

For Postal Delivery
 Department of Labor and Industries
 Factory Assembled Structures
 PO Box 44430
 Olympia WA 98504-4430



STATE OF WASHINGTON
 DEPT. OF LABOR AND
 INDUSTRIES
 FAS PLAN REVIEW/SECTION
 APPROVED
 12/09/2024
 SUBJECT TO CODE
 AND FIELD INSPECTION

For Non-Postal Delivery (e.g., FedEx, UPS)
 Department of Labor and Industries
 Factory Assembled Structures
 7273 Linderson Way SW
 Tumwater WA 98501
 www.wa.gov/lni (case sensitive)

WA Only
 WA Rev/ _____ Courtesy
 _____ Rev/WA Courtesy
 _____ Other state
 State ID

PRPF20241231

PLAN APPROVAL REQUEST
 FACTORY BUILT STRUCTURES

Applicant: Fill out completely

Manufacturer **21FBS2400126**
ATCO Structures & Logistics M717-1
 Plans to be returned to: Address
115 Peacekeepers Drive SW
 City/State/ZIP
Calgary, AB - T3E 2A8
FOR DEPARTMENT USE ONLY
 Fee Ledg Sht # **110318937** Check # **FP4370590** \$ Amount **\$367.59** Application ID **FBS2400126**
 Ap No. **21FBS2400126** Date approved **12/9/2024** Expiration date **12/9/2025**

City of Puyallup
 Development & Permitting Services
 ISSUED PERMIT
 Building Planning
 Engineering Public Works
 Fire Traffic

Contact person's printed name: **Andy Ostrowski** Date **2024-06-16** Fee enclosed **\$ 6,062.60**
 Signature Phone No **403-620-3849** FAX No _____

New plan (Master design) _____ (1 Yr design) *See appropriate WAC for fees* Initial MFG filing _____
 Renewal _____ AP No. _____ Resubmittal _____
 Addendum _____ AP No. _____ Plans review by L&I listed professional _____

Note: Identify addendum items on plan!

Code cycles (month/year):
 IBC, IRC, IMC / 2021 UPC: / 2021 NEC: / 2023 WSEC,VIAQ: / 2021 IFC: / 2021
 Size of building::
 Width: **23'-8"** Length: **64'** Area (Sq Ft): **1,771** No of modules: **2** Occupancy group: **E**
 Type construction: **V-B** Use: **OFFICE/ADMIN** SUB yr **2021** SEC yr **2023** Seismic **0.30/D**
 Roof live load PSF **45** Wind load MPH - EXP **130 / C** Floor load PSF: **125**
 Plot plan submitted? Yes No If "No", provide distance from farthest projection to nearest building/property
 Front: **30'** Rear: **30'** Left side: **30'** Right side: **30'**
 Type heat: Central forced air Hydronics Baseboard Fan powered room heater Other _____
 Type of fuel: Electric Natural gas Propane Oil Other: _____
 Insulation values: Floor **R31** Walls **R24** Roof (Flat) **R52** Roof (Vault) _____ Heating zone: Zone 1 **4c**
 WSEC compliance chapter: Energy calculations: Attached On file - AP# _____
 Component Performance Systems Analysis Prescriptive N/A Heat Pump Yes No Air conditioning Yes No Electrical service: Amps **200** **46 KVA** Phase 1 3

	N/A	Attached L&I Review	Attached/Design Professional Review	On file	
Structural calculations or test proposals	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AP# _____
Truss or rafter drawing(s)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AP# _____
Truss plan if over 3 different trusses	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AP# _____
Girder truss or ridge beam drawing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AP# _____
HVAC drawing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AP# _____
Cross section and elevation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AP# _____
Foundation plan	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AP# _____
Electrical load demand calculation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AP# _____
Panel box schedule/Electric load calc's	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AP# _____
Chassis drawing (CC units only)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AP# _____
Plumbing systems:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AP# _____

Operating pressure **65 PSI** to **80 PSI** No of fixtures **26** **29** Total developed length **30'**

RETURN PLANS VIA: Regular mail Overnight @ customer's expense Carrier _____

Other: _____ Acct # _____

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Permanent
 Alteration
 Replacement

Applicant: **21FBS2400126**

MANUFACTURER	MFG NO.
ATCO Structures & Logistics	M-717-1
PRODUCTION FACILITY ADDRESS	City of Puyallup Development & Permitting Services ISSUED PERMIT
115 Peacekeepers Drive SW	Building Planning Engineering Public Works Fire Traffic
CITY/STATE/ZIP	
Calgary, Alberta, Canada - T3E 7X4	
TELEPHONE NO.	FAX NO.
403-620-3849	
FOR DEPARTMENT USE ONLY	
FEE LEDGER SHEET NO	CHECK NO.
	\$ AMOUNT.

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 (case sensitive)

Multi-Tagged
 WA ID
 OR Other

**APPLICATION FOR INSIGNIA
 FOR FACTORY BUILT STRUCTURES**



SUBMIT ONE COPY - NOTE: A separate form is to be used for each building unless multiple buildings have the same plan approval number.

Contact person's printed name: Andy Ostrowski	Date 2024-06-14	Fee enclosed \$ 364.60
Signature 	Phone No (403) 620-3849	FAX No ()

A FEE FOR EACH INSIGNIA IS DUE WITH APPLICATION -- NOT SUBJECT TO REFUND
PLEASE MAKE CHECKS PAYABLE TO DEPT. OF LABOR & INDUSTRIES

1.	Dept Insignia No.	Mfg Serial No.	Approved Plan No.	POD	Fee								
		4642414582	21FBS2400126	1 OF 2	\$ 355.60								
	OG E	TC VB	IS S, M, P, E	SUB YR 2021	SEC YR 2023	ESL 46KVA / 39-kW	RF 45	W 130-C	SZONE D	ID 4c	HTG SVPHP	AC Y	P 29 26
2.	Dept Insignia No.	Mfg Serial No.	0.30	POD 2 OF 2	Fee \$ 31.60								
3.	Dept Insignia No.	Mfg Serial No.		POD OF	Fee \$								
4.	Dept Insignia No.	Mfg Serial No.		POD OF	Fee \$								
5.	Dept Insignia No.	Mfg Serial No.		POD OF	Fee \$								
6.	Dept Insignia No.	Mfg Serial No.		POD OF	Fee \$								
7.	Dept Insignia No.	Mfg Serial No.		POD OF	Fee \$								
8.	Dept Insignia No.	Mfg Serial No.		POD OF	Fee \$								
9.	Dept Insignia No.	Mfg Serial No.		POD OF	Fee \$								

Manufacturer to complete: _____
 Number of tags: _____ Via Regular mail Overnight at customer expense Other _____
 Carrier _____ Acct # _____

continued on reverse

FOR DEPARTMENT USE ONLY		
Date 12/9/2024	Insignia Release by Debra Anderson	To FAS Program Chief

Department of Labor and Industries
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PO Box 44430
Olympia WA 98504-4430



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FIELD INSPECTION

Paid date	Column	Check	<table border="1"> <tr> <td>Development & Permitting Services</td> <td>ISSUED PERMIT</td> </tr> <tr> <td>Building</td> <td>Planning</td> </tr> <tr> <td>Engineering</td> <td>Public Works</td> </tr> <tr> <td>Fire</td> <td>Traffic</td> </tr> </table>	Development & Permitting Services	ISSUED PERMIT	Building	Planning	Engineering	Public Works	Fire	Traffic
Development & Permitting Services	ISSUED PERMIT										
Building	Planning										
Engineering	Public Works										
Fire	Traffic										

NOTIFICATION TO LOCAL ENFORCEMENT AGENCY

www.wa.gov/lni/FAS/
(case sensitive)

Date	2024-06-14	M 717-1
Mfg	ATCO Structures & Logistics	

The Factory-Built unit identified below requires completion work at the site as specified.

Owner's name ATCO Structures & Logistics Ltd.	Mfg's serial no. 4642414582 & 4642414583	Dept insignia no.
Installation address 815 21st Street SE	Type of construction V-B	Occupancy E
ETA at site 2024-08-01	City Puyallup	State WA
ZIP+4 98372	County Pierce	Phone number 425-281-5357
Installation site is in:	<input checked="" type="checkbox"/> City	<input type="checkbox"/> County

DESCRIBE ITEMS REQUIRING COMPLETION WORK AT THE SITE

BUILDING DEPARTMENT www.wabo.org/ INSERT NAME AND ADDRESS IN SHADED AREA	ELECTRICAL DEPARTMENT www.wa.gov/lni/electrical/ INSERT NAME AND ADDRESS IN SHADED AREA
To: Development and Permitting Services City Hall, 2nd Floor 333 S Meridian Puyallup, WA 98371 Tel: 253-864-4165	To: Labor & Industries 950 Broadway, Suite 200 Tacoma, WA 98402 Tel: 253-596-3800

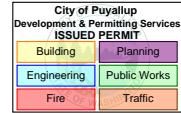
- Foundation review/inspection/approval.
- Interior and exterior mating line connections.
- Thermal envelope certificate, high pressure duct leakage test and project close out submittal (per C103.6).
- Connection of water line from utility to incoming water main.
- Supply and installation of water bottle fill station and water fountain. - inspection and approval

Roof drainage
Fire extinguisher
Number of required plumbing fixtures for overall project

Fire Sprinkler System review, inspection and approval if applicable
Fire Alarm System review, inspection and approval if applicable
Location of pull stations, alarms, and detectors per local AHJ review

- Feeders to one (1) 200A 120/240V panel with 3C#3/0 AWG CU 2 inch PVC
- Site portion of grounding electrode system.
- Fire Alarm System plan review, installation, inspection, approval as per WAC 51-50 0907, WAC 51-50 0907.10.2.
- Connection between main panel and sub-panel with 3C#3 AWG CU MC, Main panel = 200A -- Sub-panel = 100A
- Supply and installation of heat trace & plumbing protection.

Inspector's name (print/type)	Phone: (8 am to 5 pm)	Manufacturer's name (print/type) ATCO Structures & Logistics Ltd.
Office location	Date 2024-06-14	Manufacturer's signature



Factory Assembled Structures Program

Manufacturers Information on Special Inspection

As required by chapter 17 of the state building code, a “statement of special inspection” must be prepared by the design engineer/architect and submitted with the building plans for approval by the Licensed Professional plan reviewer. Special inspections must be performed by qualified special inspectors, hired by the manufacturer and approved by L&I during plan acceptance and prior to inspections taking place.

This building requires special inspections: Yes X No

*Consult the design engineer/architect of record for the building if you need help answering this question.

Name of special inspector: Samuel Randolph Inspection Type: Visual - suspended ceiling install

Name of special inspector: Samuel Randolph Inspection Type: Visual - 100% of column welds

Name of special inspector: _____ Inspection Type: _____

Name of special inspector: _____ Inspection Type: _____

Name of special inspector: _____ Inspection Type: _____

Name of special inspector: _____ Inspection Type: _____

Name of special inspector: _____ Inspection Type: _____

Name of special inspector: _____ Inspection Type: _____

* Include credentials for each special inspector in the file sent to LNI.

Manufacturers Information on Structural Observation

When required by chapter 17 of the state building code, structural observations must be provided by the design engineer/architect or their designee.

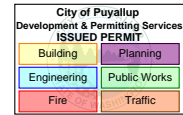
This building requires structural observation: Yes No X

*Consult the design engineer/architect of record for the building if you need help answering this question.

Name of person doing structural observations in the factory: _____

Name of person doing structural observations at the building site: _____

* Include credentials if these are not the design professionals sealing the drawings.



Statement of Special Inspections

Project: 1107994 - 28'x64' Admin Building

Project Location: Puyallup, WA

Owner: Cascade Christian School

This *Statement of Special Inspections* is submitted in fulfillment of the requirement of International Building Code, 2021 edition, Sections 1704 It includes a schedule of Special inspection services applicable to this project as well as the name of the Special Inspection Agency and the identity of other approved agencies to be retained for performing these inspections and tests. This Statement of special Inspections is for structural discipline.

The Special Inspection Agency shall keep records of all inspections and shall furnish inspection reports to the Building Official and the Registered Design Professional in Responsible Charge. Discovered discrepancies shall be brought to the immediate attention of the contractor for correction. If such discrepancies are not corrected, the discrepancies shall be brought to the attention of the Building Official and the Registered Design Professional in Responsible Charge. The Special Inspection program does not relieve the Contractor of his or her responsibility.

Job site safety and construction means and methods are solely the responsibility of the contractor.

Interim reports shall be submitted to the WA L&I FBS program and the Registered Design Professional in Responsible charge.

A Final report of Special Inspections documenting completion of all required Special Inspections, testing and correction of any discrepancies noted in the inspections shall be submitted prior to request for final inspection and placement of insignia.

The Owner recognizes his or her obligation to ensure that the construction complies with the approved permit documents and to implement this program of special inspections. In partial fulfillment of these obligations, the Owner shall employ one or more approved agencies to perform Special Inspections as required by International Building Code, 2021 edition.

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21FB02400126

Prepared by:

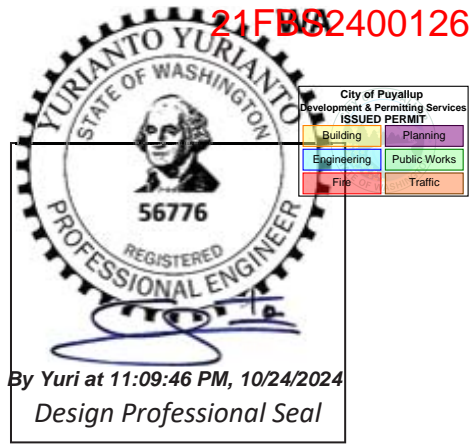
Yurianto Yurianto, PE

Professional Engineer



Signature

Date



Owner's Authorization:

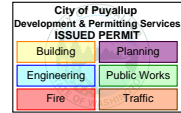
Building Official's Acceptance:

Signature

Date

Signature

Date

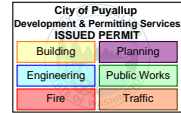


Identification of the building systems and special inspection agencies

The following materials, systems, components are identified for this project.

- Structural Steel – Columns Welds.
- Non-Structural Steel – Suspended Ceiling.

Agencies	Firm	Contact
Special Inspector / Testing Agency 1	Terracon Construction Materials Engineering & Testing	Samuel Randolph T: (864) 401 9389
Special Inspector / Testing Agency 2		
Special Inspector / Testing Agency 3		
Special Inspector / Testing Agency 4		
Special Inspector / Testing Agency 5		



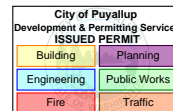
Qualifications of Special Inspectors and Testing Technicians

The qualifications of all personnel performing Special Inspection and testing activities are subject to the approval of the Building Official. The credentials of all Inspectors and testing technicians shall be provided if requested.

Minimum Qualifications of Inspection Agents:

Category	Special Inspector Minimum Qualifications
Welding	<ul style="list-style-type: none"> • Current AWS Certified Welding Inspector • Current ICC Structural Steel and Welding Certificate plus one year of relevant experience • Current Level II cert. from American Society for Non-Destructive Testing (NDT) • Current NDT Level III provided previously certified as NDT Level II
High-Strength Bolting & Steel Frame Inspection Not applicable to project	<ul style="list-style-type: none"> • Current ICC Structural Steel and Welding certification and one year of relevant experience • Intern Engineer with relevant experience • RDP with relevant experience

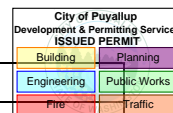
Yurianto Yurianto
 10/24/2024



Required Special Inspections and Testing

STEEL CONSTRUCTION				
Type	Continuous	Periodic	Reference Standard	Code
Minimum inspections prior to welding.	X		AISC 360 Table N5.4-1	1705.2.1
Minimum inspections during welding.	X		AISC 360 Table N5.4-2	
Minimum inspections after welding.		X	AISC 360 Table N5.4-3	
UT shall be performed on CJP groove welds subject to transversely applied tension loading in butt, T-, and Corner joints.			AISC 360 N5.5b	
a. For Risk Category III or IV structures		X 100%		
b. For Risk Category II structures		X 10%		
Minimum inspections prior to high strength bolting (except for snug-tight joints).	X		AISC 360 Table N5.6-1	
Minimum inspections during high strength bolting (except for snug-tight joints). For pretension/slip-critical joints:				
a. Turn of nut with match marking, direct tension indicator method, twist-off type tension control bolt method.		X	AISC 360 Table N5.6-2	
b. Calibrated wrench method, turn-of-nut method without matchmaking.	X			
Minimum inspections after high strength bolting.		X	AISC 360 Table N5.6-3	
Inspect fabricated or erected steel as appropriate to verify compliance with the construction drawings. Inspect braces, stiffeners, member locations, and joint details.		X	AISC 360 N5.7	
Inspect during placement of anchor rods and other embedment supporting structural steel for compliance with the construction drawings.	X		AISC 360 N5.7	
Inspect welding of steel headed stud anchors.	X		AISC 360 N6 AWS D1.1/D1.1M	
Verification for metal deck:				
a. Welding consumables, welding procedure specs, welder's qualifications prior to work, observation of work in progress, and visual inspection of all welds.	X			
b. Fasteners to be used prior to work, observation of work in progress to confirm conformance to manufacturer's recommendations, and visual inspection of completed installation.	X		AISC 360 N6	

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 10/24/2024



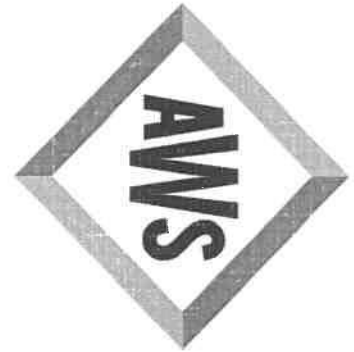
OPEN-WEB STEEL JOISTS AND /OR JOIST GIRDERS				
Type	Continuous	Periodic	Reference Standard	Code
Installation of open-web steel joists and joist girders				Table 1705.2.3
End connections – welding or bolted	-	X	SJI CJ, SJI K SJI LH/DLH OR SJI JG	
Bridging – horizontal or diagonal a. Standard bridging b. Bridging that differs from the SJI specifications	-	X	SJI CJ, SJI K SJI LH/DLH OR SJI JG	

NONSTRUCTURAL COMPONENTS				
Type	Continuous	Periodic	Reference Standard	Code
Acoustical tile or lay-in panel ceilings		X	ASCE 7-22 13.5.3.2.2	1705.13.2

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 10/24/2024

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City of Puyallup Development & Permitting Services ISSUED PERMIT	
Building	Planning
Engineering	Public Works
Fire	Traffic



American Welding Society®

*Certifies that Welding Inspector
Samuel K Randolph*

*has complied with the requirements of AWS QC1,
Standard for AWS Certification of Welding Inspectors*

15020321

CERTIFICATE NUMBER

Feb/01/2027

EXPIRATION DATE



AWS PRESIDENT

AWS QUALIFICATION & CERTIFICATION
COMMITTEE CHAIR

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Washington Association of Building Officials
PO Box 7310, Olympia, WA 98507
360-628-8669 www.wabo.org

21FBS2400126

REGISTERED SPECIAL INSPECTOR

SAMUEL K RANDOLPH
20225 CEDAR VALLEY RD E 110
LYNNWOOD WA 98036



INSPECTOR ID:
SI 02459

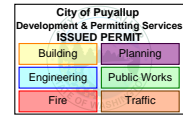
EXPIRES: **Oct 1, 2024**
Renew on or before expiration date

Valid only when certificate holder is employed by a WABO Registered Agency.

TYPES OF WORK REGISTERED

- RC REINFORCED CONCRETE
- SSB STRUCTURAL STEEL AND BOLTING
- SW STRUCTURAL WELDING
- FP SPRAY-APPLIED FIRE-RESISTIVE MATERIALS
- PA POST - INSTALLED ANCHORS

THIS CARD IS THE PROPERTY OF WABO



SEISMIC TECHNICAL GUIDE: BASIC SEISMIC CODE REQUIREMENTS

ASTM C636, E580
and ASCE7

Seismic Category A & B

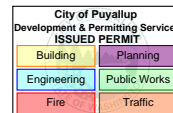
- Minimum basic installation requirements based on ASTM C636

Seismic Category C

- Systems average weight of 2.5 PSF or greater must use Heavy Duty main tees
 - Cat D lateral force bracing will be required
- Tee connections to maintain 60 lb. tension and compression
- The use of 9/16" wall mold will require 8" perimeter wires on all tees
- The use of 7/8 wall mold or greater, no perimeter wires are required
- All 4 sides must have 3/8" gap from tee end to wall (standard code)
- ICC ESR 1222 4.1.5.2 - Allows alternate installation for the ceiling to be fixed on 2 sides and floating on 2 sides. Use the ACM7 clip on the 2 floating sides. Allow for a 3/8" gap from the wall to tee end and insert a screw in the slot. Pop rivets, Mac2 clips, and ACM7 can be used on the fixed/tight sides of the ceiling
- Keep tee ends from spreading with spreader/stabilizer bars (standard code)
 - ICC ESR 1222 4.1.5.2 - Allows the use of ACM7 clips replace stabilizer bars
- Wire shall be attached to main tees 4' on center with 3 turns in 3 inches
- Wires shall be installed no more than 1:6 out of plumb

Seismic Category D, E, & F

- Gypsum Ceilings on one plane are exempt from the seismic requirements
- Ceilings less than 144 sf are exempt from seismic requirements
- Heavy Duty main tees are required (ref. ASTM C635)
- All main tees and cross tees must have 180 lb. connection capacity as tested per ASTM E3090
- Wall angle is for aesthetic purposes only and not considered structural
- Wall angle shall be 7/8" or great with the use of the ACM7 clip
- 2 adjacent walls shall have tee ends fixed tight to wall molding with the use of ACM7
 - 2 screws through clip into wall mold and 1 screw into grid through ACM7 clip fixed hole
- 2 adjacent walls shall be floating and have 3/4" gap from tee end to wall.
 - 2 screws through clip into wall mold and 1 screw into grid through ACM7 clip slot
- Tee ends tied together (i.e. perimeter stabilizer bars)
 - ACM7 replaces spreader/stabilizer bars
- 2" wall angle can be used with stabilizer bars and no ACM7 clip
- Perimeter wires required on all tee ends at 8" maximum from the wall
- Wire shall be attached to mains 4' on center to maintain deflection
- Wires shall be installed no more than 1:6 out of plumb
- Lateral Force Bracing (strut and 4 splay wires) shall be installed on ceilings over 1000 sf.
 - LFB is to be installed every 12 ft in in both directions starting 6 ft. from each wall
- Ceilings over 2500 sf. Need expansion joints or bulkhead installed to keep ceilings under 2500 sf.



USG Code Compliance Reports:

USG Ceiling Products have been manufactured and tested to meet the seismic requirements of - IBC, CBC, ASTM, ASCE, HCAi, and DSA.

Code Compliance Reports:
ICC ESR 1222 ACT
ICC ESR 4258 Drywall Suspension
USG OPM-0152-13 Wireless Corridor Solution

usg.com
cgcinc.com
usgdesignstudio.com
cgcdesignstudio.com

PRODUCT INFORMATION

See usgperformanceflooring.com for the most up-to-date product information.

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We shall not be liable for consequential, incidental or special damages, directly or indirectly sustained, nor for any loss caused by application of these goods not in accordance with current printed instructions or for other than the intended use. Our liability is expressly limited to the replacement of defective goods or a refund of the purchase price, at USG's option, and does not include costs of labor, floor-covering materials, or any other costs associated with material replacement. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from date it was or reasonably should have been discovered.

SAFETY FIRST!

Follow good safety/industrial hygiene practices during installation. Wear appropriate personal protective equipment. Read applicable SDSs and literature before specification and installation.

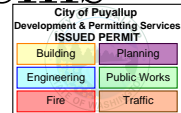
AC311584/rev 12-22

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Manufactured by
USG Interiors, LLC
550 West Adams Street
Chicago, IL 60661



Suspended Ceiling Seismic Assemblies

Seismic Compliance

Seismic compliance refers to the use of approved systems and designs that meet the seismic design requirements of a building project to provide life safety to occupants during and after an earthquake.

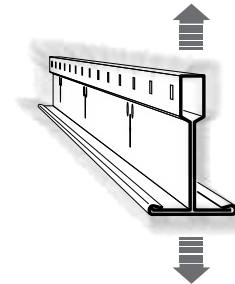
New Seismic Requirements

Seismic force levels and design criteria were once considered only in certain earthquake-prone locations. But major revisions to the International Building Code (IBC) now require seismic ceilings throughout the U.S. In addition to geographic location, the new code considers soil type and building function (e.g., hospital, school). Based on these criteria, more than half of the U.S. is now considered to have some level of seismic risk.

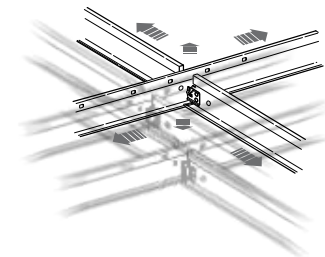
The design team, consulting engineers and code officials must work together to analyze these factors and determine the applicable seismic design category (A–F). This information is now required for every construction project and must be included in the construction documents.

Research and Design Features

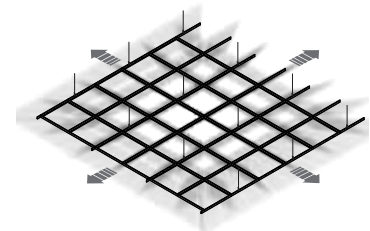
Donn grid is produced with the optimal combination of shape, size, steel gauge and connection details to produce systems with the greatest stiffness and movement resistance.



The advanced connection details used on Donn grid are nearly double the intersection strength requirement of 180 lbs. of tension and compression for seismic construction.



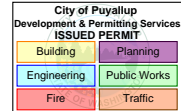
Extensive seismic testing proves the advanced connection details along with the systems' optimal combination of shape, size, and steel gauge.



Standard Seismic Applications

STATE OF WASHINGTON
DEPT. OF LABOR AND
INDUSTRIES
FAST TRACK REVIEW/SECTION
APPROVED
12/09/2024
SUBJECT TO CODE
AND FIELD INSPECTION

21FBS2400126



For lay-in acoustical panels and direct-hung acoustical tiles visit the USG Seismic Ceilings Resource Center at www.seismicceilings.com

		IBC Category C ¹	IBC Category D, E, F ²	UBC 25-2
Basic Connections, Perimeter, and Lateral Splay Bracing	Minimum intersection strength limits @ MT / CT ³	60 lbs	180 lbs	180 lbs
	Vertical hanger wire 12-gauge @ 4' o.c.	Required	Required	Required
	Connection device from vertical wire to the structure above must sustain min 100 lbs	Not required	Required	Required
	Main-tee classifications ⁴	Intermediate- or heavy-duty	Heavy-duty	Intermediate- or heavy-duty ⁴
	1 in 6 max plumb of vertical hanger wires	Required	Required	Required
	Perimeter vertical hanger wires not more than 8" from wall	Not required unless molding < 7/8"	Required	Required
	Grid end/wall clearance	Min 3/8"	Min 3/4"	Some clearance on two non-attached walls, if applicable
	Perimeter closure (molding) width	Min 7/8" (or use perimeter wires)	Min 2"	Min 7/8"
	Grid connection to perimeter attached on two adjacent walls	Not permitted	Required	Optional
	Perimeter tee ends tied together at perimeters	Required	Required	Required
	Horizontal restraint (splay wires or rigid bracing) within 2" of intersection and splayed 90° apart at 45° angles	Not required	Required ^{6,6}	Required ^{6,7}
	Compression posts (struts) 12' o.c. in both directions, starting 6' from walls	Not required	Required ^{6,6}	Required ^{6,7}
	Splay bracing connection strength 200 lbs or the design load, whichever is greater	Not required	Required	Required
	Partition attachment	Allowed only if ceiling is able to move laterally	Bracing independent of ceiling splay bracing	Allowed with bracing
	Seismic separation joint	Not required	Required for areas > 2,500 sq. ft. (or full height partition) ⁸	Not required
Rigid bracing for ceiling plane elevation changes	Not required	Required	Not required	
Light Fixture Attachment	Light fixture (all types) mechanically attached to grid per NEC 410-16 (two per fixture unless independently supported)	Required	Required ⁶	
	– Surface-mounted fixtures attached to grid	Not required	Not required	Required (including safety wires to vertical wire or structure) ⁸
	– Pendant-hung fixtures directly supported from structure with 9-gauge wire (or approved alternative)	Required	Required	Required
	– Rigid lay-in or can light fixtures			
	≤ 10 lbs, one wire to structure (may be slack)	Required	Required	Lower limit is 20 lbs.
	11 – 56 lbs, two wires from housing to structure (may be slack)	Required	Required	Required – lower limit is 20 lbs.
≥ 57 lbs, supported directly to structure by approved hangers	Required	Required	Required	
Service Applications	Air terminals			
	≤ 20 lbs, positively attached to grid	Required	Required	Required
	21 – 56 lbs, positively attached to grid and two 12-gauge wires to structure (may be slack)	Required	Required	Required
	≥ 57 lbs, directly supported to structure	Required	Required	Required
	Sprinkler heads and other penetration clearance	Min 3/8" on all sides	Min 2" dia. opening or a swing joint	Not required
Cable trays and electrical conduit independently supported and braced	Not required	Required	Not required	

Notes

The information presented is correct to the best of our knowledge at the date of issuance. Because codes continue to evolve, check with a local official prior to designing and installing a ceiling system. Other restrictions and exemptions may apply. This is only intended as a quick reference.

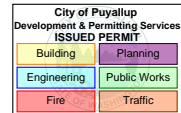
1. Refers to CISCA installation recommendations for zones 0-2 via ASCE 7. Max ceiling weight: 2.5 psf.
2. Refers to CISCA installation recommendations for zones 3-4 via ASCE 7.
3. All USG Dorn® brand ceiling suspension systems meet these requirements.
4. Per ASTM C635.
5. Required for ceilings larger than 1,000 square feet.

6. Where substantiating design calculations are not provided.
7. Seismic standards generally apply to ceilings larger than 144 square feet.
8. When intermediate-duty systems are used, No. 12-gauge hanger wires shall be attached to the suspension members within three inches of each corner of each fixture.
9. Please refer to AC3235 for more information.

Alternate Seismic Solutions

STATE OF WASHINGTON
DEPT. OF LABOR AND
INDUSTRIES
PLANNING REVIEW/SECTION
APPROVED
12/09/2024
SUBJECT TO CODE
AND FIELD INSPECTION

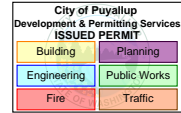
21FBS2400126



		IBC Category D, E, F (Alternate Method) ⁹	IBC Category C (Alternate Method) ⁹
Basic Connections, Perimeter, and Lateral Splay Bracing	Minimum intersection strength limits @ MT / CT ³	180 lbs	60 lbs
	Vertical hanger wire 12-gauge @ 4' o.c.	Required	Required
	Connection device from vertical wire to the structure above must sustain min 100 lbs	Required	Not required
	Main-tee classifications ⁴	Heavy Duty	Intermediate or Heavy Duty
	1 in 6 max plumb of vertical hanger wires	Required	Required
	Perimeter vertical hanger wires not more than 8" from wall	Required	Not required
	Grid end/wall clearance	3/4" min.	3/8" min.
	Perimeter closure (molding) width	Min. 7/8" with ACM7 Seismic Clip	Min. 7/8"
	Grid connection to perimeter attached on two adjacent walls	Required	N/A
	Perimeter tee ends tied together at perimeters	Required (ACM7 Seismic Clip satisfies this requirement)	Required (ACM7 Seismic Clip satisfies this requirement)
	Horizontal restraint (splay wires or rigid bracing) within 2" of intersection and splayed 90° apart at 45° angles	Required ^{5, 6}	Not required
	Compression posts (struts) 12' o.c. in both directions, starting 6' from walls	Required ^{5, 6}	Not required
	Splay bracing connection strength 200 lbs or the design load, whichever is greater	Required	Not required
	Partition attachment	Bracing independent of ceiling splay bracing	Allowed only if ceiling is able to move laterally
Seismic separation joint	Required for areas >2,500 sq. ft. (or full height partition) ⁶	Not required	
Rigid bracing for ceiling plane elevation changes	Required	Not required	
Light-Fixture Attachment	Light fixture (all types) mechanically attached to grid per NEC 410-16 (two per fixture unless independently supported)	Required	Required
	– Surface-mounted fixtures attached to grid	Not required	Not required
	– Pendant-hung fixtures directly supported from structure with 9-gauge wire (or approved alternative)	Required	Required
	– Rigid lay-in or can light fixtures		
	≤ 10 lbs, one wire to structure (may be slack)	Required	Required
	11 – 56 lbs, two wires from housing to structure (may be slack)	Required	Required
≥ 57 lbs, supported directly to structure by approved hangers	Required	Required	
Service Applications	Air terminals		
	≤ 20 lbs, positively attached to grid	Required	Required
	21 – 56 lbs, positively attached to grid and two 12-gauge wires to structure (may be slack)	Required	Required
	≥ 57 lbs, directly supported to structure	Required	Required
	Sprinkler heads and other penetration clearance	Min 2" dia. opening or a swing joint	Min 3/8" on all sides
Cable trays and electrical conduit independently supported and braced	Required	Not required	

1. Refers to CISC installation recommendations for zones 0-2 via ASCE 7. Max ceiling weight: 2.5 psf.
 2. Refers to CISC installation recommendations for zones 3-4 via ASCE 7.
 3. All USG Dom[®] brand ceiling suspension systems meet these requirements.
 4. Per ASTM C635.
 5. Required for ceilings larger than 1,000 square feet.

6. Where substantiating design calculations are not provided.
 7. Seismic standards generally apply to ceilings larger than 144 square feet.
 8. When intermediate-duty systems are used, No. 12-gauge hanger wires shall be attached to the suspension members within three inches of each corner of each fixture.
 9. Please refer to AC3235 for more information.



Seismic construction standards are established to prevent structural collapse during or after an earthquake that could cause panic, injury or death. More than half of the U.S. is now considered to be at some level of risk for seismic activity, based on three factors:

Factors that Determine Seismic Design Category	
Soil Conditions	<p>Certain soil types may be prone to liquefaction, when the stress and shaking of earthquake forces cause sediments to behave like liquids rather than a solid, reducing or eliminating structural support. The soil at a building site is analyzed and categorized into one of six types:</p> <p>A – Hard rock C – Very dense soil and soft rock E – Soft soil B – Rock D – Stiff soil (default) F – Special soils</p>
Building Usage	<p>The function of the structure also determines the level of precaution that is to be designed and built in. Building types fall into three groups:</p> <p>Seismic Use Group III: essential facilities such as hospitals, fire departments and police departments that must function both during and after an earthquake.</p> <p>Seismic Use Group II: buildings that constitute a substantial public interest, such as power plants and those that house more than 300 people.</p> <p>Seismic Use Group I: all other buildings.</p>
Geographic Location	<p>Thoughts of earthquakes and seismic activity may typically bring to mind California and the West Coast. However, this is not the only region considered to face seismic risks. In fact, more than 3,500 earthquakes have been recorded east of the Mississippi River since 1700. Today's building codes are recognizing that seismic activity may be a risk almost anywhere in the country.</p>

By analyzing these three criteria for a construction project, you can determine the seismic design category (A-F). This is typically done by the project's structural engineer. The design team performs the analysis required to assign the seismic design category for a construction project and must include that information in the construction methods documents. This tells the construction team the required level of performance for the building.

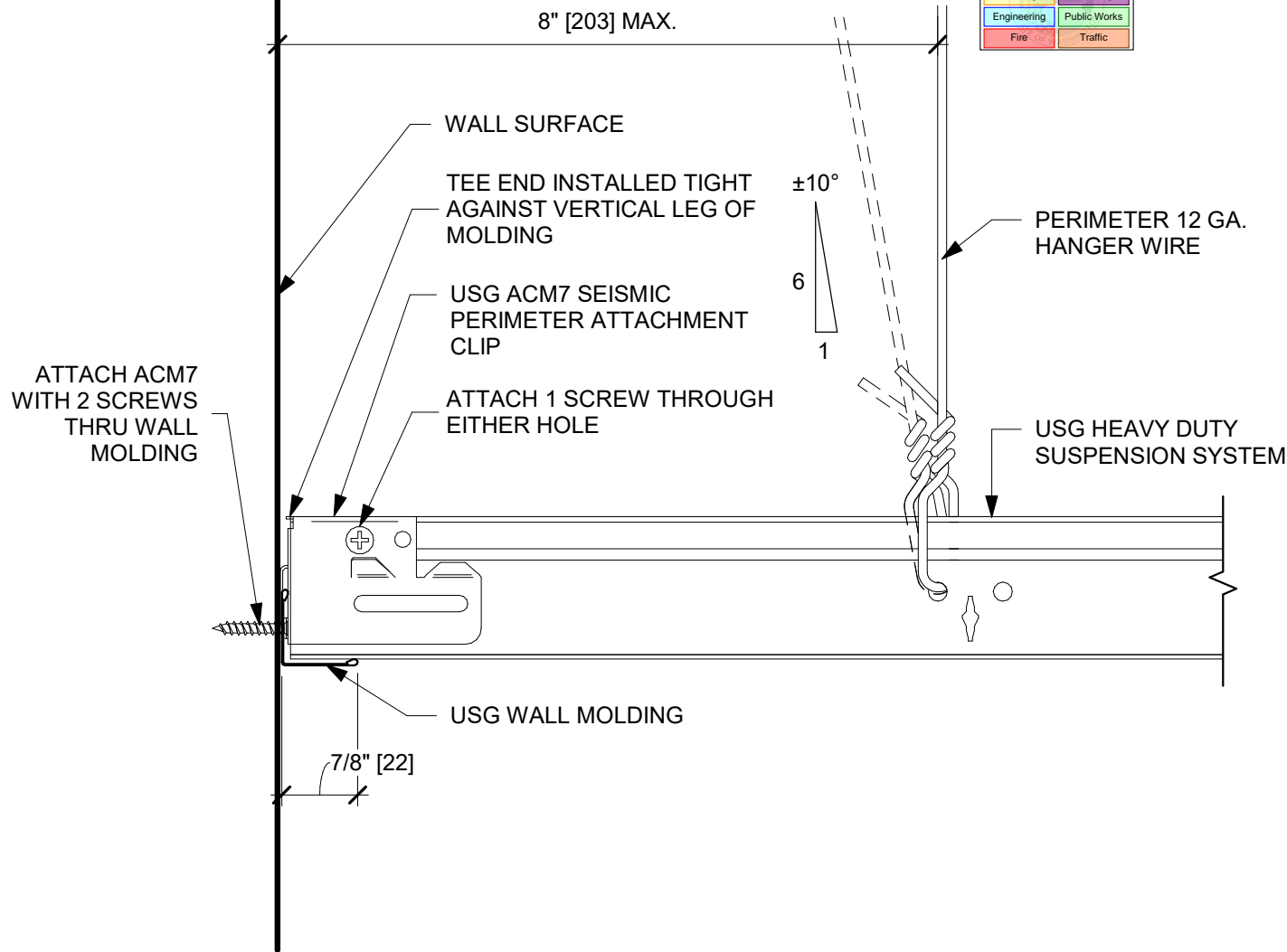
Refer to local building codes to determine in which section of the specification the seismic design category must appear (usually in the general-contractor section of the specification and on the first page of structural drawings).

Learn more at www.seismicceilings.com

To find out more about new requirements for seismic ceilings, visit the USG Seismic Ceilings Resource Center at seismicceilings.com. This informative online resource features in-depth articles about the code change, FAQs, and interviews with ceilings experts. It also includes a comprehensive library of architectural details downloadable in PDF and CAD formats.

Physical Data/ Footnotes	<p>Material Hot-dipped galvanized steel.</p> <p>Recycled Content 25%. For details, see the Sustainability selector.</p> <p>Installation Must be installed in compliance with ASTM C636, CISCA, and standard industry practices.</p> <p>Limitations The performance of Down ACM7 seismic clip and systems is based on the specific combination of superior components, and design and installation methods shown. Components from other manufacturers were not evaluated, and their use or any mixed use is not recommended.</p>	<p>ICC Evaluation Service, Inc., Report Compliance Suspension systems manufactured by USG Interiors, LLC, have been reviewed and are approved by listing in ICC-ES Evaluation Report 1222. Evaluation Reports are subject to reexamination, revision and possible cancellation. Please refer to usgdesignstudio.com or 800 USG.4YOU for current reports.</p> <p>L.A. Research Report Compliance Down brand suspension systems manufactured by USG Interiors, LLC, have been reviewed and are approved by listing in the following L.A. Research Report number: 25764.</p>	<p>AC156 Disclaimer The current ICC-ES acceptance criterion (AC) used for the testing and evaluation of seismic clips is AC156, Acceptance Criteria for Seismic Qualification by Shake-Table Testing of Nonstructural Components and Systems. AC156 was not specifically designed to provide testing guidelines or pass/fail criteria for acoustical suspension systems in a seismic event. However, in the absence of a specific AC for this purpose, ICC-ES allowed AC156 to act as the basis for all seismic testing and evaluation for the acoustical ceiling suspended ceilings industry.</p> <p>Code Compliance Testing and evaluation performed at the University at Buffalo (SUNY), the Department of Civil, Structural and</p>	<p>Environmental Engineering—Structural Engineering and Earthquake Simulation Laboratory (SEESL) qualify the performance of these systems according to the AC156—Seismic Qualification Specification, and AC368—Acceptance Criteria for Suspended Ceiling Framing Systems. Several alternative materials, designs and methods of construction were evaluated and tested. Results of this investigation indicates that these tested alternative designs are at least the equivalent of that prescribed in the code for quality, strength, effectiveness, fire resistance, durability and safety. These alternative designs are at least equivalent to the criteria set forth in AC156 and AC368, and otherwise demonstrate compliance with the performance features of</p>	<p>the codes. The data and test results presented provide technical evidence on which a code official can base approval.</p> <p>Note The University of Buffalo and the University of California do not endorse specific products.</p> <p>Construction Details Please see AC3235 for construction details.</p> <p>Safety First! Follow good safety/industrial hygiene practices during installation. Wear appropriate personal protective equipment. Read MSDS and literature before specification and installation.</p>
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City of Puyallup Development & Permitting Services ISSUED PERMIT	
Building	Planning
Engineering	Public Works
Fire	Traffic



USG Corporation
 550 West Adams Street, Chicago, IL 60661
 T. 800-USG4YOU www.USG.com

**USG DONN SUSPENSION SYSTEM
 SEISMIC DETAILS
 CATEGORY D,E,F**

ISSUE RECORD:
 12/14/21

ISSUE: DATE:

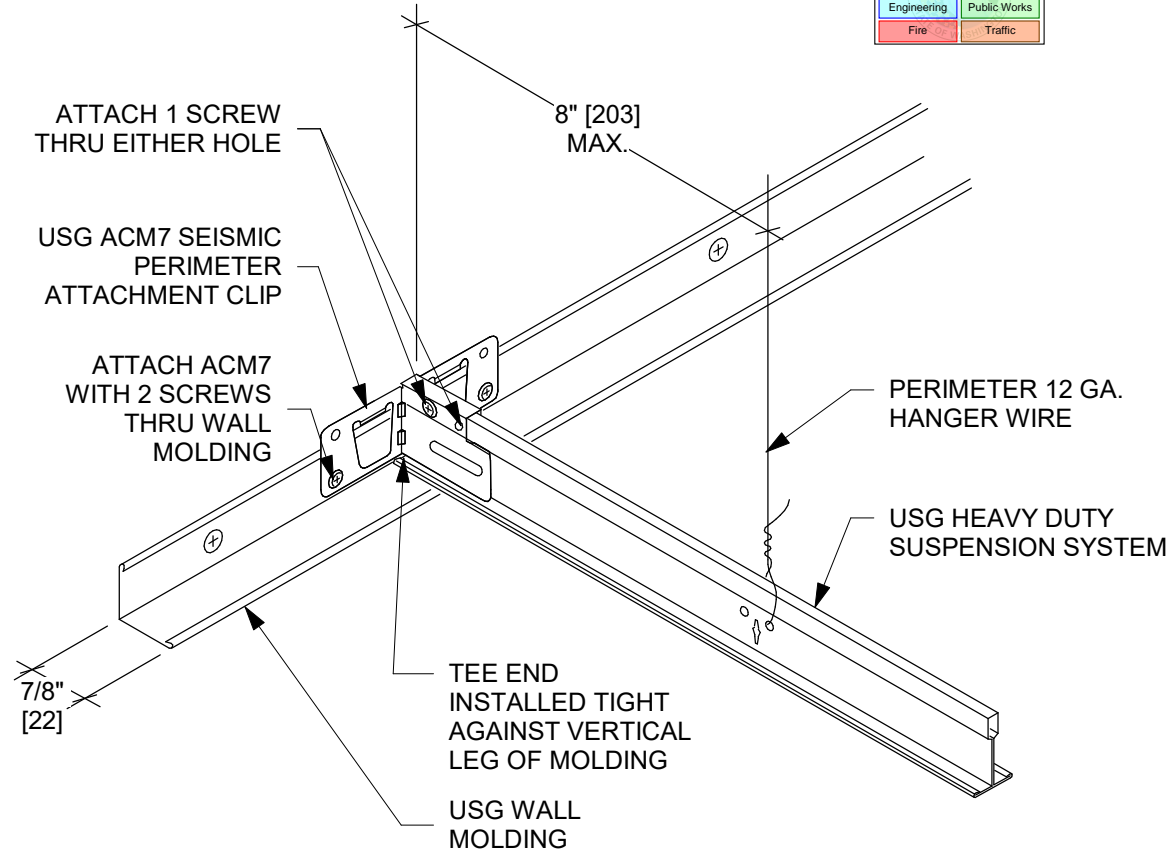
SHEET INFORMATION:
 SCALE: 6" = 1'-0"

USG-SC-99196

PERIMETER DETAIL - 7/8" WALL MOLDING - FIXED SIDE
 - ELEVATION VIEW

Exp. 12/09/2025

City of Puyallup Development & Permitting Services ISSUED PERMIT	
Building	Planning
Engineering	Public Works
Fire	Traffic



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**USG DONN SUSPENSION SYSTEM
 SEISMIC DETAILS
 CATEGORY D,E,F**

ISSUE RECORD:
 12/15/21

ISSUE: DATE:

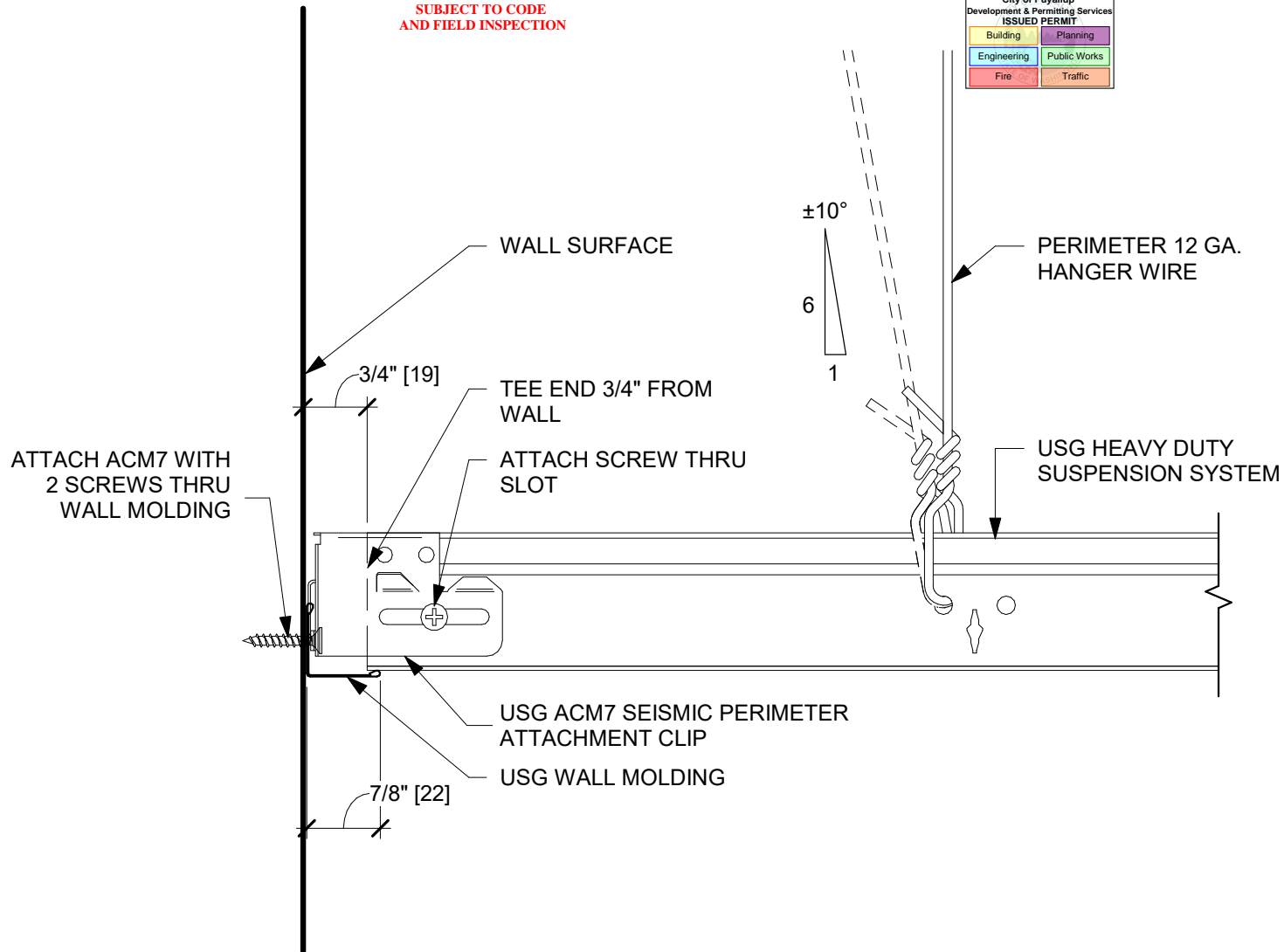
SHEET INFORMATION:
 SCALE: 3" = 1'-0"

USG-SC-99197

PERIMETER DETAIL - 7/8" WALL MOLDING - FIXED SIDE
 - ISOMETRIC VIEW

Exp. 12/09/2025

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**USG DONN SUSPENSION SYSTEM
 SEISMIC DETAILS**
 CATEGORY D,E,F

ISSUE RECORD:
 12/13/21

ISSUE: DATE:

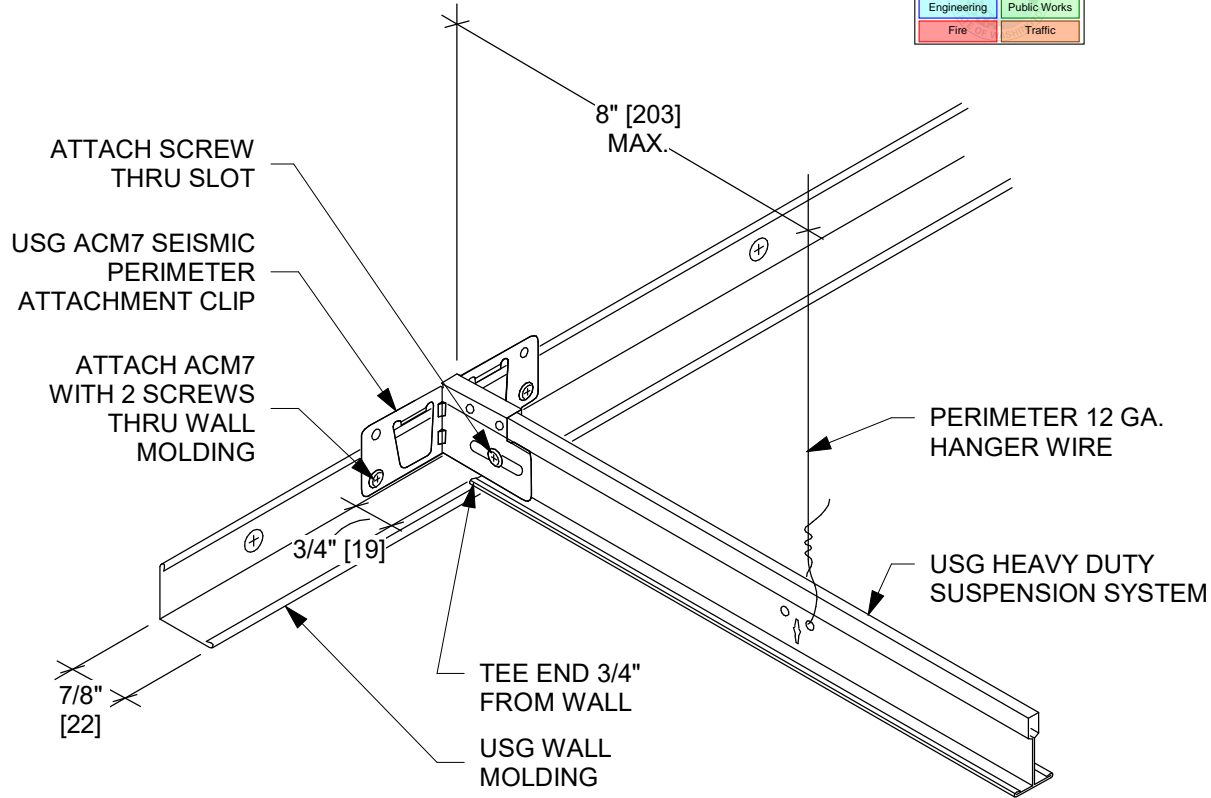
SHEET INFORMATION:
 SCALE: 6" = 1'-0"

USG-SC-99198

PERIMETER DETAIL - 7/8" WALL MOLDING - FLOATING
 SIDE - ELEVATION VIEW

Exp. 12/09/2025

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Engineering	Public Works
Fire	Traffic



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**USG DONN SUSPENSION SYSTEM
 SEISMIC DETAILS
 CATEGORY D,E,F**

ISSUE RECORD:
 12/15/21

ISSUE: DATE:

SHEET INFORMATION:
 SCALE: 3" = 1'-0"

USG-SC-99199

PERIMETER DETAIL - 7/8" WALL MOLDING - FLOATING
 SIDE - ISOMETRIC VIEW

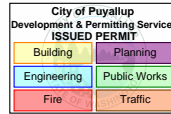
Exp. 12/09/2025

PLOT DATE: 2024-07-24 12:20:52 PM

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ATCO

STATE OF WASHINGTON
DEPT. OF LABOR AND
INDUSTRIES
FAS PLAN REVIEW/SECTION
APPROVED
12/09/2024
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AND FIELD INSPECTION



21FBS2400126

CASCADE CHRISTIAN SCHOOL ADMIN OFFICE

28x64 ASL USA SR FLEET

815 21st STREET SE, PUYALLUP, WA, 98372



STATE OF WASHINGTON
DEPT. OF LABOR AND INDUSTRIES
FACTORY ASSEMBLED STRUCTURES
ELECTRICAL PLAN REVIEW

PLAN APPROVAL #21FBS2400126

SUBJECT TO CODE AND FIELD INSPECTION

BY: JASON SUMMERS DATE: 11/04/2024
EXPIRATION DATE: See main plans examiner stamp

STATE OF WASHINGTON
DEPT. OF LABOR AND INDUSTRIES
SPECIALTY COMPLIANCE SERVICES DIVISION
FACTORY ASSEMBLED STRUCTURES
PLAN APPROVAL #21FBS2400126

SUBJECT TO FIELD INSPECTION.
OVERSIGHTS, OR VIOLATION OF RCW/WAC'S
OR WA STATE CODES ARE NOT APPROVED

Debra Anderson DATE: 12/09/2024
EXPIRATION DATE: 12/09/2025.

E occupancy based on final installation on site.

WAC 296-150F-0320 (8) All electrical plans for educational facilities must be prepared by, or under the direction of, a consulting engineer registered under chapter 18.43 RCW in compliance with chapters 246-320 and 388-97 WAC as applicable and stamped with the engineer's mark and signature.

FACTORY ADDRESS: 115 PEACEKEEPERS DR SW, CALGARY, ALBERTA, T3E 7X4

FACTORY CONTACT: OWAIS KHAN E. owais.khan@atco.com T. 403.801.2796

DESIGN PROFESSIONAL : YURI YURIANTO E. yurianto@modularconsultant.com

WAC 296.46B 010(4), WAC 296-150F 0500
Electrical wiring and equipment must be sufficiently accessible, at the time of inspection, to allow the inspector to visually inspect the installation. Cover inspection required for electrical and other systems, including insulation, enclosed in walls. Ceiling, floor.

WAC 296-150F 0500
(a) A "cover" inspection during construction of the unit before the electrical, plumbing, mechanical, and structural systems are covered is required.
Do not cover any portion of the structure until the FAS inspector has inspected the area and provided permission to cover. --- FAS inspector does not spot check

OVERALL LIST - SERIAL NUMBERS

UNIT	SERIAL NUMBER	COMMENT
1 OF 2	4642414582	
2 OF 2	4642414583	



By Yuri at 7:30:44 PM, 7/24/2024

ATCO PROJECT #: 1107994

DRAWING LIST - BUILDING PERMIT

21FBS2400126

SHEET NUMBER	SHEET NAME
GM000	COVER SHEET & SERIAL NUMBERS
AM001	ARCHITECTURAL DRAWING LIST & GENERAL INFORMATION
AM002	ARCHITECTURAL GENERAL INFORMATION
AM010	ASSEMBLY SCHEDULES
AM020	OVERALL DOOR & WINDOW SCHEDULE
AM051	OVERALL FIRE SAFETY PLAN
AM101	OVERALL FLOOR PLAN
AM200	OVERALL BUILDING ELEVATION
AM201	OVERALL BUILDING ELEVATION
AM210	OVERALL BUILDING SECTIONS
AM211	OVERALL BUILDING SECTIONS
AM301	EXTERIOR FINISH DETAILS - CLADDING
AM302	EXTERIOR FINISH DETAILS - CLADDING
AM303	EXTERIOR FINISH DETAILS - CLADDING
AM310	EXTERIOR FINISH DETAILS - CLADDING
AM400	INTERIOR FINISH DETAILS - WASHROOM
AM401	INTERIOR FINISH DETAILS - OPEN WORK SPACE
AM402	INTERIOR FINISH DETAILS - WASHROOM PARTITIONS
EM001	ELECTRICAL DRAWING LIST, LEGEND & SINGLE LINE DIAGRAM
EM002	GENERAL NOTES & LIGHTING BUDGET CALCULATIONS
EM101	OVERALL POWER & DATA PLAN - LEVEL 1
EM201	OVERALL LIGHTING PLAN - LEVEL 1
EM301	OVERALL FIRE ALARM PLAN - LEVEL 1
EM302	FIRE RISER DIAGRAM
EM500	ELECTRICAL DETAILS
EM501	ELECTRICAL DETAILS
EM600	PANEL SCHEDULES
EM603	LPD CALCULATIONS
EM604	LOAD CALCULATIONS
MM001	MECHANICAL DRAWING LIST & GENERAL INFORMATION
MM002	MECHANICAL SCHEDULES
MM003	MECHANICAL SCHEDULES 2
MM101	OVERALL HVAC PLAN - LEVEL 1
MM301	OVERALL PLUMBING PLAN - LEVEL 1
MM310	PLUMBING DETAILS
SC100	FOUNDATION PLAN
SC200	FOUNDATION DETAILS
SM001	STRUCTURAL DRAWING LIST & GENERAL INFORMATION
SM101	OVERALL STRUCTURAL PLAN - LEVEL 1
SM121-101	STRUCTURAL FLOOR FRAMING PLAN - UNIT 101
SM121-102	STRUCTURAL FLOOR FRAMING PLAN - UNIT 102
SM141	OVERALL SEISMIC CEILING PLAN
SM151-101	STRUCTURAL ROOF FRAMING PLAN - UNIT 101
SM151-102	STRUCTURAL ROOF FRAMING PLAN - UNIT 102
SM300	EXTERIOR STRUCTURAL DETAILS
SM301	EXTERIOR STRUCTURAL DETAILS
SM302	EXTERIOR STRUCTURAL DETAILS
SM303	EXTERIOR STRUCTURAL DETAILS
SM304	EXTERIOR STRUCTURAL DETAILS
SM500	STEEL FABRICATION DETAILS
SM501	STEEL FABRICATION DETAILS

BUILDING DESIGN PARAMETERS/ STATE PLATE INFORMATION:

- USE / OCCUPANCY: E (EDUCATIONAL) - B
- CONSTRUCTION TYPE: V-B (UNSPRINKLERED)
- SPRINKLER SYSTEM: NO
- FIRE ALARM SYSTEM: NO
- BUILDING AREA: 1780 SQFT
- BUILDING HEIGHT: <15 FEET
- NUMBER OF STOREYS: 1
- NUMBER OF MODULES: 2 (REFER TO SERIAL # - LEGEND)
- OCCUPANT LOAD: 17 PERSONS
- CLIMATE ZONE: 4C
- EXTERIOR WALL FIRE RATING: NOT RATED - B
- THIS BUILDING MUST BE INSTALLED WITH THE FIRE SEPARATION DISTANCES AS REQUIRED BY IBC TABLE 602, AND SECTION 704.3
- ENERGY CODE COMPLIANCE: WSEC 2021
- MANUFACTURER'S DATA PLATE AND STATE LABELS ARE TO BE LOCATED ABOVE THE ELECTRICAL PANEL.

GENERAL NOTES:

ACCESS TO BUILDING FOR PERSONS IN WHEELCHAIRS IS DESIGNED BY AND FIELD BUILT BY OTHERS AND SUBJECT TO LOCAL JURISDICTION. AT LEAST 60% OF PUBLIC ENTRANCES (INCLUDING PRIMARY ENTRANCE) AND ALL REQUIRED EXITS MUST BE ACCESSIBLE.

ALL DOORS SHALL BE OPENABLE FROM THE EGRESS SIDE WITHOUT THE USE OF A KEY, TOOL, SPECIAL KNOWLEDGE OR EFFORT. MANUALLY OPERATED FLUSH BOLTS OR SURFACE BOLTS SHALL NOT BE USED.

ALL GLAZING WITHIN A 24 INCH ARC OF DOORS, WHOSE BOTTOM EDGE IS LESS THAN 60 INCHES ABOVE THE FLOOR, AND ALL GLAZING IN DOORS SHALL BE SAFETY, TEMPERED OR ACRYLIC PLASTIC SHEET.

ALL STEEL STRAPS REFERENCED ON FLOOR PLAN SHALL BE 1.5 INCH x 26 GA. w/(8) 15 GA. x 7/16 INCH CROWN x 1 1/2 INCH STAPLES WITH A MINIMUM OF 1" PENETRATION EACH END OF STRAP OR EQUVALENT FROM RIDGE BEAM TO COLUMN, AND COLUMN TO FLOOR.

MINIMUM CORRIDOR WIDTH IS 44 INCHES (IF APPLICABLE).

PORTABLE FIRE EXTINGUISHER PER N.F.P.A. - 101 INSTALLED BY OTHERS ON SITE, AND SUBJECT TO LOCAL JURISDICTION AND APPROVAL.

THIS BUILDING HAS NOT BEEN DESIGNED FOR COASTAL HAZARD AREAS, OCEAN HAZARD OR REGULATORY FLOOD PLAIN AREAS.

ALL INTERIOR WALL AND CEILING FINISHES SHALL BE CLASS 'B' OR BETTER IN CORRIDORS. ALL INTERIOR WALL AND CEILING FINISHES SHALL BE CLASS 'C' OR BETTER IN ROOMS AND ENCLOSED SPACES.

ALL INTERIOR ENCLOSED AREAS OF PLENUM WALL FINISHES SHALL BE CLASS 'A' OR BETTER. CARPET SHALL BE CLASS II OR BETTER.

STATE CODES:

- BUILDING: 2021 WASHINGTON STATE BUILDING CODE (2021 IBC, AMENDED)
- PLUMBING: 2021 WASHINGTON PLUMBING CODE (2021 UPC, AMENDED)
- MECHANICAL: 2021 WASHINGTON STATE MECHANICAL CODE (2021 IMC, AMENDED)
- ELECTRICAL: 2023 WASHINGTON ELECTRICAL CODE (2023 NFPA 70, AMENDED)
- ENERGY: 2021 WASHINGTON STATE COMMERCIAL ENERGY CODE (2021 IECC, AMENDED)
- ACCESSIBILITY: 2017 WASHINGTON ACCESSIBILITY CODE (ANSI A117.1, AMENDED)

FLOOD LOAD:

THIS BUILDING IS NOT DESIGNED TO BE SUBMERGED OR SUBJECTED TO WAVE ACTION WHEN LOCATED IN A FLOOD PRONE OR ZONE AREA. THE FINISH FLOOR ELEVATION MUST BE LOCATED ABOVE THE BUILDING SITE FLOOD PLANE LEVEL FOR THIS BUILDING TO BE LOCATED IN A FLOOD PRONE OR ZONE AREA SUBJECT TO LOCAL JURISDICTION.

ACCESSIBILITY NOTES:

THE INTERNATIONAL SYMBOL OF ACCESSIBILITY SIGN SHALL BE DISPLAYED AT ALL ACCESSIBLE RESTROOM FACILITIES AND AT ACCESSIBLE BUILDING ENTRANCES UNLESS ALL ENTRANCES ARE ACCESSIBLE. INACCESSIBLE ENTRANCES SHALL HAVE DIRECTIONAL SIGNS INDICATING THE ROUTE TO THE NEAREST ACCESSIBLE ENTRANCE.

WHERE STORAGE FACILITIES SUCH AS CABINETS, SHELVES, CLOSETS, AND DRAWERS ARE PROVIDED AT LEAST ONE OF EACH TYPE PROVIDED SHALL CONTAIN STORAGE SPACE COMPLYING WITH THE FOLLOWING: DOORS, ETC. TO SUCH SPACES SHALL BE ACCESSIBLE (ie. TOUCH LATCHES, U-SHAPED PULLS); SPACES SHALL BE WITHIN 15 INCHES MINIMUM AND 48 INCHES MAXIMUM OF THE FLOOR FOR FORWARD REACH OR 9 INCHES MINIMUM AND 54 INCHES MAXIMUM, OF THE FLOOR FOR SIDE REACH; CLOTHES RODS SHALL BE A MAXIMUM OF 54 INCHES ABOVE THE FLOOR (48 INCHES MAXIMUM WHEN DISTANCE FROM WHEELCHAIR TO ROD EXCEEDS 10 INCHES).

CONTROLS, DISPENSERS, RECEPTACLES AND OTHER OPERABLE EQUIPMENT SHALL BE NO HIGHER THAN 45 INCHES ABOVE THE FLOOR FOR FRONT APPROACH OR 54 INCHES ABOVE THE FLOOR FOR SIDE APPROACH. RECEPTACLES ON WALLS SHALL BE MOUNTED NO LESS THAN 15 INCHES ABOVE THE FLOOR. EXCEPTION: HEIGHT LIMITATIONS DO NOT APPLY WHERE THE USE OF SPECIAL EQUIPMENT DICTATES OTHERWISE OR WHERE ELECTRICAL RECEPTACLES ARE NOT NORMALLY INTENDED FOR USE BY BUILDING OCCUPANTS.

WHERE EMERGENCY WARNING SYSTEMS ARE PROVIDED, THEY SHALL INCLUDE BOTH AUDIBLE AND VISUAL ALARMS. THE VISUAL ALARMS SHALL BE LOCATED THROUGH-OUT, INCLUDING RESTROOMS, AND PLACED 80 INCHES ABOVE THE FLOOR OR 6 INCHES BELOW CEILING, WHICHEVER IS LOWER. *Not reviewed or approved by WA L&I*

DOORS TO ALL ACCESSIBLE SPACES SHALL HAVE ACCESSIBLE HARDWARE (ie. LEVER-OPERATED, PUSH-TYPE, U-SHAPED) MOUNTED NO HIGHER THAN 48 INCHES ABOVE THE FLOOR.

ALL DOORS SHALL BE OPENABLE BY A SINGLE EFFORT. THE MAXIMUM FORCE REQUIRED TO OPEN A DOOR SHALL NOT EXCEED 8.5 LBS. FOR EXTERIOR SWINGING DOORS AND 5 LBS. FOR ALL SLIDING, FOLDING, AND INTERIOR SWINGING DOORS.

FLOOR SURFACES SHALL BE STABLE, FIRM, AND SLIP-RESISTANT. CHANGES IN LEVEL BETWEEN 0.25 INCH AND 0.5 INCH SHALL BE BEVELED WITH A SLOPE NO GREATER THAN 1:2. CHANGES IN LEVEL GREATER THAN 0.5 INCH REQUIRE RAMPS. CARPET PILE THICKNESS SHALL BE 0.5 INCH MAX. GRATINGS IN FLOOR SHALL HAVE SPACES NO GREATER THAN 0.5 INCH WIDE IN ONE DIRECTION. DOORWAY THRESHOLDS SHALL NOT EXCEED 0.5 INCH IN HEIGHT.

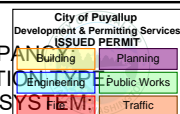
SEALED DRAWING :

WASHINGTON REGISTERED ARCHITECT OR ENGINEER

MODEL APPROVAL :

THIRD PARTY OR REGISTERED ARCHITECT OR ENGINEER - STATE OF WASHINGTON

- GENERAL NOTE:**
- DRINKING FOUNTAIN, BOTTLE FILLING STATION SHALL BE PROVIDED AND INSTALLED BY OTHERS ON SITE.
 - THIS BUILDING SHALL NOT BE LOCATED IN AREAS WITH SNOW, WIND, AND/OR SEISMIC LOADS IN EXCESS OF THOSE NOTED IN THE BUILDING DESIGN LOADS.
 - U-VALUES FOR ROOF, WALLS, FLOORS, DOORS AND WINDOWS MAY EXCEED THE MINIMUM REQUIRED U-VALUES NOTED IN THE ENERGY REPORT.



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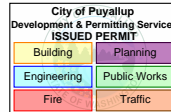
REV.	DATE	DESCRIPTION	BY	CHK/APR
B	2024-10-28	RE-ISSUED FOR STATE APPROVAL	NM	
A	2024-06-07	ISSUED FOR STATE APPROVAL	NM	

PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH	DRAWING TITLE:	ARCHITECTURAL DRAWING LIST & GENERAL INFORMATION		
CLIENT:	CASCADE CHRISTIAN SCHOOL	PROJECT NO:	1107994	DRAWING NO:	AM001
			Exp. 12/09/2025	REV. #	B

PLOT DATE: 2024-10-26 5:11:51 PM

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11x17 Titleblock



PLOT DATE: 2024-07-24 12:20:39 PM

R2024.1

11x17 Titleblock

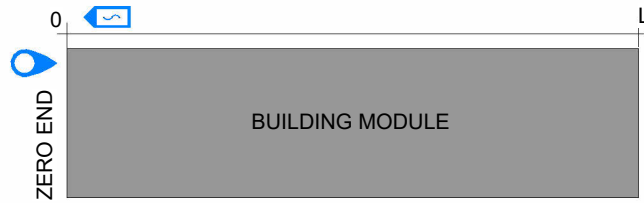
ZERO END:

ARROW INDICATES THE LOCATION OF THE ZERO END ON THE UNIT
ORDINATE DIMENSIONS WILL START AT THIS POINT

SHIPPING DIRECTION:

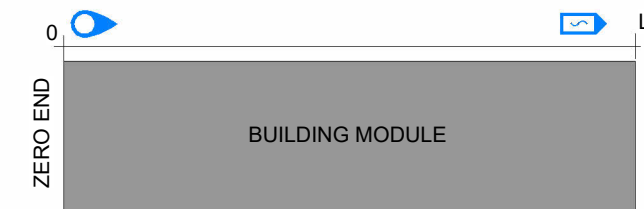
ARROW INDICATES THE DIRECTION OF TRAVEL

EXAMPLE 1:



OR,

EXAMPLE 2:



ARCHITECTURAL ABBREVIATIONS

ABBREVIATION	DEFINITION
ACC	ACCESSIBLE
ACFL	ACCESS FLOOR
AD	AREA DRAIN
ADJ	ADJACENT
AFF	ABOVE FINISHED FLOOR
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
B/O	BOTTOM OF
BFC	BELOW FINISHED CEILING
BLDG	BUILDING
BSC	BELOW STRUCTURAL CEILING
C/L	CENTRE LINE
C/W	COMPLETE WITH
CIP	CAST IN PLACE
CJ	CONTROL JOINT
CLR	CLEARANCE
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONT	CONTINUOUS
DEG	DEGREES
DIA	DIAMETER
DIM	DIMENSION
DL	DEAD LOAD
DP	DEPTH
DWG	DRAWING
EA	EACH
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATOR
F/O	FACE OF
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER
FIM	FREE ISSUE MATERIAL
FLR	FLOOR
FT	FOOT/ FEET
GA	GAUGE
GWB	GYPSUM WALL BOARD
GWG	GEORGIAN WIRE GLASS
GYP	GYPSUM
ID	INSIDE DIAMETER
INFO	INFORMATION
INSUL	INSULATION
L	LENGTH

ARCHITECTURAL ABBREVIATIONS

ABBREVIATION	DEFINITION
LL	LIVE LOAD
m	METER
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MEZZ	MEZZANINE
MIN	MINIMUM
MISC	MISCELLANEOUS
mm	MILLIMETER
N/A	NOT APPLICABLE
NIC	NOT IN CONTRACT
No.	NUMBER
NTS	NOT TO SCALE
O/C	ON CENTRE
O/H	OVERHEAD
OD	OUTSIDE DIAMETER
OPP	OPPOSITE
OWSJ	OPEN WEB STEEL JOIST
PLAM	PLASTIC LAMINATE
PSPI	PLANT SUPPLIED PLANT INSTALLED
PSSI	PLANT SUPPLIED SITE INSTALLED
PT	PRESSURE TREATED
R	RADIUS
R/W	REINFORCE WITH
REINF	REINFORCED
SF	SQUARE FEET
SIM	SIMILAR
SOG	SLAB ON GRADE
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
SSSI	SITE SUPPLIED SITE INSTALLED
STC	SOUND TRANSMISSION CLASS
STD	STANDARD
STRUCT	STRUCTURAL
SUSP	SUSPENDED
T/O	TOP OF
TBD	TO BE DETERMINED
TOC	TOP OF CURB
TOF	TOP OF FLOOR
TOS	TOP OF STEEL
TYP	TYPICAL
U/G	UNDER GROUND
U/S	UNDERSIDE
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
W/C	WATER CLOSET



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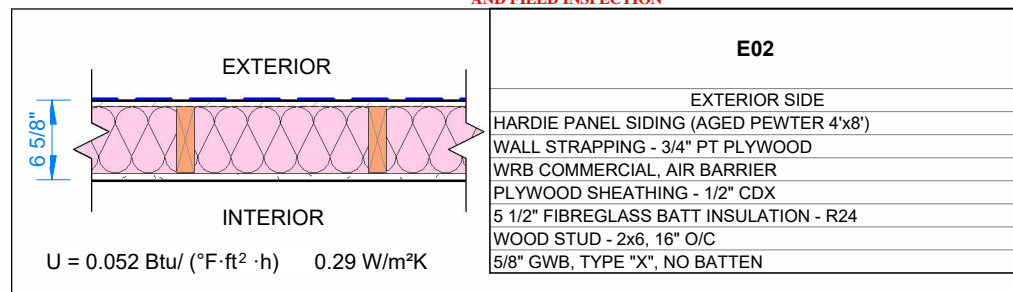
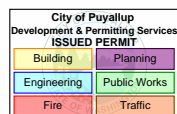
REV.	DATE	DESCRIPTION	BY	CHK/APR
A	2024-06-07	ISSUED FOR STATE APPROVAL	NM	

PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH
CLIENT:	CASCADE CHRISTIAN SCHOOL

DRAWING TITLE:	ARCHITECTURAL GENERAL INFORMATION		
PROJECT NO:	1107994	DRAWING NO:	AM002
REV. #	A	Exp. 12/09/2025	

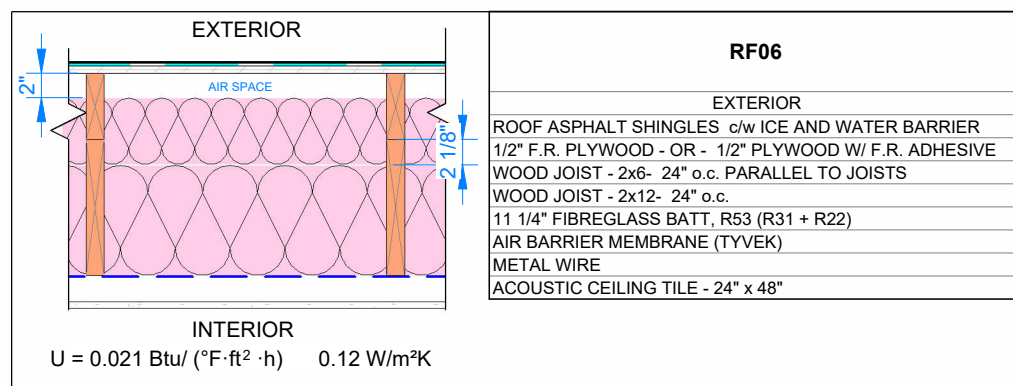
EXTERIOR WALLS

STATE OF WASHINGTON
DEPT. OF LABOR AND
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APPROVED
12/09/2024
SUBJECT TO CODE
AND FIELD INSPECTION

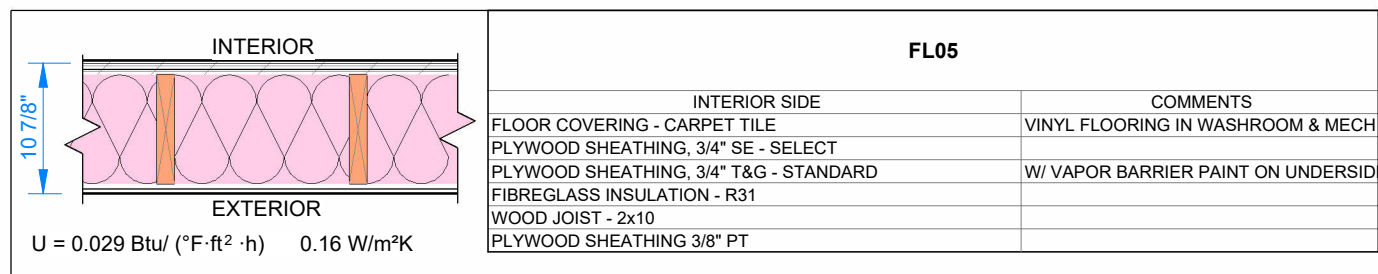


NOTE:
- 5/8" TYPE "X" VINYL COVERED GYPSUM (CLASS I F.S. , CLASS II VAPOR RETARDER)
- DOUBLE TOP PLATE (SPF #2)
- TRIPLE 2x6 (SPF #2) ROUGH OPENING HEADERS

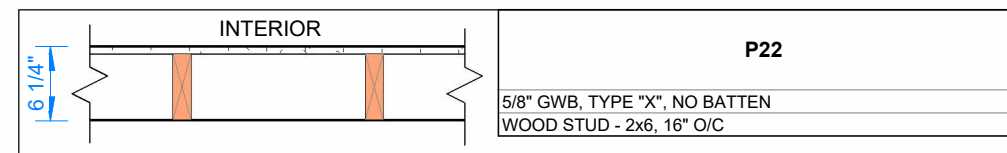
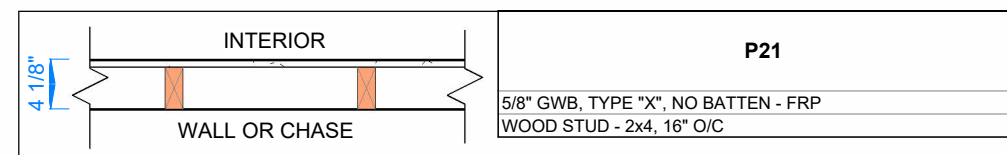
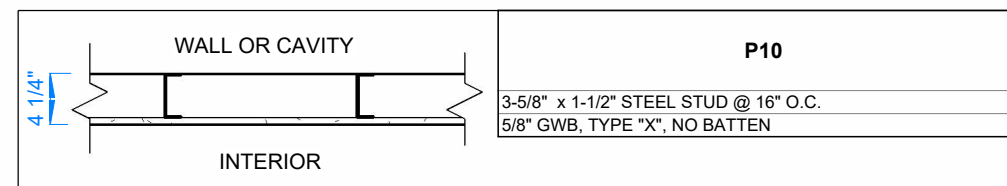
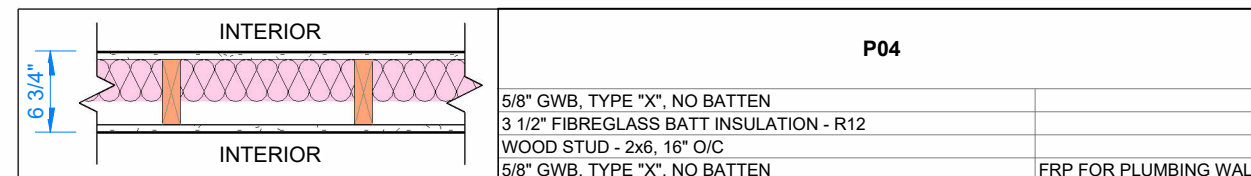
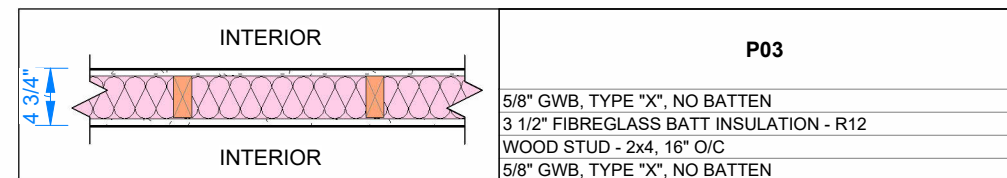
ROOFS



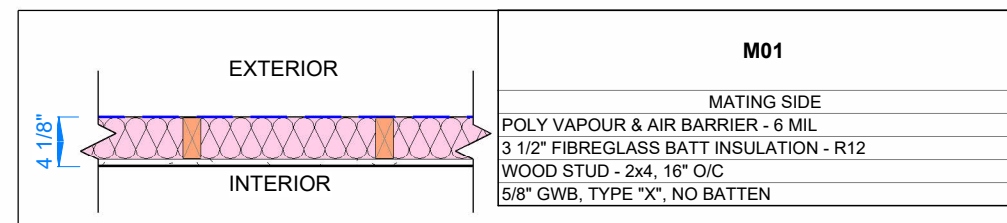
FLOORS



PARTITIONS



MATING WALL



PLOT DATE: 2024-07-24 12:20:41 PM

11x17 Titleblock R2024.1



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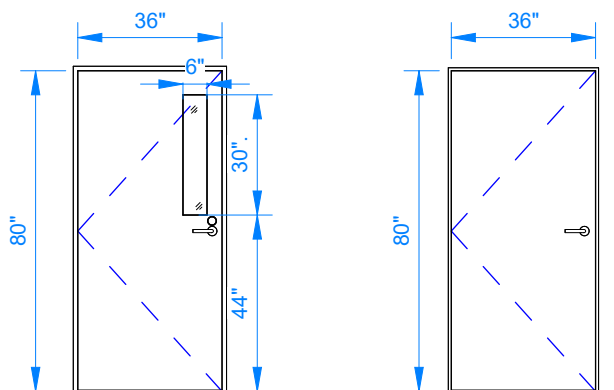
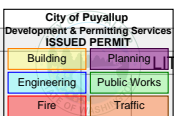
REV.	DATE	DESCRIPTION	BY	CHK/APR
A	2024-06-07	ISSUED FOR STATE APPROVAL	NM	

PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH
CLIENT:	CASCADE CHRISTIAN SCHOOL

DRAWING TITLE:	ASSEMBLY SCHEDULES		
PROJECT NO:	1107994	DRAWING NO:	AM010
REV. #	A	Exp. 12/09/2025	

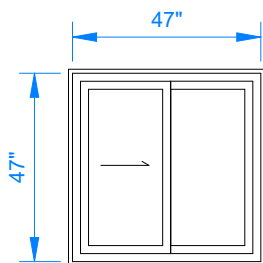
DOOR SCHEDULE.

