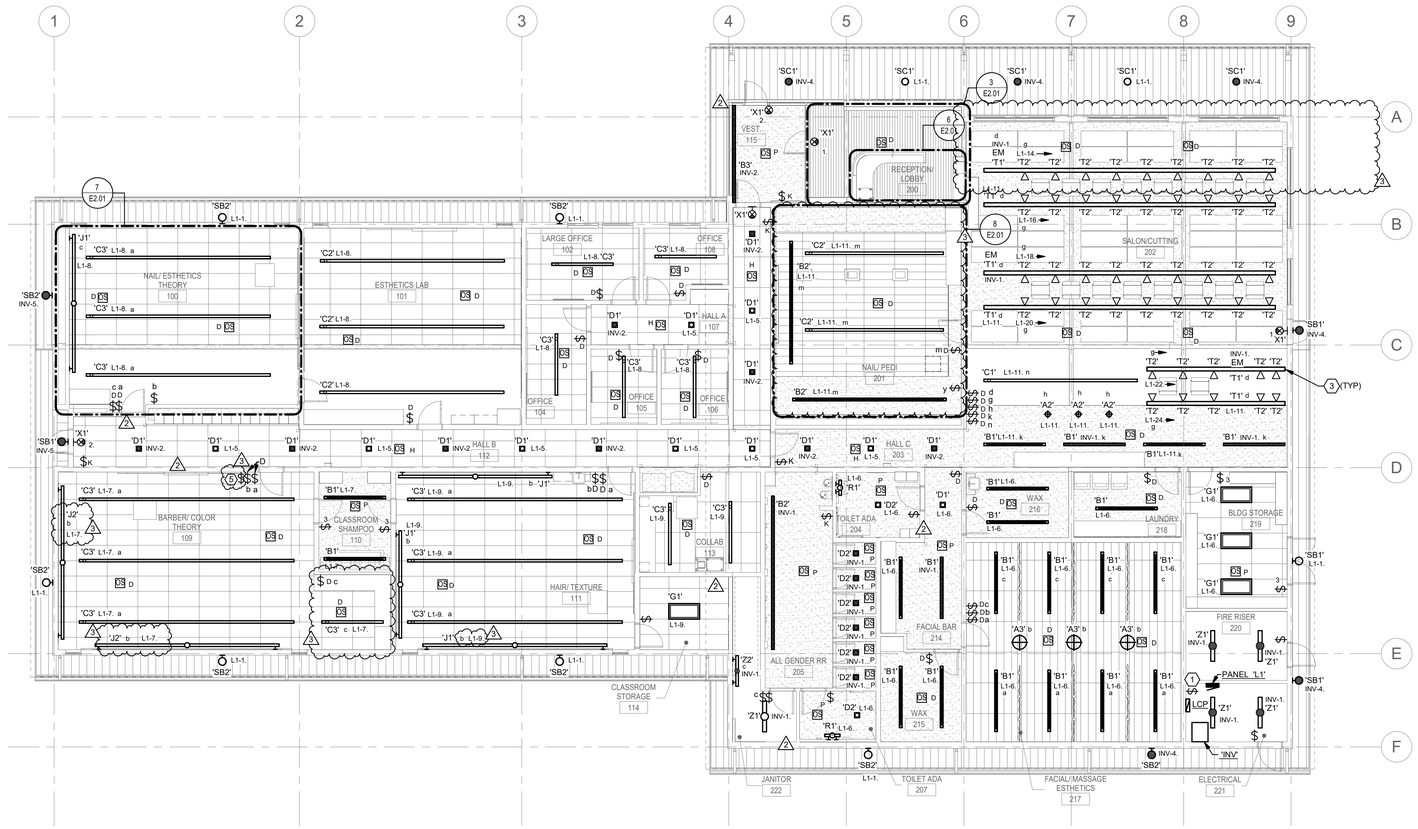
1/4" = 1'-0"

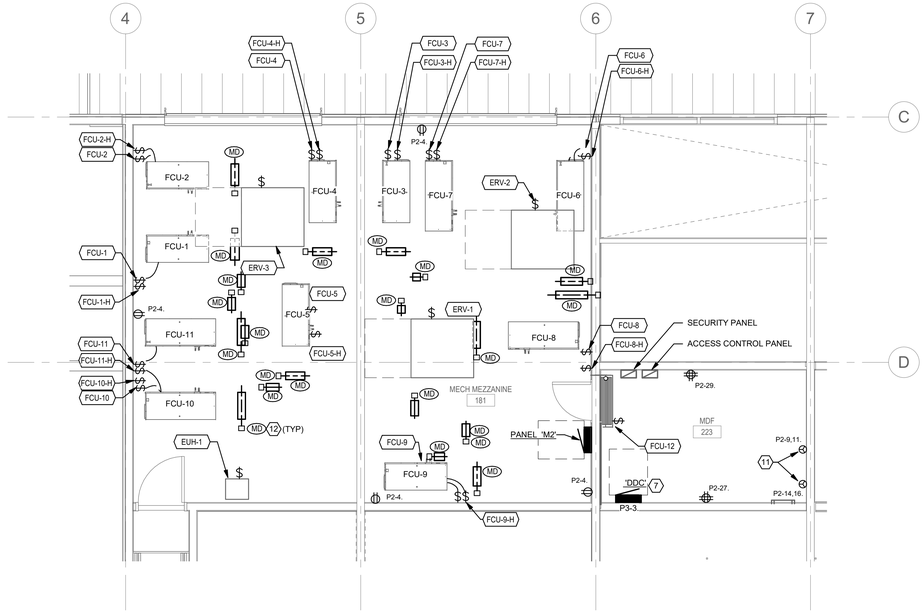


ENLARGED FLOOR PLAN - 7 NAIL/ESTHETICS THEORY 100 - LIGHTING

0' 2' 4' 8'

1/4" = 1'-0"

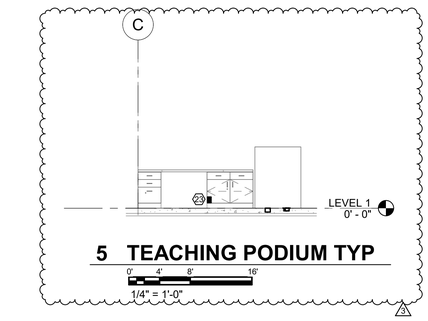

1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
'SC1'
INV-4.
'SC1'
L1-1.
'SC1'
INV-4.
'SC1'
L1-1.
'SC1'
INV-4.
7
E2.01
'SB2'
L1-1.
'J1'
c
L1-8. a
NAIL/ ESTHETICS THEORY
100
'C3' L1-8. a
'C2' L1-8.
ESTHETICS LAB
101
'C2' L1-8.
'C2' L1-8.
'C3' L1-8. a
'C3' L1-8. a
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'SB2'
INV-5.
'SB1'
INV-5.
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INV-2.
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L1-5.
HALL B
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INV-2.
'D1'
L1-5.
'D1'
INV-2.
'D1'
L1-5.
'C3' L1-7. a
'JZ'
b
L1-7.
'C3' L1-7. a
'C3' L1-7. a
'JZ' b L1-7.
BARBER/ COLOR THEORY
109
'B1' L1-7.
3 CLASSROOM SHAMPOO
110
'B1'
'C3' L1-9. a
'J1'
b
L1-9.
'C3' L1-9. a
'C3' L1-9. a
'J1' b L1-9.
HAIR/ TEXTURE
111
'C3' c L1-7.
'C3'
L1-9.
'C3'
L1-9.
COLLAB
113
'G1'
L1-9.
CLASSROOM STORAGE
114
LARGE OFFICE
102
'C3' L1-8.
OFFICE
105
OFFICE
104
OFFICE
106
'D1'
INV-2.
'D1'
L1-5.
'D1'
HALL A
107
'C3' L1-8.
'C3' L1-8.
'C3' L1-8.



2 MECHANICAL MEZZANINE PLAN - POWER

0' 2' 4' 8'

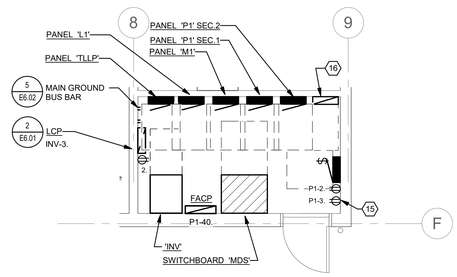
1/4" = 1'-0"



5 TEACHING PODIUM TYP

0' 4' 8' 16'

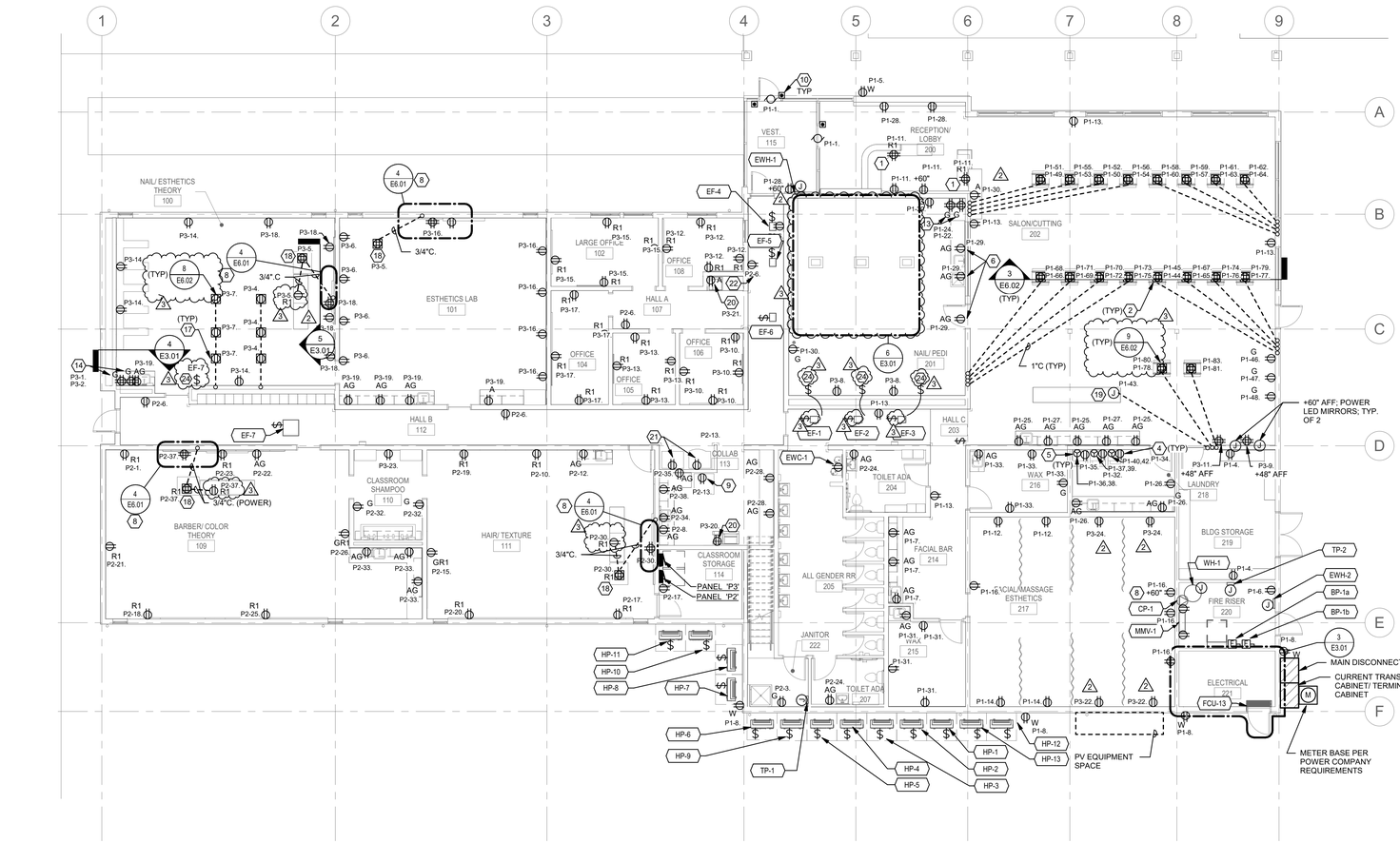
1/4" = 1'-0"



3 ENLARGED ELECT ROOM 148

0' 4' 8' 16'

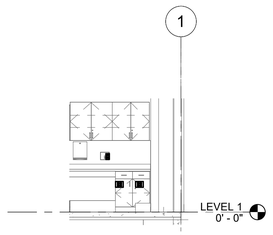
1/4" = 1'-0"



1 OVERALL FLOOR PLAN - POWER

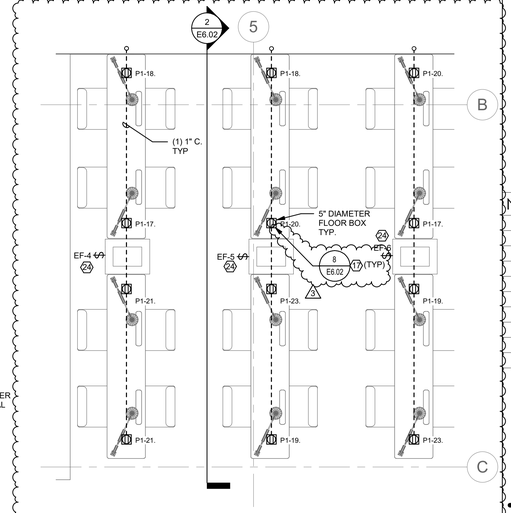
0' 4' 8' 16'

1/8" = 1'-0"



4 SECTION - CASEWORK

1/4" = 1'-0"



6 ENLARGED OVERHEAD VIEW - NAIL/PEDI 201

0' 4' 8' 16'

3/8" = 1'-0"

GENERAL SHEET NOTES

A. PROVIDE TAMPER RESISTANT RECEPTACLES PER NEC 406.12.

SHEET KEYNOTES

1. CASEWORK MOUNTED RECEPTACLE.
2. FLUSH FLOOR RECEPTACLE FOR CONNECTION OF CUTTING STATION. COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO ROUGH-IN. TWO DEDICATED CIRCUITS TO BE PROVIDED TO EACH STATION. CUTTING STATION TO BE PROVIDED WITH INTEGRAL QUAD OUTLET BY MANUFACTURER. ELECTRICAL CONTRACTOR TO CUT A HOLE IN THE BOTTOM OF FURNITURE TO ACCESS FLOOR BOX. FLOORBOX BASIS OF DESIGN: LEGRAND WIREMOLD RPSFB FLOOR BOX WITH RPFCTCBK COVER. REMOVE GASKET PROVIDED WITH COVER AS NECESSARY FOR FLUSH TO FLOOR FLOOR POWER PROVIDER SHALL CAULK SEAL AROUND EDGE AS NECESSARY TO MAINTAIN LIQUIDTIGHT SEAL. SEE DETAIL 3 #9/E6.02.
3. BUILDING SIGN.
4. WASHER. PROVIDE GFCI CIRCUT BREAKER.
5. DRYER. PROVIDE NEMA 6-30R, UTILIZE (2) #10 CU, (1) #10 CU GND., IN 3/4" C. CONFIRM RECEPTACLE REQUIREMENT WITH PRODUCT DATA.
6. MOUNT RECEPTACLE HORIZONTALLY.
7. DIV 26 CONTRACTOR TO COORDINATE FINAL DDC PANEL LOCATION WITH CONTROLS CONTRACTOR.
8. POWER CONNECTION FOR 'SMART BOARD'. SMART BOARD IS OFCI. COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO ROUGH-IN. REFER TO DETAIL 4 ON E6.01 FOR CLASSROOM SMART DISPLAY REQUIREMENTS.
9. REFRIGERATOR. PROVIDE GFCI BREAKER.
10. PROVIDE FLUSH MOUNT ADA PUSHBUTTON.
11. (2) 30A, 208V/1P RECEPTACLES FOR DATA RACK.
12. PROVIDE 120V CONNECTION TO MOTORIZED DAMPER, PROVIDE A DEDICATED CIRCUIT PER HVAC ASSOCIATED UNIT. REFER TO PANEL SCHEDULE M1 FOR CIRCUIT INFORMATION.
13. CHARGING STATION. CASEWORK MOUNTED RECEPTACLE INSIDE CABINET.
14. CHARGING STATION; LOCATE OUTLETS IN BACK OF CASEWORK ON TOP SHELF OR LOWER CABINET. COORDINATE EXACT LOCATION WITH ARCHITECT AND OWNER PRIOR TO ROUGH-IN.
15. IRRIGATION CONTROLLER.
16. SNOW MELT CONTROLLER. (ALTERNATE #3)
17. CONCRETE RATED, 4" DIAMETER FLUSH MOUNTED FLOORBOX WITH RECESSED 1-GANG. PROVIDE 20A DUPLEX RECEPTACLE WITH BRUSHED ALUMINUM HINGED LID. BASIS-OF-DESIGN: HUBBELL RF400 BASE WITH RF406BK BLACK COVER (WITH 20A DUPLEX OPTION). LOCATE FLOORBOX TO BE UNDER THE NAIL STATION CHAIR OPENING. POSITION TO THE FAR RIGHT, CENTER OF THE OPENING BELOW THE FACTORY PROVIDED OUTLET STRIP. COORDINATE EXACT FINAL INSTALL DIMENSIONS/LOCATION WITH ARCHITECT, SEE DETAIL #8/E6.02. 1
18. 3-SECTION FLOOR BOX. KCC STANDARD/BASIS-OF-DESIGN: FSR FL-500P-8-B, 8" OPTION WITH BLACK HINGED COVER. FACEPLATES/OPENINGS FOR (2) DUPLEX POWER RECEPTACLES, (1) GANG DATA, (1) GANG AV.
19. POWER FOR CABINET LIGHTING (PROVIDED WITH CABINET).
20. COPIER. PROVIDE DEDICATED CIRCUIT.
21. VENDING MACHINES. PROVIDE GFCI BREAKER.
22. TIMECLOCK CONNECTION. COORDINATE MOUNTING HEIGHT WITH ARCHITECT.
23. PROVIDE DUPLEX RECEPTACLE IN BACK OF CASEWORK OF TEACHING DESK. PROVIDE ACCESS TO RECEPTACLE FROM LEG SPACE OF DESK. COORDINATE EXACT LOCATION OF DESK AND SIZE OF ACCESS OPENING WITH ARCHITECT. 3
24. PROVIDE EXHAUST FAN CONTROL SEPARATE FROM MAINTENANCE DISCONNECT. PROVIDE LABELING ON SWITCH DESIGNATING EXHAUST FAN NUMBER. COORDINATE FINAL LOCATION WITH ARCHITECT/OWNER.

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REGISTERED PROFESSIONAL ENGINEER
72777PE
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JUNE 03, 2010
MARK K. O'LEARY
EXPIRES: 12/31/26

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Klamath Community College, Cosmetology Center Project

7390 S 6TH STREET
KLAMATH FALLS, OR
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No.	Description	Date
2	Addendum #2	4/9/2026
3	Addendum #3	4/21/2026

Project Number 2507
Date 3/16/2026

PERMIT / BID SET

OVERALL FLOOR PLAN - POWER

E3.01

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FAULT CURRENT

Arc Fault Bus Name	Arc Fault Bus kV	Equip Type	Bus Bolted Fault (kA)
L1	0.208	Panelboard	19.41
M1	0.208	Panelboard	20.582
M2	0.208	Panelboard	11.73
MAIN DISC	0.208	Switchgear	21.967
MDS	0.208	Switchgear	21.421
P1	0.208	Panelboard	20.582
P2	0.208	Panelboard	7.516
P3	0.208	Panelboard	6.894
SNOW	0.208	Panelboard	18.853

VOLTAGE DROP

FEEDER	BUS RATING	VOLTAGE	# OF SETS WIRES	WIRE SIZE	MATERIAL	LOAD (AMPS)	LENGTH	VOLTAGE DROP	% VOLTAGE DROP	2% TOLERANCE MET?
UTILITY XFMR TO MAIN DISC.	1000	208	3	400	CU	695	20	0.26	0.12%	YES
MAIN DISC TO 'MDS'	1000	208	3	400	CU	695	10	0.39	0.19%	YES
MDS' TO P1	400	208	2	250	AL	265	8	0.41	0.20%	YES
MDS' TO P2	225	208	1	300	AL	108	85	1.12	0.19%	YES
MDS' TO M2	225	208	1	300	AL	161	75	1.48	0.19%	YES
MDS' TO L1	125	208	1	2/0	AL	30	8	0.07	0.19%	YES

LOADS SUMMARY AT SWITCHBOARD: MDS

Load Type	Connected Load	NEC Demand Factor	NEC Estimated Demand	Panel Totals	
Motor	62778.0	102.12%	64109.2		
L	8796.6	125.00%	10995.7	**Total Connected Load:**	293,184.28
R	37680.0	63.27%	23840.0	**Total Est. Demand:**	291,194.63
H	54115.7	100.00%	54115.7	**Total Conn. Current:**	813.8 A
C	33280.0	125.00%	41600.0	**Total Est. DemandCurrent:**	808.28 A
G	95934.0	100.00%	95934.0		
WH	600.0	100.00%	600.0		

FEEDER SCHEDULE

A,C,S,X A=Aluminum
C=Conduit only
S=Service secondary
X=Seperately derived system

202 3 #12 CU, 1 #12 CU GND., IN 3/4" C

203 3 #12 CU, 1 #12 CU GND., IN 3/4" C

1000C 3 SETS OF (4 - 400 kcmil CU IN 3" C.)

1000S 3 SETS OF (4 - 400 kcmil CU IN 3" C.)

1254A 4 #2/0 AL, 1 #6 CU GND., IN 2" C.

2254A 4 - 300 kcmil AL, 1 #4 CU GND., IN 3" C.

4004A 2 SETS OF (4 - 250 kcmil AL, 1 #2 CU GND., IN 2 1/2" C.)

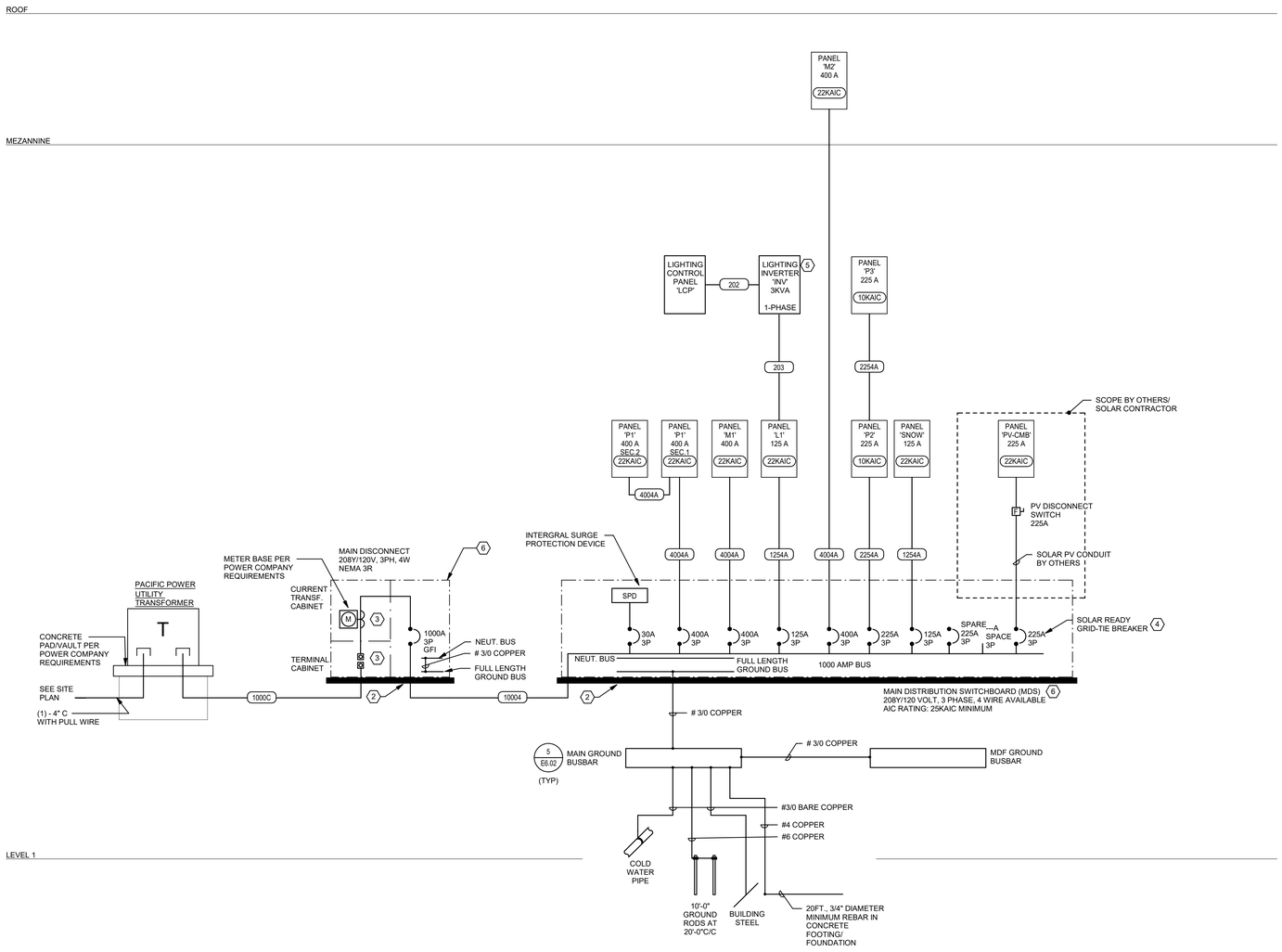
10004 3 SETS OF (4 - 400 kcmil CU, 1 #2/0 CU GND., IN 3" C.)

GENERAL DETAIL NOTES

A. CALCULATED VALUES FOR AVAILABLE FAULT CURRENT ARE SUITABLE FOR PLAN REVIEW PURPOSES BUT ARE NOT CONSIDERED ACCURATE FOR ACTUAL INSTALLED FEEDER ROUTING. UPDATE THE AS-BUILT DRAWING SET AT THE CONSTRUCTION SITE WITH RESULTS OF CALCULATIONS FOR FAULT CURRENT BASED ON ACTUAL FEEDER LENGTHS AND ROUTING USING RESULTS OF LICENSED SOFTWARE PER APPROVED ELECTRICAL DISTRIBUTION SYSTEM STUDY (SECTION 26 05 73).

