PRSG20251114

Illuminated Ellipse Sign S01
mounted flush to fascia.

S02 **Paint Note:**
Paint and Patch signband to Existing color. (Color TBD)

Center on THIS Reveal

PROPOSED ELEVATION
Scale: 3/16" - 1'-0"

EXISTING ELEVATION

Note:
Elevation shown is preliminary, field survey required prior to fabrication of signs.

S01 (1) Illuminated Letterset on Oval Background

S02 Patch and Paint Sign Band to Existing Color

City of Puyallup
Development & Permitting Services
ISSUED PERMIT

Building	Planning
Engineering	Public Works
Fire	Traffic

City of Puyallup Building REVIEWED FOR COMPLIANCE
BSnowden
10/16/2025
3:54:46 PM

The approved construction plans, documents, and all engineering must be posted on the job at all inspections in a visible and readily accessible location.

Full sized legible color plans are required to be provided by the permitee on site for inspection.

Approval of submitted plans is not an approval of omissions or oversights by this office or non compliance with any applicable regulations of local government. The contractor is responsible for making sure that the building complies with all applicable codes and regulations of the local government.

atlas BRANDING THE WORLD
National Headquarters: 1077 West Blue Heron Blvd.
West Palm Beach, Florida 33404
800.772.7932
www.atlasbtw.com

Revisions:
NR 06.09.2025 Re-centered Sign
SD 06.27.2025 Updated to reface; removed 'patch' note from S02
SD 07.21.2025 Updated to new sign
...
...

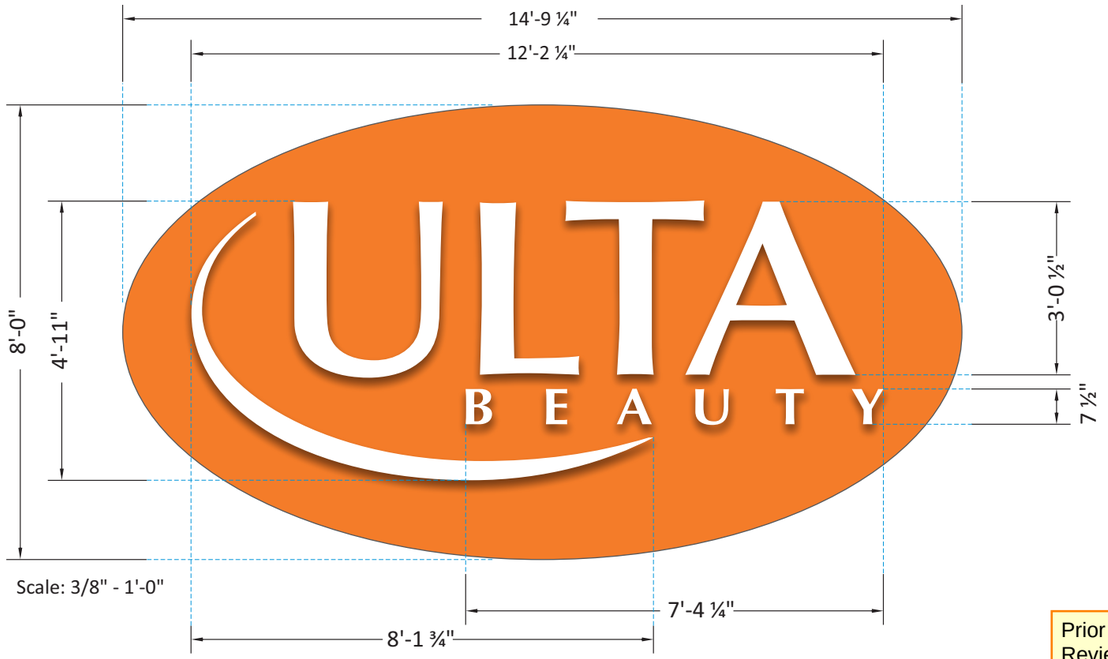
LL Signature: _____
Printed Name: _____
Company: _____
Date: _____