TYPE MARK	QTY.	FUNCTION	DOOR SWING	PANEL TYPE	DIMENSIONS					DOOR PANEL PARAMETERS				FRAME PARAMETERS			KICKPLATE			HARDWARE										COMMENTS		
					SILL HEIGHT	WIDTH	HEIGHT	ROUGH WIDTH	ROUGH HEIGHT	EXTERIOR COLOUR	INTERIOR COLOUR	REQ.	WIDTH	HEIGHT	FRAME TYPE	THROAT SIZE	FRAME COLOUR	REQ.	WIDTH	HEIGHT	PANIC HARDWARE	KEYED ENTRY LEVER SET	DOREX L42 GRADE 2 PRIVACY LEVER	PASSAGE LEVER	ALUM NEOPRENE WEATHER STRIP	36" ALUM/TPE DOOR SWEEP C/W DRIP CAP	DOOR CLOSER	BALL BEARING HINGES, 4 1/2" X 4"	DS801TBA - 8" ALUMINUM 1/2" RISE THRESHOLD		STORE ROOM LOCKSET	D-PULL, ALUMINUM 9", CW 4X16" PUSH PLATE
D265C	2	Exterior	LHR	COMM. INSULATED STEEL	0' - 0"	3' - 0"	6' - 8"	3' - 2 1/4"	6' - 9"	ANCHORS AWEIGH	SOFTWARE SW7074	Yes	0' - 6"	2' - 6"	WELDED	0' - 6 5/8"	-EXT ANCHORS AWEIGH SW9179 / INT SOFTWARE SW7074	No	0' - 0"	0' - 0"	Yes	Yes	No	Yes	Yes	3	1			Yes	No	UVALUE=0.146 Btu/h*sqft°F
D550F	1	Interior	RH	SC WOOD	0' - 0"	3' - 0"	6' - 8"	3' - 1 1/2"	6' - 9 1/8"	SOFTWARE SW7074	SOFTWARE SW7074	No	0' - 0"	0' - 0"	18ga EXP REV STEEL FRAME	0' - 4 3/4"	SOFTWARE SW7074	Yes	2' - 10 1/2"	0' - 10"	No	Yes	No	Yes	3		No	No	No	Yes	BARRIER FREE SIGN	
D550N	2	Interior	RH	SC WOOD	0' - 0"	3' - 0"	6' - 8"	3' - 1 1/2"	6' - 9 1/8"	SOFTWARE SW7074	SOFTWARE SW7074	No	0' - 0"	0' - 0"	18ga EXP REV STEEL FRAME	0' - 4 3/4"	SOFTWARE SW7074	Yes	2' - 10 1/2"	0' - 10"	No	No	No	No	3		No	Yes	No	Yes	BARRIER FREE SIGN, SELF CLOSING HINGE	
D550P	1	Interior	RH	SC WOOD	0' - 0"	3' - 0"	6' - 8"	3' - 1 1/2"	6' - 9 1/8"	SOFTWARE SW7074	SOFTWARE SW7074	No	0' - 0"	0' - 0"	18ga EXP REV STEEL FRAME	0' - 4 3/4"	SOFTWARE SW7074	No	0' - 0"	0' - 0"	No			No	3		Yes	No	Yes			
D560G	2	Interior	LH	SC WOOD	0' - 0"	3' - 0"	6' - 8"	3' - 1 1/2"	6' - 9 1/8"	SOFTWARE SW7074	SOFTWARE SW7074	No	0' - 0"	0' - 0"	18ga EXP REV STEEL FRAME	0' - 4 1/8"	SOFTWARE SW7074	No	0' - 0"	0' - 0"		Yes		No	3			No	Yes			
D560G	1	Interior	RH	SC WOOD	0' - 0"	3' - 0"	6' - 8"	3' - 1 1/2"	6' - 9 1/8"	SOFTWARE SW7074	SOFTWARE SW7074	No	0' - 0"	0' - 0"	18ga EXP REV STEEL FRAME	0' - 4 1/8"	SOFTWARE SW7074	No	0' - 0"	0' - 0"		Yes		No	3			No	Yes			
D560G	1	Interior	RHR	SC WOOD	0' - 0"	3' - 0"	6' - 8"	3' - 1 1/2"	6' - 9 1/8"	SOFTWARE SW7074	SOFTWARE SW7074	No	0' - 0"	0' - 0"	18ga EXP REV STEEL FRAME	0' - 6 3/4"	SOFTWARE SW7074	No	0' - 0"	0' - 0"		Yes		No	3			No	Yes			



D265 C
HMI 36x80
6x30 LITE
EXP REV

D550 - D560
SC WOOD 36x80
EXP REV



WS280
PVC SLIDER
47X47

404.2.7.2 Door spring hinges shall be adjusted so that from an open position of 70 degrees, the door shall move to the closed position in 1.5 seconds minimum.

NOTE:
MINIMUM REQUIRED U-VALUES FOR DOORS AND WINDOWS MAY EXCEED IN THIS PACKAGE COMPARING TO WHAT HAS BEEN CALCULATED IN ENERGY REPORT.

604.9.3 Wheelchair accessible toilet compartment doors shall be self-closing. A door pull complying with Section 404.2.6 shall be placed on both sides of the door near the latch. Operational parts on door shall have a shape that is easy to grasp with one hand and does not require tight grasping, pinching or twisting of the wrist to operate and shall be 34 inches minimum and 48 inches maximum above the floor.

404.2.7 Door closing speed for door closers shall be adjusted so that from an open position of 90 degrees, the time required to move the door or gate to an open position of 12 degrees shall be 5 seconds minimum.

XX - #Y - ZZ DOOR TAG LEGEND:
DOOR STOP LOCATION
WS: WALL MOUNTED DOOR STOP
FS: FLOOR MOUNTED DOOR STOP
HP: HINGE PIN
CS: CHAIN STOP
THRESHOLD SIZE
X: X" FLAT ALUMINUM THRESHOLD
XT: X" THERMALLY BROKEN THRESHOLD
DOOR SWING
LH: LEFT HAND
RH: RIGHT HAND
RHR: RIGHT HAND REVERSE
LHR: LEFT HAND REVERSE

DOOR & WINDOW LEGEND

WINDOW SCHEDULE

WINDOW NO.	QTY	DIMENSIONS				TYPE	ROUGH OPENING		MATERIAL	FINISH COLOUR	JAMB THICKNESS	GLAZING		WINDOW COLOUR	NFRC	WINDOW SHGC	WINDOW U-VALUE, (Btu/h-ft2-F)	COMMENTS
		WIDTH	HEIGHT	HEAD HEIGHT	SILL HEIGHT		WIDTH	HEIGHT				DESCRIPTION	DP					
WS280	4	47"	47"	82"	35"	HORZ SLIDER	48"	48"	PVC	WHITE	6 5/8"	DUAL GLAZED, SOFTCOAT LOW E, ARGON	45	WHITE	0.20	0.3	0.239	BUG SCREEN



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A	2024-06-07	ISSUED FOR STATE APPROVAL	NM	

PROJECT:
28x64 ASL USA SR FLEET
OFFICE WASH

DRAWING TITLE:
OVERALL DOOR & WINDOW SCHEDULE

CLIENT:
CASCADE CHRISTIAN SCHOOL

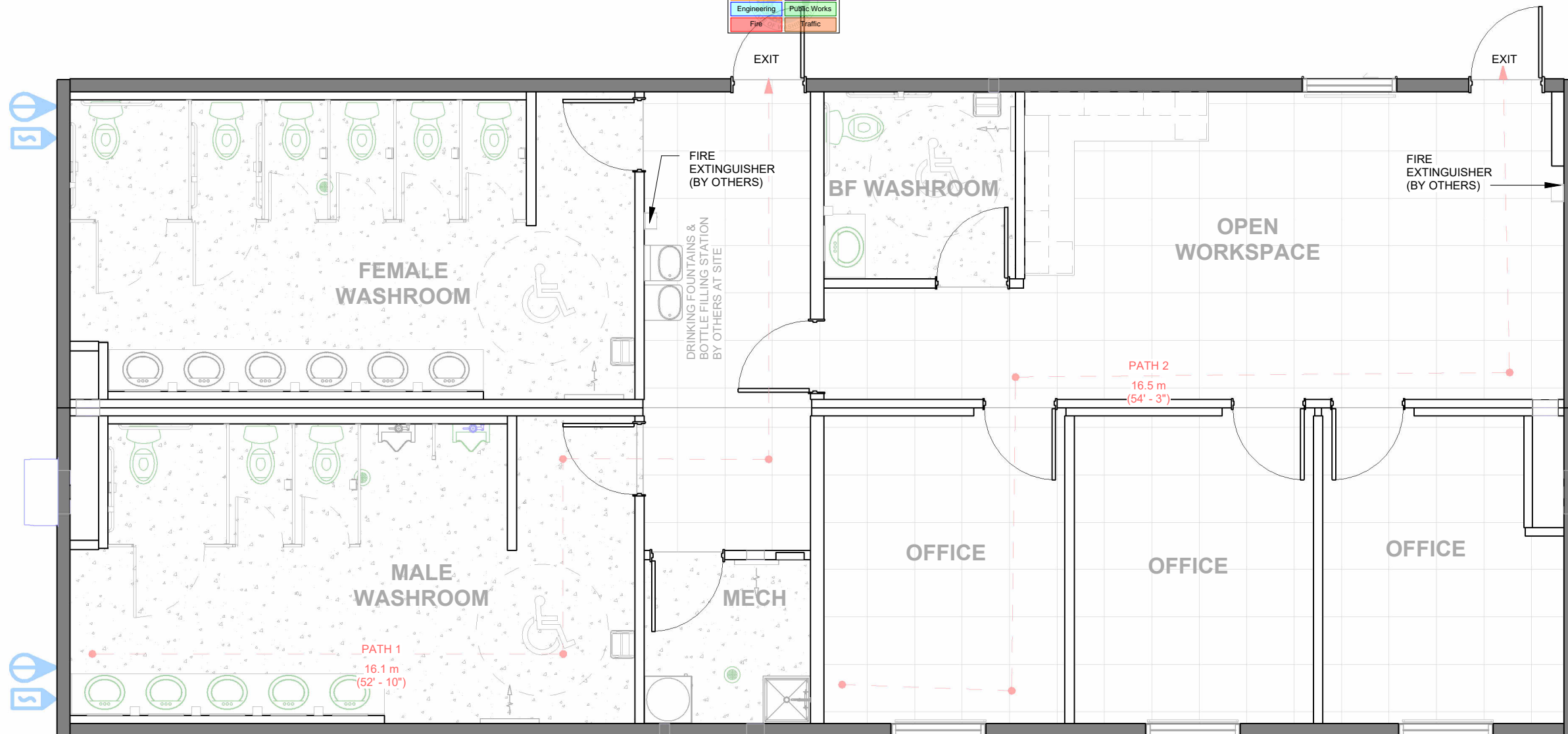
PROJECT NO:
1107994
DRAWING NO:
AM020
Exp. 12/09/2025

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STATE OF WASHINGTON
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AND FIELD INSPECTION

City of Puyallup
Development & Permitting Services
ISSUED PERMIT

Building	Planning
Engineering	Public Works
Fire	Traffic



1 OVERALL FIRE SAFETY PLAN
3/16" = 1'-0"

PATH OF TRAVEL SCHEDULE		
PATH	ft	m
PATH 1	52' - 10 1/4"	16 m
PATH 2	54' - 2 7/8"	17 m

KEY PLAN

101
102

CRITICAL
TRANSPORT
DIMENSIONS
L: 70' - 0"
W: 15' - 11"
H: 13' - 2"



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PROJECT:
28x64 ASL USA SR FLEET
OFFICE WASH

CLIENT:
CASCADE CHRISTIAN SCHOOL

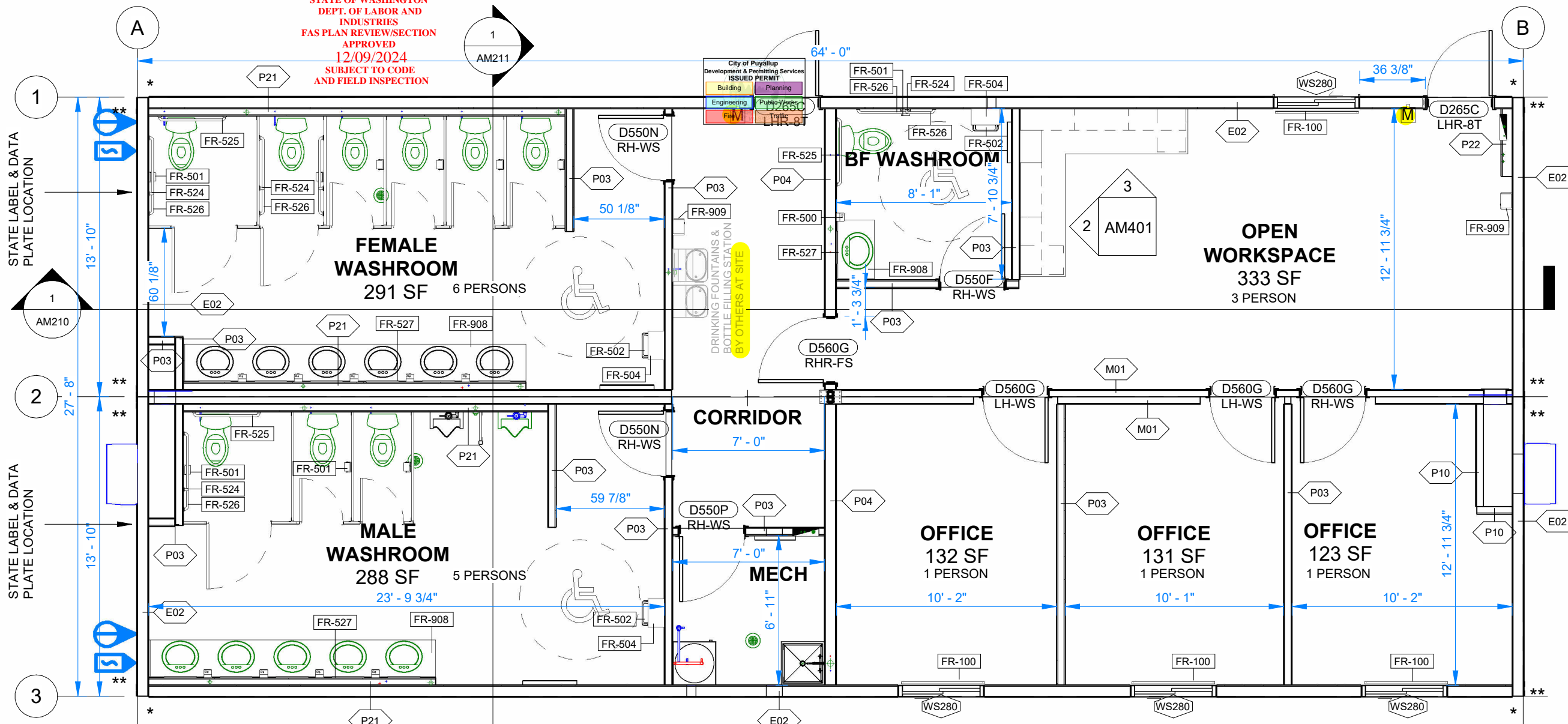
DRAWING TITLE:
OVERALL FIRE SAFETY PLAN

PROJECT NO:
1107994
DRAWING NO:
AM051
Exp. 12/09/2025

REV. #
A

STATE OF WASHINGTON
DEPT. OF LABOR AND
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City of Puyallup
Development & Permitting Services
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Building Planning
Engineering Public Works
FR-501
FR-526
FR-524
FR-504



DOOR SCHEDULE UNIT

DOOR TAG	QTY
D265C	2
D550F	1
D550N	2
D550P	1
D560G	4
	10

WINDOW SCHEDULE UNIT

WINDOW NO.	QTY
WS280	4

* = (1) MSTC28
** = (2) MSTC28

NOTE:
- FOR DOOR AND WINDOW SIZES REFER TO AM020.
- ALL TURNING CIRCLES ARE 67" RADIUS WITH 10" OF ALLOWABLE OVERLAP WITH PROVIDED KNEE SPACE BELOW AS PER WA 2017 A117.1 - 304.3.1 - CIRCULAR SPACE
- TOTAL REQUIRED EGRESS CAPACITY: 0.2" PER PERSONX 17 PERSONS = 3.4"
- OCCUPANT LOAD : 150 SQFT / PER PERSON

KEY PLAN

101
102

1 OVERALL FLOOR PLAN
3/16" = 1'-0"

OVERALL - ROOM FINISH SCHEDULE

ROOM	FLOOR FINISH	BASE FINISH	WALL FINISH	WALL TRIM	CEILING FINISH	CEILING HEIGHT
BF WASHROOM	COMMERCIAL GRADE VINYL ROLL GOODS (TARKETT STANDARD PLUS, COLOUR:21003 494)	4" RUBBER BASE, COLOR: COI / ROPPE BLACK	VC CLAD GYPSUM NO BATTENS, COLOR: DLETA MOONLIGHT- FRP ON PLUMBING WALL	VC BATTEN @ DOORS, WINDOWS 24X48 T-BAR CEILING W/COLOR CORNERS, DELTA MOONLIGHT	WHITE, RADAR 2742 ILLUSION 2/24 SLT	7' - 8"
CORRIDOR	COI CARPET, COLOR: CLEVERISH	4" RUBBER BASE, COLOR: COI / ROPPE BLACK	VC CLAD GYPSUM NO BATTENS, COLOR: DLETA MOONLIGHT	VC BATTEN @ DOORS, WINDOWS 24X48 T-BAR CEILING W/COLOR CORNERS, DELTA MOONLIGHT	WHITE, RADAR 2742 ILLUSION 2/24 SLT	7' - 10"
FEMALE WASHROOM	COMMERCIAL GRADE VINYL ROLL GOODS (TARKETT STANDARD PLUS, COLOUR:21003 494)	4" RUBBER BASE, COLOR: COI / ROPPE BLACK	VC CLAD GYPSUM NO BATTENS, COLOR: DLETA MOONLIGHT- FRP ON PLUMBING WALL	VC BATTEN @ DOORS, WINDOWS 24X48 T-BAR CEILING W/COLOR CORNERS, DELTA MOONLIGHT	WHITE, RADAR 2742 ILLUSION 2/24 SLT	7' - 8"
MALE WASHROOM	COMMERCIAL GRADE VINYL ROLL GOODS (TARKETT STANDARD PLUS, COLOUR:21003 494)	4" RUBBER BASE, COLOR: COI / ROPPE BLACK	VC CLAD GYPSUM NO BATTENS, COLOR: DLETA MOONLIGHT- FRP ON PLUMBING WALL	VC BATTEN @ DOORS, WINDOWS 24X48 T-BAR CEILING W/COLOR CORNERS, DELTA MOONLIGHT	WHITE, RADAR 2742 ILLUSION 2/24 SLT	7' - 8"
MECH	COMMERCIAL GRADE VINYL ROLL GOODS (TARKETT STANDARD PLUS, COLOUR:21003 494)	4" RUBBER BASE, COLOR: COI / ROPPE BLACK	VC CLAD GYPSUM NO BATTENS, COLOR: DLETA MOONLIGHT	VC BATTEN @ DOORS, WINDOWS NA		8' - 0 1/4"
OFFICE	COI CARPET, COLOR: CLEVERISH	4" RUBBER BASE, COLOR: COI / ROPPE BLACK	VC CLAD GYPSUM NO BATTENS, COLOR: DLETA MOONLIGHT	VC BATTEN @ DOORS, WINDOWS 24X48 T-BAR CEILING W/COLOR CORNERS, DELTA MOONLIGHT	WHITE, RADAR 2742 ILLUSION 2/24 SLT	7' - 10"
OPEN WORKSPACE	COI CARPET, COLOR: CLEVERISH	4" RUBBER BASE, COLOR: COI / ROPPE BLACK	VC CLAD GYPSUM NO BATTENS, COLOR: DLETA MOONLIGHT	VC BATTEN @ DOORS, WINDOWS 24X48 T-BAR CEILING W/COLOR CORNERS, DELTA MOONLIGHT	WHITE, RADAR 2742 ILLUSION 2/24 SLT	7' - 10"

FURNITURE AND EQUIPMENT SCHEDULE

TAG	QTY	DESCRIPTION
FR-100	4	VINYL CORDLESS MINI BLINDS 45"W X 47"H COLOR: WHITE
FR-111	1	COAT HOOK BOARD - 2 HOOKS - 57" AFF
FR-500	10	SOAP DISPENSER
FR-501	10	SINGLE ROLL TOILET PAPER HOLDER
FR-502	3	WALL MOUNTED WASTE DISPOSAL BIN - 7" FROM BOTTOM TO FINISHED FLOOR
FR-503	2	COAT HOOK BOARD - 4 HOOKS - 57" AFF
FR-504	3	WALL MOUNTED PAPER TOWEL DISPENSER - 46" FROM BOTTOM TO FINISHED FLOOR
FR-524	5	18" GRAB BAR, BARRIER FREE WASHROOM
FR-525	3	36" GRAB BAR, BARRIER FREE WASHROOM
FR-526	5	42" GRAB BAR, BARRIER FREE WASHROOM
FR-527	12	MIRROR BOBRICK B-165 SIZE: 18"W x 36"H
FR-908	3	ADA LAVATORY COUNTERTOP. 4" BACKSPLASH. HQ LAMINATE COLOR WILSONART COTE D'AZURE
FR-909	2	FIRE EXTINGUISHER - BY OTHERS

CRITICAL TRANSPORT DIMENSIONS
L: 70' - 0"
W: 15' - 11"
H: 13' - 2"



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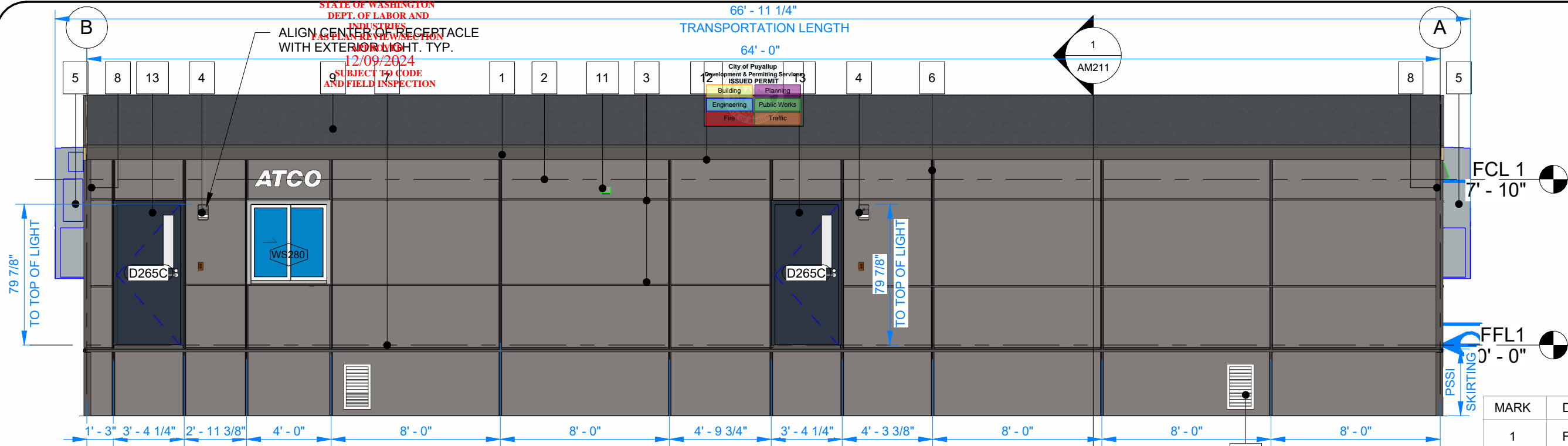
REV.	DATE	DESCRIPTION	BY	CHK/APR
A	2024-06-07	ISSUED FOR STATE APPROVAL	NM	

PROJECT: 28x64 ASL USA SR FLEET
OFFICE WASH
CLIENT: CASCADE CHRISTIAN SCHOOL

DRAWING TITLE: OVERALL FLOOR PLAN
PROJECT NO: 1107994
DRAWING NO: AM101
REV. #: A
Exp. 12/09/2025

STATE OF WASHINGTON
DEPT. OF LABOR AND
INDUSTRIES
ALIGN CENTER OF RECEPTACLE
WITH EXTERIOR LIGHT. TYP.
12/09/2024
SUBJECT TO CODE
AND FIELD INSPECTION

66' - 11 1/4"
TRANSPORTATION LENGTH
64' - 0"

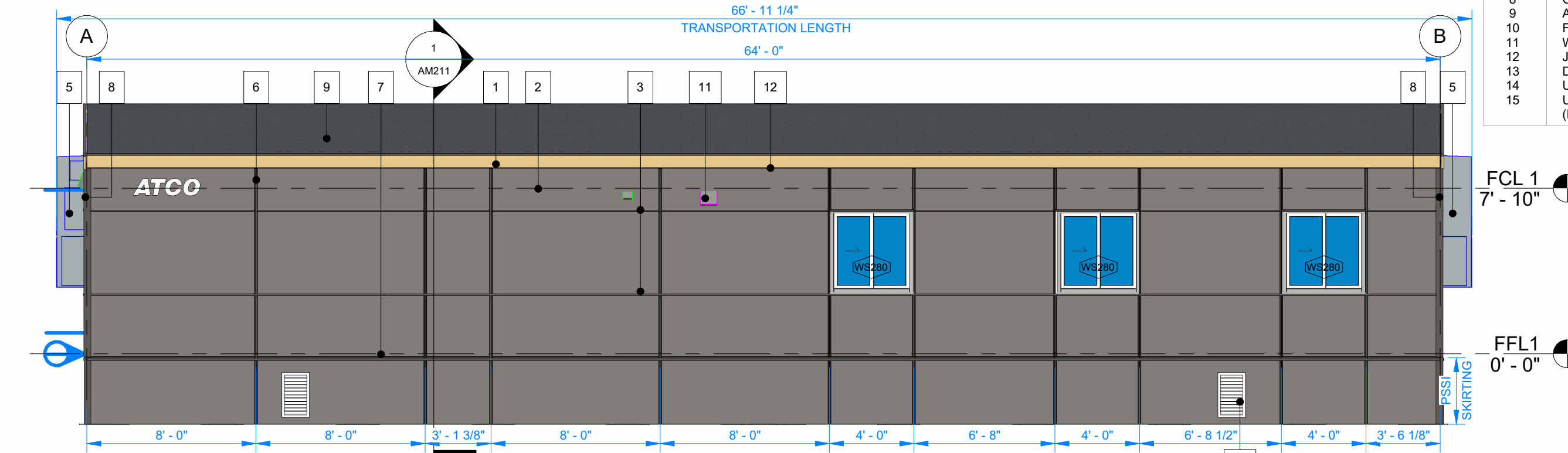


1 FRONT ELEVATION
3/16" = 1'-0"

NOTE:
- COLOR MATCH SCREWS
- SEE AM 300 FOR TYPICAL SIDING FASTENING PATTERN

MARK	DESCRIPTION
1	FASCIA - CHARCOAL
2	HARDIE PANEL - AGED PEWTER
3	MODIFIED DRIP CAP - CHARCOAL
4	EXTERIOR LIGHT
5	BARD UNIT
6	DOUBLE J-TRIM - CHARCOAL
7	STARTER - CHARCOAL
8	OUTSIDE CORNER - CHARCOAL
9	ASPHALT ROOF SHINGLE - ESTATE GRAY
10	FLAT STOCK - REGENT GREY
11	WALL CAP
12	J TRIM - CHARCOAL
13	DOOR - ANCHORS AWEIGH
14	UNDER-FLOOR VENT (MIN.14" x 24") - PSSI
15	UNDER-FLOOR ACCESS HATCH (MIN.12"X18")- PSSI

66' - 11 1/4"
TRANSPORTATION LENGTH
64' - 0"



2 BACK ELEVATION
3/16" = 1'-0"

CRITICAL
TRANSPORT
DIMENSIONS
L: 70' - 0"
W: 15' - 11"
H: 13' - 2"



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A	2024-06-07	ISSUED FOR STATE APPROVAL	NM	

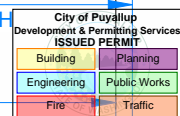
PROJECT:
28x64 ASL USA SR FLEET
OFFICE WASH
CLIENT:
CASCADE CHRISTIAN SCHOOL

DRAWING TITLE:
OVERALL BUILDING ELEVATION
PROJECT NO:
1107994
DRAWING NO:
AM200
REV. #
A
Exp. 12/09/2025

PLOT DATE: 2024-07-24 12:20:47 PM

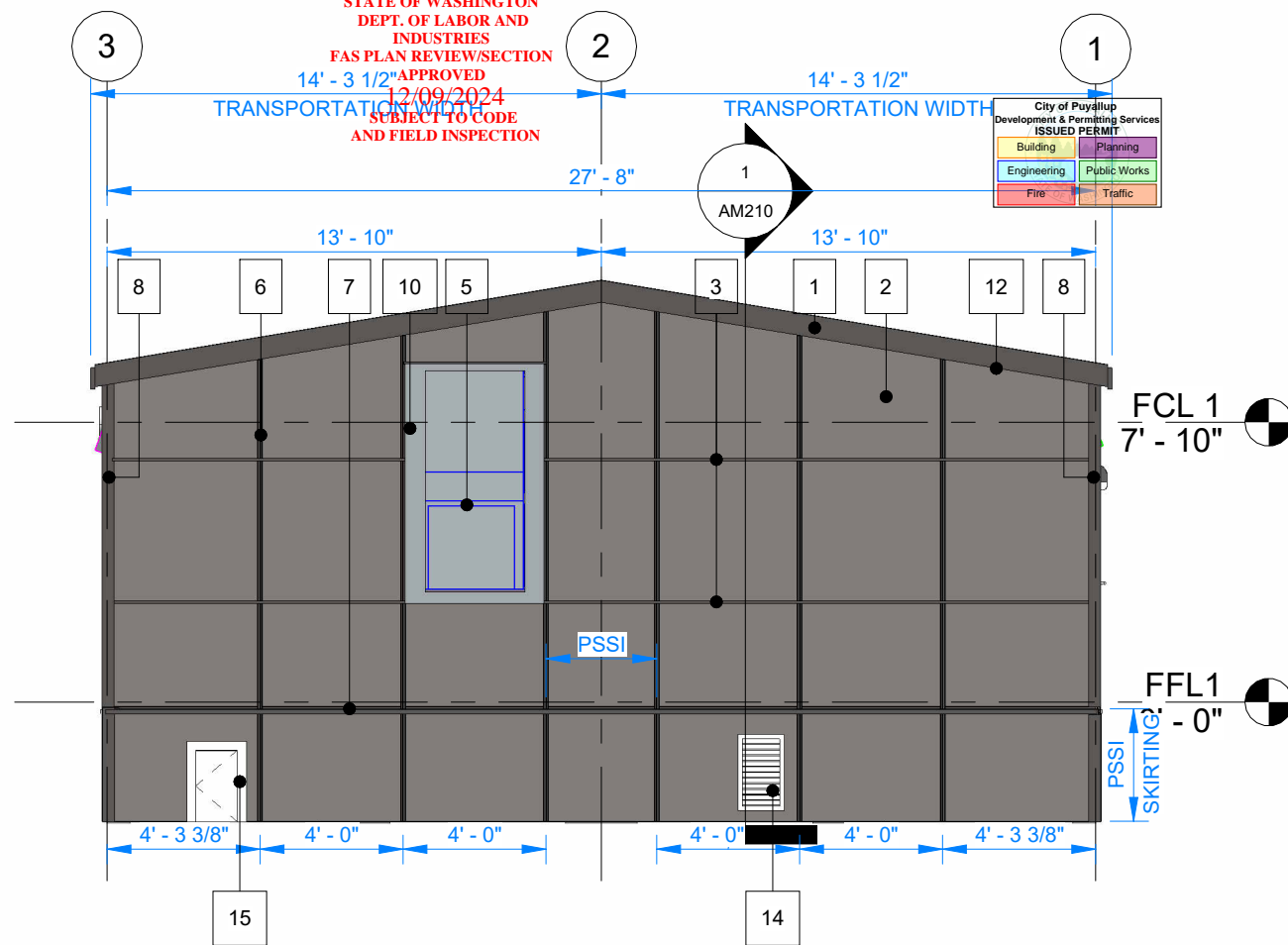
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AND FIELD INSPECTION

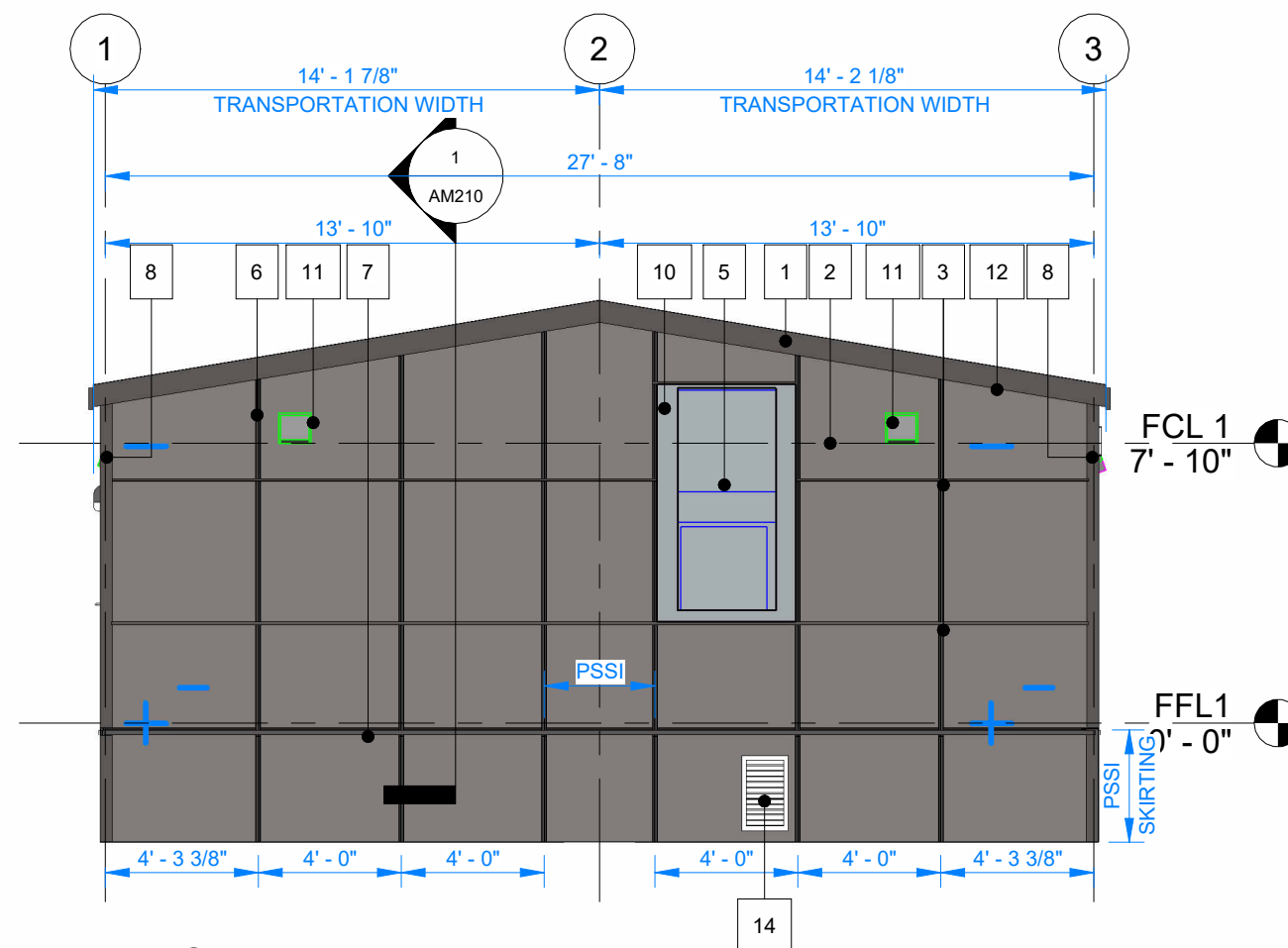


MARK	DESCRIPTION
1	FASCIA - CHARCOAL
2	HARDIE PANEL - AGED PEWTER
3	MODIFIED DRIP CAP - CHARCOAL
4	EXTERIOR LIGHT
5	BARD UNIT
6	DOUBLE J-TRIM - CHARCOAL
7	STARTER - CHARCOAL
8	OUTSIDE CORNER - CHARCOAL
9	ASPHALT ROOF SHINGLE - ESTATE GRAY
10	FLAT STOCK - REGENT GREY
11	WALL CAP
12	J TRIM - CHARCOAL
13	DOOR - ANCHORS AWEIGH
14	UNDER-FLOOR VENT (MIN.14" x 24") - PSSI
15	UNDER-FLOOR ACCESS HATCH (MIN.12"X18")- PSSI

NOTE:
- COLOR MATCH SCREWS
- SEE AM 300 FOR TYPICAL SIDING FASTENING PATTERN



1 RIGHT ELEVATION
3/16" = 1'-0"



2 LEFT ELEVATION
3/16" = 1'-0"

CRITICAL
TRANSPORT
DIMENSIONS
L: 70' - 0"
W: 15' - 11"
H: 13' - 2"

FOR PERMIT

REV.	DATE	DESCRIPTION	BY	CHK/APR
A	2024-06-07	ISSUED FOR STATE APPROVAL	NM	

PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH
CLIENT:	CASCADE CHRISTIAN SCHOOL

DRAWING TITLE: OVERALL BUILDING ELEVATION	
PROJECT NO: 1107994	DRAWING NO: AM201
REV. # A	Exp. 12/09/2025

PLOT DATE: 2024-07-24 12:20:49 PM

R2024.1

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21FBS2400126

R53 (R-31 AND R-22) FIBERGLASS BATT
INSULATION WITH AIR BARRIER
AND INSULATION NETTING

2X6 FURRING @ 24"
O.C. SPACING

2X12 RAFTERS @ 24"
O.C. SPACING

City of Puyallup
Development & Permitting Services
ISSUED PERMIT

Building	Planning
Engineering	Public Works
Fire	Traffic

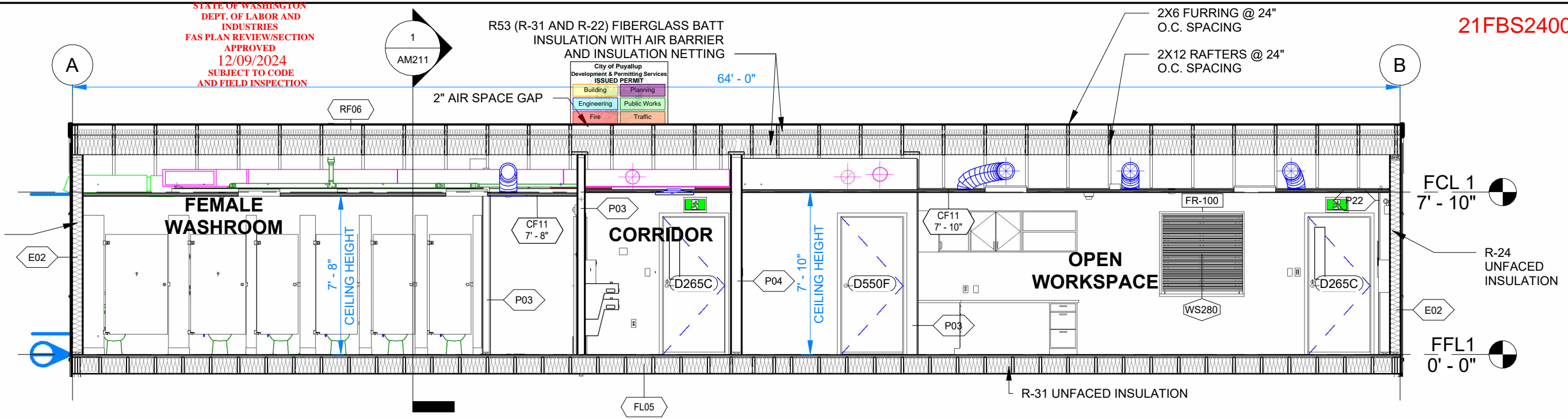
1
AM211

2" AIR SPACE GAP

64' - 0"

PLOT DATE: 2024-07-24 12:20:53 PM

R2024.1
11x17 Titleblock



1 BUILDING SECTION - LONG
3/16" = 1'-0"

AIR BARRIER SYSTEM:

ROOF: TYVEK AT UNDER SIDE OF ROOF RAFTERS. (EXTEND MEMBRANE 6" BEYOND OUTER EDGE OF ROOF RAFTERS TO ALLOW SEALING TO MEMBRANE ON EXTERIOR ON WALLS, LAP JOINTS TO MAINTAIN WATER BARRIER AT EXTERIOR, USE APPROVED SEAM TAPE)(PROVIDE FLAP OF MEMBRANE AT BUILDING MATE LINE TO ALLOW FOR SITE SEALING ACROSS MATE LINE).

WALLS: TYVEK COMMERCIAL AS WEATHER RESISTIVE BARRIER AND AIR BARRIER, SEAL AROUND WINDOWS, DOORS AND PENETRATIONS, INSTALL AS PER MANUFACTURER'S INSTRUCTION, SEAL LAPS WITH WRB TAPE, EXTEND TYVEK AROUND CORNERS OF MATING WALLS

FLOOR: TONGUE AND GROVE PLYWOOD, DOUBLE LAYER WITH OFFSET JOINTS, SEAMS TO BE FILLED AND CAULKED

ROOF VENT CALCULATION (IBC 2021 SECTION 1202.2.1.VENTILATION):

VENTING REQUIRED:
ROOF AREA 1773 SQ.FT /150 = 11.82 SQ.FT 11.82 x 144 = 1702.08 SQ.IN REQUIRED

VENTING PROVIDED:
RIDGE CAP VENT : 11 SQ.IN PER LINEAR FEET : 11 X 64=704 SQ.IN
64 BAYS BETWEEN RAFTERS : 64 x 11 1/2" x 1 1/2" = 1104 SQ.IN

FOUNDATION VENT CALCULATION: (IBC 2021 SECTION 1202. VENTILATION):

VENTING REQUIRED:
(27' 8 1/2 x 64') /150 = 1773/150 = 11.82 SQ.FT 11.82x 144 = 1703 SQ.IN REQUIRED

VENTING PROVIDED:
6 SCREENED FOUNDATION VENT : 6 x 336 SQ.IN = 2016 SQ.IN
NOTE : VENTS ARE 14" x 24" EACH (336 SQ.IN)

NOTE:
FOR ROOF, WALL AND FLOOR ASSEMBLY DETAILS REFER TO AM010.

CRITICAL
TRANSPORT
DIMENSIONS
L: 70' - 0"
W: 15' - 11"
H: 13' - 2"



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REV.	DATE	DESCRIPTION	BY	CHK/APR
A	2024-06-07	ISSUED FOR STATE APPROVAL	NM	

PROJECT:
28x64 ASL USA SR FLEET
OFFICE WASH

CLIENT:
CASCADE CHRISTIAN SCHOOL

DRAWING TITLE:
OVERALL BUILDING SECTIONS

PROJECT NO:
1107994

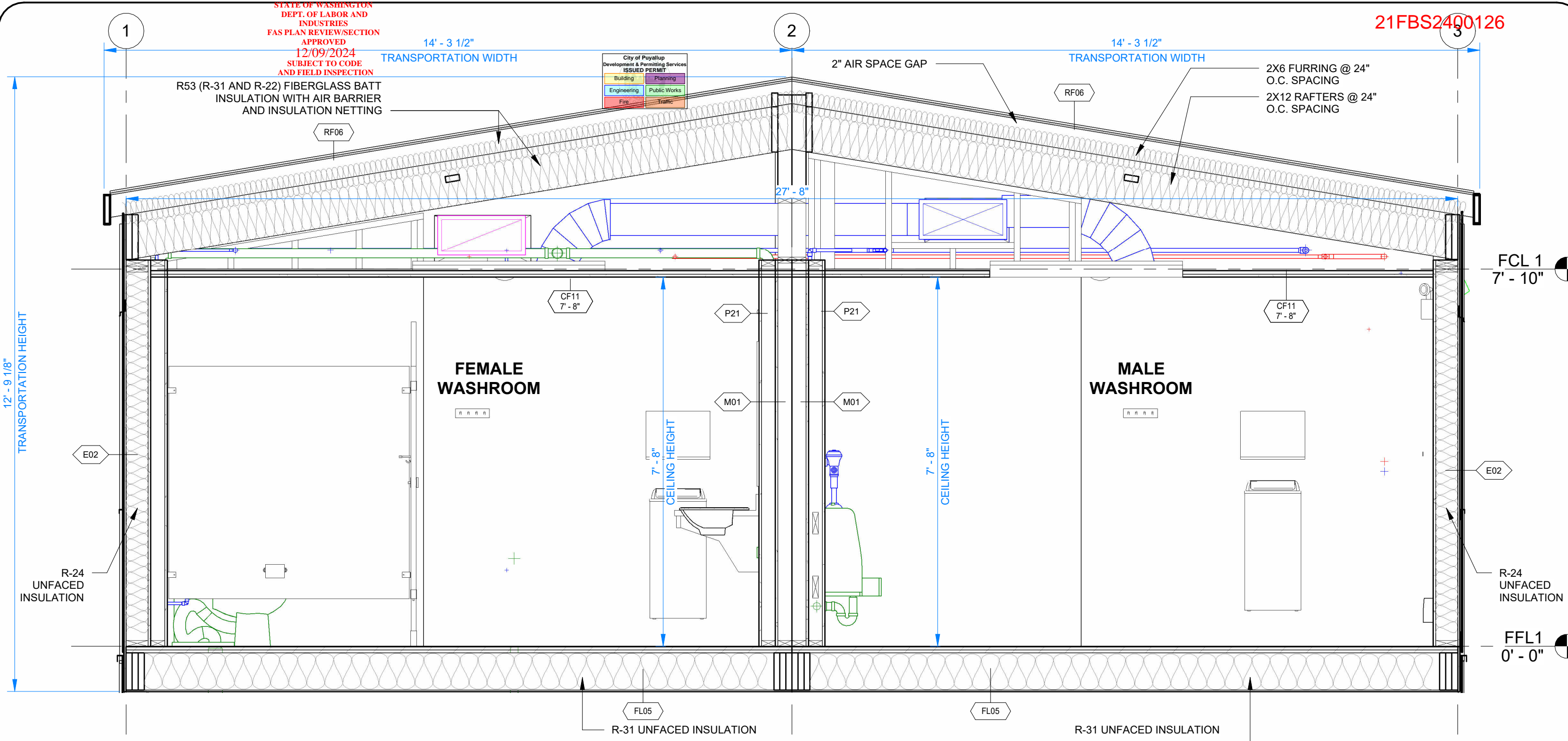
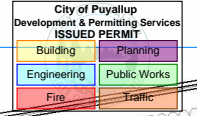
DRAWING NO:
AM210

REV. #
A

Exp. 12/09/2025

STATE OF WASHINGTON
DEPT. OF LABOR AND
INDUSTRIES
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AND FIELD INSPECTION

21FBS2400126



1 BUILDING SECTION - SHORT
1/2" = 1'-0"

NOTE:
FOR ROOF, WALL AND FLOOR ASSEMBLY DETAILS REFER
TO AM010.

CRITICAL
TRANSPORT
DIMENSIONS
L: 70' - 0"
W: 15' - 11"
H: 13' - 2"

FOR PERMIT

REV.	DATE	DESCRIPTION	BY	CHK/APR
A	2024-06-07	ISSUED FOR STATE APPROVAL	NM	

PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH
CLIENT:	CASCADE CHRISTIAN SCHOOL

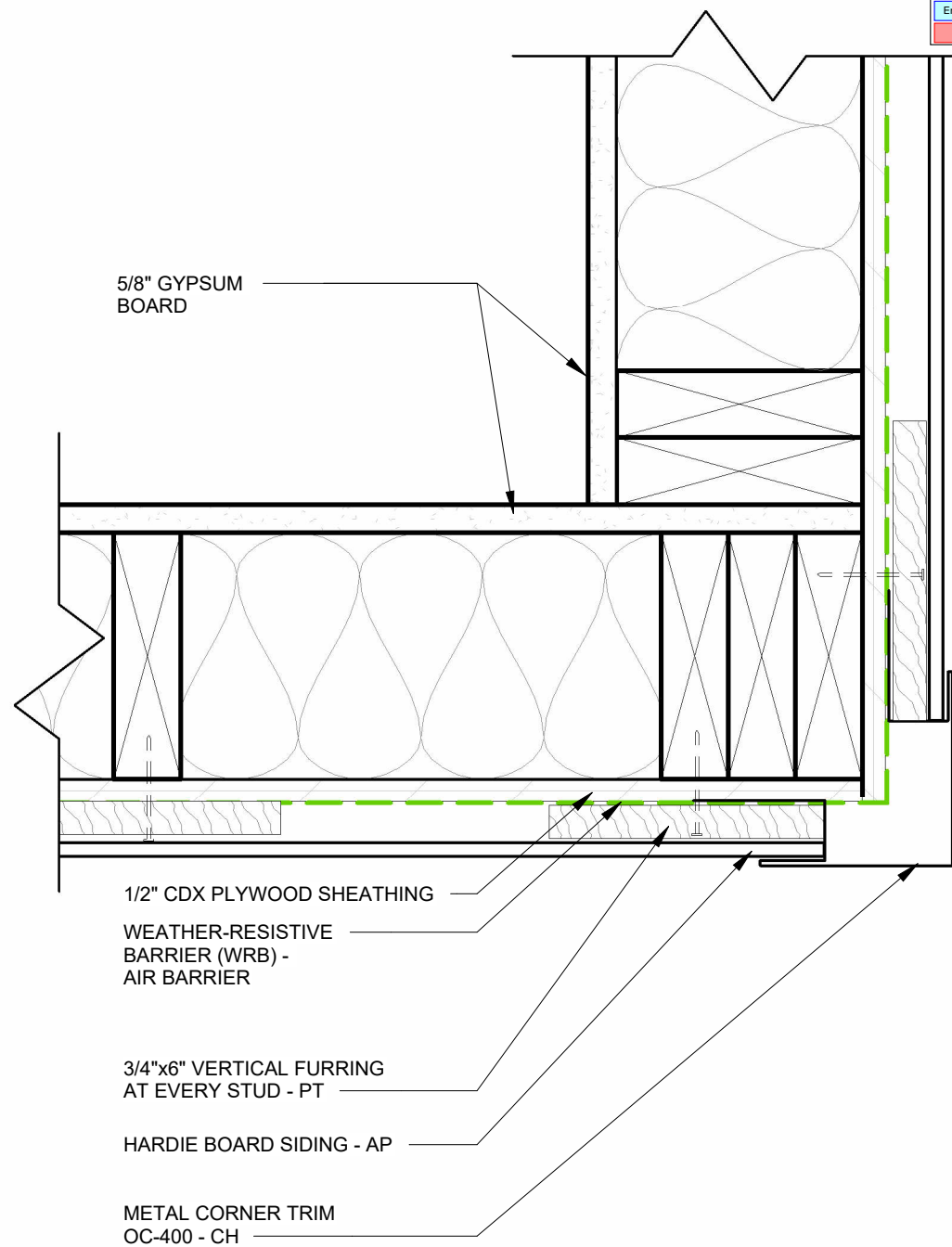
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PROJECT NO: 1107994	DRAWING NO: AM211
Exp. 12/09/2025	REV. # A

PLOT DATE: 2024-07-24 12:20:55 PM

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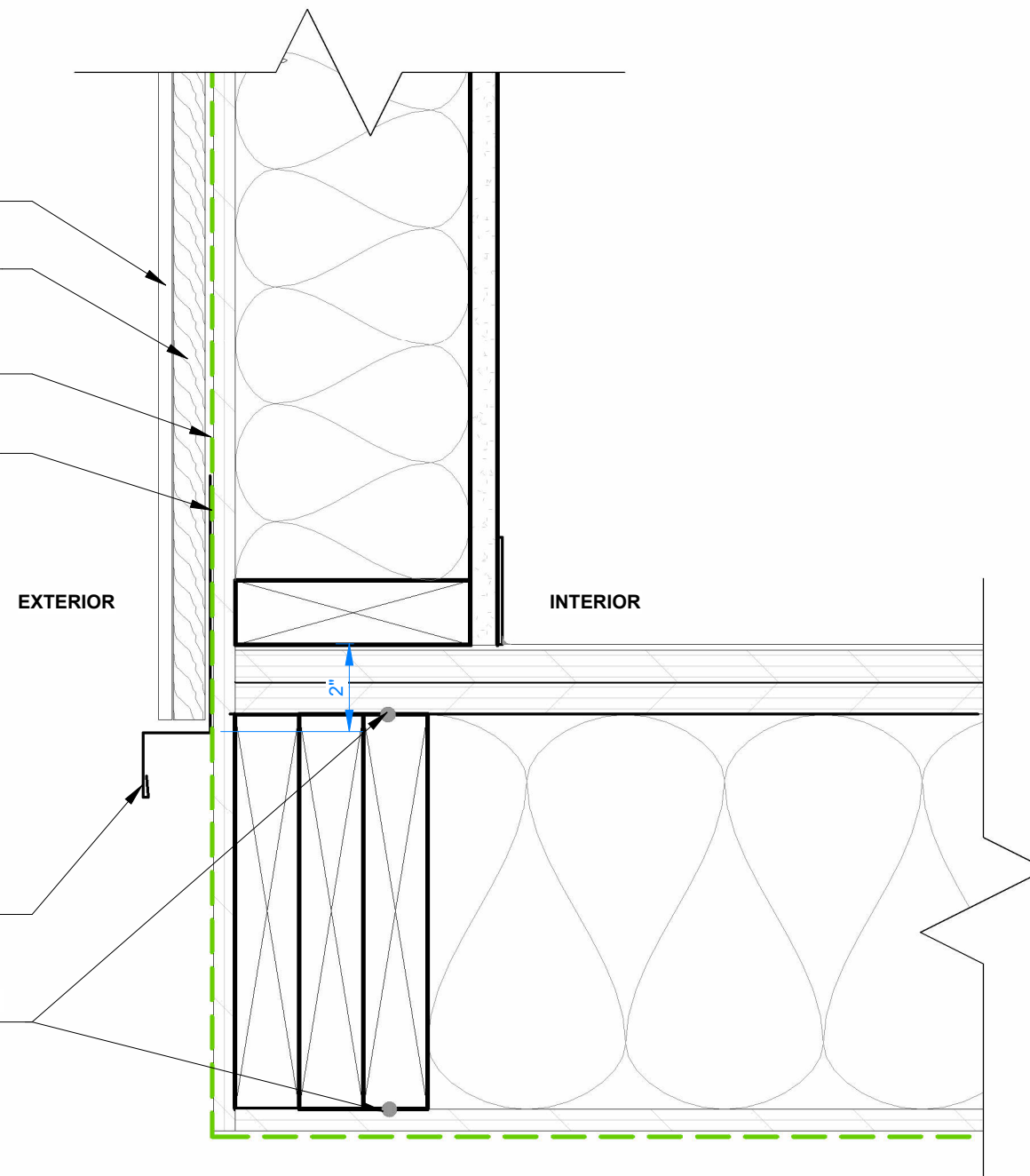
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City of Puyallup Development & Permitting Services ISSUED PERMIT	
Building	Planning
Engineering	Public Works
Fire	Traffic



① HARDIE BOARD SIDING CORNER1
 3" = 1'-0"

- HARDIE PANEL - AP
- 3/4"x6" VERTICAL FURRING AT EVERY STUD - PT
- WEATHER-RESISTIVE BARRIER (WRB)- AIR BARRIER
- 1/2" CDX PLYWOOD SHEATHING
- PAINT ANY CUT HARDIE EDGE - COLOR MATCH WITH PANEL
- MINIMUM 1/4" BETWEEN SIDING AND STARTER



② HARDIE PANEL DETAIL AT FLOOR1
 3" = 1'-0"

PLOT DATE: 2024-07-24 12:20:57 PM

R2022.1

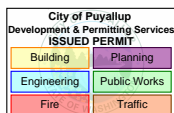
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FOR PERMIT

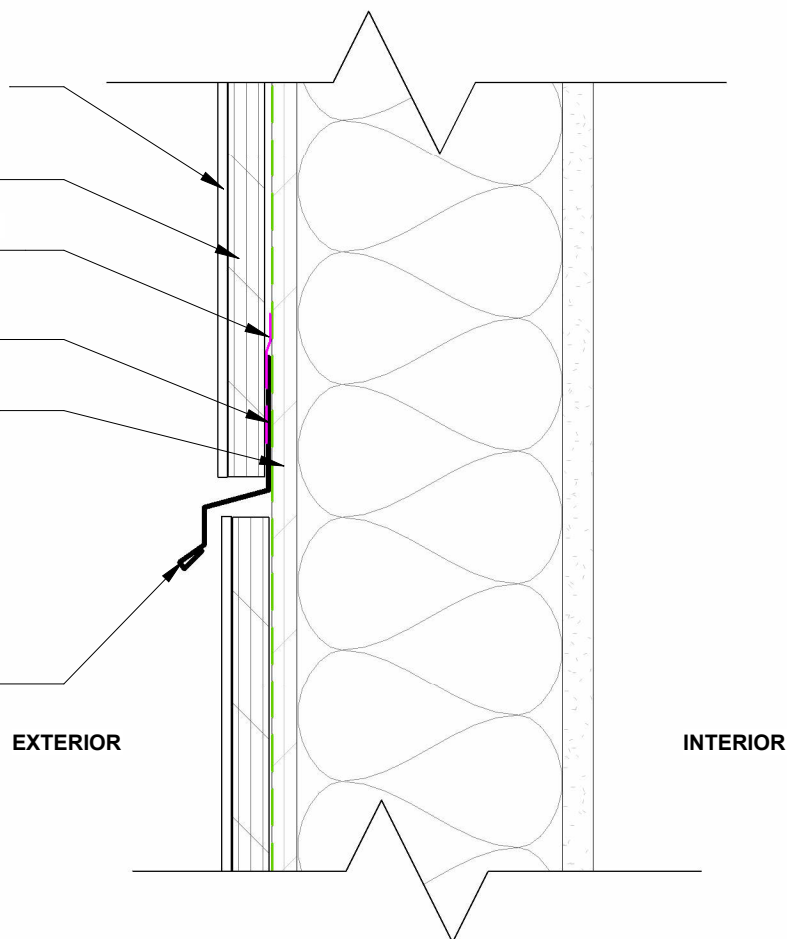
REV.	DATE	DESCRIPTION	BY	CHK/APR
A	2024-06-07	ISSUED FOR STATE APPROVAL	NM	

PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH
CLIENT:	CASCADE CHRISTIAN SCHOOL

DRAWING TITLE:	EXTERIOR FINISH DETAILS - CLADDING		
PROJECT NO:	1107994	DRAWING NO:	AM301
REV. #	A	Exp. 12/09/2025	



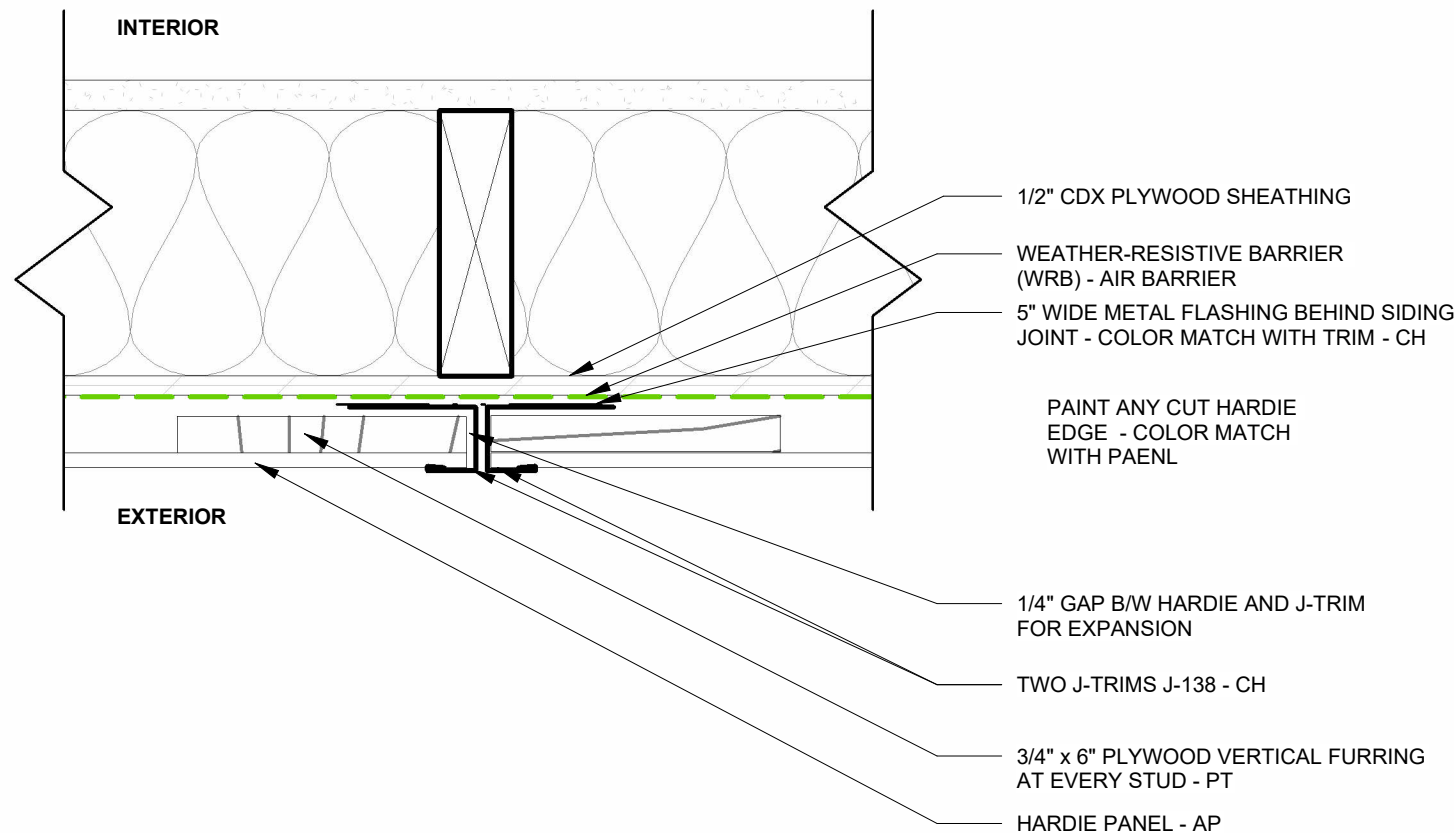
- HARDIE BOARD SIDING - AP
- 3/4"x6" VERTICAL FURRING AT EVERY STUD - PT
- SELF-ADHERED MEMBRANE (SAM) OVER FLASHING
- WEATHER-RESISTIVE BARRIER (WRB)- AIR BARRIER
- 1/2" CDX PLYWOOD SHEATHING
- PAINT ANY CUT HARDIE EDGE - COLOR MATCH WITH PAENL
- MINIMUM 1/4" BETWEEN SIDING AND DRIP CAP
- MD-138 DRIP CAP - CH



EXTERIOR

INTERIOR

1 BOARD TO BOARD SECTION DETAIL1
 3" = 1'-0"



INTERIOR

EXTERIOR

- 1/2" CDX PLYWOOD SHEATHING
- WEATHER-RESISTIVE BARRIER (WRB) - AIR BARRIER
- 5" WIDE METAL FLASHING BEHIND SIDING JOINT - COLOR MATCH WITH TRIM - CH
- PAINT ANY CUT HARDIE EDGE - COLOR MATCH WITH PAENL
- 1/4" GAP B/W HARDIE AND J-TRIM FOR EXPANSION
- TWO J-TRIMS J-138 - CH
- 3/4" x 6" PLYWOOD VERTICAL FURRING AT EVERY STUD - PT
- HARDIE PANEL - AP

2 HARDIE PANEL TRANSITION PLAN
 3" = 1'-0"

PLOT DATE: 2024-07-24 12:20:58 PM

R2022.1

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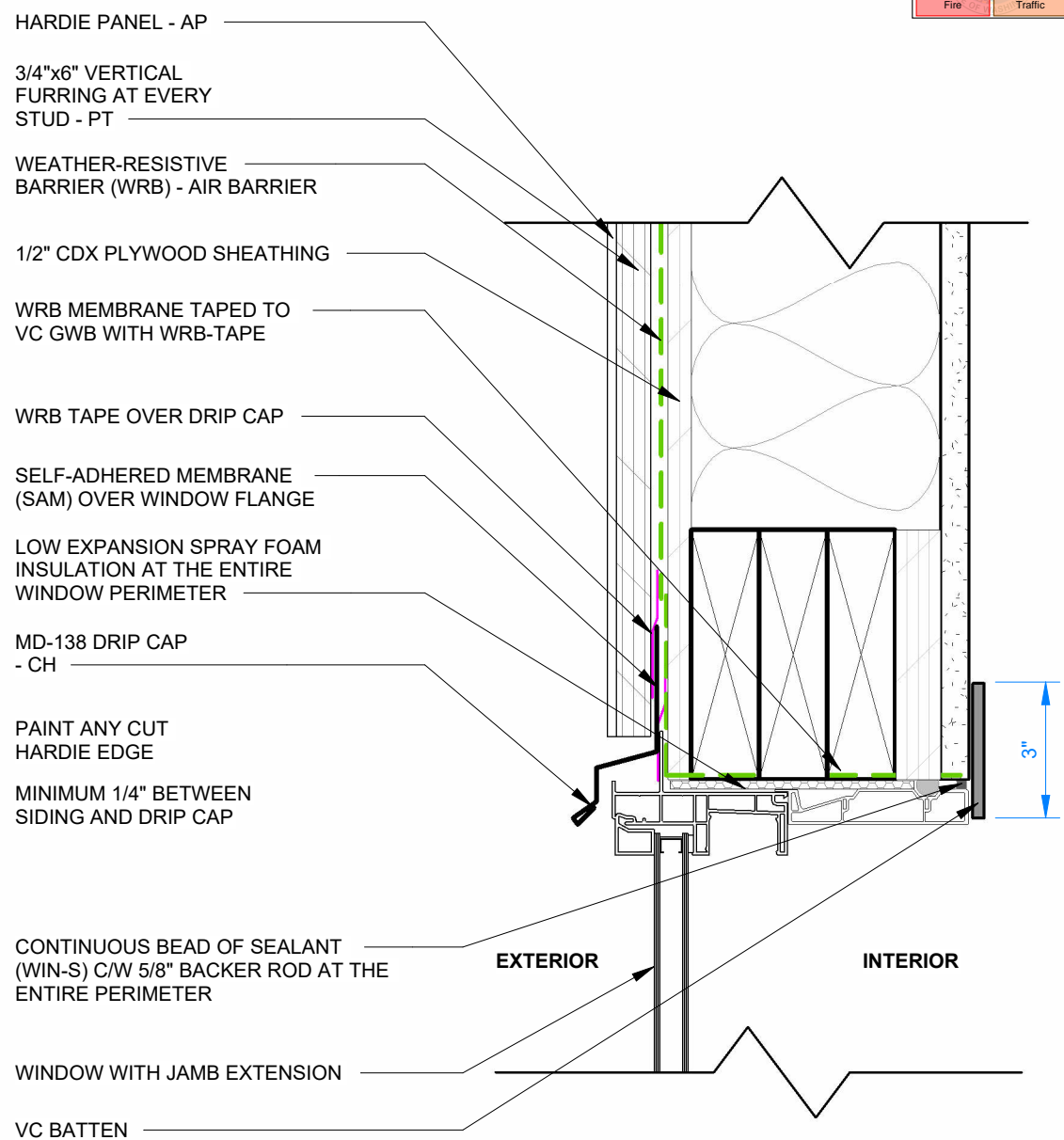
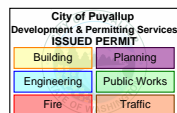
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A	2024-06-07	ISSUED FOR STATE APPROVAL	NM	

PROJECT: 28x64 ASL USA SR FLEET OFFICE WASH

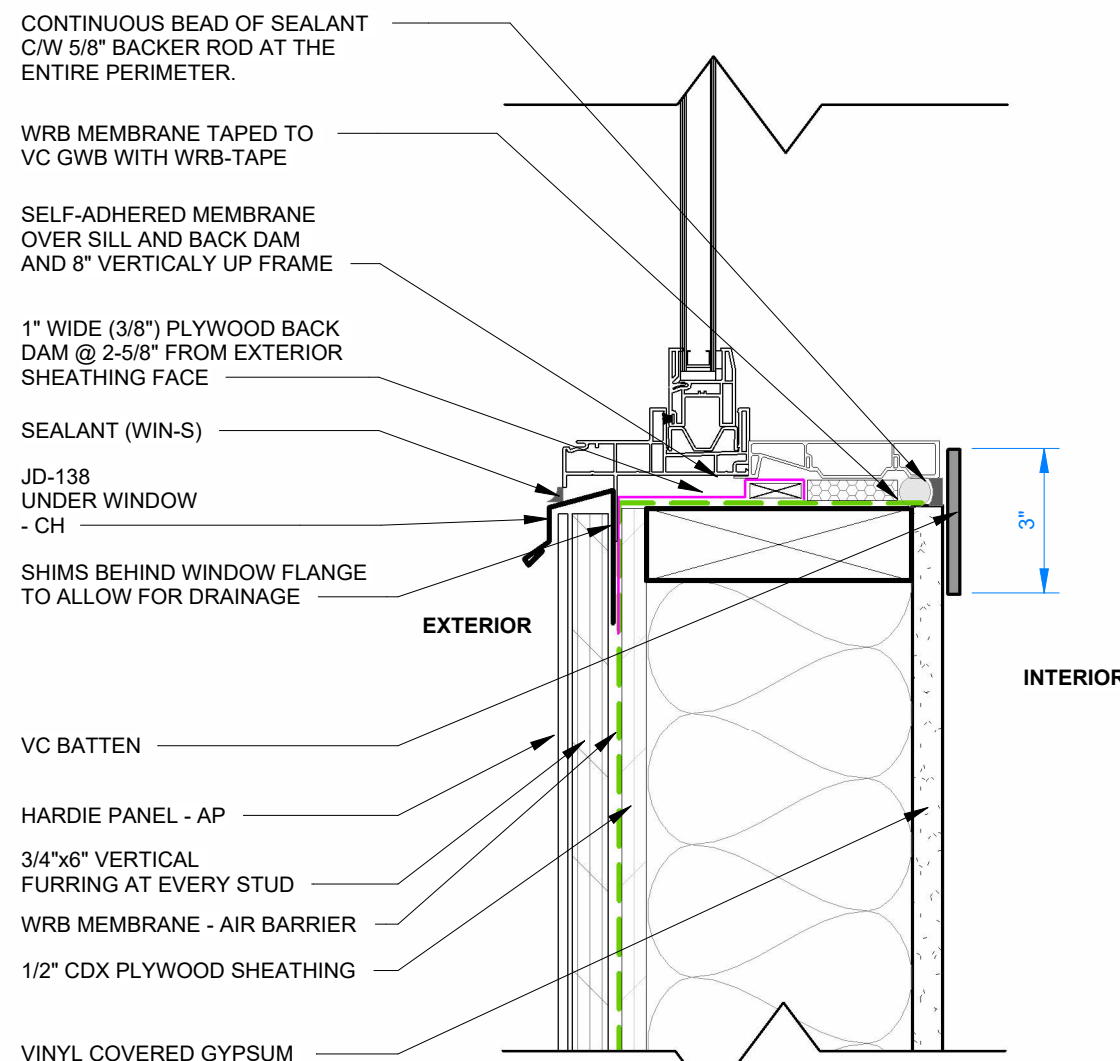
CLIENT: CASCADE CHRISTIAN SCHOOL

DRAWING TITLE: EXTERIOR FINISH DETAILS - CLADDING

PROJECT NO: 1107994
 DRAWING NO: AM302
 REV. # A
 Exp. 12/09/2025



① WINDOW HEADER DETAIL
 3" = 1'-0"



② WINDOW SILL DETAIL
 3" = 1'-0"

PLOT DATE: 2024-07-24 12:20:59 PM

R2022.1

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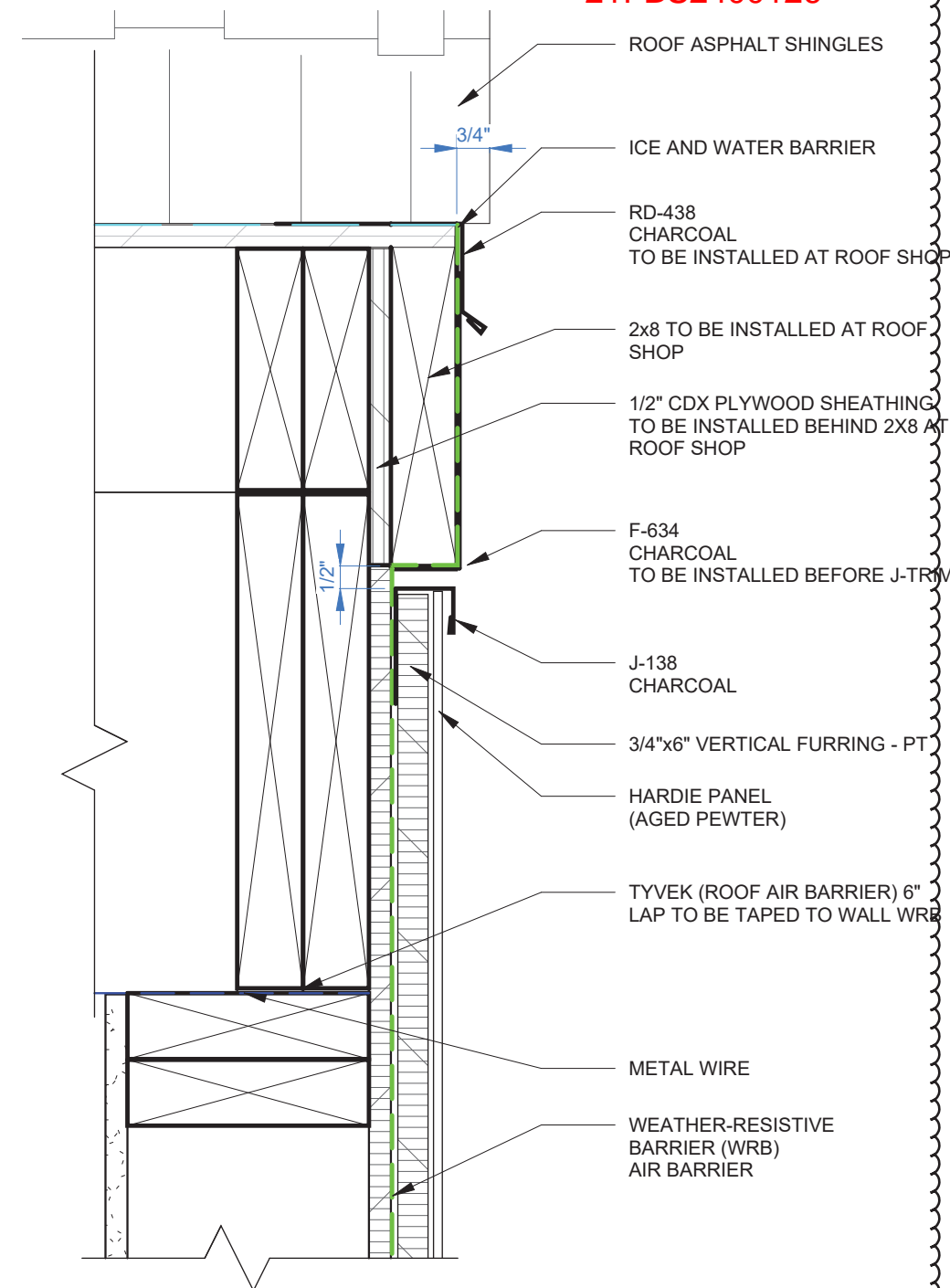
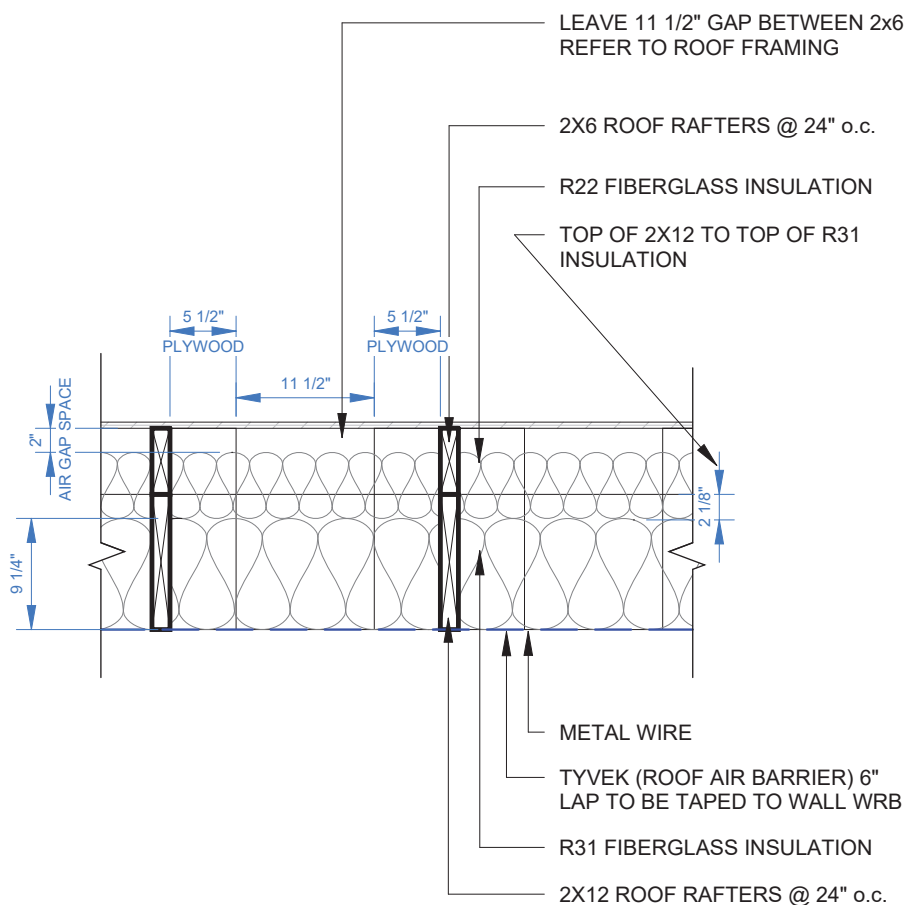
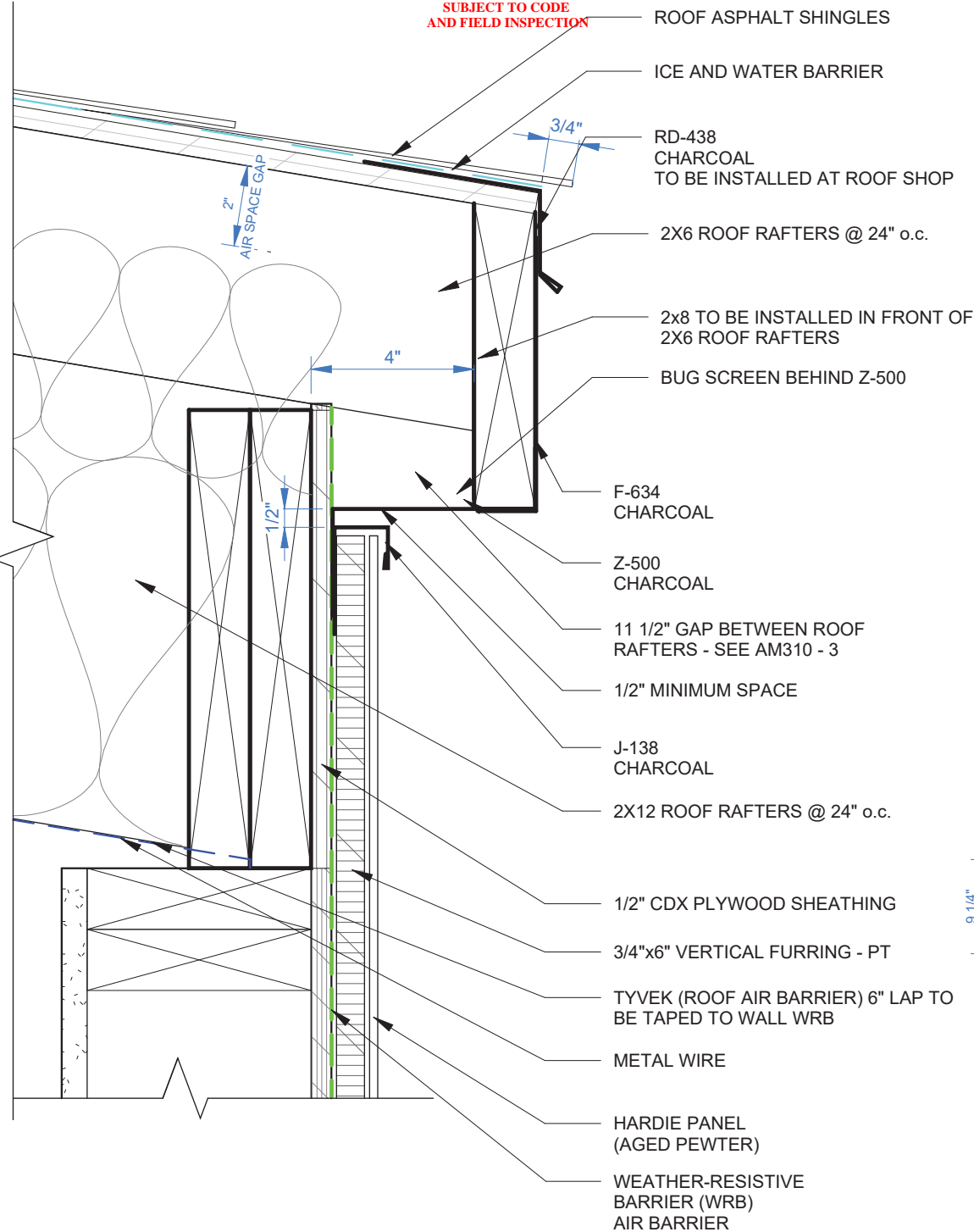
REV.	DATE	DESCRIPTION	BY	CHK/APR
A	2024-06-07	ISSUED FOR STATE APPROVAL	NM	

PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH
CLIENT:	CASCADE CHRISTIAN SCHOOL

DRAWING TITLE:	EXTERIOR FINISH DETAILS - CLADDING		
PROJECT NO:	1107994	DRAWING NO:	AM303
REV. #	A	Exp. 12/09/2025	

STATE OF WASHINGTON
DEPT. OF LABOR AND
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City of Puyallup Development & Permitting Services ISSUED PERMIT	
Building	Planning
Engineering	Public Works
Fire	Traffic