DETAIL KEYNOTES

1. INSTALL FEEDER FROM TRANSFORMER SECONDARY TO MAIN BREAKER IN SWITCHBOARD / PANEL, NOT TO EXCEED 25 FEET PER NEC 240.21(C)(6).
2. PROVIDE 3-1/2 INCH HIGH CONCRETE HOUSEKEEPING PAD UNDER TRANSFORMER/SWITCHBOARD.
3. CURRENT TRANSFORMER/TERMINAL CABINET PER POWER COMPANY REQUIREMENTS.
4. COORDINATE FINAL SOLAR PV GRID-TIE BREAKER SIZE WITH SOLAR PV DESIGN-BUILD CONTRACTOR.
5. EMERGENCY EGRESS LIGHTING INVERTER, BASIS OF DESIGN: MYERS ILLUMINATOR IE SINGLE PHASE, 3.0KVA, 208V/1P-IN, 120V/1P-OUT, 20A/1P INTEGRAL OUTPUT BREAKERS (SEE SCHEDULE).
6. MIN AIC RATING 25KA



1 ONE-LINE POWER DISTRIBUTION DIAGRAM

NO SCALE

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No.	Description	Date
3	Addendum #3	4/21/2026

Project Number 2507
Date 3/16/2026

PERMIT / BID SET

SINGLE LINE DIAGRAMS - ELECTRICAL

E4.01

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PANELBOARD: P1 SEC.1

MAIN LUG ONLY | **BUS AMPACITY:** 400 A | **EQUIPMENT RATING:** 120/208 V, 3PH, 4 WIRE | **FOR AIC RATING SEE ONE-LINE DIAGRAM**

MOUNTING: SURFACE | **ENCLOSURE:** TYPE 1 | **LOCATION:** ELECTRICAL ROOM | **SUPPLIED FROM:** MDS

Accessories: Provide Feed -Thru Lugs

CKT	Description/Location	Type	C.B.	Pole	Note	Load (VA) A	B	C	Load (VA) A	B	C	Note	Pole	C.B.	Type	Description/Location	CKT
1	MOTOR DOOR VEST 115	Motor	20 A	1		100			360				1	20 A	R	R - ELECT ROOM	2
3	IRRIGATION CONTROLLER	G	20 A	1			180			360			1	20 A	R	R - STORAGE 219	4
5	R - EXTERIOR	R	20 A	1				180			420		1	20 A	Moto...	R - FIRE RISER 220	6
7	R - FACIAL 214	R	20 A	1		540			720				1	20 A	R	R - EXTERIOR	8
9	FACP	G	20 A	1			500			550			1	20 A	G	LED POWERED MIRROR	10
11	R - RECEPTION 200	R	20 A	1				720			360		1	20 A	R	R - FACIAL/MASSAGE 217	12
13	R - HALL 203, 214, 205, 202	R	20 A	1		900			360				1	20 A	R	R - FACIAL/MASSAGE 217	14
15	LED POWERED MIRROR	G	20 A	1			550			720			1	20 A	R	R - FACIAL/MASSAGE 217	16
17	NAIL PEDI 201 - TABLES	G	20 A	1				360			360		1	20 A	G	NAIL PEDI 201 - TABLES	18
19	NAIL PEDI 201 - TABLES	G	20 A	1		360			360				1	20 A	G	NAIL PEDI 201 - TABLES	20
21	NAIL PEDI 201 - TABLES	G	20 A	1			360			180			1	20 A	R	CHARGING STATION - 201	22
23	NAIL PEDI 201 - TABLES	G	20 A	1				360			180		1	20 A	R	CHARGING STATION - 201	24
25	R - SALON CUTTING 202	R	20 A	1		540			540				1	20 A	R	R - LAUNDRY 218	26
27	R - SALON CUTTING 202	R	20 A	1			360			540			1	20 A	R	R - RECEPTION 200	28
29	R- NAIL PEDI 201	R	20 A	1				540			540		1	20 A	R	R- NAIL PEDI 201	30
31	R - WAX 215 TILT TABLE	R	20 A	1		720			1,500			1	1	20 A	G	WASHER	32
33	R - WAX 216 TILT TABLE	R	20 A	1			720			1,500		1	1	20 A	G	WASHER	34
35	WASHER	G	20 A	1	1			1,500			2,500		2	30 A	G	DRYER	36
37	DRYER	G	30 A	2		2,500			2,500			--	--	--	--	--	38
39	--	--	--	--	--		2,500			2,500			2	30 A	G	DRYER	40
41	SPARE BREAKER	--	20 A	1				0			2,500	--	--	--	--	--	42
	Total Connected load Ph. A					267 A			Panel Connected Load: 92.9 kVA							257.9 A	
	Total Connected load Ph. B					260 A			Total Demand Load: 92.8 kVA							257.7 A	
	Total Connected load Ph. C					250 A											

Notes:
1. PROVIDE GFCI TYPE CIRCUIT BREAKER.
2. PROVIDE HANDLE TIE FOR CIRCUITS THAT FEED CUTTING STATION, REFER TO FLOOR PLANS FOR CIRCUIT INFORMATION.

Load Type Definitions:
Motor (125% largest Motor + 100% remaining motors) | K = Kitchen (Demand as per NEC Table 220.56) | C = Continuous Load (125%) | X = X-Rays (Demand per NEC 660.6)
R = Receptacles (to 10kVA100%, over 10 kVA 50%) | G = General Load (Non-continuous) (100%) | L = Lighting (125%) | H = Heating (100%)
E = Existing Load 30-day metered (125%) | EL = Elevator (Demand as per NEC Table 620.14) | W = Water Heater (125%) | EV = Electric Vehicle Charger

Load Type	Connected Load	NEC Demand Factor	NEC Demand Load	Panel Totals	
Motor	340.0	117.65%	400.0		
G	82300.0	100.00%	82300.0	Total Connected Load:	92900.0 VA
R	10260.0	98.73%	10130.0	Total NEC Demand:	92830.0 VA
				Total Connected Current:	257.9 A
				Total NEC Demand Current:	257.7 A

PANELBOARD: P1 SEC.2

MAIN LUG ONLY | **BUS AMPACITY:** 400 A | **EQUIPMENT RATING:** 120/208 V, 3PH, 4 WIRE | **FOR AIC RATING SEE ONE-LINE DIAGRAM**

MOUNTING: SURFACE | **ENCLOSURE:** TYPE 1 | **LOCATION:** | **SUPPLIED FROM:** P1

Accessories:

CKT	Description/Location	Type	C.B.	Pole	Note	Load (VA) A	B	C	Load (VA) A	B	C	Note	Pole	C.B.	Type	Description/Location	CKT
43	POWER SPACE 27	G	20 A	1		360			1,500			2	1	20 A	G	CUTTING STATION	44
45	CUTTING STATION	G	20 A	1	-		1,500			1,500			1	20 A	G	R - HAIR DRYERS	46
47	R - HAIR DRYERS	G	20 A	1				1,500			1,500		1	20 A	G	R - HAIR DRYERS	48
49	CUTTING STATION	G	20 A	1	2	1,500			1,500			2	1	20 A	G	CUTTING STATION	50
51	CUTTING STATION	G	20 A	1	-		1,500			1,500		-	1	20 A	G	CUTTING STATION	52
53	CUTTING STATION	G	20 A	1	2			1,500			1,500	2	1	20 A	G	CUTTING STATION	54
55	CUTTING STATION	G	20 A	1	-	1,500			1,500			-	1	20 A	G	CUTTING STATION	56
57	CUTTING STATION	G	20 A	1	2		1,500			1,500		2	1	20 A	G	CUTTING STATION	58
59	CUTTING STATION	G	20 A	1	-			1,500			1,500	-	1	20 A	G	CUTTING STATION	60
61	CUTTING STATION	G	20 A	1	2	1,500			1,500			2	1	20 A	G	CUTTING STATION	62
63	CUTTING STATION	G	20 A	1	-		1,500			1,500		-	1	20 A	G	CUTTING STATION	64
65	CUTTING STATION	G	20 A	1	2			1,500			1,500	2	1	20 A	G	CUTTING STATION	66
67	CUTTING STATION	G	20 A	1	-	1,500			1,500			-	1	20 A	G	CUTTING STATION	68
69	CUTTING STATION	G	20 A	1	2		1,500			1,500		2	1	20 A	G	CUTTING STATION	70
71	CUTTING STATION	G	20 A	1	-			1,500			1,500	-	1	20 A	G	CUTTING STATION	72
73	CUTTING STATION	G	20 A	1	2	1,500			1,500			2	1	20 A	G	CUTTING STATION	74
75	CUTTING STATION	G	20 A	1	-		1,500			1,500		-	1	20 A	G	CUTTING STATION	76
77	CUTTING STATION	G	20 A	1	2			1,500			1,500	2	1	20 A	G	CUTTING STATION	78
79	CUTTING STATION	G	20 A	1	-	1,500			1,500			-	1	20 A	G	CUTTING STATION	80
81	CUTTING STATION	G	20 A	1	2		1,500			0			1	20 A	--	SPARE BREAKER	82
83	CUTTING STATION	G	20 A	1	-			1,500			0	1	1	20 A	--	SPARE BREAKER	84
	Total Connected load Ph. A					166 A			Panel Connected Load: 58.9 kVA							163.4 A	
	Total Connected load Ph. B					163 A			Total Demand Load: 58.9 kVA							163.4 A	
	Total Connected load Ph. C					163 A											

Notes:

Load Type Definitions:
Motor (125% largest Motor + 100% remaining motors) | K = Kitchen (Demand as per NEC Table 220.56) | C = Continuous Load (125%) | X = X-Rays (Demand per NEC 660.6)
R = Receptacles (to 10kVA100%, over 10 kVA 50%) | G = General Load (Non-continuous) (100%) | L = Lighting (125%) | H = Heating (100%)
E = Existing Load 30-day metered (125%) | EL = Elevator (Demand as per NEC Table 620.14) | W = Water Heater (125%) | EV = Electric Vehicle Charger

Load Type	Connected Load	NEC Demand Factor	NEC Demand Load	Panel Totals	
G	58860.0	100.00%	58860.0		
				Total Connected Load:	58860.0 VA
				Total NEC Demand:	58860.0 VA
				Total Connected Current:	163.4 A
				Total NEC Demand Current:	163.4 A

PANELBOARD: P2

MAIN LUG ONLY | **BUS AMPACITY:** 225 A | **EQUIPMENT RATING:** 120/208 V, 3PH, 4 WIRE | **FOR AIC RATING SEE ONE-LINE DIAGRAM**

MOUNTING: SURFACE | **ENCLOSURE:** TYPE 1 | **LOCATION:** CLASSROOM STORAGE 114 | **SUPPLIED FROM:** MDS

Accessories: Provide Feed -Thru Lugs

CKT	Description/Location	Type	C.B.	Pole	Note	Load (VA) A	B	C	Load (VA) A	B	C	Note	Pole	C.B.	Type	Description/Location	CKT
1	R - BARBER 109	R	20 A	1		180			550				1	20 A	G	SECURITY PANEL	2
3	R- JAN 222, TP-1	R, G	20 A	1			420			720			1	20 A	R	R - MECH MEZZ 181	4
5	ACCESS CONTROL PANEL	G	20 A	1				550			900		1	20 A	R	R - HALL 107, 112	6
7	EWC-1	Motor	15 A	1	1	384			500				1	20 A	R	R - TOASTER	8
9	DATA RACK - MDF 204	G	30 A	2			2,000			180			1	20 A	R	R - HAIR TEXTURE 112	10
11	--	--	--	--	--	--		2,000			180		1	20 A	R	R - HAIR TEXTURE 112	12
13	REFRIGERATOR - COLAB 113L	G	20 A	1	1	800			2,000				2	30 A	G	DATA RACK - MDF 204	14
15	R - HAIR TEXTURE 112	R	20 A	1			180			2,000		--	--	--	--	--	16
17	R - HAIR TEXTURE 112	R	20 A	1				360			180		1	20 A	R	R - BARBER 109	18
19	R - HAIR TEXTURE 112	R	20 A	1		180			180				1	20 A	R	R - HAIR TEXTURE 112	20
21	R - BARBER 109	R	20 A	1			180			180			1	20 A	R	R - BARBER 109	22
23	R - BARBER 109	R	20 A	1				180			360		1	20 A	R	R - TOILETS 204, 207, 205	24
25	R - BARBER 109	R	20 A	1		180			180				1	20 A	R	R - BARBER 109	26
27	R - MDF 204	R	20 A	1			360			360			1	20 A	R	R - COLLAB 113	28
29	R - MDF 204	R	20 A	1				360			720		1	20 A	R	R - HAIR TEXTURE 112	30
31	R - MDF 204	R	20 A	1		360			360				1	20 A	R	R - CLASSROOM SHAMPOO 110	32
33	R - BARBER 109 STORAGE	R	20 A	1			540			1,500			1	20 A	R	R - DEDICATED COUNTER	34
35	R - MICROWAVE	R	20 A	1				1,500			0		1	20 A	--	SPARE BREAKER	36
37	R - BARBER 109	R	20 A	1		720			1,500				1	20 A	R	R - DED COUNTER	38
39	SPARE BREAKER	--	20 A	1			0			0			1	20 A	--	SPARE BREAKER	40
41	SPARE BREAKER	--	20 A	1				0			0		1	20 A	--	SPARE BREAKER	42
	Total Connected load Ph. A					110 A			Panel Connected Load: 40.4 kVA							112.3 A	
	Total Connected load Ph. B					119 A			Total Demand Load: 31.8 kVA							88.4 A	
	Total Connected load Ph. C					108 A											

Notes:
1. PROVIDE GFCI TYPE CIRCUIT BREAKER.

Load Type Definitions:
Motor (125% largest Motor + 100% remaining motors) | K = Kitchen (Demand as per NEC Table 220.56) | C = Continuous Load (125%) | X = X-Rays (Demand per NEC 660.6)
R = Receptacles (to 10kVA100%, over 10 kVA 50%) | G = General Load (Non-continuous) (100%) | L = Lighting (125%) | H = Heating (100%)
E = Existing Load 30-day metered (125%) | EL = Elevator (Demand as per NEC Table 620.14) | W = Water Heater (125%) | EV = Electric Vehicle Charger

Load Type	Connected Load	NEC Demand Factor	NEC Demand Load	Panel Totals	
Motor	384.0	125.00%	480.0		
G	12640.0	100.00%	12640.0	Total Connected Load:	40444.0 VA
R	27420.0	68.23%	18710.0	Total NEC Demand:	31830.0 VA
				Total Connected Current:	112.3 A
				Total NEC Demand Current:	88.4 A

PANELBOARD: M1

MAIN LUG ONLY | **BUS AMPACITY:** 400 A | **EQUIPMENT RATING:** 120/208 V, 3PH, 4 WIRE | **FOR AIC RATING SEE ONE-LINE DIAGRAM**

MOUNTING: SURFACE | **ENCLOSURE:** TYPE 1 | **LOCATION:** ELECTRICAL ROOM | **SUPPLIED FROM:** MDS

Accessories: Provide Feed -Thru Lugs

CKT	Description/Location	Type	C.B.	Pole	Note	Load (VA) A	B	C	Load (VA) A	B	C	Note	Pole	C.B.	Type	Description/Location	CKT
1	CP-1	Motor	15 A	1		65			1,000				1	15 A	H	EWH-1	2
3	WH-1	WH	15 A	1			600			1,248			2	20 A	Motor	HP-13	4
5	MMV-1	G	15 A	1				384			1,248	--	--	--	--	--	6
7	EWH-2	H	15 A	1		1,000			978				2	15 A	Motor	BP-1a	8
9	SPARE BREAKER	--	20 A	1			0			978		--	--	--	--	--	10
11	BP-1b	Motor	15 A	2				978			0		1	20 A	--	SPARE BREAKER	12
13	--	--	--	--	--	978			1,248				2	20 A	Motor	HP-12	14
15	SPARE BREAKER	--	20 A	1			0			1,248		--	--	--	--	--	16
17	HP-1	Motor	20 A	2				1,331			0		1	20 A	--	SPARE BREAKER	18
19	--	--	--	--	--	1,331			1,331				2	25 A	Motor	HP-5	20
21	HP-10	Motor	40 A	2			2,662			1,331		--	--	--	--	--	22
23	--	--	--	--	--			2,662			1,331		2	25 A	Motor	HP-9	24
25	SPARE BREAKER	--	20 A	1		0			1,331			--	--	--	--	--	26
27	HP-8	Motor	40 A	2			1,331			1,331			2	25 A	Motor	HP-3	28
29	--	--	--	--	--			1,331			1,331	--	--	--	--	--	30
31	HP-2	Motor	25 A	2		1,331			2,662				2	40 A	Motor	HP-11	32
33	--	--	--	--	--		1,331			2,662		--	--	--	--	--	34
35	HP-4	Motor	25 A	2				1,331			2,662		2	40 A	Motor	HP-7	36
37	--	--	--	--	--	1,331			2,662			--	--	--	--	--	38
39	HP-6	Motor	40 A	2			2,662			--			1	--	--	BUSSED SPACE	40
41	--	--	--	--	--			2,662			--		1	--	--	BUSSED SPACE	42
	Total Connected load Ph. A					144 A			Panel Connected Load: 51.9 kVA							144.0 A	
	Total Connected load Ph. B					145 A			Total Demand Load: 53.2 kVA							147.7 A	
	Total Connected load Ph. C					144 A											

Notes:

Load Type Definitions:
Motor (125% largest Motor + 100% remaining motors) | K = Kitchen (Demand as per NEC Table 220.56) | C = Continuous Load (125%) | X = X-Rays (Demand per NEC 660.6)
R = Receptacles (to 10kVA100%, over 10 kVA 50%) | G = General Load (Non-continuous) (100%) | L = Lighting (125%) | H = Heating (100%)
E = Existing Load 30-day metered (125%) | EL = Elevator (Demand as per NEC Table 620.14) | W = Water Heater (125%) | EV = Electric Vehicle Charger

Load Type	Connected Load	NEC Demand Factor	NEC Demand Load	Panel Totals	
H	1999.2	100.00%	1999.2		
Motor	48903.2	102.72%	50234.4	Total Connected Load:	51886.4 VA
G	384.0	100.00%	384.0	Total NEC Demand:	53217.6 VA
WH	600.0	100.00%	600.0	Total Connected Current:	144.0 A
				Total NEC Demand Current:	147.7 A

PANELBOARD: M2

MAIN LUG ONLY | **BUS AMPACITY:** 225 A | **EQUIPMENT RATING:** 120/208 V, 3PH, 4 WIRE | **FOR AIC RATING SEE ONE-LINE DIAGRAM**

MOUNTING: SURFACE | **ENCLOSURE:** TYPE 1 | **LOCATION:** MECHANICAL MEZZANINE | **SUPPLIED FROM:** MDS

Accessories:

CKT	Description/Location	Type	C.B.	Pole	Note	Load (VA) A	B	C	Load (VA) A	B	C	Note	Pole	C.B.	Type	Description/Location	CKT
1	MOTORIZED DAMPER - FCU-1	Motor	20 A	1		550			832				2	15 A	Motor	EF-2	2
3	FCU-7-H	H	30 A	2			2,496			832		--	--	--	--	--	4
5	--	--	--	--	--			2,496			550		1	20 A	Motor	MOTORIZED DAMPER - FCU-9	6
7	FCU-10-H	H	30 A	2		2,496			2,496				2	30 A	H	FCU-11-H	8
9	--	--	--	--	--		2,496			2,496		--	--	--	--	--	10
11	FCU-8-H	H	50 A	2				4,000			2,814		2	40 A	H	EUH-1	12
13	--	--	--	--	--	4,000			2,814			--	--	--	--	--	14
15	FCU-6-H	H	50 A	2			3,619			550			1	20 A	Motor	MOTORIZED DAMPER - FCU-8	16
17	--	--	--	--	--	3,619			550				1	20 A	Motor	MOTORIZED DAMPER - FCU-5	18
19	MOTORIZED DAMPER - FCU-6	Motor	20 A	1		550			550				1	20 A	Motor	MOTORIZED DAMPER - FCU-3	20
21	MOTORIZED DAMPER - FCU-4	Motor	20 A	1			550			550			1	20 A	Motor	MOTORIZED DAMPER - FCU-11	22
23	MOTORIZED DAMPER - FCU-2	Motor	20 A	1				550			85		1	20 A	Motor	EF-1,2,3	24
25	MOTORIZED DAMPER - FCU-10	Motor	20 A	1		550			915				2	15 A	Motor	ERV-1	26
27	ERV-2	Motor	15 A	2			915			915		--	--	--	--	--	28
29	--	--	--	--	--			915			915		2	15 A	Motor	ERV-3	30
31	FCU-4-H	H	20 A	2		1,356			915			--	--	--	--	--	32
33	--	--	--	--	--		1,356			1,356			2	20 A	H	FCU-5-H	34
35	FCU-9-H	H	20 A	2				1,356			1,356	--	--	--	--	--	36
37	--	--	--	--	--	1,356			1,356				2	20 A	H	FCU-1-H	38
39	FCU-2-H	H	20 A	2			1,356			1,356		--	--	--	--	--	40
41	--	--	--	--	--			1,356			1,356		2	20 A	H	FCU-3-H	42
43	EF-4,5,6	Motor	20 A	1		410			1,356			--	--	--	--	--	44
45	SPARE BREAKER	--	20 A	1			0			0			1	20 A	--	SPARE BREAKER	46
47	SPARE BREAKER	--	20 A	1				0			0		1	20 A	--	SPARE BREAKER	48
49	SPARE BREAKER	--	20 A	1		0			0				1	20 A	--	SPARE BREAKER	50
51	BUSSED SPACE	--	--	1			--			--			1	--	--	BUSSED SPACE	52
53	BUSSED SPACE	--	--	1				--			--		1	--	--	BUSSED SPACE	54
55	BUSSED SPACE	--	--	1		--			--				1	--	--	BUSSED SPACE	56
57	BUSSED SPACE	--	--	1			--			--			1	--	--	BUSSED SPACE	58
59	BUSSED SPACE	--	--	1				--			--		1	--	--	BUSSED SPACE	60
	Total Connected load Ph. A					189 A			Panel Connected Load: 65.3 kVA							181.2 A	
	Total Connected load Ph. B					174 A			Total Demand Load: 65.7 kVA							182.4 A	
	Total Connected load Ph. C					184 A											

Notes:

Load Type Definitions:
Motor (125% largest Motor + 100% remaining motors) | K = Kitchen (Demand as per NEC Table 220.56) | C = Continuous Load (125%) | X = X-Rays (Demand per NEC 660.6)
R = Receptacles (to 10kVA100%, over 10 kVA 50%) | G = General Load (Non-continuous) (100%) | L = Lighting (125%) | H = Heating (100%)
E = Existing Load 30-day metered (125%) | EL = Elevator (Demand as per NEC Table 620.14) | W = Water Heater (125%) | EV = Electric Vehicle Charger

Load Type	Connected Load	NEC Demand Factor	NEC Demand Load	Panel Totals	
H	52116.5	100.00%	52116.5		
Motor	13150.8	103.48%	13608.4	Total Connected Load:	65267.3 VA
				Total NEC Demand:	65724.9 VA
				Total Connected Current:	181.2 A
				Total NEC Demand Current:	182.4 A

PANELBOARD: P3

MAIN LUG ONLY | **BUS AMPACITY:** 225 A | **EQUIPMENT RATING:** 120/208 V, 3PH, 4 WIRE | **FOR AIC RATING SEE ONE-LINE DIAGRAM**

MOUNTING: SURFACE | **ENCLOSURE:** TYPE 1 | **LOCATION:** | **SUPPLIED FROM:** P2

Accessories:

CKT	Description/Location	Type	C.B.	Pole	Note	Load (VA) A	B	C	Load (VA) A	B	C	Note	Pole	C.B.	Type	Description/Location	CKT
1	R - DEDICATED CHARGING	R	20 A	1		180			180				1	20 A	R	R - DEDICATED CHARGING	2
3	DDC PANEL	G	20 A	1			500			1,080			1	20 A	R	R - NAIL/ESTHETICS FLOOR BOXES	4
5	R -	R	20 A	1				900			720		1	20 A	R	R - ESTHETICS LAB	6
7	R - NAIL/ESTHETICS FLOOR BOXES	R	20 A	1		1,080			360				1	20 A	R	R - NAIL/PEDI	8
9	R - SALON/CUTTING MIRROR...	R	20 A	1			360			720			1	20 A	R	R - OFFICE 106	10
11	R - SALON/CUTTING MIRROR...	R	20 A	1				360			720		1	20 A	R	R - OFFICE 108	12
13	R - OFFICE 105	R	20 A	1		720			720				1	20 A	R	R - NAIL/ESTHETICS	14
15	R - OFFICE 102	R	20 A	1			720			900			1	20 A	R	R - ESTHETICS LAB	16
17	R - OFFICE 104	R	20 A	1				720			900		1	20 A	R	R - NAIL/ESTHETICS	18
19	R - ESTHETICS LAB	R	20 A	1		900			1,000				1	20 A	G	COPIER - COLLAB 113	20
21	COPIER - HALL 107	G	20 A	1			1,000			360			1	20 A	R	R - FACIAL/MASSAGE 217	22
23	R - HAIR DRYER	R	20 A	1				1,000			360		1	20 A	R	R - FACIAL/MASSAGE 217	24
25	SPARE BREAKER	--	20 A	1		0			0				1	20 A	--	SPARE BREAKER	26
27	SPARE BREAKER	--	20 A	1			0			0			1	20 A	--	SPARE BREAKER	28
29	SPARE BREAKER	--	20 A	1				0			0		1	20 A	--	SPARE BREAKER	30
31	BUSSED SPACE	--	--	1		--			--				1	--	--	BUSSED SPACE	32
33	BUSSED SPACE	--	--	1			--			--			1	--	--	BUSSED SPACE	34
35	BUSSED SPACE	--	--	1				--			--		1	--	--	BUSSED SPACE	36
37	BUSSED SPACE	--	--	1		--			--				1	--	--	BUSSED SPACE	38
39	BUSSED SPACE	--	--	1			--			--			1	--	--	BUSSED SPACE	40
41	BUSSED SPACE	--	--	1				--			--		1	--	--	BUSSED SPACE	42
	Total Connected load Ph. A					43 A			Panel Connected Load: 16.5 kVA							45.7 A	
	Total Connected load Ph. B					48 A			Total Demand Load: 14.5 kVA							40.2 A	
	Total Connected load Ph. C					48 A											

Notes:

Load Type Definitions:
Motor (125% largest Motor + 100% remaining motors) | K = Kitchen (Demand as per NEC Table 220.56) | C = Continuous Load (125%) | X = X-Rays (Demand per NEC 660.6)
R = Receptacles (to 10kVA100%, over 10 kVA 50%) | G = General Load (Non-continuous) (100%) | L = Lighting (125%) | H = Heating (100%)
E = Existing Load 30-day metered (125%) | EL = Elevator (Demand as per NEC Table 620.14) | W = Water Heater (125%) | EV = Electric Vehicle Charger

Load Type	Connected Load	NEC Demand Factor	NEC Demand Load	Panel Totals	
G	2500.0	100.00%	2500.0		
R	13960.0	85.82%	11980.0	Total Connected Load:	16460.0 VA
				Total NEC Demand:	14480.0 VA
				Total Connected Current:	45.7 A
				Total NEC Demand Current:	40.2 A