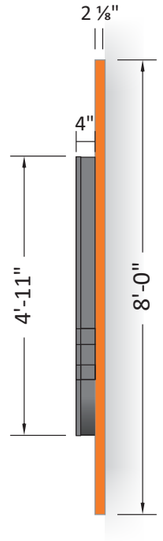
Store #1032

PM:
Drawn By: SO
Date: 04.10.2025

Address: 3500 Meridian
City State: Puyallup, WA 98373
Drawing Number: 213922-ELE1
Page: 2

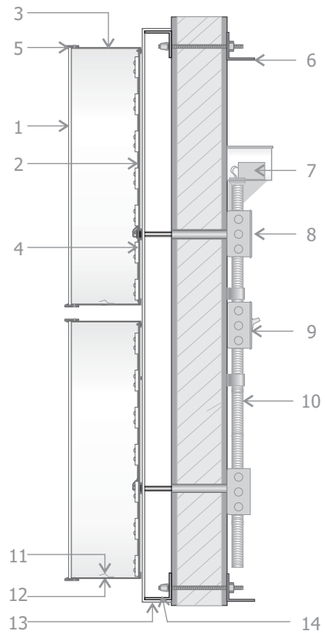
PRSG20251114





Prior to installation:
Review anchor and/or epoxy product's ICC-ES Report and install the product per the report(s). If the report states special inspection(s) are required - the final special inspection report must be on site during City inspections.

Remote Wired with
Controlled Background Panel



SCOPE

- Manufacture & install (1) new channel-letter on background 2 ⅛" background panel sign.

GENERAL DESCRIPTION

- Illuminated channel letters (4" depth)
  Letter returns are of aluminum, painted PMS 431C Gray.
- Faces of (7328) white acrylic
- Faces secured with Dove Gray trimcap
- Letters are internally illuminated by white LED modules
- Power supplies are installed remotely behind fascia.
- Letters installed onto 2 ⅛" deep .100" alum. BG panel, painted Orange
- Sign installed onto fascia with angle clips & non-corrosive fasteners

SQUARE FOOTAGE

- 8'-0" x 14'-9 ¼" = **118.16 Sq. Ft.**

COLOR SCHEDULE

ALL FACES: .177" 7328 White acrylic

LTR RETURNS: Painted PMS 431C Gray

TRIMCAP: Dove Gray

PANEL FACE & RETURNS: PMS 158 Orange (Semi-gloss)

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

1	.177" acrylic face
2	3mm ACM aluminum back
3	4" returns to be .040 aluminum
4	illumination to be provided by LED.
5	trimcap "Dove Gray"
6	mounting varies upon location and wall material
7	power supply remote
8	junction box
9	listed disconnect switch
10	primary power source
11	weep hole cover to be white pre-finished aluminum
12	weep hole
13	2 ⅛" deep flanged .100" aluminum panel
14	aluminum mounting angle (all four sides)

ELECTRICAL NOTES

1. All materials and fasteners meet 3004.4
2. All electrical components are UL listed, labeled and approved.
3. Sign grounded according to NEC 6007.7
4. Signs manufactured and listed NEC 600.3 and marked per NEC 600.4.
5. All branch circuits per NEC 600 .5(B).1 or (B).2.
6. All Signs controlled by photocell or time clock per FBC 13-415. (ABC).1.4.
7. One visible 20 amp disconnect per sign per circuit per NEC 600.6(A).1

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Revisions:
SD 06.27.2025 Updated to reface & retrofit
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LL Signature: _____
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Store #1032