1 ROOF DETAIL - LONG WALL
3" = 1'-0"

3 GAP BETWEEN 2x6 RAFTERS
3/4" = 1'-0"

2 ROOF DETAIL - SHORT WALL
3" = 1'-0"

FOR PERMIT

REV.	DATE	DESCRIPTION	BY	CHK/APR
B	2024-10-28	RE-ISSUED FOR STATE APPROVAL	NM	
A	2024-10-28	ISSUED FOR STATE APPROVAL	NM	

PROJECT:
28x64 ASL USA SR FLEET
OFFICE WASH

DRAWING TITLE:
EXTERIOR FINISH DETAILS - CLADDING

CLIENT:
CASCADE CHRISTIAN SCHOOL

PROJECT NO:
1107994
DRAWING NO:
AM310
REV. #
B

Exp. 12/09/2025

PLOT DATE: 2024-10-26 4:50:54 PM

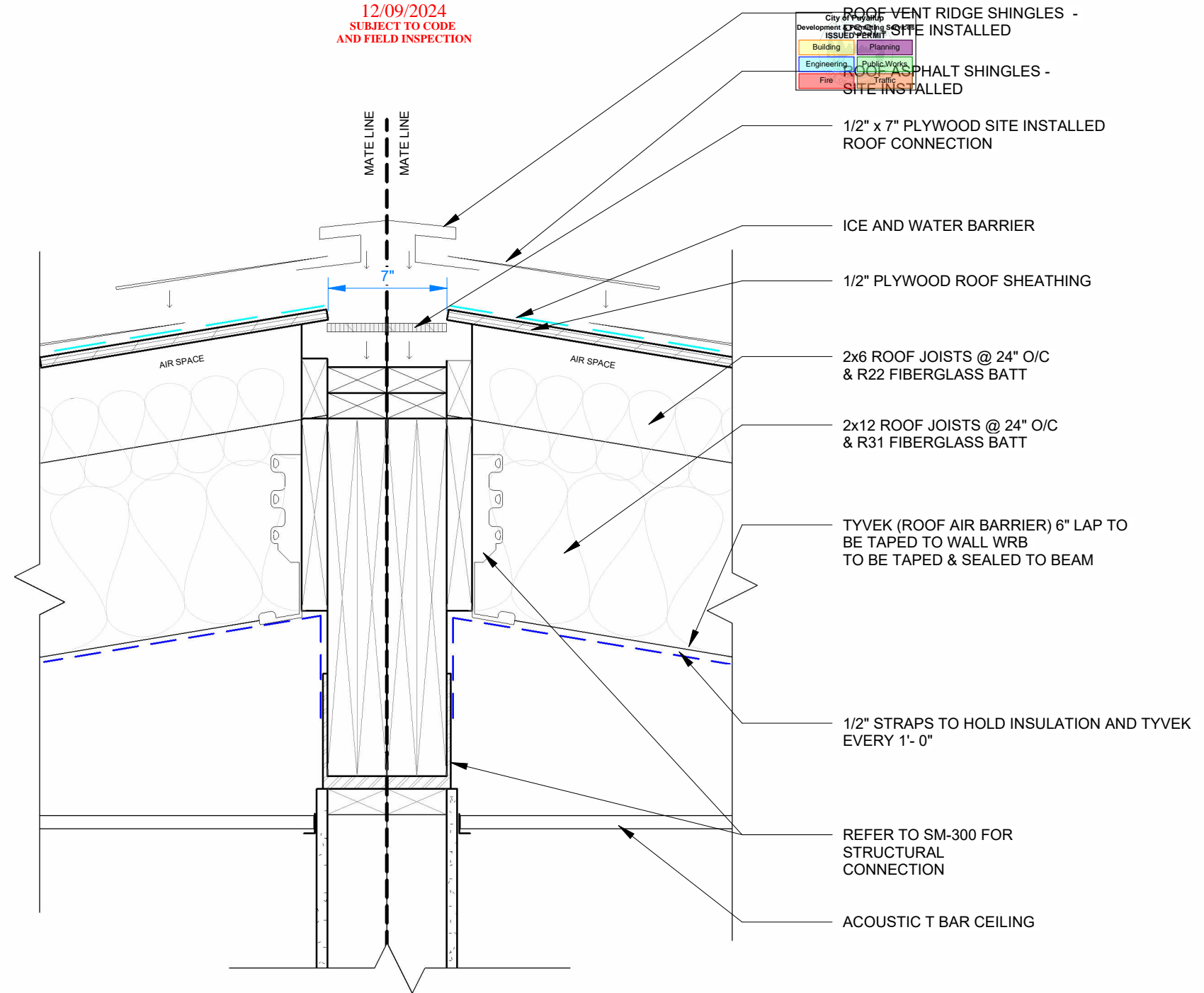
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STATE OF WASHINGTON
DEPT. OF LABOR AND
INDUSTRIES
FAS PLAN REVIEW/SECTION
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AND FIELD INSPECTION

City of Everett
Development & Planning
ISSUED PERMIT

Building	Planning
Engineering	Public Works
Fire	Police



1 ROOF CONNECTION
1 1/2" = 1'-0"



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REV.	DATE	DESCRIPTION	BY	CHK/APR
A	2024-12-03	ISSUED FOR STATE APPROVAL	NM	

PROJECT:
28x64 ASL USA SR FLEET
OFFICE WASH

CLIENT:
CASCADE CHRISTIAN SCHOOL

DRAWING TITLE:
EXTERIOR FINISH DETAILS - ROOF
CONNECTION

PROJECT NO:
1107994

DRAWING NO:
AM312

REV. #
A

Exp. 12/09/2025

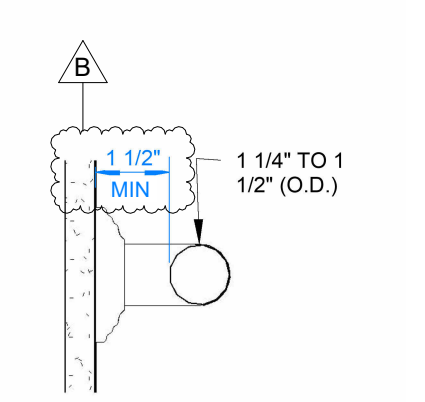
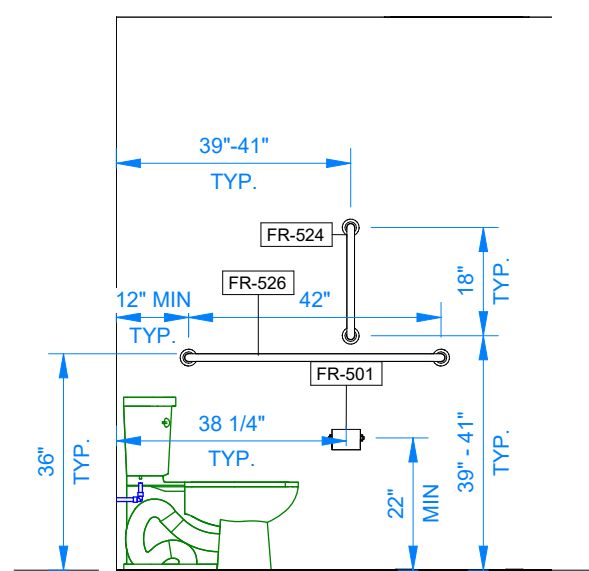
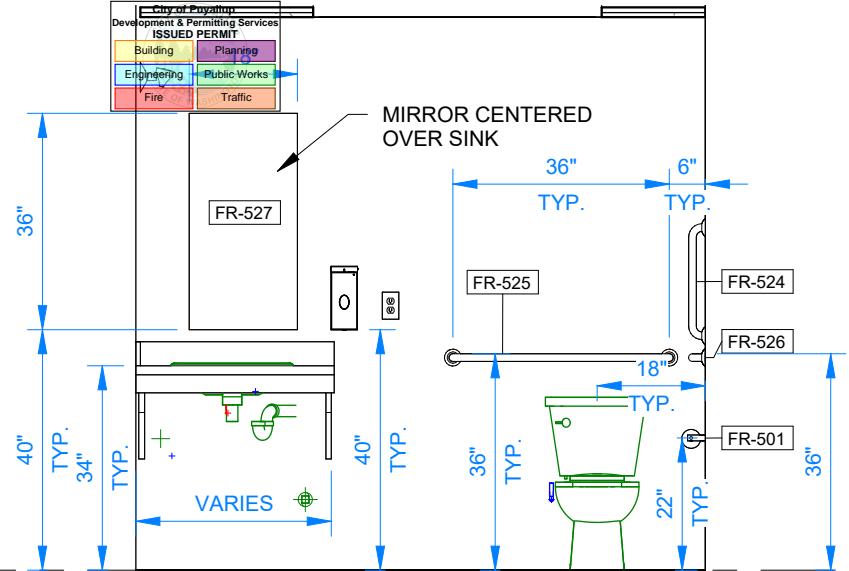
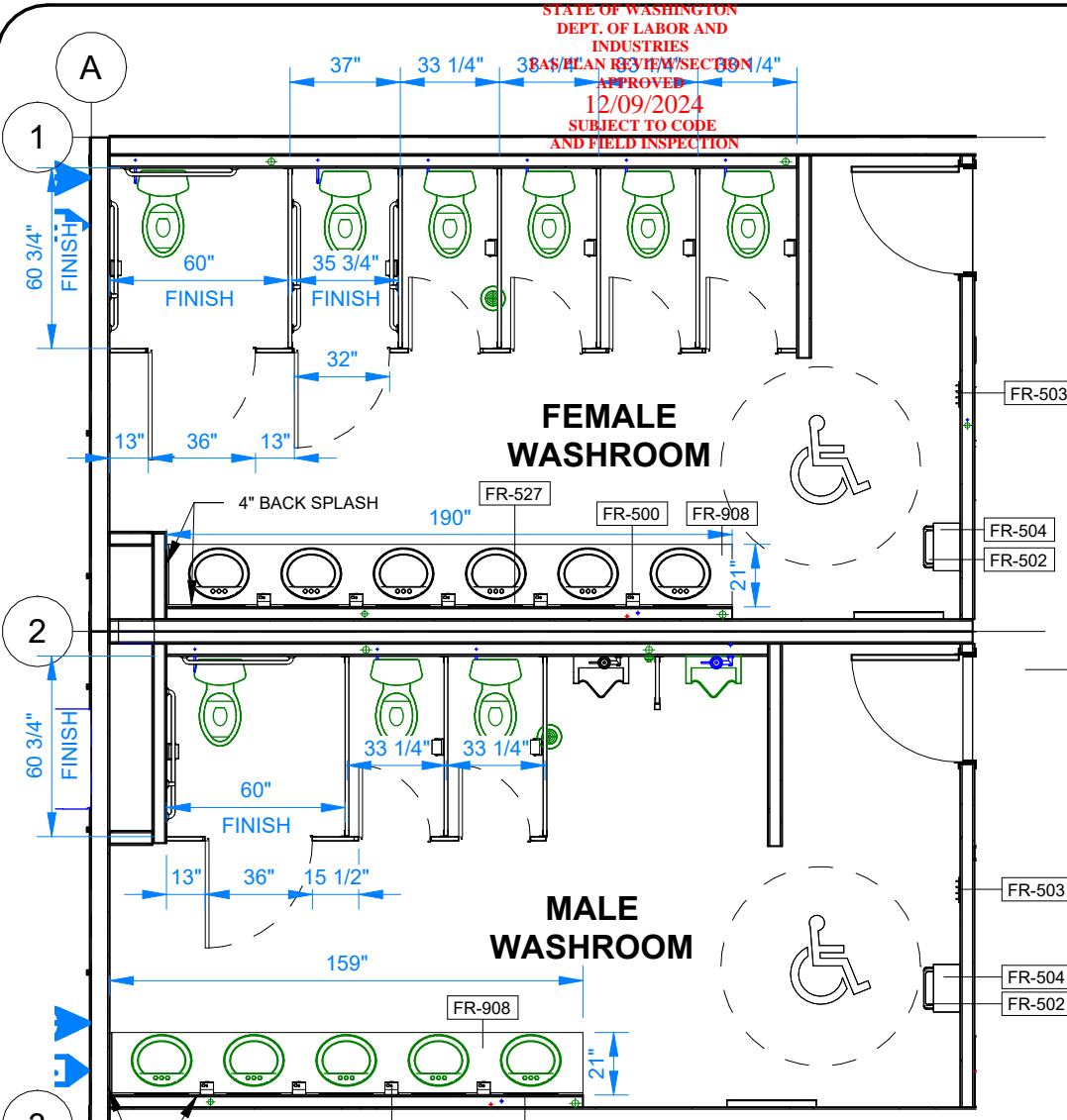
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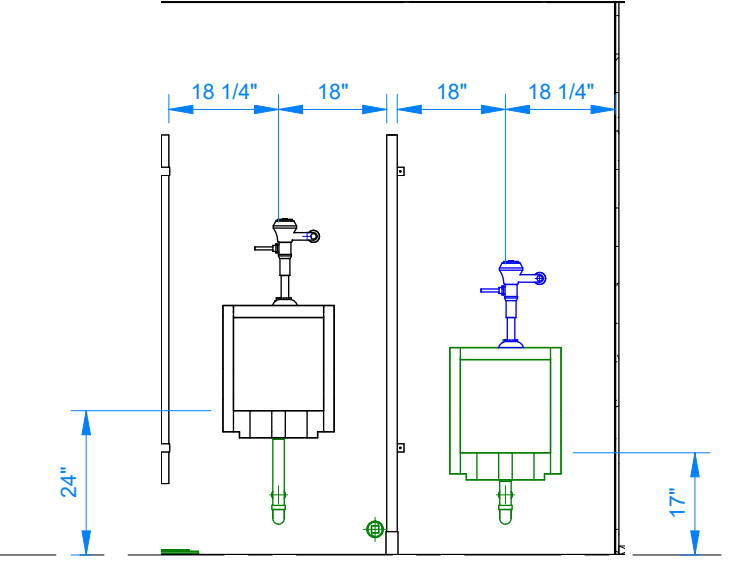
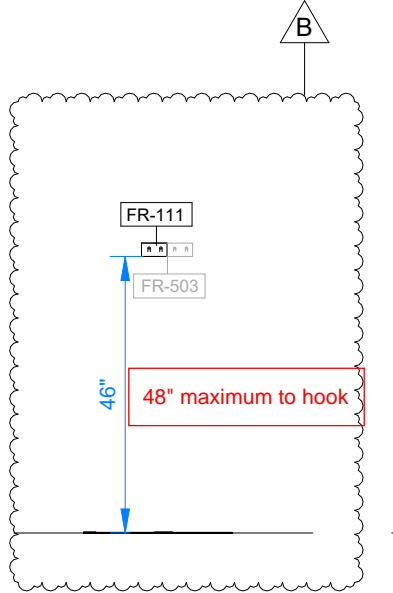
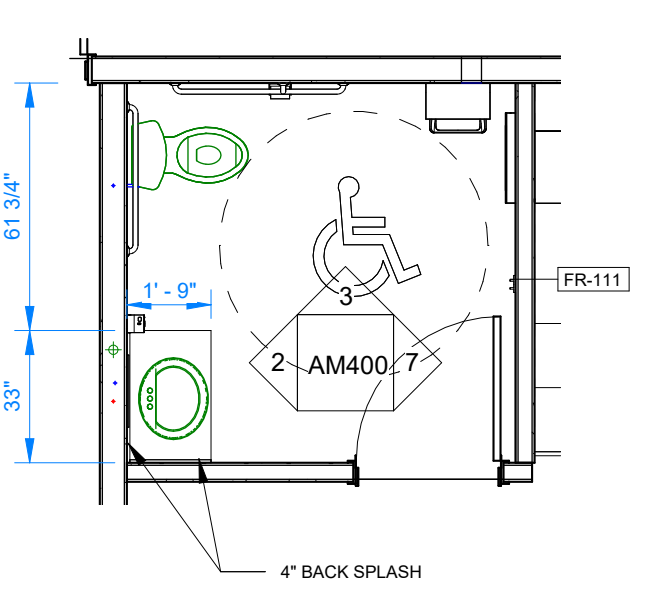
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STATE OF WASHINGTON
DEPT. OF LABOR AND
INDUSTRIES
BASIS PLAN REVIEW SECTION 14
APPROVED
12/09/2024
SUBJECT TO CODE
AND FIELD INSPECTION

City of Pasco
Development & Permitting Services
ISSUED PERMIT
Building Planning
Engineering Public Works
Fire Traffic



FURNITURE AND EQUIPMENT SCHEDULE		
TAG	QTY	DESCRIPTION
FR-100	4	VINYL CORDLESS MINI BLINDS 45"W X 47"H COLOR: WHITE
FR-111	1	COAT HOOK BOARD - 2 HOOKS - 46" AFF
FR-500	10	SOAP DISPENSER
FR-501	10	SINGLE ROLL TOILET PAPER HOLDER
FR-502	3	WALL MOUNTED WASTE DISPOSAL BIN - 7" FROM BOTTOM TO FINISHED FLOOR
FR-503	2	COAT HOOK BOARD - 4 HOOKS - 46" AFF
FR-504	3	WALL MOUNTED PAPER TOWEL DISPENSER - 46" FROM BOTTOM TO FINISHED FLOOR
FR-524	5	18" GRAB BAR, BARRIER FREE WASHROOM
FR-525	3	36" GRAB BAR, BARRIER FREE WASHROOM
FR-526	5	42" GRAB BAR, BARRIER FREE WASHROOM
FR-527	12	MIRROR BOBRICK B-165 SIZE: 18"W x 36"H
FR-908	3	ADA LAVATORY COUNTERTOP. 4" BACKSPLASH. HQ LAMINATE COLOR WILSONART COTE D'AZURE
FR-909	2	FIRE EXTINGUISHER - BY OTHERS



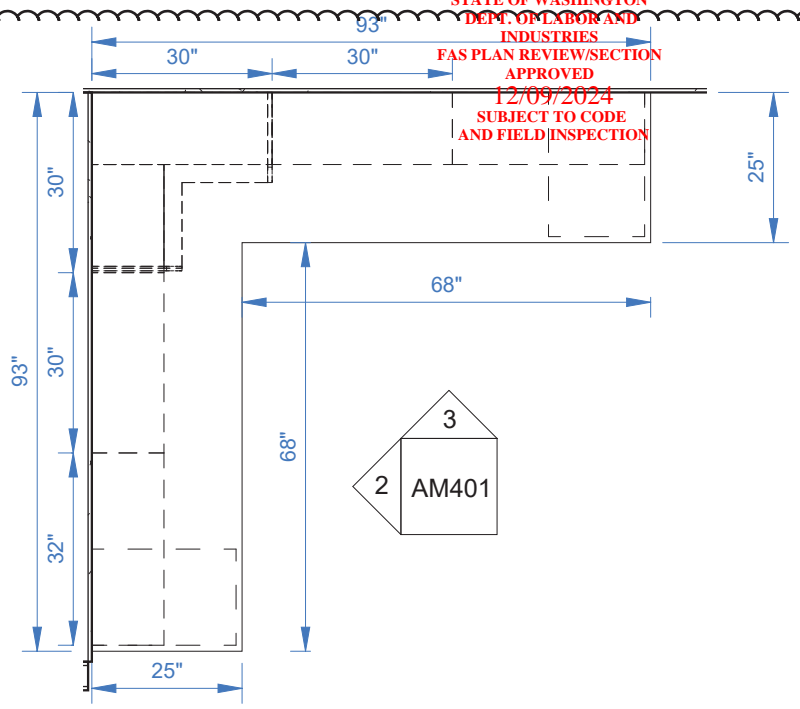
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REV.	DATE	DESCRIPTION	BY	CHK/APR
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A	2024-06-07	ISSUED FOR STATE APPROVAL	NM	

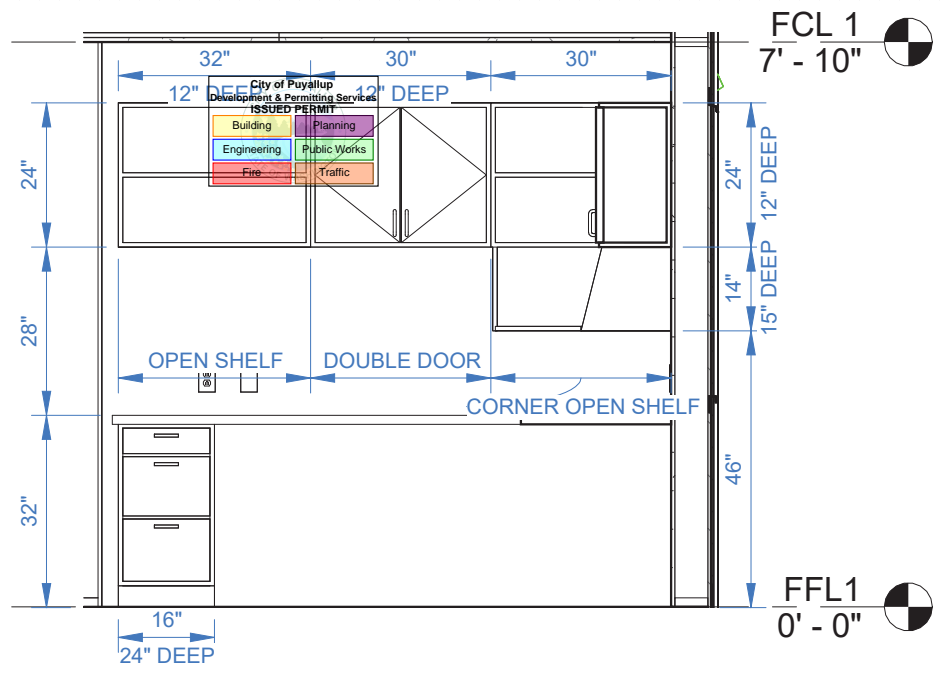
PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH
CLIENT:	CASCADE CHRISTIAN SCHOOL

DRAWING TITLE:	INTERIOR FINISH DETAILS - WASHROOM		
PROJECT NO:	1107994	DRAWING NO:	AM400
Exp. 12/09/2025		REV. #	B

STATE OF WASHINGTON
 DEPT. OF LABOR AND
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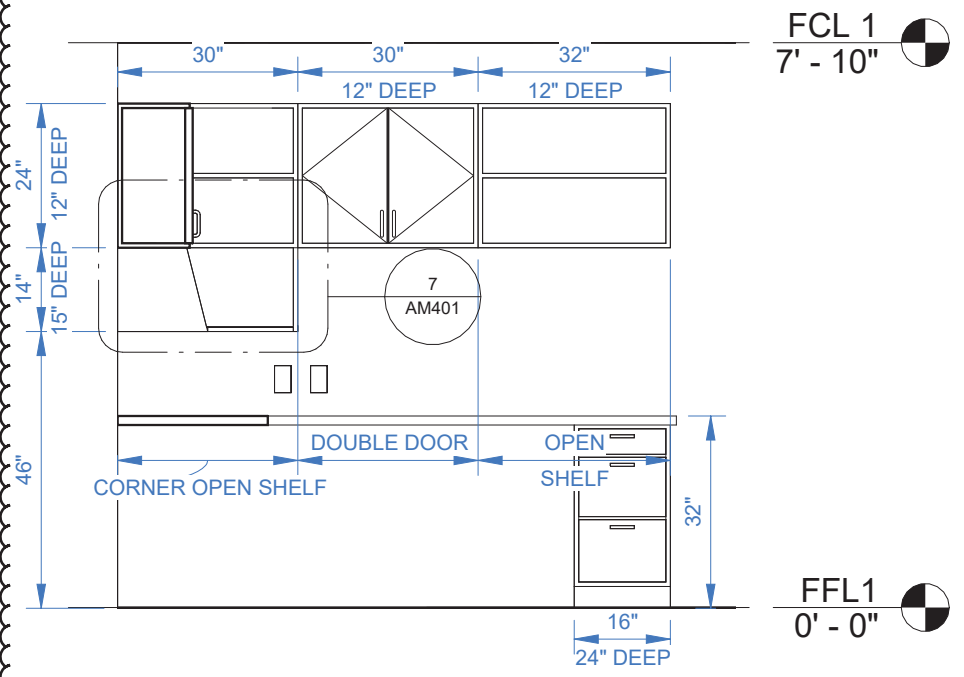
1 OPEN WORK SPACE MILLWORK
 3/8" = 1'-0"



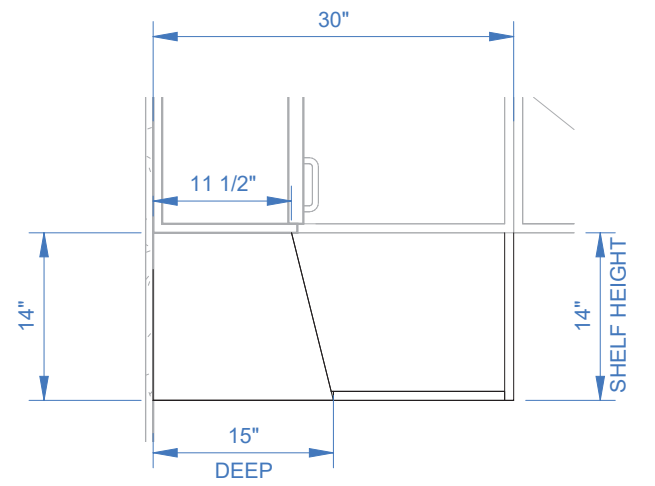
2 ELEVATION 1
 3/8" = 1'-0"

MILLWORK FINISH LEGEND

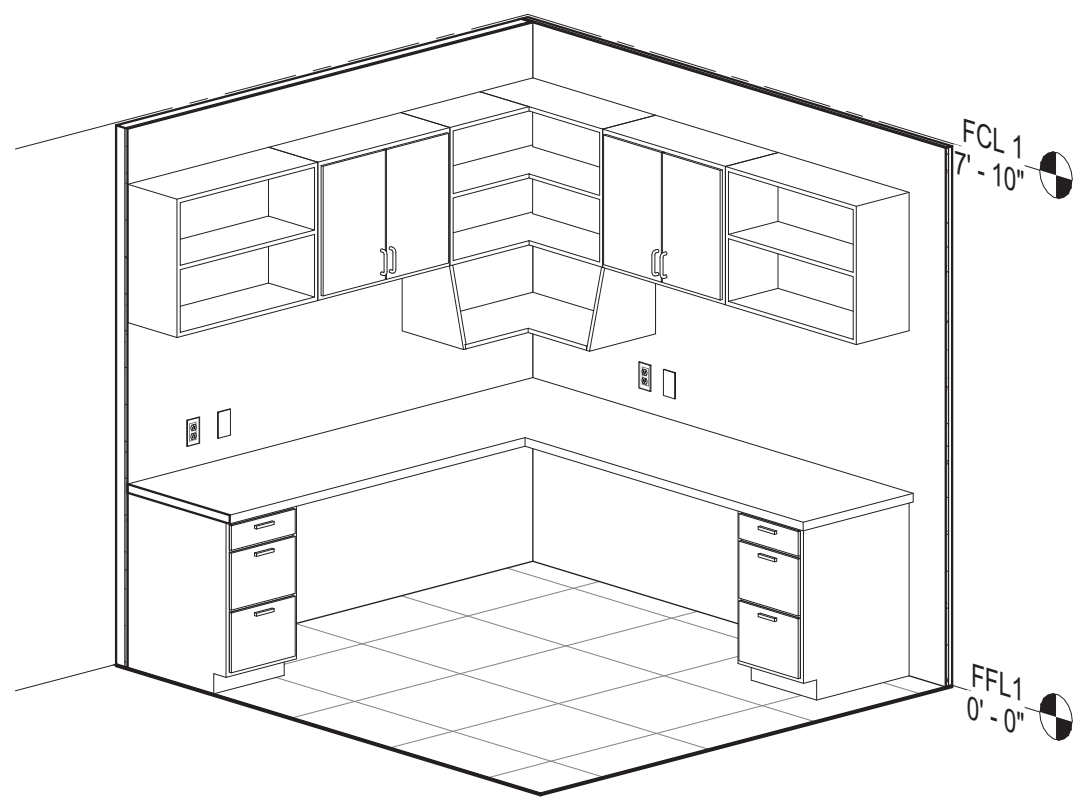
TYPE	COLOUR	MATERIAL
LOWER DRAWERS	WHITE MATTE	THERMAFOIL
UPPER CABINETS, DOORS & SHELVES	WHITE MATTE	THERMAFOIL
COUNTER TOP	COTE D'AZUR	PLASTIC LAMINATE



3 ELEVATION 2
 3/8" = 1'-0"



7 BARRIER FREE SHELF
 3/4" = 1'-0"



4 3D VIEW

PLOT DATE: 2024-10-26 4:50:39 PM
 11x17 Titleblock R2024.1

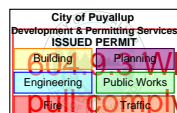
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B	2024-10-28	RE-ISSUED FOR STATE APPROVAL	NM	
A	2024-10-28	ISSUED FOR STATE APPROVAL	NM	

PROJECT:
 28x64 ASL USA SR FLEET
 OFFICE WASH
 CLIENT:
 CASCADE CHRISTIAN SCHOOL

DRAWING TITLE:
 INTERIOR FINISH DETAILS - OPEN WORK
 SPACE
 PROJECT NO:
 1107994
 DRAWING NO:
 AM401
 REV. #
 B
 Exp. 12/09/2025



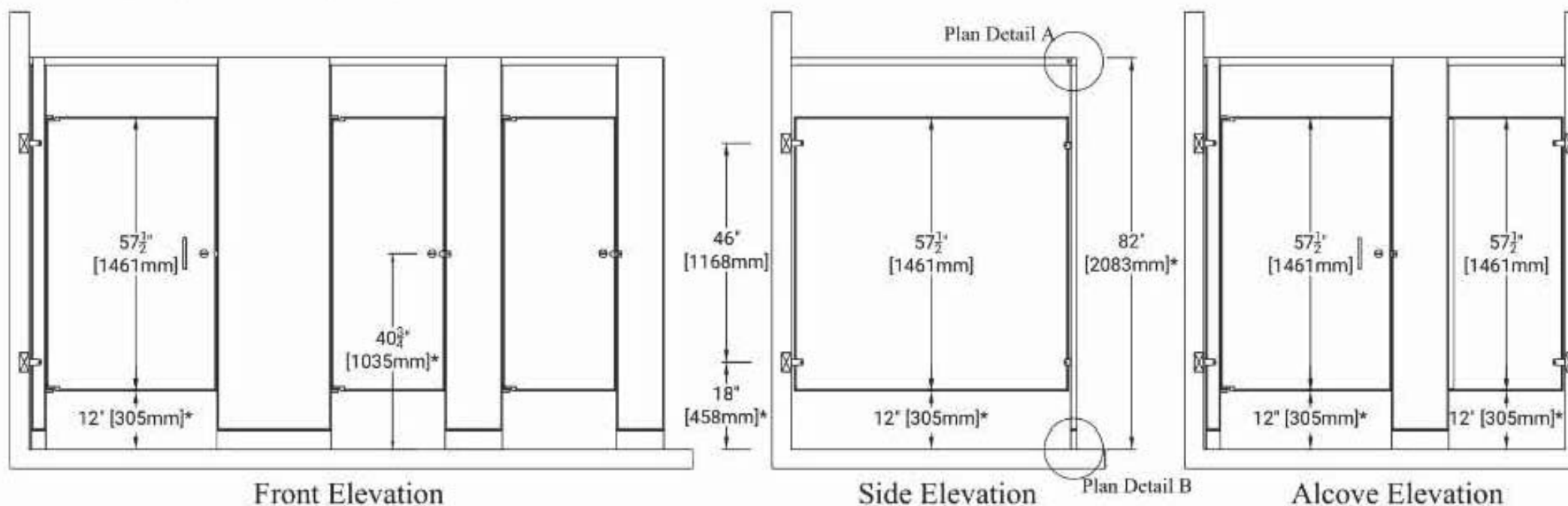
Wheelchair accessible toilet compartment doors shall be self-closing. A door complying with Section 404.2.6 shall be placed on both sides of the door near the latch. Operational parts on door shall have a shape that is easy to grasp with one hand and does not require tight grasping, pinching or twisting of the wrist to operate and shall be 34 inches minimum and 48 inches maximum above the floor.

404.2.7 Door closing speed for door closers shall be adjusted so that from an open position of 90 degrees, the time required to move the door or gate to an open position of 12 degrees shall be 5 seconds minimum.

Metal Toilet Partitions

Standard Series - Headrail Braced - 12" [305mm] AFF

Chrome - Concealed Latch & Concealed Hinge

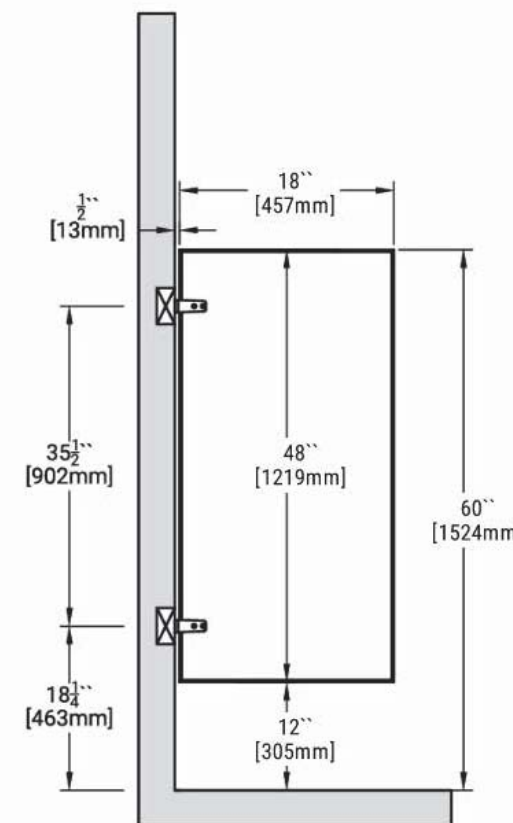


Metal Urinal Screens

Standard Series - Wall mounted

12" [305mm] AFF

Stirrups Bracket Installation



PLOT DATE: 2024-10-26 4:55:53 PM

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B	2024-10-28	RE-ISSUED FOR STATE APPROVAL	NM	
A	2024-10-28	ISSUED FOR STATE APPROVAL	NM	

PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH	DRAWING TITLE:	INTERIOR FINISH DETAILS - WASHROOM PARTITIONS	
CLIENT:	CASCADE CHRISTIAN SCHOOL	PROJECT NO:	1107994	REV. #
		DRAWING NO:	AM402	B

Exp. 12/09/2025

PLOT DATE: 2024-10-23 11:32:21 AM

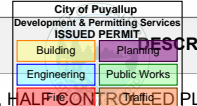
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DRAWING LIST - ELECTRICAL MANUFACTURING

SHEET NUMBER	SHEET NAME SUBJECT TO CODE AND FIELD INSPECTION
EM001	ELECTRICAL DRAWING LIST, LEGEND & SINGLE LINE DIAGRAM
EM002	GENERAL NOTES & LIGHTING BUDGET CALCULATIONS
EM101	OVERALL POWER & DATA PLAN - LEVEL 1
EM201	OVERALL LIGHTING PLAN - LEVEL 1
EM301	OVERALL FIRE ALARM PLAN - LEVEL 1
EM302	FIRE RISER DIAGRAM
EM500	ELECTRICAL DETAILS
EM501	ELECTRICAL DETAILS
EM600	PANEL SCHEDULES
EM603	LPD CALCULATIONS
EM604	LOAD CALCULATIONS
Grand total: 11	

STATE OF WASHINGTON
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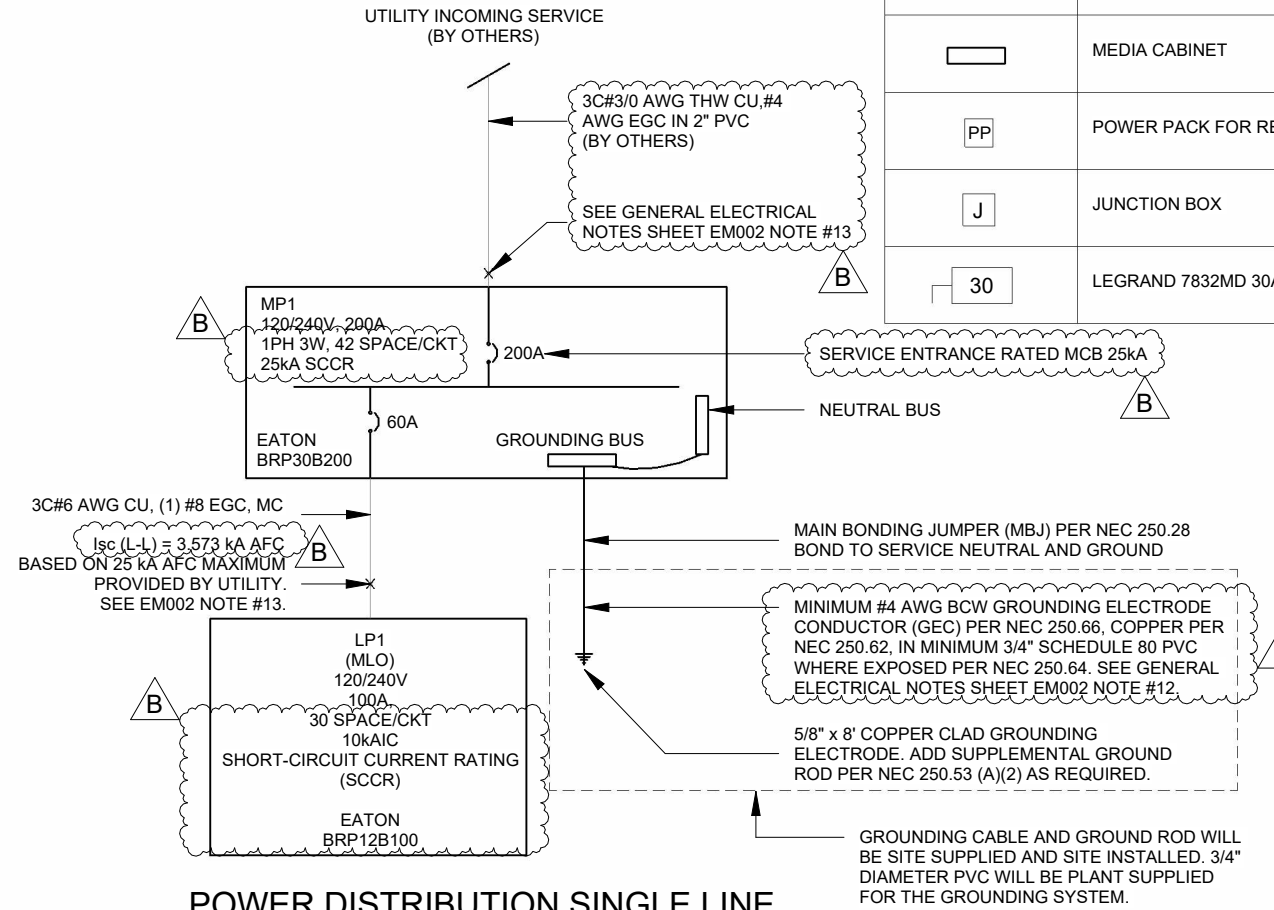
POWER & DATA SYMBOL LEGEND

SYMBOL	DESCRIPTION	MOUNTING HEIGHT
	20A, 125V, HALF-CONTROLLED PLUG LOAD DUPLEX RECEPTACLE, WHITE	18" AFF TO CENTRE OF DEVICE BOX, UNLESS OTHERWISE SPECIFIED
	RADIANT TAMPER RESISTANT 20A SELF-TEST GFCI RECEPTACLES WITH SAFELOCK PROTECTION, WHITE	REFER TO DRAWING FOR DETAILS
	HARDWIRED ELECTRICAL CONNECTION TO EQUIPMENT	
	DATA OUTLET	18" AFF TO CENTRE OF DEVICE BOX, UNLESS OTHERWISE SPECIFIED
	ELECTRICAL PANELBOARD, REFER TO PANEL SCHEDULE FOR SIZING, MODEL AND BREAKER LAYOUT	66" AFF TO HIGHEST OVERCURRENT DEVICE
	MEDIA CABINET	60" AFF TO THE TOP THE CABINET
	POWER PACK FOR RECEPTACLES	CEILING MOUNTED
	JUNCTION BOX	CEILING MOUNTED
	LEGRAND 7832MD 30A DISCONNECT	48" AFF TO CENTRE OF DEVICE BOX, UNLESS OTHERWISE SPECIFIED

LIGHTING SYMBOL LEGEND

SYMBOL	DESCRIPTION	MOUNTING HEIGHT
	LOW VOLTAGE LIGHT SWITCH	48" AFF TO CENTRE, UNLESS OTHERWISE SPECIFIED
	UNIVERSAL RUNNING MAN EXIT SIGN / DIRECTIONAL SIGNAGE PROVIDED WITH ARROW	84" AFF TO CENTRE, UNLESS OTHERWISE SPECIFIED
	EMERGENCY LIGHT BATTERY UNIT	87" AFF TO CENTRE, UNLESS OTHERWISE SPECIFIED
	EMERGENCY LIGHT DOUBLE REMOTE HEAD	84" AFF TO CENTRE, UNLESS OTHERWISE SPECIFIED
	EXTERIOR LIGHT FIXTURE	77" AFF TO WIRE HOLE, UNLESS OTHERWISE SPECIFIED
	EMERGENCY LIGHT SINGLE REMOTE HEAD	84" AFF TO CENTRE, UNLESS OTHERWISE SPECIFIED
	WIRELESS CEILING MOUNTED OCCUPANCY SENSOR	CEILING MOUNTED
	TROFFER FIXTURE	CEILING MOUNTED
	WIRELESS REMOTE CONTROL SWITCH	48" AFF TO CENTRE, UNLESS OTHERWISE SPECIFIED
	POWER PACK FOR LIGHTING	CEILING MOUNTED
	FIXTURE TYPE TAG - REFER TO LUMINAIRE SCHEDULE	N/A

21FBS2400126



MECHANICAL DEVICE LEGEND

SYMBOL	DESCRIPTION	MOUNTING HEIGHT
	THERMOSTAT	REFER TO MECHANICAL PLAN

ELECTRICAL ABBREVIATIONS

ABBREVIATION	DESCRIPTIONS
AFF	ABOVE FINISHED FLOOR
DP	DISTRIBUTION PANEL
FACP	FIRE ALARM CONTROL PANEL
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
MCA	MINIMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MLO	MAIN LUG ONLY
MOCB	MAXIMUM OVERCURRENT CIRCUIT PROTECTION
MP	MAIN PANEL
SCCR	SHORT-CIRCUIT CURRENT RATING
SP	SUB-PANEL
WP	WEATHER PROOF

FIRE ALARM SYMBOL LEGEND FOR REFERENCE ONLY

SYMBOL	DESCRIPTION	MOUNTING HEIGHT
	SMOKE DETECTOR (BY OTHERS)	CEILING MOUNTED
	MANUAL PULL STATION (BY OTHERS)	42" AFF TO CENTRE, UNLESS OTHERWISE SPECIFIED
	HORN/ STROBE (BY OTHERS)	84" AFF TO CENTRE, UNLESS OTHERWISE SPECIFIED
	STROBE (BY OTHERS)	84" AFF TO CENTRE, UNLESS OTHERWISE SPECIFIED
	HEAT DETECTOR (BY OTHERS)	CEILING MOUNTED

NOTE:
1. ONLY ROUGH INS WILL BE PROVIDED AT PLANT. ALL WIRING DEVICES AND CABLING WILL BE SITE SUPPLIED AND SITE INSTALLED, BY OTHERS
2. WAC-296-46B 760 FIRE ALARM BOXES SHALL BE RED IN COLOR INSIDE AND OUT.

NO part of system is reviewed or approved

POWER DISTRIBUTION SINGLE LINE DIAGRAM N.T.S

CODE & DESIGN COMPLIANCE
REFERENCE
1. WASHINGTON STATE BUILDING CODE 2021
2. NATIONAL ELECTRICAL CODE 2023

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B	2024-10-23	RE-ISSUED FOR STATE APPROVAL	OS	AH
A	2024-06-07	ISSUED FOR STATE APPROVAL	DB	

PROJECT: 28x64 ASL USA SR FLEET OFFICE WASH	DRAWING TITLE: ELECTRICAL DRAWING LIST, LEGEND & SINGLE LINE DIAGRAM
CLIENT: CASCADE CHRISTIAN SCHOOL	PROJECT NO: 1107994
	DRAWING NO: EM001
	REV. # B

Exp. 12/09/2025

ENERGY CODE NOTES - LIGHTING

ENERGY CODE NOTES - LIGHTING

-LIGHTING CONTROL METHOD TO COMPLY TO GENERAL LIGHTING CONTROL REQUIREMENTS (C405.2.10):

OCCUPANCY SENSORS WILL BE INSTALLED THROUGHOUT BUILDING (C405.4.2(1)) OCCUPANCY SENSORS SHALL BE CONFIGURED TO TURN OFF LIGHTS WITHIN 20MIN OF ALL OCCUPANTS LEAVING THE SPACE; THEY SHALL BE MANUAL ON, OR CONFIGURED TO AUTOMATICALLY TURN ON THE LIGHTING TO NOT MORE THAN 50% POWER; THEY NEED TO INCORPORATE A MANUAL CONTROL TO ALLOW OCCUPANTS TO TURN LIGHTS OFF. MANUAL CONTROLS ARE NOT REQUIRED IN CORRIDORS, STAIRWAYS, RESTROOMS, LOCKER ROOMS, LOBBIES OR OTHER AREAS WHERE A MANUAL OPERATION WOULD ENDANGER SAFETY OR SECURITY.

-TIME SWITCH CONTROLS: NOT REQUIRED (C405.2.2.)

-MANUAL CONTROLS: REQUIRED (C405.2.3.) - PROVIDED WITH REMOTE CONTROL SWITCHES.

-LIGHTING REDUCTION CONTROLS (C405.2.4.) - NOT REQUIRED

-DAYLIGHT RESPONSE CONTROLS (C405.2.5.) - NOT PROVIDED.

-ADDITIONAL LIGHTING CONTROLS (C405.2.6): NOT PROVIDED

-AREA CONTROLS (C495.2.7): NOT REQUIRED

-ADVANCED LIGHTING CONTROLS (C405.2.8.): NOT REQUIRED

-EXTERIOR LIGHTING CONTROLS (C405.2.9): CONTROLS TO COMPLY TO C405.2.9.1 - C405.2.9.4.

DAYLIGHT SHUTOFF (C405.2.9.1.) THE EXTERIOR LIGHTING COMES WITH A BUILT-IN PHOTOMETRIC SENSOR THAT SHUTS-OFF THE LIGHT ONCE THE SET LIGHTING LEVEL IS ACHIEVED. REQUIRED, FIXTURES C/W DAYLIGHT SENSING PROVIDED BUILDING FACADE, LANDSCAPE LIGHTING (C405.2.9.2.): NOT PROVIDED

-INTERIOR LIGHTING POWER REQUIREMENTS : TOTAL CONNECTED INTERIOR LIGHTING POWER IS NO GREATER THAN INTERIOR LIGHTING

POWER ALLOWANCE (C405.4.): SEE WSEC SPREADSHEET CALCULATION, BUILDING AREA METHOD USED

-EXTERIOR LIGHTING POWER REQUIREMENTS (C405.5) : TOTAL CONNECTED EXTERIOR LIGHTING POWER IS NO GREATER THAN EXTERIOR

LIGHTING POWER ALLOWANCE: SEE WSEC SPREADSHEET CALCULATION, EXTERIOR LIGHTING ZONE: 2

LIGHTING BUDGET CALCULATIONS

MAXIMUM ALLOWED INTERIOR LIGHTING LOAD (NFPA 2023 220.42a)

Table with 4 columns: SPACE TYPE, AREA, VA/FT², ALLOWED VA. Rows include CLASSROOM (1792 ft², 1.3, 2329.6 VA) and TOTAL ALLOWED VA (2329.6 VA).

LIGHT REDUCTION / REDUCED LIGHTING POWER (PER WSEC C406.3.1)

TOTAL ALLOWED VA X 0.75 = 2329.6 VA x 0.75 = 1747.2 VA SECTION C4006 ADDITIONAL EFFICIENCY OPTIONS

PROPOSED INTERIOR LIGHTING PACKAGE:

(12) LED 2'X4' TROFFER AUTO DIMMABLE @ 39VA/FIXTURE 480 VA TOTAL PROPOSED LIGHTING LOAD FOR THE COMPLEX 480 VA

PERCENTAGE OF INSTALLED INTERIOR LIGHTING CONFIGURED WITH ENHANCED CONTROL FUNCTIONS (WSEC C406.4)

100% / 12 LIGHTS = 8.33% PER LIGHT, 20 LIGHTS W/ ENHANCED CONTROLS X 8.33 = 100%

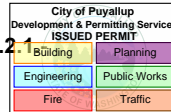
MAXIMUM ALLOWABLE EXTERIOR LIGHTING WATTAGE FOR BUILDING ENTRANCES & EXITS

(2) ENTRANCES X 3 ft @ 19.6W/linear-ft (WSEC TABLE C405.5.3(2), ZONE 4 117.6 W

PROPOSED EXTERIOR LIGHTING PACKAGE:

(2) LED 3CCT SELECTABLE AUTO DIMMABLE UL CERTIFIED @ 20VA/FIXTURE 40 VA

STATE OF WASHINGTON DEPT. OF LABOR AND INDUSTRIES FAS PLAN REVIEW/SECTION APPROVED 12/09/2024 SUBJECT TO CODE INSPECTION



WAC296.46B-010(7) All electrical equipment, materials, devices, and appliances shall be listed to U.S. Standards. Definition: "Electrical equipment" includes electrical conductors, conduit, raceway, apparatus, materials, components, and other electrical equipment not exempted by RCW 19.28.006. Approved NRTAs can be found here:

https://lni.wa.gov/licensing-permits/electrical/electrical-installation-information/electrical-product-testing-and-engineering-evaluation#accredited-product-testing-laboratories



GENERAL ELECTRICAL NOTES:

21FBS2400126

- 1. ALL WIRE SHALL BE MIN OF #12 AWG, UNLESS OTHERWISE SPECIFIED.
2. UNLESS OTHERWISE INDICATED, ALL WIRES AND CABLES SHALL BE COPPER AND MC TYPE
3. ALL WIRING MUST CONFORM TO NFPA 70, 72 & 101.
4. ALL ELECTRICAL DEVICES ARE TO BE WHITE IN COLOUR.
5. ALL DIMENSIONS ARE APPROXIMATE, UNLESS OTHERWISE SPECIFIED.
6. LOCATION OF ELECTRICAL DEVICES ARE APPROXIMATE, UNLESS OTHERWISE SPECIFIED.
7. ALL MOUNTING HEIGHTS ARE ABOVE FINISHED FLOOR (AFF), UNLESS OTHERWISE SPECIFIED.
8. ALL WIRES AND JUNCTION BOXES SHALL BE APPROPRIATELY LABELLED.
9. ALL ELECTRICAL COMPONENTS SHALL CONFORM WITH UL LISTING & FM APPROVAL.
10. WHERE DEVICE RELOCATION IS REQUIRED DUE TO CONFLICTS WITH OTHER DEVICES AND/OR EQUIPMENT, THE ELECTRICAL CONTRACTOR SHALL INSTALL THE DEVICES UP TO 1M/3 FEET FROM ORIGINAL LOCATION WITHOUT APPROVAL FROM THE ENGINEER. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL REDLINE DRAWINGS TO ATCO ENGINEERING UPON COMPLETION OF MANUFACTURING.
11. WHERE A DEVICE IS SPECIFIED WITH AN EXACT MODEL NUMBER AND AN ALTERNATE IS PROVIDED, ENGINEERING MUST BE NOTIFIED AND THE ALTERNATE DEVICES MUST BE APPROVED PRIOR TO INSTALLATION.
12. GROUNDING WIRE SIZE IS BASED ON THE 3/0 CALCULATED INCOMING FEEDER SIZE. IN CASE THERE WILL BE CHANGES, WIRE SIZE SHALL BE BASED AS PER NEC TABLE 250.66 (GROUNDING ELECTRODE CONDUCTOR FOR ALTERNATING-CURRENT SYSTEMS).
13. INSTALLER SHALL:
a. VERIFY THE AVAILABLE FAULT CURRENT (AFC) AS PROVIDED BY THE UTILITY.
b. IF THE AFC EXCEEDS 25 KAIC (RATING OF DESIGNATED PANEL), CONSULT WITH ENGINEER BEFORE CONTINUING WITH INSTALLATION.
c. FURNISH AND INSTALL FIELD MARKING PER NEC 110.24(A)

LIGHTING NOTES:

- 1. REFER TO LUMINAIRE SCHEDULE FOR LIGHT FIXTURE TYPES.
2. ALL WIRE SHALL BE #12 AWG FOR EMERGENCY LIGHTING CIRCUITS.
3. DISCONNECT LEADS OF THE EMERGENCY BATTERY PACKS FROM BATTERY TERMINALS PRIOR TO SHIPPING. ONCE ON SITE, RECONNECT LEADS, CHARGE FOR TWENTY-FOUR (24) HOURS THEN TEST ALL EMERGENCY/EXIT LIGHT BATTERIES FOR 30 MINUTES.
4. SEND ALL SITE TESTING DOCUMENTATION TO ATCO ENGINEERING PRIOR TO PROJECT COMPLETION (IF APPLICABLE)

POWER NOTES:

- 1. TELEPHONE/DATA OUTLETS SHALL HAVE 3/4" EMT CONDUIT STUBBED UP TO CEILING SPACE COMPLETE WITH PLASTIC BUSHING. PULL STRING SHALL BE SUPPLIED FOR EACH OUTLET.
2. ALL THERMOSTAT WIRE SHALL BE 7C#18 LOW VOLTAGE WIRE.
3. ALL ELECTRIC RESISTANCE SPACE HEATERS SHALL BE CONTROLLED BY INDEPENDENT THERMOSTATS LOCATED IN THE SPACE AS PER NEC 2023.
4. PROVISIONS FOR HEAT TRACE USING A 1" EMT STUB DOWN PROVIDED WITH GFCI CIRCUIT BREAKER.
5. REFER TO MECHANICAL DRAWINGS FOR EXACT LOCATIONS AND MOUNTING HEIGHTS OF ALL MECHANICAL EQUIPMENT PRIOR TO INSTALLATION.
6. ALL RECEPTACLE COVER PLATES SHALL BE LABELED WITH WHITE LABELS C/W BLACK LETTERING AND SHALL IDENTIFY THE PANEL NAME AND CIRCUIT BREAKER NUMBER.
7. PROVIDE LABELS FOR SPECIAL PURPOSE SWITCHES, RECEPTACLES AND ELECTRICAL DEVICES.
8. ALL ELECTRICAL MATERIAL AND INSTALLATIONS SHOWN AND/OFF SPECIFIED SHALL BE INSTALLED AS PER THE MANUFACTURER'S RECOMMENDATIONS AND SHALL COMPLY IN STRICT ACCORDANCE WITH THE LATEST EDITION OF CSA STANDARDS AND THE NEC 2023.
9. SEND ALL SITE TESTING DOCUMENTATION TO ATCO ENGINEERING PRIOR TO PROJECT COMPLETION.

PANELBOARD NOTES:

- 1. PANELBOARDS SHALL BE COMPLETE WITH LOCKABLE PANEL DOORS, PANEL SCHEDULES, ARC FLASH STICKERS.
2. MAIN SERVICE CONNECTION TO MAIN PANELBOARD TO BE COMPLETED ON SITE (BY OTHERS).
3. SCHEDULE 40 RIGID POLYVINYL CHLORIDE STUBDOWN PROVIDED FOR MAIN SERVICE ENTRANCE AS PER WAC 296-46B-230 043 (7).



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Revision table with columns: REV., DATE, DESCRIPTION, BY, CHK/APR. Includes entries for RE-ISSUED FOR STATE APPROVAL.

Project information table including PROJECT: 28x64 ASL USA SR FLEET OFFICE WASH, CLIENT: CASCADE CHRISTIAN SCHOOL, DRAWING TITLE: GENERAL NOTES & LIGHTING BUDGET CALCULATIONS, PROJECT NO: 1107994, DRAWING NO: EM002, REV. # B.

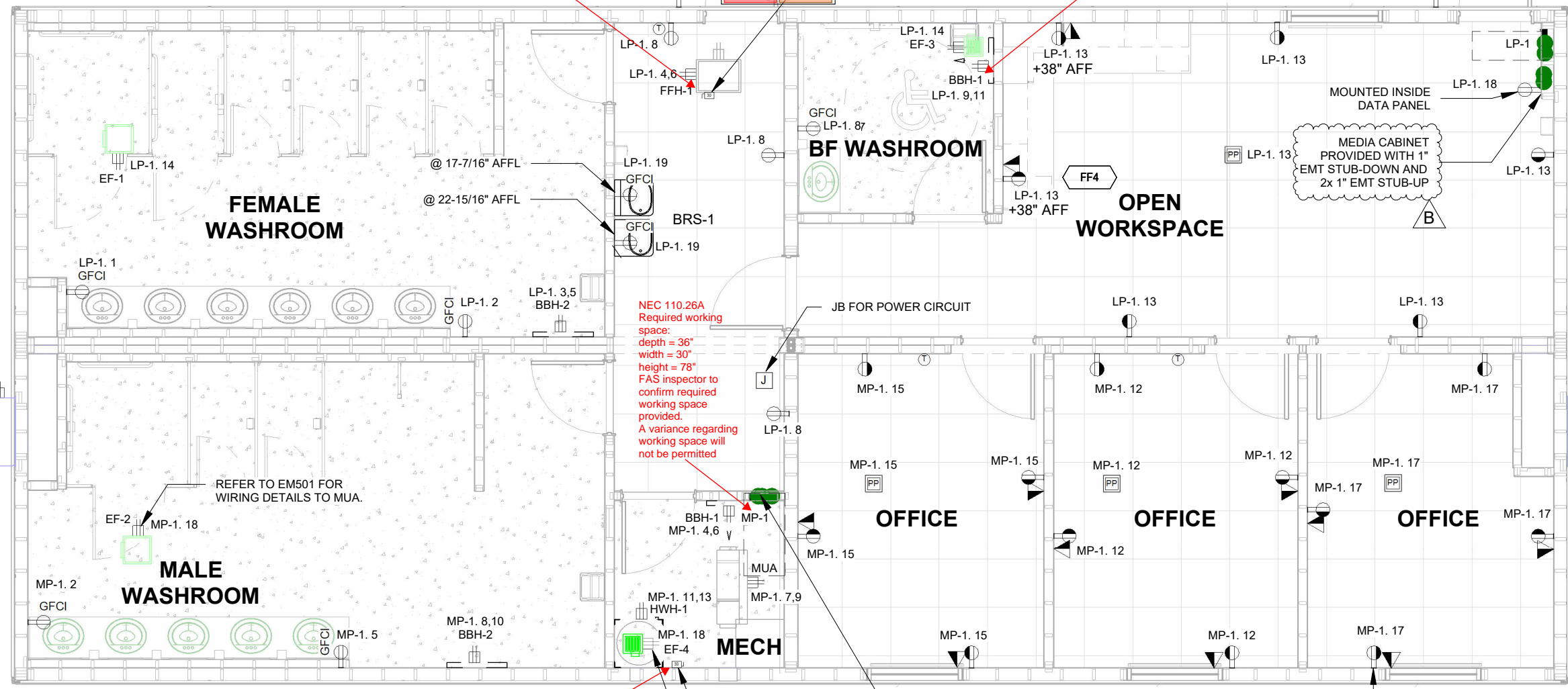
STATE OF WASHINGTON
DEPT. OF LABOR AND
INDUSTRIES
WAC 296-150F 0500
FAS PLAN REVIEW 10/22/24
Approval plates on disconnecting means
are to show designation of circuit source
panel board that supplies disconnect, circuit
numbers, and identify what it is disconnecting. Must
SUBJECT TO CODE
AND FIELD IDENTIFICATION PLATE. (Not a sticker)
Install identification plate on FFH-1 disc.

WAC 296-46B 010(7) Elect. Baseboard heaters (BBH) shall be listed to US standards as evaluated by a national recognized testing laboratory approved by WA State L&I Electrical section.
---- FAS inspector to confirm "US" listing of baseboard heaters.

21FBS2400126

ENERGY CODE NOTES - POWER
-50% OF RECEPTACLES IN ENCLOSED OFFICES, CONFERENCE ROOMS, BREAK ROOMS TO HAVE CONTROLLED RECEPTACLES,
-CONTROLLED RECEPTACLES ARE SPLIT RECEPTACLES CONNECTED TO POWER PACK, AND CONTROLLED BY OCCUPANCY SENSOR (C405.10.1.)

City of Puyallup Development & Permitting Services ISSUED PERMIT	
Building	Planning
Engineering	Public Works
Fire	Traffic



NEC 110.26A
Required working space:
depth = 36"
width = 30"
height = 78"
FAS inspector to confirm required working space provided.
A variance regarding working space will not be permitted

WAC 296.46B 110.022
Identification plates on disconnecting means are to show designation of circuit source panel board that supplies disconnect, circuit numbers, and identify what it is disconnecting. Must be an IDENTIFICATION PLATE. (Not a sticker)
Install identification plate on or adjacent to HVAC disconnect access panel (typ. all HVAC units)

WAC 296.46B 010(4), WAC 296-150F 0500
All electrical wiring and equipment must be sufficiently accessible, at the time of inspection, to allow the inspector to visually inspect the installation. Cover inspection required for electrical and other systems, including insulation, enclosed in walls. Ceiling, floor.

1 FFL 1 - E - POWER & SYSTEMS
3/16" = 1'-0"



EF'S TO BE CONNECTED TO LIGHTING CIRCUIT AND OCCUPANCY SENSOR

WAC296.46B-010(7) All electrical equipment, materials, devices, and appliances shall be listed to U.S. Standards.
Definition: "Electrical equipment" includes electrical conductors, conduit, raceway, apparatus, materials, components, and other electrical equipment not exempted by RCW 19.28.006.

WAC 296.46B 110.022
ID plate on HWH-1 Disc.

30A DISCONNECT SWITCH FOR HWH-1

COMPLETE PV SYSTEM, INVERTER, GATEWAYS & CONTROLLER WILL BE LOCATED IN THE ADJACENT BUILDING (SITE SUPPLIED AND INSTALLED BY OTHERS)
PROVIDED WITH STUB DOWN USING 1" EMT FOR FUTURE PV SYSTEMS
REFER TO EM600 MP-1 PANEL SCHEDULE FOR OTHER STUBS

HALF-CONTROLLED TYPE RECEPTACLE (TYPICAL)
REFER TO POWER LEGEND ON SHEET EM001 AND SHEET EM500 FOR RECEPTACLE WIRING DETAILS

FOR PERMIT

REV.	DATE	DESCRIPTION	BY	CHK/APR
B	2024-10-23	RE-ISSUED FOR STATE APPROVAL	OS	AH
A	2024-06-07	ISSUED FOR STATE APPROVAL	DB	

PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH
CLIENT:	CASCADE CHRISTIAN SCHOOL

DRAWING TITLE:	OVERALL POWER & DATA PLAN - LEVEL 1		
PROJECT NO:	1107994	DRAWING NO:	EM101
Exp. 12/09/2025		REV. #	B

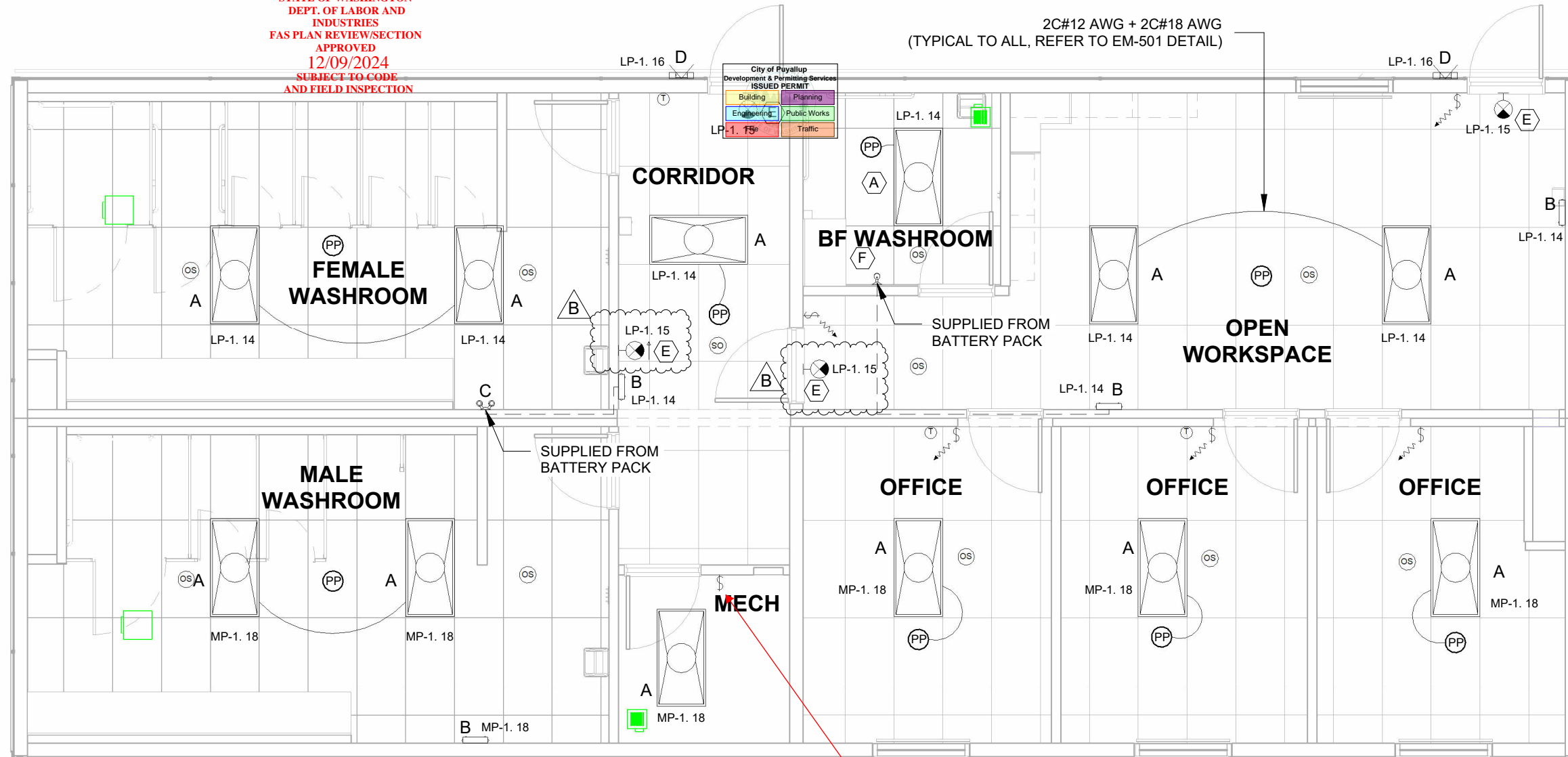
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R2024.1
11x17 Titleblock

STATE OF WASHINGTON
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AND FIELD INSPECTION

City of Puyallup
Development & Permitting Services
ISSUED PERMIT
Building Planning
Engineering Public Works
LP-1. FS Traffic

2C#12 AWG + 2C#18 AWG
(TYPICAL TO ALL, REFER TO EM-501 DETAIL)



WAC296.46B-010(7) All electrical equipment, materials, devices, and appliances shall be listed to U.S. Standards. Definition: "Electrical equipment" includes electrical conductors, conduit, raceway, apparatus, materials, components, and other electrical equipment not exempted by RCW 19.28.006.

WSEC 405.2.1 Occupancy sensor required in Mech rm. NEC 110.26D - must have override

WAC 296.46B 010(4), WAC 296-150F 0500 All electrical wiring and equipment must be sufficiently accessible, at the time of inspection, to allow the inspector to visually inspect the installation. Cover inspection required for electrical and other systems, including insulation, enclosed in walls. Ceiling, floor.

1 FFL 1 - E - LIGHTING
3/16" = 1'-0"

NOTE:
1. ENTRY, MECH ROOM, WASHROOM'S LIGHTS ARE NON DIMMABLE, FUNCTION IS ON/OFF.
2. OFFICES & OPEN WORKSPACE WILL BE PROVIDED WITH DIMMING FUNCTION.

LUMINAIRE SCHEDULE							
TAG	COUNT	MANUFACTURER	MODEL	DESCRIPTION	LAMP COLOUR	WATTAGE	VOLTAGE
A	12	COOPER LIGHTING	24FP4740C	2X4 LED TROFFER FIXTURE	4000 K	40 W	
B	4	HUBBELL	PE2EU	EMERGENCY BATTERY PACK			
C	1	HUBBELL	PERHC	EMERGENCY REMOTE HEAD, DOUBLE			
D	2	AIMLITE	W31-L GEN 2	LED WALL LIGHT EXTERIOR WITH PHOTOCCELL, NO5000 K JB NEEDED		14 W	
E	4	HUBBELL	CCRRC	WALL/ CEILING MOUNT EXIT SIGN			
F	1	HUBBELL	PERHC	EMERGENCY REMOTE HEAD, SINGLE			



KEY PLAN

101
102

PLOT DATE: 2024-10-23 11:32:25 AM

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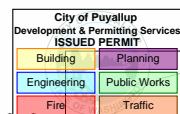
FOR PERMIT

REV.	DATE	DESCRIPTION	BY	CHK/APR
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A	2024-06-07	ISSUED FOR STATE APPROVAL	DB	

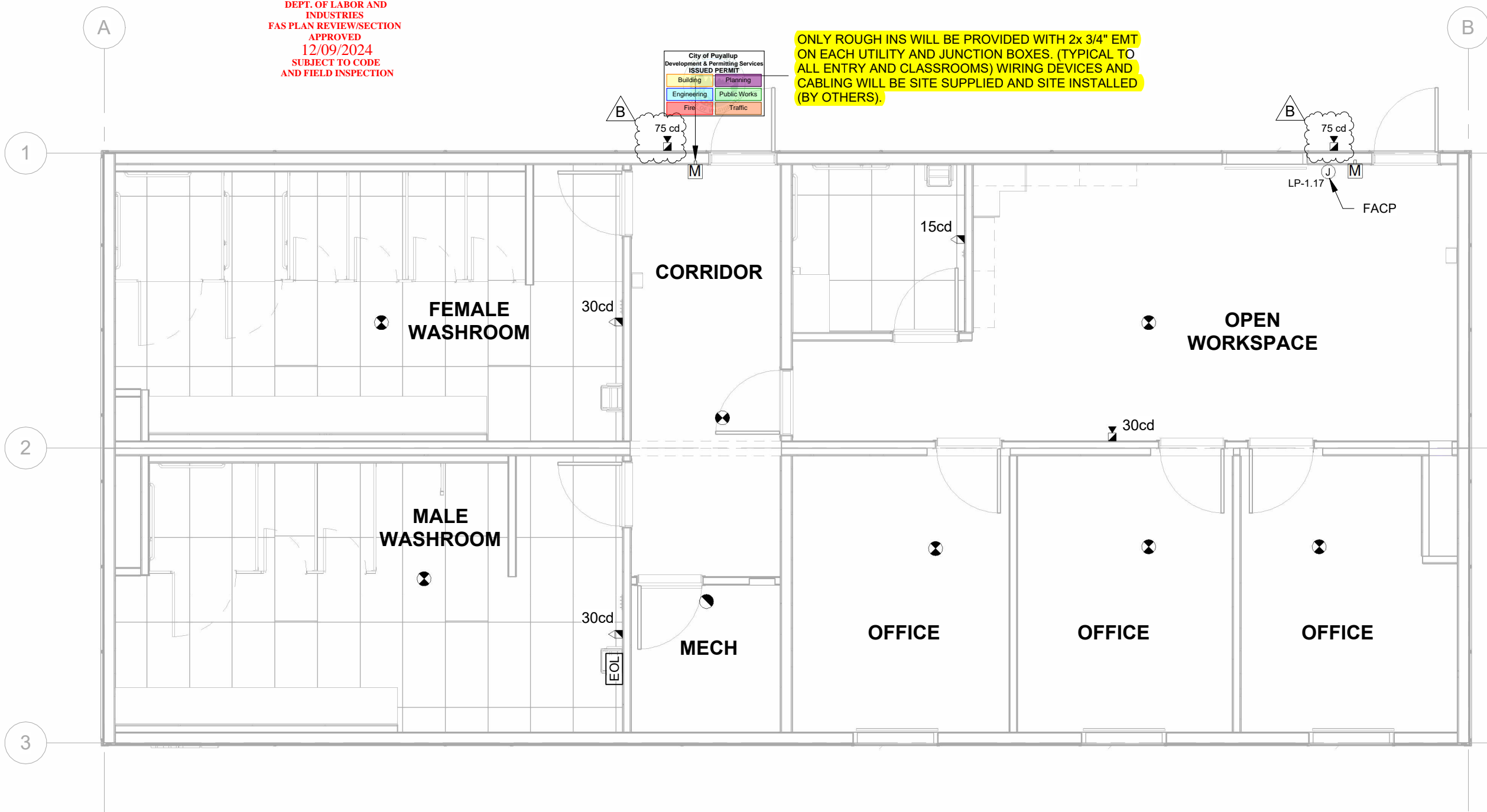
PROJECT: 28x64 ASL USA SR FLEET OFFICE WASH	DRAWING TITLE: OVERALL LIGHTING PLAN - LEVEL 1
CLIENT: CASCADE CHRISTIAN SCHOOL	PROJECT NO: 1107994
	DRAWING NO: EM201
	REV. # B

Exp. 12/09/2025

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ONLY ROUGH INS WILL BE PROVIDED WITH 2x 3/4" EMT ON EACH UTILITY AND JUNCTION BOXES. (TYPICAL TO ALL ENTRY AND CLASSROOMS) WIRING DEVICES AND CABLING WILL BE SITE SUPPLIED AND SITE INSTALLED (BY OTHERS).



① FFL 1 - E - FIRE ALARM
3/16" = 1'-0"
FOR REFERENCE ONLY



NOTE:

WAC -296-46B 760 - Fire Alarm boxes shall be red in color inside and out.

WAC 51-54A 907.11.2 Design Review: The Fire Alarm has not been reviewed or approved by FAS. The fire alarm system construction documents shall be reviewed by a NICET III, an ESA/NTS Certified Fire Alarm Designer (CFAD) Level III Fire in fire alarms, or a licensed professional engineer (PE) in Washington prior to being submitted for permitting. The reviewing professional shall submit a stamped, signed, and dated letter; or a verification method approved by the local authority having jurisdiction (site location in WA State) indicating the system has been reviewed and meets or exceeds the design requirements of the state of Washington and the local jurisdiction.

KEY PLAN

101
102



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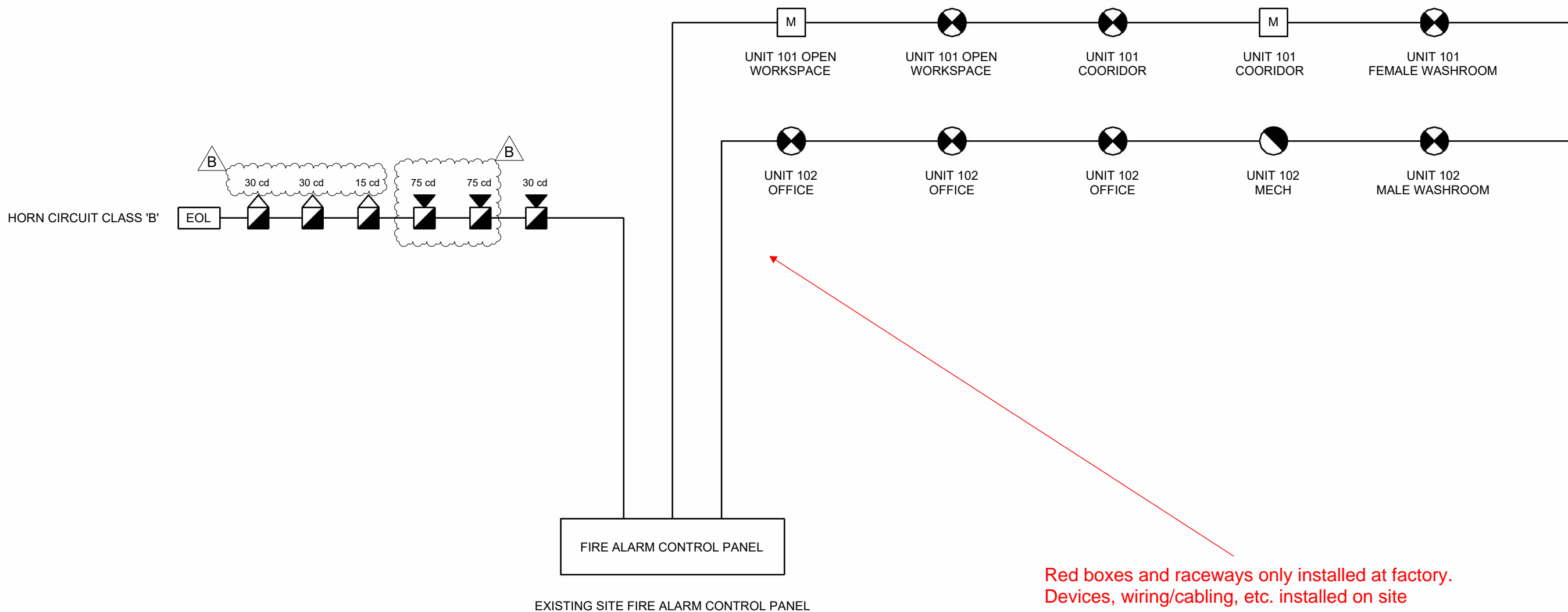
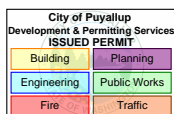
REV.	DATE	DESCRIPTION	BY	CHK/APR
B	2024-10-23	RE-ISSUED FOR STATE APPROVAL	OS	AH
A	2024-06-07	ISSUED FOR STATE APPROVAL	DB	

PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH	DRAWING TITLE:	OVERALL FIRE ALARM PLAN - LEVEL 1
CLIENT:	CASCADE CHRISTIAN SCHOOL	PROJECT NO:	1107994
		DRAWING NO:	EM301
		REV. #	B

Exp. 12/09/2025

PLOT DATE: 2024-10-23 11:32:26 AM

11x17 Titleblock R2024.1



1 FIRE ALARM RISER DIAGRAM
3" = 1'-0"
FOR REFERENCE ONLY

WAC 51-54A 907.11.2 Design Review: The Fire Alarm has not been reviewed or approved by FAS. The fire alarm system construction documents shall be reviewed by a NICET III, an ESA/NTS Certified Fire Alarm Designer (CFAD) Level III Fire in fire alarms, or a licensed professional engineer (PE) in Washington prior to being submitted for permitting. The reviewing professional shall submit a stamped, signed, and dated letter; or a verification method approved by the local authority having jurisdiction (site location in WA State) indicating the system has been reviewed and meets or exceeds the design requirements of the state of Washington and the local jurisdiction.