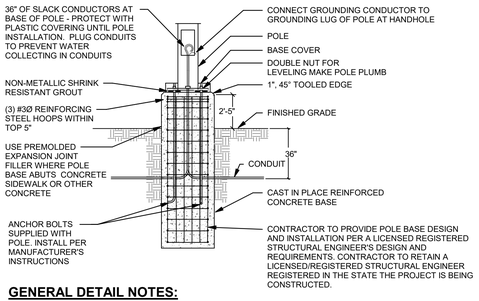
PANELBOARD: L1

MAIN LUG ONLY | **BUS AMPACITY:** 125 A | **EQUIPMENT RATING:** 120/208 V, 3PH, 4 WIRE | **FOR AIC RATING SEE ONE-LINE DIAGRAM**

MOUNTING: SURFACE | **ENCLOSURE:** TYPE 1 | **LOCATION:** ELECTRICAL ROOM | **SUPPLIED FROM:** MDS

Accessories:

CKT	Description/Location	Type	C.B.	Pole	Note	Load (VA) A	B	C	Load (VA) A	B	C	Note	Pole	C.B.	Type	Description/Location	CKT
1	L - EXTERIOR WALL MOUNTED	L	20 A	1	1	70			168				1	20 A	L	L - NAIL/PEDI STATION OVERHEAD	2
3	L - RECEPTION/LOBBY	L	20 A	1			134			224			1	20 A	L	L - MEZZ	4
5	L - HALL B/C/VEST	L	20 A	1	1			110			1,298		1	20 A	L	L - RR/WAX/LAUNDRY/FACIAL/STOR	6
7	L - BARBER/COLOR/SHAMPOO	L	20 A	1		877			1,432				1	20 A	L	L - NAIL/ESTHETICS/LAB/OFFICES	8
9	L - HAIR/TEXTURE/COLLAB/STORAGE	L	20 A	1			890			1,330			2	20 A	Spar...	INV	10
11	L - SALON/CUTTING/NAIL/PEDI	L	20 A	1				1,198			227	--	--	--	--	--	12
13	SPARE BREAKER	--	20 A	1		0			189				2	1	20 A	L	L - TRACK LIGHTING	14
15	L - SITE LIGHT POLES	L	20 A	2	1		61			189			2	1	20 A	L	L - TRACK LIGHTING	16
17	--	--	--	--	--			61			189		2	1	20 A	L	L - TRACK LIGHTING	18
19	SPARE BREAKER	--	20 A	1		0			189				2	1	20 A	L	L - TRACK LIGHTING	20
21	SPARE BREAKER	--	20 A	1			0			105			2	1	20 A	L	L - TRACK LIGHTING	22
23	SPARE BREAKER	--	20 A	1				0			105		2	1	20 A	L	L - TRACK LIGHTING



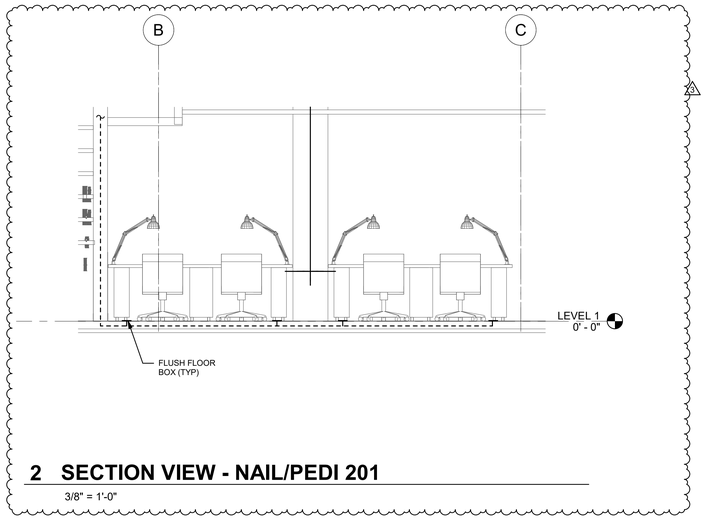
GENERAL DETAIL NOTES:

A. CONDUCTORS THROUGH POLE TO LUMINAIRE TO BE RATED 90° C

B. SEE LUMINAIRE SCHEDULE FOR POLE HEIGHT.

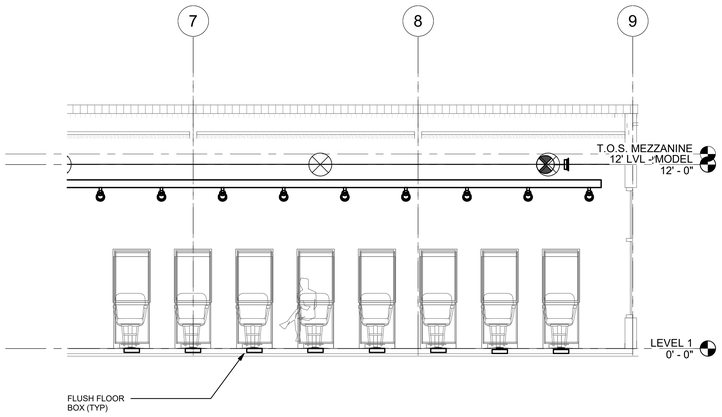
1 AREA LUMINAIRE STANDARD PEDESTAL ANCHOR BASE

NO SCALE



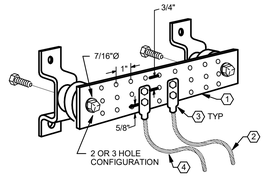
2 SECTION VIEW - NAIL/PEDI 201

3/8" = 1'-0"



3 SECTION VIEW - SALON/CUTTING 202

1/4" = 1'-0"

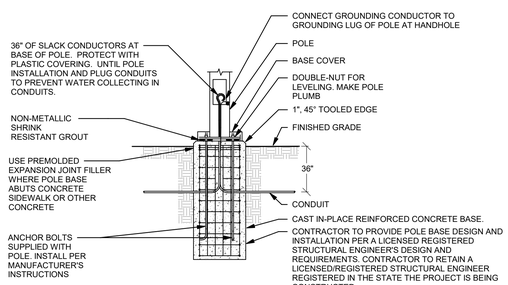


DETAIL KEYNOTES

1. COPPER GROUND BAR, TMGB - 1/4"X4"X20", TGB - 1/4"X4"X10" , , HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2. 3/0 BARE COPPER GROUND CONDUCTOR TO MAIN SERVICE EQUIPMENT GROUND OR TBB.
3. 2-HOLE LUG.
4. 3/0 BARE COPPER GROUND CONDUCTOR TO BUILDING STEEL.

5 GROUNDING BAR DETAIL

NO SCALE



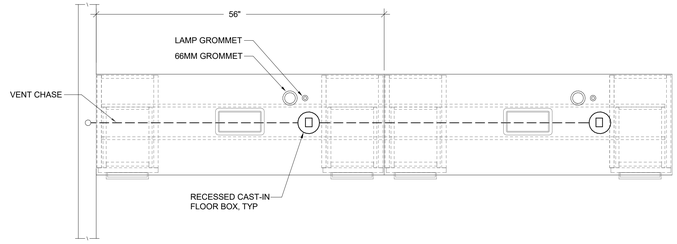
GENERAL DETAIL NOTES:

A. CONDUCTORS THROUGH POLE TO LUMINAIRE TO BE RATED 90° C

B. SEE LUMINAIRE SCHEDULE FOR POLE HEIGHT.

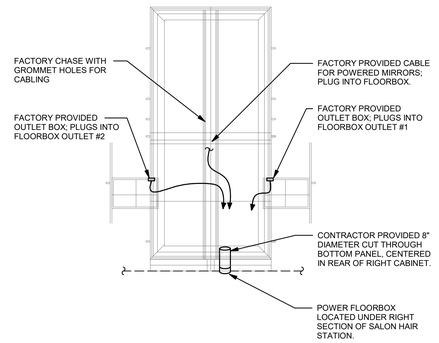
6 AREA LUMINAIRE STANDARD FLUSH ANCHOR BASE

NO SCALE



8 NAIL STATION ELECTRICAL OUTLET DETAIL

NO SCALE



9 SALON ELECTRICAL OUTLET DETAIL

NO SCALE

BBT ARCHITECTS
1140 sw Simpson Ave. - Suite 200
Bend, Oregon 97702
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REGISTERED PROFESSIONAL ENGINEER
72777PE
OREGON
JUNE 03, 2010
MARK K. O'LEARY
EXPIRES: 12/31/26

INTERFACE ENGINEERING
PROJECT 2025-1011
CONTACT Michael Nelson
100 SW Main Street, Suite 1600
Portland, OR 97204
TEL 503.382.2266
www.interfaceengineering.com

Klamath Community College, Cosmetology Center Project

7390 S 6TH STREET
KLAMATH FALLS, OR
97603

No.	Description	Date
3	Addendum #3	4/21/2026

Project Number 2507
Date 3/16/2026

PERMIT / BID SET

DETAILS - ELECTRICAL

E6.02

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PANELBOARD: SNOW

MAIN LUG ONLY
BUS AMPACITY: 125 A
EQUIPMENT RATING: 120/208 V, 3PH, 4 WIRE
FOR AIC RATING SEE ONE-LINE DIAGRAM

MOUNTING: SURFACE
ENCLOSURE: TYPE 1
LOCATION:
SUPPLIED FROM: MDS

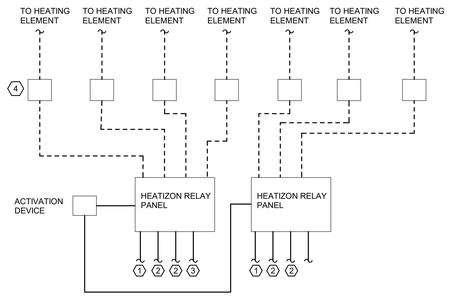
Accessories:

CKT	Description/Location	Type	C.B.	Pole	Note	Load (VA) A	B	C	A	B	C	Note	Pole	C.B.	Type	Description/Location	CKT
1	SNOWMELT 1	C	50 A	2	1	3,744			3,744			1	2	50 A	C	SNOWMELT 3	2
3	--	--	--	--	--		3,744			3,744		--	--	--	--	--	4
5	SNOWMELT 2	C	50 A	2	1			3,744			3,744	1	2	50 A	C	SNOWMELT 4	6
7	--	--	--	--	--	3,744			3,744			--	--	--	--	--	8
9	SNOWMELT 5	C	30 A	2	1	1,664				360		1	1	20 A	G	CONTROL CIRCUIT	10
11	--	--	--	--	--		1,664				0	1	1	20 A	--	SPARE BREAKER	12
13	SPARE BREAKER	--	30 A	2		0			0			1	1	20 A	--	SPARE BREAKER	14
15	--	--	--	--	--		0			--		1	1	--	--	BUSSED SPACE	16
17	SPARE BREAKER	--	30 A	2				0			--	1	1	--	--	BUSSED SPACE	18
19	--	--	--	--	--	0			--			1	1	--	--	BUSSED SPACE	20
21	BUSSED SPACE	--	--	1			--			--		1	1	--	--	BUSSED SPACE	22
23	BUSSED SPACE	--	--	1				--			--	1	1	--	--	BUSSED SPACE	24
	Total Connected load Ph. A					125 A			Panel Connected Load: 33.6 kVA							93.4 A	
	Total Connected load Ph. B					80 A			Total Demand Load: 42.0 kVA							116.5 A	
	Total Connected load Ph. C					76 A											

Notes:
1.) PROVIDE 30mA GFEP TYPE CIRCUIT BREAKER.

Load Type Definitions:
Motor (125% largest Motor + 100% remaining motors)
R = Receptacles (to 10kVA100%, over 10 kVA 50%)
E = Existing Load 30-day metered (125%)
K = Kitchen (Demand as per NEC Table 220.56)
G = General Load (Non-continuous) (100%)
EL = Elevator (Demand as per NEC Table 620.14)
C = Continuous Load (125%)
L = Lighting (125%)
W = Water Heater (125%)
X = X-Rays (Demand per NEC 660.6)
H = Heating (100%)
EV = Electric Vehicle Charger

Load Type	Connected Load	NEC Demand Factor	NEC Demand Load	Panel Totals	
C	33280.0	125.00%	41600.0		
G	360.0	100.00%	360.0	**Total Connected Load:**	33640.0 VA
				Total NEC Demand:	41960.0 VA
				Total Connected Current:	93.4 A
				Total NEC Demand Current:	116.5 A



1 SNOW MELT SYSTEM

NO SCALE

GENERAL SHEET NOTES

A. SNOWMELT SYSTEM IS DESIGN BUILD BY CONTRACTOR. BASIS-OF-DESIGN: HEATIZON HOTT-WIRE SNOWMELT SYSTEM WITH CABLING INSTALLED ON 8" CENTERS, (2) M330 SERIES RELAY PANELS, (1) M326ARS ARIEL MOUNT TEMPERATURE SENSOR CONTROL, (4) 208V, 1PH, 50A CIRCUITS, (1) 208V, 1PH, 30A CIRCUIT, AND 120V, 20A CIRCUIT FOR CONTROL. DESIGN BUILD CONTRACTOR TO PROVIDE NECESSARY COMPONENTS FOR A COMPLETE AND OPERABLE SYSTEM. COORDINATE WITH ARCHITECT/OWNER TO VERIFY ACTIVATION DEVICE AND LOCATION.

B. PROVIDE GFEP PROTECTION FOR CIRCUITS FEEDING RELAY PANEL.

C. HEATING ELEMENT CONNECTION QUANTITY FOR DIAGRAMMATIC PURPOSES ONLY.

3 D. SNOW MELT SYSTEM TO BE BID AS ADD ALT#3

SHEET KEYNOTES

1. PROVIDE 120V, 20A/1P CONNECTION FOR RELAY PANEL POWER TO 'SNOW' PANEL.
2. PROVIDE 208V, 50A/2P CONNECTION FOR RELAY SWITCH TO 'SNOW' PANEL.
3. PROVIDE 208V, 30A/2P CONNECTION FOR RELAY SWITCH TO 'SNOW' PANEL.
4. PROVIDE JUNCTION/TERMINAL BOX AS REQUIRED PER MANUFACTURER INSTALLATION INSTRUCTIONS.

BBT ARCHITECTS
1140 sw Simpson Ave. - Suite 200
Bend, Oregon 97702
t 541.382.5535 | f 541.389.8033

REGISTERED PROFESSIONAL ENGINEER
72777PE
OREGON
JUNE 03, 2010
MARK K. O'LEARY
EXPIRES: 12/31/26

INTERFACE ENGINEERING
PROJECT 2025-1011
CONTACT Michael Nelson
100 SW Main Street, Suite 1600
Portland, OR 97204
TEL 503.382.2266
www.interfaceengineering.com

Klamath Community College, Cosmetology Center Project

7390 S 6TH STREET
KLAMATH FALLS, OR
97603

No.	Description	Date
2	Addendum #2	4/9/2026
3	Addendum #3	4/21/2026

Project Number 2507
Date 3/16/2026

PERMIT / BID SET

DETAILS - ELECTRICAL

E6.03

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PART 3
SUBSTITUTION REQUESTS & APPROVALS

CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE

UNDERSIGNED ATTESTS THAT FUNCTION AND QUALITY ARE EQUAL TO OR SUPERIOR TO SPECIFIED ITEMS.

FOR USE BY ARCHITECT:

X Accepted _____ Accepted as Noted
_____ Not Accepted _____ Received Too Late

By: **Bennett Sapin, BBT**
Date: **4/21/26**
Remarks: _____

Submitted By: James Audrey

Signature : James Audrey

Title: Project Support, Business Development

Firm: Mule-Hide Products Co. Inc.

Address: 1195 Prince Hall Drive, Beloit, WI 53511

Telephone: 608-802-3347

Date : April 13, 2026

Above signature must be by person having authority to legally bind his firm to the above terms.

END OF SECTION

SUBSTITUTION REQUEST
(During the Bidding/Negotiating Stage)

Project: Klamath Community College Cosmetology Building

Substitution Request Number: KCCC-01

From: James Audrey, Business Development Project Support

To: Nathan Buckley, Denise Reid, Kyle Burke, Bennett Sapin

Date: April 13, 2026

BBT Architecture

A/E Project Number: Project No: 2450.00

Re: Product Substitution Request

Contract For: Klamath Community College

Specification Title: TPO Roofing

Section: 07500

Page:350

Article/Paragraph: Part 2 Products 2.2 TPO Roofing

Proposed Substitution: MuleHide 60 mil TPO roof system, including all components and accessories

Manufacturer Mule-Hide Products Co, Inc. Address: 1195 Prince Hall Drive, Beloit, WI 53511 Phone: 608-361-6806

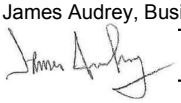
Trade Name TPO Roofing Membrane Model No. MH TPO 115 FLEECEBACK GRY

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.
Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution. This is a direct substitution with an equal product based on the specified installation. Acceptance of this request will cause no changes in building design or construction costs to owner.

Submitted by: James Audrey, Business Development Project Support

Signed by: 

Firm: Mule-Hide Products Co., Inc.

Address: 1195 Prince Hall Drive

Beloit, WI 53511

Telephone: 608-361-6806 or 608-718-4246

A/E's REVIEW AND ACTION

☐ Substitution approved - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: Date:

Supporting Data Attached: ☐ Drawings ☑ Product Data ☐ Samples ☐ Tests ☑ Reports ☐ _____

*samples upon request

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110 South Union St., Suite 100, Alexandria, VA 22314

SECTION 01 2500
SUBSTITUTIONS

TO: **BBT Architects**
1140 SW Simpson Ave., Ste. 200
Bend, OR. 97702

PROJECT NAME: Klamath Community College Cosmetology Building

We hereby submit for consideration, the following product instead of specified item for above project:

Section: 26 51 00 Paragraph: 2.1

Specified Item: QTL ZALA

Proposed Substitution: Luminaire Type: F2 - PureEdge LRF7

Attach complete dimensional information and technical data including laboratory tests, if applicable.

Include complete information on changes to Drawings and/or specifications, which proposed substitution will require for its proper installation.

Submit with request all necessary samples and substantiating data to provide equal quality, performance, and appearance to that which is specified. Clearly mark manufacturer's literature to indicate equality in performance. Differences in quality of materials and construction shall be indicated.

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

1. The proposed substitutions do not affect dimensions shown on drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.
5. The proposed substitution will have no affect on applicable codes.
6. The manufacturer's guarantee or warranties of proposed product is equivalent to; or exceeds that of the specified product.
7. Proposed substituted item will match all sizes, profiles, specifications and colors of item originally specified.

List of names and location of three similar projects on which product was used, date of installation, and Architect's name and phone number.

Project No. 1: Eug Tailwinds Renovation, Eugene, OR, 03/2026, Mike McWain Architect - 318/681-9515
Project No. 2: River Grove Elementary School Replacement, Lake Oswego, OR, 05/2023, Arcadis IBI Group - 503/226-6950
Project No. 3: Rothko Pavilion - Portland Art Museum, Portland, OR, 08/2023, Hennebery Eddy Architects - 503/227-4860

SECTION 01 2500
SUBSTITUTIONS

CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE

UNDERSIGNED ATTESTS THAT FUNCTION AND QUALITY ARE EQUAL TO OR SUPERIOR TO SPECIFIED ITEMS.

FOR USE BY ARCHITECT:

X Accepted _____ Accepted as Noted
_____ Not Accepted _____ Received Too Late

By: **Bennett Sapin, BBT**
Date: **4/21/26**
Remarks: _____

Submitted By: Grant Spolar

Signature : 

Title: Sales Support Coordinator

Firm: The Lighting Project

Address: 4317 E Thurston Way

Vancouver, WA 98662

Telephone: 360/314-4100

Date : _____

Above signature must be by person having authority to legally bind his firm to the above terms.

END OF SECTION

SECTION 01 2500
SUBSTITUTIONS

01 2500-3

TO: **BBT Architects**
1140 SW Simpson Ave., Ste. 200
Bend, OR. 97702

PROJECT NAME: Klamath Community College Cosmetology Building

We hereby submit for consideration, the following product instead of specified item for above project:

Section: Division 26 Paragraph: All

Specified Item Lighting

Proposed Substitution: See Substitution Package

Attach complete dimensional information and technical data including laboratory tests, if applicable.

Include complete information on changes to Drawings and/or specifications, which proposed substitution will require for its proper installation.

Submit with request all necessary samples and substantiating data to provide equal quality, performance, and appearance to that which is specified. Clearly mark manufacturer's literature to indicate equality in performance. Differences in quality of materials and construction shall be indicated.

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

1. The proposed substitutions do not affect dimensions shown on drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.
5. The proposed substitution will have no affect on applicable codes.
6. The manufacturer's guarantee or warranties of proposed product is equivalent to; or exceeds that of the specified product.
7. Proposed substituted item will match all sizes, profiles, specifications and colors of item originally specified.

List of names and location of three similar projects on which product was used, date of installation, and Architect's name and phone number.

Project No. 1: Available upon request
Project No. 2:
Project No. 3:

SECTION 01 2500
SUBSTITUTIONS

CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE

UNDERSIGNED ATTESTS THAT FUNCTION AND QUALITY ARE EQUAL TO OR SUPERIOR TO SPECIFIED ITEMS.

FOR USE BY ARCHITECT:

X Accepted _____ Accepted as Noted
_____ Not Accepted _____ Received Too Late

By: Lynn Baker
Date: 4/21/26
Remarks: B1

Submitted By: Adriana Alejandre

Signature : Adriana Alejandre

Title: Tech/Sales Support

Firm: Solus Lighting & Controls

Address: 1820 E Burnside St Portland, OR 97214

Telephone: (503) 768-9999

Date : 4/16/2026

Above signature must be by person having authority to legally bind his firm to the above terms.

END OF SECTION

Submitted by Solus Lighting & Controls			
SOLUS Lighting & Controls	**Job Name:** KCC Cosmetology Architect: Barber Barrett Tuner Architects (Bend) Engineer: Interface Engineering, Inc.- Portland (Portland)	**Catalog Number:** BPRO3-REC-FLSH-LED35-90-PROG1000-8-TMW-BTW-XX-SC-UNV-XX-DM01 Notes:	**Type:** **B1** SOLUS26-234409

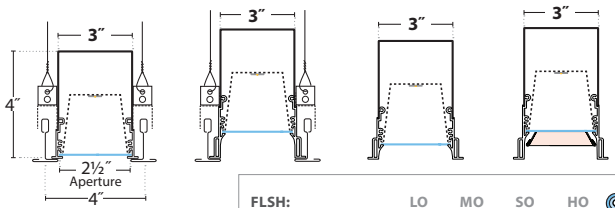
BionicPro3™ | Recessed Linear

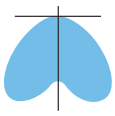
PRUDENTIAL LTG.
PRULITE.COM 213.746.0360



T-BAR (X1, X1M, X1T, X2, X6, X9) **HARD CEILING (X3, X7, X11)**

FLSH REG1 REG.5 LVR1





BPRO3-REC-FLSH-LED35-MO-BTW
2747 Delivered Lumens
23 Watts
121 lm/w
1.84 Spacing Criteria

Lumen output may vary +/– 5%
Light Loss Factor (LLF) for CCTs other than 3500K:
4000K +2%, 3000K -5%, 2700K -20%
90 CRI -15% (3K, 3500K, 4K & 5K
ADC -2% LLF
Louver LLF 30% White, 50% Silver, 70% Black

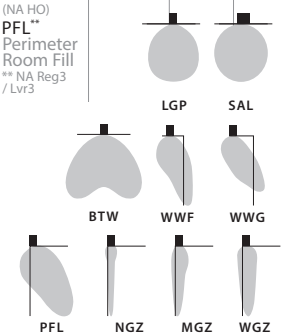
FLSH:		LO	MO	SO	HO
SAL	Lm/Ft	435	640	885	1115
BTW	Lm/Ft	470	685	950	1200
WWF	Lm/Ft	475	700	975	1225
WWG / PFL	Lm/Ft	475	700	975	1225
NGZ	Lm/Ft	525	775	1075	1200
MGZ	Lm/Ft	475	700	975	1225
WGZ	Lm/Ft	525	775	1075	1200
LGP	Lm/Ft	475	700	975	—
	W/Ft	3.8	5.6	7.8	10.5

LUMEN CHART AT 3500K-80 CRI
SEE PAGE 5-6 FOR REGRESS

SMART SPECS

SOCIAL MEDIA KIT · SEAMLESS · TechZone4 · Declare. · DLC QPL LISTED · CONSULT FACTORY FOR IC RATED · UGR16 WELL Building Standard · 5 YEAR WARRANTY · Made in the USA