PM:
Drawn By: SO
Date: 04.10.2025

Address: 3500 Meridian
City State: Puyallup, WA 98373
Drawing Number: 213922-S01

PRSG20251114

GENERAL

1. ALL MATERIALS AND WORK SHALL CONFORM TO THE REQUIREMENTS OF THE WASHINGTON STATE BUILDING CODE (REF 2021 IBC).
2. CONSTRUCTION METHODS AND PROJECT SAFETY: DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE AND DO NOT INDICATE METHODS, PROCEDURES, OR SEQUENCE OF CONSTRUCTION. TAKE NECESSARY PRECAUTIONS TO MAINTAIN AND ENSURE THE INTEGRITY OF THE STRUCTURE DURING CONSTRUCTION. THE EOR WILL NOT ENFORCE SAFETY MEASURES OR REGULATIONS. THE CONTRACTOR SHALL DESIGN, CONSTRUCT, AND MAINTAIN ALL SAFETY DEVICES AND SHALL BE SOLELY RESPONSIBLE FOR CONFORMING TO ALL LOCAL, STATE, AND FEDERAL SAFETY AND HEALTH STANDARDS, LAWS, AND REGULATIONS.
3. VERIFY ALL DIMENSIONS, ELEVATIONS AND SITE CONDITIONS PRIOR TO THE START OF CONSTRUCTION AND NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES OR INCONSISTENCIES THAT ARE FOUND. NOTED DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS. DO NOT SCALE DRAWINGS.
4. ALL OMISSIONS AND/OR CONFLICTS BETWEEN THE VARIOUS ELEMENTS OF THE WORKING DRAWINGS AND SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND FIELD INSPECTOR. THE ENGINEER SHALL PROVIDE A SOLUTION PRIOR TO PROCEEDING WITH ANY WORK AFFECTED BY THE CONFLICT OR OMISSION.
5. WHERE NO CONSTRUCTION DETAILS ARE SHOWN OR NOTED FOR ANY PART OF THE WORK, USE THOSE FOR OTHER SIMILAR WORK.
6. WHEN A DETAIL IS IDENTIFIED AS TYPICAL, APPLY IN ESTIMATING AND CONSTRUCTION TO EVERY LIKE CONDITION WHETHER OR NOT THE REFERENCE IS REPEATED IN EVERY INSTANCE.
7. CHANGES TO THE DRAWINGS: OBTAIN PRIOR WRITTEN APPROVAL.
8. WORK PERFORMED IN CONFLICT WITH THE DRAWINGS OR APPLICABLE BUILDING CODE REQUIREMENTS SHALL BE CORRECTED AT THE EXPENSE OF THE CONTRACTOR.

DESIGN CRITERIA

1. STRUCTURE IS DESIGNED IN ACCORDANCE WITH ASCE 7-16: MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.
2. WIND LOAD:
   - BASIC WIND SPEED, V_{ULT} = 100 MPH MAXIMUM
   - INTERIOR WIND PRESSURE: p_{asd} = 5 PSF
   - p_{ult} = 8 PSF
   - RISK CATEGORY: II EXPOSURE: C
3. SNOW LOAD:
   - IMPORTANCE FACTOR, I_s = 1.0
   - SURFACE ROUGHNESS: C EXPOSURE: C
   - GROUND 25 PSF MAXIMUM.
   - ROOF --- PSF
4. ROOF LIVE LOAD: --- PSF

STEEL

1. STEEL SHAPES SHALL CONFORM TO THE FOLLOWING (U.N.O.):

RND. HSS	ASTM A500, GR C	Fy=46 KSI MIN.
SQ./RECT. HSS	ASTM A500, GR C	Fy=50 KSI MIN.
THREADED ROD	ASTM A36	Fy=36 KSI MIN.
STEEL PLATE	ASTM A36	Fy=36 KSI MIN.
ANGLE & CHANNEL	ASTM A36	Fy=36 KSI MIN.
STD. PIPE	ASTM A53, GR B	Fy=35 KSI MIN.
STRUCT. PIPE	ASTM A252, GR 3	Fy=45 KSI MIN.
WIDE FLANGE	ASTM A992	Fy=50 KSI MIN.