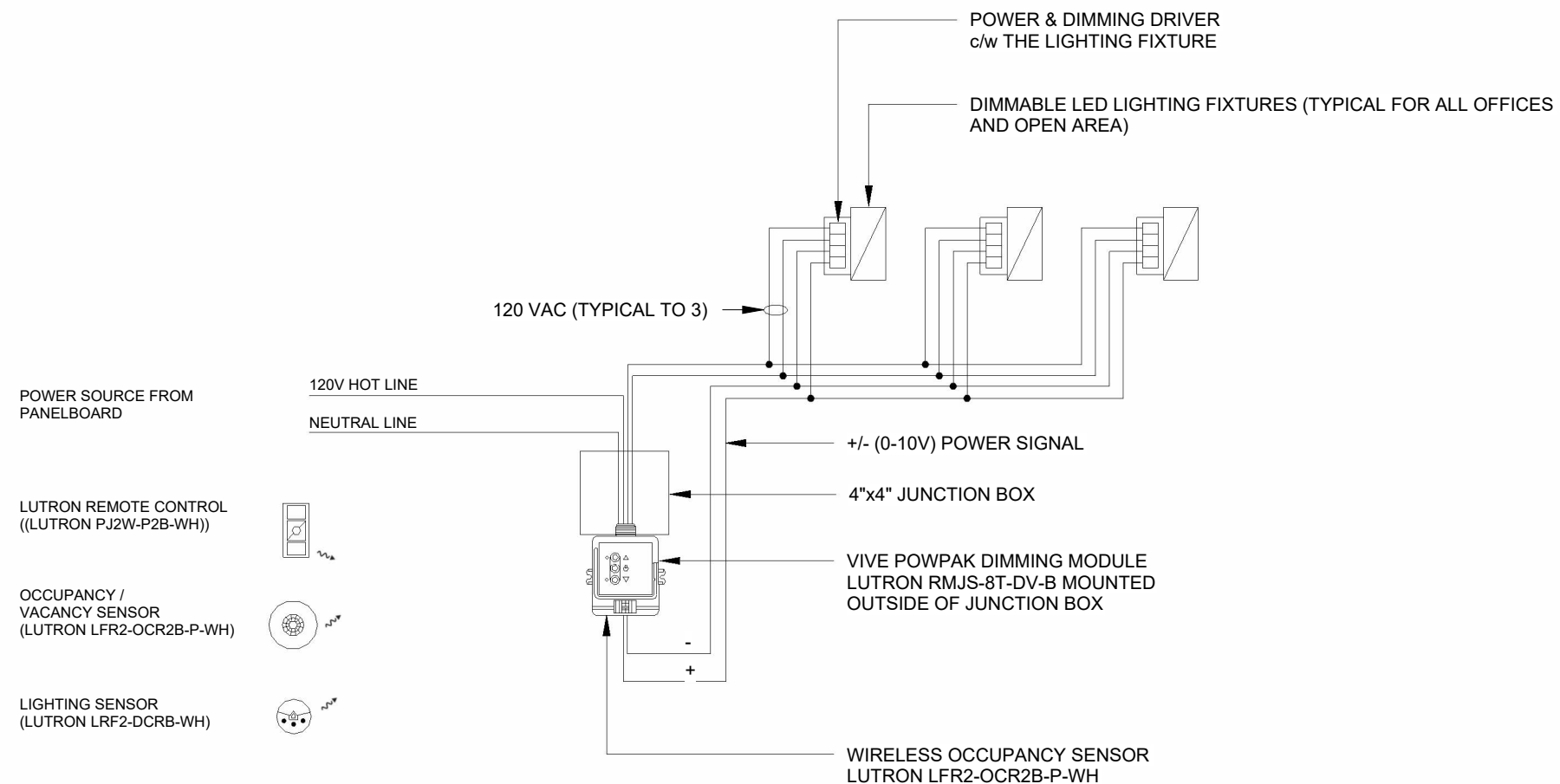
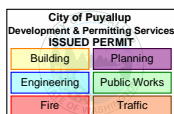


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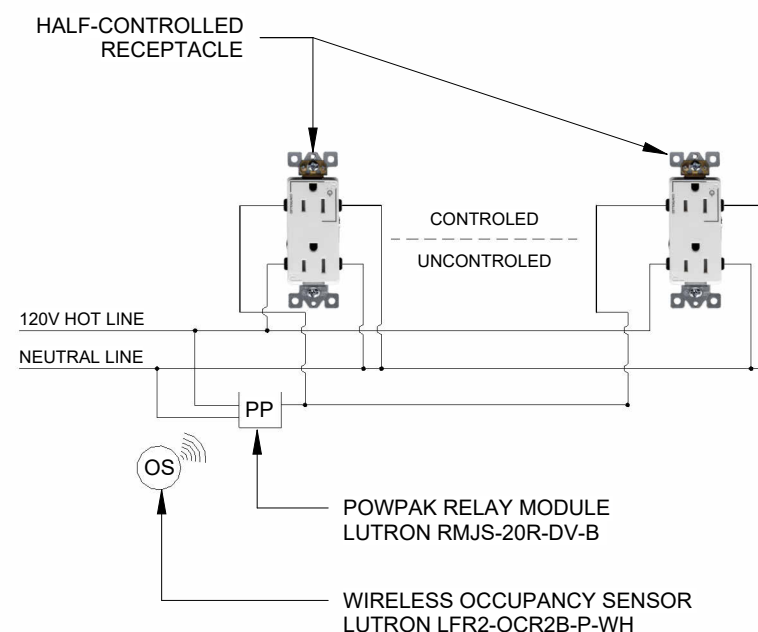
REV.	DATE	DESCRIPTION	BY	CHK/APR
B	2024-10-23	RE-ISSUED FOR STATE APPROVAL	OS	AH
A	2024-06-07	ISSUED FOR STATE APPROVAL	DB	

PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH
CLIENT:	CASCADE CHRISTIAN SCHOOL

DRAWING TITLE:	FIRE RISER DIAGRAM		
PROJECT NO:	1107994	DRAWING NO:	EM302
REV. #	B	Exp. 12/09/2025	



1 LIGHTING CONTROL DIAGRAM
 1/8" = 1'-0"



2 RECEPTACLE CONTROL DIAGRAM
 1/8" = 1'-0"



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A	2024-06-07	ISSUED FOR STATE APPROVAL	DB	

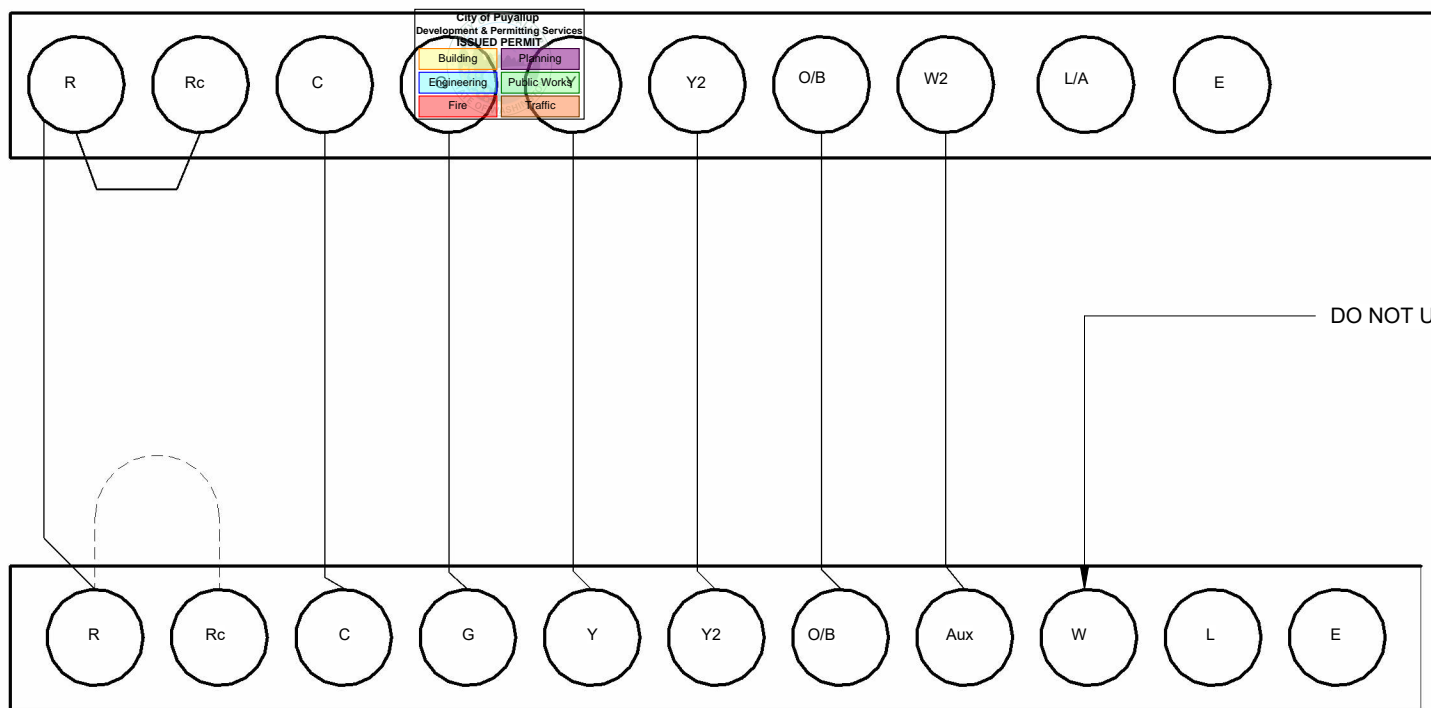
PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH
CLIENT:	CASCADE CHRISTIAN SCHOOL

DRAWING TITLE:	ELECTRICAL DETAILS		
PROJECT NO:	1107994	DRAWING NO:	EM500
REV. #	B	Exp. 12/09/2025	

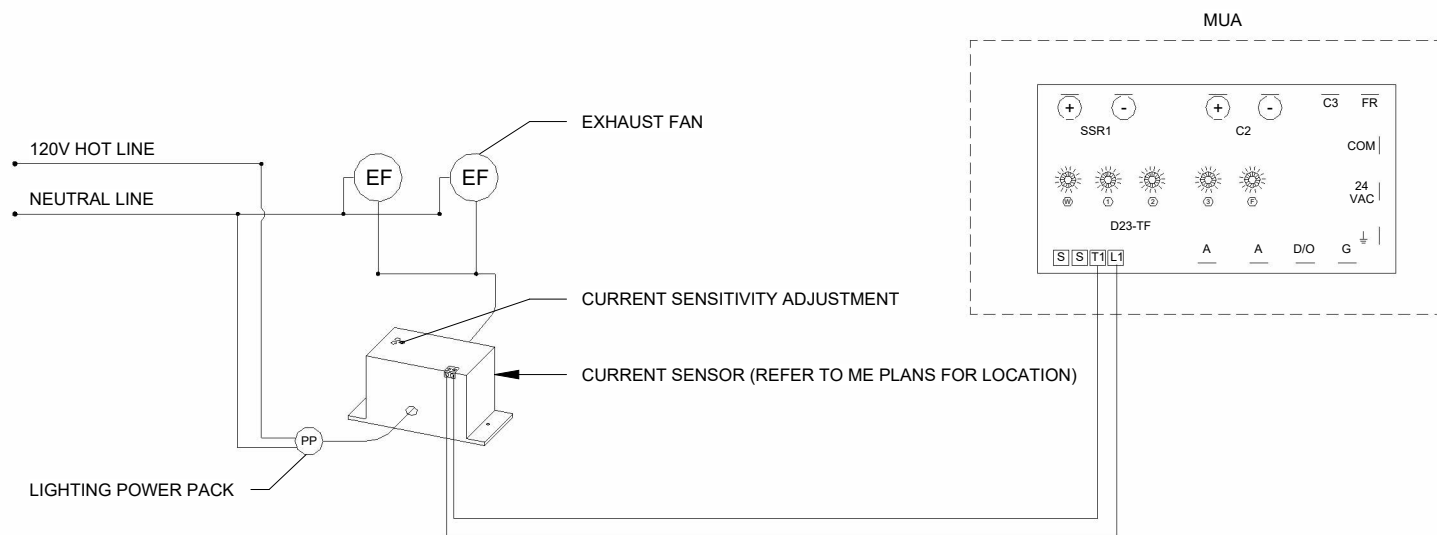
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STATE OF WASHINGTON
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 AND FIELD INSPECTION
 T-STAT
 HONEYWELL
 T6 PRO



1 BARD CONNECTION
 1/4" = 1'-0"



2 MUA CONTROL DIAGRAM
 1/8" = 1'-0"



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B	2024-10-23	RE-ISSUED FOR STATE APPROVAL	OS	AH
A	2024-06-07	ISSUED FOR STATE APPROVAL	DB	

PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH
CLIENT:	CASCADE CHRISTIAN SCHOOL

DRAWING TITLE:	ELECTRICAL DETAILS		
PROJECT NO:	1107994	DRAWING NO:	EM501
REV. #	B	Exp. 12/09/2025	

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Panel MP-1

Location: MECH 108
Unit #: UNIT-102
Supply From:
Mounting: Flush
Enclosure: NEMA 1 Indoor

Volts: 120/240 Single
Phases: 1
Wires: 3
Cable Size: 3C #3/0 AWG THW Cu, #4 AWG EGC
Stub Requirements: 2" SCHED 40 RIGID PVC + 1-1/2" EMT + 1" EMT FOR PV SYSTEMS + 3/4" PVC GND + 3/4" EMT FOR HEAT TRACE

City of Puyallup
Development & Permitting Services
ISSUED PERMIT
Building, Electrical, Fire, Fire Alarm, Fire Sprinkler, Fire Traffic, Fire Alarm, Fire Traffic, Fire Alarm, Fire Traffic
Panel Rating: 200 A
MCB Rating: 200 A
MLO Rating: N/A
Est. Demand Load: 36 kW
Short Circuit Rating: 25 kAIC

#	Circuit Description	Trip	Ø	A	B	Ø	Trip	Circuit Description	#	
1	BARD-1	70 A	2	4000	180	1	20 A	Male Washroom Sink Receptacle	2	
3					4000			150	2	20 A
5	Male Washroom Sink Receptacle	20 A	1	180	150	2	20 A	BBH-2 <small>NEC 424.19 - NEC 110.25 Breaker lock out device</small>	6	
7	MUA	40 A	2		3000				250	8
9				3000	250	10				
11	HWH-1	20 A	2		1500	720	1	20 A	Office Receptacles	12
13				1500	4000	14				
15	Office Receptacles	20 A	1		720	4000	2	70 A	BARD-1	16
17	Office Receptacles	20 A	1	720	384	1	20 A	Unit-101 Lighting	18	
19	LP-1	60 A	2		3660				0	1
21				3350	22					
23										24
25										26
27										28
29										30
31										32
33										34
35										36
37										38
39						0	2	40 A	Back Feed Breaker for PV Systems (To be Site Supplied and Site Installed) - by Others	40
41				0		42				
Total Load				A	B					
Total Load				17705 VA	17999 VA					

Notes:
* HEAT TRACE CCTS TO USE 30mA GFCI BREAKERS
REFER TO SHEET EM604 FOR DEMAND LOAD CALCULATIONS

Panel LP-1

Location: OPEN WORKSPACE 102
Unit #: UNIT-101
Supply From: MP-1
Mounting: Flush
Enclosure: NEMA 1 Indoor

Volts: 120/240 Single
Phases: 1
Wires: 3
Cable Size: 3C #6AWG Cu, (1) EGC, MC
Stub Requirements: 1-1/2" EMT + 3/4" PVC FOR GROUNDING

21FBS2400126

Panel Model #: BRP12B100
Frame Rating: 100 A
MCB Rating: 1 A
MLO Rating: N/A
Est. Demand Load: 7 kW
Short Circuit Rating: 10kAIC

#	Circuit Description	Trip	Ø	A	B	Ø	Trip	Circuit Description	#	
1	Female Washroom Sink Receptacle	20 A	1	180	180	1	20 A	Female Washroom Sink Receptacle	2	
3	BBH-2 <small>NEC 424.19 - NEC 110.25 Breaker lock out device</small>	20 A	2		250				1000	2
5				250	1000	6				
7	Bf Washroom Sink Receptacle	20 A	1		180	540	1	20 A	Entrance Receptacles	8
9	BBH-1 <small>NEC 424.19 - NEC 110.25 Breaker lock out device</small>	20 A	2	150	180	1	20 A	Exterior GFCI	10	
11					150				180	12
13	Open Workspace Receptacles	20 A	1	1080	466	1	20 A	Unit-102 Lighting	14	
15	Exit Signs	20 A	1		320				40	1
17	FACP*	20 A	1	0	180	1	20 A	Data Cabinet Receptacle	18	
19	Bottle Refilling Station	20 A	1		690				20	
21										22
23										24
25										26
27										28
29										30
Total Load				A	B					
Total Load				3660 VA	3350 VA					

Notes:
* PROVIDE RED HANDLE LOCKABLE FOR THE FIRE ALARM CIRCUIT BREAKER
** REFER TO EM604 FOR DEMAND LOAD CALCULATIONS



NEC 110.14(D) Tightening torque values for terminal connections shall be indicated on equipment or in installation instructions provided by the manufacturer. An approved means, such as a calibrated torque tool, shall be used to achieve the indicated torque value. USE TORQUE SEAL OR SIMILAR TO IDENTIFY ALL TERMINATIONS THAT HAVE BEEN TORQUED TO COMPLY WITH THIS REQUIREMENT FOR L&I INSPECTOR TO VERIFY. Please document values used for inspector to verify.

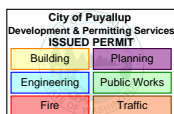
WAC 296-46B 010(7) Elect. Baseboard heaters (BBH) shall be listed to US standards as evaluated by a national recognized testing laboratory (NRTL) approved by WA State L&I Electrical section. ---- FAS inspector to confirm listing of baseboard heaters. Approved NRTLs can be found here:
<https://lni.wa.gov/licensing-permits/electrical/electrical-installation-information/electrical-product-testing-and-engineering-evaluation/accredited-product-testing-laboratories>

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REV.	DATE	DESCRIPTION	BY	CHK/APR
B	2024-10-23	RE-ISSUED FOR STATE APPROVAL	OS	AH
A	2024-06-07	ISSUED FOR STATE APPROVAL	DB	

PROJECT: 28x64 ASL USA SR FLEET OFFICE WASH
CLIENT: CASCADE CHRISTIAN SCHOOL

DRAWING TITLE: PANEL SCHEDULES
PROJECT NO: 1107994
DRAWING NO: EM600
REV. #: B
Exp. 12/09/2025



Lighting Power Density					
SL NO.	ROOM NAME	AREA(ft2)	Lighting Fixture	Wattage	LPD(watt/ft2)
1	MALE WASHROOM	291	COOPER LIGHTING 24FP4740C	82.8	0.28
2	FEMALE WASHROOM	288	COOPER LIGHTING 24FP4740C	82.8	0.29
3	BF WASHROOM	64	COOPER LIGHTING 24FP4740C	41.4	0.65
4	OPEN WORKSPACE	333	COOPER LIGHTING 24FP4740C	82.8	0.25
5	OFFICE	132	COOPER LIGHTING 24FP4740C	41.4	0.31
6	OFFICE	132	COOPER LIGHTING 24FP4740C	41.4	0.31
7	OFFICE	132	COOPER LIGHTING 24FP4740C	41.4	0.31
8	CORRIDOR	91	COOPER LIGHTING 24FP4740C	41.4	0.45
9	MECH. ROOM	48.4	COOPER LIGHTING 24FP4740C	41.4	0.86



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PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH
CLIENT:	CASCADE CHRISTIAN SCHOOL

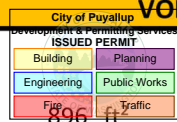
DRAWING TITLE:	LPD CALCULATIONS		
PROJECT NO:	1107994	DRAWING NO:	EM603
REV. #	B	Exp. 12/09/2025	

PLOT DATE: 2024-10-23 11:32:31 AM

11x17 Titleblock R2024.1

28x64 OFFICE WASH - CASCADE (UNIT-102) - MP-1

VOLTAGE SYSTEM 120/240, 1 PHASE, 60Hz



1. GENERAL LIGHTING LOAD*			896 ft ²	x	3	va/ft ²	=	2688 va
								Sub-total
							=	2688 va
2. Application of demand factor								
RECEPTACLES			14	x	180		=	2520 va
								Sub-total
							=	5208 va
	Qty.	Unit Load	Connected Load		Demand Factor	Demanded Load		
3. BARD-1	2	8332	16664 va		125%	20830.00	=	20830.00 va
4. BBH-1	1	300	300 va		100%	300.00	=	300.00 va
5. BBH-2	1	500	500 va		100%	500.00	=	500.00 va
6. WATER HEATER	1	3000	3000 va		125%	3750.00	=	3,750.00 va
7. MUA	1	6000	6000 va		100%	6000.00	=	6,000.00 va
8. LP-1	1	9370	9370 va		100%	9370.00	=	9,370.00 va
TOTAL DEMANDED LOAD		=						45958 va

Calculations: 45958 / 240 = 191 AMPERES Note: * This is the general lighting load served by this panel Unit 102.

Overcurrent Device: 200AT, 2P, 240V, 60Hz
Feeder Size: 3C#3/0 AWG Copper THW Type + 1C #4 AWG BCW (Site Supplied and Site Installed - by Others)
Conduit Size: 2" Diameter EMT

28x64 OFFICE WASH - CASCADE (UNIT-101) - LP-1

VOLTAGE SYSTEM 120/240, 1 PHASE, 60Hz

1. GENERAL LIGHTING LOAD*			896 ft ²	x	3	x	125%	va/ft ²	=	3360 va
										Sub-total
									=	3360 va
2. Application of demand factor										
RECEPTACLES			14	x	180		=	2520 va		
								Sub-total		
							=	5880 va		
	Qty.	Unit Load	Connected Load		Demand Factor	Demanded Load				
3. FFH-1	1	2000	2000 va		100%	2000.00	=	2000.00 va		
4. BBH-1	1	300	300 va		100%	300.00	=	300.00 va		
5. BBH-2	1	500	500 va		100%	500.00	=	500.00 va		
6. BOTTLE REFILLING STATION	1	690	690 va		100%	690.00	=	690.00 va		
TOTAL DEMANDED LOAD		=						9370 va		

Calculations: 9370 / 240 = 39 AMPERES Note: * This is the general lighting load served by this panel Unit 101.

Overcurrent Device: 60AT, 2P, 240V, 60Hz
Feeder Size: 3C#6 AWG Copper THW Type + 1C #8 AWG BCW
Conduit Size: 1-1/2" Diameter EMT



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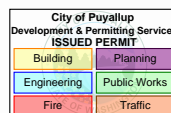
REV.	DATE	DESCRIPTION	BY	CHK/APR
B	2024-10-23	RE-ISSUED FOR STATE APPROVAL	OS	AH
A	2024-07-20	RE-ISSUED FOR STATE APPROVAL	OS/DB	AH

PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH	DRAWING TITLE:	LOAD CALCULATIONS
CLIENT:	CASCADE CHRISTIAN SCHOOL	PROJECT NO:	1107994
		DRAWING NO:	EM604
		Exp. 12/09/2025	REV. # B

DRAWING LIST - MECHANICAL MANUFACTURING

SHEET NUMBER	SHEET TITLE & GENERAL INFORMATION
MM001	MECHANICAL DRAWING LIST & GENERAL INFORMATION
MM002	MECHANICAL SCHEDULES
MM003	MECHANICAL SCHEDULES 2
MM101	OVERALL HVAC PLAN - LEVEL 1
MM301	OVERALL PLUMBING PLAN - LEVEL 1
MM310	PLUMBING DETAILS
Grand total: 6	

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MECHANICAL LEGEND	
SYMBOL	DESCRIPTION
	T-BAR CEILING DIFFUSER, NECK SIZE AS SHOWN.
	LAY-IN EGGCRATE RETURN AIR GRILLE.
	FLEXIBLE DUCT, SIZE TO MATCH DIFFUSER NECK SIZE.
	DUCT TAKE-OFF C/W BALANCING DAMPER. DUCT SIZE TO MATCH DIFFUSER NECK SIZE.
	SUPPLY/RETURN AIR GALV. DUCTWORK
	DUCT WITH EXTERNAL INSULATION
	DUCT WITH INTERNAL INSULATION / LINING
	WALL MOUNTED THERMOSTAT
	FIRE DAMPER
	DUCT REDUCERS, SIZES AS SHOWN.
	FIRE EXTINGUISHER
	DIFFUSER GRILL OR REGISTER TYPE NECK OR FACE SIZE AIR FLOW IMPERIAL:CFM (IN) METRIC:L/S(MM)
	MECH. EQUIPMENT TAG
	DETAIL NUMBER DRAWING NUMBER

PLUMBING LEGEND	
SYMBOL	DESCRIPTION
	DRAINAGE PIPING
	VENT PIPING
	COLD WATER PIPING
	HOT WATER PIPING

MECHANICAL ABBREVIATIONS	
ABBREVIATION	DEFINITION
AFF	ABOVE FINISHED FLOOR
AFR	ABOVE FINISHED ROOF
CWSR	CLOTHES WASHER
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DHWR	DOMESTIC HOT WATER RECIRC
DW	DISH WASHER
E/A	EXHAUST AIR
FD	FIRE DAMPER
FIM	FREE ISSUED MATERIAL
NFHB	NON-FREEZE HOSE BIBB
PL	REFRIGERANT PIPING LIQUID
PSPI	PLANT SUPPLIED PLANT INSTALLED
PSSI	PLANT SUPPLIED SITE INSTALLED
R/A	RETURN AIR
RS	REFRIGERANT PIPING SUCTION
S/A	SUPPLY AIR
SAN	SANITARY PIPING
SD	SMOKE DAMPER
SSSI	SITE SUPPLIED SITE INSTALLED
T/A	TRANSFER AIR
VENT	VENTING PIPING

- NOTES:**
- MECHANICAL SYSTEMS AND EQUIPMENT SERVING HEATING, COOLING, VENTILATING, AND OTHER NEEDS SHALL COMPLY WITH SECTION WSEC NREC C403.2 (REFERRED TO AS THE MANDATORY PROVISIONS).
 - LOAD CALCULATIONS ARE BASED ON REQUIREMENTS FOR PUYALLUP, WASHINGTON. BUILDING SHALL BE CONSIDERED PERMANENT IN NATURE AND ANY RELOCATION SHALL CLASSIFY THIS AS A 'MOVED' BUILDING.
 - EQUIPMENT SHALL MEET THE MINIMUM EFFICIENCY REQUIREMENTS OF TABLES C403.3.2(1).
 - PACKAGED ELECTRIC EQUIPMENT PROVIDING BOTH HEATING AND COOLING WITH A TOTAL COOLING CAPACITY GREATER THAN 6,000 BTU/H SHALL BE A HEAT PUMP. C403.3.2.6
 - THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH ZONE SHALL BE CONTROLLED BY INDIVIDUAL THERMOSTATIC CONTROLS CAPABLE OF RESPONDING TO TEMPERATURE WITHIN THE ZONE. AT A MINIMUM, EACH FLOOR OF A BUILDING SHALL BE CONSIDERED AS A SEPARATE ZONE. C403.4.1
 - UNITARY AIR COOLED HEAT PUMPS SHALL INCLUDE MICROPROCESSOR CONTROLS THAT MINIMIZE SUPPLEMENTAL HEAT USAGE DURING START-UP, SET-UP, AND DEFROST CONDITIONS. THESE CONTROLS SHALL ANTICIPATE NEED FOR HEAT AND USE COMPRESSION HEATING AS THE FIRST STAGE OF HEAT. CONTROLS SHALL INDICATE WHEN SUPPLEMENTAL HEATING IS BEING USED THROUGH VISUAL MEANS (E.G. LED INDICATORS). HEAT PUMPS EQUIPPED WITH SUPPLEMENTARY HEATERS SHALL BE INSTALLED WITH CONTROLS THAT PREVENT SUPPLEMENTAL HEATER OPERATION ABOVE 40°F. C403.4.1
 - SETPOINT OVERLAP RESTRICTIONS. WHERE USED TO CONTROL BOTH HEATING AND COOLING, ZONE THERMOSTATIC CONTROLS SHALL PROVIDE A TEMPERATURE RANGE OR DEADBAND OF AT LEAST 5°F WITHIN WHICH THE SUPPLY OF HEATING AND COOLING ENERGY TO THE ZONE IS CAPABLE OF BEING SHUT OFF OR REDUCED TO A MINIMUM. C403.4.1
 - FOR ALL OCCUPANCIES OTHER THAN GROUP R, EACH ZONE SHALL BE PROVIDED WITH THERMOSTATIC SETBACK CONTROLS THAT ARE CONTROLLED BY EITHER AN AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROL SYSTEM. C403.4.1
 - THERMOSTATIC SETBACK CONTROLS SHALL HAVE THE CAPABILITY TO SET BACK OR TEMPORARILY OPERATE THE SYSTEM TO MAINTAIN ZONE TEMPERATURE DOWN TO 55°F OR UP TO 85°F. C403.4.1
 - AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROLS SHALL BE CAPABLE OF STARTING AND STOPPING THE SYSTEM FOR SEVEN DIFFERENT DAILY SCHEDULES PER WEEK AND RETAINING THEIR PROGRAMMING AND TIME SETTING DURING A LOSS OF POWER FOR AT LEAST 10 HOURS. ADDITIONALLY, THE CONTROLS SHALL HAVE A MANUAL OVERRIDE THAT ALLOWS TEMPORARY OPERATION OF THE SYSTEM FOR UP TO 2 HOURS; A MANUALLY OPERATED TIMER CAPABLE OF BEING ADJUSTED TO OPERATE THE SYSTEM FOR UP TO 2 HOURS; OR AN OCCUPANCY SENSOR. C403.4.1
 - AUTOMATIC START CONTROLS SHALL BE PROVIDED FOR EACH HVAC SYSTEM. THE CONTROLS SHALL BE CAPABLE OF AUTOMATICALLY ADJUSTING THE DAILY START TIME OF THE HVAC SYSTEM IN ORDER TO BRING EACH SPACE TO THE DESIRED OCCUPIED TEMPERATURE IMMEDIATELY PRIOR TO SCHEDULED OCCUPANCY. C403.4.1
 - BOTH OUTDOOR AIR SUPPLY AND EXHAUST DUCTS SHALL BE EQUIPPED WITH MOTORIZED DAMPERS THAT WILL AUTOMATICALLY SHUT WHEN THE SYSTEMS OR SPACES SERVED ARE NOT IN USE OR DURING BUILDING WARM-UP, COOLDOWN, AND SETBACK. GRAVITY DAMPERS IN LIEU OF MOTORIZED DAMPER C403.7.8.1
 - VENTILATION, EITHER NATURAL OR MECHANICAL, SHALL BE PROVIDED IN ACCORDANCE WITH CHAPTER 4 OF THE INTERNATIONAL MECHANICAL CODE. WHERE MECHANICAL VENTILATION IS PROVIDED, THE SYSTEM SHALL PROVIDE THE CAPABILITY TO REDUCE THE OUTDOOR AIR SUPPLY TO THE MINIMUM REQUIRED BY CHAPTER 4 OF THE INTERNATIONAL MECHANICAL CODE.
 - DUCTWORK SHALL BE CONSTRUCTED AND ERECTED IN ACCORDANCE WITH THE INTERNATIONAL MECHANICAL CODE. C403.10.1
 - ALL LONGITUDINAL AND TRANSVERSE JOINTS, SEAMS AND CONNECTIONS OF SUPPLY AND RETURN DUCTS OPERATING AT A STATIC PRESSURE LESS THAN OR EQUAL TO 2 INCHES OF WATER GAUGE (W.G.) (500 PA) SHALL BE SECURELY FASTENED AND SEALED WITH WELDS, GASKETS, MASTICS (ADHESIVES), MASTIC-PLUS EMBEDDED-FABRIC SYSTEMS OR TAPES INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. PRESSURE CLASSIFICATION SPECIFIC TO THE DUCT SYSTEM SHALL BE CLEARLY INDICATED ON THE CONSTRUCTION DOCUMENTS IN ACCORDANCE WITH THE INTERNATIONAL MECHANICAL CODE. C403.10.2
 - COMMISSIONING FOR MECHANICAL EQUIPMENT, MECHANICAL CONTROLLED EQUIPMENT INCLUDING AND FINAL COMMISSIONING REPORT REQUIRED AFTER SITE COMPLEXING
 - AIR BALANCING REPORT TO BE SUBMITTED TO OWNER AFTER COMPLEXING
 - CLOSE OUT DOCUMENTATION (INCLUDING RECORD DOCUMENTS, O&M MANUALS, WSEC COMPLIANCE REPORTS) AND TRAINING OF BUILDING OPERATION FOR ALL MECHANICAL COMPONENTS REQUIRED AFTER COMPLEXING ON SITE



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B	2024-10-28	RE-ISSUED FOR STATE APPROVAL	RB	
A	2024-06-07	ISSUED FOR STATE APPROVAL	RB	

PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH
CLIENT:	CASCADE CHRISTIAN SCHOOL

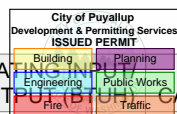
DRAWING TITLE:		MECHANICAL DRAWING LIST & GENERAL INFORMATION	
PROJECT NO:	1107994	DRAWING NO:	MM001
REV. #	B	Exp. 12/09/2025	

PLOT DATE: 2024-07-24 1:31:40 PM

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BARD UNIT SCHEDULE

TAG	QTY.	DESCRIPTION	MANUFACTURER	MODEL	SOURCE	HEATING CAPACITY (BTU/H)	COOLING CAPACITY (TON)	SUPPLY AIR FLOW (CFM)	E.S.P. ("W.C.)	OUTSIDE AIR (CFM)	ELECTRICAL				REMARKS
											FAN POWER (HP)	VOLTAGE (V)	PHASE	FREQUENCY (HZ)	
BARD-1	2	WALL MOUNTED HEAT PUMP 2 TON COOLING WITH 8KW HEATING	BARD	W24HY-A08XP4XXX	ELECTRIC	27303	2	800	0.5	175	0.3	230	1	60	T6 PRO 2 STAGE THERMOSTAT, 11.3 EER, 3.3 COP, ECM MOTOR, NIGHT SETBACK TEMP 55°F

BASEBOARD HEATER SCHEDULE

TAG	QTY	DESCRIPTION	MANUFACTURER	MODEL	HEATING CAPACITY (W)	ELECTRICAL		REMARKS
						VOLTAGE (V)	PHASE	
BBH-1	2	ELECTRIC BASEBOARD HEATER	OUELLET	OFM0300	225	240/208	1	C/W INTEGRAL THERMOSTAT
BBH-2	2	ELECTRIC BASEBOARD HEATER	OUELLET	OFM0500	375	240/208	1	C/W INTEGRAL THERMOSTAT

DIFFUSER AND GRILLE SCHEDULE

TAG	QTY	DESCRIPTION	MANUFACTURER	MODEL	SIZE (INCH)	FINISH
R-1	2	TRANSFER AIR GRILLE	DAYUS	DARH	12"x24"	WHITE
S-1	17	SUPPLY AIR SQUARE CEILING DIFFUSER, FIXED PATTERN, STEEL	NAILOR	RNS3	8"ø	WHITE
S-2	1	TRANSFER AIR GRILLE	DAYUS	DARH	8"x8"	WHITE

IMC Ventilation per natural ventilation - See sheet MM003 note

DUCT ACCESSORY SCHEDULE

TAG	QTY.	MANUFACTURER	SIZE	DESCRIPTION	REMARKS
HOOD-1	2	BUDRICH	4"ø	DUCT - EXHAUST WALL CAP	BACKDRAFT DAMPER AND BIRDSCREEN
HOOD-2	2	BUDRICH	8"ø	DUCT - EXHAUST WALL CAP	BACKDRAFT DAMPER AND BIRDSCREEN
HOOD-3	1	BUDRICH	8"ø	DUCT - INTAKE WALL CAP	WITH BIRDSCREEN

Female = 420 cfm
Male = 350 cfm
unisex = 70 cfm

IMC Table 403.3.1.1 exhaust rates

50/70 cfm
note e.Rates are per water closet or urinal. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.

ELECTRIC FORCE FLOW SCHEDULE

TAG	QTY.	DESCRIPTION	MANUFACTURER	MODEL	HEATING CAPACITY (kW)	ELECTRICAL		REMARKS
						VOLTAGE (V)	PHASE	
FFH-1	1	CEILING SURFACE MOUNTED ELECTRIC FORCE FLOW HEATER	OUELLET	OACP2000	2000/1500	240/208	1	TBAR MOUNTING KIT, OTH3000 REMOTE THERMOSTAT

EXHAUST FAN SCHEDULE

TAG	QTY	DESCRIPTION	MANUFACTURER	MODEL	E.S.P. (W.C.)	AIR FLOW (CFM)	SONES	OPERATION	ELECTRICAL				REMARKS
									AMPERAGE (A)	VOLTAGE (V)	PHASE	FREQUENCY (HZ)	
EF-1	1	CEILING MOUNTED EXHAUST FAN	BROAN	L300E	0.31	300	3.4	OCCUPANCY SENSOR	2.6	120	1	60	
EF-2	1	CEILING MOUNTED EXHAUST FAN	BROAN	L250E	0.25	250	2.9	OCCUPANCY SENSOR	2.1	120	1	60	
EF-3	1	CEILING MOUNTED EXHAUST FAN	ORTECH	ODM-5004	0.1	50	0.4	OCCUPANCY SENSOR	0.13	120	1	60	
EF-4	1	CEILING MOUNTED EXHAUST FAN	ORTECH	ODM-5004	0.1	50	0.4	OCCUPANCY SENSOR	0.13	120	1	60	

MAKE UP AIR UNIT SCHEDULE

TAG	QTY	DESCRIPTION	MANUFACTURER	MODEL	SOURCE	SUPPLY AIR FLOW (CFM)	HEATING INPUT/OUTPUT	ELECTRICAL			NOTES
								VOLTAGE (V)	PHASE	FREQUENCY (HZ)	
MUA-1	1	MINI MAKE UP AIR UNIT	THERMOLEC	FER-8-6-240/1	ELECTRIC	300	20477	240	1	60	MUA IS CONTROLLED BY CURRENT SENSOR CONNECTED TO WASHROOM EXHAUST FAN



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PROJECT: 28x64 ASL USA SR FLEET OFFICE WASH

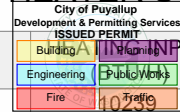
DRAWING TITLE: MECHANICAL SCHEDULES

CLIENT: CASCADE CHRISTIAN SCHOOL

PROJECT NO: 1107994 Exp. 12/09/2025
DRAWING NO: MM002

REV. # A

WATER HEATER SCHEDULE



TAG	QTY	DESCRIPTION	MANUFACTURER	MODEL	UNIT	SOURCE	VOLUME (GAL)	ELECTRICAL		COMMENTS
								VOLTAGE (V)	PHASE	
HWH-1	1	COMMERCIAL ELECTRIC WATER HEATER	A.O. SMITH	DELC-30		ELECTRIC	30	120	1	2x1.5 kW ELEMENTS

PLUMBING FIXTURE SCHEDULE

TAG	QTY.	DESCRIPTION	MANUFACTURER	MODEL	TRIM	COMMENTS
FDR-1	3	FLOOR DRAIN, WOOD DECK	WATTS	WWDFD-3PVC		C/W TRAPGUARD
LAV-1	12	SINK, OVAL, SELF-RIMMING, COUNTERTOP	PROFLO	PF20174WH	MATCO NORCA P4L-400BNP	
MS-1	1	SINK, MOP, 24" x 24"	MUSTEE	63M	FIAT MODEL#830-AA	
UR-1	2	URINAL, WALL HUNG	AMERICAN STANDARD	MAYBROOK 6581.001	DELTA 81T231	
WC-1	7	FLOOR MOUNTED TANK TYPE ELOGNATED BOWL TOILET	PROFLO	PF5112HEWH TANK PFI401TWH ELONGATED BOWL	-	BEMIS 1950 OPEN FRONT SEAT WITH COVER
WC-2	3	TOILET, FLOOR MOUNTED, TANK TYPE ELOGNATED BOWL	AMERICAN STANDARD	4133A218.020 DUAL FLUSH BOWL 3705216.020 ELONGATED RIGHT-HEIGHT BOWL	-	BEMIS 1950 OPEN FRONT SEAT WITH COVER

OUTSIDE AIR CALCULATIONS DURING HEAT/COOL MODE

(IMC & 51-52 WAC)

NOTE: THESE CALCULATION ONLY APPLY DURING HEATING OR COOLING CYCLES - WHEN MECHANICAL UNIT IS OPERATING. AT ALL OTHER TIMES BULDING USES **NATURAL VENTILATION** AND HVAC UNIT AND IT'S AIR MOVING FANS ARE OFF

Az ZONE FLOOR AREA = 1000 FT² (LESS WASHROOMS)

Pz ZONE POPULATION = 5 PER 1,000 FT² Pz = (1000/1000) * 5 = 5

Rp PEOPLE OUTDOOR AIR RATE = 5

Ra AREA OUTDOOR AIR RATE = 0.06

MIN. OUTDOOR AIR CFM REQ. = (Rp * Pz) + (Ra * Az)

$$= (5 * 5) + (0.06 * 1000)$$

$$= (25) + (60)$$

25 + 60 = 85 MIN CFM REQUIRED (FROM 2 BARDS)

HEAT PUMP FAN (HIGH SPEED/DRY COIL) = 800 CFM

TOTAL EXHAUST = 650 CFM

LESS MAKEUP = 300 CFM

FRESH AIR = 350 CFM

MIN. OUTSIDE AIR (OA) AS A PERCENTAGE OF DAMPER OPENING

$$(175 \text{ CFM} / 800 \text{ CFM}) \times 100\% = 21\%$$

SET DAMPER MIN. POS. TO: 175 CFM FOR BARD



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PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH
CLIENT:	CASCADE CHRISTIAN SCHOOL

DRAWING TITLE:	MECHANICAL SCHEDULES 2		
PROJECT NO:	1107994	DRAWING NO:	MM003
REV. #	A	Exp. 12/09/2025	

PLOT DATE: 2024-07-24 1:31:42 PM

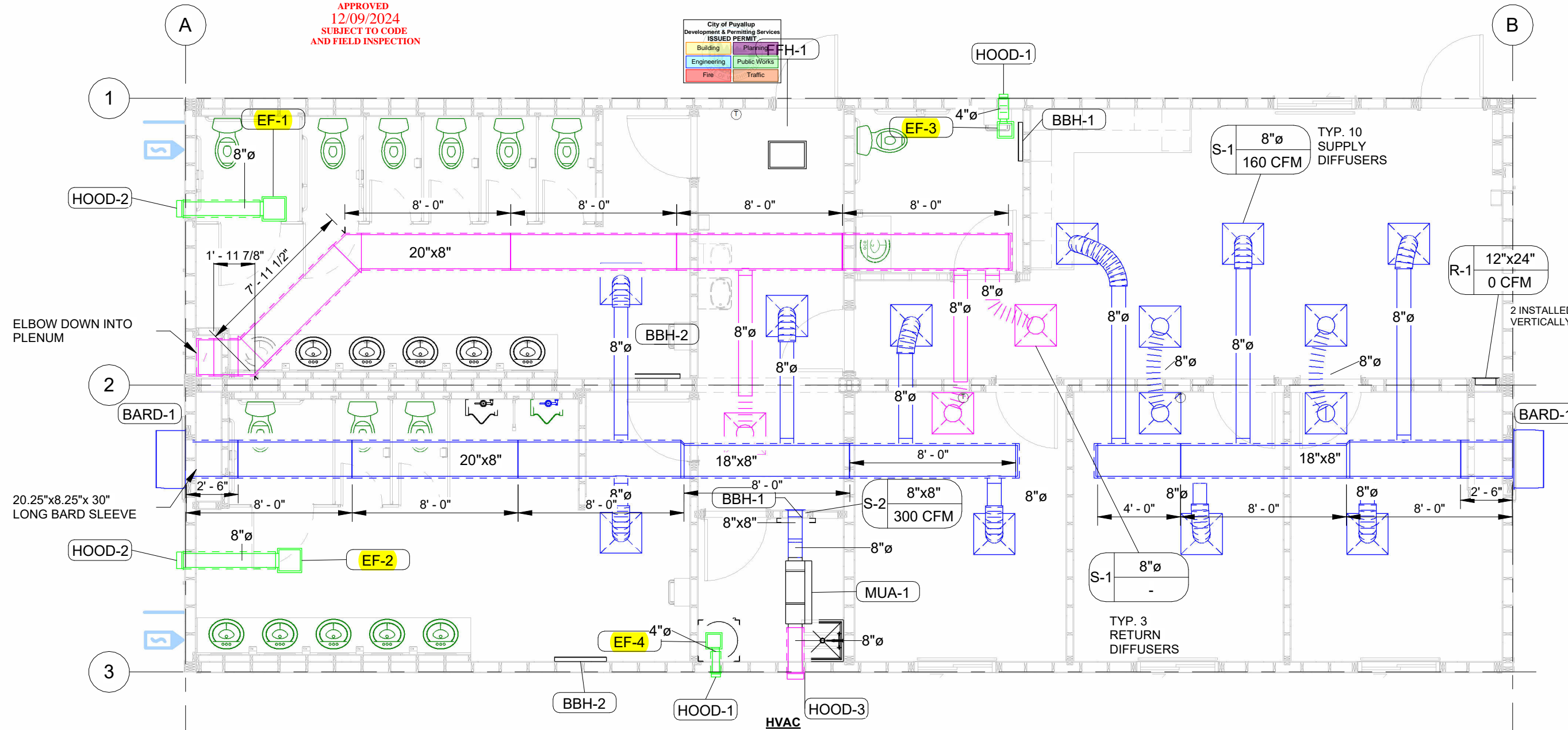
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City of Puyallup
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Building	Planning
Engineering	Public Works
Fire	Traffic



1 OVERALL HVAC PLAN
3/16" = 1'-0"

HEAT/COOL: WALL MOUNT 2 TON COOLING WITH 8 KW HEATING (COLOR BUCKEYE GRAY)
W/ BUILT-IN DISCONNECT
AC W/ ELECTRICAL HEAT
NOTE: OUTDOOR INTAKE AIR DAMPER TO BE IN CLOSED POSITION FOR SHIPPING
NOTE: INTAKE AIR DAMPER MUST BE ADJUSTED ON SITE FOR PROPER AIRFLOW - SEE HVAC UNIT OPERATING INSTRUCTIONS.

SUPPLY DUCT: SINGLE 1" FIBERGLASS DUCTBOARD UNDER ROOF, FLEXIBLE BRANCH DUCT WITH BALANCING DAMPERS, LOW PRESSURE DUCT
RETURN DUCT: SINGLE 1" FIBERGLASS DUCTBOARD UNDER ROOF, FLEXIBLE BRANCH DUCT, LOW PRESSURE DUCT
EXHAUST DUCT: SHEET METAL OR FLEXIBLE DUCTWORK WITH R-5 INSULATION
MUA DUCT: SHEET METAL DUCTWORK. INTAKE DUCT WITH R-5 INSULATION
DIFFUSERS: 24X24 TBAR LAY-IN (CEILING)
RETURN AIR: 24X24 TBAR LAY-IN (CEILING)
THERMOSTAT: PROGRAMMABLE FOR CENTRAL HVAC UNIT - UP 48"
NOTE: ALL DUCTWORK CONSTRUCTION TO COMPLY WITH IMC
NOTE: ALL RELIEF, OUTSIDE AIR INTAKES AND EXHAUST OPENINGS PROVIDED WITH DAMPERS.
NOTE: ALL COMMISSIONING IF REQUIRED TO BE DONE ON SITE



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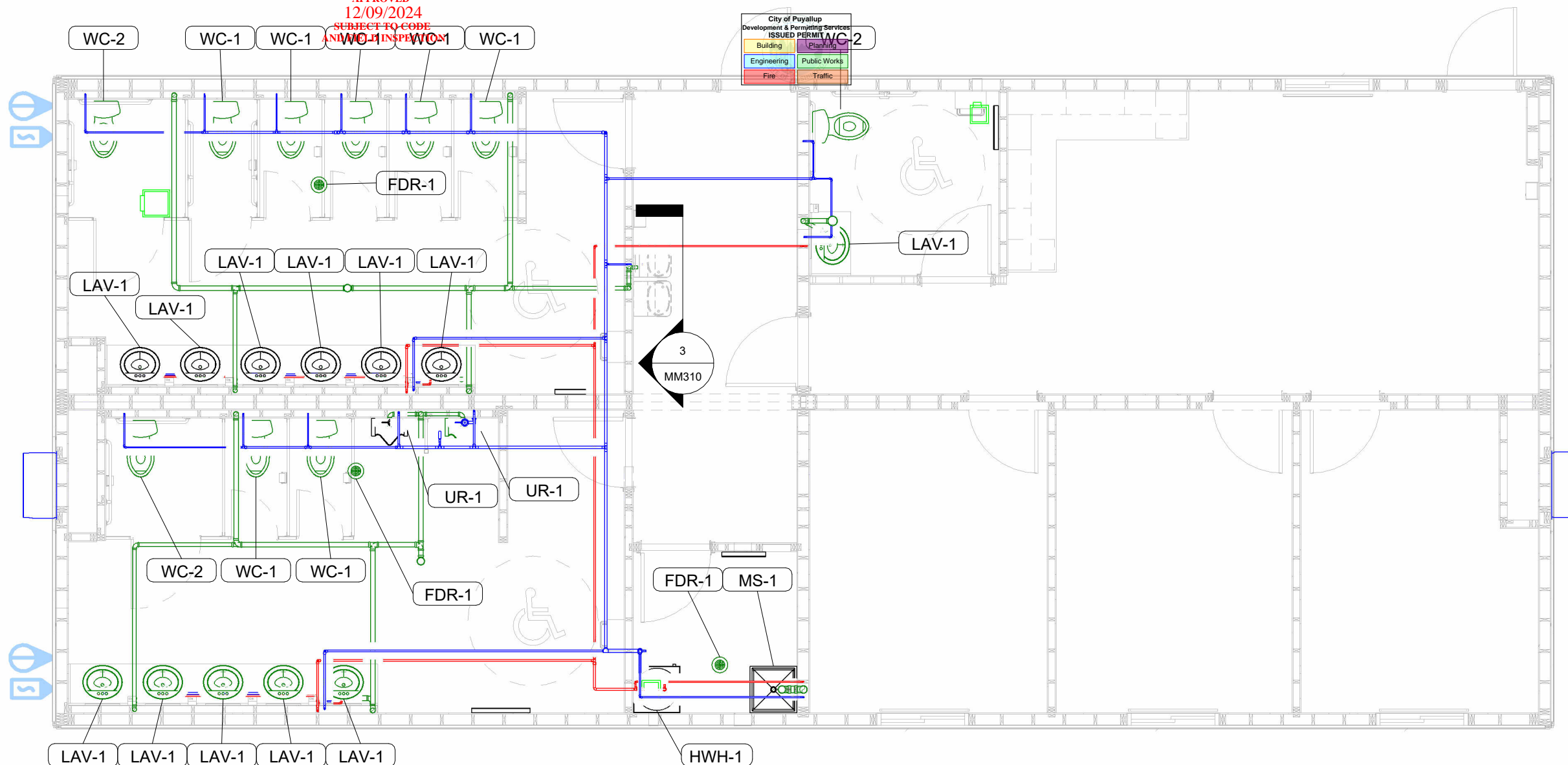
PROJECT: 28x64 ASL USA SR FLEET OFFICE WASH
CLIENT: CASCADE CHRISTIAN SCHOOL

DRAWING TITLE: OVERALL HVAC PLAN - LEVEL 1
PROJECT NO: 1107994
DRAWING NO: MM101
REV. #: A
Exp. 12/09/2025

PLOT DATE: 2024-07-24 1:31:45 PM
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City of Puyallup
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Building Planning
Engineering Public Works
Fire Traffic



1 OVERALL PLUMBING PLAN
3/16" = 1'-0"

PLUMBING GENERAL NOTES

1. ALL REQUIRED CLEANOUTS SHALL BE INSTALLED AS PER THE 2021 WASHINGTON STATE PLUMBING CODE.
2. ALL VALVES, UNIONS, ETC. TO BE THE SAME SIZE AS LINE SIZE UNLESS OTHERWISE NOTED.
3. ALL WASTE AND VENT PIPING SHALL BE SLOPED AT 1/4" PER FOOT.
4. EACH PLUMBING VENT SHALL TERMINATE ABOVE ROOF AND NOT LESS THAN TEN (10) FEET FROM OR AT LEAST THREE (3) FEET ABOVE ANY WINDOW, DOOR, OPENING OR AIR INTAKE.
5. ALL DRAINAGE PIPING TO BE CONCEALED WHERE POSSIBLE.
6. ALL COLD AND HOT WATER DOMESTIC PIPING TO BE TYPE "PEX"
7. ALL WASTE, VENT DRAINAGE LINES AND FITTINGS TO BE PVC, SCH 40.
8. SUPPORT FOR PEX PIPE LESS THAN 1" SHALL BE EVERY 32".
9. SUPPORT FOR PVC PIPE SHALL BE EVERY 48".
10. ALL DRAINAGE PVC & PEX PIPE STUBBED TO UNDERSIDE OF STRUCTURAL FLOOR WITH MAIN SANITARY & DOMESTIC FOR SITE CONNECTION, HARNESS & INSULATION, BY OTHERS ON-SITE.
11. SITE SETUP TEAM TO COORDINATE WITH SANITARY & WATER INLET PENETRATIONS.
12. ALL PLUMBING FITTINGS AND HOT WATER HEATER TO HAVE SHUT OFF VALVES.
13. DESIGN WATER PRESSURE 55 PSI, DEVELOPED LENGTH ESTIMATED AT 70 FT.
14. NO INTERIOR PLUMBING INSULATION REQUIRED. EXTERIOR SANITARY HEAT TRACING AND INSULATION TO BE INSTALLED AS DETERMINED BY SITE INSTALLERS.

PLOT DATE: 2024-07-24 1:31:47 PM

R2024.1

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REV.	DATE	DESCRIPTION	BY	CHK/APR
A	2024-06-07	ISSUED FOR STATE APPROVAL	RB	

PROJECT:
28x64 ASL USA SR FLEET
OFFICE WASH

DRAWING TITLE:
OVERALL PLUMBING PLAN - LEVEL 1

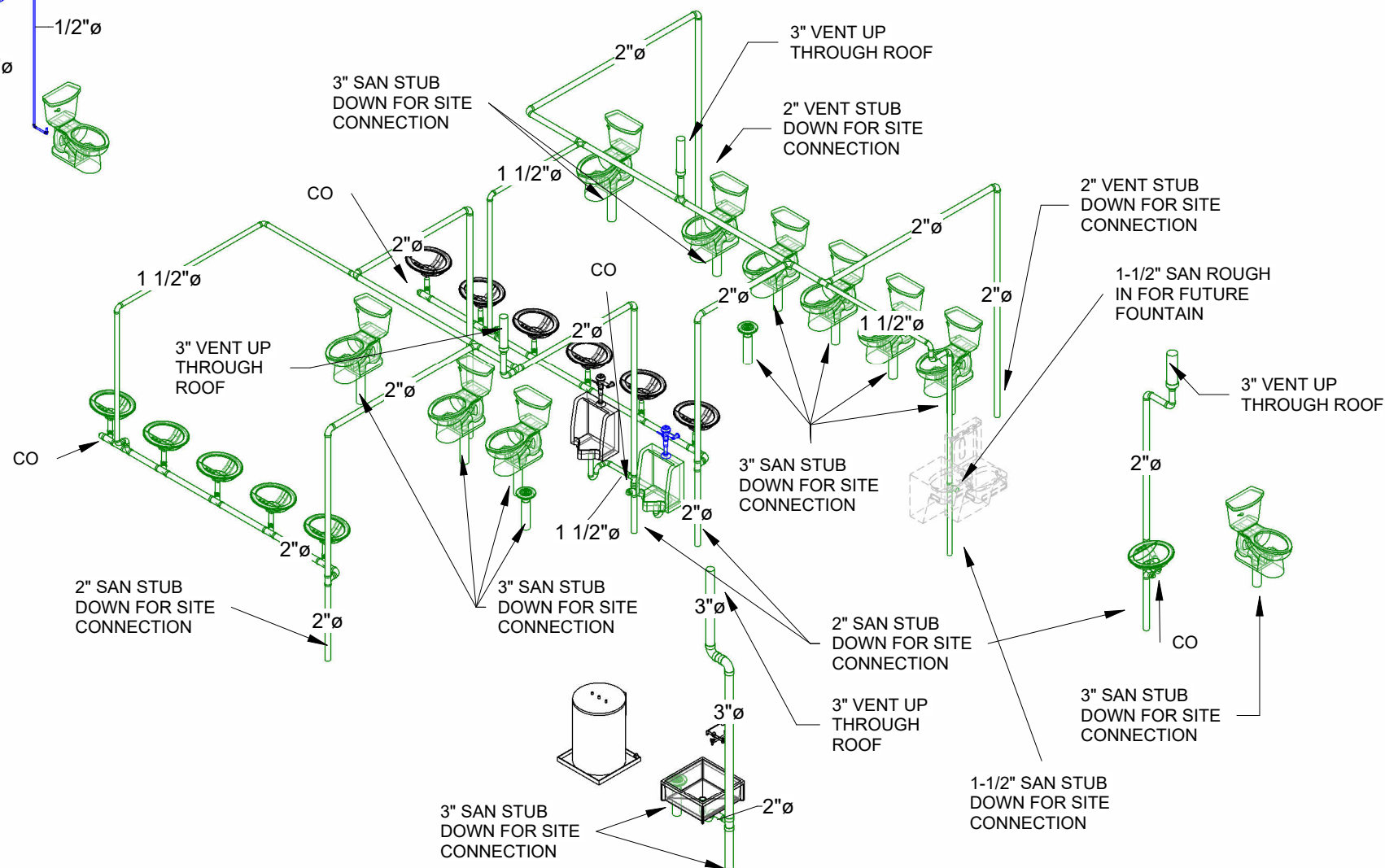
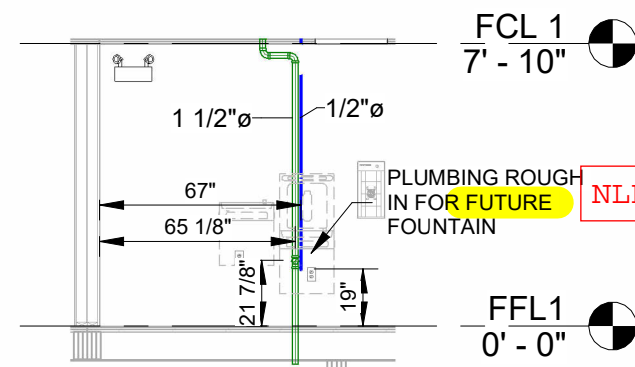
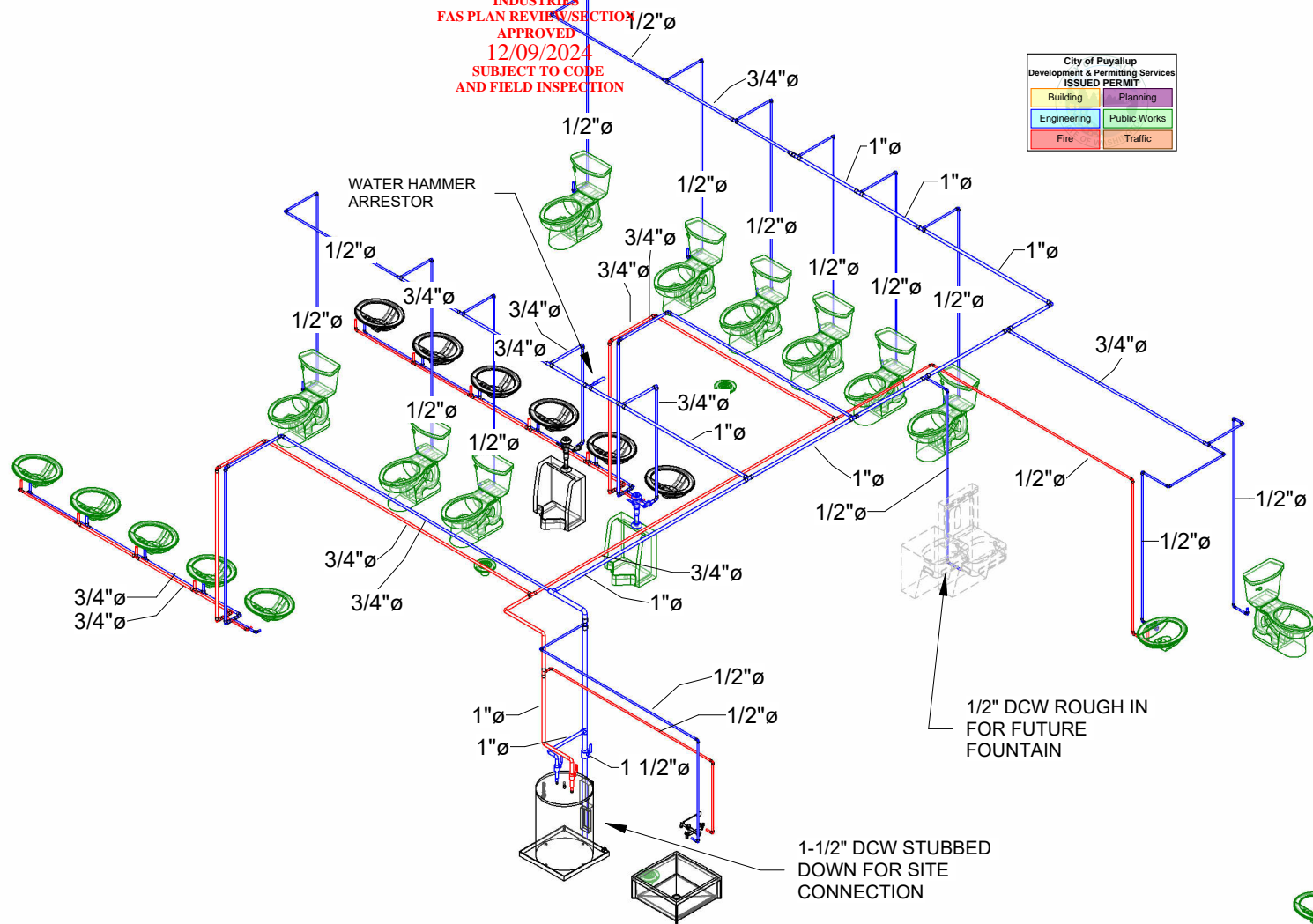
CLIENT:
CASCADE CHRISTIAN SCHOOL

PROJECT NO:
1107994
DRAWING NO:
MM301
Exp. 12/09/2025

REV. #
A

STATE OF WASHINGTON
DEPT. OF LABOR AND
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12/09/2024
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AND FIELD INSPECTION

City of Puyallup Development & Permitting Services ISSUED PERMIT	
Building	Planning
Engineering	Public Works
Fire	Traffic



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PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH
CLIENT:	CASCADE CHRISTIAN SCHOOL

DRAWING TITLE:	PLUMBING DETAILS		
PROJECT NO:	1107994	DRAWING NO:	MM310
REV. #	A	Exp. 12/09/2025	

PLOT DATE: 2024-07-24 12:32:20 PM

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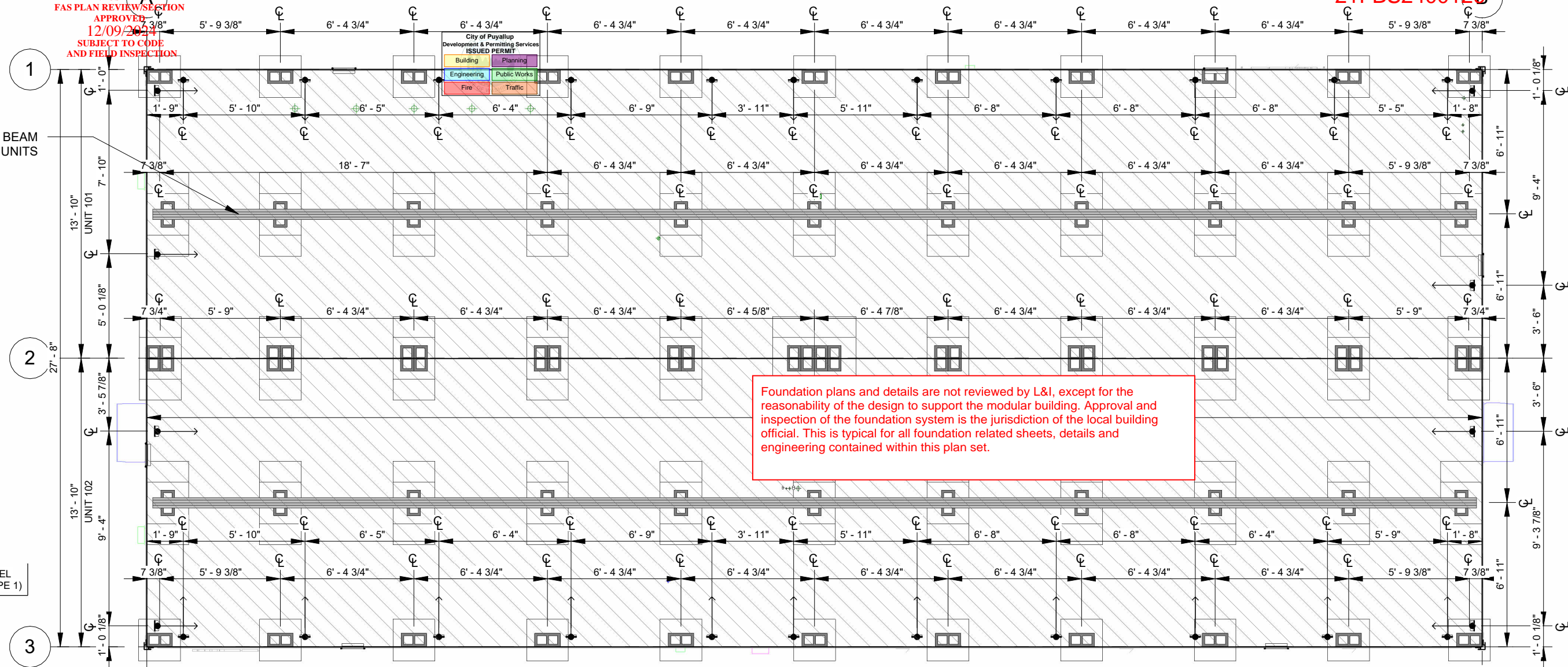
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21FBS2400126



By Yuri at 7:30:26 PM, 7/24/2024



Foundation plans and details are not reviewed by L&I, except for the reasonability of the design to support the modular building. Approval and inspection of the foundation system is the jurisdiction of the local building official. This is typical for all foundation related sheets, details and engineering contained within this plan set.

1 STRUCTURAL FOUNDATION PLAN

SCALE: 3/16" = 1'-0"

STRUCTURAL NOTES

- 1. GENERAL:
1.1. BUILDING DIMENSIONS FROM THE MODULAR BUILDING MANUFACTURERS MAY VARY AND INSIGNIFICANT ADJUSTMENTS MAY BE MADE IN THE FIELD.
1.2. ANY VARIATION IN INSTALLATION OR MATERIALS OF THE FOUNDATION REQUIRES ENGINEER CONCURRENCE PRIOR TO PURCHASE AND INSTALLATION OF THE FOUNDATION MATERIALS.
1.3. A GEOTECHNICAL REPORT WAS NOT PROVIDED FOR THIS DESIGN. IBC MINIMUM VALUES FOR SOIL BEARING WAS USED. VERIFY BEARING CAPACITY WITH LOCAL BUILDING OFFICIAL PRIOR TO INSTALLATION. OWNER IS RESPONSIBLE FOR PROVIDING A STABLE, LEVEL AND SMOOTH SUBGRADE.
2. DESIGN INFORMATION & LOADING:
2.1. BUILDING CODE
2.1.1. 2021 WASHINGTON STATE BUILDING CODE (2021 IBC, AMENDED) & OSSC-2019
2.1.2. BUILDING RISK CATEGORY II
2.2. ROOF LCHE LOADS:
2.2.1. 45 PSF-GROUND SNOW LOAD
2.2.2. 45 PSF-ROOF DESIGN SNOW LOAD
2.2.3. 20 PSF-ROOF DESIGN LCHE LOAD
2.3. FLOOR LCHE LOAD: CLASSROOM
2.3.1. 125 PSF UNIFORM
2.3.2. 1,000# CONCENTRATED
2.4. WIND CRITERION:
2.4.1. Vult=130 MPH, Vasd=101 MPH, EXP C, Kzt=1.0
2.5. SEISMIC CRITERION: Sds=1.04, S1=0.61, Ie=1.0, SEISMIC CATEGORY, D
2.6. ASSUMED SOIL BEARING: 2,000 PSF, ASSUMED SITE SOIL CLASS D-DEFAULT

- 3. CONCRETE: (24"x24"x4", MIN. PRECAST BEARING PADS)
3.1. DESIGN COMP.STRENGTH 2,500 PSI
3.2. REINF. YIELD 60 KSI
4. MASONRY:
4.1. 8x16 UNITS ASTM C-90, GRADE N
4.2. UNITS MAY BE 8" &/OR 4" NOMINAL HEIGHT UNITS.
4.3. SET SINGLE DRY-STACKED UNITS W/CORES VERTICAL & NO MORE THAN 24-INCHES HIGH, PER PLAN.
4.4. SET DOUBLE ALTERNATING DRY-STACKED UNITS W/CORES VERTICAL & NO MORE THAN 48-INCHES HIGH, PER PLAN.
4.5. SET DOUBLE ALTERNATING DRY-STACKED UNITS W/CORES VERTICAL, CELLS GROUTED TO WITHIN (3) UNITS FROM TOP, NO MORE THAN 72-INCHES HIGH, PER PLAN. IF HIGHER THAN 72-INCHES A SPECIAL STRUCTURAL REVIEW IS REQUIRED.
5. WOOD:
5.1. ALL WOOD MEMBERS OF THE FOUNDATION SYSTEM SHALL BE SPF-STD OR BETTER, UNLESS NOTED OTHERWISE.
5.2. ALL WOOD IN CONTACT WITH SOIL, ASPHALT, MASONRY, OR CONCRETE SHALL BE PRESSURE TREATED (P.T.), FOR EXPOSURE.
5.3. ALL WOOD WITHIN 6-INCHES OF SUBGRADE TO BE TREATED FOR EXPOSURE AND INSECTS.
5.4. CONNECTORS IN CONTACT WITH P.T. WOOD TO BE HOT-DIPPED GALVANIZED OR STAINLESS STEEL CONNECTORS.
5.5. WOOD BEARING PADS MAY BE SUBSTITUTED FOR 24x24 CONCRETE PADS ONE FOR ONE AND SHALL BE P.T. 2x12-24" LONG, MIN.

- 6. SPECIALTY ITEMS:
6.1. METAL PIERS TO BE CAPABLE OF SUPPORTING 6,000#
6.2. ABS PADS MAY BE SUBSTITUTED FOR 24"x24" CONCRETE PADS ONE FOR ONE AND SHALL BE "BLACK PAD" OR EQUIVALENT, 24"x24", MIN.
6.4. TRANSVERSE & LONGITUDINAL SOIL ANCHORS TO BE MINUTEMAN ANCHORS, MARK 'MMA-35' MODEL '36-XDH', X-DRCHE ANCHORS OR EQUIVALENT W/ A MIN. ALLOWABLE DESIGN LOAD OF 1,800# IN ASPHALT.
6.5. UPLIFT SOIL ANCHORS TO BE MINUTEMAN ANCHORS, MARK 'MMA-92', MODEL '4430 EZD 3 4' OR 'GW-2 -NC1' AUGER STYLE SOIL ANCHORS W/STABILIZER HEAD OR EQUIVALENT W/ A MIN. ALLOWABLE DESIGN LOAD OF 3,150#. PRE-DRILL ASPHALT AND BASE PRIOR TO INSTALLATION. REFILL DRILLED HOLE.
6.6. COMPLETE FINAL ADJUSTMENT OF TIES TO BUILDING ONLY AFTER BUILDING IS FULLY BLOCKED AND LEVELED.
6.7. INSTALL ALL SPECIALTY ITEMS PER THE MANUFACTURER'S RECOMMENDATIONS.
7. VENTING:
7.1. IF CRAWLSPACE IS ENCLOSED, PROVIDE UNDER FLOOR VENTILATION AT 1 NET SF OF VENTILATION PER 150 SF OF FLOOR AREA.
7.2. IF A CLASS 1 VAPOR RETARDER IS INSTALLED THE RATIO MAY BE INCREASED TO 11500.
8. ACCESS:
8.1. PROVIDE MINIMUM 18"x24" ACCESS TO THE UNDER FLOOR AREA.
8.2. PROVIDE 18" MIN. CLEARANCE FROM SOIL TO UNDERSIDE OF ANY UNTREATED WOOD MEMBER.
8.3. PROVIDE 12" MIN. CLEARANCE UNDER FROM SOIL TO UNDERSIDE OF ALL BUILDING MEMBERS.
9. SITE CONDITIONS:
9.1. FOUNDATION SUBGRADE TO BE 2-INCH MINIMUM ASPHALT PAVEMENT OVER A MINIMUM OF 4-INCH THICK COMPACTED ROAD-MIX GRAVEL PAD OVER UNDISTURBED NATCHE SUITABLE STABLE SOILS OR STRUCTURAL FILL.



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Revision table with columns: REV., DATE, DESCRIPTION, BY, CHK/APR. Includes entry: A, 2024-06-07, ISSUED FOR STATE APPROVAL, CB

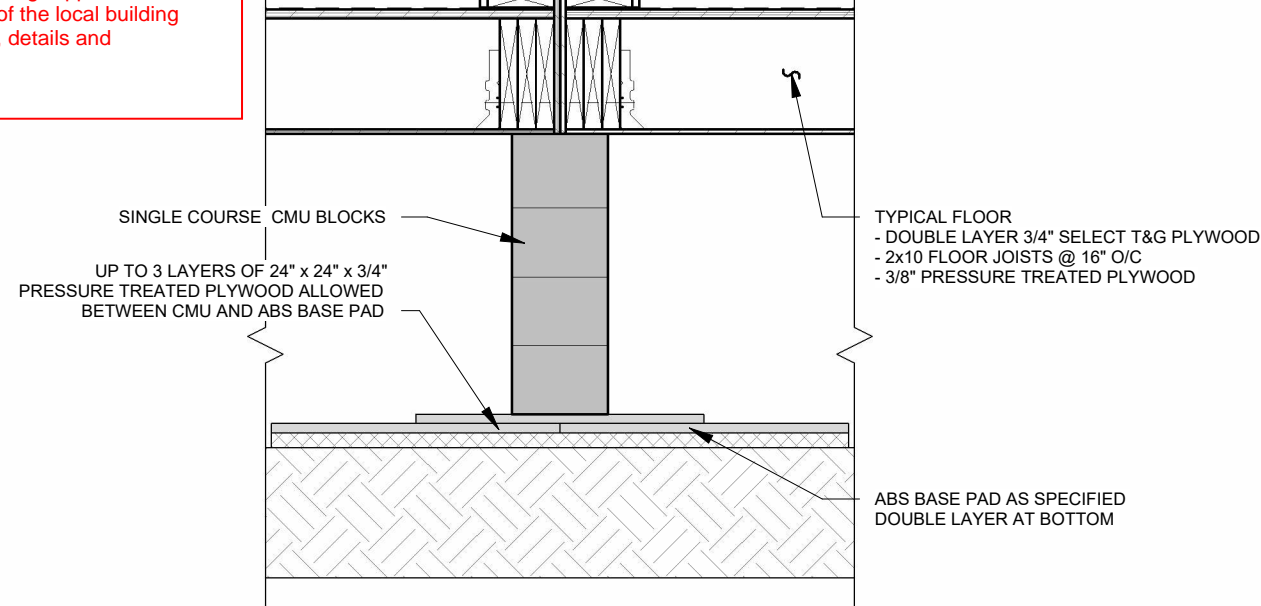
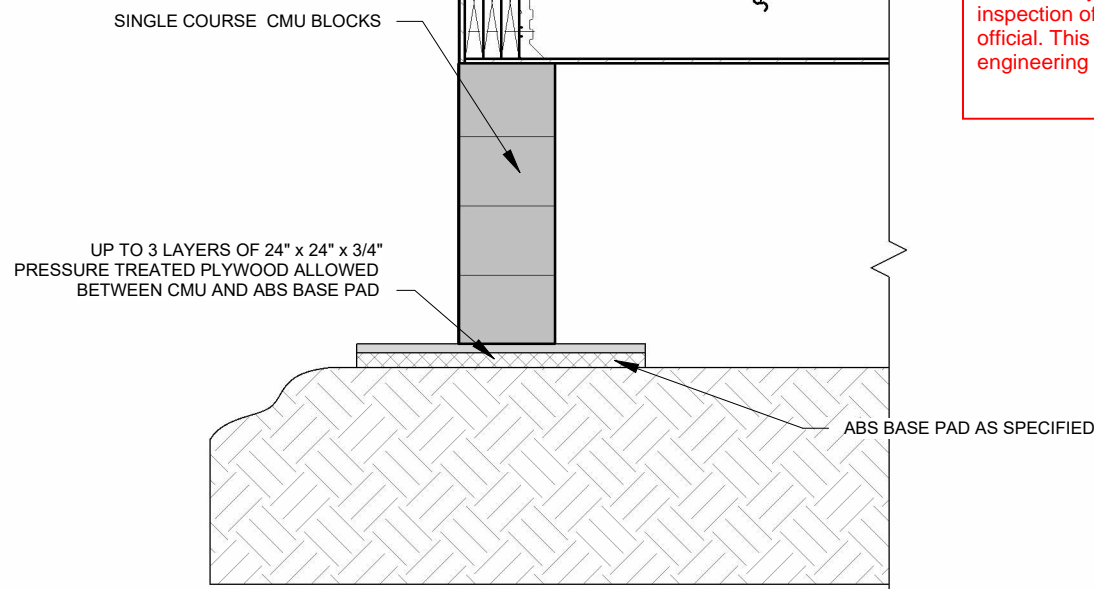
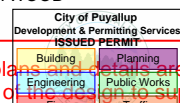
PROJECT: 28x64 ASL USA SR FLEET OFFICE WASH
CLIENT: CASCADE CHRISTIAN SCHOOL

DRAWING TITLE: FOUNDATION PLAN
PROJECT NO: 1107994 Exp. 12/09/2025
DRAWING NO: SC100
REV. #: A

STATE OF WASHINGTON
DEPT. OF LABOR AND
INDUSTRIES
EAS/PLAN REVIEW/SECTION
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TYPICAL FLOOR
- DOUBLE LAYER 3/4" SELECT T&G PLYWOOD
- 2x10 FLOOR JOISTS @ 16" O/C
- 3/8" PRESSURE TREATED PLYWOOD

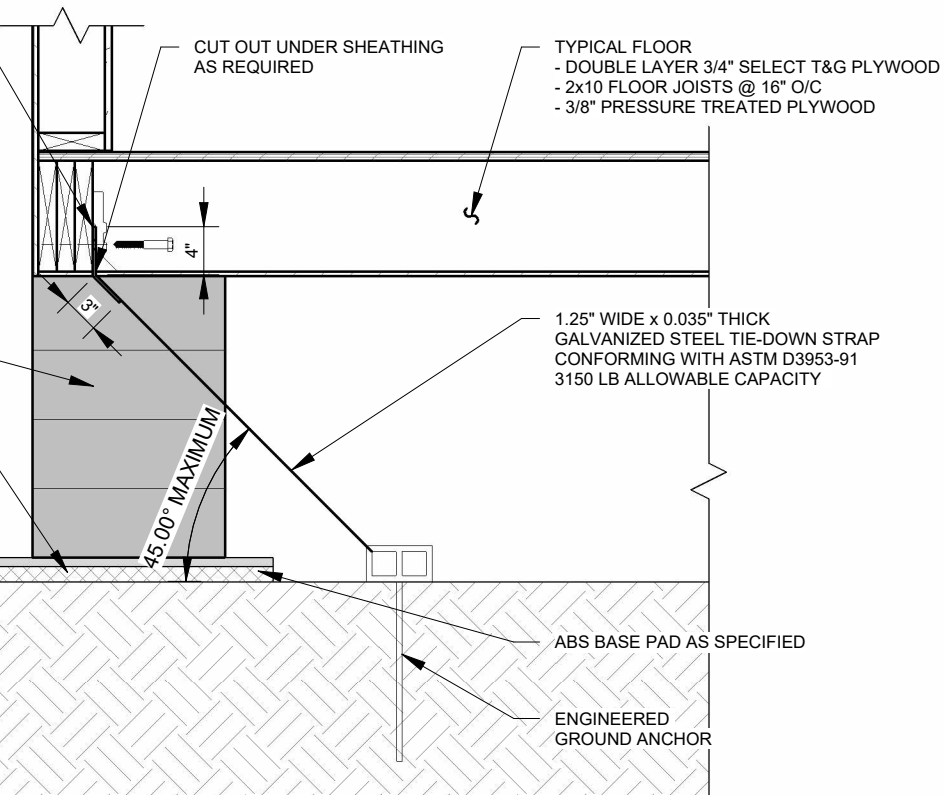
Foundation plans are not reviewed by L&I, except for the reasonability of the design to support the modular building. Approval and inspection of the foundation system is the jurisdiction of the local building official. This is typical for all foundation related sheets, details and engineering contained within this plan set.



1 FOUNDATION PERIMETER DETAIL

SCALE: 3/4" = 1'-0"

INSTALL STEEL ANCHOR BRACKET - TYPE 1 AS INDICATED
CW (2) 5/8" x 4 1/2" LONG LAG SCREWS
SEE OVERALL STRUCTURAL FOUNDATION PLAN FOR LOCATION OF STEEL ANCHOR BRACKETS



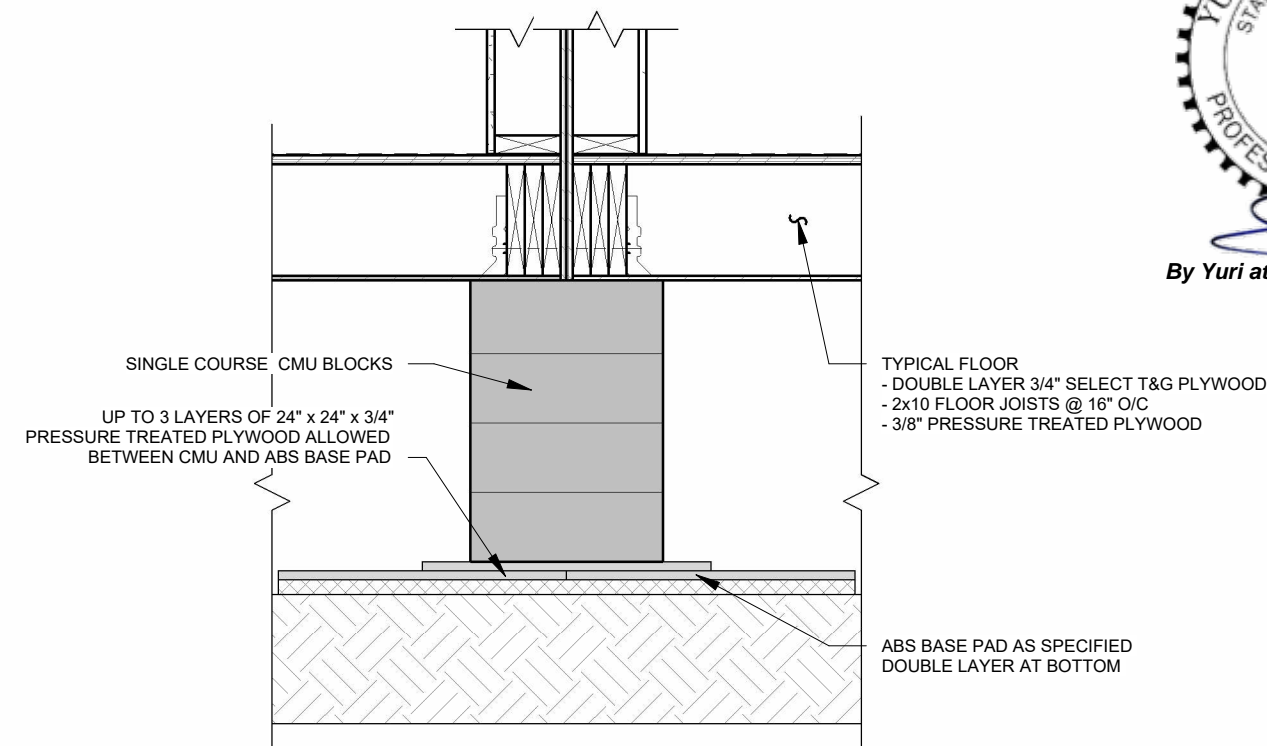
Use Standard Earth Ground Anchors Installed To Fullest Depth With Stabilizer Plates. Total (9) Tie-Downs At Each Structura Long Side And (2) Tie-Downs Per Short Side.

3 FOUNDATION SOIL ANCHOR

SCALE: 3/4" = 1'-0"

2 FOUNDATION MATING LINE DETAIL

SCALE: 3/4" = 1'-0"



4 FOUNDATION COLUMN SUPPORT DETAIL

SCALE: 3/4" = 1'-0"



By Yuri at 7:30:29 PM, 7/24/2024



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PROJECT: 28x64 ASL USA SR FLEET OFFICE WASH

DRAWING TITLE: FOUNDATION DETAILS

CLIENT: CASCADE CHRISTIAN SCHOOL

PROJECT NO: 1107994 Exp. 12/09/2025
DRAWING NO: SC200

REV. # A

PLOT DATE: 2024-07-24 12:32:04 PM

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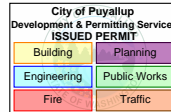
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STATE OF WASHINGTON
DEPT. OF LABOR AND
INDUSTRIES

DRAWING LIST - STRUCTURAL MANUFACTURING

SHEET NUMBER	SHEET NAME
SC100	FOUNDATION PLAN
SC200	FOUNDATION DETAILS
SM001	STRUCTURAL DRAWING LIST & GENERAL INFORMATION
SM101	OVERALL STRUCTURAL PLAN - LEVEL 1
SM121-101	STRUCTURAL FLOOR FRAMING PLAN - UNIT 101
SM121-102	STRUCTURAL FLOOR FRAMING PLAN - UNIT 102
SM141	OVERALL SEISMIC CEILING PLAN
SM151-101	STRUCTURAL ROOF FRAMING PLAN - UNIT 101
SM151-102	STRUCTURAL ROOF FRAMING PLAN - UNIT 102
SM300	EXTERIOR STRUCTURAL DETAILS
SM301	EXTERIOR STRUCTURAL DETAILS
SM302	EXTERIOR STRUCTURAL DETAILS
SM303	EXTERIOR STRUCTURAL DETAILS
SM304	EXTERIOR STRUCTURAL DETAILS
SM500	STEEL FABRICATION DETAILS
SM501	STEEL FABRICATION DETAILS
Grand total: 16	

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STRUCTURAL ABBREVIATIONS

ABBREVIATION	DESCRIPTION
ACC	ACCESSIBLE
ACFL	ACCESS FLOOR
AD	AREA DRAIN
ADJ	ADJACENT
AFF	ABOVE FINISHED FLOOR
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
B/O	BOTTOM OF
BFC	BELOW FINISHED CEILING
BLDG	BUILDING
BSC	BELOW STRUCTURAL CEILING
C/L	CENTRE LINE
C/W	COMPLETE WITH
CIP	CAST IN PLACE
CJ	CONTROL JOINT
CLR	CLEARANCE
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONT	CONTINUOUS
DEG	DEGREES
DIA	DIAMETER
DIM	DIMENSION
DL	DEAD LOAD
DP	DEPTH
DWG	DRAWING
EA	EACH
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATOR
F/O	FACE OF
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER
FIM	FREE ISSUE MATERIAL
FLR	FLOOR
FT	FOOT/FEET
GA	GAUGE
GWB	GYPSUM WALL BOARD
GWG	GEORGIAN WIRE GLASS
GYP	GYPSUM
ID	INSIDE DIAMETER
INFO	INFORMATION
INSUL	INSULATION
L	LENGTH
LL	LIVE LOAD

21FBS2400126

STRUCTURAL ABBREVIATIONS

ABBREVIATION	DESCRIPTION
m	METER
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MEZZ	MEZZANINE
MIN	MINIMUM
MISC	MISCELLANEOUS
mm	MILLIMETER
N/A	NOT APPLICABLE
NIC	NOT IN CONTRACT
No.	NUMBER
NTS	NOT TO SCALE
O/C	ON CENTRE
O/H	OVERHEAD
OD	OUTSIDE DIAMETER
OPP	OPPOSITE
OWSJ	OPEN WEB STEEL JOIST
PLAM	PLASTIC LAMINATE
PSSI	PLANT SUPPLIED SITE INSTALLED
PT	PRESSURE TREATED
R	RADIUS
R/W	REINFORCE WITH
REINF	REINFORCED
SF	SQUARE FEET
SIM	SIMILAR
SOG	SLAB ON GRADE
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
SSSI	SITE SUPPLIED SITE INSTALLED
STC	SOUND TRANSMISSION CLASS
STD	STANDARD
STRUCT	STRUCTURAL
SUSP	SUSPENDED
T/O	TOP OF
TBD	TO BE DETERMINED
TOC	TOP OF CURB
TOF	TOP OF FLOOR
TOS	TOP OF STEEL
TYP	TYPICAL
U/G	UNDER GROUND
U/S	UNDERSIDE
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
W/C	WATER CLOSET

BUILDING DESIGN LOADS:

ROOF LCHE LOAD: 20 PSF
 FLOOR LCHE LOAD UNIFORM: 125 PSF
 FLOOR LCHE LOAD CONCENTRATED: 2000 LBS
 ROOF SNOW LOAD: 45 PSF
 GROUND SNOW LOAD: 45 PSF
 WIND LOAD: 130 MPH @ 3-SEC GUST
 WIND EXPOSURE CATEGORY: C (VULT: 130 MPH, VASD: 121 MPH)
 SEISMIC DESIGN CATEGORY: D
 SITE DESIGN CLASSIFICATION: D
 OCCUPANCY CLASSIFICATION: **E** PER IBC **E occupancy**

FLOOD LOAD:

THIS BUILDING IS NOT DESIGNED TO BE SUBMERGED OR SUBJECTED TO WAVE ACTION WHEN LOCATED IN A FLOOD PRONE OR ZONE AREA. THE FINISH FLOOR ELEVATION MUST BE LOCATED ABOVE THE BUILDING SITE FLOOD PLANE LEVEL FOR THIS BUILDING TO BE LOCATED IN A FLOOD PRONE OR ZONE AREA SUBJECT TO LOCAL JURISDICTION.