SERIES	LENS POS.	LED COLOR	OUTPUT	NOMINAL LENGTH	TRIM COLOR	LOUVER COLOR	DISTRIBUTION	MOUNTING	CIRCUITING	VOLTAGE	CEILING SYSTEMS	DRIVERS	OPTIONS, CONTROL SENSORS & CORNERS
BPRO3-REC BionicPro 3″ Slot	FLSH Flush Lens LVR Louver Flush REG.5 ½″ Regress LVR1 Louver ½″ Regress REG1 1″ Regress LVR3* Louver 2½″ Regress REG3* 3″ Regress * NA BTW/ WWF/ WWG/ PFL	LED27 2700K (90CRI) LED3 3000K LED35 3500K LED4 4000K LED3-90 3000K (90CRI) LED35-90 3500K (90CRI) LED4-90 4000K (90CRI) LED5-90 5000K (90CRI) bios: **STATIC:** BLU3S BLU35S BLU4S **DYNAMIC:** BLU3D* BLU35D* BLU4D* * Dynamic BIOS, SkyBlue spike can be dimmed, CCT warms slightly TU TuHue 2700-6500K Tunable White TU2** TuHue 2200-5000K Tunable White AMB** AmberHue Warm Dim 2200K-5000K ** NA HO CHR Chroma-Hue RGBW (DMX at HO only)	1,000L LO Low MO Medium SO Standard HO High (Non-IC rated, consult factory for EMHE) PROG Programmable Light Output (Specify desired lm/ft or w/ft) NOTE: Consult factory for High Output (HO)	2′ 3′ 4′ 5′ 6′ 7′ 8′ R___ (Row Length, ⅛″ increments) NOTE: Individual fixtures are NOT intended for row mounting. Requires field-cut filler fixture at end of row.	TMW Textured Matte White (Standard) YGW Gloss White Y__ Premium Color CC Custom Color *LUXE METALLICS:* YBZ Bronze YCP Copper Penny YGN Gold Nugget	SKIP COLUMN IF LOUVER IS NOT NEEDED TMW Textured Matte White YGW Gloss White YBK Black Matte Y__ Premium Color CC Custom Color *LUXE METALLICS:* YBZ Bronze YCP Copper Penny YGN Gold Nugget	CONFIRM SAL Satin Lens BTW** Batwing WWF** Flat Wall Wash WWG** Focal Glow Wall Wash NGZ Narrow Wall Graze MGZ Medium Wall Graze WGZ Wide Wall Graze LGP Low Glare Prismatic (NA HO) PFL** Perimeter Room Fill ** NA Reg3 / Lvr3 NOTE: All distributions available with Louvers	LP Light Pocket WTW Wall to Wall See page 8 for details All non nominal lengths require FIELD CUTTABLE filler fixture at end of row	SC SC Single Circuit	CONFIRM UNV (120-277) NA with EMHE Emergency 120 277 347 (Emergency battery requires a Step Down transformer and remote box)	X1 T-Bar 15/16″ X1M T-Bar 9/16″ X1T 15/16″ T-Bar Tegular X2 Dimensional T-Bar Armstrong Interlude®, Tegular X3 Hard Ceiling (Flange Trim) X6 Slot Grid, Tegular X7 Mud-Over Flange X9†† Finished Extruded Side (Grid Ceiling) X11†† Finished Extruded Side (Ceilings needing nominal lengths) S†† See page 7	ND Non-Dimming DM01 0-10v, 1% Dimming (Standard) LDE1 Hi-lume 1% EcoSystem LED (Soft fade on, fade-to-black dimming) ECO 1% 0-10v, EldoLED (Logarithmic dimming std) ECDA 1% DALI, EldoLED (Logarithmic dimming std) nLight-Air Acuity nLight Drivers (ECDA driver ONLY) nLight-Wired Acuity nLight Drivers (ECO driver ONLY) SOLO 0.1% 0-10v, EldoLED (Dim-to-dark, Logarithmic dimming std) SODA 0.1% DALI, EldoLED (Dim-to-dark, Logarithmic dimming std) STEP Signify Advance Step Dimming 2WIRE ELV/ Forward/Reverse Phase Driver **HUES:** E10V 2 Channel Color Control EDALI 2 Channel Color Control EDMX Chroma-Hue or Static White NOTE: May require Insulation Detector (ID), see page 6	EMHE‡ Emergency Battery (800 Delivered lumens, CA Title 20 compliant, 4′ or < Remote) ETS-DR‡ Iota ETS-DR Emergency Transfer Switch ‡ 2″+3″: Non-IC rated, NA with UNV voltage, Adds 1⅞″ height, see page 6 EMC Emergency Circuiting FTR Feather WTW Asymmetric on Perpendicular Wall (See page 9, NA HO or LGP) IDSM Insulation Detector Side Mount (for plenums <6″ where fixtures are non-IC rated) CP Chicago Plenum OMB Overhead Mounting Bracket (X3, X7 and X9 optional installation — 2x per fixture) **SENSORS:** (See Page 21) 205 WattStopper PIR Occupancy **205-ON/OFF** **205-STEP:** Dim to 50% **205-DM:** Dim to 1% (NA with DALI) ATHENA Lutron RF (Dim-to-Off Standard) LVOC‡‡ Lutron Vive (Occ & RF) LVRF‡‡ Lutron Vive (RF Only) ‡‡ Requires Lutron driver NXSMP Hubbell (Occ) rES7 Daylight+(PIR Acoustic) (Occ) (nLight-Air) Part Number: rES7-PDT-180D-G2 nES7 Daylight+(PIR Acoustic) (Occ) (nLight-Wired) Part Number: nES-PDT7-ADCX LUX Philips DLR **CORNERS:** C2-60 Lit 60° C2-90 Lit 90° C2-120 Lit 120° C2-135 Lit 135° C3T Lit 90° 3-Way: T C3Y Lit 120° 3-Way: Y C4T Lit 90° 4-Way: + C4X Lit 45°-135° 4-Way: X C8I Lit Inside 2-Plane C8O Lit Outside 2-Plane **90° LOUVERS AVAILABLE (CONSULT FACTORY FOR OTHER ANGLES)** LRT Linear to Recessed Transition NOTE: Corners currently NA with Louvers, consult factory DWNLT Downlights (See page 2)



Prudential Ltg. reserves the right to change design specifications or materials without notice. Please visit prulite.com for most current data.
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SECTION 01 2500
SUBSTITUTIONS

01 2500-3

TO: **BBT Architects**
1140 SW Simpson Ave., Ste. 200
Bend, OR. 97702

PROJECT NAME: Klamath Community College Cosmetology Building

We hereby submit for consideration, the following product instead of specified item for above project:

Section: Division 26 Paragraph: All

Specified Item Lighting

Proposed Substitution: See Substitution Package

Attach complete dimensional information and technical data including laboratory tests, if applicable.

Include complete information on changes to Drawings and/or specifications, which proposed substitution will require for its proper installation.

Submit with request all necessary samples and substantiating data to provide equal quality, performance, and appearance to that which is specified. Clearly mark manufacturer's literature to indicate equality in performance. Differences in quality of materials and construction shall be indicated.

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

1. The proposed substitutions do not affect dimensions shown on drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.
5. The proposed substitution will have no affect on applicable codes.
6. The manufacturer's guarantee or warranties of proposed product is equivalent to; or exceeds that of the specified product.
7. Proposed substituted item will match all sizes, profiles, specifications and colors of item originally specified.

List of names and location of three similar projects on which product was used, date of installation, and Architect's name and phone number.

Project No. 1: Available upon request
Project No. 2:
Project No. 3:

SECTION 01 2500
SUBSTITUTIONS

CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE

UNDERSIGNED ATTESTS THAT FUNCTION AND QUALITY ARE EQUAL TO OR SUPERIOR TO SPECIFIED ITEMS.

FOR USE BY ARCHITECT:

X Accepted _____ Accepted as Noted
_____ Not Accepted _____ Received Too Late

By: Lynn Baker
Date: 4/21/26
Remarks: B2

Submitted By: Adriana Alejandre

Signature : Adriana Alejandre

Title: Tech/Sales Support

Firm: Solus Lighting & Controls

Address: 1820 E Burnside St Portland, OR 97214

Telephone: (503) 768-9999

Date : 4/16/2026

Above signature must be by person having authority to legally bind his firm to the above terms.

END OF SECTION

Submitted by Solus Lighting & Controls

Job Name:
KCC Cosmetology
Architect: Barber Barrett Tuner Architects (Bend)
Engineer: Interface Engineering, Inc.- Portland (Portland)

Catalog Number:
BPRO3-REC-FLSH-LED35-90-PROG500-20-TMW-XX-XX-SC-UNV-XX-DM01

Notes:

Type:
B2

SOLUS26-234409

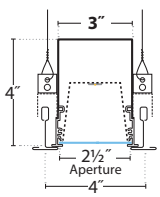
BionicPro3™ | Recessed Linear

PRUDENTIAL LTG.
PRULITE.COM 213.746.0360

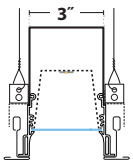


T-BAR (X1, X1M, X1T, X2, X6, X9)

FLSH

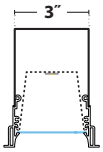


REG1

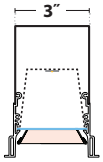


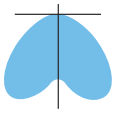
HARD CEILING (X3, X7, X11)

REG.5



LVR1





BPRO3-REC-FLSH-LED35-MO-BTW

2747	Delivered Lumens
23	Watts
121	lm/w
1.84	Spacing Criteria

Lumen output may vary +/– 5%
Light Loss Factor (LLF) for CCTs other than 3500K:
4000K +2%, 3000K -5%, 2700K -20%
90 CRI -15% (3K, 3500K, 4K & 5K
ADC -2% LLF
Louver LLF 30% White, 50% Silver, 70% Black

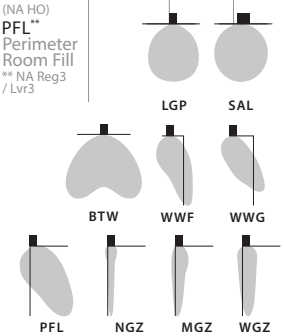
FLSH:

		LO	MO	SO	HO
SAL	Lm/Ft	435	640	885	1115
BTW	Lm/Ft	470	685	950	1200
WWF	Lm/Ft	475	700	975	1225
WWG / PFL	Lm/Ft	475	700	975	1225
NGZ	Lm/Ft	525	775	1075	1200
MGZ	Lm/Ft	475	700	975	1225
WGZ	Lm/Ft	525	775	1075	1200
LGP	Lm/Ft	475	700	975	—
	W/Ft	3.8	5.6	7.8	10.5

LUMEN CHART AT 3500K-80 CRI
SEE PAGE 5-6 FOR REGRESS

SMART SPECS

SOCIAL MEDIA KIT · SEAMLESS · TechZone4 · Declare. · DLC QPL LISTED · CONSULT FACTORY FOR IC RATED · UGR16 WELL Building Standard · 5 YEAR WARRANTY · Made in the USA

SERIES	LENS POS.	LED COLOR	OUTPUT	NOMINAL LENGTH	TRIM COLOR	LOUVER COLOR	DISTRIBUTION	MOUNTING	CIRCUITING	VOLTAGE	CEILING SYSTEMS	DRIVERS	OPTIONS, CONTROL SENSORS & CORNERS
BPRO3-REC BionicPro 3″ Slot	FLSH Flush Lens LVR Louver Flush REG.5 ½″ Regress LVR1 Louver ½″ Regress REG1 1″ Regress LVR3* Louver 2½″ Regress REG3* 3″ Regress * NA BTW/ WWF/ WWG/ PFL	LED27 2700K (90CRI) LED3 3000K LED35 3500K LED4 4000K LED3-90 3000K (90CRI) LED35-90 3500K (90CRI) LED4-90 4000K (90CRI) LED5-90 5000K (90CRI) bios: **STATIC:** BLU3S BLU35S BLU4S **DYNAMIC:** BLU3D* BLU35D* BLU4D* * Dynamic BIOS, SkyBlue spike can be dimmed, CCT warms slightly TU TuHue 2700-6500K Tunable White TU2*** TuHue 2200-5000K Tunable White AMB** AmberHue Warm Dim 2200K-5000K ** NA HO CHR Chroma-Hue RGBW (DMX at HO only)	LO Low MO Medium SO Standard HO High (Non-IC rated, consult factory for EMHE) PROG Programmable Light Output (Specify desired lm/ft or w/ft) **NOTE:** Consult factory for **High Output (HO)**	2′ 3′ 4′ 5′ 6′ 7′ 8′ R___ (Row Length, ⅛″ increments) **NOTE:** Individual fixtures are NOT intended for row mounting. **Requires field-cut filler fixture at end of row.**	TMW Textured Matte White (Standard) YGW Gloss White Y__ Premium Color CC Custom Color *LUXE METALLICS:* YBZ Bronze YCP Copper Penny YGN Gold Nugget	**SKIP COLUMN IF LOUVER IS NOT NEEDED** TMW Textured Matte White YGW Gloss White YBK Black Matte Y__ Premium Color CC Custom Color *LUXE METALLICS:* YBZ Bronze YCP Copper Penny YGN Gold Nugget	SAL Satin Lens BTW** Batwing WWF** Flat Wall Wash WWG** Focal Glow Wall Wash NGZ Narrow Wall Graze MGZ Medium Wall Graze WGZ Wide Wall Graze LGP Low Glare Prismatic (NA HO) PFL** Perimeter Room Fill ** NA Reg3 / Lvr3 LP Light Pocket WTW Wall to Wall See page 8 for details All non nominal lengths require **FIELD CUTTABLE** filler fixture at end of row  **NOTE:** All distributions available with Louvers	SC Single Circuit	UNV (120-277) NA with EMHE Emergency 120 277 347 (Emergency battery requires a Step Down transformer and remote box)	X1 T-Bar 15/16″ X1M T-Bar 9/16″ X1T 15/16″ T-Bar Tegular X2 Dimensional T-Bar Armstrong Interlude®, Tegular X3 Hard Ceiling (Flange Trim) X6 Slot Grid, Tegular X7 Mud-Over Flange X9†† Finished Extruded Side (Grid Ceiling) X11†† Finished Extruded Side (Ceilings needing nominal lengths) S†† See page 7	ND Non-Dimming DM01 0-10v, 1% Dimming (Standard) LDE1 Hi-lume 1% EcoSystem LED (Soft fade on, fade-to-black dimming) ECO 1% 0-10v, EldoLED (Logarithmic dimming std) ECDA 1% DALI, EldoLED (Logarithmic dimming std) nLight-Air Acuity nLight Drivers (ECDA driver ONLY) nLight-Wired Acuity nLight Drivers (ECO driver ONLY) SOLO 0.1% 0-10v, EldoLED (Dim-to-dark, Logarithmic dimming std) SODA 0.1% DALI, EldoLED (Dim-to-dark, Logarithmic dimming std) STEP Signify Advance Step Dimming 2WIRE ELV/ Forward/Reverse Phase Driver **HUES:** E10V 2 Channel Color Control EDALI 2 Channel Color Control EDMX Chroma-Hue or Static White **NOTE:** May require Insulation Detector (ID), see page 6	EMHE‡ Emergency Battery (800 Delivered lumens, CA Title 20 compliant, 4′ or < Remote) ETS-DR‡ Iota ETS-DR Emergency Transfer Switch ‡ 2″+3″: Non-IC rated, NA with UNV voltage, Adds 1⅞″ height, see page 6 EMC Emergency Circuiting FTR Feather WTW Asymmetric on Perpendicular Wall (See page 9, NA HO or LGP) IDSM Insulation Detector Side Mount (for plenums <6″ where fixtures are non-IC rated) CP Chicago Plenum OMB Overhead Mounting Bracket (X3, X7 and X9 optional installation — 2x per fixture) **SENSORS:** (See Page 21) 205 WattStopper PIR Occupancy **205-ON/OFF** **205-STEP:** Dim to 50% **205-DM:** Dim to 1% (NA with DALI) ATHENA Lutron RF (Dim-to-Off Standard) LVOC‡‡ Lutron Vive (Occ & RF) LVRF‡‡ Lutron Vive (RF Only) ‡‡ Requires Lutron driver NXSMP Hubbell (Occ) rES7 Daylight+(PIR Acoustic) (Occ) (nLight-Air) Part Number: rES7-PDT-180D-G2 nES7 Daylight+(PIR Acoustic) (Occ) (nLight-Wired) Part Number: nES-PDT7-ADCX LUX Philips DLR **CORNERS:** C2-60 Lit 60° C2-90 Lit 90° C2-120 Lit 120° C2-135 Lit 135° C3T Lit 90° 3-Way: T C3Y Lit 120° 3-Way: Y C4T Lit 90° 4-Way: + C4X Lit 45°-135° 4-Way: X C8I Lit Inside 2-Plane C8O Lit Outside 2-Plane **90° LOUVERS AVAILABLE (CONSULT FACTORY FOR OTHER ANGLES)** LRT Linear to Recessed Transition **NOTE:** Corners currently NA with Louvers, consult factory DWNLT Downlights (See page 2)

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SECTION 01 2500
SUBSTITUTIONS

01 2500-3

TO: **BBT Architects**
1140 SW Simpson Ave., Ste. 200
Bend, OR. 97702

PROJECT NAME: Klamath Community College Cosmetology Building

We hereby submit for consideration, the following product instead of specified item for above project:

Section: Division 26 Paragraph: All

Specified Item Lighting

Proposed Substitution: See Substitution Package

Attach complete dimensional information and technical data including laboratory tests, if applicable.

Include complete information on changes to Drawings and/or specifications, which proposed substitution will require for its proper installation.

Submit with request all necessary samples and substantiating data to provide equal quality, performance, and appearance to that which is specified. Clearly mark manufacturer's literature to indicate equality in performance. Differences in quality of materials and construction shall be indicated.

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

1. The proposed substitutions do not affect dimensions shown on drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.
5. The proposed substitution will have no affect on applicable codes.
6. The manufacturer's guarantee or warranties of proposed product is equivalent to; or exceeds that of the specified product.
7. Proposed substituted item will match all sizes, profiles, specifications and colors of item originally specified.

List of names and location of three similar projects on which product was used, date of installation, and Architect's name and phone number.

Project No. 1: Available upon request
Project No. 2:
Project No. 3:

SECTION 01 2500
SUBSTITUTIONS

CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE

UNDERSIGNED ATTESTS THAT FUNCTION AND QUALITY ARE EQUAL TO OR SUPERIOR TO SPECIFIED ITEMS.

FOR USE BY ARCHITECT:

X Accepted _____ Accepted as Noted
_____ Not Accepted _____ Received Too Late

By: Lynn Baker
Date: 4/21/26
Remarks: B3

Submitted By: Adriana Alejandre

Signature : Adriana Alejandre

Title: Tech/Sales Support

Firm: Solus Lighting & Controls

Address: 1820 E Burnside St Portland, OR 97214

Telephone: (503) 768-9999

Date : 4/16/2026

Above signature must be by person having authority to legally bind his firm to the above terms.

END OF SECTION

Submitted by Solus Lighting & Controls

Job Name:
KCC Cosmetology
Architect: Barber Barrett Tuner Architects (Bend)
Engineer: Interface Engineering, Inc.- Portland (Portland)

Catalog Number:
BPRO3-REC-FLSH-LED35-90-PROG350-12-TMW-XX-XX-SC-UNV-XX-DM01

Notes:

Type:
B3

SOLUS26-234409

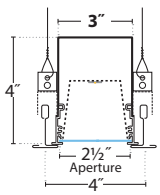
BionicPro3™ | Recessed Linear

PRUDENTIAL LTG.
PRULITE.COM 213.746.0360

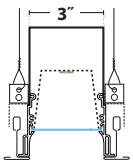


T-BAR (X1, X1M, X1T, X2, X6, X9)

FLSH

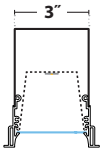


REG1

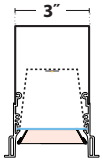


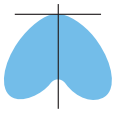
HARD CEILING (X3, X7, X11)

REG.5



LVR1





BPRO3-REC-FLSH-LED35-MO-BTW
2747 Delivered Lumens
23 Watts
121 lm/w
1.84 Spacing Criteria

Lumen output may vary +/– 5%
Light Loss Factor (LLF) for CCTs other than 3500K:
4000K +2%, 3000K -5%, 2700K -20%
90 CRI -15% (3K, 3500K, 4K & 5K
ADC -2% LLF
Louver LLF 30% White, 50% Silver, 70% Black

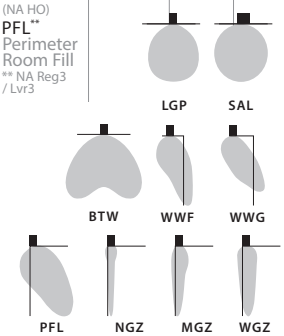
FLSH:		LO	MO	SO	HO
SAL	Lm/Ft	435	640	885	1115
BTW	Lm/Ft	470	685	950	1200
WWF	Lm/Ft	475	700	975	1225
WWG / PFL	Lm/Ft	475	700	975	1225
NGZ	Lm/Ft	525	775	1075	1200
MGZ	Lm/Ft	475	700	975	1225
WGZ	Lm/Ft	525	775	1075	1200
LGP	Lm/Ft	475	700	975	—
	W/Ft	3.8	5.6	7.8	10.5

LUMEN CHART AT 3500K-80 CRI
SEE PAGE 5-6 FOR REGRESS

SMART SPECS

SOCIAL MEDIA KIT · SEAMLESS · TechZone4 · Declare. · DLC · CONSULT FACTORY FOR IC RATED · UGR16 WELL Building Standard · 5 YEAR WARRANTY · Made in the USA

SERIES	LENS POS.	LED COLOR	OUTPUT	NOMINAL LENGTH	TRIM COLOR	LOUVER COLOR	DISTRIBUTION	MOUNTING	CIRCUITING	VOLTAGE	CEILING SYSTEMS	DRIVERS	OPTIONS, CONTROL SENSORS & CORNERS
BPRO3-REC			350L	12'		CONFIRM	CONFIRM		SC	CONFIRM			
BionicPro 3″ Slot	FLSH Flush Lens LVR Louver Flush REG.5 ½″ Regress LVR1 Louver ½″ Regress REG1 1″ Regress LVR3* Louver 2½″ Regress REG3* 3″ Regress * NA BTW/ WWF/ WWG/ PFL	LED27 2700K (90CRI) LED3 3000K LED35 3500K LED4 4000K LED3-90 3000K (90CRI) LED35-90 3500K (90CRI) LED4-90 4000K (90CRI) LED5-90 5000K (90CRI) bios: **STATIC:** BLU3S BLU35S BLU4S **DYNAMIC:** BLU3D* BLU35D* BLU4D* * Dynamic BIOS, SkyBlue spike can be dimmed, CCT warms slightly TU TuHue 2700-6500K Tunable White TU2** TuHue 2200-5000K Tunable White AMB** AmberHue Warm Dim 2200K-5000K ** NA HO CHR Chroma-Hue RGBW (DMX at HO only)	LO Low MO Medium SO Standard HO High (Non-IC rated, consult factory for EMHE) PROG Programmable Light Output (Specify desired lm/ft or w/ft) **NOTE:** Consult factory for **High Output (HO)**	2′ 3′ 4′ 5′ 6′ 7′ 8′ R___ (Row Length, ⅛″ increments) **NOTE:** Individual fixtures are NOT intended for row mounting. **Requires field-cut filler fixture at end of row.**	TMW Textured Matte White (Standard) YGW Gloss White Y__ Premium Color CC Custom Color *LUXE METALICS:* YBZ Bronze YCP Copper Penny YGN Gold Nugget	**SKIP COLUMN IF LOUVER IS NOT NEEDED** TMW Textured Matte White YGW Gloss White YBK Black Matte Y__ Premium Color CC Custom Color *LUXE METALICS:* YBZ Bronze YCP Copper Penny YGN Gold Nugget	SAL Satin Lens BTW** Batwing WWF** Flat Wall Wash WWG** Focal Glow Wall Wash NGZ Narrow Wall Graze MGZ Medium Wall Graze WGZ Wide Wall Graze LGP Low Glare Prismatic (NA HO) PFL** Perimeter Room Fill ** NA Reg3 / Lvr3	LP Light Pocket WTW Wall to Wall See page 8 for details All non nominal lengths require **FIELD CUTTABLE** filler fixture at end of row	SC Single Circuit	UNV (120-277) NA with EMHE Emergency 120 277 347 (Emergency battery requires a Step Down transformer and remote box)	X1 T-Bar 15/16″ X1M T-Bar 9/16″ X1T 15/16″ T-Bar Tegular X2 Dimensional T-Bar Armstrong Interlude®, Tegular X3 Hard Ceiling (Flange Trim) X6 Slot Grid, Tegular X7 Mud-Over Flange X9†† Finished Extruded Side (Grid Ceiling) X11†† Finished Extruded Side (Ceilings needing nominal lengths) S†† See page 7	ND Non-Dimming DM01 0-10v, 1% Dimming (Standard) LDE1 Hi-lume 1% EcoSystem LED (Soft fade on, fade-to-black dimming) ECO 1% 0-10v, EldoLED (Logarithmic dimming std) ECDA 1% DALI, EldoLED (Logarithmic dimming std) nLight-Air Acuity nLight Drivers (ECDA driver ONLY) nLight-Wired Acuity nLight Drivers (ECO driver ONLY) SOLO 0.1% 0-10v, EldoLED (Dim-to-dark, Logarithmic dimming std) SODA 0.1% DALI, EldoLED (Dim-to-dark, Logarithmic dimming std) STEP Signify Advance Step Dimming 2WIRE ELV/ Forward/Reverse Phase Driver **HUES:** E10V 2 Channel Color Control EDALI 2 Channel Color Control EDMX Chroma-Hue or Static White **NOTE:** May require Insulation Detector (ID), see page 6	EMHE‡ Emergency Battery (800 Delivered lumens, CA Title 20 compliant, 4′ or < Remote) ETS-DR‡ Iota ETS-DR Emergency Transfer Switch ‡ 2″+3″: Non-IC rated, NA with UNV voltage, Adds 1⅞″ height, see page 6 EMC Emergency Circuiting FTR Feather WTW Asymmetric on Perpendicular Wall (See page 9, NA HO or LGP) IDSM Insulation Detector Side Mount (for plenums <6″ where fixtures are non-IC rated) CP Chicago Plenum OMB Overhead Mounting Bracket (X3, X7 and X9 optional installation — 2x per fixture) **SENSORS:** (See Page 21) 205 WattStopper PIR Occupancy **205-ON/OFF** **205-STEP:** Dim to 50% **205-DM:** Dim to 1% (NA with DALI) ATHENA Lutron RF (Dim-to-Off Standard) LVOC‡‡ Lutron Vive (Occ & RF) LVRF‡‡ Lutron Vive (RF Only) ‡‡ Requires Lutron driver NXSMP Hubbell (Occ) rES7 Daylight+(PIR Acoustic) (Occ) (nLight-Air) Part Number: rES7-PDT-180D-G2 nES7 Daylight+(PIR Acoustic) (Occ) (nLight-Wired) Part Number: nES-PDT7-ADCX LUX Philips DLR **CORNERS:** C2-60 Lit 60° C2-90 Lit 90° C2-120 Lit 120° C2-135 Lit 135° C3T Lit 90° 3-Way: T C3Y Lit 120° 3-Way: Y C4T Lit 90° 4-Way: + C4X Lit 45°-135° 4-Way: X C8I Lit Inside 2-Plane C8O Lit Outside 2-Plane **90° LOUVERS AVAILABLE (CONSULT FACTORY FOR OTHER ANGLES)** LRT Linear to Recessed Transition **NOTE:** Corners currently NA with Louvers, consult factory DWNLT Downlights (See page 2)



NOTE: All distributions available with Louvers

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SECTION 01 2500
SUBSTITUTIONS

01 2500-3

TO: **BBT Architects**
1140 SW Simpson Ave., Ste. 200
Bend, OR. 97702

PROJECT NAME: Klamath Community College Cosmetology Building

We hereby submit for consideration, the following product instead of specified item for above project:

Section: Division 26 Paragraph: All

Specified Item Lighting

Proposed Substitution: See Substitution Package

Attach complete dimensional information and technical data including laboratory tests, if applicable.

Include complete information on changes to Drawings and/or specifications, which proposed substitution will require for its proper installation.

Submit with request all necessary samples and substantiating data to provide equal quality, performance, and appearance to that which is specified. Clearly mark manufacturer's literature to indicate equality in performance. Differences in quality of materials and construction shall be indicated.

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

1. The proposed substitutions do not affect dimensions shown on drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.
5. The proposed substitution will have no affect on applicable codes.
6. The manufacturer's guarantee or warranties of proposed product is equivalent to; or exceeds that of the specified product.
7. Proposed substituted item will match all sizes, profiles, specifications and colors of item originally specified.