2. MACHINE BOLTS SPECIFIED AS "A307" SHALL CONFORM TO ASTM A307 w/ NUTS PER ASTM A563A & WASHERS PER ASTM F844 (U.N.O.). THREADED PARTS, NUTS, AND WASHERS SHALL BE HDG OR ZP AS DEFINED HEREIN.
3. STRUCTURAL BOLTS SHALL CONFORM TO ASTM F3125 GRADES A325 OR A490 AS SPECIFIED ("A325" OR "A490") w/ NUTS PER ASTM A563DH & WASHERS PER ASTM F436.
   A. WHERE DESIGNATED AS "-X", CARE MUST BE TAKEN TO ENSURE THREADS ARE EXCLUDED FROM THE SHEAR PLANE(S).
   B. WHERE DESIGNATED AS "-N" OR IF NO DESIGNATION IS NOTED, THREADS MAY BE INCLUDED IN THE SHEAR PLANE(S).
   C. WHERE SPECIFIED, "A325" MAY BE HDG OR ZP AS DEFINED HEREIN.
   D. GRADE "A490" SHALL NOT BE HDG OR ZP AS DEFINED HEREIN.
4. ANCHORS CAST IN CONCRETE SHALL CONFORM TO ASTM F1554 GR. 36 (U.N.O.) w/ NUTS TO ASTM A563 AND WASHERS TO ASTM F436. PARTS SHALL BE HOT-DIP GALVANIZED (HDG) OR ZINC (MECHANICAL) PLATED (ZP). PARTS EMBEDDED ENTIRELY IN CONCRETE MAY BE PLAIN STEEL.
5. WHERE SPECIFIED FOR STEEL THREADED PARTS, NUTS, AND WASHERS, HOT-DIP GALVANIZING (HDG) SHALL CONFORM TO ASTM F2329 AND ZINC (MECHANICAL) PLATING (ZP) TO CLASS 55 PER ASTM B695.
6. PLAIN STEEL FASTENERS ARE NOT TO BE USED UNLESS SPECIFIED.
7. ZINC ELECTRO-PLATED FASTENERS PER ASTM F1941 MAY BE SUBSTITUTED FOR INTERIOR APPLICATIONS, BUT ARE OTHERWISE NOT TO BE USED UNLESS SPECIFIED.
8. NUTS AND WASHERS SHALL HAVE THE SAME COATING AS THE CORRESPONDING THREADED PART.
9. WHERE SPECIFIED, IRON AND STEEL HARDWARE SHALL BE HOT-DIP GALVANIZED PER ASTM A153.
10. STAINLESS STEEL (SS) BOLTS, STUDS, AND THREADED ROD SHALL CONFORM TO ASTM F593 AND BE ALLOY 304 OR 316 w/ NUTS TO ASTM F594. NUTS AND WASHERS SHALL MATCH THE ALLOY OF THE THREADED PART.
11. WELDING:
    A. WELD STRUCTURAL STEEL IN COMPLIANCE WITH ANSI/AWS D1.1 AND AISC SPECIFICATION, CHAPTER J. WELDERS SHALL BE CERTIFIED AS REQUIRED BY THE LOCAL BUILDING AUTHORITY. WELDING SHALL BE DONE BY ELECTRIC ARC PROCESS USING LOW-HYDROGEN ELECTRODES WITH SPECIFIED TENSILE STRENGTH NOT LESS THAN 70 KSI UNLESS NOTED OTHERWISE.
    B. UNLESS A LARGER WELD SIZE IS INDICATED, PROVIDE MINIMUM SIZE WELD PER AISC SPECIFICATION, SECTION J2, TABLE J2.4.

ALUMINUM

1. FABRICATE AND ERECT ALUMINUM IN COMPLIANCE WITH THE 2020 ALUMINUM DESIGN MANUAL (ADM1), THE SPECIFICATIONS FOR ALUMINUM SHEET METAL WORK (ASM35), AND CHAPTER 20 OF THE BUILDING CODE.
2. ALUMINUM SHAPES SHALL CONFORM TO THE FOLLOWING:

PIPE & TUBE	6061-T6	ASTM B429	Fy=35 KSI MIN.
STRUCT. PROFILES	6061-T6	ASTM B308	Fy=35 KSI MIN.
SHEET & PLATE	6061-T6	ASTM B209	Fy=35 KSI MIN.
STAPLE TUBE	6063-T5	ASTM B221	Fy=16 KSI MIN.