By Yuri at 7:30:32 PM, 7/24/2024

[Structural Aspects Only]
MEP Dead Weights, Seismic/Wind Loads,
Supports, Anchors & Hole Penetrations.

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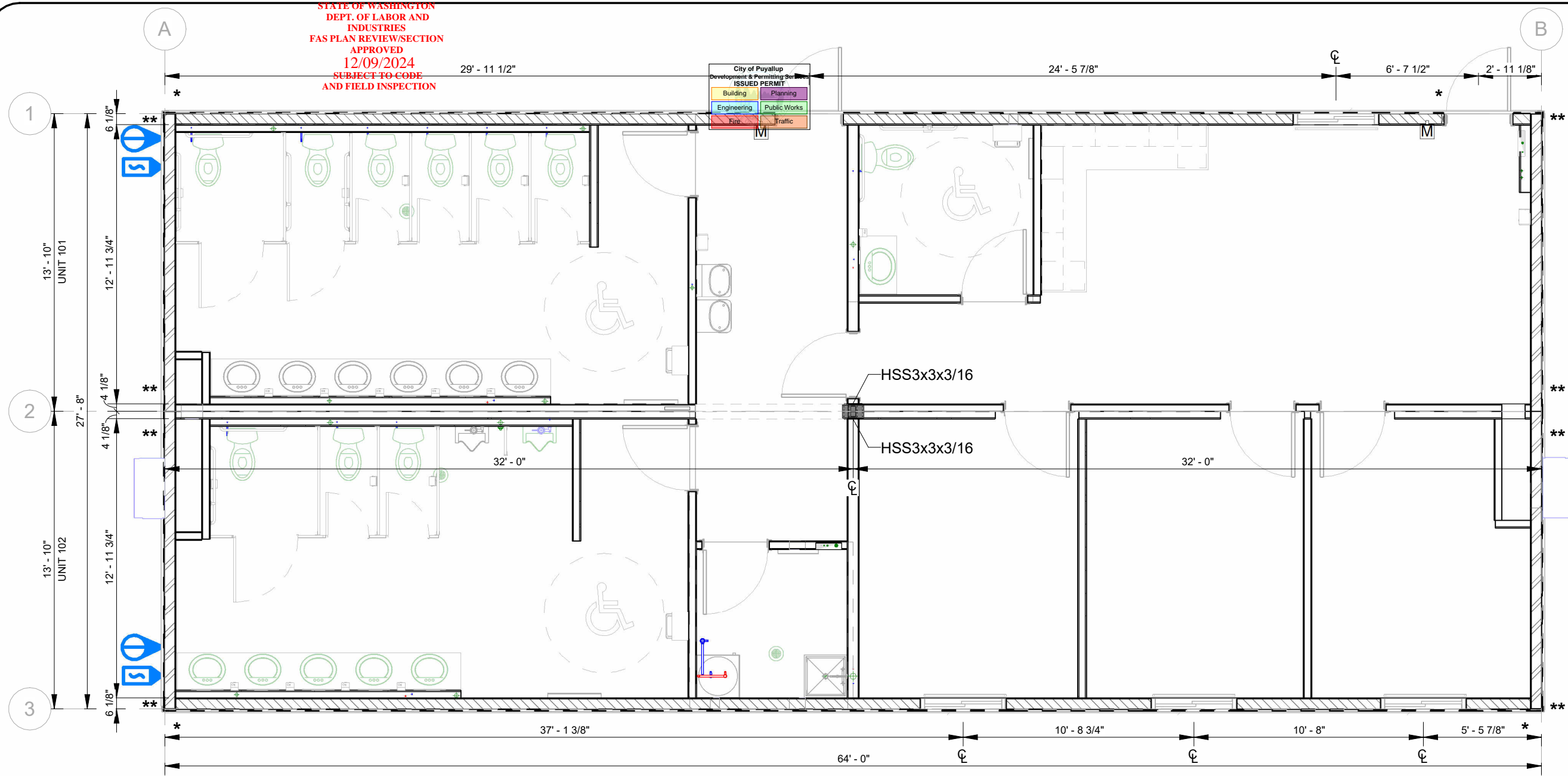
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REV.	DATE	DESCRIPTION	BY	CHK/APR
A	2024-06-07	ISSUED FOR STATE APPROVAL	CB	

PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH	DRAWING TITLE:	STRUCTURAL DRAWING LIST & GENERAL INFORMATION		
CLIENT:	CASCADE CHRISTIAN SCHOOL	PROJECT NO:	1107994	DRAWING NO:	SM001
			Exp. 12/09/2025	REV. #	A

STATE OF WASHINGTON
DEPT. OF LABOR AND
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City of Puyallup
Development & Permitting Services
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Building Planning
Engineering Public Works
Exp. Traffic



By Yuri at 7:30:34 PM, 7/24/2024

- * (1) MSTC28
- ** (2) MSTC28

1 OVERALL STRUCTURAL FLOOR PLAN
AM200 SCALE: 3/16" = 1'-0"

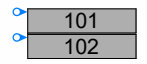
FASTENING SCHEDULE

WALL FASTENING SCHEDULE:
PLATE TO STUD: MIN. OF 2- 0.121 x 3" NAILS
SHEETROCK TO STUD (INTERIOR) 0.091 x 2 1/2" NAILS @ 18" O.C. EDGE AND CONSTRUCTION ADHESIVE IN FIELD
BOTTOM PLATE TO FLOOR 0.120 x 3" NAILS @ 8" O.C.
WALL SHEATHING TO STUD 0.131 X 2 1/2" END WALLS - @ 4" O.C. EDGE, 12" O.C. FIELD BLOCKED; LONG WALLS - 6" O.C. EDGE, 12" O.C. FIELD
THREE STUD CORNER CONNECTION 0.120 x 3" NAILS @ 8" O.C.

FLOOR FASTENING SCHEDULE:
CLASS "A" BOTTOM BOARD TO JOIST 16 GA. x 3/8" WIDE CROWN @ 12" MAX. EDGES ONLY
FLOOR DECKING TO 2X10 JOIST GLUED AND SCREWED W/ 2 1/4" x 0.120" SUBLOC PRO NAIL SCREWS @ 6" EDGE/ 8" FIELD

ROOF:
ROOF RIM TO TOP PLATE 0.120" x 3" NAILS @ 8" O.C.
LEDGER TO RIDGEBEAM (3) 1/4" x 3" LONG SDS SCREWS IN EACH JOIST SPACE, STAGGERED
SHEATHING TO ROOF MEMBERS 2 1/2" x 0.131" BISSETT GALVANIZED NAIL SCREWS @ 4" EDGE/ 12" FIELD

KEY PLAN



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PROJECT:
28x64 ASL USA SR FLEET
OFFICE WASH

CLIENT:
CASCADE CHRISTIAN SCHOOL

DRAWING TITLE:
OVERALL STRUCTURAL PLAN - LEVEL 1

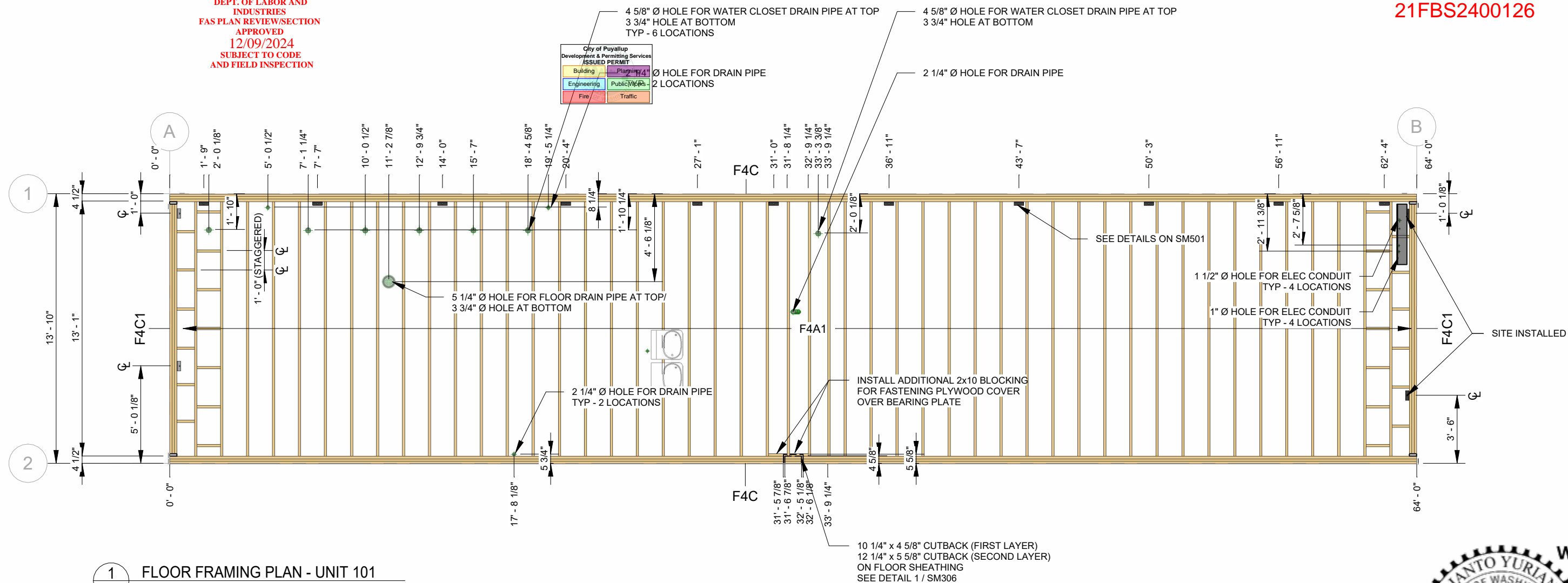
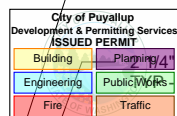
PROJECT NO:
1107994

DRAWING NO:
SM101

REV. #
A

Exp. 12/09/2025

STATE OF WASHINGTON
DEPT. OF LABOR AND
INDUSTRIES
FAS PLAN REVIEW/SECTION
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12/09/2024
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AND FIELD INSPECTION



1 FLOOR FRAMING PLAN - UNIT 101
AM200 SCALE: 3/16" = 1'-0"

FLOOR JOIST SCHEDULE - UNIT 101				
ID	CONSTRUCTION	QTY.	LENGTH	NOTES
F4A1	2x10 @ 16" O/C C/W LUS28	48	13' - 1"	-
F4C	3 - 2x10	2	64' - 0"	-
F4C1	3 - 2x10 C/W HUC210-3	2	13' - 0 7/8"	C/W INVERTED JOIST HANGERS

FLOOR SHEATHING SCHEDULE			
SUBFLOOR	SUBFLOOR FASTENING	UNDERFLOOR	UNDERFLOOR FASTENING
LAYERS 3/4" D. FIR SELECT T&G & 1 LAYER 3/4" SELECT PLYWOOD	GLUED AND SCREWED W/ 2 1/4" x 0.120" SUBLOC PRO NAIL SCREWS @ 6" EDGE/ 8" FIELD	3/8" PRESSURE TREATED PLYWOOD	2" STAPLED @ 3" EDGE/ 6" FIELD

FLOOR JOIST HANGER SCHEDULE			
# OF PLY/ JOIST HANGER TYPE	MODEL ID	FASTENERS	
		HEADER	JOIST
1 - 2x10	SIMPSON LUS28	(6) 0.148" x 3"	(4) 0.148" x 3"
3 - 2x10 (CONCEALED)	SIMPSON HUC210-3	(18) 0.162" x 2 1/2"	(10) x 0.148" x 3"

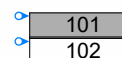
NOTES:
 • ALL DIMENSIONS FROM FACE OF STRUCTURE UNLESS NOTED OTHERWISE
 • ALL HOLE LOCATIONS TAKEN FROM FACE OF STRUCTURE TO CENTRE LINE OF HOLE

NOTES:
 - FILL ALL FASTENER HOLES AS PER MANUFACTURER'S SPECIFICATIONS
 - SEE ARCHITECTURAL DRAWINGS FOR BACKING AND INSULATION
 - SEE STRUCTURAL SCHEDULES FOR WALL, FLOOR AND ROOF CONSTRUCTION
 - FASTENING OF BUILT-UP BEAMS SHALL BE 3 1/4" x 0.120" NAILS @ 16" O/C [4-ROWS] PER LAMINATION
 - CONSTRUCTION OF BUILT-UP BEAMS SHALL BE HAVE SPLICES A MINIMUM OF 48" APART



By Yuri at 7:30:35 PM, 7/24/2024

KEY PLAN



CRITICAL TRANSPORT DIMENSIONS
 L: 70' - 0"
 W: 15' - 11"
 H: 13' - 2"



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REV.	DATE	DESCRIPTION	BY	CHK/APR
A	2024 -06-07	ISSUED FOR STATE APPROVAL	CB	

PROJECT: 28x64 ASL USA SR FLEET OFFICE WASH

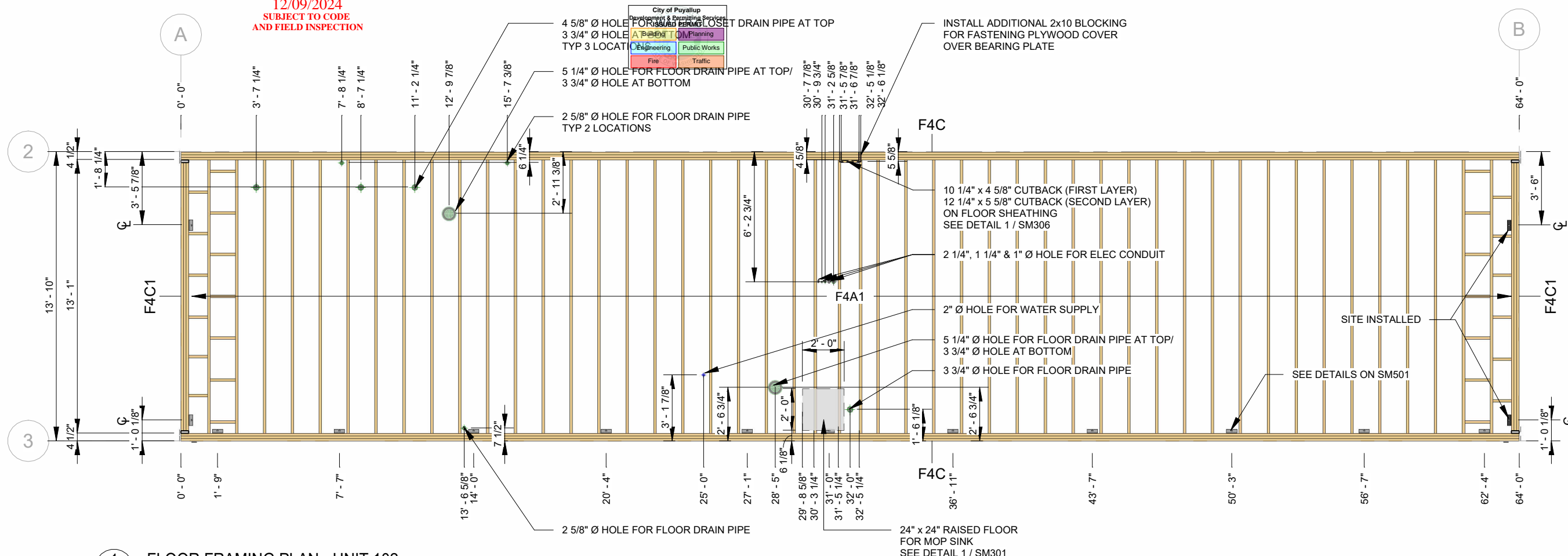
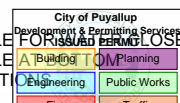
CLIENT: CASCADE CHRISTIAN SCHOOL

DRAWING TITLE: STRUCTURAL FLOOR FRAMING PLAN - UNIT 101

PROJECT NO: 1107994 Exp. 12/09/2025
 DRAWING NO: SM121-101

REV. # A

STATE OF WASHINGTON
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1 FLOOR FRAMING PLAN - UNIT 102
AM200 SCALE: 3/16" = 1'-0"

ID	CONSTRUCTION	QTY.	LENGTH	NOTES
F4A1	2x10 @ 16" O/C C/W LUS28	48	13' - 1"	-
F4C	2 - 2x10	2	64' - 0"	-
F4C1	3 - 2x10 C/W HUC210-3	2	13' - 0 7/8"	C/W INVERTED JOIST HANGERS

SUBFLOOR	SUBFLOOR FASTENING	UNDERFLOOR	UNDERFLOOR FASTENING
LAYERS 3/4" D. FIR SELECT T&G & 1 LAYER 3/4" SELECT PLYWOOD	GLUED AND SCREWED W/ 2 1/4" x 0.120" SUBLOC PRO NAIL SCREWS @ 6" EDGE/ 8" FIELD	3/8" PRESSURE TREATED PLYWOOD	2" STAPLED @ 3" EDGE/ 6" FIELD

# OF PLY/ JOIST HANGER TYPE	MODEL ID	FASTENERS	
		HEADER	JOIST
1 - 2x10	SIMPSON LUS28	(6) 0.148" x 3"	(4) 0.148" x 3"
3 - 2x10 (CONCEALED)	SIMPSON HUC210-3	(18) 0.162" x 2 1/2"	(10) x 0.148" x 3"

NOTES:
 • ALL DIMENSIONS FROM FACE OF STRUCTURE UNLESS NOTED OTHERWISE
 • ALL HOLE LOCATIONS TAKEN FROM FACE OF STRUCTURE TO CENTRE LINE OF HOLE

NOTES:
 - FILL ALL FASTENER HOLES AS PER MANUFACTURER'S SPECIFICATIONS
 - SEE ARCHITECTURAL DRAWINGS FOR BACKING AND INSULATION
 - SEE STRUCTURAL SCHEDULES FOR WALL, FLOOR AND ROOF CONSTRUCTION
 - FASTENING OF BUILT-UP BEAMS SHALL BE 3 1/4" x 0.120" NAILS @ 16" O/C [4-ROWS] PER LAMINATION
 - CONSTRUCTION OF BUILT-UP BEAMS SHALL BE HAVE SPLICES A MINIMUM OF 48" APART

KEY PLAN
 101
 102
CRITICAL TRANSPORT DIMENSIONS
 L: 70' - 0"
 W: 15' - 11"
 H: 13' - 2"



By Yuri at 7:30:36 PM, 7/24/2024

PLOT DATE: 2024-07-24 12:32:08 PM

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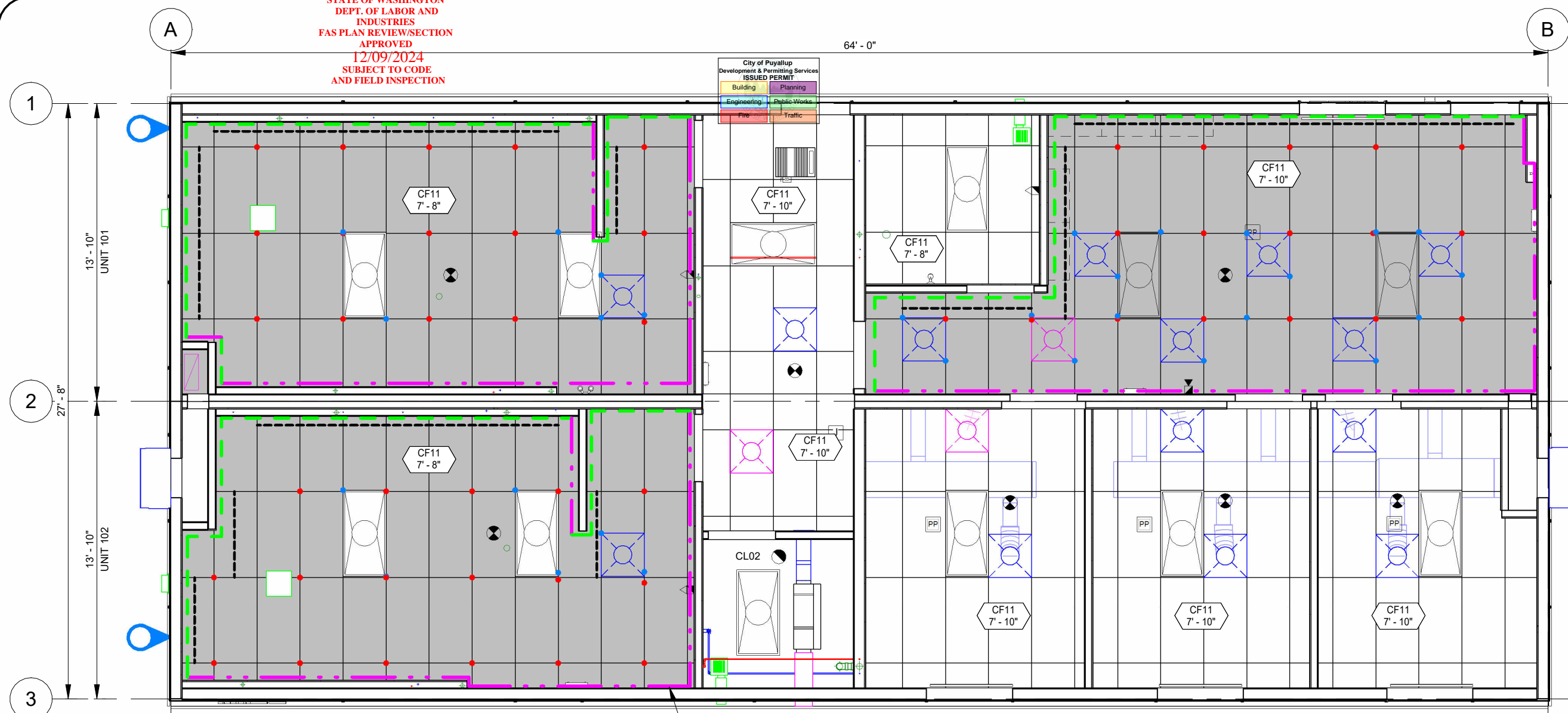
REV.	DATE	DESCRIPTION	BY	CHK/APR
A	2024 -06-07	ISSUED FOR STATE APPROVAL	CB	

PROJECT: 28x64 ASL USA SR FLEET OFFICE WASH	DRAWING TITLE: STRUCTURAL FLOOR FRAMING PLAN - UNIT 102
CLIENT: CASCADE CHRISTIAN SCHOOL	PROJECT NO: 1107994
	DRAWING NO: SM121-102
	REV. # A

Exp. 12/09/2025

PLOT DATE: 2024-07-24 1:46:21 PM

11x17 Titleblock R2024.1



1 OVERALL SEISMIC CEILING PLAN
AM200 SCALE: 3/16" = 1'-0"

SEISMIC REFLECTED CEILING DETAILS/ INSTALLATION
SEE DETAILS ON SM303
TYP

FOR HEAVY DUTY GRIDS:

- VERTICAL HANGER WIRE, 12 GAUGE, SECURED TO CEILING TEES
MAXIMUM 4 FT. WIRE SPACING
- VERTICAL HANGER WIRE, 12 GAUGE, SECURED TO LIGHT FIXTURES
THIS WIRE MAY BE SLACK

LIGHTING FIXTURES SHALL BE CONNECTED WITH 2 HANGERS WIRES TO THE HOUSING
MECHANICAL SERVICES SHALL BE CONNECTED WITH 2 HANGERS TO THE FIXTURE
SURFACE MOUNTED LIGHTING SHALL BE POSITCHELY CLAMPED TO THE GRID
CLAMPING DEVICE TO HAVE A WIRE TO THE GRID OR ROOF STRUCTURE
GRID INTERSECTIONS SHALL BE CONNECTED WITH SEPARATION JOINT CLIP
VERTICAL HANGER WIRE MAY NOT BE MORE THAN 1/6 OUT OF PLUMB
VERTICAL HANGERS MUST BE STRAIGHT AND SHALL NOT USE BENDS OR KINKS FOR LEVELING

- NON-FIXED GRID-TO-WALL CONNECTIONS SHALL USE 7/8" OR LARGER WALL MOULDING
W/ MINIMUM 3/4" WALL CLEARANCE
(SEE DETAIL 3/ SM304 FOR NON-FIXED CONNECTION)
- STABILIZER BAR NEEDED ON SIDES NOT ATTACHED SEE DETAIL 3/ SM304

■ THE GRID MUST BE CONNECTED TO THE PERIMETER ON TWO ADJACENT SIDES
(SEE DETAIL 2/ SM304 FOR FIXED CONNECTION)
- LINE ON DRAWING DENOTES WHICH SIDE OF GRID IS ATTACHED TO THE L-ANGLE TRIM

⊕ BRACE STARTING AT 6' FROM ADJACENT WALLS (2" MAX OF TEE INTERSECTION) THEN 12' O/C
IN BOTH DIRECTIONS (SEE DETAIL 7/SM304)

REGULAR CEILING GRIDS WILL BE INSTALLED AS PER TYPICAL ACT (CF03)

SEISMIC DESIGN APPLICABLE FOR SEISMIC DESIGN CATEGORY D
SUSPENDED CEILING SYSTEMS SHALL CONFORM TO ASTM C635 AND ASTM E580
CEILING AREAS LESS THAN 144 SQ.FT. ARE EXEMPT FROM ANY SEISMIC BRACING REQUIREMENTS
CEILING AREAS LESS THAN 1000 SQ.FT. ARE EXEMPT FROM LATERAL FORCE BRACING REQUIREMENTS

CEILING GRID CONSTRUCTION LEGEND			
TAG	ACT GRID TYPE	HANGER WIRE	
CF03	24" x 48" ACT GRID L MOLDS (7/8") OR LARGER DXL26 MAIN TEES - HEAVY DUTY DXL424 CROSS TEES DH4 4-WAY CLIPS AT JOINTS	12 GAUGE HANGER WIRE	



By Yuri at 7:30:37 PM, 7/24/2024

[Structural Aspects Only]
MEP Dead Weights, Seismic/Wind Loads,
Supports, Anchors & Hole Penetrations.

KEY PLAN

- 101
- 102



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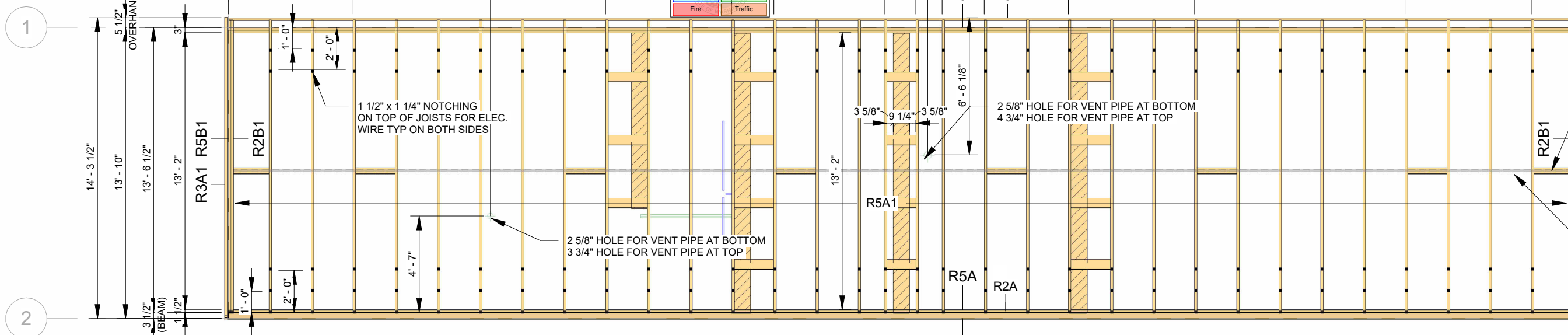
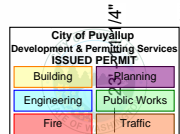
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REV.	DATE	DESCRIPTION	BY	CHK/APR
A	2024 -06-07	ISSUED FOR STATE APPROVAL	CB	

PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH
CLIENT:	CASCADE CHRISTIAN SCHOOL

DRAWING TITLE: OVERALL SEISMIC CEILING PLAN	
PROJECT NO: 1107994	DRAWING NO: SM141
Exp. 12/09/2025	REV. # A

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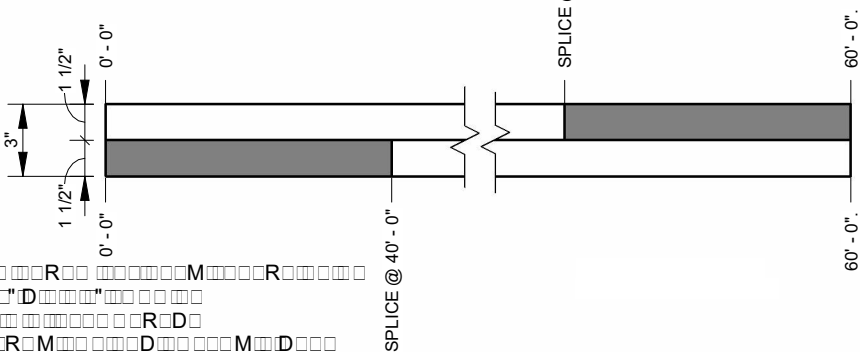
2x4 BLOCKS AT 10' O/C
FASTEN W/ (2) 12D NAILS AT EACH END
TYP

INSTALL 1 1/2" GALVANIZED STRAP
ON BOTTOM OF RAFTERS W/ STAPLES

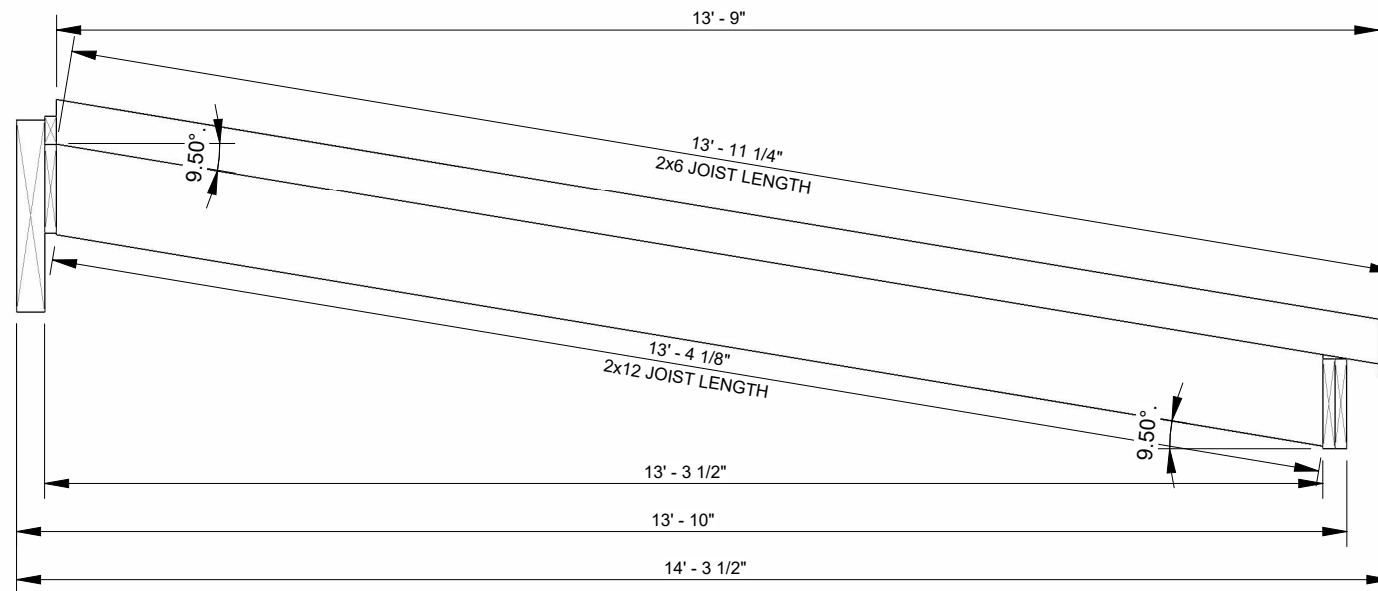


By Yuri at 7:30:39 PM, 7/24/2024

1 ROOF FRAMING - UNIT 101
SCALE: 3/16" = 1'-0"



S - LVL BEAM SPLICE DIMENSIONS
SCALE: 1 1/2" = 1'-0"



NOTES:
• ALL DIMENSIONS FROM FACE OF STRUCTURE UNLESS NOTED OTHERWISE
• ALL HOLE LOCATIONS TAKEN FROM FACE OF STRUCTURE TO CENTRE LINE OF HOLE

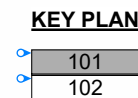
ID	CONSTRUCTION	QTY.	LENGTH	NOTES
R2A	2x4	1	64' - 0"	-
R2A1	2x6 @ 24" O/C	32	13' - 11 3/4"	C/W A34 BRACKETS @ BEAM END
R2B1	2 - 2x6	2	13' - 11 3/4"	C/W A34 BRACKETS @ BEAM END
R3A	2x8	1	64' - 0"	-
R3A1	2x8	2	14' - 5 7/8"	INSTALLED W/ 1/2" PLYWOOD UNDERNEATH
R5A	2x12	1	64' - 0"	-

ID	CONSTRUCTION	QTY.	LENGTH	NOTES
R5A1	2x12 @ 24" O/C C/W LRU210Z	32	13' - 5 3/4"	C/W HANGERS ON BEAM SIDE
R5B	2 - 2x12	1	64' - 0"	-
R5B1	2 - 2x12	2	13' - 5 3/4"	C/W 2 A34 BRACKETS @ EACH END
RGA1	(2 PLY 1 3/4" LVL) 3 1/2" x 24" 2.0E LVL BEAM	1	64' - 0"	C/W WALL FRAMING

SHEATHING	FASTENING
1/2" FIRE RATED PLYWOOD	2 1/2" x 0.131" BISSETT GALVANIZED NAIL SCREWS @ 4" EDGE/ 12" FIELD

# OF PLY/ JOIST HANGER TYPE	MODEL ID	FASTENERS	
		HEADER	JOIST
2x12	SIMPSON LRU210Z	(6) 0.162" x 2 1/2"	(7) 0.162" x 2 1/2"
2 - 2x12	A34 FRAMING ANGLE	(8) 0.131" x 1 1/2"	(8) 0.131" x 1 1/2"

NOTES:
- FILL ALL FASTENER HOLES AS PER MANUFACTURER'S SPECIFICATIONS
- SEE ARCHITECTURAL DRAWINGS FOR BACKING AND INSULATION
- SEE STRUCTURAL SCHEDULES FOR WALL, FLOOR AND ROOF CONSTRUCTION



CRITICAL TRANSPORT DIMENSIONS
L: 70' - 0"
W: 15' - 11"
H: 13' - 2"

FOR PERMIT

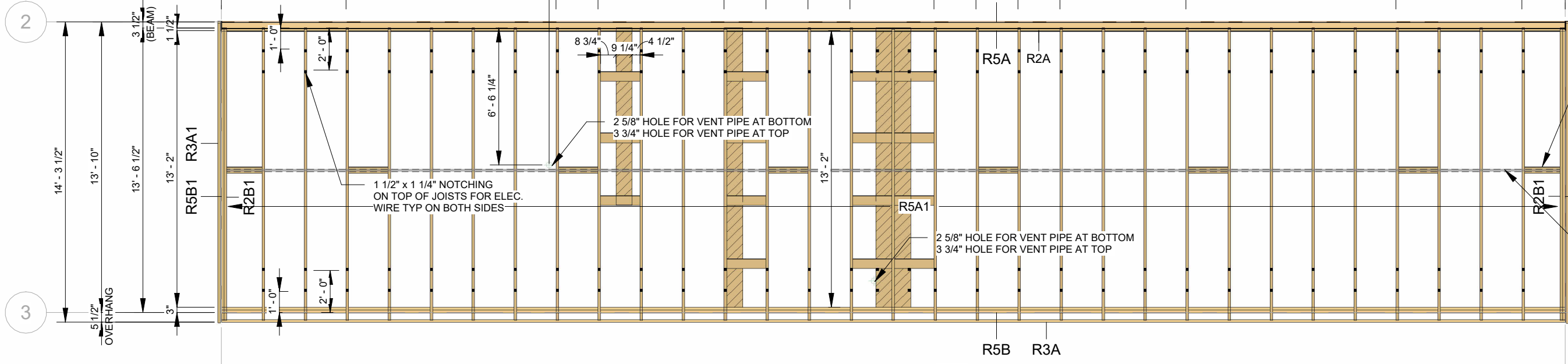
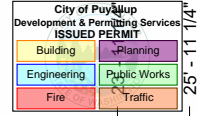
REV.	DATE	DESCRIPTION	BY	CHK/APR
A	2024 -06-07	ISSUED FOR STATE APPROVAL	CB	

PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH
CLIENT:	CASCADE CHRISTIAN SCHOOL

DRAWING TITLE:	STRUCTURAL ROOF FRAMING PLAN - UNIT 101		
PROJECT NO:	1107994	DRAWING NO:	SM151-101
REV. #	A	Exp. 12/09/2025	

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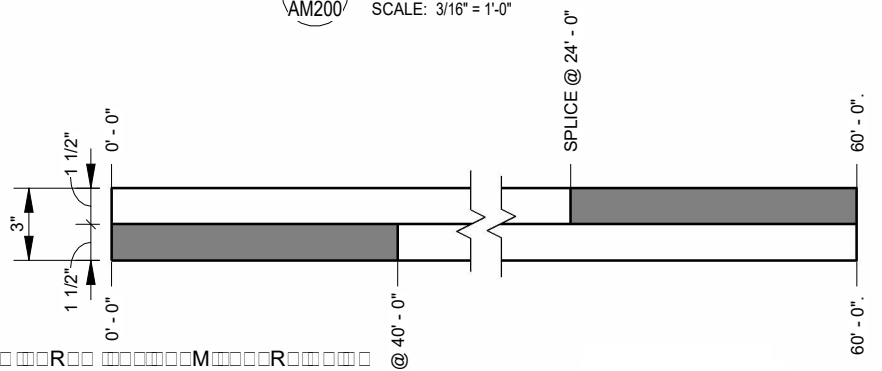
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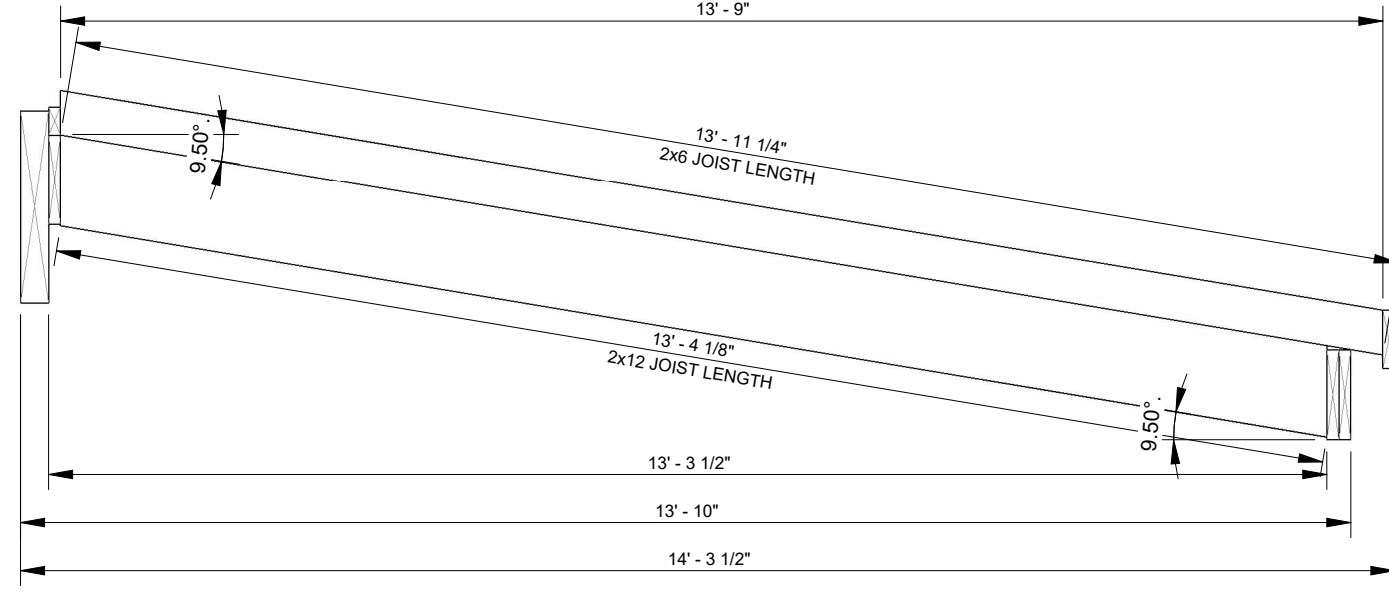
2x4 BLOCKS AT 10' O/C
FASTEN W/ (2) 12D NAILS AT EACH END
TYP

INSTALL 1 1/2" GALVANIZED STRAP
ON BOTTOM OF RAFTERS W/ STAPLES

1 ROOF FRAMING - UNIT 102
AM200 SCALE: 3/16" = 1'-0"



S - LVL BEAM SPLICE DIMENSIONS
SCALE: 1 1/2" = 1'-0"



By Yuri at 7:30:42 PM, 7/24/2024

NOTES:
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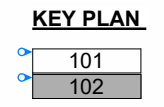
ROOF JOIST SCHEDULE - UNIT 102				
ID	CONSTRUCTION	QTY.	LENGTH	NOTES
R2A	2x4	1	64' - 0"	-
R2A1	2x6 @ 24" O/C	31	13' - 11 3/4"	C/W A34 BRACKETS @ BEAM END
R2B1	2 - 2x6	2	13' - 11 3/4"	C/W A34 BRACKETS @ BEAM END
R3A	2x8	1	64' - 0"	-
R3A1	2x8	2	14' - 7"	INSTALLED W/ 1/2" PLYWOOD UNDERNEATH
R5A	2x12	1	64' - 0"	-

ROOF JOIST SCHEDULE - UNIT 102				
ID	CONSTRUCTION	QTY.	LENGTH	NOTES
R5A1	2x12 @ 24" O/C C/W LRU210Z	31	13' - 5 3/4"	C/W HANGERS ON BEAM SIDE
R5B	2x12	1	64' - 0"	-
R5B1	2 - 2x12	2	13' - 5 3/4"	C/W 2 A34 BRACKETS @ EACH END
RGA1	(2 PLY 1 3/4" LVL) 3 1/2" x 24" 2.0E LVL BEAM	1	64' - 0"	C/W WALL FRAMING

ROOF SHEATHING SCHEDULE	
SHEATHING	FASTENING
1/2" FIRE RATED PLYWOOD	2 1/2" x 0.131" BISSETT GALVANIZED NAIL SCREWS @ 4" EDGE/ 12" FIELD

ROOF JOIST HANGER SCHEDULE			
# OF PLY/ JOIST HANGER TYPE	MODEL ID	FASTENERS	
		HEADER	JOIST
2x12	SIMPSON LRU210Z	(6) 0.162" x 2 1/2"	(7) 0.162" x 2 1/2"
2 - 2x12	A34 FRAMING ANGLE	(8) 0.131" x 1 1/2"	(8) 0.131" x 1 1/2"

NOTES:
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- SEE ARCHITECTURAL DRAWINGS FOR BACKING AND INSULATION
- SEE STRUCTURAL SCHEDULES FOR WALL, FLOOR AND ROOF CONSTRUCTION



CRITICAL TRANSPORT DIMENSIONS
L: 70' - 0"
W: 15' - 11"
H: 13' - 2"



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PROJECT: 28x64 ASL USA SR FLEET OFFICE WASH
CLIENT: CASCADE CHRISTIAN SCHOOL

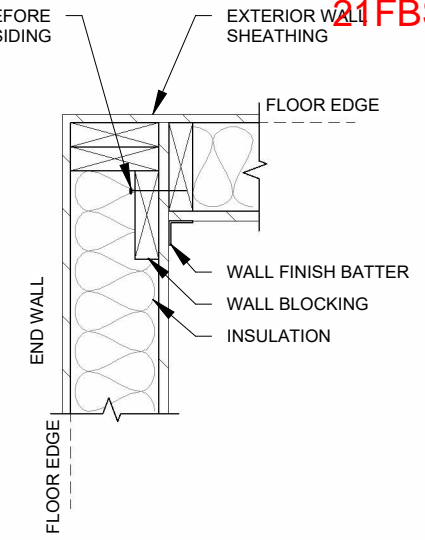
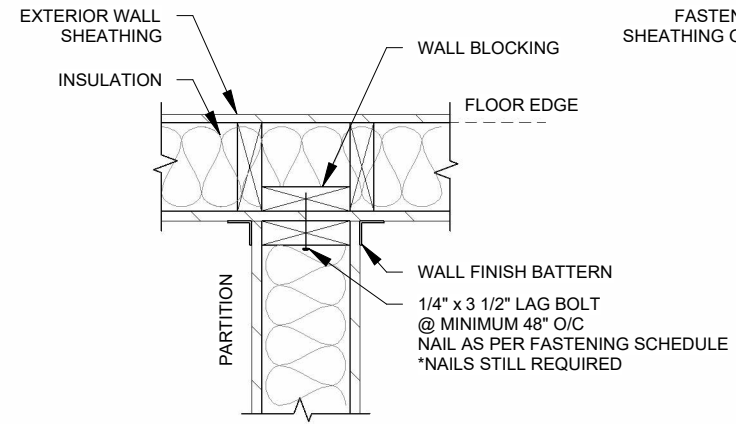
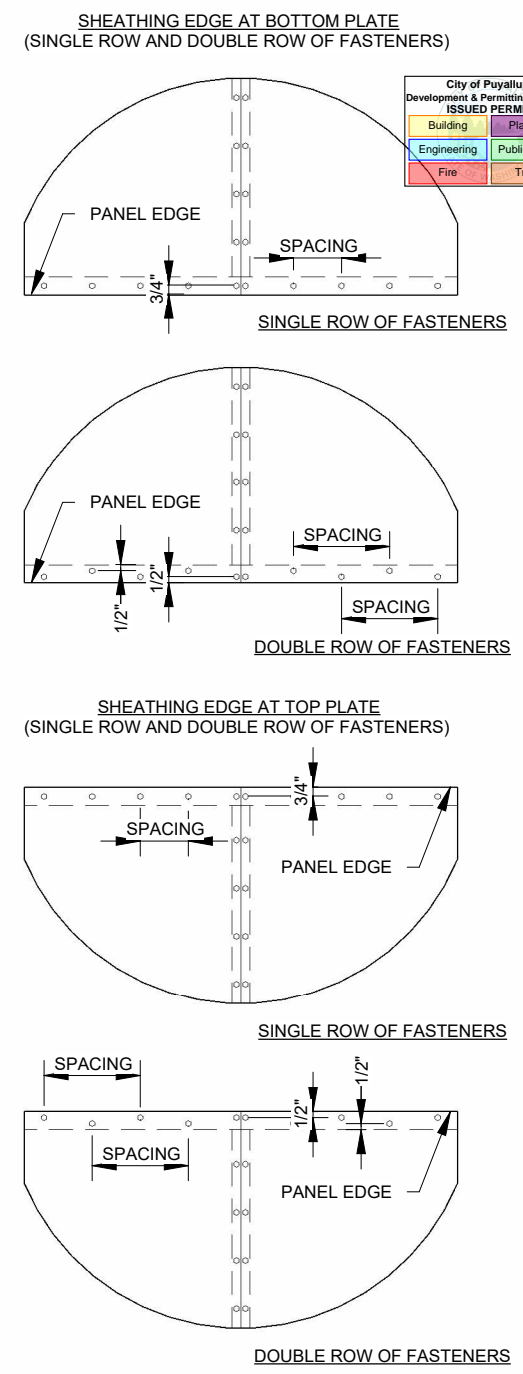
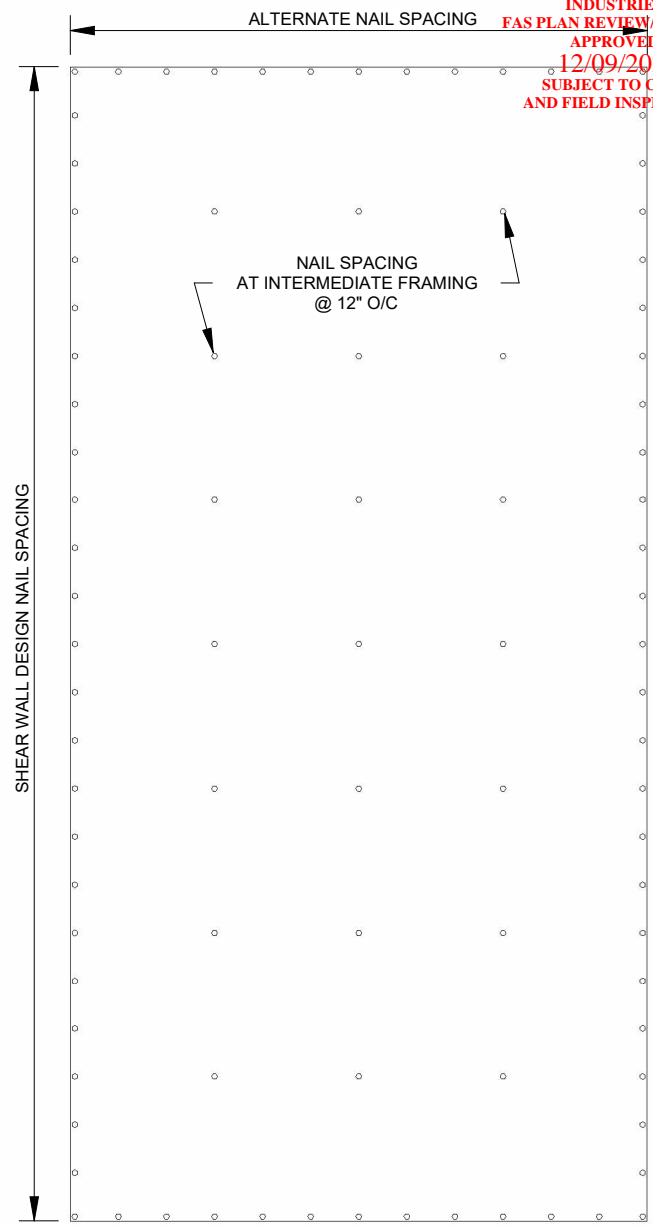
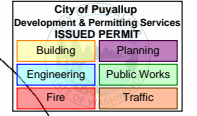
DRAWING TITLE: STRUCTURAL ROOF FRAMING PLAN - UNIT 102
PROJECT NO: 1107994 Exp. 12/09/2025
DRAWING NO: SM151-102
REV. #: A

PLOT DATE: 2024-07-24 12:32:11 PM

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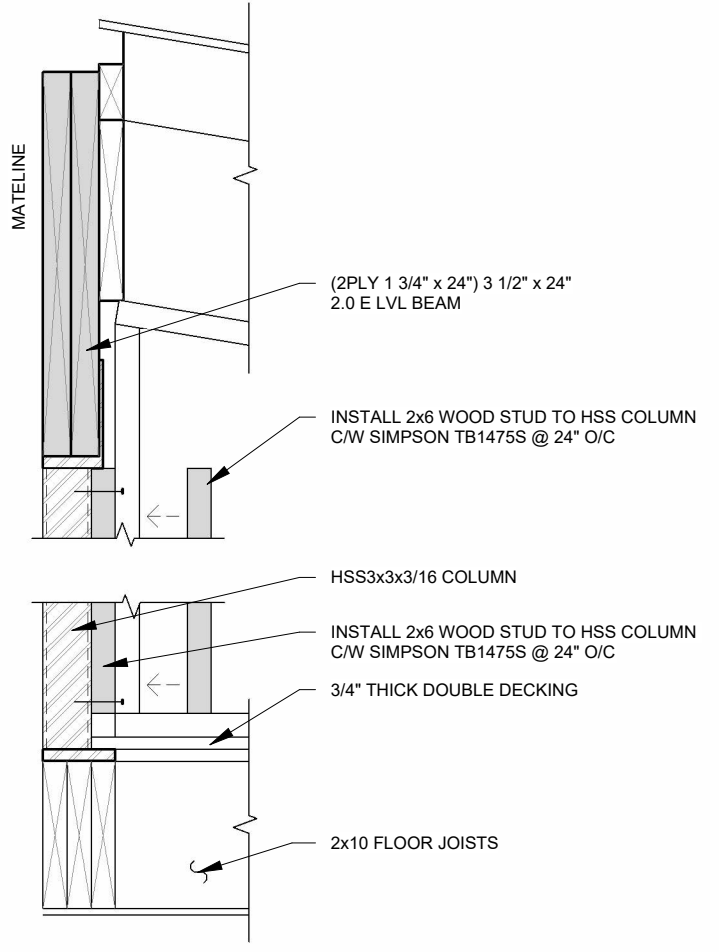
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21 FBS2400126



2 WALL FASTENING DETAILS
SCALE: 1" = 1'-0"

END WALL ATTACHMENT



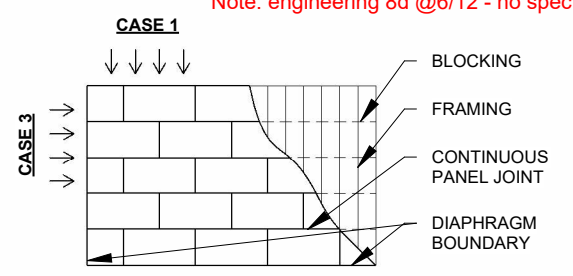
3 WOOD STUD / HSS COLUMN FASTENING DETAIL
SCALE: 1" = 1'-0"

NOTES:
• EDGE PANEL/ BOUNDARY NAIL SPACING 4" O/C (PER STRUCTURAL CALCULATIONS)

Note: engineering 8d @6/12 - no spec insp

ROOF DIAPHRAGM PANEL ORIENTATIONS

ROOF DIAPHRAGM/ SHEAR WALL PANEL SCHEDULE
 • ROOF DIAPHRAGM PANEL:
 USE 1/2" FIRE RATED PLYWOOD (PS1/ PS2)
 2 1/2" x 0.131" BISSETT GALVANIZED NAIL SCREWS @ 4" O/C EDGE/ 12" O/C FIELD
 • SHEAR WALL PANEL:
 USE 1/2" CDX PLYWOOD (APA RATED)
 2 1/2" x 0.131" NAILS @ 4" EDGE/ 12" FIELD
 C/W 2x4 BLOCKING AT ALL SHEATHING JOINTS, DOUBLE END STUD NAILED AT 2" EACH



1 ROOF DIAPHRAGM / SHEAR PANEL DETAILS
SCALE: 3/4" = 1'-0"



By Yuri at 7:30:44 PM, 7/24/2024

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REV.	DATE	DESCRIPTION	BY	CHK/APR
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PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH
CLIENT:	CASCADE CHRISTIAN SCHOOL

DRAWING TITLE:	EXTERIOR STRUCTURAL DETAILS		
PROJECT NO:	1107994	DRAWING NO:	SM300
REV. #	A	Exp. 12/09/2025	

Size	Description	Comments	Size	Type	Spacing Of Fasteners O/C ("P" = Perimeter) ("F" = Field)					
					Floor	Wall	Partition	Roof	Roof	
3/8"	OSB/ Plywood		1/2" x 1-3/4"	44G Bab Staple	4			8	3	6
3/8"	Plywood Underlay (Top Layer)	Double Flooring	1/2" x 1-3/4"	44G Bab Staple	4					
7/16"	OSB		1/2" x 1-3/4"	44G Bab Staple	4			8	4	12
1/2"	OSB/ Plywood (Bottom Layer)		1/2" x 1-3/4"	44G Bab Staple	4	8	4	8		
7/16"	OSB (Bottom Layer)		#8 x 1-3/4"	Low Root Wood Screw					3	6
5/8"	T & G Plywood		1/2" x 2-1/2"	63G Bab Staple	4	8				
5/8"	T & G Plywood		#8 x 1-3/4"	Low Root Wood Screw	16	16			6	12
3/4"	T & G Plywood		1/2" x 2-1/2"	63G Bab Staple	4	8				
3/4"	T & G Plywood		#8 x 1-3/4"	Low Root Wood Screw	16	16			6	12
1-1/8"	T & G Plywood	Fastening To Metal Floor Joist	8d Ring Shank	Hardened Nail	6	6				
1-1/8"	T & G Plywood	Fastening To Metal Floor Joist	#12 x 24 x 2-1/2" Screw	Self-Drilling Metal Screw	6	6				
3/8"	V.C. Drywall		1" x 1-1/4"	31G Bab Staple			8			
3/8"	V.C. Drywall		1-1/4"	Foam Adhesive				24		
1/2"	Plain Drywall		#6 x 1-1/4"	Drywall Screw			12	12		
1/2"	Plain Drywall		1-1/4"	Drywall Screw					12	12
1/2"	V.C. Drywall		1" x 1-1/2"	38G Bab Staple		8			8	
1/2"	V.C. Drywall		#6 x 1-5/8"	Foam Adhesive						24
5/8"	Plain Drywall		#6 x 1-5/8"	Drywall Screw		12	12	12	12	
5/8"	V.C. Drywall		1" x 1-1/2"	38G Bab Staple		8			8	
5/8"	V.C. Drywall		3/8" Continuous Bead	Adhesive			Dbf Bead	Sgl Bead		
3/8"	FRP Board		1/2" x 1-1/4"	31G Bab Staple			10		10	
3/8"	FRP Board		1/4" x 1"	NYLON Tap Ins.				24		24
5.2mm	Luan Paneling	Stud 16" On Center	7/32" x 1"	351G Bab Brown Staple			6	12		
3.2mm	Luan Paneling	Stud 16" On Center	7/32" x 5/8"	355/ 8G Brown Staple			6	12		
1/4"	V.C. Luan Paneling	Stud 16" On Center	7/32" x 1"	351G Bab White Staple			4		4	
1/4"	V.C. Luan Paneling	Stud 16" On Center	1-1/4"	Foam Adhesive				24		24
1/2"	Ceiling Board	Roof Joist 16" On Center	1-1/4" x 1"	31G Bab Staple					6	12
1/2"	Inner Seal	Stud 16" On Center	.0915" x 2-1/8"	EC22 ASB Hot Nail			6	12		
1/2"	Inner Seal	Stud 16" On Center	1-1/4"	RD 504 Nail						
30 Ga.	Roof Edge		1/2" x 1-1/2"	38G Bab Staple						2
	Termination Bar		#8 x 1-1/4"	Pan Head Screw					6	
	Batten/ Baseboard/ Casing		.072" x 2"	DA21 EPDN Nail			12			
1/2"	Canvex/ Bottom Board		1-1/4" x 1"	31G Bab Staple	3					
7/16"	Smartside Panel Siding		.090" x 2"	C6R90BDG Nail			6	12		
28 Ga.	Low Rib Siding		#9 x 1-1/2"	Wood Screw				12		
28 Ga.	Low Rib Siding		#14 x 7/8"	Lap Screw			12			

General Fastening Schedules For Studs

Stud Size	Stud Location	Floor Qty.	Walls Qty.	Partition Qty.	Roof Qty.	Size Of Nail or Staple	Type	Comments
2x4	To Plate	3	3	3	3	.131 x 3 1/4"	S12D131 Nail	Min. 3/4" Edge Of Plate
2x6	To Plate	3	3	3	3			
2x8	To Plate	4	3	-	3			
2x10	To Plate	4	-	-	3			
2x12	To Plate	5	-	-	4			
(*) 2x_	To 2x_	16" STGRD	16" STGRD	16" STGRD	16" STGRD	.131 x 3 1/4"	S12D131 Nail	Double or Triple Plates, Studs, Joist, Cripples
2x4	Headers	-	12" On Center STGRD	12" On Center STGRD	-	.131 x 3 1/4"	S12D131 Nail	Headers Are End Nailed Through Stud W/ Qty.5 Nails (.131 x 3-1/4") Each End
2x6	Headers	-	"	"	-			"
2x8	Headers	-	"	"	-			"
2x10	Headers	-	"	"	-			"
2x4 / 2x6	Wall To	1 Per 4'	16" On Center	16" On Center	1 Per 4'	#8 x 3-1/2"	Woodscrew	Stud At 16" or 24" On Center
2x4 / 2x6	Wall To	2/ Stud Space			2/ Stud Space	.131 x 3 1/4"	S12D131 Nail	
2x4 / 2x6	Partition To	16" On Center	16" On Center	16" On Center	16" On Center	.131 x 2-1/2"		
-	Sealtite BTM Sheathing	8" On Center	-	-	-	31G BAB	Staple	
-	Wall Blocking To Stud	1" On Center				38G BAB	Staple	Stitch On Surface

- (*) Inter Connection Of All Sizes Of Multiple Members Are To Follow The Inter Connections As Listed Above (In 2x4 To 2x4)
- Wood To Wood AdhesCHes Should Meet AFG-10 Regulations
- Wall Boarding AdhesCHes Should Meet ASTM C557 Requirements
- Staples Shall Be 16 Gauge or Heavier As Required

NOTES:

- FASTENING SHALL BE AS PER ABOVE UNLESS NOTED OTHERWISE ON DRAWINGS



By Yuri at 7:30:44 PM, 7/24/2024



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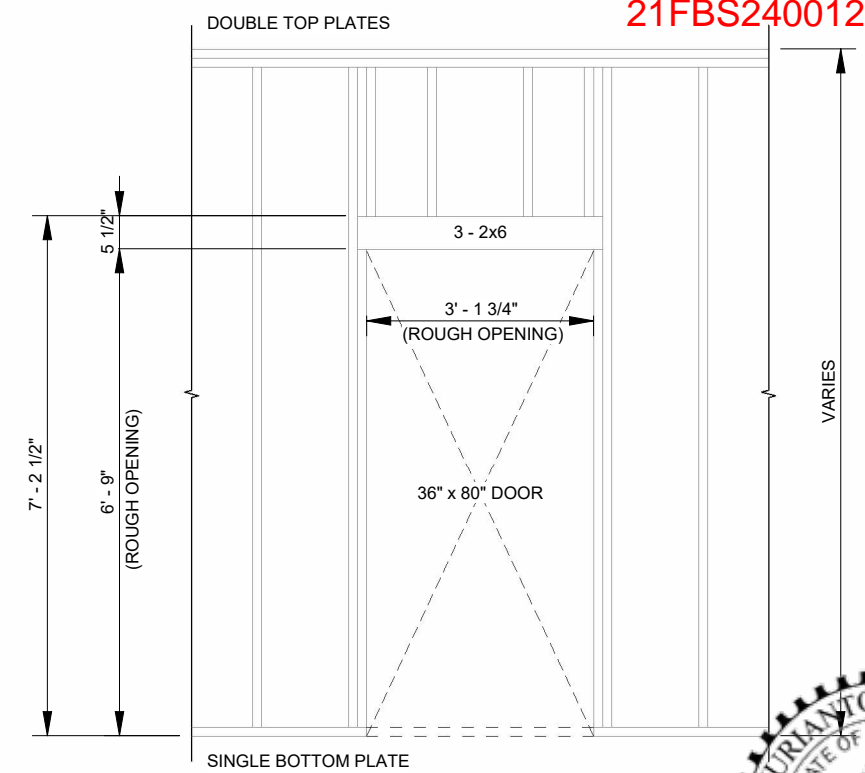
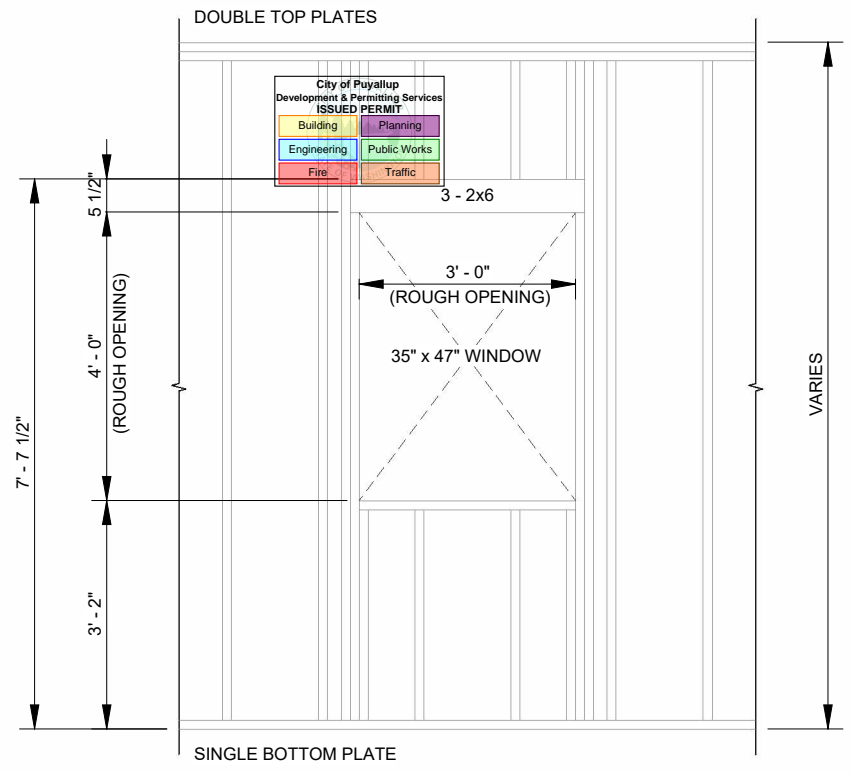
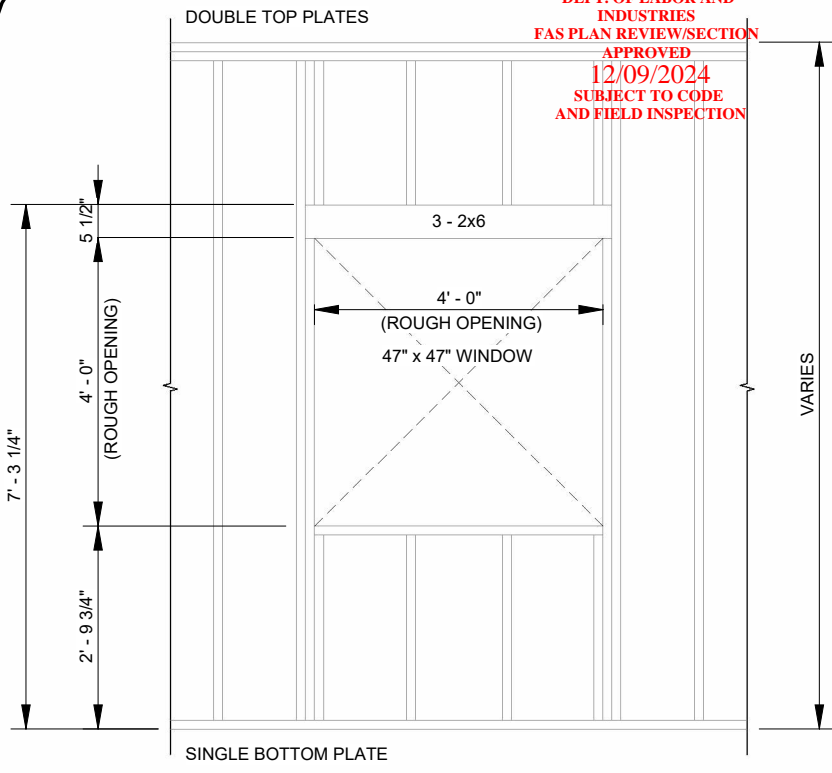
PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH	DRAWING TITLE:	EXTERIOR STRUCTURAL DETAILS
CLIENT:	CASCADE CHRISTIAN SCHOOL	PROJECT NO:	1107994
		DRAWING NO:	SM301
		REV. #	A

Exp. 12/09/2025

PLOT DATE: 2024-07-24 12:32:15 PM

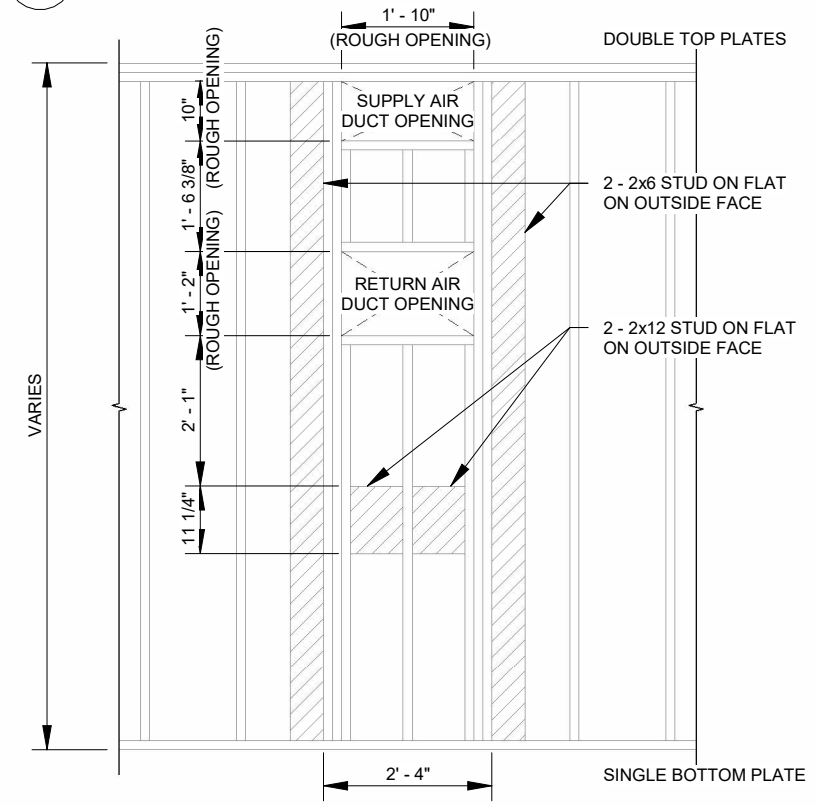
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21FBS2400126



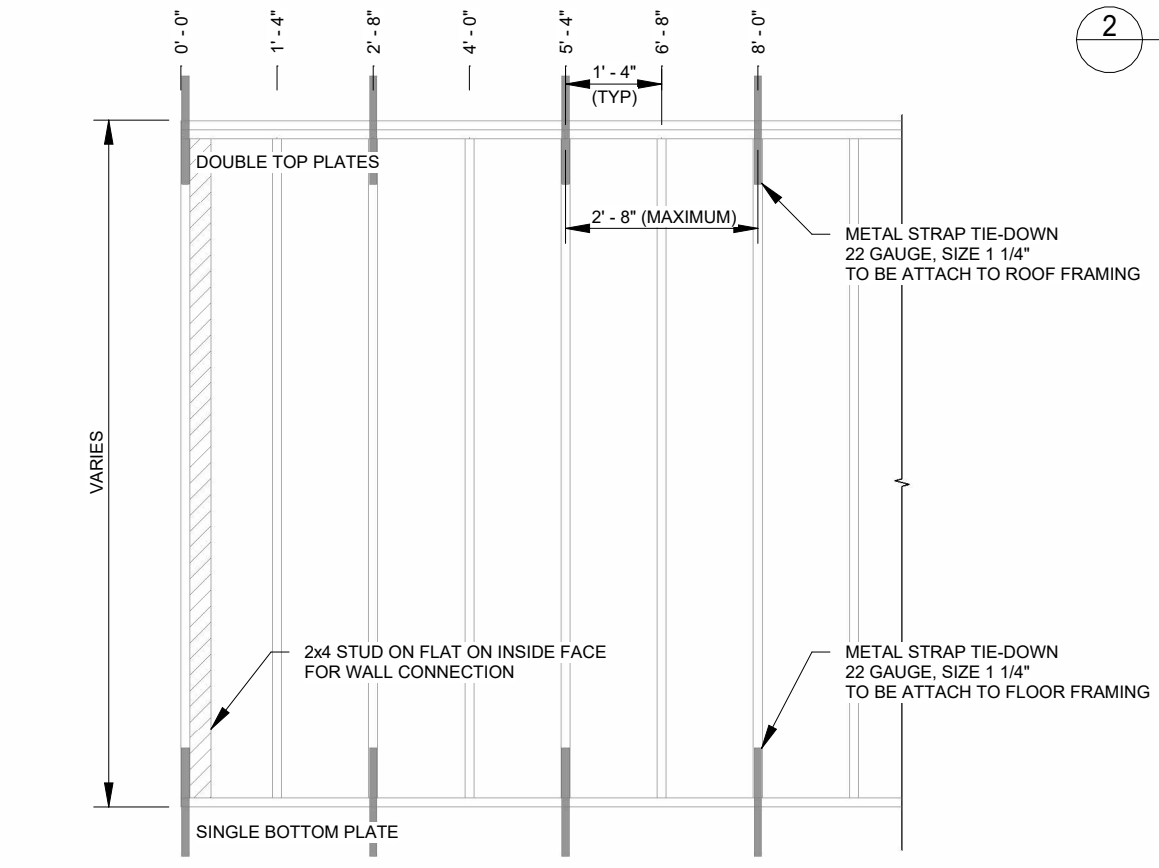
1 TYPICAL WINDOW FRAMING DETAIL

SCALE: 3/8" = 1'-0"



3 TYPICAL END WALL FRAMING DETAIL - BARD

SCALE: 3/8" = 1'-0"

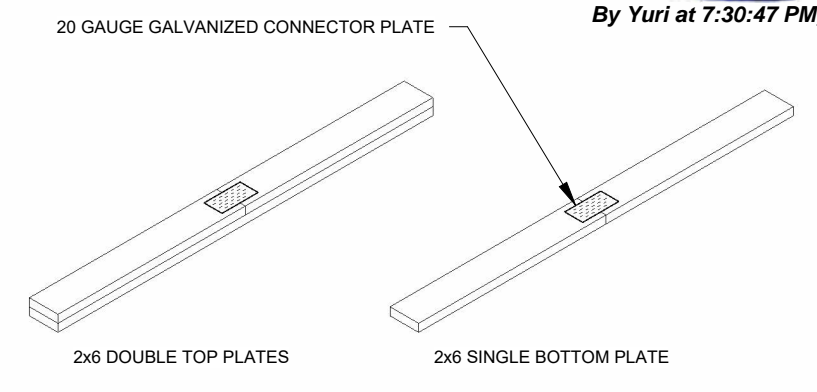


4 TYPICAL EXTERIOR WALL FRAMING DETAIL

SCALE: 3/8" = 1'-0"

2 TYPICAL EXTERIOR DOOR FRAMING DETAIL

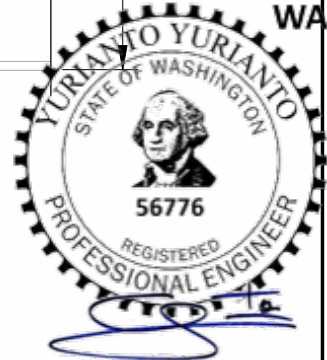
SCALE: 3/8" = 1'-0"



5 TYPICAL LUMBER CONNECTION DETAIL

SCALE: 3/8" = 1'-0"

- NOTES:**
- DOUBLE SIDE PLATE JOINTS TO BE SPACED WITH A MINIMUM OF 4'-0" APART.
 - USE GALVANIZED STEEL CONNECTOR PLATE GAUGE (EAGLE METAL E20 STRUCTURAL CONNECTOR PLATE OR EQUAL).
 - PRESS PLATE TO CONNECT DIMENSIONAL LUMBER TO CREATE DESIRED PLATE LENGTH.
 - PLATE MAY BE INSTALLED WITH 1/4" VARIANCE FROM CENTER OF JOINT.
 - NAILING THROUGH CONNECTOR PLATES INTO STUD END MEMBERS IS PERMISSIBLE.
 - DOUBLE TOP PLATES TO BE FASTENED TOGETHER USING 2 1/2" x 0.131" NAILS @ 8" O/C.