List of names and location of three similar projects on which product was used, date of installation, and Architect's name and phone number.

Project No. 1: Available upon request
Project No. 2:
Project No. 3:

SECTION 01 2500
SUBSTITUTIONS

CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE

UNDERSIGNED ATTESTS THAT FUNCTION AND QUALITY ARE EQUAL TO OR SUPERIOR TO SPECIFIED ITEMS.

FOR USE BY ARCHITECT:

X Accepted _____ Accepted as Noted
_____ Not Accepted _____ Received Too Late

By: Lynn Baker
Date: 4/21/26
Remarks: B4

Submitted By: Adriana Alejandre

Signature : Adriana Alejandre

Title: Tech/Sales Support

Firm: Solus Lighting & Controls

Address: 1820 E Burnside St Portland, OR 97214

Telephone: (503) 768-9999

Date : 4/16/2026

Above signature must be by person having authority to legally bind his firm to the above terms.

END OF SECTION

Submitted by Solus Lighting & Controls

Job Name:
KCC Cosmetology
Architect: Barber Barrett Tuner Architects (Bend)
Engineer: Interface Engineering, Inc.- Portland (Portland)

Catalog Number:
BPRO3-PER-REG1-LED35-90-PROG500-9'4"-TMW-TMW-SAL-XX-SC-UNV-XX-DM01

Notes:

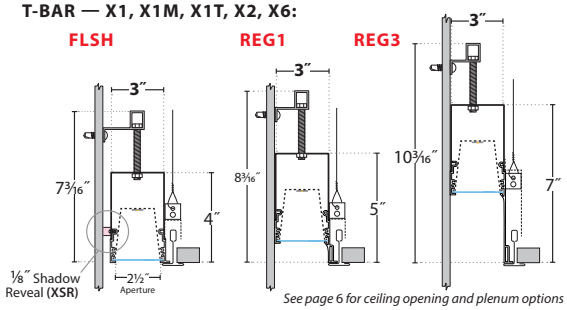
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B4
SOLUS26-234409

BionicPro3™ | Perimeter

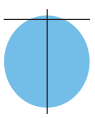
PRUDENTIAL LTG.
PRULITE.COM 213.746.0360



T-BAR — X1, X1M, X1T, X2, X6:



See page 6 for ceiling opening and plenum options



BPRO3-PER-FLSH-LED35-MO-SAL
2300 Delivered Lumens
23 Watts
101 Lm/W

FLSH:		LO	MO	SO	HO
SAL	Lm/Ft	435	640	885	1115
PFL	Lm/Ft	475	700	975	1225
NGZ	Lm/Ft	525	775	1075	1200
MGZ	Lm/Ft	475	700	975	1225
WGZ	Lm/Ft	525	775	1075	1200
LGP	Lm/Ft	475	700	975	—
	W/Ft	3.8	5.6	7.8	10.5

LUMEN CHART AT 3500K-80 CRI
SEE PAGE 5 FOR REGRESS

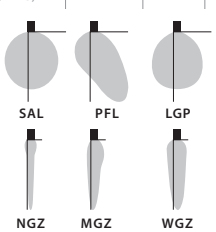
SMART SPECS

Lumen output may vary +/– 5%
Light Loss Factor (LLF) for CCTs other than 3500K:
4000K +2%, 3000K -5%, 2700K -20%
90 CRI -15% (3K, 3500K, 4K & 5K ADC -2% LLF
Louver LLF 30% White, 50% Silver, 70% Black

TUNABLE WHITE
Tū Hue · Amber Hue · Blu Hue · Chroma Hue

SOCIAL MEDIA KIT · SEAMLESS · Declare. · DLC LISTED · TechZone4 · CONSULT FACTORY FOR IC RATED · 5 YEAR WARRANTY · Made in the USA

SERIES	LENS POS.	LED COLOR	OUTPUT	NOMINAL LENGTH	TRIM COLOR	LOUVER COLOR	DISTRIBUTION	MOUNTING	CIRCUITING	VOLTAGE	CEILING SYSTEMS	DRIVERS	OPTIONS, CONTROL SENSORS & CORNERS
BPRO3-PER			500L	9'4"			CONFIRM		SC		CONFIRM		
Bionicpro 3" Perimeter	FLSH Flush Lens LVR Louver Flush REG.5 ½" Regress LVR1 Louver ½" Regress REG1 1" Regress LVR3* Louver 2½" Regress REG3* 3" Regress * NA PFL	LED27 2700K (90CRI) LED3 3000K LED35 3500K LED4 4000K LED3-90 3000K (90CRI) LED35-90 3500K (90CRI) LED4-90 4000K (90CRI) LED5-90 5000K (90CRI) **PRUHUES:** bios: **STATIC:** BLU3S BLU35S BLU4S **DYNAMIC:** BLU3D* BLU35D* BLU4D* * Dynamic BIOS, SkyBlue spike can be dimmed, CCT warms slightly TU TuHue 2700-6500K Tunable White TU2** TuHue 2200-5000K Tunable White AMB** Amber-Hue Warm Dim 2200K-5000K ** NA-HO CHR Chroma-Hue RGBW (DMX at HO only)	LO Low MO Medium SO Standard HO High PROG Programmable Light Output (Specify desired lm/ft or w/ft)	2′ 3′ 4′ 5′ 6′ 7′ 8′ R___ (Row Length) **NOTE:** Individual fixtures are NOT intended for row mounting. Requires field-cut filler fixture at end of row	TMW Textured Matte White (Standard) YGW Gloss White Y__ Premium Color CC Custom Color *LUXE METALLICS:* YBZ Bronze YCP Copper Penny YGN Gold Nugetd Nugget	**SKIP COLUMN IF LOUVER IS NOT NEEDED** TMW Textured Matte White YGW Gloss White YBK Black Matte Y__ Premium Color CC Custom Color *LUXE METALLICS:* YBZ Bronze YCP Copper Penny YGN Gold Nugetd Nugget	SAL Satin Lens NGZ Narrow Wall Graze MGZ Medium Wall Graze WGZ Wide Wall Graze LGP Low Glare Prismatic (NA HO) PFL Perimeter Room Fill (NA Reg3 / Lvr3)	LP Light Pocket WTW Wall to Wall Requires filler fixture at end of row. See page 7 for details All non nominal lengths require **FIELD CUTTABLE** filler fixture at end of row	SC Single Circuit	UNV (120-277) 120 277 347 (Emergency battery requires a Step Down transformer and remote box)	X1 15⁄16″ T-Bar X1M 9⁄16″ T-Bar X1T 15⁄16″ T-Bar Tegular X2 Dimensional T-Bar Armstrong Interlude® X3 Hard Ceiling (Flange Trim) X6 Slot Grid X7 Mud-Over Flange X9†† Finished Extruded Side (Grid Ceiling) X11†† Finished Extruded Side (Ceilings needing nominal lengths) †† See page 6	ND Non-Dimming DM01 0-10v, 1% Dimming (Standard) LDE1 Hi-lume 1% EcoSystem LED (Soft fade on, fade-to-black dimming) ECO 1% 0-10v, EldoLED (Logarithmic dimming std) ECDA 1% DALI, EldoLED (Logarithmic dimming std) nLight-Air Acuity nLight Drivers (ECDA driver ONLY) nLight-Wired Acuity nLight Drivers (ECO driver ONLY) SOLO 0.1% 0-10v, EldoLED (Dim-to-dark, Logarithmic dimming std) SODA 0.1% DALI, EldoLED (Dim-to-dark, Logarithmic dimming std) STEP Signify Advance Step Dimming 2WIRE ELV/ Forward/Reverse Phase Driver **PRUHUES:** E10V 2 Channel Color Control EDALI 2 Channel Color Control EDMX ChromaHue or Static White **NOTE:** May require Insulation Detector (ID), see page 3	EMHE / EMHE-RTK‡ CA T20 Emergency Battery / Remote Test Kit (900 Delivered lumens, CA Title 20 compliant, 4′ or < Remote) ETS-DR / ETS-RTK‡ Iota ETS-DR Emergency Transfer Switch / Remote Test Kit ‡ 2″ + 3″: Non-IC rated, NA with UNV voltage, Adds 1⅞″ height, see page 7 EMC Emergency Circuiting FTR End of row feathering to soften Wall Grazing or PFL effect on Perpendicular Wall (WTW) (See page 8, NA HO or LGP) CP Chicago Plenum IDSM Insulation Detector Side Mount (for plenums <6″ where fixtures are non-IC rated, see page 3) XSR ⅛″ Shadow Reveal (See page 9) **SENSORS:** (See Page 19) 205 WattStopper PIR Occupancy **205-ON/OFF** **205-STEP:** Dim to 50% **205-DM:** Dim to 1% (NA with DALI) ATHENA Lutron RF (Dim-to-Off Standard) LVOC‡‡ Lutron Vive (Occ & RF) LVRF‡‡ Lutron Vive (RF Only) ‡‡ Requires Lutron driver NXSMP Hubbell (Occ) rES7 Daylight+ (PIR Acoustic) (Occ) (nLight-Air) Part Number: rES7-PDT-180D-G2 nES7 Daylight+(PIR Acoustic) (Occ) (nLight-Wired) Part Number: nES-PDT7-ADCX **NOTE:** Sensors NA with REG3, tile mount (by others) **CORNERS:** C2I-60 Lit 60° Inside C2O-60 Lit 60° Outside C2I-90 Lit 90° Inside C2O-90 Lit 90° Outside C2I-120 Lit 120° Inside C2O-120 Lit 120° Outside C2I-135 Lit 135° Inside C2O-135 Lit 135° Outside C3T Lit 90° 3-Way: T **90° LOUVERS AVAILABLE (CONSULT FACTORY FOR OTHER ANGLES)** DWNLT Downlights (See page 2)



NOTE:
All distributions available with Louvers

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SECTION 01 2500
SUBSTITUTIONS

01 2500-3

TO: **BBT Architects**
1140 SW Simpson Ave., Ste. 200
Bend, OR. 97702

PROJECT NAME: Klamath Community College Cosmetology Building

We hereby submit for consideration, the following product instead of specified item for above project:

Section: Division 26 Paragraph: All

Specified Item Lighting

Proposed Substitution: See Substitution Package

Attach complete dimensional information and technical data including laboratory tests, if applicable.

Include complete information on changes to Drawings and/or specifications, which proposed substitution will require for its proper installation.

Submit with request all necessary samples and substantiating data to provide equal quality, performance, and appearance to that which is specified. Clearly mark manufacturer's literature to indicate equality in performance. Differences in quality of materials and construction shall be indicated.

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

1. The proposed substitutions do not affect dimensions shown on drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.
5. The proposed substitution will have no affect on applicable codes.
6. The manufacturer's guarantee or warranties of proposed product is equivalent to; or exceeds that of the specified product.
7. Proposed substituted item will match all sizes, profiles, specifications and colors of item originally specified.

List of names and location of three similar projects on which product was used, date of installation, and Architect's name and phone number.

Project No. 1: Available upon request
Project No. 2:
Project No. 3:

SECTION 01 2500
SUBSTITUTIONS

CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE

UNDERSIGNED ATTESTS THAT FUNCTION AND QUALITY ARE EQUAL TO OR SUPERIOR TO SPECIFIED ITEMS.

FOR USE BY ARCHITECT:

X Accepted _____ Accepted as Noted
_____ Not Accepted _____ Received Too Late

By: Lynn Baker
Date: 4/21/26
Remarks: C1

Submitted By: Adriana Alejandre

Signature : Adriana Alejandre

Title: Tech/Sales Support

Firm: Solus Lighting & Controls

Address: 1820 E Burnside St Portland, OR 97214

Telephone: (503) 768-9999

Date : 4/16/2026

Above signature must be by person having authority to legally bind his firm to the above terms.

END OF SECTION

Submitted by Solus Lighting & Controls

Job Name:
KCC Cosmetology
Architect: Barber Barrett Tuner Architects (Bend)
Engineer: Interface Engineering, Inc.- Portland (Portland)

Catalog Number:
BPRO3-LIN-FLSH-LED35-90-PROG1000-PROG500-XX-YBK-BTW-XX-XX-SC-XX-XX-DM01

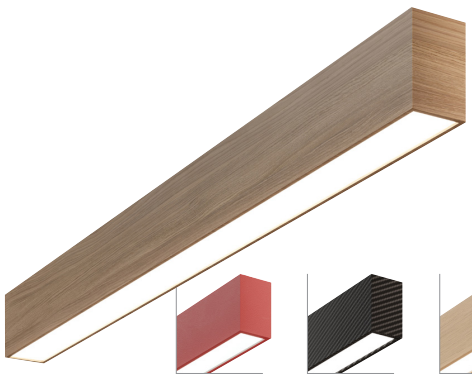
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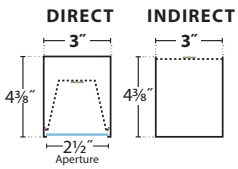
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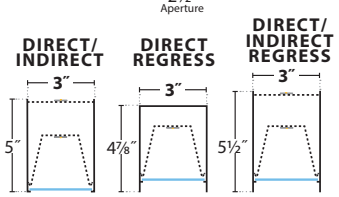
BionicPro3 | Linear

PRUDENTIAL LTG.
PRULITE.COM 213.746.0360



MEDIUM WALNUT | RED LEATHER | CARBON FIBER | VARA OAK





DIRECT:		LO	MO	SO	HO
SAL	Lm/Ft	435	640	885	1100
BTW	Lm/Ft	470	685	950	1200
WWF	Lm/Ft	475	700	975	1225
WWG / PFL	Lm/Ft	475	700	975	1225
NGZ	Lm/Ft	525	775	1075	1200
MGZ	Lm/Ft	475	700	975	1225
WGZ	Lm/Ft	525	775	1075	1200
LGP	Lm/Ft	475	700	975	—
	W/Ft	3.8	5.6	7.8	10.5
INDIRECT:		**LO**	**MO**	**SO**	**HO**
SYM	Lm/Ft	625	825	1075	1375
HCW	Lm/Ft	300	450	625	775
MCW	Lm/Ft	400	550	750	1000
SCW	Lm/Ft	575	875	1170	1450
SACW	Lm/Ft	500	750	1000	1200
	W/Ft	3.8	5.6	7.8	10.5
DIRECT / INDIRECT:					
	W/Ft	7.6	11.2	15.6	21

LUMEN CHART AT 3500K-80 CRI
SEE PAGE 6 FOR REGRESS

SMART SPECS

TUNABLE WHITE
Tū Hue | Amber Hue | Blu Hue | Chroma Hue

SOCIAL MEDIA

D: 1000L/ft
I: 500L/ft

SEAMLESS | Declare. | DLC | UGR16 WELL Building Standard | 5 YEAR | Made in the USA

Lumen output may vary +/– 5%
Light Loss Factor (LLF) for CCTs other than 3500K:
4000K +2%, 3000K -5%, 2700K -20%
90 CRI -15% (3K, 3500K, 4K & 5K
ADC -2% LLF
Louver LLF 30% White, 50% Silver, 70% Black

SE-RIES	LENS POS.	LED COLOR	OUT-PUT	LENGTH	COLOR / LAMINATE	LAM. CAN-OPY COLOR	LOUVER COLOR	DISTRIBUTION	UP OP-TIONS	CIRCU-ITING	MOUNTING	CEILING TYPE	DRIVERS	OPTIONS & SENSORS
BPRO3-LIN		-	-	CONFIRM	YBK			CONFIRM	CONFIRM		CONFIRM			
Bion-icPro 3″ Linear	FLSH Flush Lens LVR ½″ Re-gress with Lou-ver REG.5 ½″ Re-gress IND Indi-rect Only (Select NW No Down-ligh	LED27 2700K (90CRI) LED3 3000K LED35 3500K LED4 4000K LED3-90 3000K (90CRI) LED35-90 3500K (90CRI) LED4-90 4000K (90CRI) LED5-90 5000K (90CRI) **PRUHUES:** bios **STATIC:** BLU3S BLU35S BLU4S **DYNAMIC:** BLU3D* BLU35D* BLU4D* * Dynamic BIOS, SkyBlue spike can be dimmed, CCT warms slightly TU TuHue 2700-6500K Tunable White TU2 **TuHue 2200-5000K Tunable White AMB** AmberHue Warm Dim 2200K-5000K ** NA HO CHR ChromaHue RGBW (DMX at HO only) **DOWN & UP CCT IF DIF-FERENT**	LO Low MO Me-dium SO Stan-dard HO High PROG Pro-gram-mable Light Out-put (Specify desired lm/ft or w/ft)	2′ 3′ 4′ 5′ 6′ 7′ 8′ R___ (Row Length, 1″ incre-ments. Consult factory for custom lengths) SRL Sym-metric Row Length (See page 12) **NOTE:** Individual fixtures are NOT intended for row mounting	TMW Textured Matte White (Standard) YGW Gloss White Y___ Pre-mium Color CC___ Cus-tom Color *LUXE METAL-LICS:* YBZ Bronze YCP Copper Penny YGN Gold Nugget **NOTE:** For LUXE finishes, Stem and Canopy are White (TMW) unless specified otherwise. **LAMINATE FINISHES (SPECIFY CAN-OPY COLOR IN NEXT COLUMN ➡)** LOK Vara Oak LEW Evreux Walnut LOG Oxi-dized Gold LOB Oxi-dized Black L___ Special Order Laminate (EXTENDED LEAD TIMES) **NOTE:** For Laminate finishes, Stem and Canopy are White (TMW) unless specified otherwise.	(SKIP THIS COLUMN IF LAMINATE FINISH IS NOT SELECTED) TMW Textured Matte White (Standard) YGW Gloss White Y___ Premium Color CC___ Custom Color *LUXE METAL-LICS:* YBZ Bronze YCP Copper Penny YGN Gold Nug-get **NOTE:** For LUXE finishes, Stem and Canopy are White (TMW) unless specified otherwise.	(SKIP THIS COLUMN IF LOUVER IS NOT SELECTED) TMW Textured Matte White (Standard) YGW Gloss White Y___ Premium Color CC___ Custom Color *LUXE ME-TALLICS:* YBZ Bronze YCP Copper Penny YGN Gold Nugget **NOTE:** All canopies painted White (TMW) unless specified otherwise.	CHOOSE DOWN –AND– UP **DOWN:** NW No Direct SAL Satin Lens BTW Batwing WWF Flat Wall Wash WWG Focal Glow Wall Wash PFL Perim-eter Room Fill NGZ Narrow Wall Graze MGZ Medium Wall Graze WGZ Wide Wall Graze LGP Low Glare Pris-matic (NA HO) **UP:** NU No In-direct SYM Sym-metric (Frosted ADC, Standard) HCW Hard Ceiling Wash MCW Me-dium Ceiling Wash SCW Soft Ceiling Wash SACW Soft Asym-metric Ceiling Wash	TG Top Glow ADC Acrylic Dust Cover (Clear) Standard for SYM (Frosted) TGADC Top Glow with Acrylic Dust Cover **UP OP-TIONS AVAIL-ABLE WITH ANY UP DISTRI-BUTION**	SC Single Circuit (Down & Up will dim together) DC Dual Circuit (Needed if dim-ming Down separate-ly from Up) **VOLT-AGE** UNV (120-277) 347 (Emer-gency battery requires remote driver box)	(SPECIFY CEILING TYPE IN NEXT COL-UMN ➡) CA48″, 96″ or 144″ Aircraft Cable (Adjust-able) SURF Sur-face Mount (Direct only) RSC Rigid Stem Center SSC Swivel Stem Center (~45° of rotation) **(SPECIFY MOUNTING LOCATION IN NEXT COLUMN ➡)** WMC (Chan-nel) .75″ Tall Continuous Channel WMC2 (Channel) 2″ Tall Continu-ous Channel WMU (Bracket) .5″ Tall Bracket WMU1 (Bracket) 1″ Tall Bracket WMU2 (Bracket) 2″ Tall Bracket WM Direct to Wal WBx.x Wall Bracket (2″- 6″ in .5″ increments, 3″ standard if not specified)	**CEILING TYPE:** X1 T-Bar X3 Hard Ceiling X6 Slot Grid **MOUNT-ING LOCA-TION:** WALL (For Wall or Mullion Mount) SUR Ceiling WALL	ND Non-Dimming DM01 0-10v, 1% Dimming (Standard) LDE1 Hi-lume 1% EcoSystem LED (Soft fade on, fade-to-black dimming) ECO 1% 0-10v, EldoLED (Logarithmic dim-ming std) ECDA 1% DALI, EldoLED (Logarithmic dim-ming std) nLight-Air Acuity nLight Drivers (ECDA driver ONLY) nLight-Wired Acuity nLight Drivers (ECO driver ONLY, Requires Remote Driver) SOLO 0.1% 0-10v, EldoLED (Dim-to-dark, Logarithmic dim-ming std) SODA 0.1% DALI, EldoLED (Dim-to-dark, Loga-rithmic dimming std) STEP Signify Advance Step Dimming 2WIRE ELV/For-ward/Reverse Phase Driver **PRUHUES:** E10V 2 Channel Color Control EDALI 2 Channel Color Control EDMX Chroma-Hue or Static White	EMHE CA T20 Emergency Battery (1250 Delivered lumens; CA Title 20 compliant) ETS-DR Iota ETS-DR Emer-gency Transfer Switch EMC Emergency Circuiting FTR Feather WTW Asym-metric on Perpendicular Wall (NA HO or LGP) EBCP1G /2G Single / Dual Gang (Electrical Box Cover Plate/ Mud Ring) COS Custom On-Center Spacing for Wall/Surface Brackets **SENSORS:** 205 WattStopper PIR Occupancy **205-ON/OFF** **205-STEP:** Dim to 50% **205-DM:** Dim to 1% (NA with DALI) ATHENA Lutron RF (Dim-to-Off Standard) LVOC‡‡ Lutron Vive (Occ & RF LVRF‡‡ Lutron Vive (RF Only) ‡‡ Requires Lutron driver NXSMP Hubbell (Occ) rES7 Daylight+(PIR Acoustic) (Occ) (nLight-Air) Part Number: rES7-PDT-180D-G2 nES7 Daylight+(PIR Acoustic) (Occ) LUX Philips DLR **CORNERS:** C2-60 Lit 60° C2-90 Lit 90° C2-120 Lit 120° C2-135 Lit 135° C3T Lit 90° 3-Way: T C3Y Lit 120° 3-Way: Y C4T Lit 90° 4-Way: + C4X Lit 45°-135° 4-Way: X C8I Lit Inside 2-Plane C8O Lit Outside 2-Plane **90° LOUVERS AVAILABLE (CONSULT FACTORY FOR OTHER ANGLES)** LRT Linear to Recessed Transition (Straight rows only) DWNLT Downlights

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SECTION 01 2500
SUBSTITUTIONS

01 2500-3

TO: **BBT Architects**
1140 SW Simpson Ave., Ste. 200
Bend, OR. 97702

PROJECT NAME: Klamath Community College Cosmetology Building

We hereby submit for consideration, the following product instead of specified item for above project:

Section: Division 26 Paragraph: All

Specified Item Lighting

Proposed Substitution: See Substitution Package

Attach complete dimensional information and technical data including laboratory tests, if applicable.

Include complete information on changes to Drawings and/or specifications, which proposed substitution will require for its proper installation.

Submit with request all necessary samples and substantiating data to provide equal quality, performance, and appearance to that which is specified. Clearly mark manufacturer's literature to indicate equality in performance. Differences in quality of materials and construction shall be indicated.

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

1. The proposed substitutions do not affect dimensions shown on drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.
5. The proposed substitution will have no affect on applicable codes.
6. The manufacturer's guarantee or warranties of proposed product is equivalent to; or exceeds that of the specified product.
7. Proposed substituted item will match all sizes, profiles, specifications and colors of item originally specified.

List of names and location of three similar projects on which product was used, date of installation, and Architect's name and phone number.

Project No. 1: Available upon request
Project No. 2:
Project No. 3:

SECTION 01 2500
SUBSTITUTIONS

CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE

UNDERSIGNED ATTESTS THAT FUNCTION AND QUALITY ARE EQUAL TO OR SUPERIOR TO SPECIFIED ITEMS.

FOR USE BY ARCHITECT:

X Accepted _____ Accepted as Noted
_____ Not Accepted _____ Received Too Late

By: Lynn Baker
Date: 4/21/26
Remarks: C2

Submitted By: Adriana Alejandre

Signature : Adriana Alejandre

Title: Tech/Sales Support

Firm: Solus Lighting & Controls

Address: 1820 E Burnside St Portland, OR 97214

Telephone: (503) 768-9999

Date : 4/16/2026

Above signature must be by person having authority to legally bind his firm to the above terms.