3. ALL SHOP AND FIELD WELDS SHALL BE PERFORMED BY AN AISC QUALITY CERTIFIED FABRICATOR.
4. UNLESS A LARGER WELD SIZE IS INDICATED, PROVIDE MINIMUM SIZE WELD PER ADM 1.
5. FILLER SHALL BE 5556 ALLOY REGARDLESS OF MEMBER THICKNESS. NO OTHER FILLER ALLOY SHALL BE USED UNLESS NOTED OTHERWISE.

CONCRETE & REINFORCEMENT

1. MINIMUM 28-DAY COMPRESSIVE STRENGTH (f'c) SHALL BE 2,500 PSI.
2. REINFORCEMENT TO BE ASTM A615 GR 60, Fy=60 KSI UNO.
3. CALCIUM CHLORIDE OR ADDED CHLORIDE IS NOT PERMITTED.
4. ALL REINFORCED CONCRETE SHALL BE CONSOLIDATED WITH MECHANICAL VIBRATORS.
5. MINIMUM CONCRETE COVER:
   - CAST AGAINST & EXPOSED TO EARTH 3"
   - EXPOSED TO EARTH OR WEATHER 2"
6. CHAIRS AND SPACERS: AS REQUIRED TO MAINTAIN COVER.
7. GROUT SHALL BE NON-SHRINK AND NON-METALLIC WITH A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI AT (1) DAY. MIX AND PLACE IN ACCORDANCE WITH MANUFACTURER INSTRUCTIONS.

FOUNDATIONS

1. DESIGN BEARING PRESSURES ARE PER IBC CLASS 4 PRESUMPTIVE VALUES (NO SPECIAL INSPECTION REQUIRED):
   - LATERAL BEARING: 150 PSF/FT
   - VERTICAL BEARING: 2,000 PSF

EXISTING CONDITIONS

1. ENGINEER WILL NOT BE PERFORMING ON-SITE INSPECTIONS OR VERIFICATIONS. IT IS THE RESPONSIBILITY OF THE INSTALLER AND OWNER(S) TO IDENTIFY EXISTING CONDITIONS AND CONTACT ENGINEER WITH ANY DISCREPANCIES OR CONCERNS.
2. EXISTING INFORMATION HAS BEEN FURNISHED BY THE ENTITY WHOM THIS DOCUMENT WAS PREPARED FOR. ENGINEER IN NO WAY CERTIFIES THIS INFORMATION AS "AS-BUILT".
3. FEATURES OF WORK ANNOTATED AS "VERIFY" (OR SIMILAR) MUST BE INSPECTED, VERIFIED AS SUCH, AND DOCUMENTED PRIOR TO FABRICATION AND INSTALLATION.
4. IF THERE IS ANY REASON TO BELIEVE THE EXISTING CONDITIONS DETAILED HEREIN ARE NOT ACCURATE, CONTRACTOR SHALL CEASE WORK AND NOTIFY ENGINEER IMMEDIATELY.
5. CONTRACTOR SHALL INSPECT AND CONFIRM THE QUALITY OF EXISTING STRUCTURE AS "IN GOOD REPAIR". STRUCTURE SHALL BE FREE OF CORROSION, DECAY, AND ANY OTHER MATERIAL, FABRICATION, ASSEMBLY, OR INSTALLATION DEFECT. IF THERE ARE ANY INDICATIONS THAT THIS IS NOT THE CASE, CONTRACTOR SHALL CEASE WORK IMMEDIATELY AND NOTIFY ENGINEER.