By Yuri at 7:30:47 PM, 7/24/2024



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PROJECT: 28x64 ASL USA SR FLEET OFFICE WASH

CLIENT: CASCADE CHRISTIAN SCHOOL

DRAWING TITLE: EXTERIOR STRUCTURAL DETAILS

PROJECT NO: 1107994 Exp. 12/09/2025

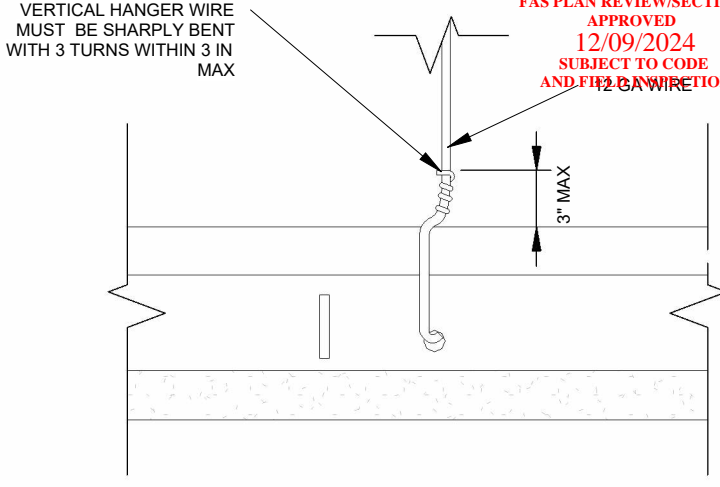
DRAWING NO: SM302

REV. #: A

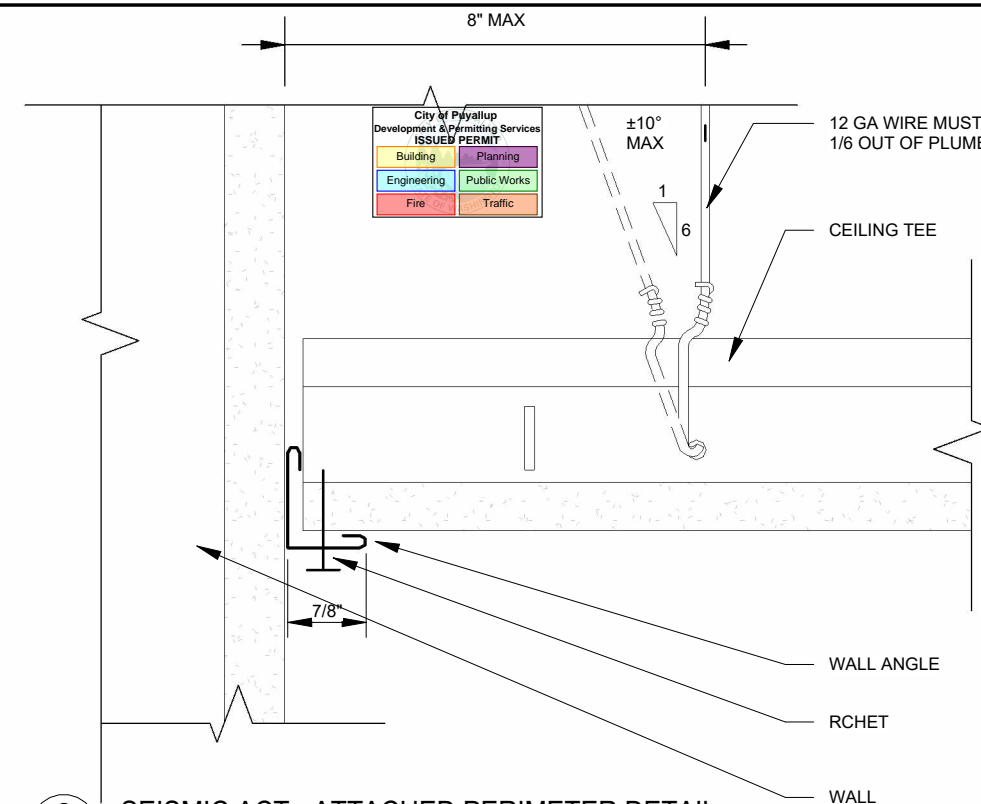
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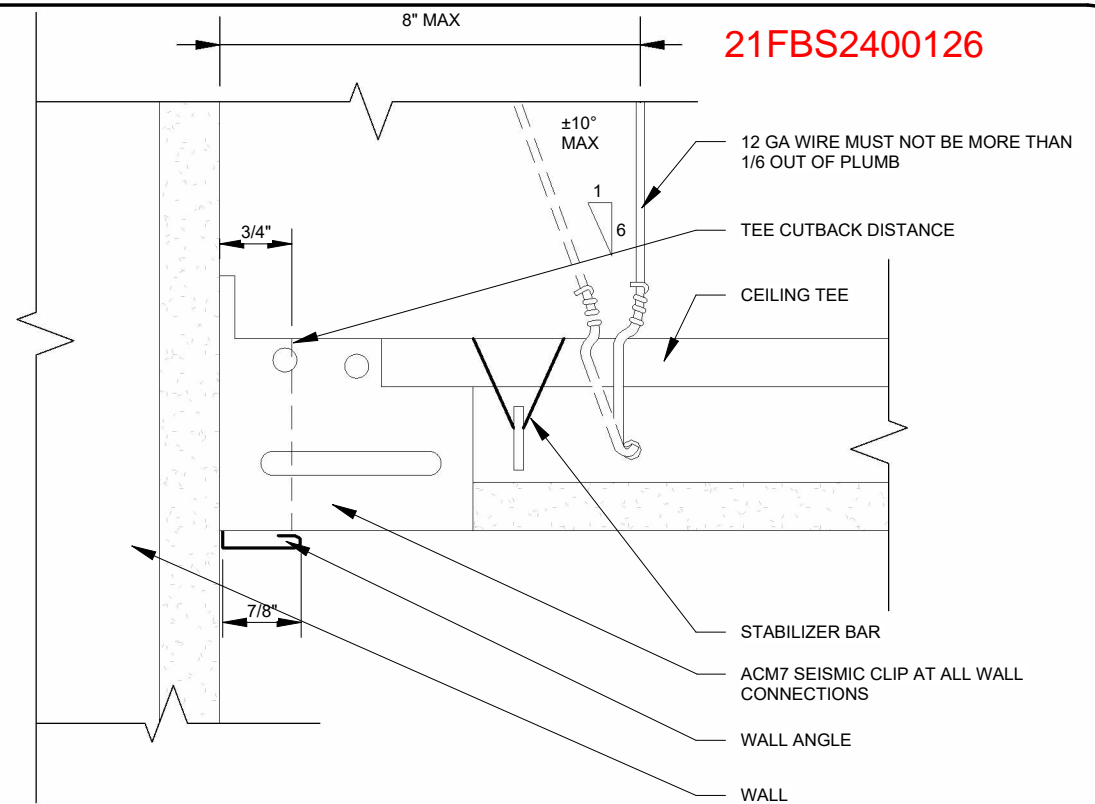
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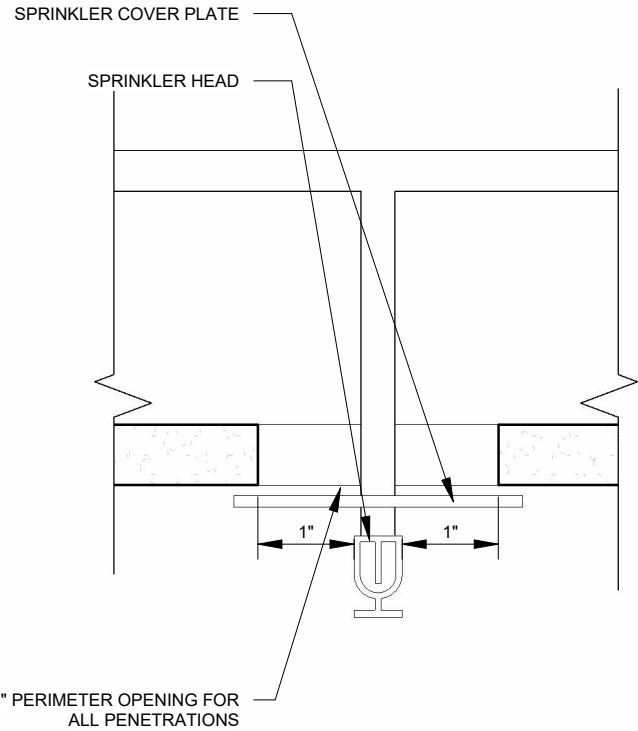
1 SEISMIC ACT - CEILING TIE OFF DETAIL
SCALE: 6" = 1'-0"



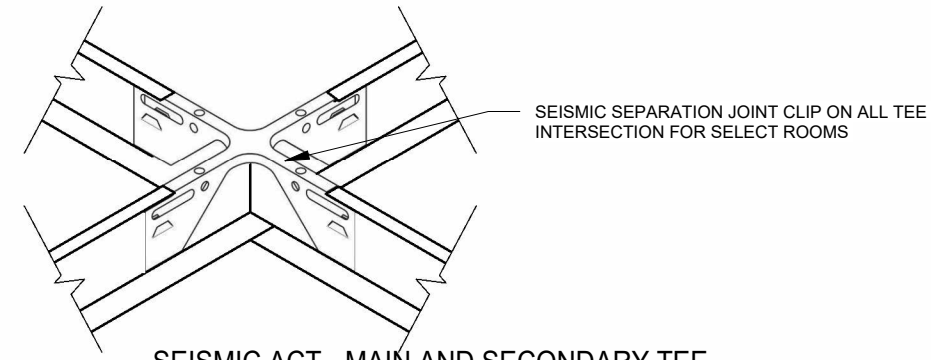
2 SEISMIC ACT - ATTACHED PERIMETER DETAIL
SCALE: 6" = 1'-0"



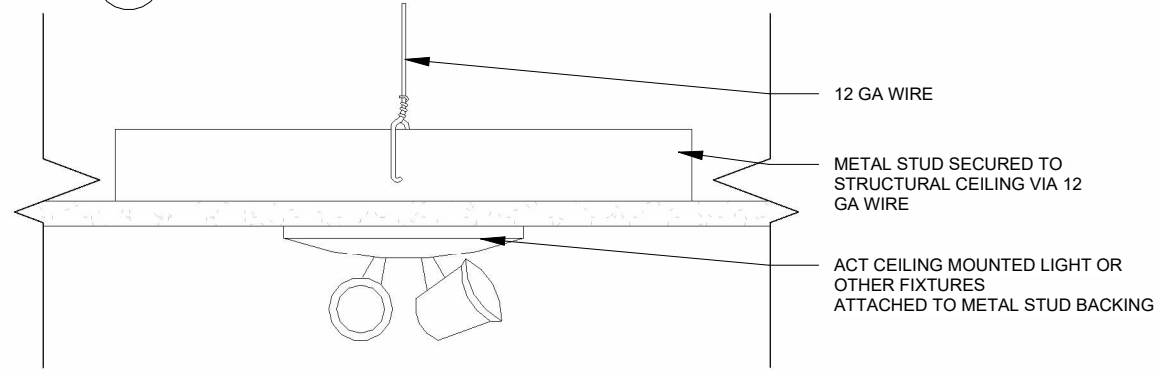
3 SEISMIC ACT - DETACHED PERIMETER DETAIL
SCALE: 6" = 1'-0"



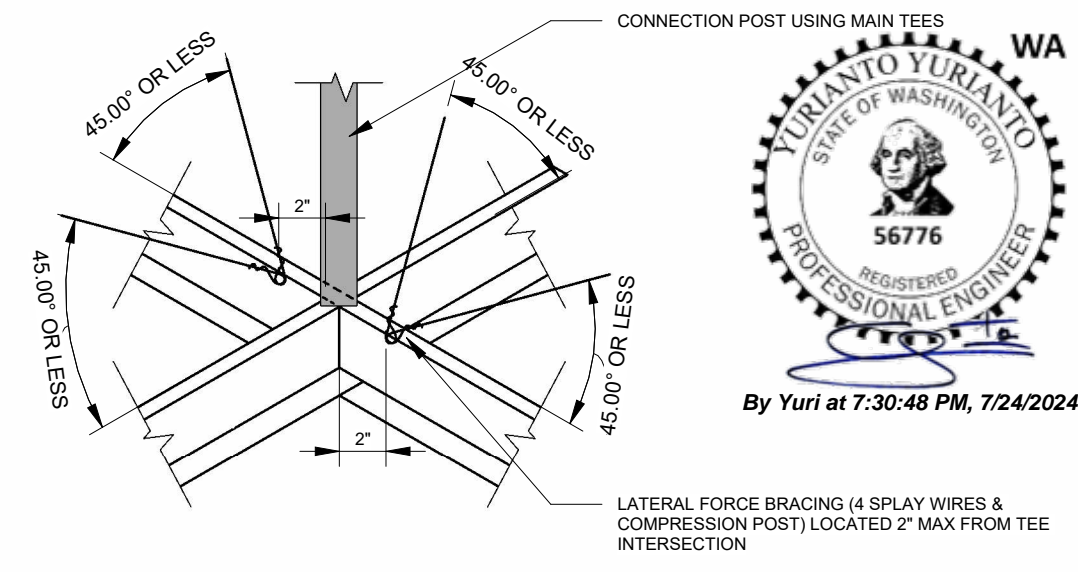
4 SEISMIC ACT - PENETRATIONS OFFSET DETAIL
SCALE: 6" = 1'-0"



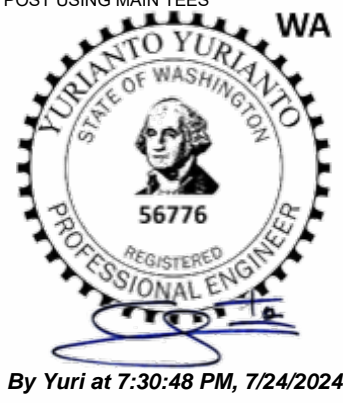
5 SEISMIC ACT - MAIN AND SECONDARY TEE CONNECTION
SCALE: 1 1/2" = 1'-0"



6 SEISMIC ACT - EMERGENCY LIGHT & SIGN BACKING
SCALE: 3" = 1'-0"



7 SEISMIC ACT - LATERAL FORCE BRACING
SCALE: 1 1/2" = 1'-0"



By Yuri at 7:30:48 PM, 7/24/2024

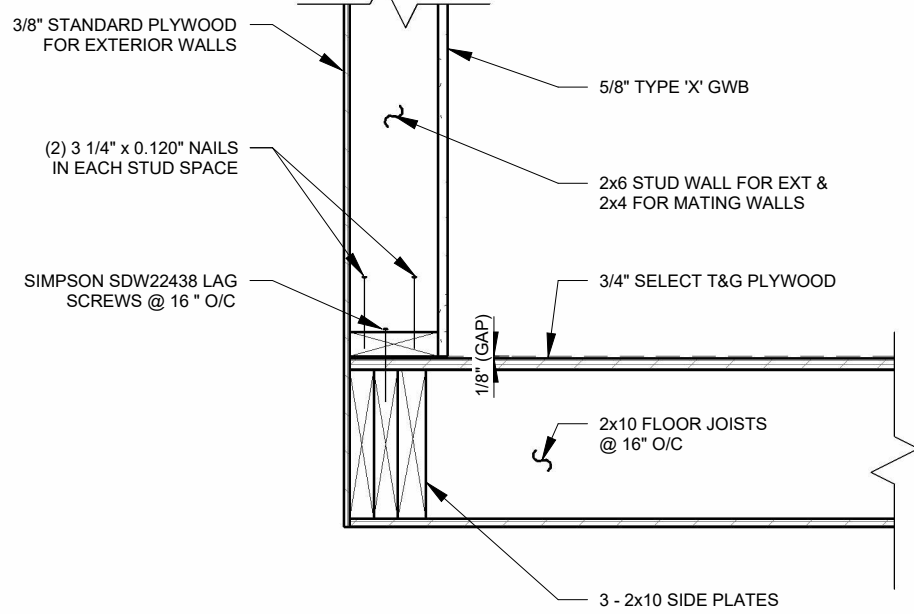
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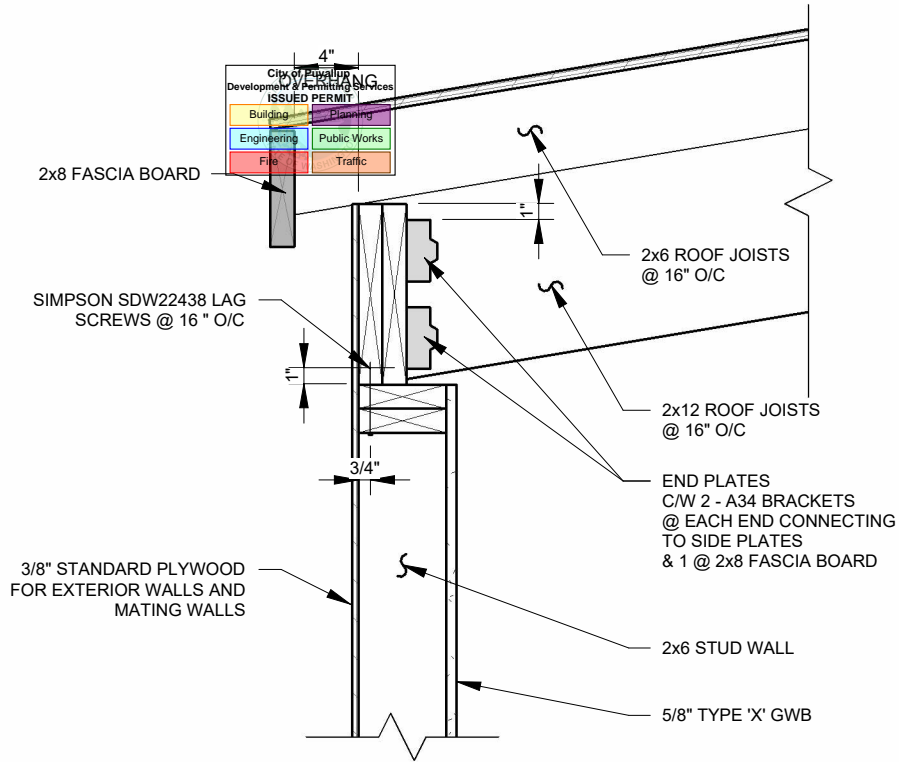
PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH
CLIENT:	CASCADE CHRISTIAN SCHOOL

DRAWING TITLE:	EXTERIOR STRUCTURAL DETAILS		
PROJECT NO:	1107994	DRAWING NO:	SM303
Exp. 12/09/2025		REV. #	A

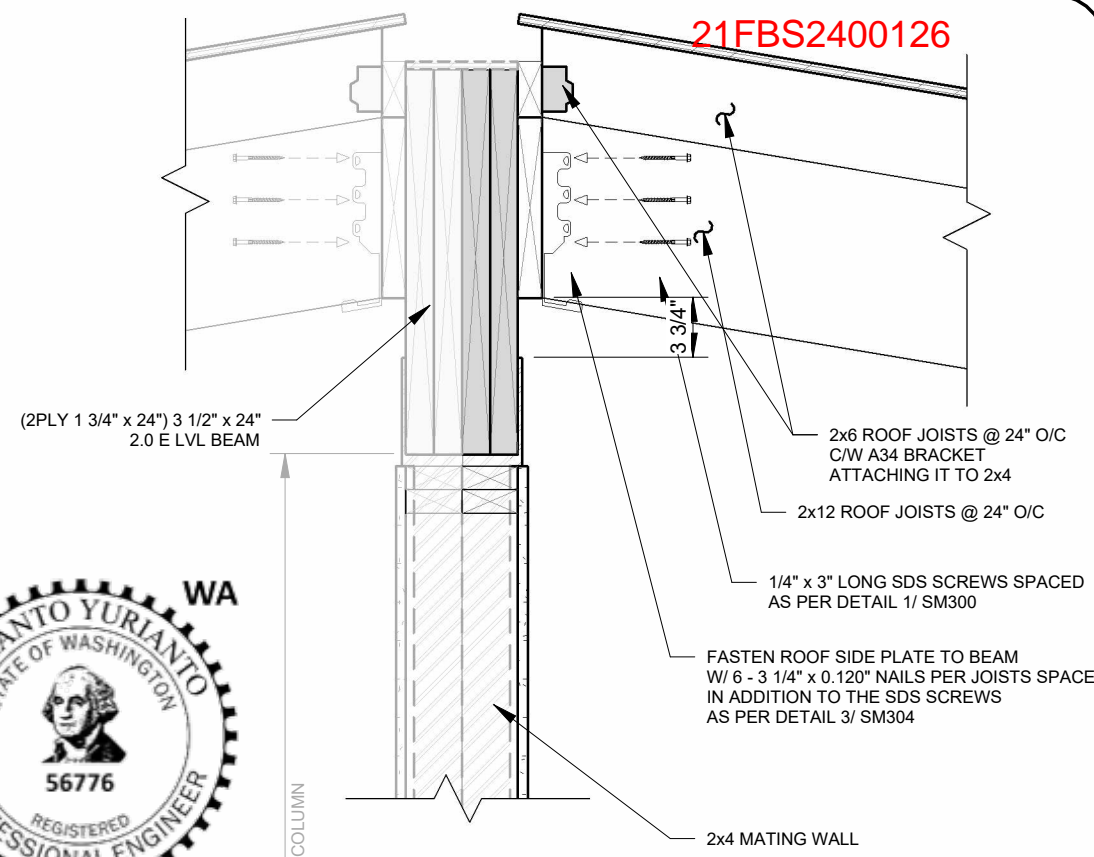
NOTES: FABRICATION
 • LAG SCREW HEAD TO ENGAGE BOTTOM PLATE
 • WATCH FOR BOTTOM PLATE LIFT DURING
 INSTALLATION
 • SUBJECT TO CODE
 • ON FIELD INSPECTION



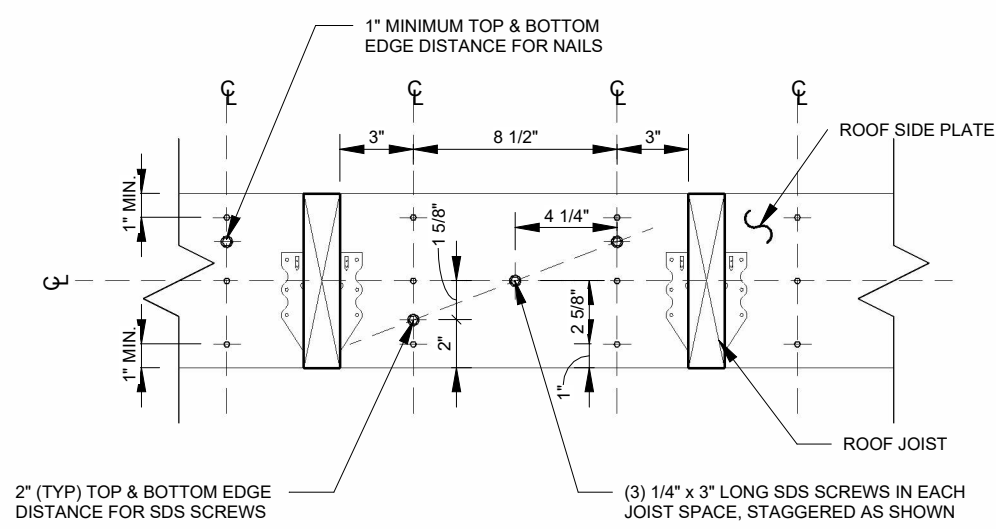
1 TYPICAL FLOOR CONNECTION DETAIL
SCALE: 1" = 1'-0"



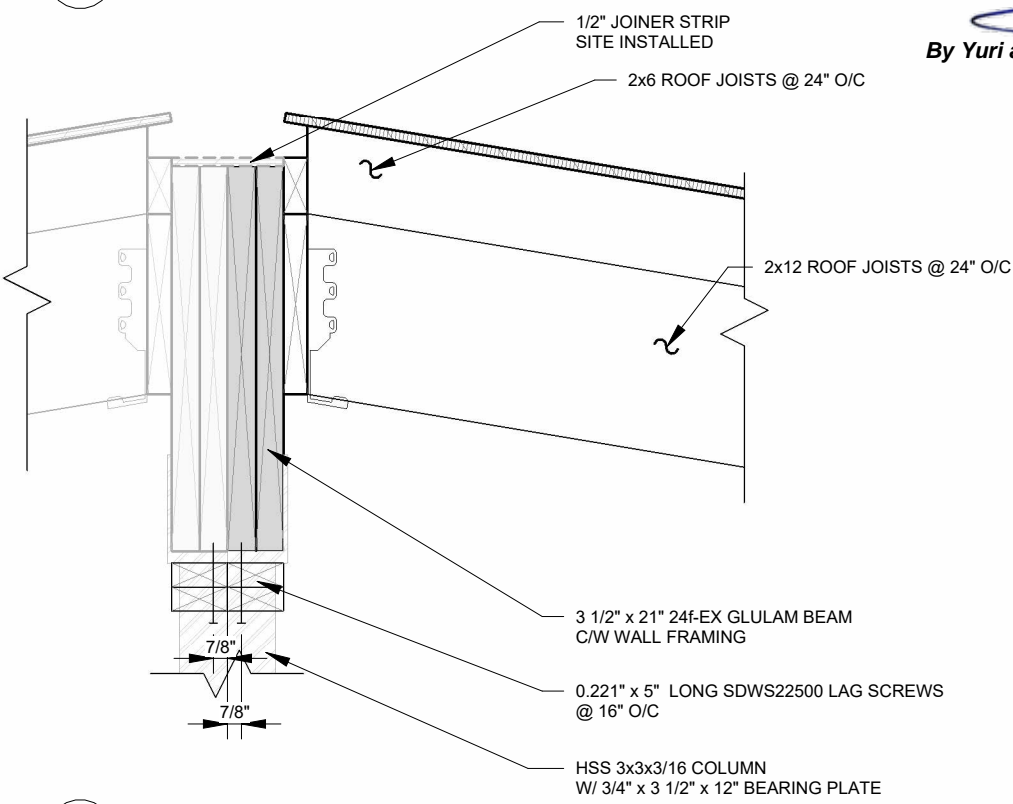
2 TYPICAL ROOF CONNECTION DETAIL @ LONG WALL
SCALE: 1" = 1'-0"



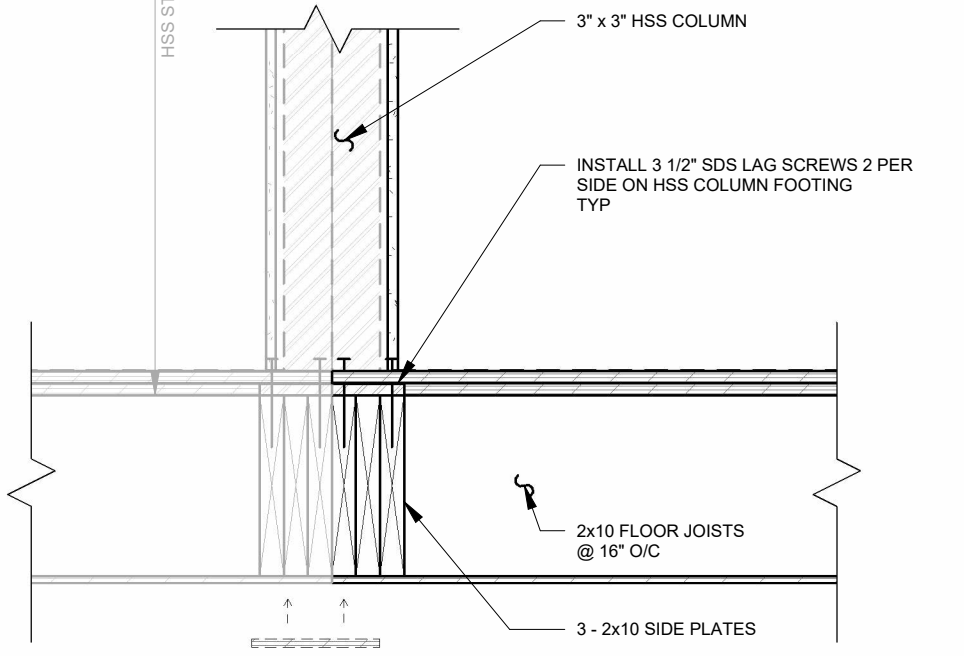
4 TYPICAL BEAM/COLUMN CONNECTION DETAIL
SCALE: 1" = 1'-0"



3 ROOF SIDE PLATE FASTENING DETAIL
SCALE: 1 1/2" = 1'-0"



5 TYPICAL RIDGEBEAM DETAIL
SCALE: 1" = 1'-0"



4 TYPICAL BEAM/COLUMN CONNECTION DETAIL
SCALE: 1" = 1'-0"

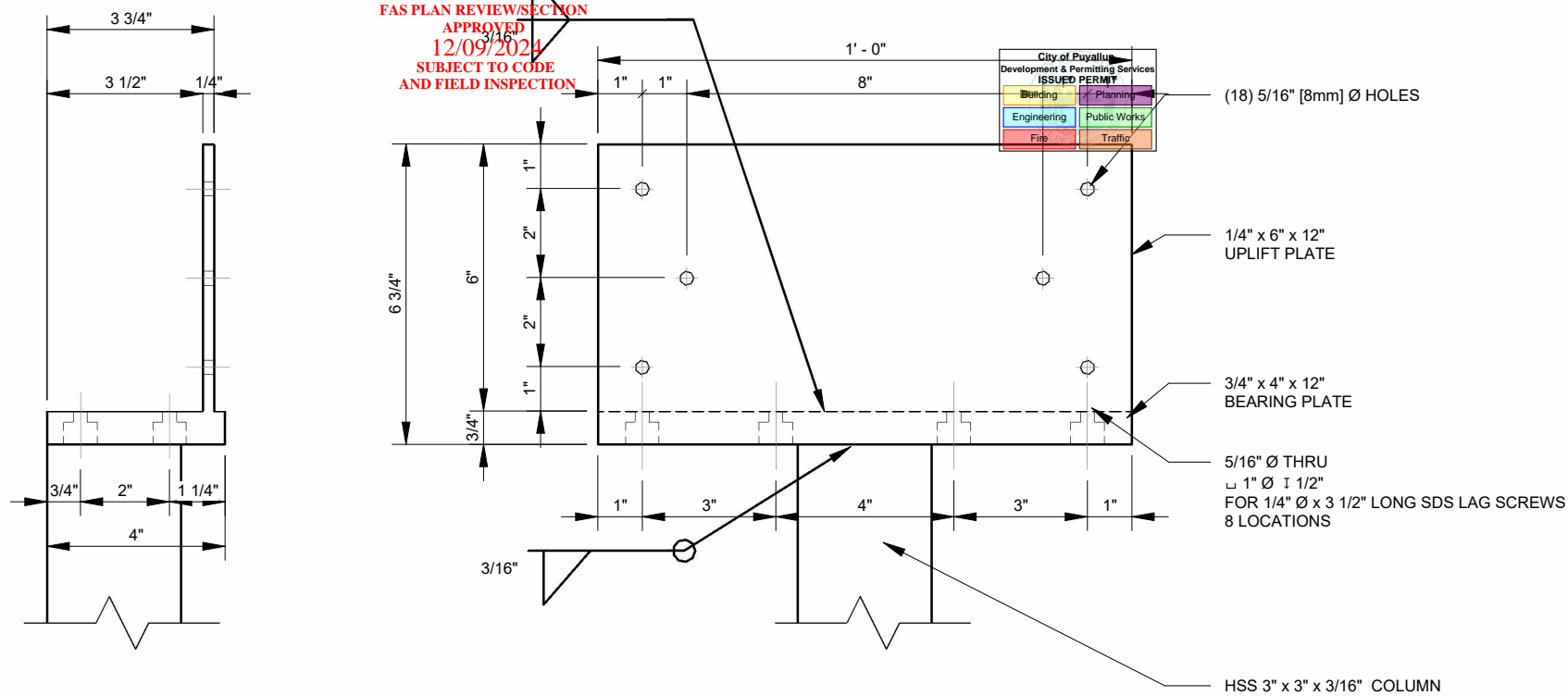
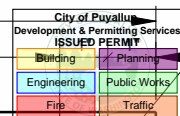
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CLIENT:	CASCADE CHRISTIAN SCHOOL

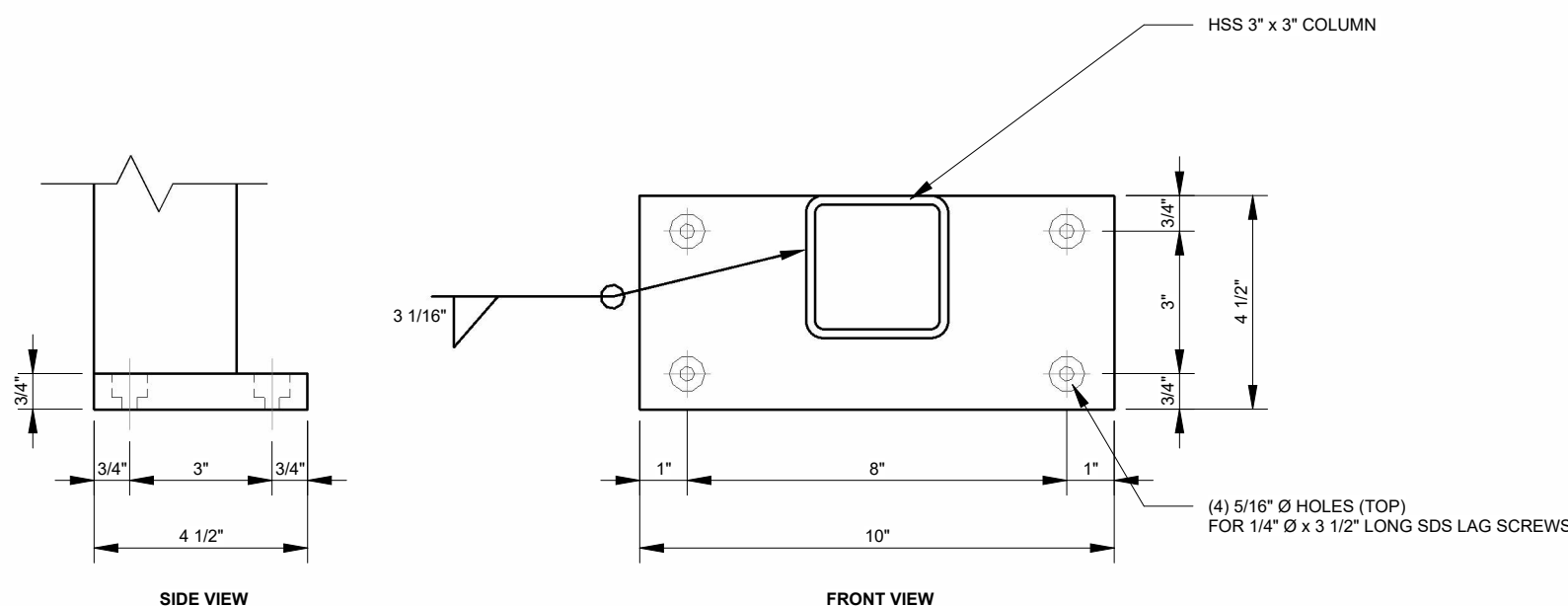
DRAWING TITLE:	EXTERIOR STRUCTURAL DETAILS		
PROJECT NO:	1107994	DRAWING NO:	SM304
REV. #	A	Exp. 12/09/2025	

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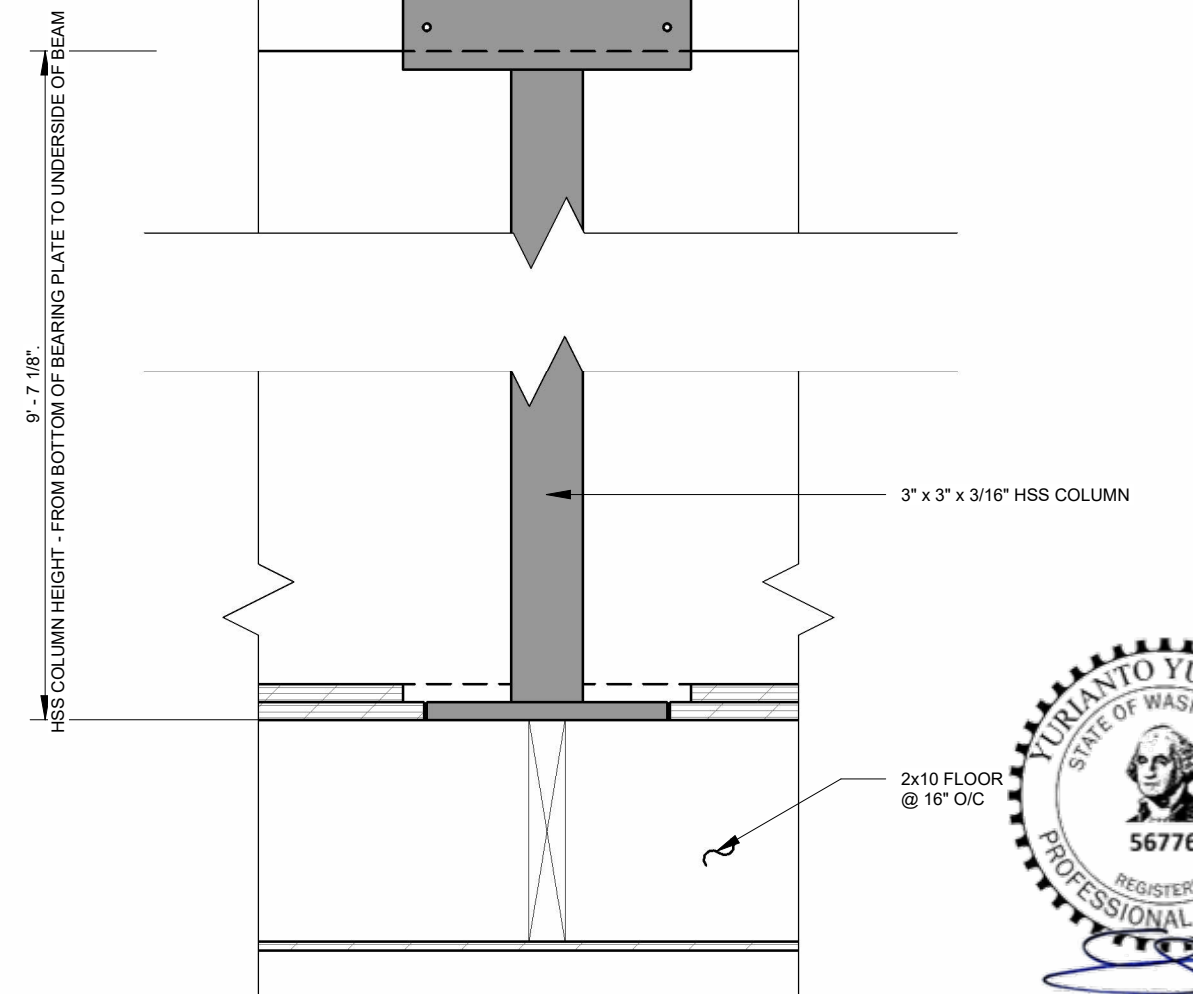
Special inspection required for all welding

1 HSS COLUMN BEAM CAP
SCALE: 3" = 1'-0"

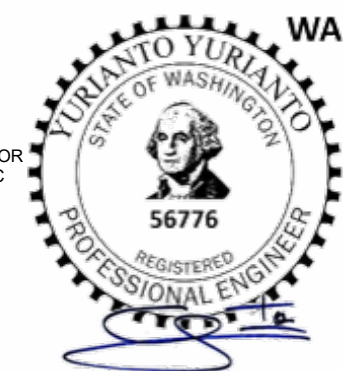


QUANTITY OF COLUMNS:
-2 PER COMPLEX

2 HSS COLUMN FLOOR BEARING PLATE
SCALE: 3" = 1'-0"



3 HSS COLUMN CONNECTION DETAIL
SCALE: 1 1/2" = 1'-0"



By Yuri at 7:30:52 PM, 7/24/2024

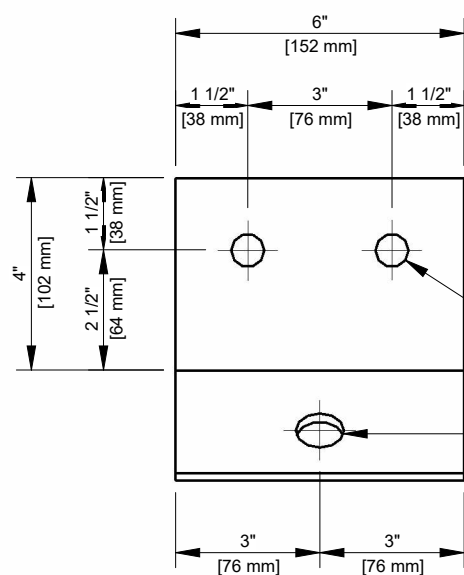
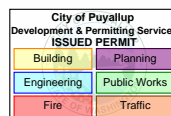
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PROJECT:	28x64 ASL USA SR FLEET OFFICE WASH
CLIENT:	CASCADE CHRISTIAN SCHOOL

DRAWING TITLE:	STEEL FABRICATION DETAILS		
PROJECT NO:	1107994	DRAWING NO:	SM500
REV. #	A	Exp. 12/09/2025	

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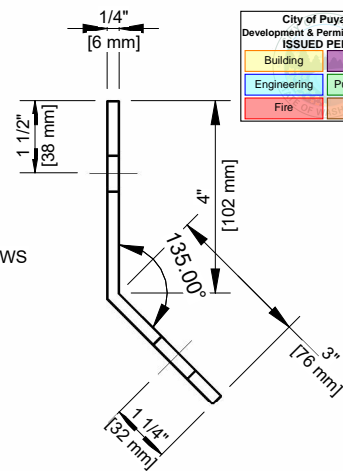
(2) 11/16" [17mm] Ø HOLES
 FOR 5/8" [16mm] Ø x 4" [114mm] LONG LAG SCREWS
 TYP

1" [25mm] Ø HOLE
 FOR STEEL ANCHOR CONNECTION
 TYP

FRONT VIEW

STEEL ANCHOR BRACKET - TYPE 1
 MAT'L 300W ANGLE

QUANTITY = 30



SIDE VIEW

NOTES:
 • WIRE BRUSHED, PRIME AND APPLY 1 COAT BLACK ENAMEL

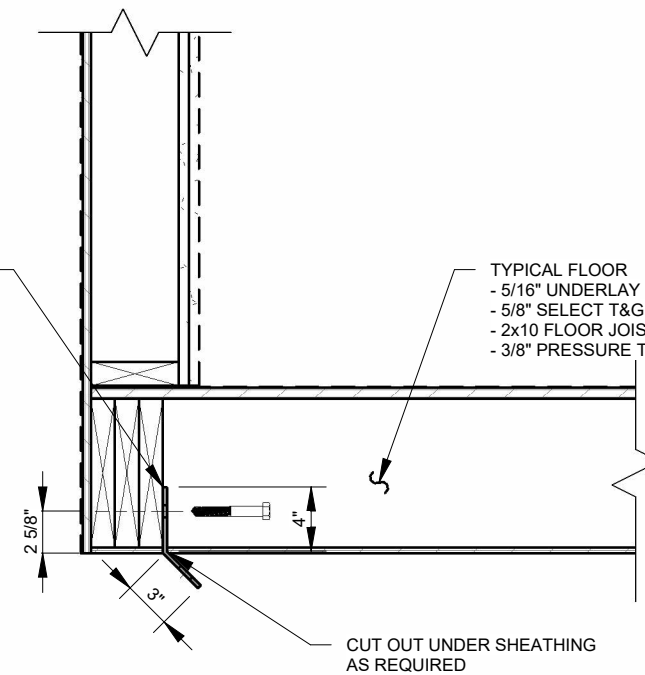
1 STEEL ANCHOR BRACKET DETAIL

SCALE: 3" = 1'-0"

2 TYPICAL STEEL ANCHOR BRACKET CONNECTION DETAIL.

SCALE: 1" = 1'-0"

INSTALL STEEL ANCHOR BRACKET
 AS INDICATED
 C/W (2) 5/8" x 4" LONG LAG SCREWS
 SEE FLOOR FRAMING PLAN
 FOR LOCATION OF STEEL ANCHOR BRACKETS



By Yuri at 7:30:53 PM, 7/24/2024



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PROJECT:
 28x64 ASL USA SR FLEET
 OFFICE WASH

DRAWING TITLE:
 STEEL FABRICATION DETAILS

CLIENT:
 CASCADE CHRISTIAN SCHOOL

PROJECT NO:
 1107994
 DRAWING NO:
 SM501
 Exp. 12/09/2025

REV. #
 A

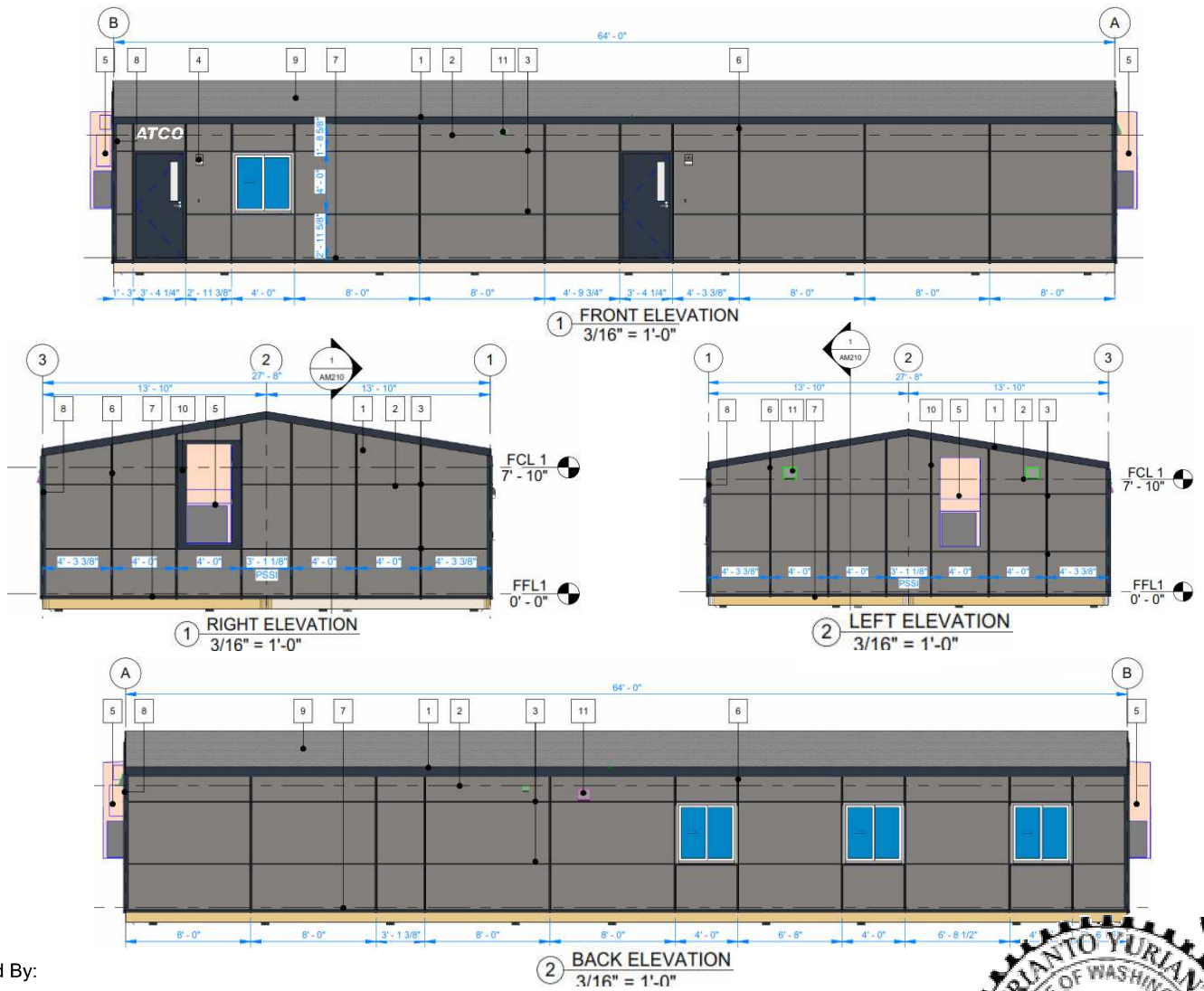
STRUCTURAL CALCULATIONS PACKAGE

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City of Puyallup Development & Permitting Services ISSUED PERMIT	
Building	Planning
Engineering	Public Works
Fire	Traffic

Client : ATCO Structures & Logistic
Project No : 1107994
Project Name : Cascade Christian School
Location : 815 21st St SE Puyallup WA 98372
Subject : Modular Building and Foundation Design

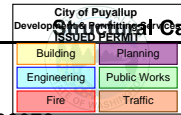


Prepared By:
Yurianto Yurianto, S.E., P.E., M.Sc.
S.E. in State of IL, MA, NV, HI, OK, AZ.
5760 Legacy Dr. B3-333. Plano, TX 75024
(972) 896-5373
yurianto@modularconsultant.com
MSC Project No : AT24050
Date: 6/10/2024
Rev: Final



ATCO Structures & Logistics 1106 North Temple Dr. Diboll, TX 75941

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12/09/2024
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Structural Calculations

AT24050

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372
Phone:	(972) 896-5373	Subject :	Modular Building and Foundation Design
Email:	yurianto@modularconsultant.com	Date:	6/10/2024

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City of Puyallup
Development Services
ISSUE PERMIT

Building	Planning
Engineering	Public Works
Fire	Traffic

Original Calculations
AT24050

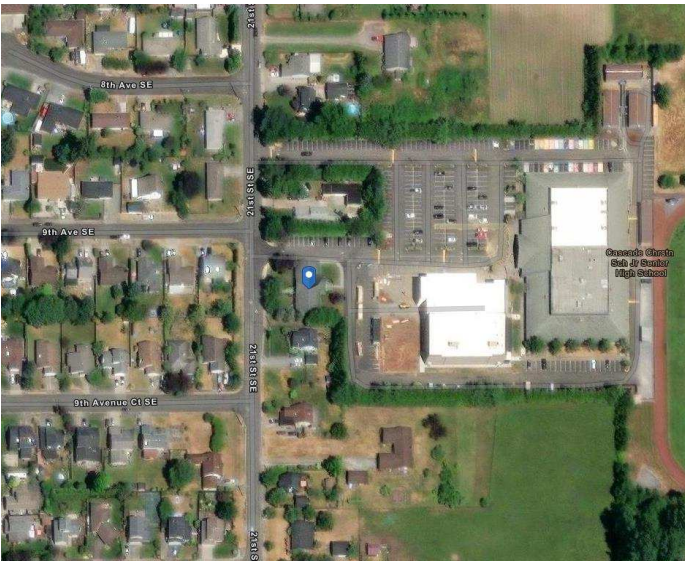
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Email :	yurianto@modularconsultant.com	Date :	6/10/2024
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Design Codes Address: 815 21st St SE Puyallup WA 98372 WA

Permanent Structure
Building Code: IBC 2021 IBC 2021 https://codes.iccsafe.org/codes/i-codes
ASCE 7-16 ASCE 7-16 https://asce7hazardtool.online/

Design load code V_{ASD} 101 mph
Risk Category **II** Wind Speed, V_{ULT} **130** mph

Ground Elevation **0** ft from sea level
Wind Exposure Category **C**



Seismic $S_s = 0.300$ g SDC = D
 $S_1 = 0.200$ g (Seismic Design Category)
Soil class **D**

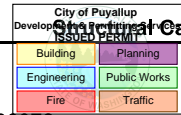
Ground Snow $p_g = 45.00$ psf
Non Reducible Roof Snow **40.00** psf

Local Jurisdiction Requirements

County: Pierce County
Weblink: https://www.cityofpuyallup.org/

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Structural Calculations

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994	AT24050
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School	
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Phone:	(972) 896-5373	Subject :	Modular Building and Foundation Design	2 Plex
Email:	yurianto@modularconsultant.com	Date:	6/10/2024	Final

DESIGN CRITERIA

Address 815 21st St SE Puyallup WA 98372

Permanent Structure

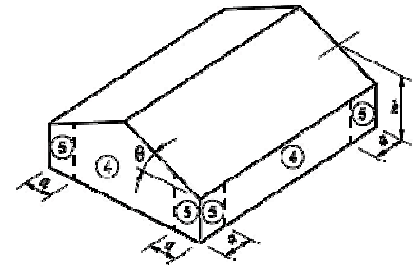
Design Codes IBC 2021 IBC 2021
ASCE 7-16 ASCE 7-16

<u>Roof Live Load</u>	Ordinary - flat, pitched or curved.	$L_{o \text{ roof}} = 20$ psf	$L_{conc} = 300$ lb
<u>Floor Live Load</u>	Access floor system - Office use	$L_{o \text{ floor}} = 50$ psf	$L_{conc} = 2000$ lb
	Storage warehouses - Light	$L_{o \text{ floor}} = 125$ psf	$L_{conc} = 0$ lb

<u>Snow Load</u>	Roof Type	Gable
	Ground snow loads	$p_g = 45.00$ psf
	Terrain category	C
	Exposure of roof	Fully Exposed
	Risk category	II
	Thermal factor	$C_t = 1.10$
	Exposure factor	$C_e = 0.9$
	Importance factor for snow loads	$I_s = 1.00$
	Roof surface type	All Other Surfaces
	Roof slope factor	$C_s = 1.000$
	Flat roof snow	$p_f = 31.19$ psf
	Sloped roof snow Load	$p_s = 31.19$ psf
	Non reducible roof snow	40.00 40.00 psf

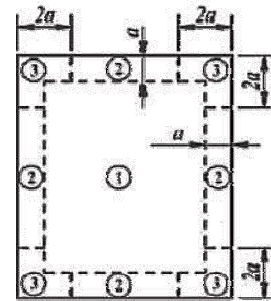
Component & Cladding Design Wind Pressures

End zone length $a = 3.00$ ft
 $2a = 6.00$ ft



Wall Zone

<u>Wind Load</u>	Risk category	II
	Wind exposure category	C
	Basic wind speed	$V_{ULT} = 130$ mph
		$V_{ASD} = 101$ mph
	Ground elevation above sea level	$z_g = 0$ ft
	Wind importance factor	$I_w = 1.00$
	Gust-effect factor	$G = 0.85$
	Wind exposure category	$K_h = 0.85$
	Ground Elevation Factor	$K_e = 1.00$
	Wind Directional Factor	$K_d = 0.85$
	Internal Pressure Coefficient	$(G C_{pi}) = +/- 0.18$
	Topographic factor	$K_{zt} = 1.0$
	Mean roof velocity pressure	$q_h = 31.22$ psf



ROOF PLAN

<u>Seismic Load</u>	Soil site classification	D
	Soil type	Stiff soil
	Risk Category	II
	Importance factor	$I_e = 1.00$
	Short period ground acceleration	$S_s = 0.300$ g
	1-second ground acceleration	$S_1 = 0.200$ g
	Short period site coefficient	$F_a = 1.560$
	Long period site coefficient	$F_v = 2.200$
	For short periods, $F_a S_s$	$S_{MS} = 0.468$ g
	For 1-second period, $F_v S_1$	$S_{M1} = 0.440$ g
	For short periods, $2/3 S_{MS}$	$S_{DS} = 0.312$ g
	For 1-second period, $2/3 S_{M1}$	$S_{D1} = 0.293$ g
	Seismic Design Category	D

Roof	Trib Area	Outward	Inward
	ft ²	psf	psf
Zone 1	64	-48.34	16.00
Zone 2	64	-64.11	16.00
Zone 1	9	-58.69	16.00
Zone 2	9	-77.42	16.00
Zone 3	9	-105.51	16.00

Wall	Trib Area	Outward	Inward
	ft ²	psf	psf
Zone 4	21	-34.33	31.52
Zone 5	21	-41.13	31.52
Zone 4	9	-35.96	33.15
Zone 5	9	-44.39	33.15

Note: Pressure shown is at strength (LRFD) level

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Structural Calculations

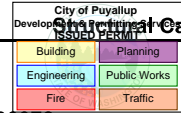
Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994	AT24050
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LOAD COMBINATIONS

<u>Load Types</u>	<u>ASD Load Combinations</u>	<u>LRFD Load Combinations</u>
D Dead	D	1.4D
L Live	D + L	1.2D + 1.6L
Lr Roof Live	D + Lr	1.2D + 1.6L + 0.5Lr
S Snow	D + S	1.2D + 1.6L + 0.5S
E Earthquake	D + 0.75L + 0.75Lr	1.2D + L + 1.6Lr
W Wind	D + 0.75L + 0.75S	1.2D + L + 1.6S
	D + 0.7E	1.2D + 1.6Lr
	D + 0.6W	1.2D + 1.6Lr + 0.5W
	D + 0.75L + 0.75Lr + 0.45W	1.2D + 1.6S
	D + 0.75L + 0.75S + 0.45W	1.2D + 1.6S + 0.5W
	0.6D + 0.6W	1.2D + L + 0.5Lr + W
	0.6D + 0.7E	1.2D + L + 0.5S + W
		1.2D + L + 0.2S + E
		0.9D + W
		0.9D + E

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DEAD LOADS

Code ASCE 7-16

ASCE 7-16

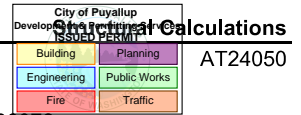
[Table C3.1-1a, pg. 426]

Summary

Roof & Ceiling dead load	12.00	DL _{R&C} =	12.00	psf
Exterior wall dead load	12.00	DL _{Wall_{ext}} =	12.00	psf
Interior wall dead load	6.00	DL _{Wall_{int}} =	6.00	psf
Floor dead load	12.00	DL _{Floor} =	12.00	psf

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LIVE LOAD

Roof Live Load

[Section 4.8, pg. 17]

<i>Roof ID</i>	<i>Main Roof</i>
Design load code ASCE 7-16	ASCE 7-16
Roof type	Ordinary - flat, pitched or curved.
Roof shape	Flat or Pitched
Pitched roof angle 9.24	$\theta = 9.24$ degrees .

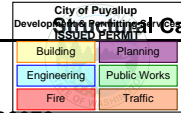
Min. Uniform load	20	$L_{o\ roof} = 20$ psf	Reduction permitted ?	Yes	[Table 4.3-1, pg. 15]
Uniform roof live load reduction	Yes	$L_r = L_o R_1 R_2$			

<i>Member ID</i>	<i>Roof Rafter</i>	<i>Ridge Beam</i>
Member Span	$L = 13.83$ ft	64.00 ft
Member Tributary Width	$W_t = 2.00$ ft	13.83 ft
Tributary area	$A_t = 28$ ft ²	885 ft ²
Number of inch of rise per foot	$F = 1.95$	1.95
1 for $A_t \leq 200$ ft ² $R_1 = 1.2 - 0.001 A_t$ for $200 \text{ ft}^2 < A_t < 600 \text{ ft}^2$ 0.6 for $A_t \geq 600 \text{ ft}^2$	$R_1 = 1.00$	0.60
1 for $F \leq 4$ $R_2 = 1.2 - 0.05 F$ for $4 < F < 12$ 0.6 for $F \geq 12$	$R_2 = 1.00$	1.00
$L_r = L_o R_1 R_2$ (12 psf $\leq L_r \leq 20$ psf)	$L_o R_1 R_2 = 20.0$ psf	12.0 psf
Design uniform roof live load	$L_r = 20.0$ psf	12.0 psf
Min. Concentated load	$L_{conc} = 300$ lb	300 lb

Note: Uniform load is to be applied on horizontal projection supported by the member.
Concentrated load is to be applied to roof primary member
Concentrated load shall be located so as to produce the max. load effects in the members

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Calculations

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Floor Live Load

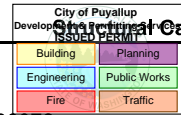
[Section 4.7, pg. 16]

Occupancy or Use	Access floor system - Office use	Storage warehouses - Light
Min. Uniform load	50 L_o floor = 50 psf	125 125 psf [Table 4.3-1, pg. 14]
Reduction permitted?	Yes Yes	No No
Is partition exist?	No	No
Additional partition load	0 0 psf	0 0 psf [Section 4.3.2]
<i>Floor ID</i>	<i>Floor Joists</i>	<i>Floor Joists</i>
Member Tributary Length	L = 13.83 ft	13.83 ft
Member Tributary Width	W _t = 1.33 ft	1.33 ft
Tributary area	A _t = 18 ft ²	18 ft ²
Element	Interior beams	Interior beams
Live load element factor	2 K _{LL} = 2	2 2 [Table 4.7-1, pg. 17]
Element influence area	K _{LL} A _t = 37 ft ²	37 ft ²
Formula of live load reduction	$L_L = L_o \left(0.25 + \frac{15}{\sqrt{K_{LL} A_T}} \right)$, L _{L min} = 0.50 L _o , (K _{LL} A _t) _{min} = 400 ft ²
Design uniform floor live load	L _L = 50 psf	125 psf
Min. Concentated load distributed over 2.5ft x 2.5ft area	2000 L _{conc} = 2000 lb = 320 psf	0 0 lb 0 psf [Section 4.4]

Note: Uniform load is to be applied on horizontal projection supported by the member.
Concentrated load shall be located so as to produce the max. load effects in the members

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SNOW LOAD

ID *Main Building*

Design load code ASCE 7-16 *ASCE 7-16* [ASCE 7-16, Chap. 7. pg. 51]

Roof Type *Gable* *Gable*

Ground snow loads 45.00 $p_g = 45.00$ psf +/- 27.2 inches [Fig. 7.2-1. pg. 52]

Horizontal distance from eave to ridge 13.83 $W = 13.83$ ft (Typically 1/2 L)

Roof angle 9.24 $\Theta = 9.24$ degrees

Terrain category *C* *C* [Table 7.3-1., pg. 58]

Exposure of roof *Fully Exposed* [Table 7.3-1., pg. 58]

Risk category *II* *II* [Table 1.5-1., pg. 4]

Thermal factor $C_t = 1.10$ Warm roofs: $C_t = 0.85$ or $C_t = 1.0$
Cold roofs: $C_t = 1.1$ or $C_t = 1.2$
Below freezing: $C_t = 1.3$ [Table 7.3-2. pg. 58]

Exposure factor $C_e = 0.9$ [Table 7.3-1., pg. 58]

Importance factor for snow loads 1.00 $I_s = 1.00$ [Table 1.5-2. pg. 5]

Roof surface type *All Other Surfaces* [Section 7.4. pg. 54]

Roof slope factor $C_s = 1.000$ [Fig. 7.4-1. pg. 59]

Snow density $g = 0.13 p_g + 14 \leq 30$ pcf
 $= 19.9$ pcf

Permanent Structure 1.00 1.00 Reduction factor
Not Applicable

Roof Slope, Θ	C_s
37.5	1
9.24	1.87
70	0

$C_s \text{ approx.} = 1.000$

Non Reducible Roof Snow $p_s = 40.00$ psf

Flat Roof Snow Loads $p_f = 0.7 C_e C_t I_s p_g$ $p_f = 31.19$ psf [Eq. 7.3-1, pg. 51]

p_f min for roof slope < 15 degrees 20.00 $p_m = 20.00$ psf [7.3.4., pg. 53]

Flat roof snow 31.19 $p_f = 31.19$ psf +/- 18.9 inches

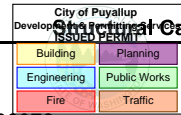
Sloped Roof Snow Loads [7.4. pg. 54]

Balanced Snow Load $p_s = C_s p_f$ 31.19 $p_s = 31.19$ psf +/- 18.9 inches [Eq. 7.4-1, pg. 54]

Unbalanced Snow Load $I_s p_g = 45.00$ psf
 $W \leq 20$ ft, with
roof rafter system

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Calculations

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	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School	Building	Planning
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372	Engineering	Public Works
Phone:	(972) 896-5373	Subject :	Modular Building and Foundation Design	Fire	Traffic
Email:	yurianto@modularconsultant.com	Date:	6/10/2024		2 Plex
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Unbalanced Snow Load , Other [7.6, pg. 57]

Roof slope run for a rise of one, $S = 1 / \tan(\theta)$ $S = 6.1$

Snow density $g = 0.13 p_g + 14 \leq 30$ pcf [Eq. 7.7-1, pg. 59]

$0.13 p_g + 14 = 19.85$ pcf < 30 pcf

Use $g = 19.85$ pcf

Eave to ridge distance, $l_u = W$ For windward portion of the roof $l_u = 13.83$ ft $l_{u \min} = 20$ ft [7.6.1, pg. 57]

Use $l_u = 20.00$ ft For Fig. 7-9 at pg. 41

Height of snow drift $h_d = 0.43 \sqrt[3]{l_u} \sqrt[4]{p_g + 10} - 1.5$ [Eq. for Fig. 7.6-1, pg. 61]

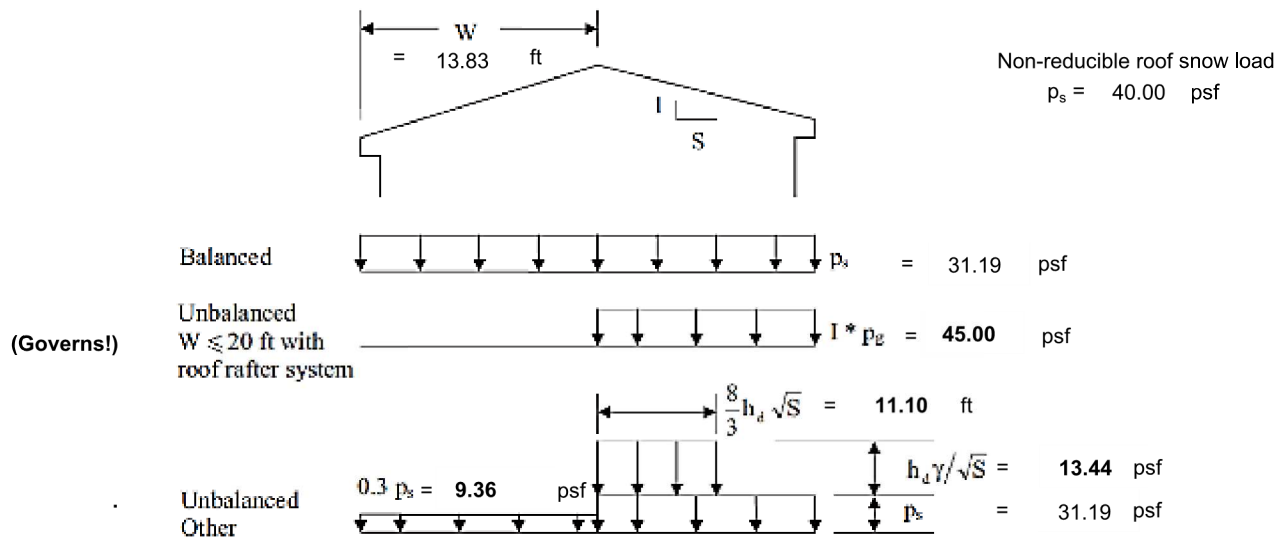
$h_d = 1.68$ ft

Leeward surcharge snow load length from ridge $\left(\frac{8}{3}\right) h_d \sqrt{S} = 11.10$ ft

Leeward surcharge snow load magnitude $h_d \gamma / \sqrt{S} = 13.44$ psf

Windward unbalanced snow load magnitude $0.3 p_s = 9.36$ psf

Summary of snow load [Fig. 7.6-2, pg. 61]

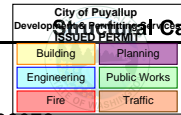


Note: Unbalanced snow loads need not be considered for $\theta > 30.2^\circ$ (7 on 12) or for $\theta < 2.38^\circ$ (1/2 on 12)

Roof angle $\theta = 9.24$ degrees
Unbalanced snow loads need to be considered

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WIND LOAD

ID *Main Building*

Design load code ASCE 7-16 *ASCE 7-16* [Table 26.6-1, pg. 266]

Structural type *Buildings - Main Wind Force Resisting System*

Roof type *Gable*

Risk category II II [Table 1.5-1, pg. 4]

Enclosure classification *Enclosed buildings* [Table 26.13-1, pg. 271]

Wind exposure category C C [Section 26.7.3, pg. 266]

Basic wind speed 130 $V_{ULT} = 130$ mph $V_{ASD} = 101$ mph [Figure 26.5-1, pg. 247-249]
Temporary Structure Max. 115

Building span L = 27.7 ft

Building length B = 64.0 ft

Roof peak height $h_r = 13.8$ ft

Roof eave height z = 11.5 ft

Mean roof height 12.6 h = 12.6 ft

Roof slope 9.2 $\theta = 9.2$ degrees y (ft) 2.25 $\tan^{-1}(y/x)$
x (ft) 13.83 9.24

Ground elevation above sea level 0 $z_g = 0$ ft

Wind importance factor $I_w = 1.00$ [Table 1.5-2, pg. 5]

Gust-effect factor G = 0.85 [Section 26.11.1, pg. 269]

Wind exposure category $K_h = 2.01 (h / z_g)^{2/\alpha}$ $K_z = 2.01 (z / z_g)^{2/\alpha}$ [Table 26.10-1, pg. 268]
 $\alpha = 9.5$ $\alpha = 9.5$
 $z_g = 900$ $z_g = 900$
 $K_h = 0.85$ $K_z = 0.85$

Ground Elevation Factor $K_e = e^{-0.0000362 z_g}$ [Table 26.9-1, pg. 268]
 $K_e = 1.00$

Wind Directional Factor 1.00 $K_d = 0.85$ [Table 26.6-1, pg. 266]

Internal Pressure Coefficient $(G C_{pi}) = +/- 0.18$ [Table 26.13-1, pg. 271]

Topographic factor $K_{zt} = 1.0$ [Section 26.8.2, pg. 268]

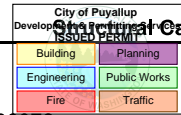
Permanent Structure 1.00 1.00 Reduction factor Not Applicable

Velocity pressure $q_h = 31.22$ psf $q_z = 31.22$ psf [Eq. 26.10-1, pg. 268]

ASCE 7-16 $q_{h (or z)} = 0.00256 K_h (or z) K_{zt} K_d K_e V^2$

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Calculations
AT24050

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372
Phone :	(972) 896-5373	Subject :	Modular Building and Foundation Design
Email :	yurianto@modularconsultant.com	Date :	6/10/2024
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End zone length determination for Components and Cladding

[Figure 30.3-1, pg. 335]

Building span	L =	27.667	ft
Building length	B =	64	ft
Mean roof height	h =	12.6	ft
Roof slope	θ =	9.2	degrees

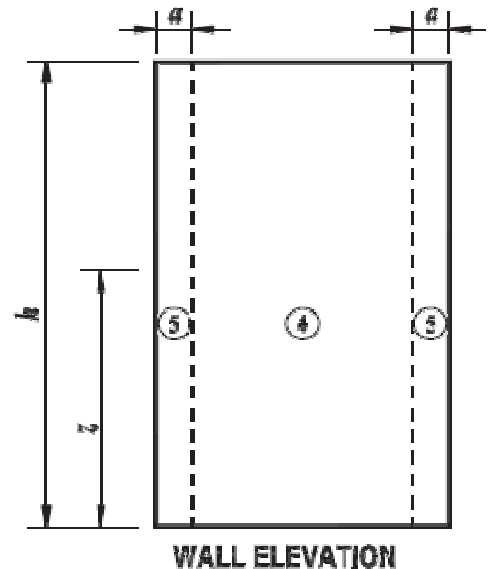
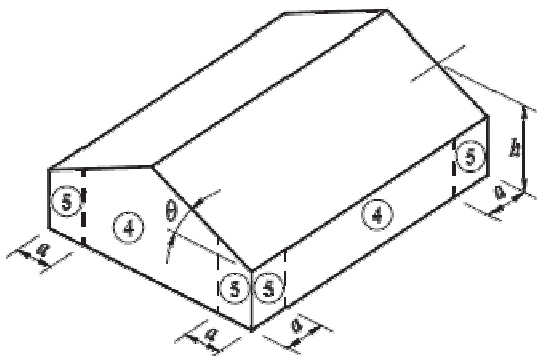
a is lesser of 10% L, 10% B, or 0.4 h	10% L =	2.77	ft
	10% B =	6.40	ft
	0.4 h =	5.05	ft
	Lesser value =	2.77	ft

a_{min} is the least of 4% (L or B), or 3 ft	4% L =	1.11	ft
	4% B =	2.56	ft
	Least of 4% (L or B) =	1.11	ft
	or	3.00	ft
a_{min} =	3.00	ft	

a_{max} for $\theta = 0$ to 7 deg roof and $\min(L,B) > 300ft$	Not Applicable
a_{max} =	0.8 h
a_{max} =	10.10 ft

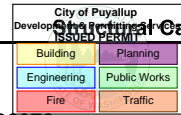
End zone length ► **a = 3.00 ft**

2a =	6.00	ft
4a =	12.00	ft



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Calculations

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ASCE 7-16

Components and Cladding

For Walls, h ≤ 60 ft

Enclosed, Partially Enclosed Buildings

[Figure 30.3-1, pg. 335]

Mean roof height h = 12.6 ft
Roof slope θ = 9.2 degrees

External Pressure Coefficient, GC_p

Member Location	Zone	Span Length (ft)	1 Effective Width		2 C&C Trib. Area (Span x Eff. Width)	3 GC _p For Walls, h ≤ 60ft		4 GC _p For Walls, h > 60ft	
			Actual (ft)	[1/3 Span] (ft)		Use → with q _h	with q _h	Use → with q _h	with q _z
Int. zone wall stud	Zone 4	8.00	1.33	2.7	21 ft ²	-1.04	0.94	-0.90	0.89
End zone wall stud	Zone 5	8.00	1.33	2.7	21 ft ²	-1.28	0.94	-1.78	0.89
Int. zone door jamb	Zone 4	7.00	3.00	2.3	21 ft ²	-1.04	0.94	-0.90	0.90
Int. zone wall panel	Zone 4	3.00	3.00	1.0	9 ft ²	-1.10	1.00	-0.90	0.90
End zone wall pane	Zone 5	3.00	3.00	1.0	9 ft ²	-1.40	1.00	-1.80	0.90

(Not Applicable)

- Note:
1. Effective width need not be less than one-third span length per definition in Chap. 26.
 2. C&C tributary areas greater than 700 ft² shall be permitted to be designed using MWFRS, per Section 30.2.3.
 3. Value of GC_p for walls shall be reduced by 10%, when θ ≤ 10° and h ≤ 60ft. Adjustment factor = 0.90
 4. For h ≤ 60ft, (CG_p) to be used with q_h. For h > 60ft. Use q_z with positive value of (GC_p) and q_h with negative value of (GC_p).

Building Enclosure Category	Enclosed buildings	[Table 26.13-1, pg. 271]
Positive internal pressure	0.18 (+GC _{pi}) = 0.18	
Negative internal pressure	-0.18 (-GC _{pi}) = -0.18	

Velocity pressure q_h = 31.22 psf q_z = 31.22 psf [Eq. 26.10-1, pg. 268]

Design Wind Pressure of Walls - Components and Cladding

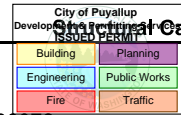
q_{h or z} [(GC_p) - (±GC_{pi})]

Member Location	Zone	[Negative Pressure] q _h [(GC _p) _{Neg} - (+GC _{pi})]	[Positive Pressure] q _{h or z} [(GC _p) _{Pos} - (-GC _{pi})]	[Comments]
Int. zone wall stud	Zone 4	-34.33 psf	31.52 psf	
End zone wall stud	Zone 5	-41.13 psf	31.52 psf	
Int. zone door jamb	Zone 4	-34.36 psf	31.55 psf	
Int. zone wall panel	Zone 4	-35.96 psf	33.15 psf	
End zone wall pane	Zone 5	-44.39 psf	33.15 psf	

- Note:
- Minimum C&C design wind pressure +/- 16.0 psf [Section 30.2.2, pg. 333]
 - Plus and minus signs signify pressures acting toward and away from the surfaces, respectively.
 - ASCE 7-16 design wind pressures are at ultimate load level.

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Phone :	(972) 896-5373	Subject :	Modular Building and Foundation Design
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Components and Cladding

For Flat Roofs, h ≤ 60 ft

Enclosed, Partially Enclosed Buildings

[Figure 30.3-1, pg. 335]

Mean roof height h = 12.6 ft
Roof slope θ = 9.2 degrees

External Pressure Coefficient, GC_p

Member Location	Zone	Span Length (ft)	1 Effective Width		2 C&C Trib. Area (Span x Eff. Width)	3 GC _p For Roofs, h ≤ 60ft		4 GC _p For Roofs, h > 60ft	
			Actual (ft)	[1/3 Span] (ft)		Use → with q _h	Use → with q _h		
Member zone 1	Zone 1	13.83	1.33	4.6	64 ft ²	-1.37	-1.16	(Not Applicable)	(Not Applicable)
Member zone 2	Zone 2	13.83	1.33	4.6	64 ft ²	-1.87	-1.97		
Roof panel zone 1	Zone 1	3.00	3.00	1.0	9 ft ²	-1.70	-1.40		
Roof panel zone 2	Zone 2	3.00	3.00	1.0	9 ft ²	-2.30	-2.30		
Roof panel zone 3	Zone 3	3.00	3.00	1.0	9 ft ²	-3.20	-3.20		

- Note:
1. Effective width need not be less than one-third span length per definition in Chap. 26.
 2. C&C tributary areas greater than 700 ft² shall be permitted to be designed using MWFRS, per Section 30.2.3.
 3. Value of GC_p for walls shall be reduced by 10%, when θ ≤ 10° and h ≤ 60ft. Adjustment factor = 1.00
 4. For h ≤ 60ft, (CG_p) to be used with q_h. For h > 60ft. Use q_z with positive value of (GC_p) and q_h with negative value of (GC_p).

Building Enclosure Category Enclosed buildings [Table 26.13-1, pg. 271]
 Positive internal pressure 0.18 (+GC_{pi}) = 0.18
 Negative internal pressure -0.18 (-GC_{pi}) = -0.18

Velocity pressure q_h = 31.22 psf q_z = 31.22 psf [Eq. 26.10-1, pg. 268]

Design Wind Pressure of Roof - Components and Cladding

$q_h [(GC_p) - (\pm GC_{pi})]$

Member Location	Zone	q _h [(GC _p) _{Neg} - (+GC _{pi})]	q _h [(GC _p) _{Pos} - (-GC _{pi})]	[Comments]
Member zone 1	Zone 1	-48.34 psf	-37.10 psf	
Member zone 2	Zone 2	-64.11 psf	-52.87 psf	
Roof panel zone 1	Zone 1	-58.69 psf	-47.45 psf	
Roof panel zone 2	Zone 2	-77.42 psf	-66.18 psf	
Roof panel zone 3	Zone 3	-105.51 psf	-94.28 psf	

- Note: Minimum C&C design wind pressure +/- 16.0 psf [Section 30.2.2, pg. 333]
 Plus and minus signs signify pressures acting toward and away from the surfaces, respectively.

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City of Puyallup Development Services		Calculations AT24050
Building	Planning	
Engineering	Public Works	
Fire	Traffic	

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372
Phone:	(972) 896-5373	Subject :	Modular Building and Foundation Design
Email:	yurianto@modularconsultant.com	Date:	6/10/2024
			2 Plex
			Final

Wind load on buildings - MWFRS (Directional Procedures)

For All Heights [Figure 27.3-1]

A. Velocity pressures ASCE 7-16 $q_{h (or z)} = 0.00256 K_{h (or z)} K_{zt} K_d K_e V^2$

Wind velocity pressure at Mean roof height	$q_h =$	31.22 psf	at h = 12.63 ft
Wind velocity pressure at Eave height	$q_z =$	31.22 psf	at z = 11.5 ft
Wind velocity pressure at 0 to 15 ft	$q_{z 0-15} =$	31.26 psf	at z = 0 to 15 ft

B. External and internal wind pressures

External wind pressure, q_{GC_p}

I. Wall Wind Pressures

a. Windward wall	$q_z GC_p =$	21.23 psf	at eave height
b. Leeward wall	$q_h GC_p =$	-13.27 psf	
c. Side walls	$q_h GC_p =$	-18.57 psf	
d. Windward wall	$q_{z 0-15} GC_p =$	21.26 psf	at 0 to 15 ft

II. Roof Wind Pressures

i. Wind Direction Normal to Ridge

a. Windward roof			
Maximum suction	$q_h GC_p =$	-23.02 psf	
Minimum suction	$q_h GC_p =$	-4.78 psf	
b. Leeward roof	$q_h GC_p =$	-12.34 psf	

ii. Wind Direction Parallel to Ridge

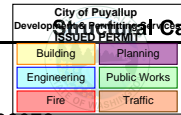
Maximum suction	$q_h GC_p =$	-23.88 psf	
Minimum suction	$q_h GC_p =$	-4.78 psf	

Internal wind pressure, $q_{GC_{pi}}$

Positive internal pressure	$q_h GC_{pi} =$	5.62 psf
Negative internal pressure	$q_h GC_{pi} =$	-5.62 psf

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Structural Calculations

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994	AT24050
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School	
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372	
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SEISMIC LOAD

ID

Main Building

Design load code ASCE 7-16

ASCE 7-16

[ASCE 7-16, Chap 11, 12, pg. 77, 89]

Structure height from base to highest level 13.75 $h_n = 13.75$ ft

Soil site classification D D [Table 20.3-1, page 204]

Soil type Stiff soil

Risk Category II II [Table 1.5-1., pg. 4]

Occupancy type Standard occupancy structures

Importance factor $I_e = 1.00$ [Table 1.5-2, page 5]

Short period ground acceleration 0.300 $S_s = 0.300$ g [Fig. 22-1, page 210-211]

1-second ground acceleration 0.200 $S_1 = 0.200$ g [Fig. 22-2, page 212-213]

Short period site coefficient $F_a = 1.560$ [Table 11.4-1, page 84]

Long period site coefficient $F_v = 2.200$ [Table 11.4-2, page 84]

S_s	F_a
0.250	1.600
0.300	1.560
0.500	1.400

F_a Interpolation = 1.560

Section 11.4.8. Exception Check

1. Site Class E with $S_s \geq 1.0$
2. Site Class D with $S_1 \geq 0.2$ $T < 1.5T_s$ $T < T_L$ Check! $C_s = Eq. (12.8-2)$
3. Site Class E with $S_1 \geq 0.2$

Permanent Structure 1.00 1.00 Reduction factor
Not Applicable

S_1	F_v
0.100	2.400
0.200	2.200
0.200	2.200

F_v Interpolation = 2.200

Adjusted Maximum Considered Earthquake (MCE) response accelerations [11.4.4, page 84]

For short periods, $F_a S_s$ $S_{MS} = 0.468$ g [Eq. (11.4-1)]
For 1-second period, $F_v S_1$ $S_{M1} = 0.440$ g [Eq. (11.4-2)]

Design spectral accelerations [11.4.4]

For short periods, $2/3 S_{MS}$ 0.312 $S_{DS} = 0.312$ g Section 12.8.1.3 Criteria not applicable [Eq. (11.4-3)]
For 1-second period, $2/3 S_{M1}$ $S_{D1} = 0.293$ g [Eq. (11.4-4)]

Seismic Design Category (SDC) [11.6, page 67]

SDC based on S_{DS} 2 B [Table 11.6-1]
SDC based on S_{D1} 4 D [Table 11.6-2]
Check $S_1 \geq 0.75$, Risk Cat. I, II, III 0 (n.a.)
Check $S_1 \geq 0.75$, Risk Cat. IV 0 (n.a.)
Seismic Design Category 4 **D**

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City of Puyallup
Development Services Department
Final Calculations

Building	Planning
Engineering	Public Works
Fire	Traffic

AT24050

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Period determination

[12.8.2, page 102]

Long-period transition period	$T_L = 6.00$ sec		[Fig. 22-14, page 225]
$T_s = S_{D1} / S_{DS}$	$T_s = 0.94$ sec		
Approximate fundamental period	$T_a = C_t h_n^x$		
Maximum value of fundamental period	$T_{max} = T_a C_u$		
Coefficient for upper limit on calculated period	$C_u = 1.5$ (For S_{D1} value see next page)		
Structure height from base to highest level	$h_n = 13.75$ ft		
Steel moment-resisting frames $T_a = 0.028 h_n^{0.8}$	$T_a = 0.228$ sec	$T_{max} = 0.342$ sec	
Eccentrically braced steel frames $T_a = 0.03 h_n^{0.75}$	$T_a = 0.214$ sec	$T_{max} = 0.321$ sec	
All other structural systems $T_a = 0.02 h_n^{0.75}$	$T_a = 0.143$ sec	$T_{max} = 0.214$ sec	

I. Transverse

II. Longitudinal

All other structural systems

All other structural systems

Structural type
Determine structure fundamental periods

$T = 0.143$ sec

$T = 0.143$ sec

Allowable Story Drift, Δ_a

[Table 12.12-1]

Risk Cat. All other structures

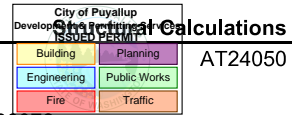
I or II	0.020	h_{sx}
III	0.015	h_{sx}
IV	0.100	h_{sx}

Risk Cat. II 0.020 $\Delta_a = 0.020 h_{sx}$

Level roof Story Height $h_{sx} = 13.75$ ft $\Delta_a = 3.30$ inches

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CHAPTER 12

Design coefficients and factors for seismic force-resisting systems

[Table 12.2-1, page 90-92]

Modular Building and Foundation Structure Type	I. Transverse	II. Longitudinal
A. Bearing W. A. Bearing W. Wood Framing w/ Wood Panel Bldg	A. Bearing Wall Systems	A. Bearing Wall Systems
15. Light-fram 15. Light-fram	15. Light-frame (wood) walls sheathed with wood structural panels rated for shear resistance	15. Light-frame (wood) walls sheathed with wood structural panels rated for shear resistance
with wood str with wood str		
rated for she. rated for she.		
Response modification coefficient	R = 6.50	R = 6.50
System overstrength factor	$\Omega_0 = 3.00$	$\Omega_0 = 3.00$
Deflection amplification factor	$C_d = 4.00$	$C_d = 4.00$

Seismic response coefficients

[12.8.1.1, page 101]

Structure seismic load directions	I. Transverse	II. Longitudinal
$C_s = \frac{S_{DS}}{\left(\frac{R}{T}\right)}$	$C_S = 0.048$ Govern!	$C_S = 0.048$ Govern!
For $T \leq T_L$, $C_{s\ max} = \frac{S_{D1}}{T\left(\frac{R}{T}\right)}$	$C_{S\ max.} = 0.316$	$C_{S\ max.} = 0.316$
For $T > T_L$, $C_{s\ max} = \frac{S_{D1}T_L}{T^2\left(\frac{R}{T}\right)}$	$C_{S\ max.} = (n.a.)$	$C_{S\ max.} = (n.a.)$
$C_{s\ min} = 0.044 S_{DS} I_e$	$C_{S\ min.} = 0.014$	$C_{S\ min.} = 0.014$
$C_{s\ min} = 0.01$	$C_{S\ min.} = 0.01$	$C_{S\ min.} = 0.01$
For $S_1 \geq 0.6\ g$, $C_{s\ min} = \frac{0.5S_1}{\left(\frac{R}{T}\right)}$	$C_{S\ min.} = (n.a.)$	$C_{S\ min.} = (n.a.)$
Design seismic response coefficients	$C_S = \boxed{0.048}$	$C_S = \boxed{0.048}$

Seismic base shear

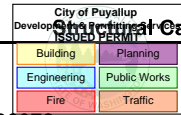
$V = C_S W$ [Eq. (12.8-1), page 101]
 $W =$ the effective seismic weight per Section 12.7.2.