END OF SECTION

Submitted by Solus Lighting & Controls

Job Name:
KCC Cosmetology
Architect: Barber Barrett Tuner Architects (Bend)
Engineer: Interface Engineering, Inc.- Portland (Portland)

Catalog Number:
BPRO3-LIN-FLSH-LED35-90-PROG500-PROG500-XX-YBK-BTW-XX-XX-SC-XX-XX-DM01

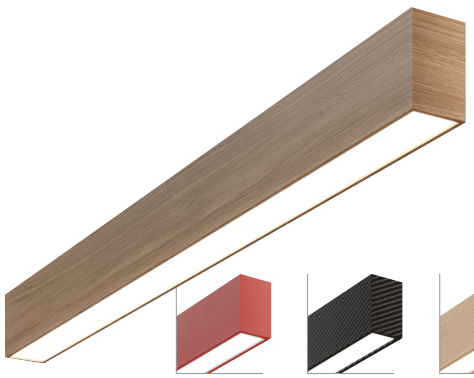
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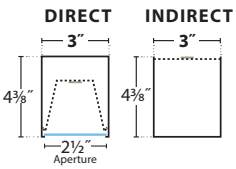
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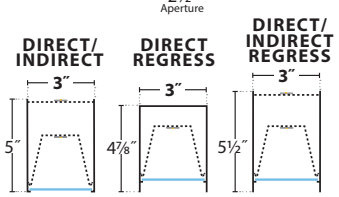
BionicPro3 | Linear

PRUDENTIAL LTG.
PRULITE.COM 213.746.0360



MEDIUM WALNUT | RED LEATHER | CARBON FIBER | VARA OAK





DIRECT:		LO	MO	SO	HO
SAL	Lm/Ft	435	640	885	1100
BTW	Lm/Ft	470	685	950	1200
WWF	Lm/Ft	475	700	975	1225
WWG / PFL	Lm/Ft	475	700	975	1225
NGZ	Lm/Ft	525	775	1075	1200
MGZ	Lm/Ft	475	700	975	1225
WGZ	Lm/Ft	525	775	1075	1200
LGP	Lm/Ft	475	700	975	—
	W/Ft	3.8	5.6	7.8	10.5
INDIRECT:		**LO**	**MO**	**SO**	**HO**
SYM	Lm/Ft	625	825	1075	1375
HCW	Lm/Ft	300	450	625	775
MCW	Lm/Ft	400	550	750	1000
SCW	Lm/Ft	575	875	1170	1450
SACW	Lm/Ft	500	750	1000	1200
	W/Ft	3.8	5.6	7.8	10.5
DIRECT / INDIRECT:					
	W/Ft	7.6	11.2	15.6	21

LUMEN CHART AT 3500K-80 CRI
SEE PAGE 6 FOR REGRESS

SMART SPECS

Lumen output may vary +/– 5%
Light Loss Factor (LLF) for CCTs other than 3500K:
4000K +2%, 3000K -5%, 2700K -20%
90 CRI -15% (3K, 3500K, 4K & 5K
ADC -2% LLF
Louver LLF 30% White, 50% Silver, 70% Black

TUNABLE WHITE
Tū Hue | Amber Hue | Blu Hue | Chroma Hue

SOCIAL MEDIA
D: 500L/ft
I: 500L/ft

SEAMLESS | Declare | DLC | UGR16 WELL Building Standard | 5 YEAR | Made in the USA

SE-RIES	LENS POS.	LED COLOR	OUT-PUT	LENGTH	COLOR / LAMINATE	LAM. CAN-OPY COLOR	LOUVER COLOR	DISTRIBUTION	UP OP-TIONS	CIRCU-ITING	MOUNTING	CEILING TYPE	DRIVERS	OPTIONS & SENSORS
BPRO3-LIN		-	- CONFIRM		YBK			CONFIRM	CONFIRM		CONFIRM	CONFIRM		
Bion-icPro 3″ Linear	FLSH Flush Lens LVR ½″ Re-gress with Lou-ver REG.5 ½″ Re-gress IND Indi-rect Only (Select NW No Down-ligh	LED27 2700K (90CRI) LED3 3000K LED35 3500K LED4 4000K LED3-90 3000K (90CRI) LED35-90 3500K (90CRI) LED4-90 4000K (90CRI) LED5-90 5000K (90CRI) **PRUHUES:** bios **STATIC:** BLU3S BLU35S BLU4S **DYNAMIC:** BLU3D* BLU35D* BLU4D* * Dynamic BIOS, SkyBlue spike can be dimmed, CCT warms slightly TU TuHue 2700-6500K Tunable White TU2 **TuHue 2200-5000K Tunable White AMB** AmberHue Warm Dim 2200K-5000K ** NA HO CHR ChromaHue RGBW (DMX at HO only) **DOWN & UP CCT IF DIF-FERENT**	LO Low MO Me-dium SO Stan-dard HO High PROG Pro-gram-mable Light Out-put (Specify desired lm/ft or w/ft)	2′ 3′ 4′ 5′ 6′ 7′ 8′ R___ (Row Length, 1″ incre-ments. Consult factory for custom lengths) SRL Sym-metric Row Length (See page 12) **NOTE:** Individual fixtures are NOT intended for row mounting	TMW Textured Matte White (Standard) YGW Gloss White Y___ Pre-mium Color CC___ Cus-tom Color *LUXE METAL-LICS:* YBZ Bronze YCP Copper Penny YGN Gold Nugget **NOTE:** For LUXE finishes, Stem and Canopy are White (TMW) unless specified otherwise. **LAMINATE FINISHES (SPECIFY CAN-OPY COLOR IN NEXT COLUMN ➡)** LOK Vara Oak LEW Evreux Walnut LOG Oxi-dized Gold LOB Oxi-dized Black L___ Special Order Laminate (EXTENDED LEAD TIMES) **NOTE:** For Laminate finishes, Stem and Canopy are White (TMW) unless specified otherwise.	(SKIP THIS COLUMN IF LAMINATE FINISH IS NOT SELECTED) TMW Textured Matte White (Standard) YGW Gloss White Y___ Premium Color CC___ Custom Color *LUXE METAL-LICS:* YBZ Bronze YCP Copper Penny YGN Gold Nug-get **NOTE:** For LUXE finishes, Stem and Canopy are White (TMW) unless specified otherwise.	(SKIP THIS COLUMN IF LOUVER IS NOT SELECTED) TMW Textured Matte White (Standard) YGW Gloss White Y___ Premium Color CC___ Custom Color *LUXE ME-TALLICS:* YBZ Bronze YCP Copper Penny YGN Gold Nugget **NOTE:** All canopies painted White (TMW) unless specified otherwise.	**CHOOSE DOWN –AND– UP** **DOWN:** NW No Direct SAL Satin Lens BTW Batwing WWF Flat Wall Wash WWG Focal Glow Wall Wash PFL Perim-eter Room Fill NGZ Narrow Wall Graze MGZ Medium Wall Graze WGZ Wide Wall Graze LGP Low Glare Pris-matic (NA HO) **UP:** NU No In-direct SYM Sym-metric (Frosted ADC, Standard) HCW Hard Ceiling Wash MCW Me-dium Ceiling Wash SCW Soft Ceiling Wash SACW Soft Asym-metric Ceiling Wash	TG Top Glow ADC Acrylic Dust Cover (Clear) Standard for SYM (Frosted) TGADC Top Glow with Acrylic Dust Cover **UP OP-TIONS AVAIL-ABLE WITH ANY UP DISTRI-BUTION**	SC Single Circuit (Down & Up will dim together) DC Dual Circuit (Needed if dim-ming Down separate-ly from Up) **VOLT-AGE** UNV (120-277) 347 (Emer-gency battery requires remote driver box)	**(SPECIFY CEILING TYPE IN NEXT COL-UMN ➡)** CA48″, 96″ or 144″ Aircraft Cable (Adjust-able) SURF Sur-face Mount (Direct only) RSC Rigid Stem Center SSC Swivel Stem Center (~45° of rotation) **(SPECIFY MOUNTING LOCATION IN NEXT COLUMN ➡)** WMC (Chan-nel) .75″ Tall Continuous Channel WMC2 (Channel) 2″ Tall Continu-ous Channel WMU (Bracket) .5″ Tall Bracket WMU1 (Bracket) 1″ Tall Bracket WMU2 (Bracket) 2″ Tall Bracket WM Direct to Wal WBx.x Wall Bracket (2″- 6″ in .5″ increments, 3″ standard if not specified)	**CEILING TYPE:** X1 T-Bar X3 Hard Ceiling X6 Slot Grid **MOUNT-ING LOCA-TION:** WALL (For Wall or Mullion Mount) SUR Ceiling WALL	ND Non-Dimming DM01 0-10v, 1% Dimming (Standard) LDE1 Hi-lume 1% EcoSystem LED (Soft fade on, fade-to-black dimming) ECO 1% 0-10v, EldoLED (Logarithmic dim-ming std) ECDA 1% DALI, EldoLED (Logarithmic dim-ming std) nLight-Air Acuity nLight Drivers (ECDA driver ONLY) nLight-Wired Acuity nLight Drivers (ECO driver ONLY, Requires Remote Driver) SOLO 0.1% 0-10v, EldoLED (Dim-to-dark, Logarithmic dim-ming std) SODA 0.1% DALI, EldoLED (Dim-to-dark, Loga-rithmic dimming std) STEP Signify Advance Step Dimming 2WIRE ELV/For-ward/Reverse Phase Driver **PRUHUES:** E10V 2 Channel Color Control EDALI 2 Channel Color Control EDMX Chroma-Hue or Static White	EMHE CA T20 Emergency Battery (1250 Delivered lumens; CA Title 20 compliant) ETS-DR Iota ETS-DR Emer-gency Transfer Switch EMC Emergency Circuiting FTR Feather WTW Asym-metric on Perpendicular Wall (NA HO or LGP) EBCP1G /2G Single / Dual Gang (Electrical Box Cover Plate/ Mud Ring) COS Custom On-Center Spacing for Wall/Surface Brackets **SENSORS:** 205 WattStopper PIR Occupancy **205-ON/OFF** **205-STEP:** Dim to 50% **205-DM:** Dim to 1% (NA with DALI) ATHENA Lutron RF (Dim-to-Off Standard) LVOC‡‡ Lutron Vive (Occ & RF LVRF‡‡ Lutron Vive (RF Only) ‡‡ Requires Lutron driver NXSMP Hubbell (Occ) rES7 Daylight+(PIR Acoustic) (Occ) (nLight-Air) Part Number: rES7-PDT-180D-G2 nES7 Daylight+(PIR Acoustic) (Occ) LUX Philips DLR **CORNERS:** C2-60 Lit 60° C2-90 Lit 90° C2-120 Lit 120° C2-135 Lit 135° C3T Lit 90° 3-Way: T C3Y Lit 120° 3-Way: Y C4T Lit 90° 4-Way: + C4X Lit 45°-135° 4-Way: X C8I Lit Inside 2-Plane C8O Lit Outside 2-Plane **90° LOUVERS AVAILABLE (CONSULT FACTORY FOR OTHER ANGLES)** LRT Linear to Recessed Transition (Straight rows only) DWNLT Downlights

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SECTION 01 2500
SUBSTITUTIONS

01 2500-3

TO: **BBT Architects**
1140 SW Simpson Ave., Ste. 200
Bend, OR. 97702

PROJECT NAME: Klamath Community College Cosmetology Building

We hereby submit for consideration, the following product instead of specified item for above project:

Section: Division 26 Paragraph: All

Specified Item Lighting

Proposed Substitution: See Substitution Package

Attach complete dimensional information and technical data including laboratory tests, if applicable.

Include complete information on changes to Drawings and/or specifications, which proposed substitution will require for its proper installation.

Submit with request all necessary samples and substantiating data to provide equal quality, performance, and appearance to that which is specified. Clearly mark manufacturer's literature to indicate equality in performance. Differences in quality of materials and construction shall be indicated.

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

1. The proposed substitutions do not affect dimensions shown on drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.
5. The proposed substitution will have no affect on applicable codes.
6. The manufacturer's guarantee or warranties of proposed product is equivalent to; or exceeds that of the specified product.
7. Proposed substituted item will match all sizes, profiles, specifications and colors of item originally specified.

List of names and location of three similar projects on which product was used, date of installation, and Architect's name and phone number.

Project No. 1: Available upon request
Project No. 2:
Project No. 3:

SECTION 01 2500
SUBSTITUTIONS

CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE

UNDERSIGNED ATTESTS THAT FUNCTION AND QUALITY ARE EQUAL TO OR SUPERIOR TO SPECIFIED ITEMS.

FOR USE BY ARCHITECT:

X Accepted _____ Accepted as Noted
_____ Not Accepted _____ Received Too Late

By: Lynn Baker
Date: 4/21/26
Remarks: C3

Submitted By: Adriana Alejandre

Signature : Adriana Alejandre

Title: Tech/Sales Support

Firm: Solus Lighting & Controls

Address: 1820 E Burnside St Portland, OR 97214

Telephone: (503) 768-9999

Date : 4/16/2026

Above signature must be by person having authority to legally bind his firm to the above terms.

END OF SECTION

Submitted by Solus Lighting & Controls

Job Name:
KCC Cosmetology
Architect: Barber Barrett Tuner Architects (Bend)
Engineer: Interface Engineering, Inc.- Portland (Portland)

Catalog Number:
BPRO3-LIN-FLSH-LED35-90-PROG500-PROG500-XX-YBK-BTW-XX-XX-SC-XX-XX-DM01

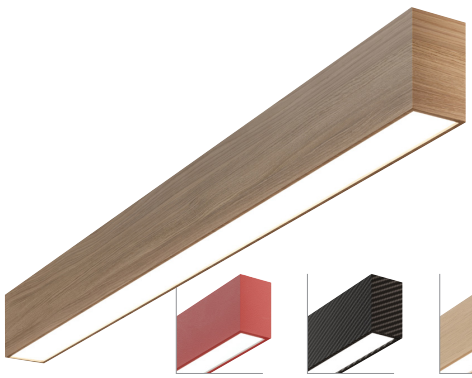
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C3

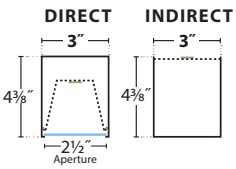
SOLUS26-234409

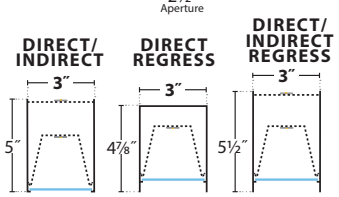
BionicPro3 | Linear

PRUDENTIAL LTG.
PRULITE.COM 213.746.0360



MEDIUM WALNUT | RED LEATHER | CARBON FIBER | VARA OAK





DIRECT:		LO	MO	SO	HO
SAL	Lm/Ft	435	640	885	1100
BTW	Lm/Ft	470	685	950	1200
WWF	Lm/Ft	475	700	975	1225
WWG / PFL	Lm/Ft	475	700	975	1225
NGZ	Lm/Ft	525	775	1075	1200
MGZ	Lm/Ft	475	700	975	1225
WGZ	Lm/Ft	525	775	1075	1200
LGP	Lm/Ft	475	700	975	—
	W/Ft	3.8	5.6	7.8	10.5
INDIRECT:		**LO**	**MO**	**SO**	**HO**
SYM	Lm/Ft	625	825	1075	1375
HCW	Lm/Ft	300	450	625	775
MCW	Lm/Ft	400	550	750	1000
SCW	Lm/Ft	575	875	1170	1450
SACW	Lm/Ft	500	750	1000	1200
	W/Ft	3.8	5.6	7.8	10.5
DIRECT / INDIRECT:					
	W/Ft	7.6	11.2	15.6	21

LUMEN CHART AT 3500K-80 CRI
SEE PAGE 6 FOR REGRESS

SMART SPECS

TUNABLE WHITE
Tū Hue | Amber Hue | Blu Hue | Chroma Hue

SOCIAL MEDIA
D:350L/ft
I:500L/ft

SEAMLESS | Declare | DLC | UGR16 WELL Building Standard | 5 YEAR | Made in the USA

Lumen output may vary +/– 5%
Light Loss Factor (LLF) for CCTs other than 3500K:
4000K +2%, 3000K -5%, 2700K -20%
90 CRI -15% (3K, 3500K, 4K & 5K
ADC -2% LLF
Louver LLF 30% White, 50% Silver, 70% Black

SE-RIES	LENS POS.	LED COLOR	OUT-PUT	LENGTH	COLOR / LAMINATE	LAM. CAN-OPY COLOR	LOUVER COLOR	DISTRIBUTION	UP OP-TIONS	CIRCU-ITING	MOUNTING	CEILING TYPE	DRIVERS	OPTIONS & SENSORS
BPRO3-LIN		-	-	CONFIRM	YBK			CONFIRM	CONFIRM		CONFIRM	CONFIRM		
Bion-icPro 3″ Linear	FLSH Flush Lens LVR ½″ Re-gress with Lou-ver REG.5 ½″ Re-gress IND Indi-rect Only (Select NW No Down-ligh	LED27 2700K (90CRI) LED3 3000K LED35 3500K LED4 4000K LED3-90 3000K (90CRI) LED35-90 3500K (90CRI) LED4-90 4000K (90CRI) LED5-90 5000K (90CRI) **PRUHUES:** bios **STATIC:** BLU3S BLU35S BLU4S **DYNAMIC:** BLU3D* BLU35D* BLU4D* * Dynamic BIOS, SkyBlue spike can be dimmed, CCT warms slightly TU TuHue 2700-6500K Tunable White TU2 **TuHue 2200-5000K Tunable White AMB** AmberHue Warm Dim 2200K-5000K ** NA HO CHR ChromaHue RGBW (DMX at HO only) **DOWN & UP CCT IF DIF-FERENT**	LO Low MO Me-dium SO Stan-dard HO High PROG Pro-gram-mable Light Out-put (Specify desired lm/ft or w/ft)	2′ 3′ 4′ 5′ 6′ 7′ 8′ R___ (Row Length, 1″ incre-ments. Consult factory for custom lengths) SRL Sym-metric Row Length (See page 12) **NOTE:** Individual fixtures are NOT intended for row mounting	TMW Textured Matte White (Standard) YGW Gloss White Y___ Pre-mium Color CC___ Cus-tom Color *LUXE METAL-LICS:* YBZ Bronze YCP Copper Penny YGN Gold Nugget **NOTE:** For LUXE finishes, Stem and Canopy are White (TMW) unless specified otherwise. **LAMINATE FINISHES (SPECIFY CAN-OPY COLOR IN NEXT COLUMN ➡)** LOK Vara Oak LEW Evreux Walnut LOG Oxi-dized Gold LOB Oxi-dized Black L___ Special Order Laminate (EXTENDED LEAD TIMES) **NOTE:** For Laminate finishes, Stem and Canopy are White (TMW) unless specified otherwise.	(SKIP THIS COLUMN IF LAMINATE FINISH IS NOT SELECTED) TMW Textured Matte White (Standard) YGW Gloss White Y___ Premium Color CC___ Custom Color *LUXE METAL-LICS:* YBZ Bronze YCP Copper Penny YGN Gold Nug-get **NOTE:** For LUXE finishes, Stem and Canopy are White (TMW) unless specified otherwise.	(SKIP THIS COLUMN IF LOUVER IS NOT SELECTED) TMW Textured Matte White (Standard) YGW Gloss White Y___ Premium Color CC___ Custom Color *LUXE ME-TALLICS:* YBZ Bronze YCP Copper Penny YGN Gold Nugget **NOTE:** All canopies painted White (TMW) unless specified otherwise.	**CHOOSE DOWN –AND– UP** **DOWN:** NW No Direct SAL Satin Lens BTW Batwing WWF Flat Wall Wash WWG Focal Glow Wall Wash PFL Perim-eter Room Fill NGZ Narrow Wall Graze MGZ Medium Wall Graze WGZ Wide Wall Graze LGP Low Glare Pris-matic (NA HO) **UP:** NU No In-direct SYM Sym-metric (Frosted ADC, Standard) HCW Hard Ceiling Wash MCW Me-dium Ceiling Wash SCW Soft Ceiling Wash SACW Soft Asym-metric Ceiling Wash	TG Top Glow ADC Acrylic Dust Cover (Clear) Standard for SYM (Frosted) TGADC Top Glow with Acrylic Dust Cover **UP OP-TIONS AVAIL-ABLE WITH ANY UP DISTRI-BUTION**	SC Single Circuit (Down & Up will dim together) DC Dual Circuit (Needed if dim-ming Down separate-ly from Up) **VOLT-AGE** UNV (120-277) 347 (Emer-gency battery requires remote driver box)	(SPECIFY CEILING TYPE IN NEXT COL-UMN ➡) CA48″, 96″ or 144″ Aircraft Cable (Adjust-able) SURF Sur-face Mount (Direct only) RSC Rigid Stem Center SSC Swivel Stem Center (~45° of rotation) (SPECIFY MOUNTING LOCATION IN NEXT COLUMN ➡) WMC (Chan-nel) .75″ Tall Continuous Channel WMC2 (Channel) 2″ Tall Continu-ous Channel WMU (Bracket) .5″ Tall Bracket WMU1 (Bracket) 1″ Tall Bracket WMU2 (Bracket) 2″ Tall Bracket WM Direct to Wal WBx.x Wall Bracket (2″- 6″ in .5″ increments, 3″ standard if not specified)	CEILING TYPE: X1 T-Bar X3 Hard Ceiling X6 Slot Grid MOUNT-ING LOCA-TION: WALL (For Wall or Mullion Mount) SUR Ceiling WALL	ND Non-Dimming DM01 0-10v, 1% Dimming (Standard) LDE1 Hi-lume 1% EcoSystem LED (Soft fade on, fade-to-black dimming) ECO 1% 0-10v, EldoLED (Logarithmic dim-ming std) ECDA 1% DALI, EldoLED (Logarithmic dim-ming std) nLight-Air Acuity nLight Drivers (ECDA driver ONLY) nLight-Wired Acuity nLight Drivers (ECO driver ONLY, Requires Remote Driver) SOLO 0.1% 0-10v, EldoLED (Dim-to-dark, Logarithmic dim-ming std) SODA 0.1% DALI, EldoLED (Dim-to-dark, Loga-rithmic dimming std) STEP Signify Advance Step Dimming 2WIRE ELV/For-ward/Reverse Phase Driver **PRUHUES:** E10V 2 Channel Color Control EDALI 2 Channel Color Control EDMX Chroma-Hue or Static White	EMHE CA T20 Emergency Battery (1250 Delivered lumens; CA Title 20 compliant) ETS-DR Iota ETS-DR Emer-gency Transfer Switch EMC Emergency Circuiting FTR Feather WTW Asym-metric on Perpendicular Wall (NA HO or LGP) EBCP1G /2G Single / Dual Gang (Electrical Box Cover Plate/ Mud Ring) COS Custom On-Center Spacing for Wall/Surface Brackets **SENSORS:** 205 WattStopper PIR Occupancy **205-ON/OFF** **205-STEP:** Dim to 50% **205-DM:** Dim to 1% (NA with DALI) ATHENA Lutron RF (Dim-to-Off Standard) LVOC‡‡ Lutron Vive (Occ & RF LVRF‡‡ Lutron Vive (RF Only) ‡‡ Requires Lutron driver NXSMP Hubbell (Occ) rES7 Daylight+(PIR Acoustic) (Occ) (nLight-Air) Part Number: rES7-PDT-180D-G2 nES7 Daylight+(PIR Acoustic) (Occ) LUX Philips DLR **CORNERS:** C2-60 Lit 60° C2-90 Lit 90° C2-120 Lit 120° C2-135 Lit 135° C3T Lit 90° 3-Way: T C3Y Lit 120° 3-Way: Y C4T Lit 90° 4-Way: + C4X Lit 45°-135° 4-Way: X C8I Lit Inside 2-Plane C8O Lit Outside 2-Plane **90° LOUVERS AVAILABLE (CONSULT FACTORY FOR OTHER ANGLES)** LRT Linear to Recessed Transition (Straight rows only) DWNLT Downlights

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SECTION 01 2500
SUBSTITUTIONS

01 2500-3

TO: **BBT Architects**
1140 SW Simpson Ave., Ste. 200
Bend, OR. 97702

PROJECT NAME: Klamath Community College Cosmetology Building

We hereby submit for consideration, the following product instead of specified item for above project:

Section: Division 26 Paragraph: All

Specified Item Lighting

Proposed Substitution: See Substitution Package

Attach complete dimensional information and technical data including laboratory tests, if applicable.

Include complete information on changes to Drawings and/or specifications, which proposed substitution will require for its proper installation.

Submit with request all necessary samples and substantiating data to provide equal quality, performance, and appearance to that which is specified. Clearly mark manufacturer's literature to indicate equality in performance. Differences in quality of materials and construction shall be indicated.

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

1. The proposed substitutions do not affect dimensions shown on drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.
5. The proposed substitution will have no affect on applicable codes.
6. The manufacturer's guarantee or warranties of proposed product is equivalent to; or exceeds that of the specified product.
7. Proposed substituted item will match all sizes, profiles, specifications and colors of item originally specified.

List of names and location of three similar projects on which product was used, date of installation, and Architect's name and phone number.

Project No. 1: Available upon request
Project No. 2:
Project No. 3:

SECTION 01 2500
SUBSTITUTIONS

CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE

UNDERSIGNED ATTESTS THAT FUNCTION AND QUALITY ARE EQUAL TO OR SUPERIOR TO SPECIFIED ITEMS.

FOR USE BY ARCHITECT:

X Accepted _____ Accepted as Noted
_____ Not Accepted _____ Received Too Late

By: Lynn Baker
Date: 4/21/26
Remarks: D1

Submitted By: Adriana Alejandre

Signature : Adriana Alejandre

Title: Tech/Sales Support

Firm: Solus Lighting & Controls

Address: 1820 E Burnside St Portland, OR 97214

Telephone: (503) 768-9999

Date : 4/16/2026

Above signature must be by person having authority to legally bind his firm to the above terms.

END OF SECTION

Submitted by Solus Lighting & Controls			
SOLUS Lighting & Controls	**Job Name:** KCC Cosmetology Architect: Barber Barrett Tuner Architects (Bend) Engineer: Interface Engineering, Inc.- Portland (Portland)	**Catalog Number:** D2LUN4A-13-35-C-XX-C-XX-Z0-XX-W Notes:	**Type:** **D1** SOLUS26-234409

ZANIBONI® LIGHTING



Luna 4 A

- Downlight
- Round
- Fixed
- 4" Inner Aperture

Project:
Type:
Contact:

ORDERING INFO

D2 LUN4A __ __ __ __ CONFIRM __ CONFIRM __ __ CONFIRM __

	MODEL	Wattage	Kelvin	CRI	Beam	Lens	Color	Driver	Installation	I.P. Rating
	LUN4A: Luna 4 A	**09** : 09W **13** : 13W **18** : 18W	**27** : 2700k **30** : 3000k **35** : 3500k **40** : 4000k **WD** : Warm Dim 1800K to 3000K (Not available with 18W) **RW** : RGBW (Temporary supply friction, lead times are 6-8 weeks for RGBW chips.) **TD** : Tunable White 2700K to 6500K (Daylight) **TH** : Tunable White 1800K to 4000K (Hospitality)	**C** : 90 **D** : VeroLux (CRI 97+ Contact your sales representative for ordering information. Check for ESD. 10 weeks lead if not in stock.)	**8** : 80° **5** : 50° **3** : 36° **2** : 24° **1** : 15° **S** : 10° (Spot beam, 10° not possible with WD, TH, TD, and RGBW)	**F** : Frosted **X** : Hex Louver + Solite **L** : Cross Louver + Solite **P** : Prismatic **S** : Solite **C** : Clear **U** : Unspecified Lens Combination	**WS** : Matte White **BK** : Matte Black **WK** : White Trim / Black Splay **BP** : Black Pearl **SN** : Satin Nickel **BZ** : Bronze **CC** : Custom Color	**00** : No Driver **N0** : Non-Dimmable **E0** : ELV Dimmable **Z0** : 0-10V Dimmable to 1% **B0** : BubblyNet **L0** : Lutron™ (Lutron EcoSystem) **D0** : DALI **X0** : Eldo DMX **V0** : Low Voltage CC2CV (Price does not include power supply)	**00** : No Housings (Option when product is installed in Low Voltage - Class 2) **D0** : Class 2, Non-IC (Remote Driver Only) **E0** : Airtight Enclosure **F0** : Chicago Plenum **G0** : Title 24 for Residential **R0** : Retro-Fit Enclosure **RL** : Retro-Fit for Lutron™ **A0** : Class 1, IC **B0** : Class 1, Non-IC **DR** : Class 2 Non IC + Retrofit	**D** : Dry IP 20 **W** : Wet IP 65

Notes:
Drivers are designed with universal input voltage compatibility, accommodating a range from 120V to 277V.

SPECIFICATIONS

LED Source
Tool-free field-replaced LED module. Propriety high performance aluminum extruded heatsink, anodized black for maximum LED life. 2 SDCM Binning for all static colors.