EVALUATION REPORT SCHEDULE

ANCHORS, FASTENERS, AND OTHER PRODUCTS SHALL CONFORM TO AND BE INSTALLED PER THEIR RESPECTIVE EVALUATION REPORT(S) AS FOLLOWS (NOT ALL APPLICABLE THIS PROJECT):

ANCHOR TYPE	REPORT #
HILTI KB-TZ2 (CS & SS) ANCHORS IN CONCRETE	ICC-ESR-4266
HILTI KB-TZ2 (CS & SS) ANCHORS IN MASONRY	ICC-ESR-4561
HILTI KH-EZ (CS & SS) ANCHORS IN CONCRETE	ICC-ESR-3027
HILTI KH-EZ (CS & SS) ANCHORS IN MASONRY	ICC-ESR-3056
HILTI HIT-HY 200 ADHESIVE IN CONCRETE	ICC-ESR-3187
HILTI HIT-HY 200 ADHESIVE IN MASONRY	ICC-ESR-3963
SIMPSON TITEN HD (CS) ANCHORS IN CONCRETE	ICC-ESR-2713
SIMPSON TITEN HD (CS & SS) ANCHORS IN MASONRY	ICC-ESR-1056
SIMPSON TITEN HD (SS) ANCHORS IN CONCRETE	UES-ER-493
TAPCON ANCHORS IN MASONRY	ICC-ESR-1671
TAPCON ANCHORS IN CONCRETE	ICC-ESR-2202
TAPCON+ SCREW ANCHORS IN CONCRETE	ICC-ESR-3699
ITW BUILDEX TEKS SDS	ICC-ESR-1976

ABBREVIATIONS

ABV.	ABOVE	G.C.	GENERAL CONTRACTOR
ADD'L.	ADDITIONAL	HDG	HOT DIP GALVANIZED
AFF	ABOVE FINISHED FLOOR	HOR.	HORIZONTAL
ALT.	ALTERNATE	O.C.	ON CENTER
ALUM.	ALUMINUM	LOC.	LOCATION
A.O.R.	ARCHITECT OF RECORD	MAX.	MAXIMUM
ARCH.	ARCHITECTURAL	MIN.	MINIMUM
BTM.	BOTTOM	(N)	NEW
BLK'G.	BLOCKING	N.T.E.	NOT TO EXCEED
CIRC.	CIRCLE/CIRCULAR	o/	OVER
CONC.	CONCRETE	O.D.	OUTSIDE DIAMETER
CONN.	CONNECTION	OPT.	OPTIONAL
CONT.	CONTINUOUS	PENE.	PENETRATION
CTR.	CONTRACTOR	REINF.	REINFORCEMENT
DIA.	DIAMETER	RND	ROUND
DET.	DETAIL	SIM.	SIMILAR
(E)	EXISTING	SS	STAINLESS STEEL
EXIST.	EXISTING	STD	STANDARD
EA.	EACH	SUPP.	SUPPLEMENTAL
E.W.	EACH WAY	SQ.	SQUARE
ELEV.	ELEVATION	T/O	TOP OF
EMBED.	EMBEDMENT	TYP.	TYPICAL
E.O.R.	ENGINEER OF RECORD	THK.	THICK(NESS)
FAB.	FABRICATOR/FABRICATION	U.N.O.	UNLESS NOTED OTHERWISE
FDN.	FOUNDATION	VERT.	VERTICAL
FRM'G.	FRAMING	w/	WITH
FTG.	FOOTING	w/o	WITHOUT
F.V.	FIELD VERIFY	ZP	ZINC (MECHANICAL) PLATED

MANUFACTURED SIGN CABINETS

UNLESS NOTED OTHERWISE, MANUFACTURED SIGN CABINETS SHALL BE DESIGNED BY THE MANUFACTURER/FABRICATOR OR OTHER COMPETENT PARTY AND FABRICATED IN ACCORDANCE WITH ALL APPLICABLE CODES, UL LISTINGS, LOCAL ORDINANCES, AND INDUSTRY STANDARDS. THIS INCLUDES FACES AND CLADDING, INTERNAL STRUCTURE, ELECTRICAL, AND ALL OTHER ACCESSORY COMPONENTS.