Seismic Force for Component Design

	I. Transverse	II. Longitudinal
For ductile structural elements members & connections	$C_s W_p$ $0.2 S_{DS} W_p$	$F_{p\ horz} = 0.048 W_p$ $F_{p\ vert} = \pm 0.062 W_p$
For nonductile structural elements anchorage to concrete and masonry	$(C_s \Omega_0) W_p$ $0.2 S_{DS} W_p$	$F_{p\ horz} = 0.144 W_p$ $F_{p\ vert} = \pm 0.062 W_p$

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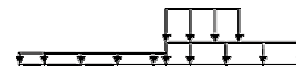
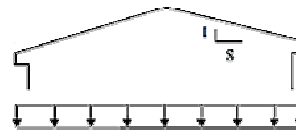
Structural Calculations

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DESIGN LOAD SUMMARY

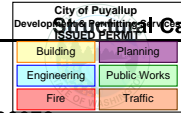
Typical frame spacing		[in o.c.]	[ft o.c.]
Roof Rafter		24.0	2.00
Wall frame		16.0	1.33
Floor frame		16.0	1.33
Ridge Beam		166.0	13.83

Load Types	Member ID	Design Loads	Frame spacing		Linear load	
			[in o.c.]	[ft o.c.]		
Dead Load	Roof & Ceiling dead load	12.0 psf	24.0	2.00	24.0	plf
	Exterior wall dead load	12.0 psf	16.0	1.33	16.0	plf
	Interior wall dead load	6.0 psf	16.0	1.33	8.0	plf
	Floor dead load	12.0 psf	16.0	1.33	16.0	plf
Roof live load	Concentrated load	$P_r = 300$ lb				
	Roof Rafter	$L_r = 20.0$ psf	24.0	2.00	40.0	plf
	Ridge Beam	$L_r = 12.0$ psf	166.0	13.83	166.0	plf
Floor live load	Access floor system - Office u Conc. load over 2.5' x 2.5'	$L_L = 50.0$ psf $P_L = 2000$ lb	16.0	1.33	66.7	plf
	Storage warehouses - Light Conc. load over 2.5' x 2.5'	$L_L = 125.0$ psf $P_L = 0$ lb	16.0	1.33	166.7	plf
Snow load	Flat roof snow	$p_f = 31.2$ psf	24.0	2.00	62.4	plf
	Non Reducible snow	$p_s = 40.0$ psf			80.0	plf
	For Pitched Roof					
	Balanced snow	$p_s = 31.2$ psf			62.4	plf
	Unbalanced snow loads need to be considered					
$W \leq 20$ ft (Governs!)	Unbalanced snow	45.0 psf			90.0	plf
$W > 20$ ft	Unbalanced snow					
	Windward roof snow	9.4 psf			18.7	plf
	Leeward roof snow	31.2 psf			62.4	plf
	Leeward surcharge snow	13.4 psf			26.9	plf
	Leeward surcharge length	11.1 ft				



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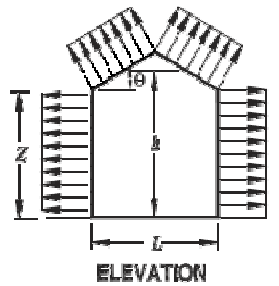
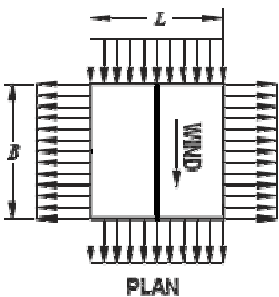
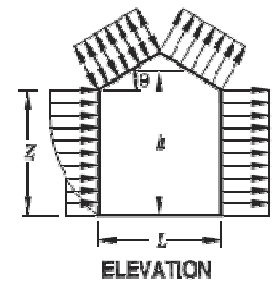
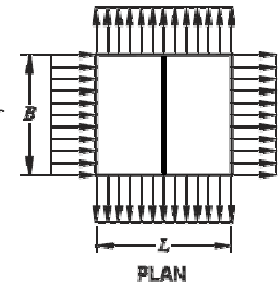
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Structural Calculations

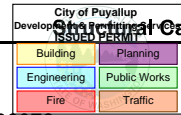
Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994	City of Puyallup Development Services	AT24050
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School	Building	Planning
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372	Engineering	Public Works
Phone:	(972) 896-5373	Subject :	Modular Building and Foundation Design	Fire	Traffic
Email:	yurianto@modularconsultant.com	Date:	6/10/2024		2 Plex
					Final

Load Types	Member ID	Design Loads	Frame spacing		Linear load
			[in o.c.]	[ft o.c.]	
Wind Load	MWFRS For Pitched Roof	(+ toward, - away from surface)	24.0	2.00	
Case 1	Windward wall at 0 - 15 ft	15.6 psf			31.3 plf
	Windward wall at eave	15.6 psf			31.2 plf
	Windward roof max. suction	-28.6 psf			-57.3 plf
	Leeward roof	-18.0 psf			-35.9 plf
	Leeward wall	-18.9 psf			-37.8 plf
	Side walls	-24.2 psf			-48.4 plf
Case 2	Windward wall at 0 - 15 ft	15.6 psf			31.3 plf
	Windward wall at eave	15.6 psf			31.2 plf
	Windward roof max. suction	-10.4 psf			-20.8 plf
	Leeward roof	-18.0 psf			-35.9 plf
	Leeward wall	-18.9 psf			-37.8 plf
	Side walls	-24.2 psf			-48.4 plf
Case 3	Windward wall at 0 - 15 ft	26.9 psf			53.7 plf
	Windward wall at eave	26.8 psf			53.7 plf
	Windward roof max. suction	-17.4 psf			-34.8 plf
	Leeward roof	-6.7 psf			-13.4 plf
	Leeward wall	-7.6 psf			-15.3 plf
	Side walls	-13.0 psf			-25.9 plf
Case 4	Windward wall at 0 - 15 ft	26.9 psf			53.7 plf
	Windward wall at eave	26.8 psf			53.7 plf
	Windward roof max. suction	0.8 psf			1.7 plf
	Leeward roof	-6.7 psf			-13.4 plf
	Leeward wall	-7.6 psf			-15.3 plf
	Side walls	-13.0 psf			-25.9 plf
Case 5	Roof	-29.5 psf			-59.0 plf
	Side walls	-24.2 psf			-48.4 plf
	Windward wall	15.6 psf			31.2 plf
	Leeward wall	-18.9 psf			-37.8 plf
Case 6	Roof	-10.4 psf			-20.8 plf
	Side walls	-24.2 psf			-48.4 plf
	Windward wall	15.6 psf			31.2 plf
	Leeward wall	-18.9 psf			-37.8 plf
Case 7	Roof	-18.3 psf			-36.5 plf
	Side walls	-13.0 psf			-25.9 plf
	Windward wall	26.8 psf			53.7 plf
	Leeward wall	-7.6 psf			-15.3 plf
Case 8	Roof	0.8 psf			1.7 plf
	Side walls	-13.0 psf			-25.9 plf
	Windward wall	26.8 psf			53.7 plf
	Leeward wall	-7.6 psf			-15.3 plf



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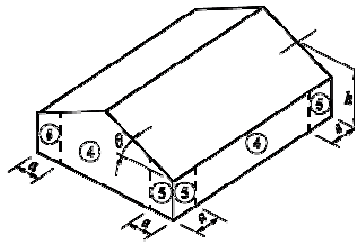
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Structural Calculations

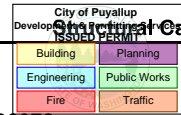
Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994	AT24050
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School	
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372	
Phone:	(972) 896-5373	Subject :	Modular Building and Foundation Design	2 Plex
Email:	yurianto@modularconsultant.com	Date:	6/10/2024	Final

Load Types	Member ID	Design Loads	Frame spacing		Linear load
			[in o.c.]	[ft o.c.]	
Wind Load	Wall Components & Cladding (+ toward, - away from surface)		16.0	1.33	
	End zone length ►	a = 3.00 ft			
Case 1 (Outward)	Int. zone wall stud Zone 4	-34.3 psf			-45.8 plf
	End zone wall stud Zone 5	-41.1 psf			-54.8 plf
	Int. zone door jamb Zone 4	-34.4 psf			-45.8 plf
	Int. zone wall panel Zone 4	-36.0 psf			-47.9 plf
	End zone wall panel Zone 5	-44.4 psf			-59.2 plf
Case 2 (Inward)	Int. zone wall stud Zone 4	31.5 psf			42.0 plf
	End zone wall stud Zone 5	31.5 psf			42.0 plf
	Int. zone door jamb Zone 4	31.6 psf			42.1 plf
	Int. zone wall panel Zone 4	33.2 psf			44.2 plf
	End zone wall panel Zone 5	33.2 psf			44.2 plf
Minimum		16.0 psf			21.3 plf



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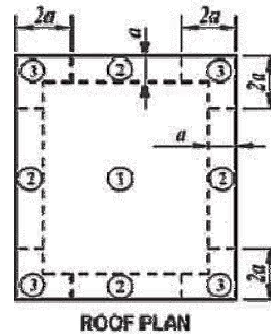
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Structural Calculations

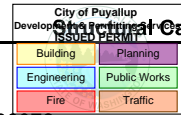
Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994	AT24050
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School	
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Email:	yurianto@modularconsultant.com	Date:	6/10/2024	Final

Load Types	Member ID	Design Loads	Frame spacing		Linear load
			[in o.c.]	[ft o.c.]	
Wind Load	Roof Components & Cladding (+ toward, - away from surface)		24.0	2.00	
	End zone length ▶	a = 3.00 ft			
Case 1	Member zone 1 Zone 1	-48.3 psf			-96.7 plf
	Member zone 2 Zone 2	-64.1 psf			-128.2 plf
	Roof panel zone 1 Zone 1	-58.7 psf			-117.4 plf
	Roof panel zone 2 Zone 2	-77.4 psf			-154.8 plf
	Roof panel zone 3 Zone 3	-105.5 psf			-211.0 plf
Case 2	Member zone 1 Zone 1	-37.1 psf			-74.2 plf
	Member zone 2 Zone 2	-52.9 psf			-105.7 plf
	Roof panel zone 1 Zone 1	-47.5 psf			-94.9 plf
	Roof panel zone 2 Zone 2	-66.2 psf			-132.4 plf
	Roof panel zone 3 Zone 3	-94.3 psf			-188.6 plf
Minimum		16.0 psf			21.3 plf



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Structural Calculations

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994	AT24050
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School	
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372	
Phone:	(972) 896-5373	Subject :	Modular Building and Foundation Design	2 Plex
Email:	yurianto@modularconsultant.com	Date:	6/10/2024	Final

Glulam Beam Member ID : Ridge Beam

RIDGE BEAM

Glulam-Balanced, West Species, 24F-1.7E WS, 3-1/2"x21"

Supports: All - Lumber Stud Wall, S. Pine No.2

Total length: 64.0'; Clear span: 31.188', 31.188'; Volume = 32.7 cu.ft.; 14 laminations, 3-1/2" maximum width, Lateral support: top = 2'-0 bottom = 4'-0 (in);

This section PASSES the design code check.

WARNING: Member length exceeds typical stock length of 60.0 ft

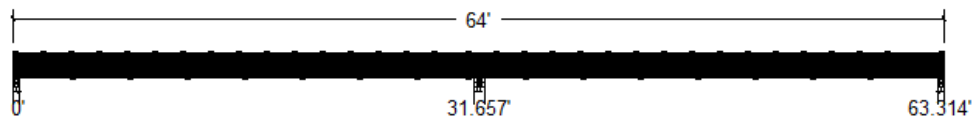
Analysis vs. Allowable Stress and Deflection using NDS 2018 :

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	fv = 135	Fv' = 241	psi	fv/Fv' = 0.56
Bending(+)	fb = 1386	Fb' = 2662	psi	fb/Fb' = 0.52
Bending(-)	fb = 2186	Fb' = 2610	psi	fb/Fb' = 0.84
Live Defl'n	0.76 = L/500	1.06 = L/360	in	0.72
Total Defl'n	1.05 = L/360	1.58 = L/240	in	0.67

Loads:

Load	Type	Distribution	Pat-tern	Location [ft]		Magnitude		Unit
				Start	End	Start	End	
Wdead	Dead	Full Area	No			12.00	(6.92')	psf
Wsnow	Snow	Full Area	Yes			40.00	(6.92')	psf
Wwind MWFRS	Wind	Full Area	No			-24.50	(6.92')	psf
Wrooflive	Roof live	Full Area	Yes			12.00	(6.92')	psf
Self-weight	Dead	Full UDL	No			14.3		plf

Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in) :



Unfactored:				
Dead	1184		3853	1184
Snow	3655		10953	3655
Wind	-2071		-6709	-2071
Roof Live	1179		3286	1179
Factored:				
Uplift	-532		-1713	-532
Total	4839		14806	4839

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Structural Calculations

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994	AT24050
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School	
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372	
Phone:	(972) 896-5373	Subject :	Modular Building and Foundation Design	2 Plex
Email:	yurianto@modularconsultant.com	Date:	6/10/2024	Final

WoodWorks

ROOF RAFTER

Lumber-soft, S. Pine, No.2, 2x12 (1-1/2"x11-1/4")

Supports: 1 - Lumber Stud Wall, S. Pine No.2; 2 - Hanger;

Roof joist spaced at 24.0" c/c; Total length: 14.19'; Clear span(horz): 13.25'; Volume = 1.7 cu.ft.; Pitch: 2/12

Lateral support: top = continuous, bottom = 6'-11 (in); Repetitive factor: applied where permitted (refer to online help);

This section PASSES the design code check.

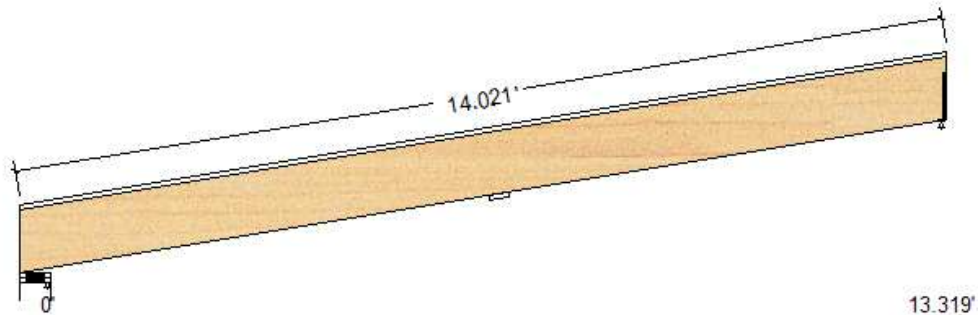
Analysis vs. Allowable Stress and Deflection using NDS 2018 :

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	fv = 54	Fv' = 201	psi	fv/Fv' = 0.27
Bending(+)	fb = 915	Fb' = 992	psi	fb/Fb' = 0.92
Bending(-)	fb = 508	Fb' = 683	psi	fb/Fb' = 0.74
Live Defl'n	0.23 = L/693	0.68 = L/240	in	0.35
Total Defl'n	0.36 = L/450	0.90 = L/180	in	0.40

Loads:

Load	Type	Distribution	Pat-tern	Location [ft]		Magnitude		Unit
				Start	End	Start	End	
Wdead	Dead	Full Area				12.00 (24.0")		psf
Wsnow	Snow	Full Area				40.00 (24.0")		psf
Wwind C&C	Wind C&C	Partial Area		3.00	13.83	-64.10 (24.0")		psf
Wrooflive	Roof live	Full Area				20.00 (24.0")		psf
Wwind C&C2	Wind C&C	Partial Area		0.00	3.00	-48.30 (24.0")		psf
Self-weight	Dead	Full UDL				4.4		plf

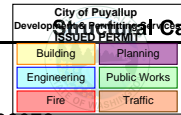
Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in) :



Unfactored:			
Dead	202		194
Snow	566		540
Wind	-821		-857
Roof Live	283		270
Factored:			
Uplift	-372		-398
Total	768		734

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Structural Calculations

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994	AT24050
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School	
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372	
Phone:	(972) 896-5373	Subject :	Modular Building and Foundation Design	2 Plex
Email:	yurianto@modularconsultant.com	Date:	6/10/2024	Final

OPENING HEADER

Lumber n-ply, S. Pine, No.2, 2x6, 3-ply (4-1/2"x5-1/2")

Supports: All - Lumber Stud Wall, S. Pine Stud

Total length: 4.25'; Clear span: 4.0'; Volume = 0.7 cu.ft.

Lateral support: top = 1'-4 bottom = at supports; (in); Repetitive factor: applied where permitted (refer to online help);

This section PASSES the design code check.

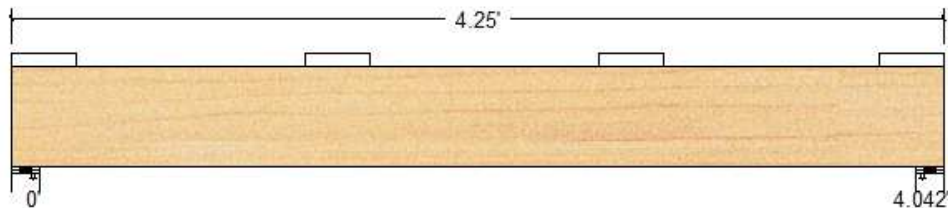
Analysis vs. Allowable Stress and Deflection using NDS 2018 :

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	fv = 55	Fv' = 201	psi	fv/Fv' = 0.27
Bending (+)	fb = 630	Fb' = 1309	psi	fb/Fb' = 0.48
Bending (-)	fb = 297	Fb' = 1687	psi	fb/Fb' = 0.18
Live Defl'n	0.03 = < L/999	0.13 = L/360	in	0.22
Total Defl'n	0.05 = < L/999	0.20 = L/240	in	0.23

Loads:

Load	Type	Distribution	Pat-tern	Location [ft]		Magnitude		Unit
				Start	End	Start	End	
Wdead	Dead	Full UDL				152.0		plf
Wsnow	Snow	Full UDL				425.0		plf
Wrooflive	Roof live	Full UDL				212.0		plf
Wwind	Wind	Full UDL				-616.0		plf
Self-weight	Dead	Full UDL				6.4		plf

Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in) :



Unfactored:			
Dead	336		336
Snow	903		903
Wind	-1309		-1309
Roof Live	451		451
Factored:			
Uplift	-584		-584
Total	1239		1239

ATCO Structures & Logistics 1106 North Temple Dr. Diboll, TX 75941

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10/2/2024
SUBJECT TO CODE
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City of Puyallup
Development Services
Engineering & Planning
Public Works
Fire & Traffic

Structural Calculations

AT24050

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372
Phone:	(972) 896-5373	Subject :	Modular Building and Foundation Design
Email:	yurianto@modularconsultant.com	Date:	6/10/2024

2 Plex
Final

JACK STUD

Lumber n-ply, S. Pine, No.2, 2x6, 1-ply (1-1/2"x5-1/2")

Support: Lumber-soft Sill plate, S. Pine No.2; Bearing length = column width (b); continuous lower support
Total length: 7.0'; Volume = 0.4 cu.ft.

Pinned base; Load face = width(b); Ke x Lb: 1.0 x 0.0 = 0.0 ft; Ke x Ld: 1.0 x 7.0 = 7.0 ft; Repetitive factor: applied where permitted (refer to online help);

This section PASSES the design code check.

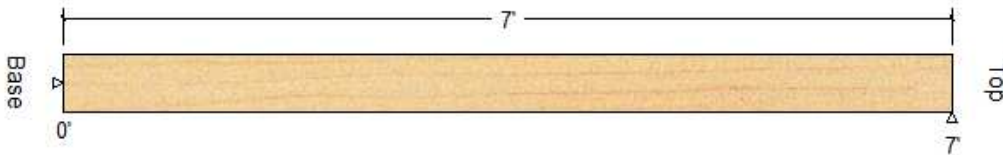
Analysis vs. Allowable Stress and Deflection using NDS 2018 :

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	fv = 17	Fv' = 280	psi	fv/Fv' = 0.06
Bending(+)	fb = 213	Fb' = 1600	psi	fb/Fb' = 0.13
Bending(-)	fb = 71	Fb' = 1600	psi	fb/Fb' = 0.04
Axial	fc = 152	Fc' = 1171	psi	fc/Fc' = 0.13
Combined (axial + eccentric + side load bending)				Eq.15.4-1 = 0.16
Axial Bearing	fc = 152	Fc* = 1610	psi	fc/Fc* = 0.09
Support Bearin	fcp = 152	Fcp = 706	psi	fcp/Fcp = 0.22
Combined (axial compression + side load bending)				Eq.3.9-3 = 0.18
Live Defl'n	0.04 = < L/999	0.70 = L/120	in	0.05
Total Defl'n	0.04 = < L/999	0.70 = L/120	in	0.06

Loads:

Load	Type	Distribution	Location [ft]		Magnitude		Unit
			Start	End	Start	End	
Pdead	Dead	Axial	(Ecc. = 0.92")		336		lbs
Psnow	Snow	Axial	(Ecc. = 0.92")		903		lbs
Prooflive	Roof live	Axial	(Ecc. = 0.92")		451		lbs
Pwind	Wind	Axial	(Ecc. = 0.92")		-1309		lbs
Load5	Wind	Full UDL			41.1		plf
Self-weight	Dead	Axial			15		lbs

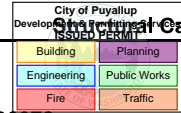
Reactions (lbs):



Unfactored:		
Lateral:		
Dead	4	-4
Snow	10	-10
Wind	130	158
Roof Live	5	-5
Axial:		
Dead	351	351
Snow	903	903
Wind	-1309	-1309
Roof Live	451	451

ATCO Structures & Logistics 1106 North Temple Dr. Diboll, TX 75941

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Structural Calculations

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994	AT24050
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School	
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372	
Phone :	(972) 896-5373	Subject :	Modular Building and Foundation Design	2 Plex
Email :	yurianto@modularconsultant.com	Date :	6/10/2024	Final

EXTERIOR 6IN WALL

Lumber Stud, S. Pine, No.2, 2x6 (1-1/2"x5-1/2")

Support: Lumber Stud Bottom plate, S. Pine No.2; Bearing length = stud thickness; continuous lower support
Spaced at 16.0" c/c; Total length: 8.0'; Volume = 0.5 cu.ft.

Pinned base; Load face = width(b); Ke x Lb: 1.0 x 0.0 = 0.0 ft; Ke x Ld: 1.0 x 8.0 = 8.0 ft; Repetitive factor:
applied where permitted (refer to online help);

This section PASSES the design code check.

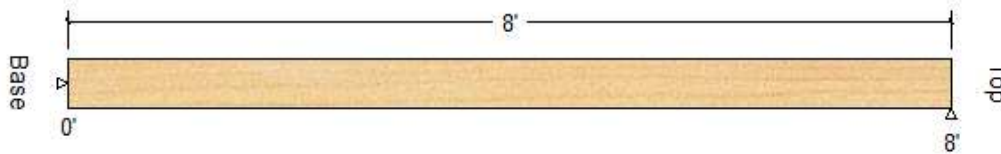
Analysis vs. Allowable Stress and Deflection using NDS 2018 :

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	fv = 24	Fv' = 280	psi	fv/Fv' = 0.09
Bending(+)	fb = 426	Fb' = 2159	psi	fb/Fb' = 0.20
Axial	fc = 64	Fc' = 1021	psi	fc/Fc' = 0.06
Combined	(axial + eccentric + side load bending)			Eq.15.4-1 = 0.20
Axial Bearing	fc = 64	Fc* = 1610	psi	fc/Fc* = 0.04
Support Bearin	fcp = 64	Fcp = 565	psi	fcp/Fcp = 0.11
Live Defl'n	0.05 = < L/999	0.80 = L/120	in	0.07
Total Defl'n	0.06 = < L/999	0.80 = L/120	in	0.07

Loads:

Load	Type	Distribution	Location [ft]		Magnitude	Unit
			Start	End		
Pdead	Dead	Axial UDL	(Ecc. = 0.92")		101	plf
Psnow	Snow	Axial UDL	(Ecc. = 0.92")		283	plf
Wwind C&C	Wind C&C	Full Area			41.10 (16.0")	psf
Prooflive	Roof live	Axial UDL	(Ecc. = 0.92")		142	plf
Self-weight	Dead	Axial UDL			13	plf

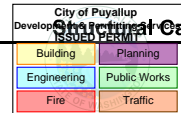
Reactions (lbs):



Unfactored:		
Lateral:		
Dead	1	-1
Snow	4	-4
Wind	219	219
Roof Live	2	-2
Axial:		
Dead	152	152
Snow	377	377
Roof Live	189	189

ATCO Structures & Logistics 1106 North Temple Dr. Diboll, TX 75941

APPROVED
12/09/2024
SUBJECT TO CODE
AND FIELD INSPECTION



Structural Calculations

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994	AT24050
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School	
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372	
Phone:	(972) 896-5373	Subject :	Modular Building and Foundation Design	2 Plex
Email:	yurianto@modularconsultant.com	Date:	6/10/2024	Final

FLOOR JOIST

Lumber-soft, S. Pine, No.2, 2x10 (1-1/2"x9-1/4")

Supports: All - Timber-soft Beam, D.Fir-L No.2

Floor joist spaced at 16.0" c/c; Total length: 13.81'; Clear span: 6.5', 6.5'; Volume = 1.3 cu.ft.

Lateral support: top = continuous, bottom = at all supports; Repetitive factor: applied where permitted (refer to online help);

This section PASSES the design code check.

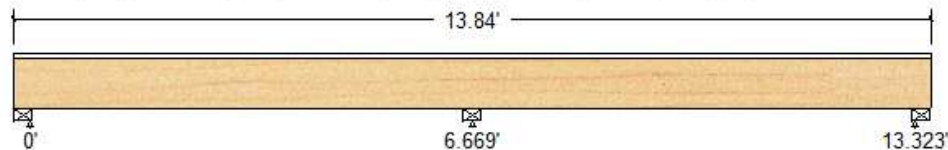
Analysis vs. Allowable Stress and Deflection using NDS 2018 :

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	$f_v = 66$	$F_v' = 175$	psi	$f_v/F_v' = 0.38$
Bending(+)	$f_b = 355$	$F_b' = 920$	psi	$f_b/F_b' = 0.39$
Bending(-)	$f_b = 580$	$F_b' = 760$	psi	$f_b/F_b' = 0.76$
Live Defl'n	$0.03 = < L/999$	$0.22 = L/360$	in	0.13
Total Defl'n	$0.03 = < L/999$	$0.33 = L/240$	in	0.10

Loads:

Load	Type	Distribution	Pat-tern	Location [ft]		Magnitude	Unit
				Start	End		
Floor dead	Dead	Full Area	No			12.00 (16.0")	psf
Floor live	Live	Full Area	No			125.00 (16.0")	psf
Concentrated	Live	Concentrated	No	At Increments		2000 (50.0")	lbs
Pdead	Dead	Point	No	0.25		152	lbs
Psnow	Snow	Point	No	0.25		377	lbs
Pwind	Wind	Point	No	0.25		-821	lbs
Prooflive	Roof live	Point	No	0.25		189	lbs
Self-weight	Dead	Full UDL	No			3.6	plf

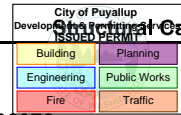
Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in) :



Unfactored:				
Dead	205		163	53
Live	459		1388	460
Snow	377			
Wind	-821			
Roof Live	189			
Conc Live	400		611	399
Factored:				
Uplift	-370			
Total	832		1551	513

ATCO Structures & Logistics 1106 North Temple Dr. Diboll, TX 75941

APPROVED
12/9/2024
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Structural Calculations

AT24050

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372
Phone :	(972) 896-5373	Subject :	Modular Building and Foundation Design
Email :	yurianto@modularconsultant.com	Date :	6/10/2024
			Final

FLOOR RIM

Lumber n-ply, S. Pine, No.2, 2x10, 3-ply (4-1/2"x9-1/4")

Supports: All - Lumber-soft Sill plate, S. Pine No.2

Total length: 49.13'; Clear span: 7.625', 7.375', 7.375', 7.375', 7.375', 7.625'; Volume = 14.2 cu.ft.

Lateral support: top = 1'-4 bottom = 1'-4 (in); Repetitive factor: applied where permitted (refer to online help);

This section PASSES the design code check.

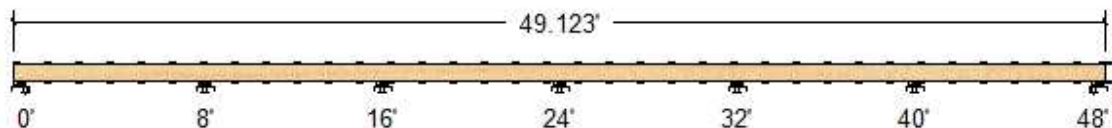
WARNING: Member length exceeds typical stock length of 18.0 ft

Analysis vs. Allowable Stress and Deflection using NDS 2018 :

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	$f_v = 97$	$F_v' = 201$	psi	$f_v/F_v' = 0.48$
Bending(+)	$f_b = 656$	$F_b' = 1043$	psi	$f_b/F_b' = 0.63$
Bending(-)	$f_b = 893$	$F_b' = 1043$	psi	$f_b/F_b' = 0.86$
Live Defl'n	$0.06 = < L/999$	$0.27 = L/360$	in	0.23
Total Defl'n	$0.09 = < L/999$	$0.40 = L/240$	in	0.22

Load	Type	Distribution	Pat-tern	Location [ft]		Magnitude		Unit
				Start	End	Start	End	
Wdead	Dead	Full UDL	No			154.0		plf
Wlive	Live	Full UDL	No			438.0		plf
Wsnow	Snow	Full UDL	No			283.0		plf
Wwind	Wind	Full UDL	No			-616.0		plf
Wrooflive	Roof live	Full UDL	No			142.0		plf
Self-weight	Dead	Full UDL	No			10.8		plf

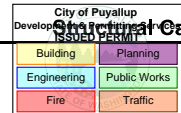
Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in) :



Unfactored:									
Dead	606	1496	1268	1344	1268	1496	606		
Live	1627	3976	3369	3571	3369	3976	1627		
Snow	1051	2569	2177	2308	2177	2569	1051		
Wind	-2289	-5591	-4738	-5023	-4738	-5591	-2289		
Roof Live	528	1289	1092	1158	1092	1289	528		
Factored:									
Uplift	-1009	-2457	-2083	-2207	-2083	-2457	-1009		
Total	2615	6404	5427	5753	5427	6404	2615		

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Structural Calculations

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Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372	
Phone:	(972) 896-5373	Subject :	Modular Building and Foundation Design	2 Plex
Email:	yurianto@modularconsultant.com	Date:	6/10/2024	Final

Modular Structural Consultants LLC

Project:
Engineer:
Descrip: Column

Page # ____
5/29/2024

ASDIP Steel 5.6.4.1

STEEL COLUMN DESIGN

www.asdipsoft.com

GEOMETRY

Column Designation	HSS3X3X3/16
Steel Yield Strength Fy	50.0 ksi
Modulus of Elasticity Es	29000 ksi
Member Length L	9.35 ft
Effective Length Kx-factor	1.00
Effective Length Ky-factor	1.00
Unbraced Length Lb	N.A. ft

PROPERTIES

Weight	7 lb/ft	Sx	1.6 in ³
Area	1.9 in ²	Zx	2.0 in ³
Depth	3.0 in	rx	1.14 in
Width	3.00 in	ly	2.5 in ⁴
t nom	0.19 in	Sy	1.6 in ³
t des	0.17 in	Zy	2.0 in ³
lx	2.5 in ⁴	ry	1.14 in
		J	4.03 in ⁴

UNFACTORED LOADS (Elastic Second-Order Analysis)

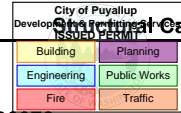
	Dead	Live	RLive	Snow	Wind	Seismic	
Axial Force P	3.9	0.0	3.3	11.0	-6.7	0.0	kip
Mx at Bottom	0.0	0.0	0.0	0.0	0.0	0.0	k-ft
Mx at Top	0.0	0.0	0.0	0.0	0.0	0.0	k-ft
My at Bottom	0.0	0.0	0.0	0.0	0.0	0.0	k-ft
My at Top	0.0	0.0	0.0	0.0	0.0	0.0	k-ft

COLUMN STRENGTH

Comb	Pr (kip)	Pc (kip)	Pr/Pc Ratio	Mx (k-ft)	Mcx (k-ft)	Mx/Mcx Ratio	Mry (k-ft)	Mcy (k-ft)	Mry/Mcy Ratio	H1-1a Ratio	H1-1b Ratio	
①	3.9	27.9	0.14	0.0	4.9	0.00	0.0	4.9	0.00	N.A.	0.07	OK
②	7.2	27.9	0.26	0.0	4.9	0.00	0.0	4.9	0.00	0.26	N.A.	OK
③	14.9	27.9	0.53	0.0	4.9	0.00	0.0	4.9	0.00	0.53	N.A.	OK
④	6.4	27.9	0.23	0.0	4.9	0.00	0.0	4.9	0.00	0.23	N.A.	OK
⑤	12.2	27.9	0.44	0.0	4.9	0.00	0.0	4.9	0.00	0.44	N.A.	OK
⑥	-0.1	27.9	0.00	0.0	4.9	0.00	0.0	4.9	0.00	N.A.	0.00	OK
⑦	4.3	27.9	0.15	0.0	4.9	0.00	0.0	4.9	0.00	N.A.	0.08	OK
⑧	3.4	27.9	0.12	0.0	4.9	0.00	0.0	4.9	0.00	N.A.	0.06	OK
⑨	9.1	27.9	0.33	0.0	4.9	0.00	0.0	4.9	0.00	0.33	N.A.	OK
⑩	12.5	27.9	0.45	0.0	4.9	0.00	0.0	4.9	0.00	0.45	N.A.	OK
⑪	-1.7	27.9	-0.06	0.0	4.9	0.00	0.0	4.9	0.00	N.A.	-0.03	OK
⑫	1.9	27.9	0.07	0.0	4.9	0.00	0.0	4.9	0.00	N.A.	0.03	OK

ATCO Structures & Logistics 1106 North Temple Dr. Diboll, TX 75941

APPROVED
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AND FIELD INSPECTION



Calculations

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994	City of Puyallup Development Services	AT24050
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School	Building	Planning
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372	Engineering	Public Works
Phone:	(972) 896-5373	Subject :	Modular Building and Foundation Design	Fire	Traffic
Email:	yurianto@modularconsultant.com	Date:	6/10/2024		2 Plex
					Final

Modular Structural Consultants LLC

Project:
Engineer:
Descrip: Column

Page # ____
5/29/2024

ASDIP Steel 5.6.4.1

STEEL COLUMN DESIGN

www.asdipsoft.com

COMPRESSION

Slenderness Ratio $K_x L / r_x$	98.4
Slenderness Ratio $K_y L / r_y$	98.4
Max. Slenderness Ratio	98.4 OK
Limit States	Nominal Pn
Flexural Buckling	46.5 kip ←
Torsional Buckling	N.A. kip
Flexural-Torsional Buckling	N.A. kip
Nominal Strength Pn	46.5 kip
Safety Factor Ω	1.67
Allowable Strength P_n/Ω	27.9 kip
P / P_n/Ω Design Ratio	0.53 OK

BENDING ABOUT Y-Y

Limit States	Nominal Mn
Yielding	8.2 k-ft ←
Lateral-Torsional Buckling	N.A. k-ft
Flange Local Buckling	N.A. k-ft
Web Local Buckling	N.A. k-ft
Nominal Strength Mn	8.2 k-ft
Safety Factor Ω	1.67
Allowable Strength M_n/Ω	4.9 k-ft
M / M_n/Ω Design Ratio	0.00 OK

SEISMIC PROVISIONS

Design Spectral Acc. Sds	0.75
Overstrength Seismic Factor Ω_0	3.00

LOCAL BUCKLING

Flanges in Flexure	Compact
Walls in Compression	Non-slender
Webs in Flexure	Compact

BENDING ABOUT X-X

Moment at 1/4 point of Lb	N.A. k-ft
Moment at 1/2 point of Lb	N.A. k-ft
Moment at 3/4 point of Lb	N.A. k-ft
L. T. Buckling Cb-factor	N.A.

Limit States

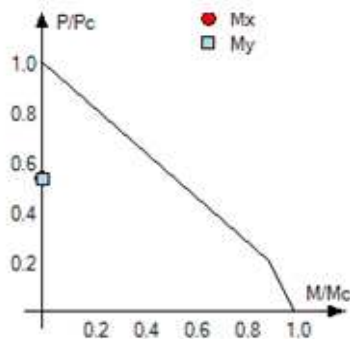
Limit States	Nominal Mn
Yielding	8.2 k-ft ←
Lateral-Torsional Buckling	N.A. k-ft
Flange Local Buckling	N.A. k-ft
Web Local Buckling	N.A. k-ft
Nominal Strength Mn	8.2 k-ft
Safety Factor Ω	1.67
Allowable Strength M_n/Ω	4.9 k-ft
M / M_n/Ω Design Ratio	0.00 OK

COMBINED FORCES

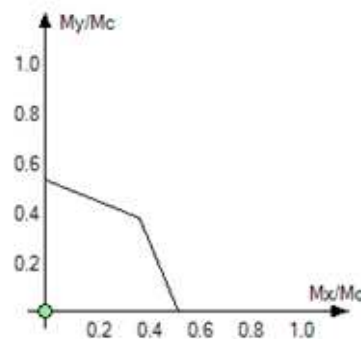
Combined Forces Ratio	0.53 OK
-----------------------------	---------

DESIGN CODES

Steel Design	AISC 360-16
Load Combinations	ASCE 7-10/16



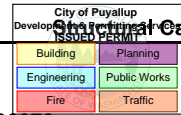
INTERACTION DIAGRAM



BIAXIAL BENDING DIAGRAM

ATCO Structures & Logistics 1106 North Temple Dr. Diboll, TX 75941

APPROVED
10/2/24
SUBJECT TO CODE
AND FIELD INSPECTION



Structural Calculations

AT24050

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372
Phone:	(972) 896-5373	Subject :	Modular Building and Foundation Design
Email:	yurianto@modularconsultant.com	Date:	6/10/2024

FLOOR MATELINE BEAM

Lumber n-ply, S. Pine, No.2, 2x8, 4-ply (6"x7-1/4")

Supports: All - Lumber-soft Sill plate, S. Pine No.2

Total length: 40.13'; Clear span: 6.188', 5.875', 5.875', 5.875', 5.875', 6.188'; Volume = 12.1 cu.ft.

Lateral support: top = 1'-4 bottom = 1'-4 (in); Repetitive factor: applied where permitted (refer to online help);

This section PASSES the design code check.

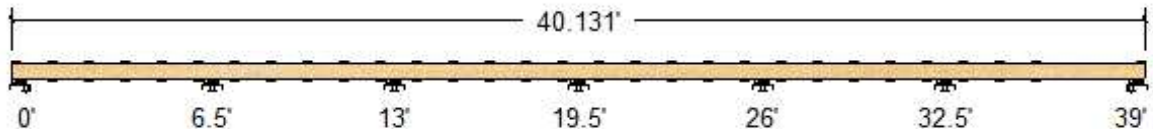
WARNING: Member length exceeds typical stock length of 18.0 ft

Analysis vs. Allowable Stress and Deflection using NDS 2018 :

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	fv = 99	Fv' = 175	psi	fv/Fv' = 0.57
Bending (+)	fb = 867	Fb' = 1052	psi	fb/Fb' = 0.82
Bending (-)	fb = 1047	Fb' = 1052	psi	fb/Fb' = 1.00
Live Defl'n	0.10 = L/806	0.22 = L/360	in	0.45
Total Defl'n	0.10 = L/760	0.32 = L/240	in	0.32

Load	Type	Distribution	Pat-tern	Location [ft]		Magnitude		Unit
				Start	End	Start	End	
Wdead	Dead	Full Area	No			6.00	(6.88')	psf
Wlive	Live	Full Area	Yes			125.00	(6.88')	psf
Self-weight	Dead	Full UDL	No			11.3		plf

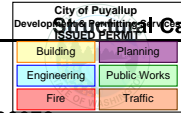
Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in) :



Unfactored:									
Dead	158	388	328	348	328	388	158		
Live	2984	6811	6488	6660	6488	6811	2984		
Factored:									
Uplift		-85	-789	-619	-789	-85			
Total	3142	7198	6817	7008	6817	7198	3142		

ATCO Structures & Logistics 1106 North Temple Dr. Diboll, TX 75941

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12/07/2024
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Structural Calculations

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994	AT24050
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School	
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372	
Phone :	(972) 896-5373	Subject :	Modular Building and Foundation Design	2 Plex
Email :	yurianto@modularconsultant.com	Date :	6/10/2024	Final

SHEAR WALLS

WoodWorks® Shearwalls **SOFTWARE FOR WOOD DESIGN**

WoodWorks® Shearwalls 2023

zShear Walls.wsw

May. 30, 2024 00:45:14

Project Information

DESIGN SETTINGS

Design Code IBC 2021/AWC SDPWS 2021		Wind Standard ASCE 7-16 Directional (All heights)		Seismic Standard ASCE 7-16		
Load Combinations			Building Code Capacity Modification			
For Design (ASD)		For Deflection (Strength)		Wind	Seismic	
0.70 Seismic + 0.60 Dead		1.00 Seismic + 0.90 Dead		1.00	1.00	
0.60 Wind + 0.60 Dead		1.00 Wind + 0.90 Dead				
Duration Factor	Service Conditions and Load Duration		Max Shearwall Offset [ft]			
-	Temperature Range	Moisture Content Fabrication	Plan (within story)	Elevation (between stories)		
	-	19% (<-19%)	0.50	-		
Wood panels		Maximum Height-to-width Ratio			Gypsum	
Blocked	Unblocked	Fiberboard	Lumber	Blocked	Unblocked	
3.5	2.0	-	Wind	-	-	
Ignore shear resistance contribution of...			Forces based on...			
Wall segments		Seismic		Hold-downs	Applied loads	
Side with invalid aspect ratio		Any gypsum, lumber, fiberboard		Drag struts	Applied loads	
Shearwall relative rigidity: Deflection-based stiffness of wall segments						
Non-identical materials and construction on the shearline: Allowed, except for material type						
Deflection Equation: 3-term from SDPWS 4.3-1						
Drift limit for wind design: 1 / 360 story height						
FTAO strap: Continuous at top of highest opening and bottom of lowest						

SITE INFORMATION

Wind ASCE 7-16 Directional (All heights)			Seismic ASCE 7-16 12.8 Equivalent Lateral Force Procedure		
Design Wind Speed	130 mph		Risk Category	Category II - All others	
Serviceability Wind Speed	101 mph		Structure Type	Regular	
Exposure	Exposure C		Building System	Bearing Wall	
Enclosure	Enclosed		Design Category	D	
Min Wind Loads: Walls	16 psf		Site Class	D	
Roofs	8 psf		Spectral Response Acceleration		
Topographic Information [ft]			S1: 0.200g	Ss: 0.300g	
Shape	Height	Length	Fundamental Period	E-W	N-S
-	-	-	T Used	0.113s	0.113s
Site Location: -			Approximate Ta	0.113s	0.113s
Elev: 0ft			Maximum T	0.159s	0.159s
Rigid building - Static analysis			Response Factor R	6.50	6.50
Case 2	E-W loads	N-S loads	Fa: 1.56	Fv: 2.20	
Eccentricity (%)	15	15			
Loaded at	75%				

City of Puyallup Development Services	
Building	Planning
Engineering	Public Works
Fire	Traffic

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372
Phone :	(972) 896-5373	Subject :	Modular Building and Foundation Design
Email :	yurianto@modularconsultant.com	Date :	6/10/2024
			2 Plex
			Final

WoodWorks® Shearwalls zShear Walls.wsw May. 30, 2024 00:45:14

Design Summary

SHEARWALL DESIGN

Wind Shear Loads, Flexible Diaphragm
All shearwalls have sufficient design capacity.

Seismic Loads, Flexible Diaphragm
All shearwalls have sufficient design capacity.

HOLD-DOWN DESIGN

Wind Loads, Flexible Diaphragm
All hold-downs have sufficient design capacity.

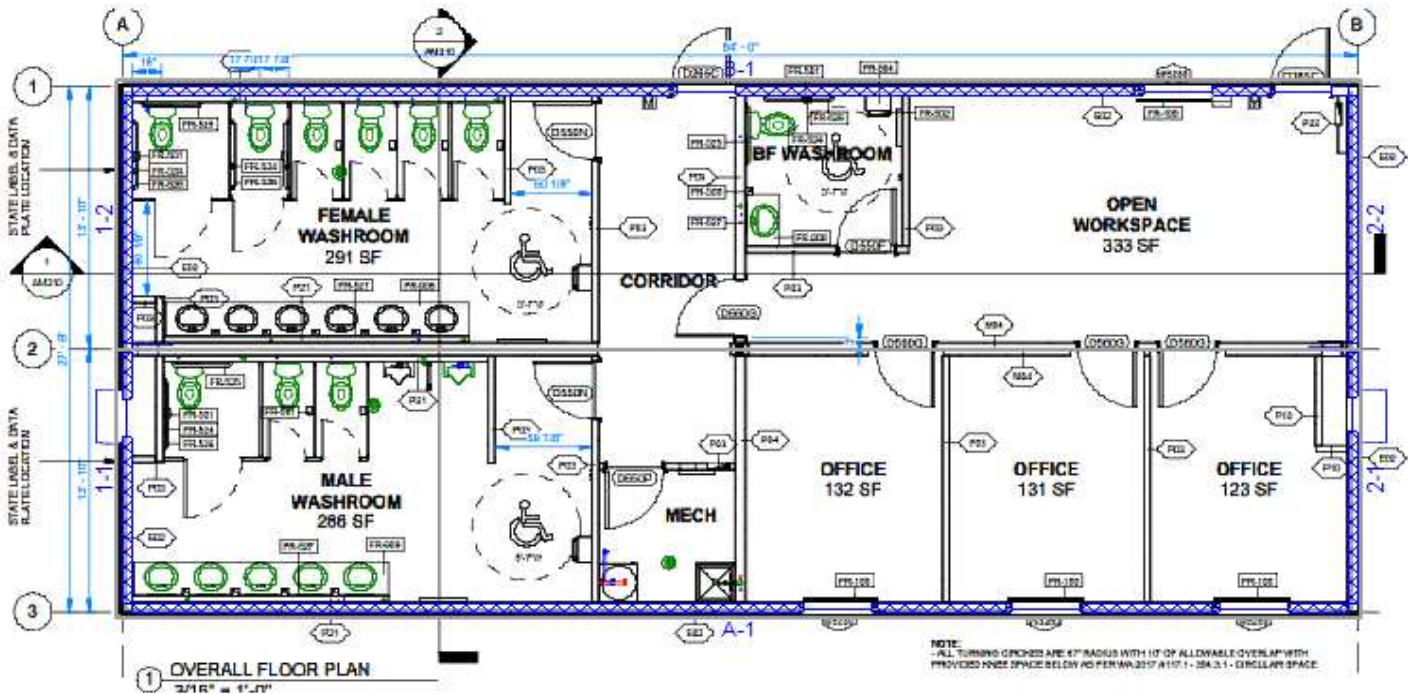
Seismic Loads, Flexible Diaphragm
All hold-downs have sufficient design capacity.

COMPRESSION FORCE DESIGN

Wind Loads, Flexible Diaphragm
Bottom plate has sufficient perpendicular-to-grain compressive capacity under all wall end studs.

Seismic Loads, Flexible Diaphragm
Bottom plate has sufficient perpendicular-to-grain compressive capacity under all wall end studs.

This Design Summary does not include failures that occur due to excessive story drift from ASCE 7 CC.2.2 (wind) or 12.12 (seismic). Refer to Story Drift table in this report to verify this design criterion. Refer to the Deflection table for possible issues regarding fastener slippage (SDPWS Table C4.2.3D).



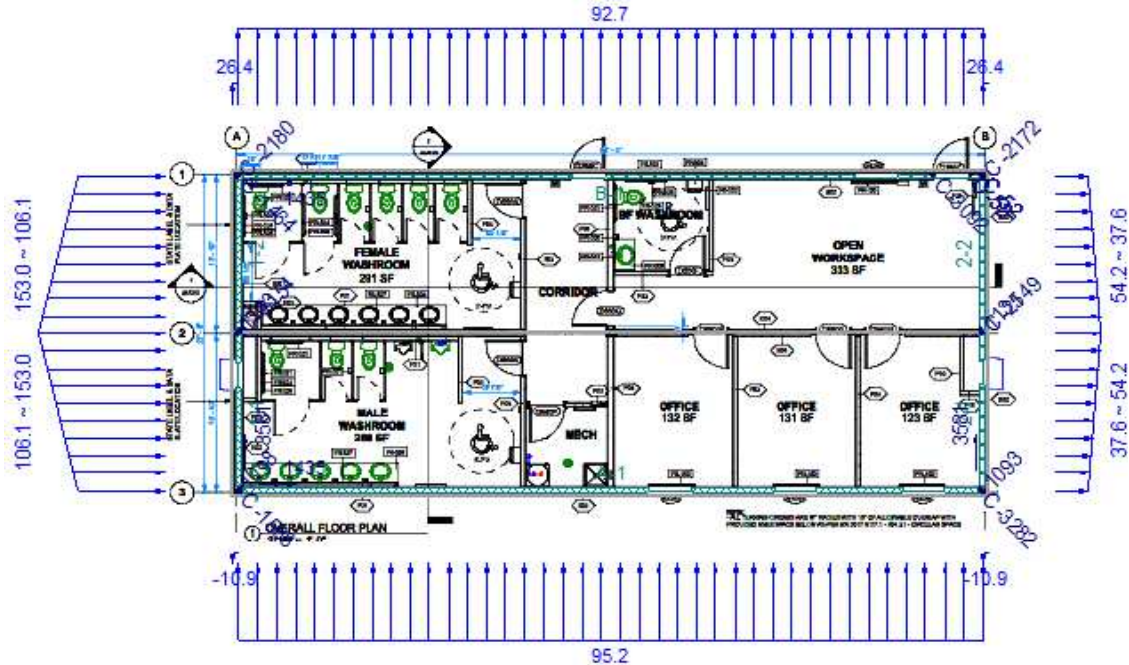
▨ Segmented ▨ Perforated ▨ Force-transfer ▨ Non-shearwall

ATCO Structures & Logistics 1106 North Temple Dr. Diboll, TX 75941

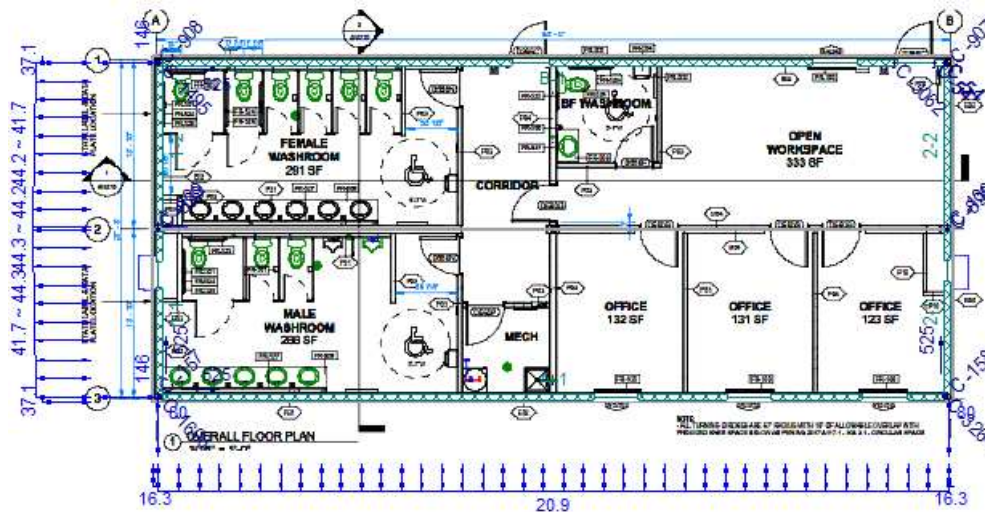
APPROVED
8/10/2024
SUBJECT TO CODE
AND FIELD INSPECTION

City of Puyallup Development Services ISSUE PERMIT		Calculations AT24050
Building	Planning	
Engineering	Public Works	
Fire	Traffic	

Engineer : Yurianto Yurianto, S.E., P.E., M.Sc. Project No : 1107994
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Phone : (972) 896-5373 Subject : Modular Building and Foundation Design 2 Plex
Email : yurianto@modularconsultant.com Date : 6/10/2024 Final



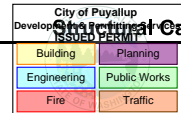
- Factored shearline force (lbs)
 - ▲ Factored holddown force (lbs)
 - C Compression force exists
 - Vertical element required
 - ↑↑↑ Unfactored applied shear load (plf)
 - ⊗ Unfactored dead load (plf,lbs)
 - ⊗ Unfactored uplift wind load (plf,lbs)
 - Applied point load or discontinuous shearline force (lbs)
- Loads: Directional Case 1 Wind (W); Forces: 0.8W + 0.8D; Flexible distribution



- Factored shearline force (lbs)
 - ▲ Factored holddown force (lbs)
 - C Compression force exists
 - Vertical element required
 - ↑↑↑ Unfactored applied shear load (plf)
 - ⊗ Unfactored dead load (plf,lbs)
 - Applied point load or discontinuous shearline force (lbs)
- Loads: Seismic (Qe); Forces: 0.7E + 0.6D; E = pQe + 0.2 Qds D; p(N9) = 1.0; p(EW) = 1.0; Qds = C.1; Flexible distribution

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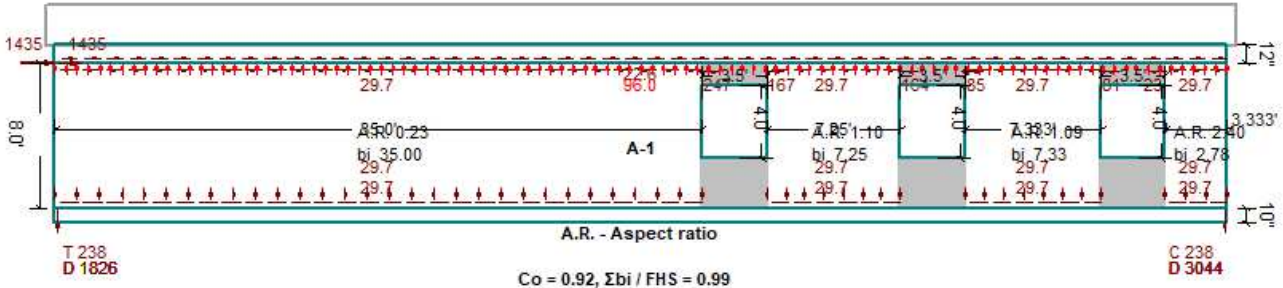


Structural Calculations

AT24050

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372
Phone :	(972) 896-5373	Subject :	Modular Building and Foundation Design
Email :	yurianto@modularconsultant.com	Date :	6/10/2024
			Final

Shearline A, at Y = -27.25 ft, Flexible Diaphragm Wind Design.



All shearwalls, Design group 1:

Exterior surface:
15/32" structural sheathing w/ 8d common nails @ 6"/12"
Shear capacity: 333.6 plf
Frame: S. Pine @ 16", blocked
Critical Segment: A-1:
Design shear force: 27.1 plf
Combined capacity : 333.6 plf
Combined capacity: 200.2 plf (Unblocked)

Factored Forces

- | Vertical | Horizontal |
|--|---|
| <ul style="list-style-type: none"> ↓ Hold-down force (lbs) ↓ Compression force (lbs) ↑↑↑ Anchorage force (t) (plf) T - Tens. overturning (lbs) C - Comp. overturning (lbs) U - Wind uplift (lbs) D - Dead (lbs) t - Anch. from offsets (lbs) | <ul style="list-style-type: none"> → Line/wall force for collector design V (lbs) → Diaphragm-to-collector force V/L (plf) → Anchorage or collector force vmax (plf) → Drag strut force (lbs) → Strap/blocking force (lbs) |
- Factors: T,C,U = 0.6; D = 0.6 (tens), 1.0 (comp)
Combined: T - D + U + t (tens); C + D - U (comp)

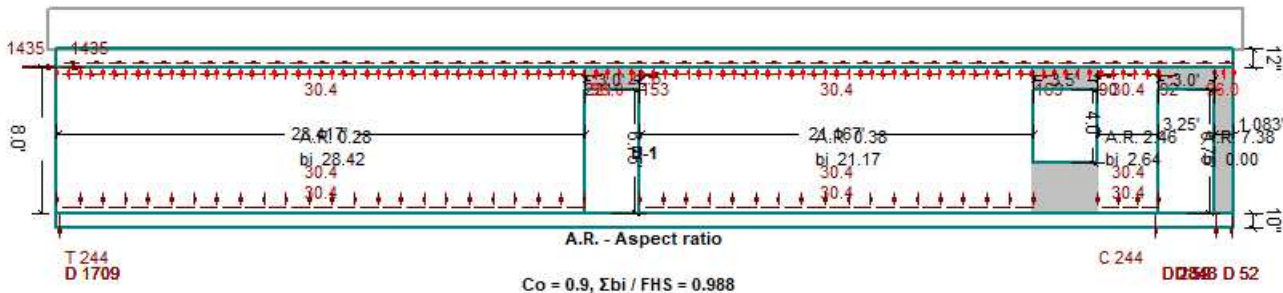
Unfactored Loads

- ↓↓↓ Dead ↑↑↑ Wind uplift

West

East

Shearline B, at Y = 0 ft, Flexible Diaphragm Wind Design.



All shearwalls, Design group 1:

Exterior surface:
15/32" structural sheathing w/ 8d common nails @ 6"/12"
Shear capacity: 325.9 plf
Frame: S. Pine @ 16", blocked
Critical Segment: B-1:
Design shear force: 27.2 plf
Combined capacity : 325.9 plf
Combined capacity: 195.5 plf (Unblocked)

Factored Forces

- | Vertical | Horizontal |
|--|---|
| <ul style="list-style-type: none"> ↓ Hold-down force (lbs) ↓ Compression force (lbs) ↑↑↑ Anchorage force (t) (plf) T - Tens. overturning (lbs) C - Comp. overturning (lbs) U - Wind uplift (lbs) D - Dead (lbs) t - Anch. from offsets (lbs) | <ul style="list-style-type: none"> → Line/wall force for collector design V (lbs) → Diaphragm-to-collector force V/L (plf) → Anchorage or collector force vmax (plf) → Drag strut force (lbs) → Strap/blocking force (lbs) |
- Factors: T,C,U = 0.6; D = 0.6 (tens), 1.0 (comp)
Combined: T - D + U + t (tens); C + D - U (comp)

Unfactored Loads

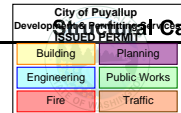
- ↓↓↓ Dead ↑↑↑ Wind uplift

West

East

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Structural Calculations

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994		
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School		AT24050
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372		
Phone:	(972) 896-5373	Subject :	Modular Building and Foundation Design		2 Plex
Email:	yurianto@modularconsultant.com	Date:	6/10/2024		Final

Wall Sheathing Out-of-Plane Capacity

[NDS - SDPWS]

Table 3.2.1 Nominal Uniform Load Capacities (psf) for Wall Sheathing Resisting Out-of-Plane Wind Loads¹

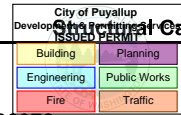
Sheathing Type ⁴	Span Rating or Grade	Minimum Thickness (in.)	Strength Axis ⁵							
			Perpendicular to Supports				Parallel to Supports			
			Maximum Stud Spacing (in.)	Actual Stud Spacing (in.)			Maximum Stud Spacing (in.)	Actual Stud Spacing (in.)		
				12	16	24		12	16	24
			Nominal Uniform Loads (psf)			Nominal Uniform Loads (psf)				
Wood Structural Panels (Sheathing Grades, C-C, C-D, C-C Plugged, OSB) ^{2,3}	24/0	3/8	24	425	240	105	24	90	50	30 ²
	24/16	7/16	24	540	305	135	24	110	60	35 ²
	32/16	15/32	24	625	355	155	24	155	90	45 ²
	40/20	19/32	24	955	505	265	24	255	145	75 ²
	48/24	23/32	24	1160 ³	640 ³	395 ²	24	455 ³	255 ³	115 ³
Particleboard Sheathing (M-S Exterior Glue)		3/8	16	(contact manufacturer)			16	(contact manufacturer)		
		1/2	16	(contact manufacturer)			16	(contact manufacturer)		
Particleboard Panel Siding (M-S Exterior Glue)		5/8	16	(contact manufacturer)			16	(contact manufacturer)		
		3/4	24	(contact manufacturer)			24	(contact manufacturer)		
Hardboard Siding (Direct to Studs)	Lap Siding	7/16	16	460	260	-	-	-	-	-
	Shiplap Edge Panel Siding	7/16	24	460	260	115	24	460	260	115
	Square Edge Panel Siding	7/16	24	460	260	115	24	460	260	115
Cellulosic Fiberboard Sheathing	Regular	1/2	16	90	50	-	16	90	50	-
	Structural	1/2	16	135	75	-	16	135	75	-
	Structural	25/32	16	165	90	-	16	165	90	-

Strength Axis	Perpendicular	to supports
Wood Structural Panels	15/32	in
Actual stud spacing	16	in
Nominal Capacity	355	psf
Safety Factor	1.6	
Allowable Capacity	222	psf ASD Level
Wall C&C Wind load	44.4	psf Strength Level
Load Factor	0.6	
Applied Load	27	psf ASD Level
Utilization Ratio	12%	o.k.

[3.2.1]

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Structural Calculations

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994	AT24050
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School	
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372	
Phone :	(972) 896-5373	Subject :	Modular Building and Foundation Design	2 Plex
Email :	yurianto@modularconsultant.com	Date :	6/10/2024	Final

Roof Sheeting Out-of-Plane Capacity

[NDS - SDPWS]

Table 3.2.2 Nominal Uniform Load Capacities (psf) for Roof Sheeting Resisting Out-of-Plane Wind Loads^{1,2,3}

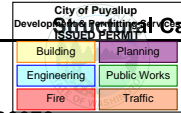
Sheathing Type ⁵	Span Rating or Grade	Minimum Thickness (in.)	Strength Axis ⁷ Applied Perpendicular to Supports						Strength Axis ⁷ Applied Parallel to Supports		
			Rafter/Truss Spacing (in.)						Rafter/Truss Spacing (in.)		
			12	16	19.2	24	32	48	12	16	24
			Nominal Uniform Loads (psf)						Nominal Uniform Loads (psf)		
Wood Structural Panels (Sheathing Grades, C-C, C-D, C-C Plugged, OSB)	24/0	3/8	425	240	165	105	-	-	90	50	30 ³
	24/16	7/16	540	305	210	135	-	-	110	60	35 ³
	32/16	15/32	625	355	245	155	90	-	155	90	45 ³
	40/20	19/32	955	595	415	265	150	-	255	145	75 ³
	48/24	23/32	1160 ³	840 ³	615 ³	395 ³	220 ³	100 ³	455 ³	255 ³	115 ³
Wood Structural Panels (Single Floor Grades, Underlayment, C-C Plugged)	16 o.c.	19/32	705	395	275	175	100	-	170	95	50 ³
	20 o.c.	19/32	815	455	320	205	115	-	235	135	70 ³
	24 o.c.	23/32	1160 ³	670 ³	465 ³	300 ³	170 ³	-	440 ³	250 ³	110 ³
	32 o.c.	7/8	1395 ⁴	1000 ⁴	695 ⁴	445 ⁴	250 ⁴	110 ⁴	1160 ⁴	655 ⁴	290 ⁴
	48 o.c.	1-1/8	1790 ⁴	1295 ⁴	1060 ⁴	805 ⁴	455 ⁴	200 ⁴	1790 ⁴	1145 ⁴	510 ⁴

Strength Axis	Perpendicular	to supports
Wood Structural Panels	15/32 in	
Rafter/Truss Spacing	24	24 in
Nominal Capacity	155	155 psf
Safety Factor	1.6	
Allowable Capacity	97	psf ASD Level
Roof C&C Wind load	105.5	105.5 psf Strength Level
Load Factor	0.6	
Applied Load	63	psf ASD Level
Utilization Ratio	65%	o.k.

[3.2.3]

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Structural Calculations

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	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School		AT24050
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372		
Phone :	(972) 896-5373	Subject :	Modular Building and Foundation Design		2 Plex
Email :	yurianto@modularconsultant.com	Date :	6/10/2024		Final

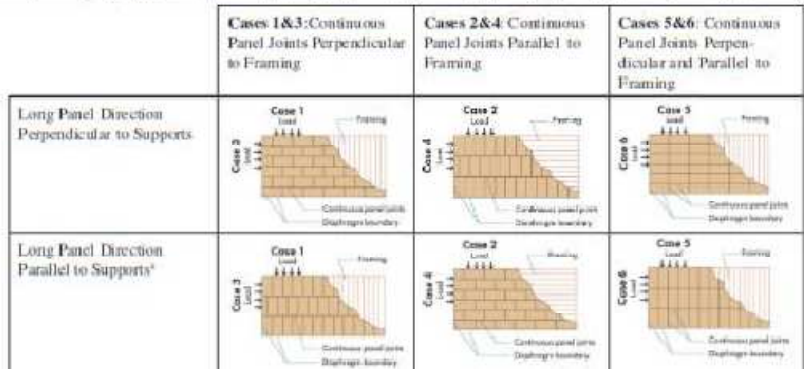
Roof Diaphragm Shear Capacity

Table 4.2C Nominal Unit Shear Capacities for Wood-Frame Diaphragms

Unblocked Wood Structural Panel Diaphragms^{1,2,3,4,5}

Sheathing Grade	Common Nail Size	Minimum Fastener Penetration in Framing (in.)	Minimum Nominal Panel Thickness (in.)	Minimum Nominal Width of Nailed Face at Supported Edges and Boundaries (in.)	A SEISMIC				B WIND			
					6 in. Nail Spacing at diaphragm boundaries and supported panel edges						6 in. Nail Spacing at diaphragm boundaries and supported panel edges	
					Case 1		Cases 2,3,4,5,6				Case 1	Cases 2,3,4,5,6
V_n (plf)	G_n (kips/in.)	V_n (plf)	G_n (kips/in.)		V_n (plf)	V_w (plf)						
Structural I	6d	1-1/4	5/16	2	OSB	PLY	OSB	PLY	460	350		
					330	9.0	7.0	250			6.0	4.5
					370	7.0	6.0	280			4.5	4.0
	480	8.5	7.0	360	6.0	4.5						
	530	7.5	6.0	400	5.0	4.0						
	570	14	10	430	9.5	7.0						
Sheathing and Single-Floor	8d	1-3/8	3/8	2	OSB	PLY	OSB	PLY	670	505		
					330	9.0	7.0	250			6.0	4.5
					370	7.0	6.0	280			4.5	4.0
	480	8.5	7.0	360	6.0	4.5						
	530	7.5	6.0	400	5.0	4.0						
	570	14	10	430	9.5	7.0						
	10d	1-1/2	15/32	2	OSB	PLY	OSB	PLY	740	560		
					330	9.0	7.0	250			6.0	4.5
					370	7.0	6.0	280			4.5	4.0
	480	8.5	7.0	360	6.0	4.5						
	530	7.5	6.0	400	5.0	4.0						
	570	14	10	430	9.5	7.0						

- Nominal unit shear capacities shall be adjusted in accordance with 4.2.3 to determine ASD allowable unit shear capacity and LRFD factored unit resistance. For general construction requirements see 4.2.6. For specific requirements, see 4.2.7.1 for wood structural panel diaphragms. See Appendix A for common nail dimensions.
- For species and grades of framing other than Douglas-Fir-Larch or Southern Pine, reduced nominal unit shear capacities shall be determined by multiplying the tabulated nominal unit shear capacity by the Specific Gravity Adjustment Factor = $[1 - (0.5 \cdot G)]$, where G = Specific Gravity of the framing lumber from the *NDS* (Table 12.3.3A). The Specific Gravity Adjustment Factor shall not be greater than 1.
- Apparent shear stiffness values, G_n , are based on nail slip in framing with moisture content less than or equal to 19% at time of fabrication and panel stiffness values for diaphragms constructed with either OSB or 3-ply plywood panels. When 4-ply or 5-ply plywood panels or composite panels are used, G_n values shall be permitted to be multiplied by 1.2.
- Where moisture content of the framing is greater than 19% at time of fabrication, G_n values shall be multiplied by 0.5.
- Diaphragm resistance depends on the direction of continuous panel joints with respect to the loading direction and direction of framing members, and is independent of the panel orientation.

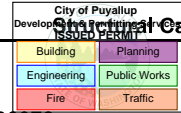


(a) Panel span rating for out-of-plane loads may be lower than the span rating with the long panel direction perpendicular to supports (See Section 3.2.2 and Section 3.2.3)

Unblocked Diaphragm Capacity	670	plf	Strength Level	
Safety Factor	2.0			
Diaphragm Capacity	335	plf	ASD Level	
Applied Load	144	plf	ASD Level (Wind Governs)	[See Shearwall Analysis]
Utilization Ratio	43%	o.k.		

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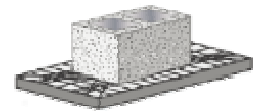
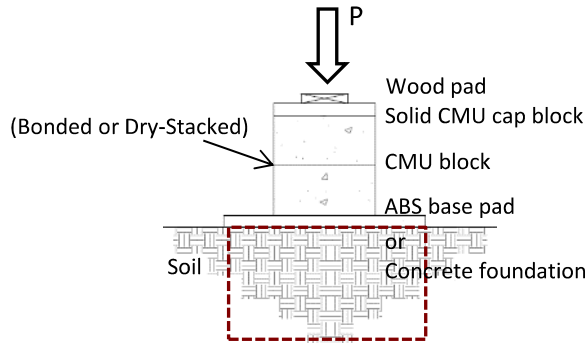
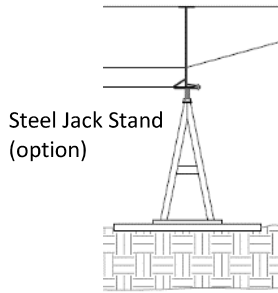
Structural Calculations

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994		
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School		AT24050
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372		
Phone:	(972) 896-5373	Subject :	Modular Building and Foundation Design		2 Plex
Email:	yurianto@modularconsultant.com	Date:	6/10/2024		Final

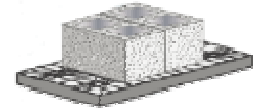
Foundations

[Pier ID] :

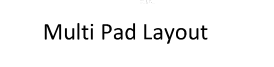
Modular building foundations



Single stack course



Double stack course



Multi Pad Layout

1. Material and Section Properties

Type of Foundations

Option 1. Dry-Stacked Without Mortar Joint

Number of stack course 1

Single wythe width

Single wythe length

$P_a = 8.00$ kips / stack
[Rated 8000 lbs per single]

Single Stack Course

$b_1 = 8$ in

$d_1 = 16$ in

Option 2 Standard Jack Stand

$P_a = 6.00$ kips / stand

Option 3. CMU Bonded with Mortar Joint

CMU cell grout

Net area of CMU block 55.3

Compressive strength

CMU allowable load, $1/4 f_m A_n$

No grout

$A_n = 55.3$ in²

$f_m = 1,350$ psi

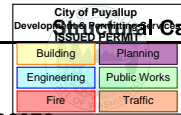
$P_a = 18.68$ kips / stack

Option 4. "Support Master" Jack Stand

$P_a = 18.00$ kips / stand

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	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School	
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Email:	yurianto@modularconsultant.com	Date:	6/10/2024	Final

2. Foundation Loading & Design Checks

→ Location **Typical Foundation**
Spacing **8.00** ft on center spacing

Applied Load P = **5.47** kips

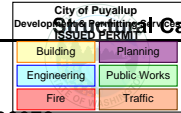
Type of Pier **Dry-Stacked Without Mortar Joint**
Allowable Load **8.00** kips / stack
Quantity **1** stacks (or stands)
Total Allowable Load $P_{a\text{ CMU}} = 8.00$ kips
Capacity ratio $(P / P_a) = 0.683 < 1.0$
Design check **O.K.**

Base Type **Single ABS Pad 24"x24"**
Base Shape Rectangular **Rectangular**
Width (or Diameter) 24 $b_2 = 24.0$ in
Length 24 $d_2 = 24.0$ in
Depth 1 **1.0** in
Area $A_b = 576$ in² = **4.00** ft²
Base Weight $B_w = 0$ kips
Allowable soil bearing capacity $q_a = 2,000$ psf
Net Soil allowable load, $q_a A_b - B_w$ $P_{a\text{ Soil}} = 8.00$ kips
Soil capacity ratio $(P / P_a) = 0.683 < 1.0$
Design check **O.K.**

→ Location **Interior Stud Pack / Column**
Applied Load P = **29.60** kips

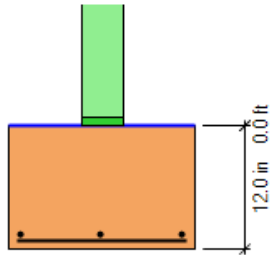
Type of Pier **Dry-Stacked Without Mortar Joint**
Allowable Load **8.00** kips / stack
Quantity **2** stacks (or stands)
Total Allowable Load $P_{a\text{ CMU}} = 16.00$ kips per set

Base Type **Multi ABS Pad 24"x48"** Pyramid Config. 2-24x24 at bottom, 1-24x24 on top
Base Shape Rectangular **Rectangular**
Width (or Diameter) 24 $b_2 = 24.0$ in
Length 48 $d_2 = 48.0$ in
Depth 2 **2.0** in
Area $A_b = 1,152$ in² = **8.00** ft²
Base Weight $B_w = 0$ kips
Allowable soil bearing capacity $q_a = 2,000$ psf
Net Soil allowable load, $q_a A_b - B_w$ $P_{a\text{ Soil}} = 16.00$ kips per set
Capacity per set of Pier & Base $\text{Min. } P_{a\text{ CMU}}, P_{a\text{ Soil}} = 16.00$ kips
Number of Set **2**
Total Capacity $P_a = 32.00$ kips
Capacity ratio $(P / P_a) = 0.925 < 1.0$
Design check **O.K.**

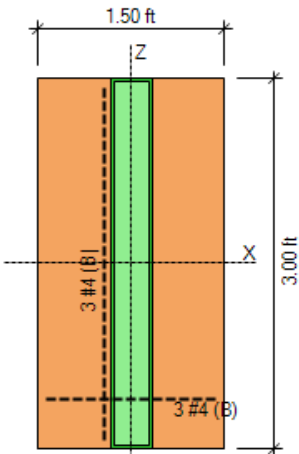


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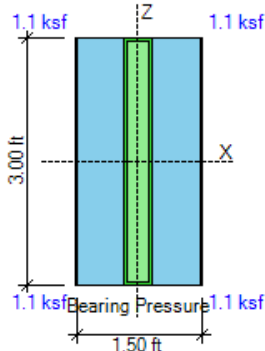
2. Poni Wall Foundation Loading & Design Checks



ELEVATION



PLAN



SOIL BEARING PRESSURES

Allow. Bearing Pressure	2.0	ksf	
Max. Bearing Pressure	1.1	ksf	✓
Area in Contact with Soil	100.0	%	
X-eccentricity / Ftg. Length	0.00	< 0.50	✓
Z-eccentricity / Ftg. Width	0.00	< 0.50	✓

BEARING PRESSURES ARE OK

LOAD TRANSFER

Column Bearing Strength Ratio	N.A.	
Footing Bearing Strength Ratio	0.02	✓
Shear Friction Strength Ratio	N.A.	
Min. Column Steel Area Ratio	N.A.	
Dev. Length Ratio at Column	N.A.	
Dev. Length Ratio at Footing	N.A.	

LOAD TRANSFER IS OK

Service		Factored	
Axial Force P	4.3	kip	
Moment about X Mx	0.0	k-ft	
Moment about Z Mz	0.0	k-ft	
Shear Force Vx	0.0	kip	
Shear Force Vz	0.0	kip	

STABILITY CHECK

Overturning Safety Factor	37.31	> 1.50	✓
Sliding Safety Factor	20.98	> 1.50	✓
Uplift Safety Factor	99.99	> 1.00	✓

STABILITY CHECK IS OK

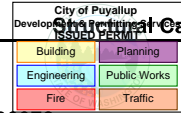
SHEAR DESIGN

	Vu	φVn	Ratio	
One-way (kip)	0.0	23.6	0.00	✓
Punching (psi)	4.3	94.4	0.05	✓

REINFORCEMENT DESIGN

- Top Bars	Mu	φMn	Ratio	
X-Bars (k-ft)	0.0	10.8	0.00	✓
Z-Bars (k-ft)	0.0	5.4	0.00	✓
X-Bars Develop. Length Ratio			N.A.	
Z-Bars Develop. Length Ratio			N.A.	
Min. Top Steel Area Ratio			N.A.	
Max. Top Bars Spacing Ratio			N.A.	

- Bottom Bars	Mu	φMn	Ratio	
X-Bars (k-ft)	0.8	17.4	0.04	✓
Z-Bars (k-ft)	0.1	21.0	0.00	✓

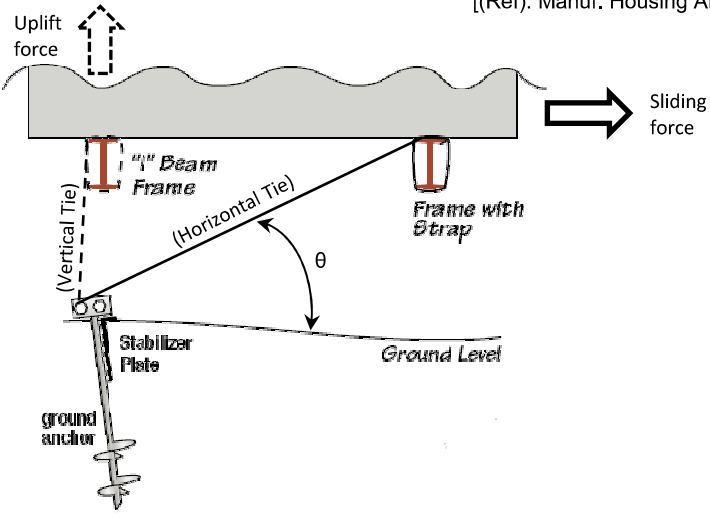
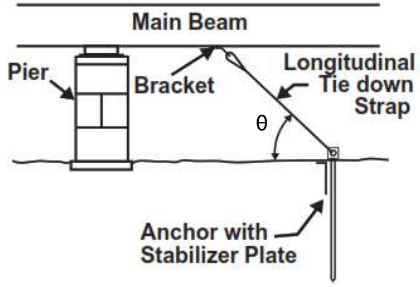


Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372
Phone :	(972) 896-5373	Subject :	Modular Building and Foundation Design
Email :	yurianto@modularconsultant.com	Date :	6/10/2024
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			Final

TIE DOWN ANCHOR

[(Ref): Manuf. Housing Anchor Installation Info.]

Longitudinal Frame Tie To Anchor

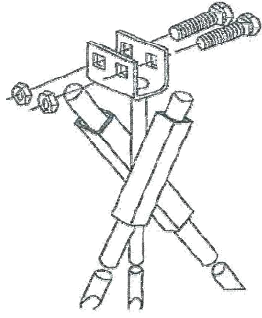
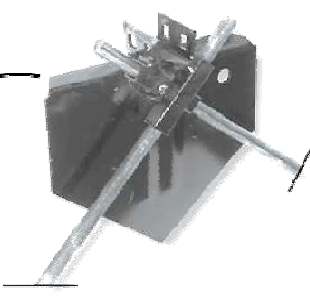
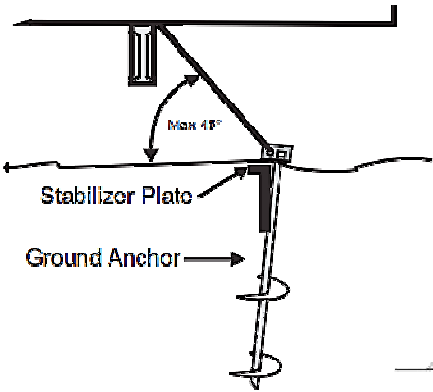


1. Anchor Allowable Working Load Limit (WLL)

Selected Ground Anchor Type
Tie Anchor WLL 3150
Horizontal Tie Angle
Horizontal Resistant, $T_{WLL} \cos \theta$
Minimum tie anchor spacing

Earth Auger w Stabilizer Plate
 $T_{WLL} = 3150$ lbs
 $\theta = 45.0$ degrees
 $H_{WLL} = 2227$ lbs
 $s = 6.00$ ft

Ground Anchor Type Options	Working Load
Earth Auger w Stabilizer Plate	3150 lb
X-plate Anchor Cross Drive	2200 lb
Cross Drive Asphalt Anchor	1800 lb
Concrete Anchor	3150 lb



Hilti KBTZ2 - 1/2"dia x 4-1-2"
3.25" min. anchor embed.
Concrete 6" thick, 3.0 ksi min.

Earth Auger w Stabilizer Plate
[Selected Anchor Type]

X-plate Anchor Cross Drive
Not Selected / Applicable

Cross Drive Asphalt Anchor
Not Selected / Applicable

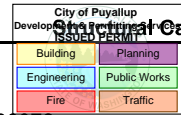
Concrete Anchor
Not Selected / Applicable

2. Building Parameter

Building span	27.67	L =	27.67	ft
Building length	64.00	B =	64.00	ft
Building height	13.75	H =	13.75	ft
Building perimeter	183.33	P =	183.3	ft
Total Roof Projected Area	1771	A_{roof} =	1771	SF
Total Wall Area	2521	A_{wall} =	2521	SF
Total Floor Area	1771	A_{floor} =	1771	SF
Transverse Wind Projected Area	880	A_{transv} =	880	SF
Longitudinal Wind Projected Area	380	A_{longit} =	380	SF

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Structural Calculations

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	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School	
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3. Building Forces

Roof weight	12.00	$W_{roof} =$	12.0	psf	Total =	21248	lb
Wall Weight	12.00	$W_{wall} =$	12.0	psf	Total =	30250	lb
Floor Weight	12.00	$W_{floor} =$	12.0	psf	Total =	21248	lb
Estimated Total Building Weight		$W_{building} =$	72747	lb			
ASD							
Total Wind Pressure	34.5	$0.6 w =$	20.7	psf	$w =$	34.5	psf
Total Transverse Wind Force	18213	$W_{transv} =$	18213	lb	Governs!		
Total Longitudinal Wind Force	7874	$W_{transv} =$	7874	lb	Governs!		
LRFD							
Seismic Force ASD (0.7 E) LRFD ($C_s \Omega_0$)							
Transverse Seismic Coefficient	0.048	$C_{S transv} =$	0.034	g	0.048	g	0.144 g
Longitudinal Seismic Coefficient	0.048	$C_{S longt} =$	0.034	g	0.048	g	0.144 g
Total Transverse Seismic Force	2444	$F_p transv =$	2444	lb	.		
Total Longitudinal Seismic Force	2444	$F_p longt =$	2444	lb	.		

Ground friction resistance (Skid Frame Only) 0 $F_{friction} =$ 0 lb **Does Not Apply** Not a Skid Frame

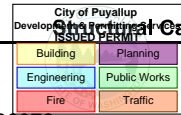
A. Transverse direction							
ASD							
Total Sliding force	18213	$H_{A trans} =$	18213	lb	→	Wind Governs!	Seismic LRFD 3492 lb
Total Uplift force		$V_{A trans} =$	0	lb			Seismic ($C_s \Omega_0$) W_p 10476 lb
B. Longitudinal direction							
Total Sliding force	7874	$H_{A longt} =$	7874	lb	→	Wind Governs!	Seismic LRFD 3492 lb
Total Uplift force		$V_{A longt} =$	0	lb			Seismic ($C_s \Omega_0$) W_p 10476 lb

4. Building Frame Tie Down

A. Transverse direction							
64.00 B = 64.00 ft							
1) Number of horizontal ties	9	$N_{horz tie} =$	9		B / N =	7.11	ft o.c.
Sliding force, $H_{A trans} / N_{horz tie}$		$H_{1 trans} =$	2024	lbs / tie			
Horz. tie capacity ratio		$H_{1 trans} / H_{WLL} =$	0.909	< 1.00. O.K.			
2) Number of vertical ties							
0 $N_{vert tie} =$ 0 No vertical tie is required!							
Uplift force, $V_{A trans} / N_{vert tie}$		$V_{1 trans} =$	0	lbs / tie			
Vert. tie capacity ratio		$V_{1 trans} / T_{WLL} =$	0.000	< 1.00. O.K.			
Seismic Anchor Force, ($C_s \Omega_0$) W_p		Shear =	1164	lb	Uplift =	1164	lb
Applicable for anchor on concrete slab							
B. Longitudinal direction							
27.67 L = 27.67 ft							
1) Number of horizontal ties	4	$N_{horz tie} =$	4		L / N =	6.92	ft o.c.
Sliding force, $H_{A trans} / N_{horz tie}$		$H_{1 longt} =$	1968	lbs / tie			
Horz. tie capacity ratio		$H_{1 longt} / H_{WLL} =$	0.884	< 1.00. O.K.			
2) Number of vertical ties							
0 $N_{vert tie} =$ 0 No vertical tie is required!							
Uplift force, $V_{A trans} / N_{vert tie}$		$V_{1 longt} =$	0	lbs / tie			
Vert. tie capacity ratio		$V_{1 longt} / T_{WLL} =$	0.000	< 1.00. O.K.			
Seismic Anchor Force, ($C_s \Omega_0$) W_p		Shear =	2619	lb	Uplift =	2619	lb
Applicable for anchor on concrete slab							

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Structural Calculations

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994	AT24050
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School	
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372	
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Email:	yurianto@modularconsultant.com	Date:	6/10/2024	Final

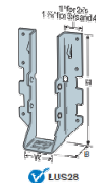
CONNECTORS, STRAPS AND TIES

→	Member ID :	Uplift tiedown
	Connector Type	1.5" metal strap, 30 gage min, with 51 ksi with 16ga staples or 6d nails
	Strap tensile strength	$F_y = 51$ ksi
	Strap thickness	$t_s = 0.0157$ inches
	Strap width	$b_s = 1.50$ inches
	Strap capacity	$P_{strap} = (0.9) 0.6 F_y t_s b_s$ (w 10% reduction for staple holes)
		$P_{strap} = 649$ lb
	Staple shear resistant	$V_{staple} = 68$ lb per staple or nail
	Number of staple	$n_{staple} = 6$ staples or nails at each end of strap
	Load duration factor	$C_D = 1.60$
	Staple capacity	$P_{staple} = V_{staple} n_{staple} C_D$
		$P_{staple} = 653$ lb per strap
	Uplift Capacity	649 lb / strap
	Number of straps	1 strap(s)
	Allowable uplift force	$P_{allow} = 649$ lb

		Tiedown - Rafter to Wall
	Applied uplift force	$P_{applied} = 372$ lb / rafter
	Rafter spacing	24.0 24 inches o.c.
	Strap spacing	32 inches o.c.
	Applied uplift force	$P_{applied} = 496$ lb / strap
	Capacity ratio	$P_{applied} / P_{allow} = 0.76 < 1.00$ O.K.

		Tiedown - Wall to Floor Rim
	Aproximate Wall Weight	120 lb per ft
	Wall Stud Spacing	16.0 16 inches o.c.
	Applied uplift force	$P_{applied} = 88$ lb / stud
	Strap spacing	48 inches o.c.
	Applied uplift force	$P_{applied} = 264$ lb / strap
	Capacity ratio	$P_{applied} / P_{allow} = 0.41 < 1.00$ O.K.

→	Member ID :	Rafter Hanger
	Connector Type	LU210 DF/SP
	Allowable uplift force	850 $P_{allow} = 850$ lb
	Applied uplift force	$P_{applied} = 372$ lb
	Capacity ratio	$P_{applied} / P_{allow} = 0.44 < 1.00$ O.K.
	Allowable bearing force	1580 $P_{allow} = 1,580$ lb
	Applied bearing force	$P_{applied} = 768$ lb
	Capacity ratio	$P_{applied} / P_{allow} = 0.49 < 1.00$ O.K.



[C-C-2019, page 104]

→	Member ID :	Shear wall tie-down (End Wall)
	Connector Type	MSTC28 DF/SP
	Allowable uplift force	3460 $P_{allow} = 3,460$ lb
	Number of straps	1 strap(s)
	Allowable uplift force	$P_{allow} = 3,460$ lb
	Applied uplift force	$P_{applied} = 1,554$ lb
	Capacity ratio	$P_{applied} / P_{allow} = 0.45 < 1.00$ O.K.

[C-C-2019, page 271]

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City of Puyallup
Development Services
Engineering
Public Works
Fire
Traffic

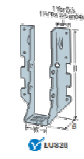
Final Calculations
AT24050

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372
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Email :	yurianto@modularconsultant.com	Date :	6/10/2024
			2 Plex
			Final

→ **Member ID :** Shear wall tie-down (Side Wall)
Connector Type MSTC28 DF/SP [C-C-2019, page 271]
 Allowable uplift force 3460 $P_{allow} = 3,460$ lb
 Number of straps 1 strap(s)
 Allowable uplift force $P_{allow} = 3,460$ lb
 Applied uplift force $P_{applied} = 244$ lb
 Capacity ratio $P_{applied} / P_{allow} = 0.07 < 1.00$. O.K.