Beams
Computer-optimized reflector design, high reflected finish aluminum for 80°, 50°, 36°, 24°, 15°, and 10°. For 10° beam angle option a Total Internal Reflection technology is used.

Trim
We use CNC machining to precision-machine 6063 aluminum trims to tight tolerances. Then, we powder coat them in our in-house facility for a durable, long-lasting finish. This process ensures that our trims meet our high standards of quality and performance.

Fixture Retention
Two torsion springs hold the fixture tight to the ceiling accommodating ceiling thickness from 1/2" to 1". Special springs for thicker ceiling available on request.

Life
L80(10K): 55,000+ hrs at 80% of initial lumens. Operating temperature: -4°F to 104°F (-20°C +40°C).

Label
ETL listed for US Canada. CE labeled. CCC label available on request.

Warranty
5 years limited warranty.
https://zanibonilighting.com/terms-and-conditions.html

Zaniboni Lighting - Ph +1(727)213-0410 - Fx +1(727)683 - 9720 - zanibonilighting.com - 101 N Garden Ave Suite 230, Clearwater - FL 33755
The manufacturer reserves the right to change or modify the design, dimensions, and photometric information at any time without notice. The manufacturer accepts no liability for consequential damage which is occasioned to the user based on the data provided.

SECTION 01 2500
SUBSTITUTIONS

01 2500-3

TO: **BBT Architects**
1140 SW Simpson Ave., Ste. 200
Bend, OR. 97702

PROJECT NAME: Klamath Community College Cosmetology Building

We hereby submit for consideration, the following product instead of specified item for above project:

Section: Division 26 Paragraph: All

Specified Item Lighting

Proposed Substitution: See Substitution Package

Attach complete dimensional information and technical data including laboratory tests, if applicable.

Include complete information on changes to Drawings and/or specifications, which proposed substitution will require for its proper installation.

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List of names and location of three similar projects on which product was used, date of installation, and Architect's name and phone number.

Project No. 1: Available upon request
Project No. 2:
Project No. 3:

SECTION 01 2500
SUBSTITUTIONS

CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE

UNDERSIGNED ATTESTS THAT FUNCTION AND QUALITY ARE EQUAL TO OR SUPERIOR TO SPECIFIED ITEMS.

FOR USE BY ARCHITECT:

X Accepted _____ Accepted as Noted
_____ Not Accepted _____ Received Too Late

By: Lynn Baker
Date: 4/21/26
Remarks: D2

Submitted By: Adriana Alejandre

Signature : Adriana Alejandre

Title: Tech/Sales Support

Firm: Solus Lighting & Controls

Address: 1820 E Burnside St Portland, OR 97214

Telephone: (503) 768-9999

Date : 4/16/2026

Above signature must be by person having authority to legally bind his firm to the above terms.

END OF SECTION

Submitted by Solus Lighting & Controls			
SOLUS Lighting & Controls	**Job Name:** KCC Cosmetology Architect: Barber Barrett Tuner Architects (Bend) Engineer: Interface Engineering, Inc.- Portland (Portland)	**Catalog Number:** D2LUN4A-09-35-C-XX-C-XX-Z0-XX-W Notes:	**Type:** **D2** SOLUS26-234409

ZANIBONI® LIGHTING



Luna 4 A

- Downlight
- Round
- Fixed
- 4" Inner Aperture

Project:
Type:
Contact:

ORDERING INFO

D2 LUN4A — — — — — CONFIRM — CONFIRM — — — CONFIRM —

	MODEL	Wattage	Kelvin	CRI	Beam	Lens	Color	Driver	Installation	I.P. Rating
	LUN4A: Luna 4 A	**09** : 09W **13** : 13W **18** : 18W	**27** : 2700k **30** : 3000k **35** : 3500k **40** : 4000k **WD** : Warm Dim 1800K to 3000K (Not available with 18W) **RW** : RGBW (Temporary supply friction, lead times are 6-8 weeks for RGBW chips.) **TD** : Tunable White 2700K to 6500K (Daylight) **TH** : Tunable White 1800K to 4000K (Hospitality)	**C** : 90 **D** : VeroLux (CRI 97+ Contact your sales representative for ordering information. Check for ESD. 10 weeks lead if not in stock.)	**8** : 80° **5** : 50° **3** : 36° **2** : 24° **1** : 15° **S** : 10° (Spot beam, 10° not possible with WD, TH, TD, and RGBW)	**F** : Frosted **X** : Hex Louver + Solite **L** : Cross Louver + Solite **P** : Prismatic **S** : Solite **C** : Clear **U** : Unspecified Lens Combination	**WS** : Matte White **BK** : Matte Black **WK** : White Trim / Black Splay **BP** : Black Pearl **SN** : Satin Nickel **BZ** : Bronze **CC** : Custom Color	**00** : No Driver **N0** : Non-Dimmable **E0** : ELV Dimmable **Z0** : 0-10V Dimmable to 1% **B0** : BubblyNet **L0** : Lutron™ (Lutron EcoSystem) **D0** : DALI **X0** : Eldo DMX **V0** : Low Voltage CC2CV (Price does not include power supply)	**00** : No Housings (Option when product is installed in Low Voltage - Class 2) **D0** : Class 2, Non-IC (Remote Driver Only) **E0** : Airtight Enclosure **F0** : Chicago Plenum **G0** : Title 24 for Residential **R0** : Retro-Fit Enclosure **RL** : Retro-Fit for Lutron™ **A0** : Class 1, IC **B0** : Class 1, Non-IC **DR** : Class 2 Non IC + Retrofit	**D** : Dry IP 20 **W** : Wet IP 65

Notes:
Drivers are designed with universal input voltage compatibility, accommodating a range from 120V to 277V.

SPECIFICATIONS

LED Source
Tool-free field-replaced LED module. Propriety high performance aluminum extruded heatsink, anodized black for maximum LED life. 2 SDCM Binning for all static colors.

Beams
Computer-optimized reflector design, high reflected finish aluminum for 80°, 50°, 36°, 24°, 15°, and 10°. For 10° beam angle option a Total Internal Reflection technology is used.

Trim
We use CNC machining to precision-machine 6063 aluminum trims to tight tolerances. Then, we powder coat them in our in-house facility for a durable, long-lasting finish. This process ensures that our trims meet our high standards of quality and performance.

Fixture Retention
Two torsion springs hold the fixture tight to the ceiling accommodating ceiling thickness from 1/2" to 1". Special springs for thicker ceiling available on request.

Life
L80(10K): 55,000+ hrs at 80% of initial lumens. Operating temperature: -4°F to 104°F (-20°C +40°C).

Label
ETL listed for US Canada. CE labeled. CCC label available on request.

Warranty
5 years limited warranty.
https://zanibonilighting.com/terms-and-conditions.html

Zaniboni Lighting - Ph +1(727)213-0410 - Fx +1(727)683 - 9720 - zanibonilighting.com - 101 N Garden Ave Suite 230, Clearwater - FL 33755
The manufacturer reserves the right to change or modify the design, dimensions, and photometric information at any time without notice. The manufacturer accepts no liability for consequential damage which is occasioned to the user based on the data provided.

SECTION 01 2500
SUBSTITUTIONS

01 2500-3

TO: **BBT Architects**
1140 SW Simpson Ave., Ste. 200
Bend, OR. 97702

PROJECT NAME: Klamath Community College Cosmetology Building

We hereby submit for consideration, the following product instead of specified item for above project:

Section: Division 26 Paragraph: All

Specified Item Lighting

Proposed Substitution: See Substitution Package

Attach complete dimensional information and technical data including laboratory tests, if applicable.

Include complete information on changes to Drawings and/or specifications, which proposed substitution will require for its proper installation.

Submit with request all necessary samples and substantiating data to provide equal quality, performance, and appearance to that which is specified. Clearly mark manufacturer's literature to indicate equality in performance. Differences in quality of materials and construction shall be indicated.

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5. The proposed substitution will have no affect on applicable codes.
6. The manufacturer's guarantee or warranties of proposed product is equivalent to; or exceeds that of the specified product.
7. Proposed substituted item will match all sizes, profiles, specifications and colors of item originally specified.

List of names and location of three similar projects on which product was used, date of installation, and Architect's name and phone number.

Project No. 1: Available upon request
Project No. 2:
Project No. 3:

SECTION 01 2500
SUBSTITUTIONS

CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE

UNDERSIGNED ATTESTS THAT FUNCTION AND QUALITY ARE EQUAL TO OR SUPERIOR TO SPECIFIED ITEMS.

FOR USE BY ARCHITECT:

X Accepted _____ Accepted as Noted
_____ Not Accepted _____ Received Too Late

By: Lynn Baker
Date: 4/21/26
Remarks: G1

Submitted By: Adriana Alejandre

Signature : Adriana Alejandre

Title: Tech/Sales Support

Firm: Solus Lighting & Controls

Address: 1820 E Burnside St Portland, OR 97214

Telephone: (503) 768-9999

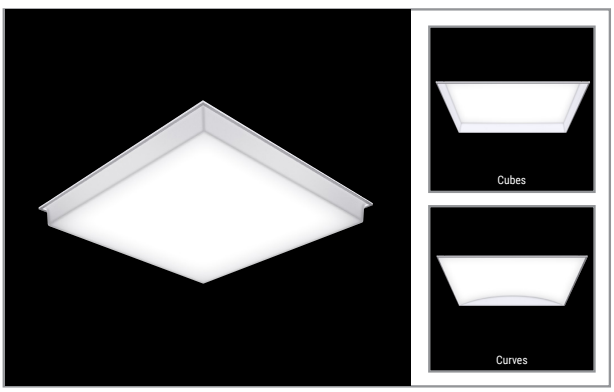
Date : 4/16/2026

Above signature must be by person having authority to legally bind his firm to the above terms.

END OF SECTION

Submitted by Solus Lighting & Controls			
SOLUS Lighting & Controls	**Job Name:** KCC Cosmetology Architect: Barber Barrett Tuner Architects (Bend) Engineer: Interface Engineering, Inc.- Portland (Portland)	**Catalog Number:** 24ID2-40-CNC-UNV-GL-L935-STD-U Notes:	**Type:** **G1** SOLUS26-234409

Project		**Catalog #**		**Type**	
Prepared by		**Notes**		**Date**	



Corelite

InDepth 2.0

LED Specification InDepth Series
1' x 4', 2' x 2', 2' x 4'

Typical Applications

Office • Education • Healthcare • Hospitality • Retail

Interactive Menu

- Order Information page 2
- Photometric Data page 4
- Connected Systems page 13
- Product Warranty

Product Certification

damp location wet location

Systems | Features & Awards

Connected Systems

Coming Soon

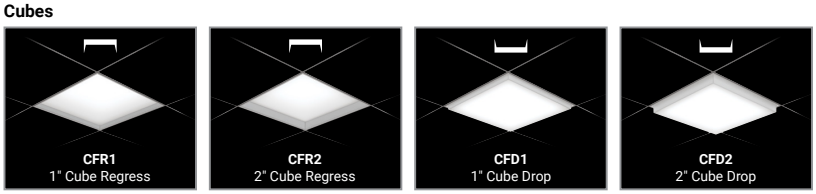
Top Product Features

- Designer delight - create ceiling topography with regressed and drop lens options from factory or convert during installation
- 80 and 90 CRI options available
- BioUp melanopic lighting options for 30% circadian boost and earn WELL Building Standard points (Coming Soon)
- Full range of lens options - cube, single curve, double curve, sweep dome and bevel (Coming Soon)
- Regressed lens provides optical cut off with smooth lens for reduced glare
- Extruded aluminum housing is matte white powder coated
- Wireless control options maintain superb aesthetics
- Options to meet Buy American Act requirements (Coming Soon)

Options

additional product diagrams

Cubes





Curves



COOPER Lighting Solutions
a signify business

SECTION 01 2500
SUBSTITUTIONS

01 2500-3

TO: **BBT Architects**
1140 SW Simpson Ave., Ste. 200
Bend, OR. 97702

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FOR USE BY ARCHITECT:

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_____ Not Accepted _____ Received Too Late

By: Lynn Baker
Date: 4/21/26
Remarks: J1

Submitted By: Adriana Alejandre

Signature : Adriana Alejandre

Title: Tech/Sales Support

Firm: Solus Lighting & Controls

Address: 1820 E Burnside St Portland, OR 97214

Telephone: (503) 768-9999

Date : 4/16/2026

Above signature must be by person having authority to legally bind his firm to the above terms.

END OF SECTION

Submitted by Solus Lighting & Controls

Job Name:
KCC Cosmetology
Architect: Barber Barrett Tuner Architects (Bend)
Engineer: Interface Engineering, Inc.- Portland (Portland)

Catalog Number:
BPRO2-LIN-FLSH-LED35-90-PROG350-XX-YBK-XX-NU-SC-XX-WALL-DM01

Notes:

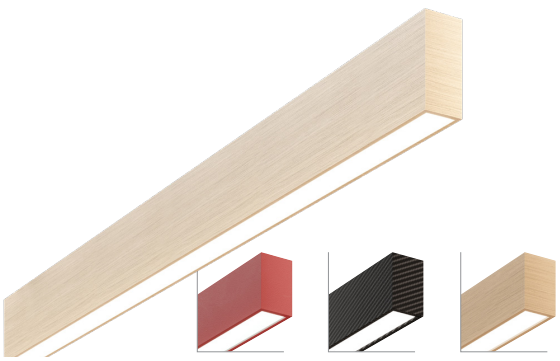
Type:
J1

SOLUS26-234409

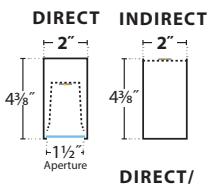
BionicPro2 | Linear

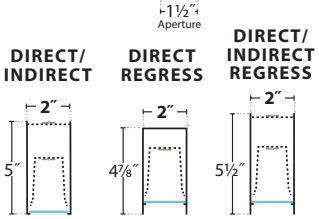
PRUDENTIAL LTG.

PRULITE.COM 213.746.0360



LIGHT WALNUT RED LEATHER CARBON FIBER VARA OAK





FLSH:

DIRECT:		LO	MO	SO	HO
SAL	Lm/Ft	390	575	790	1000
BTW	Lm/Ft	415	610	845	1060
WWF	Lm/Ft	425	625	875	1100
WWG / PFL	Lm/Ft	400	600	825	1050
NGZ	Lm/Ft	450	675	950	1250
MGZ	Lm/Ft	425	625	875	1100
WGZ	Lm/Ft	450	675	950	1250
LGP	Lm/Ft	425	625	875	1100
	W/Ft	3.8	5.6	7.8	10.5
INDIRECT:		LO	MO	SO	HO
SYM	Lm/Ft	600	800	1050	1350
MCW	Lm/Ft	400	550	750	1000
SCW	Lm/Ft	575	875	1170	1450
SACW	Lm/Ft	500	750	1000	1200
	W/Ft	3.8	5.6	7.8	10.5
DIRECT / INDIRECT:					
	W/Ft	7.6	11.2	15.6	21

LUMEN CHART AT 3500K-80 CRI
SEE PAGE 6 FOR REGRESS

SMART SPECS

Lumen output may vary +/– 5%
Light Loss Factor (LLF) for CCTs other than 3500K:
4000K +2%, 3000K -5%, 2700K -20%
90 CRI -15% (3K, 3500K, 4K & 5K
ADC -2% LLF
Louver LLF 30% White, 50% Silver, 70% Black

TUNABLE WHITE
Tū Hue · Amber Hue · Blu Hue · Chroma Hue

SOCIAL MEDIA KIT · SEAMLESS · Declare. · UGR17 WELL Building Standard · 5 YEAR LED WARRANTY · Made in the USA

350L/ft

SERIES	LENS POS.	LED COLOR	OUTPUT	LENGTH	COLOR / LAMINATE	LAM. CANOPY COLOR	LOUVER COLOR	DISTRIBUTION	UP OPTIONS	CIRCUITING	MOUNTING	CEILING TYPE	DRIVERS	OPTIONS & SENSORS
BPRO2-LIN		-	- CONFIRM		YBK			CONFIRM			CONFIRM			
BionicPro 2″ Linear	FLSH Flush Lens LVR ½″ Regress with Louver REG.5 ½″ Regress IND Indirect Only (Select NW No Downligh	LED27 2700K (90CRI) LED3 3000K LED35 3500K LED4 4000K LED3-90 3000K (90CRI) LED35-90 3500K (90CRI) LED4-90 4000K (90CRI) LED5-90 5000K (90CRI) **PRUHUES:** bios **STATIC:** BLU3S BLU35S BLU4S **DYNAMIC:** BLU3D* BLU35D* BLU4D* * Dynamic BIOS, SkyBlue spike can be dimmed, CCT warms slightly TU TuHue 2700-6500K Tunable White TU2 **TuHue 2200-5000K Tunable White AMB** AmberHue Warm Dim 2200K-5000K ** NA HO CHR ChromaHue RGBW (DMX at HO only) **DOWN & UP CCT IF DIFFERENT**	LO Low MO Medium SO Standard HO High PROG Programmable Light Output (Specify desired lm/ft or w/ft)	2′ 3′ 4′ 5′ 6′ 7′ 8′ R___ (Row Length, 1″ increments. Consult factory for custom lengths) SRL Symmetric Row Length (See page 12) **NOTE:** Individual fixtures are NOT intended for row mounting	TMW Textured Matte White (Standard) YGW Gloss White Y___ Premium Color CC___ Custom Color *LUXE METALLICS:* YBZ Bronze YCP Copper Penny YGN Gold Nugget **NOTE:** All canopies painted White (TMW) unless specified otherwise. **LAMINATE FINISHES (SPECIFY CANOPY COLOR IN NEXT COLUMN ➡)** LOK Vara Oak LEW Evreux Walnut LOG Oxidized Gold LOB Oxidized Black L___ Special Order Laminate (EXTENDED LEAD TIMES) **NOTE:** For Laminate finishes Top Plate + Stem is YBK Matte Black except for LOK and LLW it will be TMW White.	(SKIP THIS COLUMN IF LAMINATE FINISH IS NOT SELECTED) TMW Textured Matte White (Standard) YGW Gloss White Y___ Premium Color CC___ Custom Color *LUXE METALLICS:* YBZ Bronze YCP Copper Penny YGN Gold Nugget **NOTE:** All canopies painted White (TMW) unless specified otherwise.	(SKIP THIS COLUMN IF LOUVER IS NOT SELECTED) TMW Textured Matte White (Standard) YGW Gloss White Y___ Premium Color CC___ Custom Color *LUXE METALLICS:* YBZ Bronze YCP Copper Penny YGN Gold Nugget **NOTE:** All canopies painted White (TMW) unless specified otherwise.	CHOOSE DOWN –AND– UP **DOWN:** NW No Direct SAL Satin Lens BTW Batwing WWF Flat Wall Wash WWG Focal Glow Wall Wash PFL Perimeter Room Fill NGZ Narrow Wall Graze MGZ Medium Wall Graze WGZ Wide Wall Graze LGP Low Glare Prismatic (NA HO) **UP:** NU No Indirect SYM Symmetric (Frosted ADC, Standard) MCW Medium Ceiling Wash SCW Soft Ceiling Wash SACW Soft Asymmetric Ceiling Wash	TG Top Glow ADC Acrylic Dust Cover (Clear) Standard for SYM (Frosted) TGADC Top Glow with Acrylic Dust Cover **UP OPTIONS AVAILABLE WITH ANY UP DISTRIBUTION**	SC Single Circuit (Down & Up will dim together) DC Dual Circuit (Needed if dim-ming Down separate-ly from Up) **VOLTAGE** UNV (120-277) 347 (Emergency battery requires remote driver box)	(SPECIFY CEILING TYPE IN NEXT COLUMN ➡) CA48″, 96″ or 144″ Aircraft Cable (Adjustable) SURF Surface Mount (Direct only) RSC Rigid Stem Center SSC Swivel Stem Center (~45° of rotation) **(SPECIFY MOUNTING LOCATION IN NEXT COLUMN ➡)** WMC (Channel) .75″ Tall Continuous Channel WMC2 (Channel) 2″ Tall Continuous Channel WMU (Bracket) .5″ Tall Bracket WMU1 (Bracket) 1″ Tall Bracket WMU2 (Bracket) 2″ Tall Bracket WM Direct to Wal WBx.x Wall Bracket (2″- 6″ in .5″ increments, 3″ standard if not specified)	CEILING TYPE: X1 T-Bar X3 Hard Ceiling X6 Slot Grid **MOUNTING LOCATION:** WALL (For Wall or Mullion Mount) SUR Ceiling WALL	ND Non-Dimming DM01 0-10v, 1% Dimming (Standard) LDE1 Hi-lume 1% EcoSystem LED (Soft fade on, fade-to-black dimming) ECO 1% 0-10v, EldoLED (Logarithmic dimming std) ECDA 1% DALI, EldoLED (Logarithmic dimming std) nLight-Air Acuity nLight Drivers (ECDA driver ONLY) nLight-Wired Acuity nLight Drivers (ECO driver ONLY, Requires Remote Driver) SOLO 0.1% 0-10v, EldoLED (Dim-to-dark, Logarithmic dimming std) SODA 0.1% DALI, EldoLED (Dim-to-dark, Logarithmic dimming std) STEP Signify Advance Step Dimming 2WIRE ELV/Forward/Reverse Phase Driver **PRUHUES:** E10V 2 Channel Color Control EDALI 2 Channel Color Control EDMX ChromaHue or Static White	EMHE CA T20 Emergency Battery (1250 Delivered lumens; CA Title 20 compliant) ETS-DR Iota ETS-DR Emergency Transfer Switch EMC Emergency Circuiting FTR Feather WTW Asymmetric on Perpendicular Wall (NA HO or LGP) EBCP1G /2G Single / Dual Gang (Electrical Box Cover Plate/ Mud Ring) COS Custom On-Center Spacing for Wall/Surface Brackets **SENSORS:** 205 WattStopper PIR Occupancy **205-ON/OFF** **205-STEP:** Dim to 50% **205-DM:** Dim to 1% (NA with DALI) ATHENA Lutron RF (Dim-to-Off Standard) LVOC‡‡ Lutron Vive (Occ & RF LVRF‡‡ Lutron Vive (RF Only) ‡‡ Requires Lutron driver NXSMP Hubbell (Occ) rES7 Daylight+(PIR Acoustic) (Occ) (nLight-Air) Part Number: rES7-PDT-180D-G2 nES7 Daylight+(PIR Acoustic) (Occ) LUX Philips DLR **CORNERS:** C2-60 Lit 60° C2-90 Lit 90° C2-120 Lit 120° C2-135 Lit 135° C3T Lit 90° 3-Way: T C3Y Lit 120° 3-Way: Y C4T Lit 90° 4-Way: + C4X Lit 45°-135° 4-Way: X C8I Lit Inside 2-Plane C8O Lit Outside 2-Plane **90° LOUVERS AVAILABLE (CONSULT FACTORY FOR OTHER ANGLES)** LRT Linear to Recessed Transition (Straight rows only) DWNLT Downlights

Prudential Ltg. reserves the right to change design specifications or materials without notice. Please visit prulite.com for most current data.
© 2025 All rights reserved—All products manufactured at: Prudential Ltg. 1774 E. 21st Street, Los Angeles, CA 90058

SECTION 01 2500
SUBSTITUTIONS

01 2500-3

TO: **BBT Architects**
1140 SW Simpson Ave., Ste. 200
Bend, OR. 97702

PROJECT NAME: Klamath Community College Cosmetology Building

We hereby submit for consideration, the following product instead of specified item for above project:

Section: Division 26 Paragraph: All

Specified Item Lighting

Proposed Substitution: See Substitution Package

Attach complete dimensional information and technical data including laboratory tests, if applicable.

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Project No. 1: Available upon request
Project No. 2:
Project No. 3:

SECTION 01 2500
SUBSTITUTIONS

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FOR USE BY ARCHITECT:

X Accepted _____ Accepted as Noted
_____ Not Accepted _____ Received Too Late

By: Lynn Baker
Date: 4/21/26
Remarks: R1

Submitted By: Adriana Alejandre

Signature : Adriana Alejandre

Title: Tech/Sales Support

Firm: Solus Lighting & Controls

Address: 1820 E Burnside St Portland, OR 97214

Telephone: (503) 768-9999

Date : 4/16/2026

Above signature must be by person having authority to legally bind his firm to the above terms.

END OF SECTION

Pavo 2" - Wall

SIW12169 2.00 in

SPI LIGHTING

PROJECT DETAILS

JOB NAME:

TYPE:

NOTES:

DESCRIPTION

This sleek 2” cylindrical form is a pure expression of light and proof that great design is rooted in simplicity. Pavo 2” Wall is fully illuminated with no housing or metal accents to interrupt its minimalist form. It looks uniform from every angle. Its round diffuser emits a soft gradual display of light on the wall behind the fixture. This low-profile sconce is ADA-compliant and a great choice for hallways, elevator bays, vanities, or anywhere you want to add a simple yet sophisticated line of light. Available in 1' to 6' sizes.



FEATURES & BENEFITS

- The design element you've been missing
- Linearly-lit wall sconce provides even illumination along the entire length of the lens
- Meticulously designed ends have no visible shadowing
- Minimal bracketry and hardware for an exceptionally clean look
- An expression of light in its most basic form
- Provides functional light, up to 750 lumens per foot, with comfortable luminance levels
- Pairs well with the entire Pavo family of pendants
- Mount vertically or horizontally on walls or ceilings
- Compliant with Americans with Disabilities Act (ADA) requirements
- Handcrafted in USA

SPECIFICATIONS

- **LIGHT SOURCE:** White LED light engine
- **CRI:** 80+ or 90+
- **LUMEN MAINTENANCE:** L70 = >50,000 Hrs.
- **EFFICACY:** 107 lm/W delivered
- **CCT:** 2700K, 3000K, 3500K, 4000K, 5000K
- **VOLTAGE:** 120-277V standard
- **DRIVER:** Remote or integral Class 2 power supply. Max distance to the driver is: #18 AWG = 50', #16 AWG = 75', #14 AWG = 100'. For extended distances, contact factory.
- **DIMMING:** 1% minimum dim level standard
- **CONTROLS:** 0-10V standard. Lutron Athena, Current NX, and

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END OF SECTION

Submitted by Solus Lighting & Controls			
SOLUS Lighting & Controls	**Job Name:** KCC Cosmetology Architect: Barber Barrett Tuner Architects (Bend) Engineer: Interface Engineering, Inc.- Portland (Portland)	**Catalog Number:** ULEE-30011-CUSTOM500L-T3-W27-01-120/277V-F-DIM Notes:	**Type:** **SB1** SOLUS26-234409

ULEE-30011

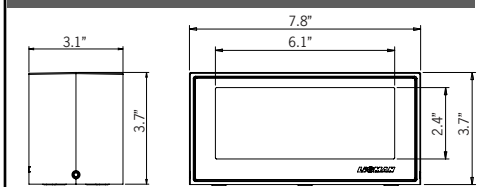
Leeds 4 Medium Surface Downlight

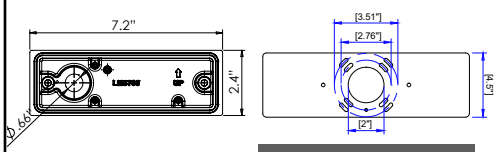
microVos TECHNOLOGY

LIGMAN LIGHTING USA



14w LED 1,675 Lumens
IP65 · Suitable For Wet Locations
IK07 · Impact Resistant
Weight 3.3 lbs

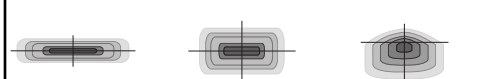




Mounting Detail

microVos TECHNOLOGY

Ligman's micro Variable Optical System provides the ability to interchange, mix & rotate optics to provide specific light distributions for optimized spacing and uniformity.