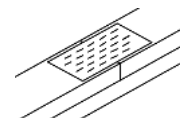
→ **Member ID :** Column tie-down
Connector Type MSTC28 DF/SP [C-C-2019, page 271]
 Allowable uplift force 3460 $P_{allow} = 3,460$ lb
 Number of straps 1 strap(s)
 Allowable uplift force $P_{allow} = 3,460$ lb
 Applied uplift force $P_{applied} = 1,713$ lb
 Capacity ratio $P_{applied} / P_{allow} = 0.50 < 1.00$. O.K.

→ **Member ID :** Floor Joist Hanger
Connector Type LU210 DF/SP [C-C-2019, page 104]
 Allowable bearing force 1390 $P_{allow} = 1,390$ lb
 Applied bearing force $P_{applied} = 832$ lb
 Capacity ratio $P_{applied} / P_{allow} = 0.60 < 1.00$. O.K.



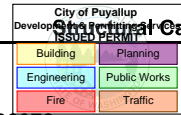
→ **Member ID :** Frame Outrigger to Floor Framing
Connector Type 5/16" x 3-1/2" lag screws
Connector Capacity $W' = W C_D C_M C_t$ [NDS Table 11.3.1]
Ref. Design Value $W = 307$ lb / in (G = 0.55) [NDS Table 12.2A]
Effective Thread Length T-E = 1.88 in [NDS Table L2]
Design Load Type Wind/Earthquake Load
Load duration factor $C_D = 1.60$
Wet Service factor $C_M = 1.00$
Temperature factor $C_t = 1.00$
Connector Uplift Capacity $W' = 921$ lb / lag screw
Number of Connector 2 lag screw(s)
 Allowable uplift force $P_{allow} = 1,842$ lb
 Applied uplift force 372 $P_{applied} = 372$ lb / stud
 Stud spacing 16 16 inches o.c.
 Lag Screw spacing 48 inches o.c.
 Applied uplift force $P_{applied} = 1,116$ lb / stud
 Capacity ratio $P_{applied} / P_{allow} = 0.61 < 1.00$. O.K.

→ **Member ID :** Splice Connector Top Plate
Connector Type Galvanized Steel Connector Plate 20-GA (Eagle Metal-E20 Structural Connector or Equal) [ESR-1082]
 Number of plate 1 plate(s)
 Zero deg tension 836 lb / in / pr [Table 2]
 Plate width 5.0 inches
 Allowable tension force $P_{allow} = 4,180$ lb
 Applied shear force 144 plf
 Total Applied Tension force $P_{applied} = 1,152$ lb per 8ft lumber joint
 Capacity ratio $P_{applied} / P_{allow} = 0.28 < 1.00$. O.K.



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	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School	
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→ **Member ID :** **Double top Plate Splice**

Connector Type 0.135"dia. x 3" nail at 8" o.c. along 8ft member

Connector Capacity $Z' = Z C_D C_M C_t$ [NDS Table 11.3.1]

Ref. Design Value $Z = 115$ lb (G = 0.55) [NDS Table 12S]

Lag screw penetration 8d min

Design Load Type Wind/Earthquake Load

Load duration factor $C_D = 1.60$

Wet Service factor $C_M = 1.00$

Temperature factor $C_t = 1.00$

Connector Shear Capacity $Z' = 184$ lb / nail

Total number of Connector **12** Nails 96" / 8" o.c.

Allowable shear force $P_{allow} = 2,208$ lb

Applied shear force **144** plf

Total Applied Tension force $P_{applied} = 1,152$ lb per 8ft lumber joint

Capacity ratio $P_{applied} / P_{allow} = 0.52 < 1.00$. O.K.

→ **Member ID :** **End Walls** **Frame End Rail to Floor Framing**

Connector Type 5/16" or 3/8" dia. x 3-1/2" lag screw

Connector Capacity $Z' = Z C_D C_M C_t$ [NDS Table 11.3.1]

Ref. Design Value $Z = 270$ lb [NDS Table 12.K]

Lag screw penetration 8d min

Design Load Type Wind/Earthquake Load

Load duration factor $C_D = 1.60$

Wet Service factor $C_M = 1.00$

Temperature factor $C_t = 1.00$

Connector Shear Capacity $Z' = 432$ lb / lag screw

Total number of Connector **5** lag screw(s) Equally spaced.

Allowable shear force $P_{allow} = 2,160$ lb

Applied shear force $P_{applied} = 2,011$ lb

Capacity ratio $P_{applied} / P_{allow} = 0.93 < 1.00$. O.K.

→ **Member ID :** **Side Walls** **Frame Outrigger to Floor Framing**

Connector Type 5/16" or 3/8" dia. x 3-1/2" lag screw

Connector Capacity $Z' = Z C_D C_M C_t$ [NDS Table 11.3.1]

Ref. Design Value $Z = 270$ lb [NDS Table 12.K]

Lag screw penetration 8d min

Design Load Type Wind/Earthquake Load

Load duration factor $C_D = 1.60$

Wet Service factor $C_M = 1.00$

Temperature factor $C_t = 1.00$

Connector Shear Capacity $Z' = 432$ lb / lag screw

Number of Connector **1** lag screw(s)

Allowable shear force $P_{allow} = 432$ lb

Applied shear force $P_{applied} = 96$ plf

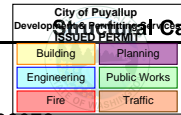
Lag Screw spacing **48** inches o.c.

Applied shear force $P_{applied} = 384$ lb

Capacity ratio $P_{applied} / P_{allow} = 0.89 < 1.00$. O.K.

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	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School	
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Wall Sheathing Nail(Staple) Withdrawal

[NDS]

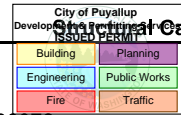
Plywood sheathing thickness	0.5	$t_{ply} = 1/2$ inches	
Nail(Staple) size		10d (3"x0.148")	
Nail(Staple) diameter	0.148	D = 0.148 inches	
Nail(Staple) length	3.00	L = 3.00 inches	
Nail(Staple) minimum penetration	1.50	1.50 inches	
Nail(Staple) penetration, L Nail(Staple) - tply		p = 2.50 inches	
Rafter wood species		Southern Pine	
Wood specific gravity		G = 0.55	[Table 11.3.2A.]
Nail(Staple) withdrawal ref. design value	46	W = 1380 G ^{5/2} D	[11.2.3.]
	46	W = 46 lbs per Nail(Staple), per inch penetration	
Load duration factor		C _D = 1.60 (D = 0.9, L = 1.0, S or L _r = 1.15, W or E = 1.6)	
Wet service factor		C _M = 1.00 (M.C. Fabrication = M.C. Service)	[Table 10.3.3.]
Temperature factor		C _t = 1.00	[Table 10.3.4.]
Nail(Staple) withdrawal adj'd design value		W' = W C _D C _M C _t	[Table 10.3.1.]
		W' = 73.6 lbs per Nail(Staple), per inch penetration	
Withdrawal capacity per Nail(Staple), W' p		P _{allow} = 184 lbs per Nail(Staple)	

Zone 5	[Connection ID] :	End Zone of wall - Wind uplift
Wind uplift pressure	44.4	q = 44.4 psf
Wind load factor		0.60
Members spacing	16	S _{member} = 16 inches o.c.
Nail(Staple)s spacing		L = 12 inches o.c.
Sheathing wind uplift area per Nail(Staple)		A = 1.33 ft ² / Nail(Staple)
Nail(Staple) withdrawal force, A q		P _{applied} = 36 lbs / Nail(Staple)
Capacity ratio		P _{applied} / P _{allow} = 0.193 < 1.00. O.K.

Zone 4.	[Connection ID] :	Interior Zone of wall - Wind Uplift
Wind uplift pressure	36.0	q = 36.0 psf
Wind load factor		0.60
Members spacing		S _{member} = 16 inches o.c.
Nail(Staple)s spacing		L = 12 inches o.c.
Sheathing wind uplift area per Nail(Staple)		A = 1.33 ft ² / Nail(Staple)
Nail(Staple) withdrawal force, A q		P _{applied} = 29 lbs / Nail(Staple)
Capacity ratio		P _{applied} / P _{allow} = 0.156 < 1.00. O.K.

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Roof Sheathing Nail(Staple) Withdrawal

[NDS]

Plywood sheathing thickness	0.5	$t_{ply} = 1/2$ inches	
Nail(Staple) size		8d (2-1/2"x0.131")	
Nail(Staple) diameter	0.131	D = 0.131 inches	
Nail(Staple) length	2.50	L = 2.50 inches	
Nail(Staple) minimum penetration	1.38	1.38 inches	
Nail(Staple) penetration, L Nail(Staple) - tply		p = 2.00 inches	
Rafter wood species		Southern Pine	
Wood specific gravity		G = 0.55	[Table 11.3.2A.]
Nail(Staple) withdrawal ref. design value	41	W = 1380 G ^{5/2} D	[11.2.3.]
	41	W = 41 lbs per Nail(Staple), per inch penetration	
Load duration factor		C _D = 1.60 (D = 0.9, L = 1.0, S or L _r = 1.15, W or E = 1.6)	
Wet service factor		C _M = 1.00 (M.C. Fabrication = M.C. Service)	[Table 10.3.3.]
Temperature factor		C _t = 1.00	[Table 10.3.4.]
Nail(Staple) withdrawal adj'd design value		W' = W C _D C _M C _t	[Table 10.3.1.]
		W' = 65.6 lbs per Nail(Staple), per inch penetration	
Withdrawal capacity per Nail(Staple), W' p		P _{allow} = 131 lbs per Nail(Staple)	

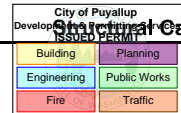
Zone 3.	[Connection ID] :	Corners of roof sheathing to rafter due to wind uplift
Wind uplift pressure	105.5	q = 105.5 psf
Wind load factor		0.60
Members spacing	24	S _{member} = 24 inches o.c.
Nail(Staple)s spacing		L = 12 inches o.c.
Sheathing wind uplift area per Nail(Staple)		A = 2.00 ft ² / Nail(Staple)
Nail(Staple) withdrawal force, A q		P _{applied} = 127 lbs / Nail(Staple)
Capacity ratio		P _{applied} / P _{allow} = 0.965 < 1.00. O.K.

Zone 2.	[Connection ID] :	Edges of roof sheathing to rafter due to wind uplift
Wind uplift pressure	77.4	q = 77.4 psf
Wind load factor		0.60
Members spacing		S _{member} = 24 inches o.c.
Nail(Staple)s spacing		L = 12 inches o.c.
Sheathing wind uplift area per Nail(Staple)		A = 2.00 ft ² / Nail(Staple)
Nail(Staple) withdrawal force, A q		P _{applied} = 93 lbs / Nail(Staple)
Capacity ratio		P _{applied} / P _{allow} = 0.708 < 1.00. O.K.

Zone 1.	[Connection ID] :	Middle of roof sheathing to rafter due to wind uplift
Wind uplift pressure	58.7	q = 58.7 psf
Wind load factor		0.60
Members spacing		S _{member} = 24 inches o.c.
Nail(Staple)s spacing		L = 12 inches o.c.
Sheathing wind uplift area per Nail(Staple)		A = 2.00 ft ² / Nail(Staple)
Nail(Staple) withdrawal force, A q		P _{applied} = 70 lbs / Nail(Staple)
Capacity ratio		P _{applied} / P _{allow} = 0.537 < 1.00. O.K.

ATCO Structures & Logistics 1106 North Temple Dr. Diboll, TX 75941

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Calculations

Engineer :	Yurianto Yurianto, S.E., P.E., M.Sc.	Project No :	1107994	AT24050
	S.E. in State of IL, MA, NV, HI, OK, AZ.	Project Name :	Cascade Christian School	
Address :	5760 Legacy Dr. B3-333. Plano, TX 75024	Location :	815 21st St SE Puyallup WA 98372	
Phone:	(972) 896-5373	Subject :	Modular Building and Foundation Design	2 Plex
Email:	yurianto@modularconsultant.com	Date:	6/10/2024	Final

Wood-Frame Diaphragms Deflection Check

4.2.2. Deflection

$$\delta_{dia} = \frac{5vL^3}{8EA_W} + \frac{0.25vL}{1000G_a} + \frac{\sum x\Delta_c}{2W} \quad (4.2-1)$$

where:

E = modulus of elasticity of diaphragm chords, psi	E = 1400 ksi	Chord	A (in ²)
A = area of chord cross-section, in. ²	(1) 2x6 Chord A = 8.25 in ²	2x6	8.25
G _a = apparent diaphragm shear stiffness from nail slip and panel shear deformation, kips/in. (from Column A, Tables 4.2A, 4.2B, 4.2C, or 4.2D)	G _a = 8.5 kips/in	2x8	10.88
L = diaphragm length, ft	L = 64.0 ft	2x10	13.88
v = induced unit shear in diaphragm, lbs/ft	v = 144 plf	2x12	22.50
W = diaphragm width, ft	W = 27.7 ft		
x = distance from chord splice to nearest sup- port, ft	x = 32.0 ft		
Δ _c = diaphragm chord splice slip, in., at the in- duced unit shear in diaphragm	Δ _c = 0.25 in		
δ _{dia} = maximum mid-span diaphragm deflection determined by elastic analysis, in.	δ _{dia} = 0.074 in + 0.271 in + 0.145 in = 0.489 in		
Allowable deflection limit	L / 360 = 2.13 in		



WoodWorks
SOFTWARE FOR WOOD DESIGN

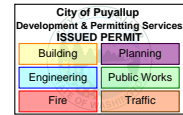
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COMPANY

July 3, 2024 09:50

PROJECT

Beam - 2 Span 32-32 - LVL.wwb

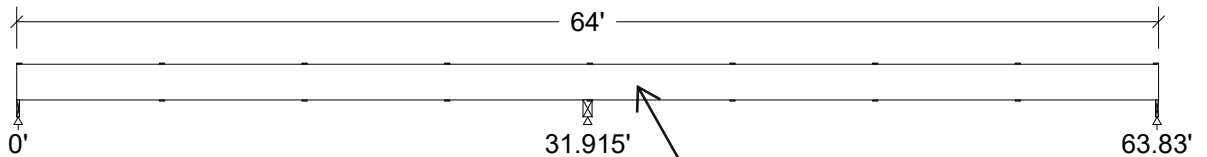


Design Check Calculation Sheet
WoodWorks Sizer 2023

Loads:

Load	Type	Distribution	Pat-tern	Location [ft]		Magnitude		Unit
				Start	End	Start	End	
Wdead	Dead	Full Area	No			12.00	(6.92')	psf
Wsnow	Snow	Full Area	Yes			40.00	(6.92')	psf
Splice 1	Pt of Interest			24.00				lbs
Splice 2	Pt of Interest			40.00				lbs
Wwind MRFRS	Wind	Full Area	No			-24.50	(6.92')	psf
Wrooflive	Roof live	Full Area	Yes			12.00	(6.92')	psf
Self-weight	Dead	Full UDL	No			24.2		plf

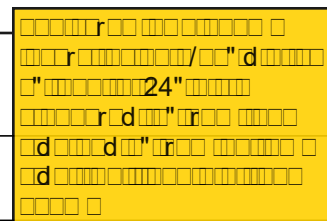
Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in) :



Unfactored:					
Dead	1299		4263		1299
Snow	3628		11002		3628
Wind	-2056		-6739		-2056
Roof Live	1170		3301		1170
Factored:					
Uplift	-454		-1486		-454
Total	4926		15265		4926
Bearing:					
Capacity					
Beam	5339		16545		5339
Support	4926		15265		4926
Des ratio					
Beam	0.92		0.92		0.92
Support	1.00		1.00		1.00
Load comb	#8		#4		#9
Length	2.03		6.30		2.03
Min req'd	2.03**		6.30**		2.03**
Cb	1.00		1.00		1.00
Cb min	1.00		1.00		1.00
Cb support	1.11		1.11		1.11
Fcp sup	625		625		625



By Yuri at 5:02:16 PM, 7/3/2024



**Minimum bearing length governed by the required width of the supporting member.

Cascade Ridge Beam

LVL n-ply, 2.0E, 2950Fb, 1-3/4"x24", 2-ply (3-1/2"x24")

Supports: All - Timber-soft Beam, D.Fir-L No.2

Total length: 64.0'; Clear span: 31.563', 31.563'; Volume = 37.3 cu.ft.

Lateral support: top = 8'-0 bottom = 8'-0 (in);

This section PASSES the design code check.

WARNING: This CUSTOM SIZE is not in the database. Refer to online help.

Beam - 2 Span 32-32 - LVL.wwb

Analysis vs. Allowable Stress and Deflection using NDS 2018 :

Criterion	Analysis Value	Design Value	Unit	Analysis/Design
Shear	$f_v = 121$	$F_v' = 328$	psi	$f_v/F_v' = 0.37$
Bending (+)	$f_b = 1114$	$F_b' = 2722$	psi	$f_b/F_b' = 0.41$
Bending (-)	$f_b = 1714$	$F_b' = 2722$	psi	$f_b/F_b' = 0.63$
Live Defl'n	$0.51 = L/751$	$1.60 = L/240$	in	0.32
Total Defl'n	$0.75 = L/510$	$1.60 = L/240$	in	0.47

Additional Data:

FACTORS:	F/E (psi)	CD	CM	Ct	CL	CV	Cfu	Cr	Cf _{rt}	Ci	LC#
F _v '	285	1.15	-	1.00	-	-	-	-	1.00	-	4
F _b ' ⁺	2950	1.15	-	1.00	0.802	0.910	-	1.00	1.00	-	8
F _b ' ⁻	2950	1.15	-	1.00	0.802	0.910	-	1.00	1.00	-	4
F _{cp} '	750	-	-	1.00	-	-	-	-	1.00	-	-
E'	2.1 million	-	-	1.00	-	-	-	-	1.00	-	8
E _{miny} '	1.06 million	-	-	1.00	-	-	-	-	1.00	-	8

CRITICAL LOAD COMBINATIONS:

Shear : LC #4 = D + S
 Bending(+): LC #8 = D + S (pattern: Ss)
 Bending(-): LC #4 = D + S
 Deflection: LC #8 = (live)
 LC #8 = (total)
 Bearing : Support 1 - LC #8 = D + S (pattern: Ss)
 Support 2 - LC #4 = D + S
 Support 3 - LC #9 = D + S (pattern: sS)
 Uplift : Support 1 - LC #6 = 0.6D + 0.6W
 Support 2 - LC #6 = 0.6D + 0.6W
 Support 3 - LC #6 = 0.6D + 0.6W

D=dead S=snow W=wind Lr=roof live

All LC's are listed in the Analysis output

Load Patterns: s=S/2, X=L+S or L+Lr, =no pattern load in this span

Load combinations: ASD Basic from ASCE 7-16 2.4

CALCULATIONS:

V max = 7632, V design = 6768 (NDS 3.4.3.1(a)) lbs; M(+) = 31199 lbs-ft; M(-) = 47993 lbs-ft
 EI = 4233.53e06 lb-in²/ply GA = 11.02e06 lb
 "Live" deflection is due to all non-dead loads (live, wind, snow...)
 Total deflection = 1.50 permanent + "live"
 Lateral stability(+): Lu = 8.00' Le = 16.50' RB = 19.7; b = full member width
 Lateral stability(-): Lu = 8.00' Le = 16.50' RB = 19.7; b = full member width

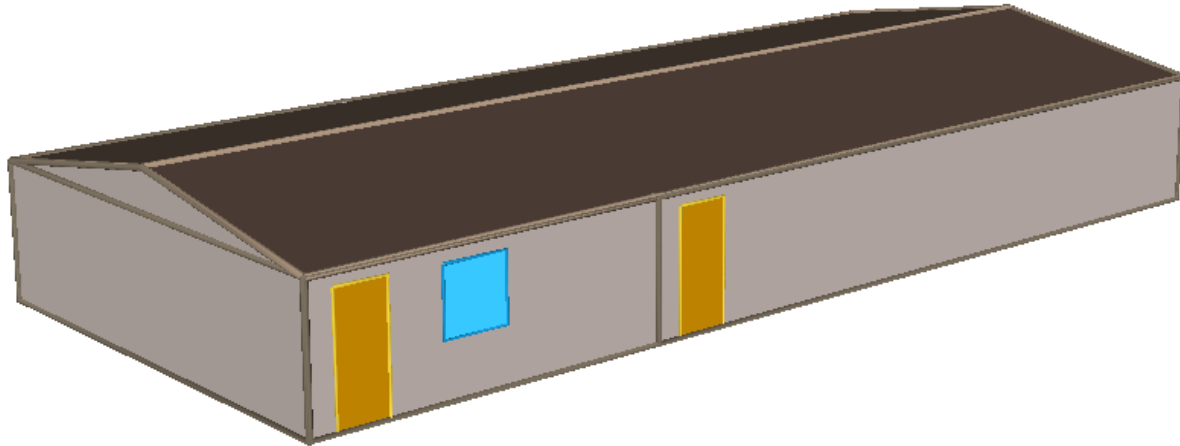
Design Notes:

1. Analysis and design are in accordance with the ICC International Building Code (IBC 2021) and the National Design Specification (NDS 2018), using Allowable Stress Design (ASD). Design values are from the NDS Supplement.
2. Please verify that the default deflection limits are appropriate for your application.
3. BUILT-UP BEAMS: it is assumed that each ply is a single continuous member (that is, no butt joints are present) fastened together securely at intervals not exceeding 4 times the depth and that each ply is equally top-loaded. Where beams are side-loaded, special fastening details may be required.
4. SCL: Structural composite lumber design has assumed: - dry service conditions - no preservative or fire-retardant treatment - no notches
5. BUILT-UP SCL: Contact manufacturer for connection details when side-loaded or when loads are not applied equally to all plies.
6. SCL: Shear deflection is calculated using true modulus of elasticity E and shear modulus G = E/16.

Building	Planning
Engineering	Public Works
Fire	Traffic

Cascade Christian School Office
815 21st Street SE
Puyallup, WA 98372
Washington State

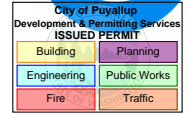
2021 Washington State Energy Code C407 Report



Prepared By:

Eric Knowles, P.E.
Solarc Energy Group
713 St Helens Ave, Suite 104
Tacoma, WA 98402
EricK@solarcenergygroup.com
206-395-4743

Final Draft:
July 24, 2024



C407 Compliance – Cascade Christian School Office

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- III. Methodology Description 7
- IV. Appendices 8
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 - B. Computer Printout of Inputs and Outputs 12

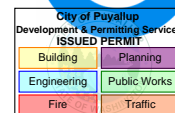
Capacity and Efficiency Ratings

MODELS	W18HB	W24HB	W30HB	W36HB	W42HC	W48HC	W60HC
Cooling Capacity in BTUH (1)	17,500 BTUH	23,400 BTUH	29,000 BTUH	36,000 BTUH	42,000 BTUH	47,500 BTUH	54,500 BTUH
Unit efficiency in EER	11.3 EER	11.3 EER	11.0 EER	11.1 EER	11.0 EER	11.0 EER	11.0 EER
High Temp Heating	16,800	22,400	26,600	33,000	39,000	42,500	52,500
Coefficient of Performance (COP)	3.5	3.3	3.4	3.3	3.3	3.3	3.3

(1) Capacity is certified in accordance with ANSI/AHRI Standard 390-2021.
(2) EER = Energy Efficiency Ratio. EER and COP are certified in accordance with ANSI/ARI Standard 390-2021.
All ratings based on fresh air intake being 100% closed (no outside air introduction).

General Unit Specifications W18 (1-1/2 Ton) Through W48 (4 Ton)

MODELS	W18HB-A	W24HB-A	W24HB-B	W24HB-C	W30HB-A	W30HB-B	W30HB-C	W36HB-A	W36HB-B	W36HB-C
Unit Voltage Rating - Phase - 60Hz	230/208 - 1	230/208 - 1	230/208 - 3	460 - 3	230/208 - 1	230/208 - 3	460 - 3	230/208 - 1	230/208 - 3	460 - 3
Operating Voltage Range	197-253 V	197-253 V	197-253 V	414-506 V	197-253 V	197-253 V	414-506 V	197-253 V	197-253 V	414-506 V
Compressor Electrical Circuit										
Voltage	230/208 V	230/208 V	230/208 V	460 V	230/208 V	230/208 V	460 V	230/208 V	230/208 V	460 V
Rated Load Amps	6.98/9.0	8.0/9.0	5.75/6.4	3.0	9.5/11.3	6.2/7.2	3.4	12.4/14.1	7.8/8.8	4.5
Branch Circuit Selection Current	9.0	10.9	7.7	3.6	14.2	9.0	4.2	16.7	10.5	5.8
Lock Rotor Amps	56.3/56.3	61.6/61.6	55.4/55.4	28	73/73	58/58	28	79/79	73/73	38
Compressor Type	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Outdoor Fan Motor & Condenser Fan										
Outdoor Fan Motor Horsepower - RPM	1/5 - 1090	1/5 - 1090	1/5 - 1090	1/5 - 1075	1/5 - 1075	1/5 - 1075	1/5 - 1075	1/5 - 1075	1/5 - 1075	1/5 - 1075
Outdoor Fan Motor - Amps	1.1 A	1.1 A	1.1 A	0.6 A	1.2 A	1.2 A	0.6 A	1.2 A	1.2 A	0.6 A
Outdoor Fan - Diameter and CFM	18" - 1800	18" - 1800	18" - 1800	18" - 1800	20" - 2400	20" - 2400	20" - 2400	20" - 2200	20" - 2200	20" - 2200
Indoor Blower Motor & Indoor Airflow										
Indoor Blower Motor - HP - Speeds	1/3HP-5 sp	1/3HP-5 sp	1/3HP-5 sp	1/2HP-5 sp	1/2HP-5 sp	1/2HP-5 sp	1/2HP-5 sp	1/2HP-5 sp	1/2HP-5 sp	1/2HP-5 sp
Indoor Blower Motor - Amps	1.0 A	1.7 A	1.7 A	1.2 A	2.3 A	2.3 A	1.1 A	2.5 A	2.5 A	1.2 A
Indoor Motor Type	Constant Torque ECM	Constant Torque ECM	Constant Torque ECM	Constant Torque ECM	Constant Torque ECM	Constant Torque ECM	Constant Torque ECM	Constant Torque ECM	Constant Torque ECM	Constant Torque ECM
Rated indoor CFM and static pressure (ESP) with wet coil and Standard filter	600 - 1	800 - 1	800 - 1	800 - 1	950 - 15	950 - 15	950 - 15	1150 - 15	1150 - 15	1150 - 15
Filter Size inches (cm) standard filter listed, 1 required	16x25x1 (41x64x3)	16x25x1 (41x64x3)	16x25x1 (41x64x3)	16x25x1 (41x64x3)	16x30x1 (41x77x3)	16x30x1 (41x77x3)	16x30x1 (41x77x3)	16x30x1 (41x77x3)	16x30x1 (41x77x3)	16x30x1 (41x77x3)
Basic Unit Weight without Vent lbs. (kg)	325 (148)	335 (152)	335 (152)	335 (152)	350 (159)	350 (159)	350 (159)	380 (173)	380 (173)	380 (173)
X - Barometric Fresh Air Damper	4.0 (1.8)	4.0 (1.8)	4.0 (1.8)	4.0 (1.8)	5.0 (2.3)	5.0 (2.3)	5.0 (2.3)	5.0 (2.3)	5.0 (2.3)	5.0 (2.3)
A - Barometric Damper w/ Exhaust	8.0 (3.6)	8.0 (3.6)	8.0 (3.6)	8.0 (3.6)	9.0 (4.0)	9.0 (4.0)	9.0 (4.0)	9.0 (4.0)	9.0 (4.0)	9.0 (4.0)
B - Blank Off Plate	1.0 (0.5)	1.0 (0.5)	1.0 (0.5)	1.0 (0.5)	1.0 (0.5)	1.0 (0.5)	1.0 (0.5)	1.0 (0.5)	1.0 (0.5)	1.0 (0.5)
M, V - Commercial Room Ventilator	31.0 (14.0)	31.0 (14.0)	31.0 (14.0)	31.0 (14.0)	35.0 (15.9)	35.0 (15.9)	35.0 (15.9)	35.0 (15.9)	35.0 (15.9)	35.0 (15.9)
D, Y, Z - Economizer	37.0 (16.8)	37.0 (16.8)	37.0 (16.8)	37.0 (16.8)	37.0 (16.8)	37.0 (16.8)	37.0 (16.8)	37.0 (16.8)	37.0 (16.8)	37.0 (16.8)
R - Energy Recovery Ventilator	54.0 (24.4)	54.0 (24.4)	54.0 (24.4)	54.0 (24.4)	54.0 (24.4)	54.0 (24.4)	54.0 (24.4)	54.0 (24.4)	54.0 (24.4)	54.0 (24.4)



C407 Compliance – Cascade Christian School Office

I. Executive Summary

The Cascade Christian School Office is a 1-story modular with open office space, (3) private offices, and multiple restrooms. The building will be at 815 21st Street SE in Puyallup, WA. The modular building is 1,792 square feet.

The Total Building Performance compliance path using the 2021 Washington State Energy Code (WSEC) was chosen because the building was unable to comply prescriptively with the following sections of the code:

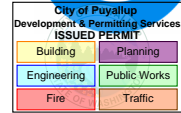
- **C402.1.5 – Component Performance Alternative:** the proposed envelope design does not meet prescriptive requirements. The proposed UA is 102.6% of the baseline UA. See Appendix A for more details.
- **C403.5 – Economizers:** the heat pumps do not qualify for any of the exceptions from Section C403.5 and economizer accessory is not provided.
- **C406.1 – Additional energy efficiency credit requirements:** the proposed design is not able to achieve the requirements of this section.

The propose design inputs are summarized in the body of the report. To compensate for the energy penalty occurring from non-compliant aspects of the design, the following Energy Efficiency Measures (EEM's) were implemented:

- **Improved Lighting Design:** The building wide lighting power density is 0.26W/sf and each fixture is equipped with integral occupancy sensors and photocell controls (entire space is daylight) to dim the lights appropriately. Additionally, the exterior lighting uses a LED fixture for the entry door.
- **Heat Pump Efficiency:** The packaged heat pumps exceed code efficiency: COP-3.3 and EER-11.3.
- **Fan Power Reduction:** The heat pump indoor units have small ECM motors that have lower fan power than the code allowance.

The new 2021 WSEC modeling guidelines require that the baseline building be modeled using the 2019 ASHRAE 90.1 Standards – Appendix G. The baseline model was developed using the ASHRAE Appendix G modeling guidelines, specifically Section G3.1.1. The baseline HVAC system was determined using Table G3.1.1-3. The envelope was based on G3.4-4. The service water heating system was based on Table G3.1.1-2. Lighting was based on Table G3.8.

Compliance with Section C407 requires meeting both a regulated site energy target and a total site energy reduction target. Tables 1, 2, and 3 on the next page shows the performance of the current proposed design compared to the baseline **meets both requirements**. Table 1 shows the energy consumption by type and which enduses are regulated. Table 2 shows that the proposed design meets the C407 requirements. Table 3 summarizes the energy savings by enduse and what contributes to the savings. Section II in this report summarizes the energy measures that contribute to the savings for each end-use.



C407 Compliance – Cascade Christian School Office

Table 1. Cascade Christian School Office – Overall Energy Savings

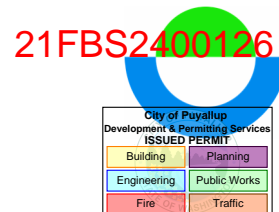
	ASHRAE Baseline			Regulated / Unregulated	Table C407.3(2) BPF 0.44			Table C407.3(3) BPF 0.58			BUILDING AREA	
	kwh	therms	MMBTU		Electric Regulated Site Energy	Gas Regulated Site Energy	Total Regulated Site Energy	Electric Unregulated Site Energy	Gas Unregulated Site Energy	Total Unregulated Site Energy		
Int Lights	4,757	-	16.24	R	16	-	16	-	-	-	1792	
Equipment	2,694	-	9.19	UR	-	-	-	9	-	9		
Heating	-	789	78.9	R	-	79	79	-	-	-		
Cooling	1,053	-	3.59	R	4	-	4	-	-	-		
Fans	1,400	-	4.78	R	5	-	5	-	-	-		
DHW	1,581	-	5.40	R	5	-	5	-	-	-		
Ext Lights	788	0	2.69	R	3	0	3	-	-	-		
Total	12,273	789	121		33	79	112	9	-	9		Total Site Energy (mmBtu/yr)
PROPOSED												
	kwh	therms	MMBTU		Electric Regulated Site Energy	Gas Regulated Site Energy	Total Regulated Site Energy	Electric Unregulated Site Energy	Gas Unregulated Site Energy	Total Unregulated Site Energy		
Int Lights	927	-	3.16	R	3	-	3	-	-	-	1792	
Equipment	2,694	-	9.19	UR	-	-	-	9	-	9		
Heating	7,052	-	24.07	R	24	-	24	-	-	-		
Cooling	667	-	2.28	R	2	-	2	-	-	-		
Fans	433	-	1.48	R	1	-	1	-	-	-		
DHW	1,581	-	5.40	R	5	-	5	-	-	-		
Ext Lights	123	-	0.42	R	0	-	0	-	-	-		
Total	13,477	0	46		37	-	37	9	-	9		Total Site Energy (mmBtu/yr)

Table 2. Cascade Christian School Office – C407 Compliance

PSEI ₁	0.381	<-- Proposed Site Energy (w/o renewables) / Total Baseline Energy			
PSEI ₂	0.483	<-- (Unregulated Baseline Energy + BPF * Regulated Baseline Energy) / Total Baseline Energy			
Definition	Proposed Site Energy	Unregulated Baseline Energy	BPF	Regulated Baseline Energy	Total Baseline Energy
mmBtu/yr	46.0	9.2	0.44	111.6	120.8
PSEI ₁	0.381	<-- Proposed Site Energy (w/ renewables) / Total Baseline Energy			
SEP _T	0.580	<-- Site Energy Performance Target from Table C407.3(3)			
Definition	Proposed Site Energy	Total Baseline Energy	BPF		
mmBtu/yr	46.0	120.8	0.58		

Table 3. Cascade Christian School Office – Enduse Savings

End Use	Energy Use Savings	Associated Energy Saving Measure
Int Lights	80.5%	Proposed LPD: 0.26 W/SF & Baseline LPD: 0.96 W/SF
Equipment	0.0%	N/A
Heating	69.5%	Natural Ventilation + HP Efficiency = COP-3.3
Cooling	36.7%	Natural Ventilation + HP Efficiency = EER-11.3
Fans	69.1%	Low fan power HP (0.343 W/CFM)
DHW	0.0%	Electric Water Heaters
Ext Lights	84.4%	(2) 19 W entry door lights
Total	61.9%	N/A



C407 Compliance – Cascade Christian School Office

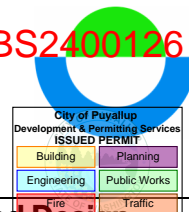
II. Project Description

The Cascade Christian School Office is a 1-story modular with open office space, (3) private offices, and multiple restrooms. The building will be at 815 21st Street SE in Puyallup, WA. The modular building is 1,792 square feet. The table below summarizes the project envelope, mechanical systems, lighting design, and other energy consumptive elements. The baseline column summarizes the 2019 ASHRAE 90.1 Appendix G inputs that are dictated by 2021 WSEC.

Cascade Christian School Office – Energy Analysis Summary		
Model	Baseline Design	Proposed Design
Parameter		
Above Grade Walls ^[1]	Climate Zone 4C: Steel-Framed Wall: U-0.123 <ul style="list-style-type: none"> 2x6 steel stud w/ R-13 Batt 	Wood framed wall- U-0.054 <ul style="list-style-type: none"> 2x6 Wood studs w/ R-21 Batt (Int. Framing)
Roof ^[1]	Insulation Entirely Above Deck: U-0.063 <ul style="list-style-type: none"> R-15 c.i. 	Joist Roofing – U-0.021 <ul style="list-style-type: none"> R-53 Insulation between joists
Floors ^[1]	Steel Joist: U-0.053 <ul style="list-style-type: none"> R-19 batt 	Joist/Framing – U-0.031 <ul style="list-style-type: none"> R-30 batt
Windows	Metal Framing <ul style="list-style-type: none"> U-0.57, SHGC- 0.39 WWR: 19% 	Vinyl Framing <ul style="list-style-type: none"> U-0.24, SHGC-0.30^[2] WWR: 4%
Doors	Opaque Doors- U-0.70	Opaque Doors- U-0.19
Shading, ext.	None	None
Infiltration	1.00 cfm/SF of total envelope area <ul style="list-style-type: none"> 2.48 ACH 	0.25 cfm/SF of total envelope area <ul style="list-style-type: none"> 0.62 ACH
Interior Lighting, power density	Space-by-Space Allowance: <ul style="list-style-type: none"> Building Wide Avg: 0.96 W/SF 	Building LPD: 0.26 W/SF
Interior Lighting, controls	No Controls	Continuous based on photocell controls.
Exterior Lighting, wattage	Connected Load Allowance: 0.18 kW <ul style="list-style-type: none"> Entry Doors: 2 x 3' 	Connected Load: 0.036 kW <ul style="list-style-type: none"> 2 x 18 W LED Lights
Exterior Lighting,	Photocell and timer controls: 12 hours a day	Photocell and timer controls: 12 hours a day
Equipment	Equipment density: <ul style="list-style-type: none"> Building Wide Avg: 0.46 W/SF 	Equipment density: <ul style="list-style-type: none"> Building Wide Avg: 0.46 W/SF

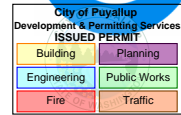
[1] U-Factors taken from WSEC Appendix A.

[2] U_{Assembly} and SHGC based on NFRC ratings.



C407 Compliance – Cascade Christian School Office

Model	Baseline	Proposed Design
Parameter		
Heating system	Code System 4: PSZ-AC # of Systems: 2 <ul style="list-style-type: none"> - Efficiency: 78% AFUE gas-furnace - Capacity: Under 225,000 btu/h - Runtime: Intermittent to meet load 	Packaged Heat Pump <ul style="list-style-type: none"> • # of Systems: 2 • Efficiency: 3.3 COP • Capacity: 27.4 kBtu/h • Runtime: Intermittent to meet load
Fans	Code System 4: PSZ-AC <ul style="list-style-type: none"> - Efficiency: 0.950 W/cfm - Airflow: 1,145 cfm avg. - Constant Volume - Runtime: Continuous during occupied period / intermittent during unoccupied period. 	Packaged Heat Pump <ul style="list-style-type: none"> • Efficiency: 0.343 W/cfm • Airflow: 800 cfm each • Constant Volume • Runtime: Intermittent to meet load
Cooling System	Code System 4: PSZ-AC <ul style="list-style-type: none"> • # of Systems: 2 • Efficiency: 3.0 COP_{nfc} • Capacity: Under 65,000 btu/h 	Packaged Heat Pump <ul style="list-style-type: none"> • # of Systems: 2 • Efficiency: EER-11.3 • Capacity: 24.0 kBtu/h
Pumps	N/a	N/a
Controls	Airside Economizer – High limit set point of 75 deg F	No economizer
OSA ventilation	Natural ventilation (See sheet MM100) + Mechanical ventilation when heat pump cycles on (350 cfm total)	Natural ventilation (See sheet MM100) + Mechanical ventilation when heat pump cycles on (350 cfm total)
Domestic Hot Water	Electric Resistance Tank	Electric Resistance Tank



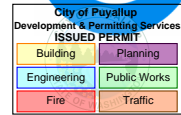
C407 Compliance – Cascade Christian School Office

III. Methodology Description

Whole Building Modeling Software

EQuest/DOE2.3 was used to model the energy and loads of both project areas. EQuest/DOE2.3 is an hour-by-hour whole building energy simulation tool that is widely used in the industry and has demonstrated robust load calculation mathematical models. The model incorporates detailed calculations of sun angles, shading, direct solar gain, solar influenced exterior surface temperatures, diversified occupancy schedules, thermal mass, HVAC thermostat schedules, building HVAC controls, ventilation, fan energy and fan heat. Input to the model includes hourly weather data.

The weather data used for the models is Typical Meteorological Year (TMY3) data for the weather stations at McChord Air Force Base TMY3 data files are statistically processed to create a typical (average) weather year using actual weather records.



C407 Compliance – Cascade Christian School Office

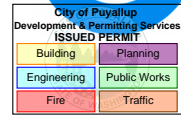
IV. Appendices

A. General Information

1. HVAC Zoning Diagram
2. UxA Calculation
3. Table C407.2 Compliance

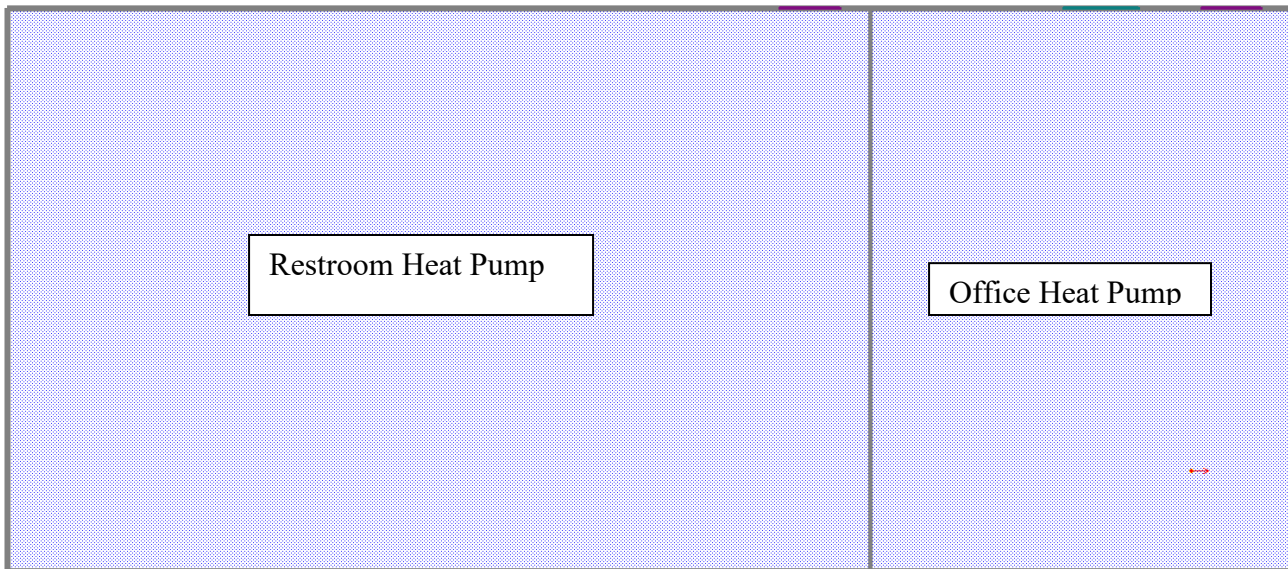
B. Computer Printout of Outputs

1. Output Reports: BEPS, BEPU, LV-D, PS-E, SS-D, SV-A



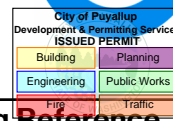
C407 Compliance – Cascade Christian School Office

A. General Information – Thermal Zoning Diagrams



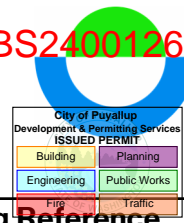
UxA Calculation

2021 Washington State Energy Code Envelope Calculations						
	Envelope Area (SF)	Proposed U-Value	Proposed U x A	Baseline U-Value	Baseline U x A	Notes
Roof	2,161	0.021	45	0.021	45	R-51 Batt
Wood-Framed Walls	1,386	0.054	75	0.051	71	R-21 Batt
Exposed Floor	1,792	0.031	56	0.029	52	R-30 batt between wood joists
Opaque Swinging Doors	42	0.370	16	0.370	16	From A.1
Vinyl Windows	64	0.240	15	0.280	18	From A.1
Total			207		201	
Proposed UA / Baseline UA					102.6%	<-- Cannot Exceed 120%



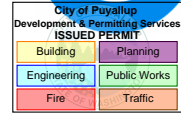
C407 Compliance – Cascade Christian School Office

Section	Title	Project Compliance Comments / Drawing Reference
C402.5	Air Leakage	
C403.1.2	Calculation of heating and cooling loads	See Heating System Sizing Loads in Appendix C of this report.
C403.1.3	Data centers	N/A
C403.2	System design	C403.2.1 - N/A C403.2.2 - See MM003 for Vent Calcs C403.2.3 - N/A (No motors > 5hp)
C403.3.1	Equipment and system sizing	See MM002 for Mech Equip Schedule
C403.3.2	HVAC equipment performance requirements	See MM002 for Mech Equip Schedule
C403.3.6	Ventilation for Group R occupancy	N/A
C403.4.1	Thermostatic controls	C403.4.1.1 - N/A C403.4.1.2 - Wall heater has integral thermostat C403.4.1.3 - N/A C403.4.1.5 - N/A C403.4.1.6 - N/A
C403.4.2	Off-hour controls	See MM001 for Mech Notes
C403.4.7	Combustion heating equipment controls	N/A - No combustion heating
C403.4.8	Group R-1 hotel/motel guestrooms	N/A - No Group R-1
C403.4.9	Group R-2 and R-3 dwelling units	N/A - No Group R-2
C403.4.10	Group R-2 sleeping units	N/A - No Group R-2
C403.4.11	Digital direct control systems	N/A - No equipment meets requirements in Table C403.4.11.1
C403.5.5	Economizer fault detect and diagnostics (FDD)	N/A - No economizers
C403.7	Ventilation and exhaust systems	C403.7.1 / 2 - No spaces meet occupancy threshold C403.7.3 - N/A C403.7.4 - No Group R-1 spaces C403.7.5 - N/A C403.7.7 - No commercial kitchens or laboratories C403.7.8 - N/A
C403.8	Fan and fan controls	C403.8.1 / 2 - N/A (No fans exceed 5hp) C403.8.3 -N/A C403.8.4 - N/A C403.8.5 - N/A



C407 Compliance – Cascade Christian School Office

Section	Title	Project Compliance Comments / Drawing Reference
C403.9.1.1	Variable flow controls	N/A
C403.9.1.2	Limitation on centrifugal fan cooling towers	N/A
C403.10	Construction of HVAC elements	N/A
C403.11	Mechanical systems located outside of the building thermal envelope	N/A
C403.15	Commercial food service	N/A
C404	Service Water Heating	N/A
C405.1	General	See General notes on Sheet EM002
C405.2	Lighting controls	See General notes on Sheet EM002
C405.3	Exit signs	N/A (no exit signs)
C405.4	Interior lighting power	See General notes on Sheet EM002
C405.5	Exterior building lighting power	See General notes on Sheet EM002
C405.6	Electrical transformers	N/A (no electrical transformers)
C405.7	Dwelling unit energy consumption	N/A (No dwelling units)
C405.8	Electric motor efficiency	N/A
C405.9	Vertical and horizontal transportation	N/A (no vertical or horizontal transportation)
C405.10	Controlled receptacles	N/A
C405.11	Voltage drop in feeders	N/A
C407	Total Building Performance	Included as part of PDF report.
C408	System commissioning	N/A (no systems meet threshold)
C409	Energy metering	N/A (building < 50,000 SF)
C410	Refrigeration requirements	N/A
C411	Solar readiness	Exempt (Building < 10,000 SF)



C407 Compliance – Cascade Christian School Office

B. Computer Printout of Inputs and Outputs

Proposed Model

Cascade School Office - Proposed DOE-2.3-50h 7/24/2024 9:26:43 BDL RUN 1

REPORT- BEPS Building Energy Performance WEATHER FILE- TACOMA MCCHORD AF WA

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY													
MBTU	3.2	0.0	9.2	24.1	2.3	0.0	0.0	1.5	0.0	0.0	5.4	0.4	46.0
FM1 NATURAL-GAS													
MBTU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MBTU	3.2	0.0	9.2	24.1	2.3	0.0	0.0	1.5	0.0	0.0	5.4	0.4	46.0
TOTAL SITE ENERGY				46.00 MBTU	25.7 KBTU/SQFT-YR GROSS-AREA				25.7 KBTU/SQFT-YR NET-AREA				
TOTAL SOURCE ENERGY				137.99 MBTU	77.0 KBTU/SQFT-YR GROSS-AREA				77.0 KBTU/SQFT-YR NET-AREA				
PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 2.86													
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00													
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 0													
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 79													

Cascade School Office - Proposed DOE-2.3-50h 7/24/2024 9:26:43 BDL RUN 1

REPORT- BEPU Building Utility Performance WEATHER FILE- TACOMA MCCHORD AF WA

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY													
KWH	927.	0.	2694.	7052.	667.	0.	0.	433.	0.	0.	1581.	123.	13477.
FM1 NATURAL-GAS													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL ELECTRICITY			13477. KWH	7.521 KWH /SQFT-YR GROSS-AREA			7.521 KWH /SQFT-YR NET-AREA						

Cascade School Office - Proposed DOE-2.3-50h 7/24/2024 9:26:43 BDL RUN 1

REPORT- LV-D Details of Exterior Surfaces WEATHER FILE- TACOMA MCCHORD AF WA (CONTINUED)

	AVERAGE U-VALUE/WINDOWS (BTU/HR-SQFT-F)	AVERAGE U-VALUE/WALLS (BTU/HR-SQFT-F)	AVERAGE U-VALUE WALLS+WINDOWS (BTU/HR-SQFT-F)	WINDOW AREA (SQFT)	WALL AREA (SQFT)	WINDOW+WALL AREA (SQFT)
NORTH	0.244	0.053	0.060	16.00	480.00	496.00
EAST	0.000	0.053	0.053	0.00	249.76	249.76
SOUTH	0.244	0.053	0.072	48.00	448.00	496.00
WEST	0.000	0.053	0.053	0.00	249.76	249.76
FLOOR	0.000	0.031	0.031	0.00	1792.00	1792.00
ROOF	0.000	0.020	0.020	0.00	1816.32	1816.32
ALL WALLS	0.244	0.053	0.062	64.00	1427.52	1491.52
WALLS+ROOFS	0.244	0.035	0.039	64.00	3243.84	3307.84
BUILDING	0.244	0.034	0.036	64.00	5035.84	5099.84



C407 Compliance – Cascade Christian School Office

Cascade School Office - Proposed

DOE-2.3-50h 7/24/2024

9:26:43

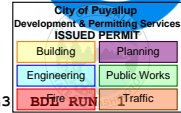
REPORT- LV-B Summary of Spaces

WEATHER FILE- TACOMA MCCHORD AF WA

NUMBER OF SPACES 3 EXTERIOR 3 INTERIOR 0

SPACE	SPACE*FLOOR MULTIPLIER	SPACE TYPE	AZIM	LIGHTS (WATT / SQFT)		EQUIP (WATT / SQFT)		INFILTRATION METHOD	ACH	AREA (SQFT)	VOLUME (CUFT)
					PEOPLE						
Spaces on floor: EL1 Ground Flr											
Restroom Spc	1.0	EXT	0.0	0.20	2.4	0.20		AIR-CHANGE	0.62	1204.0	9331.0
Office Spc	1.0	EXT	-90.0	0.47	2.9	1.00		AIR-CHANGE	0.62	588.0	4557.0
EL1 Under Roof (G.3)	1.0	EXT	0.0	0.00	0.0	0.00		AIR-CHANGE	0.62	1792.0	2099.2
BUILDING TOTALS				0.14	5.3	0.23				3584.0	15987.2
CONDITIONED FLOOR AREA =		1792.0		SQFT							
TOTAL INSTALLED LIGHTING POWER =		0.518		KW							
TOTAL INSTALLED EQUIPMENT POWER =		0.829		KW							

C407 Compliance – Cascade Christian School Office



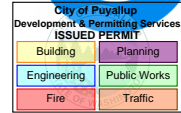
Cascade School Office - Proposed
REPORT- PS-F Energy End-Use Summary for

EMI

DOE-2.3-50h 7/24/2024 9:26:43

WEATHER FILE- TACOMA MCCHORD AF WA

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
JAN													
KWH	89.	0.	226.	1654.	113.	0.	0.	58.	0.	0.	141.	10.	2292.
MAX KW	0.436	0.000	0.746	11.171	1.636	0.000	0.000	0.489	0.000	0.000	0.710	0.028	14.576
DAY/HR	21/ 9	0/ 0	2/ 9	3/ 3	30/ 8	0/ 0	0/ 0	7/ 8	0/ 0	0/ 0	24/13	1/ 1	30/ 8
PEAK ENDUSE	0.413	0.000	0.665	11.171	1.636	0.000	0.000	0.425	0.000	0.000	0.238	0.028	
PEAK PCT	2.8	0.0	4.6	76.6	11.2	0.0	0.0	2.9	0.0	0.0	1.6	0.2	
FEB													
KWH	73.	0.	204.	1094.	53.	0.	0.	48.	0.	0.	132.	9.	1614.
MAX KW	0.411	0.000	0.746	11.171	1.428	0.000	0.000	0.518	0.000	0.000	0.729	0.028	14.187
DAY/HR	5/ 8	0/ 0	3/ 9	1/ 2	27/ 8	0/ 0	0/ 0	24/ 8	0/ 0	0/ 0	24/13	1/ 1	3/10
PEAK ENDUSE	0.268	0.000	0.746	11.171	1.196	0.000	0.000	0.319	0.000	0.000	0.487	0.000	
PEAK PCT	1.9	0.0	5.3	78.7	8.4	0.0	0.0	2.2	0.0	0.0	3.4	0.0	
MAR													
KWH	77.	0.	226.	689.	13.	0.	0.	53.	0.	0.	147.	10.	1215.
MAX KW	0.413	0.000	0.746	11.171	0.980	0.000	0.000	0.516	0.000	0.000	0.731	0.028	12.808
DAY/HR	10/ 8	0/ 0	3/ 9	1/ 4	2/ 7	0/ 0	0/ 0	13/ 8	0/ 0	0/ 0	18/13	1/ 1	3/ 7
PEAK ENDUSE	0.154	0.000	0.247	11.171	0.918	0.000	0.000	0.167	0.000	0.000	0.123	0.028	
PEAK PCT	1.2	0.0	1.9	87.2	7.2	0.0	0.0	1.3	0.0	0.0	1.0	0.2	
APR													
KWH	75.	0.	234.	278.	18.	0.	0.	33.	0.	0.	148.	10.	796.
MAX KW	0.359	0.000	0.746	7.980	0.839	0.000	0.000	0.499	0.000	0.000	0.722	0.028	8.530
DAY/HR	10/ 8	0/ 0	1/ 9	1/ 7	16/16	0/ 0	0/ 0	9/ 8	0/ 0	0/ 0	9/13	1/ 2	1/ 7
PEAK ENDUSE	0.154	0.000	0.247	7.980	0.000	0.000	0.000	0.000	0.000	0.000	0.122	0.028	
PEAK PCT	1.8	0.0	2.9	93.5	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.3	
MAY													
KWH	70.	0.	226.	106.	6.	0.	0.	22.	0.	0.	138.	10.	578.
MAX KW	0.305	0.000	0.746	2.955	0.225	0.000	0.000	0.402	0.000	0.000	0.685	0.028	4.540
DAY/HR	1/ 8	0/ 0	1/ 9	2/ 8	14/16	0/ 0	0/ 0	2/ 8	0/ 0	0/ 0	7/13	1/ 2	2/ 8
PEAK ENDUSE	0.260	0.000	0.665	2.955	0.000	0.000	0.000	0.402	0.000	0.000	0.230	0.028	
PEAK PCT	5.7	0.0	14.6	65.1	0.0	0.0	0.0	8.8	0.0	0.0	5.1	0.6	
JUN													
KWH	69.	0.	225.	30.	31.	0.	0.	18.	0.	0.	128.	10.	510.
MAX KW	0.284	0.000	0.746	1.786	0.608	0.000	0.000	0.249	0.000	0.000	0.649	0.028	3.171
DAY/HR	10/ 8	0/ 0	2/ 9	18/ 8	6/16	0/ 0	0/ 0	18/ 8	0/ 0	0/ 0	17/13	1/ 2	18/ 8
PEAK ENDUSE	0.225	0.000	0.665	1.786	0.000	0.000	0.000	0.249	0.000	0.000	0.218	0.028	
PEAK PCT	7.1	0.0	21.0	56.3	0.0	0.0	0.0	7.9	0.0	0.0	6.9	0.9	
JUL													
KWH	72.	0.	235.	3.	119.	0.	0.	29.	0.	0.	127.	10.	596.
MAX KW	0.265	0.000	0.746	0.471	1.941	0.000	0.000	0.318	0.000	0.000	0.618	0.028	3.620
DAY/HR	9/ 8	0/ 0	1/ 9	10/ 8	23/16	0/ 0	0/ 0	23/16	0/ 0	0/ 0	9/13	1/ 2	23/16
PEAK ENDUSE	0.254	0.000	0.746	0.000	1.941	0.000	0.000	0.318	0.000	0.000	0.361	0.000	
PEAK PCT	7.0	0.0	20.6	0.0	53.6	0.0	0.0	8.8	0.0	0.0	10.0	0.0	
AUG													
KWH	71.	0.	226.	3.	93.	0.	0.	25.	0.	0.	120.	10.	548.
MAX KW	0.326	0.000	0.746	0.477	1.281	0.000	0.000	0.238	0.000	0.000	0.598	0.028	2.939
DAY/HR	4/ 8	0/ 0	1/ 9	25/ 8	27/17	0/ 0	0/ 0	27/17	0/ 0	0/ 0	22/13	1/ 2	27/17
PEAK ENDUSE	0.225	0.000	0.746	0.000	1.281	0.000	0.000	0.238	0.000	0.000	0.449	0.000	
PEAK PCT	7.6	0.0	25.4	0.0	43.6	0.0	0.0	8.1	0.0	0.0	15.3	0.0	
SEP													
KWH	75.	0.	225.	47.	33.	0.	0.	20.	0.	0.	118.	10.	528.
MAX KW	0.408	0.000	0.746	3.192	0.812	0.000	0.000	0.427	0.000	0.000	0.597	0.028	4.563
DAY/HR	30/ 8	0/ 0	2/ 9	23/ 7	18/15	0/ 0	0/ 0	23/ 8	0/ 0	0/ 0	10/13	1/ 2	23/ 8
PEAK ENDUSE	0.368	0.000	0.665	2.875	0.000	0.000	0.000	0.427	0.000	0.000	0.201	0.028	
PEAK PCT	8.1	0.0	14.6	63.0	0.0	0.0	0.0	9.4	0.0	0.0	4.4	0.6	
OCT													
KWH	84.	0.	235.	305.	20.	0.	0.	29.	0.	0.	126.	10.	810.
MAX KW	0.443	0.000	0.746	11.171	1.411	0.000	0.000	0.484	0.000	0.000	0.613	0.028	14.288
DAY/HR	28/ 9	0/ 0	1/ 9	30/ 7	31/ 8	0/ 0	0/ 0	27/ 8	0/ 0	0/ 0	24/13	1/ 2	31/ 9
PEAK ENDUSE	0.371	0.000	0.746	11.171	1.297	0.000	0.000	0.345	0.000	0.000	0.358	0.000	
PEAK PCT	2.6	0.0	5.2	78.2	9.1	0.0	0.0	2.4	0.0	0.0	2.5	0.0	
NOV													
KWH	74.	0.	198.	1372.	73.	0.	0.	41.	0.	0.	114.	10.	1882.
MAX KW	0.466	0.000	0.746	11.171	1.580	0.000	0.000	0.486	0.000	0.000	0.643	0.028	14.484
DAY/HR	26/16	0/ 0	3/ 9	10/ 7	18/ 8	0/ 0	0/ 0	24/ 8	0/ 0	0/ 0	25/13	1/ 2	18/ 8
PEAK ENDUSE	0.412	0.000	0.665	11.171	1.580	0.000	0.000	0.412	0.000	0.000	0.216	0.028	
PEAK PCT	2.8	0.0	4.6	77.1	10.9	0.0	0.0	2.8	0.0	0.0	1.5	0.2	
DEC													
KWH	97.	0.	235.	1471.	95.	0.	0.	57.	0.	0.	140.	10.	2106.
MAX KW	0.466	0.000	0.746	11.171	1.696	0.000	0.000	0.511	0.000	0.000	0.678	0.028	14.632
DAY/HR	1/16	0/ 0	1/ 9	8/ 1	9/ 8	0/ 0	0/ 0	3/ 8	0/ 0	0/ 0	1/13	1/ 1	9/ 8
PEAK ENDUSE	0.413	0.000	0.665	11.171	1.696	0.000	0.000	0.431	0.000	0.000	0.227	0.028	
PEAK PCT	2.8	0.0	4.5	76.3	11.6	0.0	0.0	2.9	0.0	0.0	1.6	0.2	
=====													
KWH	927.	0.	2694.	7052.	667.	0.	0.	433.	0.	0.	1581.	123.	13477.
MAX KW	0.466	0.000	0.746	11.171	1.941	0.000	0.000	0.518	0.000	0.000	0.731	0.028	14.632
MON/DY	11/26	0/ 0	1/ 2	1/ 3	7/23	0/ 0	0/ 0	2/24	0/ 0	0/ 0	3/18	1/ 1	12/ 9
PEAK ENDUSE	0.413	0.000	0.665	11.171	1.696	0.000	0.000	0.431	0.000	0.000	0.227	0.028	
PEAK PCT	2.8	0.0	4.5	76.3	11.6	0.0	0.0	2.9	0.0	0.0	1.6	0.2	



C407 Compliance – Cascade Christian School Office

Baseline Model – Climate Zone 4C

Cascade School Office - Proposed

DOE-2.3-50h 7/24/2024 10:01:38 BDL RUN 1

REPORT- BEPS Building Energy Performance

WEATHER FILE- TACOMA MCCHORD AF WA

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL	
EM1 ELECTRICITY														
MBTU	16.2	0.0	9.2	0.0	3.6	0.0	0.0	4.8	0.0	0.0	5.4	2.7	41.9	
FM1 NATURAL-GAS														
MBTU	0.0	0.0	0.0	78.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	78.9	
MBTU	16.2	0.0	9.2	78.9	3.6	0.0	0.0	4.8	0.0	0.0	5.4	2.7	120.8	
TOTAL SITE ENERGY				120.81 MBTU	67.4 KBTU/SQFT-YR GROSS-AREA				67.4 KBTU/SQFT-YR NET-AREA					
TOTAL SOURCE ENERGY				204.58 MBTU	114.2 KBTU/SQFT-YR GROSS-AREA				114.2 KBTU/SQFT-YR NET-AREA					

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.00
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
 HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 0
 HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 0

Cascade School Office - Proposed

DOE-2.3-50h 7/24/2024 10:01:38 BDL RUN 1

REPORT- BEPU Building Utility Performance

WEATHER FILE- TACOMA MCCHORD AF WA

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY													
KWH	4757.	0.	2694.	0.	1053.	0.	0.	1400.	0.	0.	1581.	788.	12274.
FM1 NATURAL-GAS													
THERM	0.	0.	0.	789.	0.	0.	0.	0.	0.	0.	0.	0.	789.
TOTAL ELECTRICITY			12274. KWH	6.849 KWH /SQFT-YR GROSS-AREA			6.849 KWH /SQFT-YR NET-AREA						
TOTAL NATURAL-GAS			789. THERM	0.440 THERM /SQFT-YR GROSS-AREA			0.440 THERM /SQFT-YR NET-AREA						

Cascade School Office - Proposed

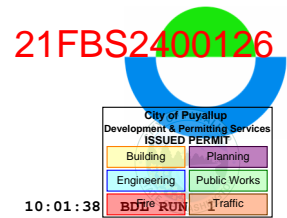
DOE-2.3-50h 7/24/2024 10:01:38 BDL RUN 1

REPORT- LV-D Details of Exterior Surfaces

WEATHER FILE- TACOMA MCCHORD AF WA

(CONTINUED)

	AVERAGE U-VALUE/WINDOWS (BTU/HR-SQFT-F)	AVERAGE U-VALUE/WALLS (BTU/HR-SQFT-F)	AVERAGE U-VALUE WALLS+WINDOWS (BTU/HR-SQFT-F)	WINDOW AREA (SQFT)	WALL AREA (SQFT)	WINDOW+WALL AREA (SQFT)
NORTH	0.520	0.117	0.174	70.90	425.10	496.00
EAST	0.000	0.117	0.117	0.00	249.76	249.76
SOUTH	0.520	0.117	0.290	212.71	283.29	496.00
WEST	0.000	0.117	0.117	0.00	249.76	249.76
FLOOR	0.000	0.052	0.052	0.00	1792.00	1792.00
ROOF	0.000	0.062	0.062	0.00	1816.32	1816.32
ALL WALLS	0.520	0.117	0.193	283.62	1207.90	1491.52
WALLS+ROOFS	0.520	0.084	0.121	283.62	3024.22	3307.84
BUILDING	0.520	0.072	0.097	283.62	4816.22	5099.84



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DOE-2.3-50h 7/24/2024 10:01:38

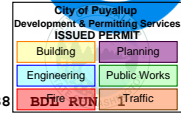
REPORT- LV-B Summary of Spaces

WEATHER FILE- TACOMA MCCHORD AF WA

NUMBER OF SPACES 3 EXTERIOR 3 INTERIOR 0

SPACE	SPACE*FLOOR MULTIPLIER	SPACE TYPE	AZIM	LIGHTS (WATT / SQFT)		EQUIP (WATT / SQFT)		INFILTRATION METHOD	ACH	AREA (SQFT)	VOLUME (CUFT)
					PEOPLE						
Spaces on floor: EL1 Ground Flr											
Restroom Spc	1.0	EXT	0.0	0.90	2.4	0.20		AIR-CHANGE	2.48	1204.0	9331.0
Office Spc	1.0	EXT	-90.0	1.10	2.9	1.00		AIR-CHANGE	2.48	588.0	4557.0
EL1 Under Roof (G.3)	1.0	EXT	0.0	0.00	0.0	0.00		AIR-CHANGE	2.48	1792.0	2099.2
BUILDING TOTALS				0.48	5.3	0.23				3584.0	15987.2
CONDITIONED FLOOR AREA =		1792.0		SQFT							
TOTAL INSTALLED LIGHTING POWER =		1.730		KW							
TOTAL INSTALLED EQUIPMENT POWER =		0.829		KW							

C407 Compliance – Cascade Christian School Office



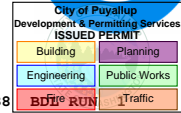
Cascade School Office - Proposed
REPORT- PS-F Energy End-Use Summary for

EMI

DOE-2.3-50h 7/24/2024 10:01:38

WEATHER FILE- TACOMA MCCHORD AF WA

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
JAN													
KWH	398.	0.	226.	0.	0.	0.	0.	99.	0.	0.	141.	67.	931.
MAX KW	1.557	0.000	0.746	0.000	0.000	0.000	0.000	0.799	0.000	0.000	0.710	0.180	3.563
DAY/HR	2/ 9	0/ 0	2/ 9	0/ 0	17/17	0/ 0	0/ 0	7/ 8	0/ 0	0/ 0	7/13	1/ 1	7/13
PEAK ENDUSE	1.557	0.000	0.746	0.000	0.000	0.000	0.000	0.549	0.000	0.000	0.710	0.000	
PEAK PCT	43.7	0.0	20.9	0.0	0.0	0.0	0.0	15.4	0.0	0.0	19.9	0.0	
FEB													
KWH	360.	0.	204.	0.	0.	0.	0.	117.	0.	0.	132.	60.	874.
MAX KW	1.557	0.000	0.746	0.000	0.000	0.000	0.000	1.025	0.000	0.000	0.729	0.180	3.495
DAY/HR	3/ 9	0/ 0	3/ 9	0/ 0	13/16	0/ 0	0/ 0	3/ 8	0/ 0	0/ 0	3/13	1/ 1	3/ 8
PEAK ENDUSE	1.381	0.000	0.665	0.000	0.000	0.000	0.000	1.025	0.000	0.000	0.245	0.180	
PEAK PCT	39.5	0.0	19.0	0.0	0.0	0.0	0.0	29.3	0.0	0.0	7.0	5.2	
MAR													
KWH	398.	0.	226.	0.	0.	0.	0.	140.	0.	0.	147.	67.	978.
MAX KW	1.557	0.000	0.746	0.000	0.001	0.000	0.000	0.820	0.000	0.000	0.731	0.180	3.545
DAY/HR	3/ 9	0/ 0	3/ 9	0/ 0	25/17	0/ 0	0/ 0	13/ 8	0/ 0	0/ 0	14/13	1/ 1	14/13
PEAK ENDUSE	1.557	0.000	0.746	0.000	0.000	0.000	0.000	0.511	0.000	0.000	0.731	0.000	
PEAK PCT	43.9	0.0	21.0	0.0	0.0	0.0	0.0	14.4	0.0	0.0	20.6	0.0	
APR													
KWH	416.	0.	234.	0.	62.	0.	0.	125.	0.	0.	148.	65.	1049.
MAX KW	1.557	0.000	0.746	0.000	3.383	0.000	0.000	1.302	0.000	0.000	0.722	0.180	7.515
DAY/HR	1/ 9	0/ 0	1/ 9	0/ 0	16/14	0/ 0	0/ 0	24/13	0/ 0	0/ 0	9/13	1/ 2	16/14
PEAK ENDUSE	1.557	0.000	0.746	0.000	3.383	0.000	0.000	1.166	0.000	0.000	0.662	0.000	
PEAK PCT	20.7	0.0	9.9	0.0	45.0	0.0	0.0	15.5	0.0	0.0	8.8	0.0	
MAY													
KWH	398.	0.	226.	0.	2.	0.	0.	70.	0.	0.	138.	67.	901.
MAX KW	1.557	0.000	0.746	0.000	1.291	0.000	0.000	1.198	0.000	0.000	0.685	0.180	4.488
DAY/HR	1/ 9	0/ 0	1/ 9	0/ 0	14/16	0/ 0	0/ 0	5/15	0/ 0	0/ 0	7/13	1/ 2	14/16
PEAK ENDUSE	1.557	0.000	0.746	0.000	1.291	0.000	0.000	0.494	0.000	0.000	0.401	0.000	
PEAK PCT	34.7	0.0	16.6	0.0	28.8	0.0	0.0	11.0	0.0	0.0	8.9	0.0	
JUN													
KWH	398.	0.	225.	0.	96.	0.	0.	98.	0.	0.	128.	65.	1009.
MAX KW	1.557	0.000	0.746	0.000	2.165	0.000	0.000	1.412	0.000	0.000	0.649	0.180	5.706
DAY/HR	2/ 9	0/ 0	2/ 9	0/ 0	6/15	0/ 0	0/ 0	11/17	0/ 0	0/ 0	17/13	1/ 2	2/14
PEAK ENDUSE	1.557	0.000	0.746	0.000	2.076	0.000	0.000	0.731	0.000	0.000	0.595	0.000	
PEAK PCT	27.3	0.0	13.1	0.0	36.4	0.0	0.0	12.8	0.0	0.0	10.4	0.0	
JUL													
KWH	416.	0.	235.	0.	381.	0.	0.	178.	0.	0.	127.	67.	1405.
MAX KW	1.557	0.000	0.746	0.000	5.519	0.000	0.000	1.635	0.000	0.000	0.618	0.180	9.818
DAY/HR	1/ 9	0/ 0	1/ 9	0/ 0	23/16	0/ 0	0/ 0	23/16	0/ 0	0/ 0	9/13	1/ 2	23/16
PEAK ENDUSE	1.557	0.000	0.746	0.000	5.519	0.000	0.000	1.635	0.000	0.000	0.361	0.000	
PEAK PCT	15.9	0.0	7.6	0.0	56.2	0.0	0.0	16.6	0.0	0.0	3.7	0.0	
AUG													
KWH	398.	0.	226.	0.	341.	0.	0.	153.	0.	0.	120.	67.	1305.
MAX KW	1.557	0.000	0.746	0.000	4.307	0.000	0.000	1.356	0.000	0.000	0.598	0.180	8.238
DAY/HR	1/ 9	0/ 0	1/ 9	0/ 0	27/17	0/ 0	0/ 0	27/17	0/ 0	0/ 0	22/13	1/ 2	27/17
PEAK ENDUSE	1.381	0.000	0.746	0.000	4.307	0.000	0.000	1.356	0.000	0.000	0.449	0.000	
PEAK PCT	16.8	0.0	9.1	0.0	52.3	0.0	0.0	16.5	0.0	0.0	5.5	0.0	
SEP													
KWH	398.	0.	225.	0.	143.	0.	0.	104.	0.	0.	118.	65.	1052.
MAX KW	1.557	0.000	0.746	0.000	2.925	0.000	0.000	1.386	0.000	0.000	0.597	0.180	6.574
DAY/HR	2/ 9	0/ 0	2/ 9	0/ 0	18/15	0/ 0	0/ 0	3/15	0/ 0	0/ 0	10/13	1/ 2	26/16
PEAK ENDUSE	1.557	0.000	0.746	0.000	2.900	0.000	0.000	1.021	0.000	0.000	0.349	0.000	
PEAK PCT	23.7	0.0	11.3	0.0	44.1	0.0	0.0	15.5	0.0	0.0	5.3	0.0	
OCT													
KWH	416.	0.	235.	0.	27.	0.	0.	103.	0.	0.	126.	67.	975.
MAX KW	1.557	0.000	0.746	0.000	2.157	0.000	0.000	1.322	0.000	0.000	0.613	0.180	5.629
DAY/HR	1/ 9	0/ 0	1/ 9	0/ 0	17/16	0/ 0	0/ 0	16/14	0/ 0	0/ 0	9/13	1/ 2	17/15
PEAK ENDUSE	1.557	0.000	0.746	0.000	2.149	0.000	0.000	0.819	0.000	0.000	0.358	0.000	
PEAK PCT	27.7	0.0	13.3	0.0	38.2	0.0	0.0	14.5	0.0	0.0	6.4	0.0	
NOV													
KWH	343.	0.	198.	0.	0.	0.	0.	109.	0.	0.	114.	65.	830.
MAX KW	1.557	0.000	0.746	0.000	0.000	0.000	0.000	1.034	0.000	0.000	0.643	0.180	3.927
DAY/HR	3/ 9	0/ 0	3/ 9	0/ 0	12/14	0/ 0	0/ 0	3/14	0/ 0	0/ 0	26/13	1/ 2	3/14
PEAK ENDUSE	1.557	0.000	0.746	0.000	0.000	0.000	0.000	1.034	0.000	0.000	0.590	0.000	
PEAK PCT	39.7	0.0	19.0	0.0	0.0	0.0	0.0	26.3	0.0	0.0	15.0	0.0	
DEC													
KWH	416.	0.	235.	0.	1.	0.	0.	105.	0.	0.	140.	67.	964.
MAX KW	1.557	0.000	0.746	0.000	1.129	0.000	0.000	1.205	0.000	0.000	0.678	0.180	4.727
DAY/HR	1/ 9	0/ 0	1/ 9	0/ 0	24/13	0/ 0	0/ 0	24/15	0/ 0	0/ 0	1/13	1/ 1	24/13
PEAK ENDUSE	1.557	0.000	0.746	0.000	1.129	0.000	0.000	0.617	0.000	0.000	0.678	0.000	
PEAK PCT	32.9	0.0	15.8	0.0	23.9	0.0	0.0	13.1	0.0	0.0	14.3	0.0	
=====													
KWH	4757.	0.	2694.	0.	1053.	0.	0.	1400.	0.	0.	1581.	788.	12274.
MAX KW	1.557	0.000	0.746	0.000	5.519	0.000	0.000	1.635	0.000	0.000	0.731	0.180	9.818
MON/DY	1/ 2	0/ 0	1/ 2	0/ 0	7/23	0/ 0	0/ 0	7/23	0/ 0	0/ 0	3/14	1/ 1	7/23
PEAK ENDUSE	1.557	0.000	0.746	0.000	5.519	0.000	0.000	1.635	0.000	0.000	0.361	0.000	
PEAK PCT	15.9	0.0	7.6	0.0	56.2	0.0	0.0	16.6	0.0	0.0	3.7	0.0	



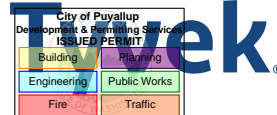
C407 Compliance – Cascade Christian School Office

Cascade School Office - Proposed
REPORT- PS-F Energy End-Use Summary for FMI

DOE-2.3-50h 7/24/2024 10:01:38
WEATHER FILE- TACOMA MCCORD AF WA

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
JAN													
THERM	0.	0.	0.	106.	0.	0.	0.	0.	0.	0.	0.	0.	106.
MAX THERM/HR	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
DAY/HR	0/0	0/0	0/0	7/8	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	7/8
PEAK ENDUSE	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FEB													
THERM	0.	0.	0.	118.	0.	0.	0.	0.	0.	0.	0.	0.	118.
MAX THERM/HR	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
DAY/HR	0/0	0/0	0/0	3/8	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	3/8
PEAK ENDUSE	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAR													
THERM	0.	0.	0.	142.	0.	0.	0.	0.	0.	0.	0.	0.	142.
MAX THERM/HR	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
DAY/HR	0/0	0/0	0/0	13/8	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	13/8
PEAK ENDUSE	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
APR													
THERM	0.	0.	0.	74.	0.	0.	0.	0.	0.	0.	0.	0.	74.
MAX THERM/HR	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
DAY/HR	0/0	0/0	0/0	9/8	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	9/8
PEAK ENDUSE	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAY													
THERM	0.	0.	0.	44.	0.	0.	0.	0.	0.	0.	0.	0.	44.
MAX THERM/HR	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
DAY/HR	0/0	0/0	0/0	7/8	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	7/8
PEAK ENDUSE	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
JUN													
THERM	0.	0.	0.	12.	0.	0.	0.	0.	0.	0.	0.	0.	12.
MAX THERM/HR	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
DAY/HR	0/0	0/0	0/0	18/8	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	18/8
PEAK ENDUSE	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
JUL													
THERM	0.	0.	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.	2.
MAX THERM/HR	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
DAY/HR	0/0	0/0	0/0	9/8	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	9/8
PEAK ENDUSE	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AUG													
THERM	0.	0.	0.	3.	0.	0.	0.	0.	0.	0.	0.	0.	3.
MAX THERM/HR	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
DAY/HR	0/0	0/0	0/0	25/8	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	25/8
PEAK ENDUSE	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SEP													
THERM	0.	0.	0.	17.	0.	0.	0.	0.	0.	0.	0.	0.	17.
MAX THERM/HR	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
DAY/HR	0/0	0/0	0/0	23/8	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	23/8
PEAK ENDUSE	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OCT													
THERM	0.	0.	0.	56.	0.	0.	0.	0.	0.	0.	0.	0.	56.
MAX THERM/HR	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
DAY/HR	0/0	0/0	0/0	31/8	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	31/8
PEAK ENDUSE	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NOV													
THERM	0.	0.	0.	111.	0.	0.	0.	0.	0.	0.	0.	0.	111.
MAX THERM/HR	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
DAY/HR	0/0	0/0	0/0	21/8	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	21/8
PEAK ENDUSE	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEC													
THERM	0.	0.	0.	105.	0.	0.	0.	0.	0.	0.	0.	0.	105.
MAX THERM/HR	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
DAY/HR	0/0	0/0	0/0	18/8	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	18/8
PEAK ENDUSE	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ANNUAL TOTALS													
THERM	0.	0.	0.	789.	0.	0.	0.	0.	0.	0.	0.	0.	789.
MAX THERM/HR	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
MON/DY	0/0	0/0	0/0	2/3	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	2/3
PEAK ENDUSE	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
PEAK PCT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Product Information Sheet



DuPont™ Tyvek® CommercialWrap®

High Performance Water-Resistive and Air Barrier (WRB)
Engineered to Stand Up to the Commercial Job Site



FEATURES/BENEFITS

Description

Engineered to provide excellent performance as an air and water barrier, DuPont™ Tyvek® CommercialWrap® delivers the added strength and durability needed in commercial construction. It provides an ideal balance of air and moisture management resulting in more durable and energy efficient structures.

Tyvek® CommercialWrap® is made from 100% flash spunbonded high density polyethylene fibers which have been fused together by heat and pressure, without binders or fillers, into a tough durable sheet structure. Additives have been incorporated into the polyethylene to provide ultraviolet light resistance.

Air and Water Barrier Performance

- Offers an ideal combination of air and water holdout plus vapor permeability.
- Air Barrier Association of America evaluated to exceed ABAA, ASHRAE 90.1 and IECC air leakage requirements when tested in accordance with ASTM E2357.
- Offers high tear-resistance and high wind-load-resistance to help stand up to commercial construction site conditions.
- Withstands up to nine months (270 days) of UV exposure*.
- ASTM E2556, Type II Compliant – Standard Specification for Vapor Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment.

Available Sizes

Tyvek® CommercialWrap® is available in the following roll sizes:

- 5' x 200' (1.5 x 61 m)
- 10' x 125' (3.1 x 38.1 m)

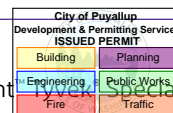
Sustainable Solutions

Tyvek® CommercialWrap® may contribute toward LEED® points in the areas of Energy and Atmosphere (EA): Optimizing the Building Envelope and Indoor Environmental Air Quality (EQ): Construction IAQ Management Plan and Low Emitting Materials. In addition, the use of a continuous air barrier is a prerequisite for LEED® applications requiring compliance with ASHRAE 90.1-2010.

By helping to effectively seal the building envelope, Tyvek® CommercialWrap® helps to reduce the amount of energy required for heating and cooling.

Complete System

Tyvek® CommercialWrap® can be integrated with DuPont Self-Adhered Flashing Products and DuPont™ Tyvek® Fluid Applied Products to offer seamless protection for wall systems that require mechanically fastened and fluid applied air and water barriers.



PROPERTIES

Review all instructions and (Material) Safety Data Sheet ((M)SDS) before use. Please contact your local DuPont representative for a list of distributors before writing specifications around this product. Product properties are as follows:

Test Method	Property	Typical Value	Units
ASTM E2357	Air Penetration Resistance	<0.01	cfm/ft ² @ 1.57 psf
ICC-ES AC 24 Section 6.11 ASTM E2273	Drainage Efficiency	Pass	-
ICC-ES AC 235 Section 4.5		>90	%
Gurley Hill (TAPPI T-460)	Air Penetration Resistance	Pass	-
ASTM E1677	Air Penetration Resistance	>1500	sec/100cc
ASTM E2178	Air Penetration Resistance	Type 1	cfm/ft ² @ 1.57 psf
ASTM E283	Wall Assembly Air Penetration Resistance	.001	cfm/ft ² @ 1.57 psf
ASTM E96-00	Water Vapor Transmission	<0.01	cfm/ft ² @ 1.57 psf
ASTM E96-00	Water Vapor Transmission	163	Method A g/m ² -24 hrs
ASTM E96-00	Water Vapor Transmission	23	Method A (perms)
ASTM E96-00	Water Vapor Transmission	200	Method B g/m ² -24 hrs
ASTM E96-00	Water Vapor Transmission	28	Method B (perms)
AATCC 127	Water Penetration Resistance	280	cm
ASTM E331	Wall Assembly Water Penetration Resistance	No leakage	Tested to 15 psf
TAPPI T-410	Basis Weight	130 (2.7)	gms/m ² (oz/yd ²)
ASTM D882	Breaking Strength	38/35	lbs/in
ASTM D1117	Tear Resistance	12/10	lbs
ASTM E84	Surface Burning Characteristics	15 Class A	Flame Spread Index Class
ASTM E84	Surface Burning Characteristics	25 Class A	Smoke Developed Index Class
NFPA 285	Flame Propagation/Multiple Assemblies	-	Pass
-	Ultra Violet Light Exposure (UV)	270 9	Days Months

Test results shown represent roll averages. Individual results may vary either above or below averages due to normal manufacturing variations, while continuing to meet product specifications.

WARNING: DuPont™ Tyvek® is combustible and should be protected from an open flame and other high heat sources. If the temperature of DuPont™ Tyvek® reaches 750°F (400°C), it will burn and the fire may spread and fall away from the point of ignition.



For more information visit us at
building.dupont.com
or call 1-833-338-7668

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