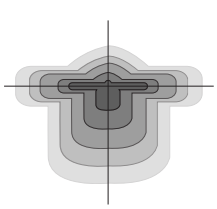


Type I | Type II | Type III



Type IV | Type V

The variable optic system allows for the designer to create hybrid distributions for precise lighting requirements.



HYBRID
TYPE I & TYPE IV

Construction

Aluminum
Less than 0.1% copper content – Marine Grade 6060 extruded & LM6 Aluminum High Pressure die casting provides excellent mechanical strength , clean detailed product lines and excellent heat dissipation.

Pre paint
8 step degrease and phosphate process that includes deoxidizing and etching as well as a zinc and nickel phosphate process before product painting.

Memory Retentive -Silicon Gasket
Provided with special injection molded "fit for purpose" long life high temperature memory retentive silicon gaskets. Maintains the gaskets exact profile and seal over years of use and compression.

Thermal management
LM6 Aluminum is used for its excellent mechanical strength and thermal dissipation properties in low and high ambient temperatures. The superior thermal heat sink design by Ligman used in conjunction with the driver, controls thermals below critical temperature range to ensure maximum luminous flux output, as well as providing long LED service life and ensuring less than 10% lumen depreciation at 50,000 hours.

Surge Suppression
Standard 10kv surge suppressor provided with all fixtures.

BUG Rating
B0 - U0 - G0 [ME/W40, T2, T3/W30, T4]
B1 - U0 - G0 [EW, M/W30, W/W30, ME/W30, T3/W40]
B1 - U0 - G1 [T1]
B2 - U0 - G0 [M/W40, W/W40]

Finishing
All Ligman products go through an extensive finishing process that includes fettling to improve paint adherence.

Paint
UV Stabilized 4.9Mil thick powder coat paint and baked at 200 Deg C. This process ensures that Ligman products can withstand harsh environments. Rated for use in natatoriums.

MicroPRIM Finishes

MicroPRIM is Ligman's trade marked decorative powder coating technology that permanently infuses colors, patterns, or imagery directly into the surface of luminaires and poles while providing protections that standard powder coating does not offer.

MicroPRIM finishes include nature-inspired wood grains and stone aesthetics, material-inspired finishes such as brushed metal, concrete, and carbon fiber, Solid colors in Ligman standard colors, as well as any RAL or Pantone color, Decorative patterns, custom imagery and more.

Coating and Infusion Process

Metal components are pre-treated and powder coated with a proprietary polyurethane-based coating engineered for outdoor architectural use. Decorative patterns or imagery are then permanently infused into the cured powder coat through a heat-based process, creating a durable, integrated finish.

Performance and Validation

MicroPRIM finishes are suitable for indoor and outdoor applications and meet AAMA2605 architectural coating requirements. Performance is validated through laboratory and real-world testing to ASTM standards for UV exposure, adhesion, abrasion, impact, salt spray, chemical resistance, and graffiti resistance.

All MicroPRIM finishes are backed by Ligman's 10-year warranty.

Key Performance Attributes
•Anti-graffiti resistance
•UV and weather resistance
•Scratch and abrasion resistance
•Natatorium Rated for installation in corrosive environments)

Hardware
Provided Hardware is Marine grade 316 Stainless steel.

Anti Seize Screw Holes
Tapped holes are infused with a special anti seize compound designed to prevent seizure of threaded connections, due to electrolysis from heat, corrosive atmospheres and moisture.

Crystal Clear Low Iron Glass Lens
Provided with tempered, impact resistant crystal clear low iron glass ensuring no green glass tinge.

Optics & LED
Precise optic design provides exceptional light control and precise distribution of light. LED CRI > 80

Lumen - Maintenance Life
L80 /B10 at 50,000 hours (This means that at least 90% of the LED still achieve 80% of their original flux)

Clean, elegant surface-mounted wall fixtures delivering class-leading performance. A minimalist design paired with exceptional power and flexibility, offering lumen packages up to 3,668 lumens—or dual configurations up to 4,982 lumens—featuring advanced MicroVos technology.

A range of small, square and rectangular, ADA compliant wall mounted luminaires with options of upward or downward light distributions. Ideally suited to illuminate the wall and surfaces in front of wall and for light accents on vertical surfaces using high efficiency LED's. The Leeds is suitable for indoor and outdoor applications and provides a clean, visually appealing solution for small, unobtrusive wall mounted luminaires.

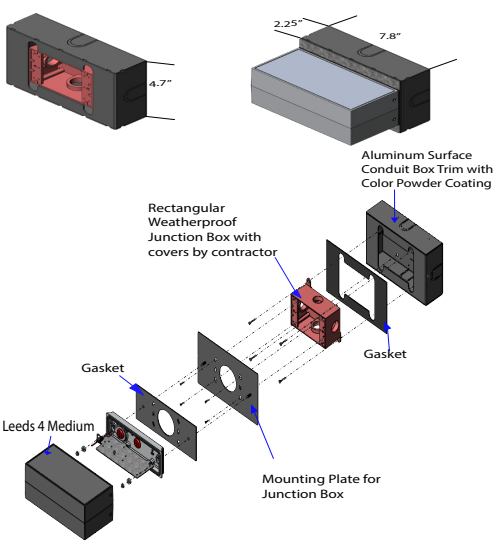
This luminaire is available in 3 different sizes and in combinations of down, up or up/down light distributions.

This fixture utilizes MicroVos Technology, meaning the ability to do Type I, II, III, IV & V distributions as well as hybrid distributions to suit the designer's requirements.

Using the MicroVos Optics allows for very wide spacing to mounting height ratios, while still providing perfect uniformity and code compliant light levels.

To meet International Dark Sky criteria, 3000k or warmer LEDs must be selected and luminaire fix mounted (+/- 15˚ allowable to permit leveling).

Additional Options (Consult Factory For Pricing)



SCBT
Surface Conduit Box Trim

NOTE: This trim covers a shallow single gang, surface mount junction box [Provided by contractor]
Example: Hubbell: - 5322-0 - 1-Gang Weatherproof Box, Five 1/2" in. Threaded Outlets - or - 5332-0 - 1-Gang Weatherproof Box, Five 3/4 in. Threaded Outlets

Ligman Lighting USA reserves the right to change specifications without prior notice, please contact factory for latest information. Due to the continual improvements in LED technology data and components may change without notice.

SECTION 01 2500
SUBSTITUTIONS

01 2500-3

TO: **BBT Architects**
1140 SW Simpson Ave., Ste. 200
Bend, OR. 97702

PROJECT NAME: Klamath Community College Cosmetology Building

We hereby submit for consideration, the following product instead of specified item for above project:

Section: Division 26 Paragraph: All

Specified Item Lighting

Proposed Substitution: See Substitution Package

Attach complete dimensional information and technical data including laboratory tests, if applicable.

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List of names and location of three similar projects on which product was used, date of installation, and Architect's name and phone number.

Project No. 1: Available upon request
Project No. 2:
Project No. 3:

SECTION 01 2500
SUBSTITUTIONS

CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE

UNDERSIGNED ATTESTS THAT FUNCTION AND QUALITY ARE EQUAL TO OR SUPERIOR TO SPECIFIED ITEMS.

FOR USE BY ARCHITECT:

X Accepted _____ Accepted as Noted
_____ Not Accepted _____ Received Too Late

By: Lynn Baker
Date: 4/21/26
Remarks: SB2

Submitted By: Adriana Alejandre

Signature : Adriana Alejandre

Title: Tech/Sales Support

Firm: Solus Lighting & Controls

Address: 1820 E Burnside St Portland, OR 97214

Telephone: (503) 768-9999

Date : 4/16/2026

Above signature must be by person having authority to legally bind his firm to the above terms.

END OF SECTION

Submitted by Solus Lighting & Controls			
SOLUS Lighting & Controls	**Job Name:** KCC Cosmetology Architect: Barber Barrett Tuner Architects (Bend) Engineer: Interface Engineering, Inc.- Portland (Portland)	**Catalog Number:** ULEE-30011-CUSTOM500L-T2-W27-01-120/277V-F-DIM Notes:	**Type:** **SB2** SOLUS26-234409

ULEE-30011

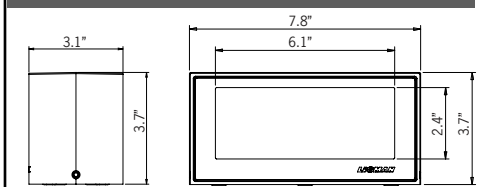
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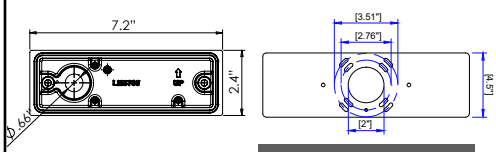
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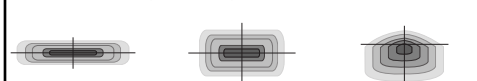




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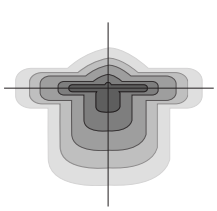


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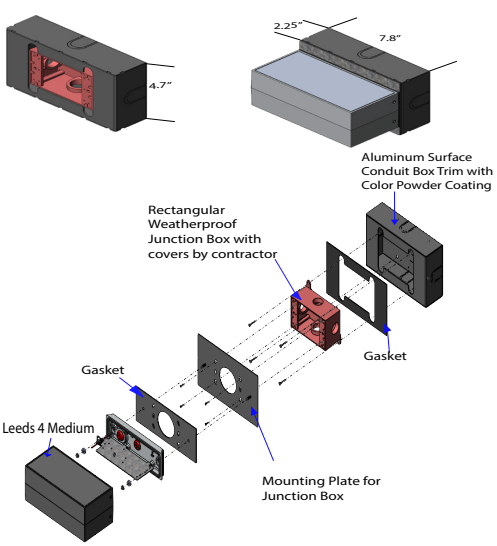
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SECTION 01 2500
SUBSTITUTIONS

01 2500-3

TO: **BBT Architects**
1140 SW Simpson Ave., Ste. 200
Bend, OR. 97702

PROJECT NAME: Klamath Community College Cosmetology Building

We hereby submit for consideration, the following product instead of specified item for above project:

Section: Division 26 Paragraph: All

Specified Item Lighting

Proposed Substitution: See Substitution Package

Attach complete dimensional information and technical data including laboratory tests, if applicable.

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List of names and location of three similar projects on which product was used, date of installation, and Architect's name and phone number.

Project No. 1: Available upon request
Project No. 2:
Project No. 3:

SECTION 01 2500
SUBSTITUTIONS

CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE

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FOR USE BY ARCHITECT:

X Accepted _____ Accepted as Noted
_____ Not Accepted _____ Received Too Late

By: Lynn Baker
Date: 4/21/26
Remarks: SC1

Submitted By: Adriana Alejandre

Signature : Adriana Alejandre

Title: Tech/Sales Support

Firm: Solus Lighting & Controls

Address: 1820 E Burnside St Portland, OR 97214

Telephone: (503) 768-9999

Date : 4/16/2026

Above signature must be by person having authority to legally bind his firm to the above terms.

END OF SECTION

CORE/WL 4

ROUND, WET LOCATION, DIRECT ILLUMINATION

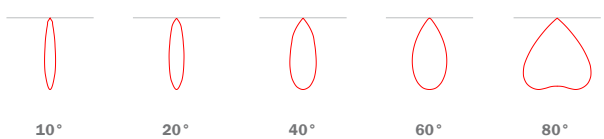


SPECIFICATIONS

PROFILE	Round
SIZE	4.5” diameter, 12.2” or 6.3” shell height
LED OUTPUT	700lm - 3,000lm
CCT/CRI	2700K/3000K/3500K/4000K • 83 CRI or 98 CRI
DIMMING/ DRIVER	Internal, Canopy, and Remote Driver: 0-10V, Phase, DALI, DMX, eldoLED, Lutron®. Dimming to 0% for select models.
POWER	5.6W to 29.3W per fixture
INPUT	100VAC to 277VAC Phase dimmable versions are 120VAC only
OPTICS	10° - 80° distribution spun aluminum reflectors. Field replaceable without tools.
FINISHES	Powder coat - TGIC polyester for exterior and interior use
MATERIAL	Extruded aluminum with stainless steel hardware
ENVIRONMENT	Wet location, IP66 rated LED module
WELL	For UGR values and recommended options that contribute to meeting the WELL Building Standard™ see WELL addendum.

*Safety and Performance information available on last page. Output and other specifications available on page 6.

DISTRIBUTIONS & PROFILES

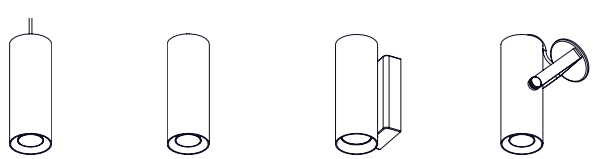


CORE/WL 4 PENDANT

CORE/WL 4 SURFACE MOUNT

CORE/WL 4 SCONCE

CORE/WL 4 YOKE

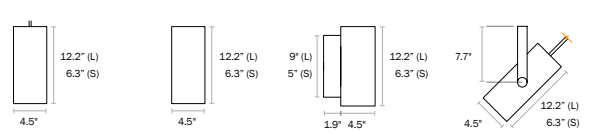


CORE/WL 4 PENDANT

CORE/WL 4 SURFACE MOUNT

CORE/WL 4 SCONCE

CORE/WL 4 YOKE



Not to scale. Dimensions are nominal. Consult factory for CAD drawing

Intertek

SECTION 01 2500
SUBSTITUTIONS

01 2500-3

TO: **BBT Architects**
1140 SW Simpson Ave., Ste. 200
Bend, OR. 97702

PROJECT NAME: Klamath Community College Cosmetology Building

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Section: Division 26 Paragraph: All

Specified Item Lighting

Proposed Substitution: See Substitution Package

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FOR USE BY ARCHITECT:

X Accepted _____ Accepted as Noted
_____ Not Accepted _____ Received Too Late

By: Lynn Baker
Date: 4/21/26
Remarks: X1

Submitted By: Adriana Alejandre

Signature : Adriana Alejandre

Title: Tech/Sales Support

Firm: Solus Lighting & Controls

Address: 1820 E Burnside St Portland, OR 97214

Telephone: (503) 768-9999

Date : 4/16/2026

Above signature must be by person having authority to legally bind his firm to the above terms.

END OF SECTION

Prestige™ Edge-Lit Series

Premium die-cast aluminum exit sign



Construction
- Housing, trim plate, trim ring and canopy made of die-cast aluminum
- U-shaped clear acrylic Legend panel features laser-etched letters and chevrons
- 6 inch EXIT lettering legend, available in red or green
- 8 inch EXIT lettering legend, available in red
- Choice of finishes: white, black or brushed aluminum, polished brass, polished chrome or bronze

Mounting
- Modular design allows for surface or recessed mount
- Canopy included for surface wall, end or ceiling mount applications
- Trim ring included for recessed wall or ceiling mount applications.
- Housing provided with conduit knock-out 1/2", top, back and end
- (C) circular or (A) angular trim plate used for surface or recessed wall or ceiling mount applications
- Hanger bars included for lay-in installation in t-bar grid

Special wording panels
- Available. Contact your sales representative with your design requirements

Electronics
- Optional **Advanced Diagnostics**
- Optional Nexus® monitoring system
- 120-277 50/60Hz

Approvals
- UL 924 listed
- Meets NFPA101 (Life Safety Code), NFPA 70 NEC, OSHA illumination standards
- E-California Energy Commission Title 20

Warranty
- Unit has a five year limited warranty
  Detailed warranty terms located on page 202 or online at:
  www.emergi-lite.com/usa/files/el_warranty.pdf

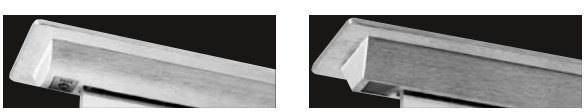
Mounting configurations



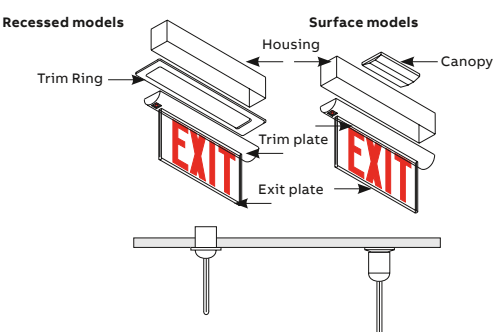
Recessed wall mount | Recessed ceiling mount

Surface wall mount | Surface ceiling mount | Surface end mount

Trim plates



Circular trim plate | Angular trim plate



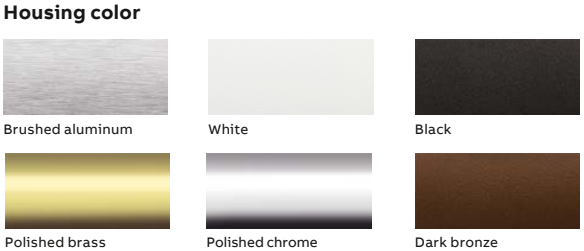
Arrow (chevron) designation



Arrow right (R) | Arrow left (L) | Double arrow (D) | Arrow right & left (RL) represents each side of a double face panel

Wording and chevrons not to scale. For illustration purposes only.

Housing color



Brushed aluminum | White | Black

Polished brass | Polished chrome | Dark bronze (painted)

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SECTION 01 2500
SUBSTITUTIONS

01 2500-3

TO: **BBT Architects**
1140 SW Simpson Ave., Ste. 200
Bend, OR. 97702

PROJECT NAME: Klamath Community College Cosmetology Building

We hereby submit for consideration, the following product instead of specified item for above project:

Section: Division 26 Paragraph: All

Specified Item Lighting

Proposed Substitution: See Substitution Package

Attach complete dimensional information and technical data including laboratory tests, if applicable.

Include complete information on changes to Drawings and/or specifications, which proposed substitution will require for its proper installation.

Submit with request all necessary samples and substantiating data to provide equal quality, performance, and appearance to that which is specified. Clearly mark manufacturer's literature to indicate equality in performance. Differences in quality of materials and construction shall be indicated.

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

1. The proposed substitutions do not affect dimensions shown on drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.
5. The proposed substitution will have no affect on applicable codes.
6. The manufacturer's guarantee or warranties of proposed product is equivalent to; or exceeds that of the specified product.
7. Proposed substituted item will match all sizes, profiles, specifications and colors of item originally specified.

List of names and location of three similar projects on which product was used, date of installation, and Architect's name and phone number.

Project No. 1: Available upon request
Project No. 2:
Project No. 3:

SECTION 01 2500
SUBSTITUTIONS

CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE

UNDERSIGNED ATTESTS THAT FUNCTION AND QUALITY ARE EQUAL TO OR SUPERIOR TO SPECIFIED ITEMS.

FOR USE BY ARCHITECT:

X Accepted _____ Accepted as Noted
_____ Not Accepted _____ Received Too Late

By: Lynn Baker
Date: 4/21/26
Remarks: Z1

Submitted By: Adriana Alejandre

Signature : Adriana Alejandre

Title: Tech/Sales Support

Firm: Solus Lighting & Controls

Address: 1820 E Burnside St Portland, OR 97214

Telephone: (503) 768-9999

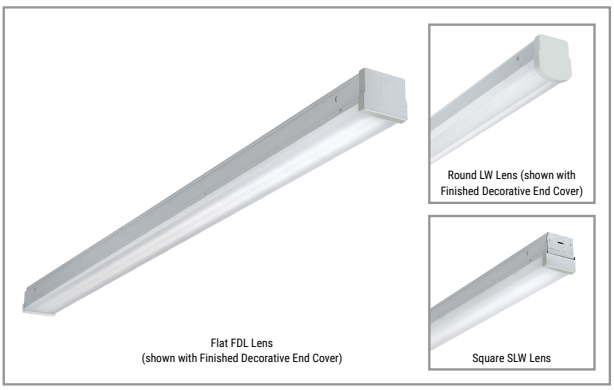
Date : 4/16/2026

Above signature must be by person having authority to legally bind his firm to the above terms.

END OF SECTION

Submitted by Solus Lighting & Controls			
SOLUS Lighting & Controls	**Job Name:** KCC Cosmetology Architect: Barber Barrett Tuner Architects (Bend) Engineer: Interface Engineering, Inc.- Portland (Portland)	**Catalog Number:** 4SNX-48SL-LC-UNV-L935-CD-1-U-XX Notes:	**Type:** **Z1** SOLUS26-234409

Project		**Catalog #**		**Type**	
Prepared by		**Notes**		**Date**	



Metalux

SNX Lensed

Flat, Round and Square Lens
Linear LED Striplight

Typical Applications

Commercial • Cove • Warehouse/Distribution • Retail • Industrial • General Aisle or Open Areas • Utility/Storage Rooms

Interactive Menu

- Order Information page 2
- Photometrics page 4
- Energy and Performance Data page 5
- Control Solutions page 10
- Product Warranty

Product Certification

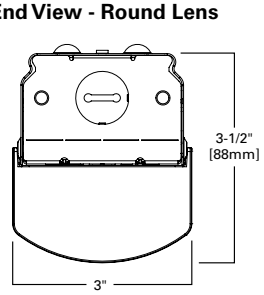
Product Features

Top Product Features

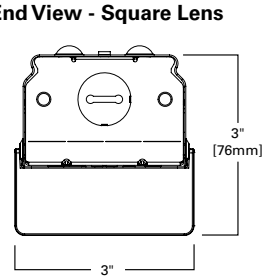
- Standard (SL) and High lumen/High Efficacy (HL) packages
- Three (3) CCT and Lumen selectable options available
- Up to 21,000 lumen and 174 LPW
- General, Narrow or Wide distributions
- Decorative end cover and multiple finishes provide a polished look
- Integral factory installed controls option allows more energy savings
- Captive lens, electrical, and channel cover assembly
- Tool-less channel cover and electrical assembly
- Options to meet Build America, Buy America, Buy American and other domestic preference requirements

Dimensional Details

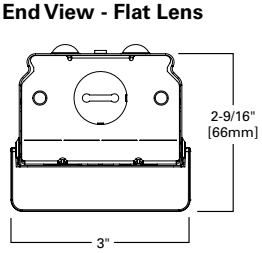
End View - Round Lens



End View - Square Lens

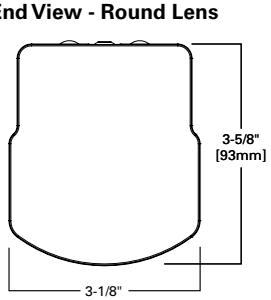


End View - Flat Lens



Finished Decorative End Covers

End View - Round Lens



additional product diagrams

COOPER Lighting Solutions
a Signify business

SECTION 01 2500
SUBSTITUTIONS

01 2500-3

TO: **BBT Architects**
1140 SW Simpson Ave., Ste. 200
Bend, OR. 97702

PROJECT NAME: Klamath Community College Cosmetology Building

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FOR USE BY ARCHITECT:

X Accepted _____ Accepted as Noted
_____ Not Accepted _____ Received Too Late

By: Lynn Baker
Date: 4/21/26
Remarks: Z2

Submitted By: Adriana Alejandre

Signature : Adriana Alejandre

Title: Tech/Sales Support

Firm: Solus Lighting & Controls

Address: 1820 E Burnside St Portland, OR 97214

Telephone: (503) 768-9999

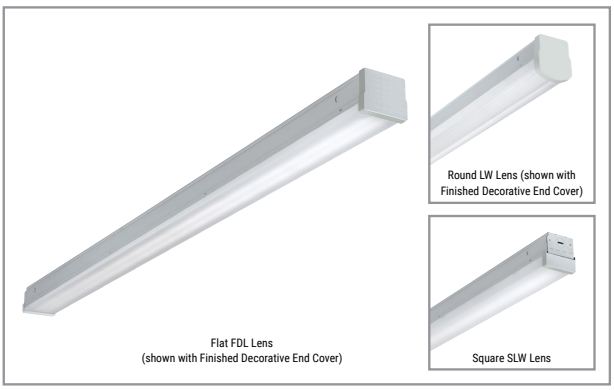
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END OF SECTION

Submitted by Solus Lighting & Controls			
SOLUS Lighting & Controls	**Job Name:** KCC Cosmetology Architect: Barber Barrett Tuner Architects (Bend) Engineer: Interface Engineering, Inc.- Portland (Portland)	**Catalog Number:** 4SNX-48SL-LC-UNV-L935-CD-1-U Notes:	**Type:** **Z2** SOLUS26-234409

Project		**Catalog #**		**Type**	
Prepared by		**Notes**		**Date**	



Metalux

SNX Lensed

Flat, Round and Square Lens
Linear LED Striplight

Typical Applications

Commercial • Cove • Warehouse/Distribution • Retail • Industrial • General Aisle or Open Areas • Utility/Storage Rooms

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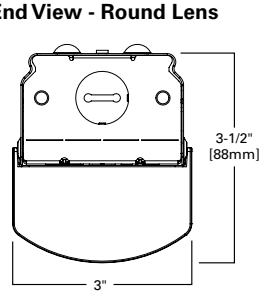
Product Features

Top Product Features

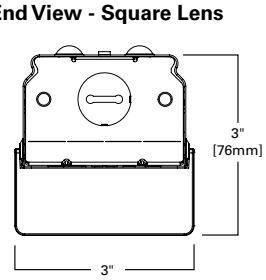
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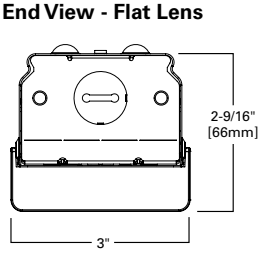
End View - Round Lens



End View - Square Lens

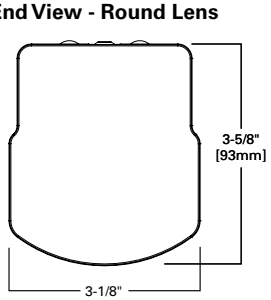


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