THE MANUFACTURER/FABRICATOR IS RESPONSIBLE FOR ENSURING ALL CABINETS ARE ASSEMBLED WITH ADEQUATE INTERNAL FRAMING AND STIFFNESS. CABINET FRAMING SHALL BE CAPABLE OF DELIVERING ALL IMPOSED DESIGN LOADS (WIND, SEISMIC, DEAD, SNOW, ETC.) DIRECTLY TO THE STRUCTURAL CONNECTIONS OR ELEMENTS DETAILED HEREIN. CABINET FRAMING SHALL LIMIT EXCESSIVE VIBRATION, DRIFT, OR DEFLECTION TO REASONABLE LEVELS.

FAILURE TO PROVIDE AN ADEQUATE LOAD PATH OR SUFFICIENT CABINET STIFFNESS MAY RESULT IN EXCESSIVE VIBRATION, DRIFT, OR DEFLECTION WHICH MAY YIELD SECOND-ORDER EFFECTS THAT CAN NEGATIVELY AFFECT THE PERFORMANCE OF THE STRUCTURAL CONNECTIONS OR ELEMENTS DETAILED HEREIN.

REVERENCE ENGINEERING MAKES NO CLAIMS AS TO THE SUITABILITY OF MANUFACTURED SIGN CABINETS IDENTIFIED AS "BY MFR." OR "BY FAB." WHICH HAVE NOT BEEN ENGINEERED, CERTIFIED, OR REVIEWED BY REVERENCE ENGINEERING UNLESS SPECIFICALLY CONTRACTED OTHERWISE AND DETAILED OR NOTED HEREIN.

THIS AREA INTENTIONALLY LEFT BLANK

DESIGN BY OTHERS NOTE

REVERENCE ENGINEERING IN NO WAY CERTIFIES OR MAKES CLAIMS TO THE SUITABILITY OF CONDITIONS OR ELEMENTS (EXISTING OR NEW) THAT ARE DESIGNED BY OTHERS. SUCH CONDITIONS AND ELEMENTS ARE IDENTIFIED AS "BY OTHERS" OR "DESIGN(ED) BY OTHERS" AND ARE NOT ENGINEERED BY REVERENCE ENGINEERING.

THE SCOPE OF ENGINEERING HEREIN ASSUMES THESE ELEMENTS HAVE BEEN, OR WILL BE, DESIGNED OR CHECKED FOR SUITABILITY BY A DESIGN PROFESSIONAL.

CONNECTION TO EXISTING STRUCTURE

REVERENCE ENGINEERING IN NO WAY CERTIFIES THE EXISTING STRUCTURE AS ADEQUATE AND ABLE TO SUPPORT THE LOADS FROM THE ASSEMBLY DETAILED HEREIN.

REVERENCE ENGINEERING HAS PROVIDED THESE DRAWINGS WITH THE UNDERSTANDING THAT THE EXISTING STRUCTURE WAS EITHER ORIGINALLY DESIGNED TO ACCEPT THE ASSEMBLY DETAILED HEREIN OR HAS BEEN (OR WILL BE) ASSESSED FOR ADEQUACY PRIOR TO FABRICATION AND INSTALLATION. IT IS THE UNDERSTANDING OF REVERENCE ENGINEERING THAT SUCH DETERMINATION OR EVALUATION HAS BEEN OR WILL BE MADE KNOWN TO THE OWNER/CONTRACTOR/FABRICATOR/SUB-CONTRACTOR.

City of Puyallup
Development & Permitting Services
ISSUED PERMIT

Building	Planning
Engineering	Public Works
Fire	Traffic

ELECTRICAL NOTE

ELECTRIC COMPONENTS AND WIRING ARE NOT DESIGNED BY REVERENCE ENGINEERING. FABRICATOR AND INSTALLER SHALL COMPLY WITH THE CURRENT VERSION OF THE ADOPTED NATIONAL ELECTRIC CODE (NEC) AND ARTICLE 600: "ELECTRIC SIGNS AND OUTLINE LIGHTING".

REVERENCE ENGINEERING
www.reverenceengineering.com
(619) 354-1152
501 W BROADWAY, STE 425
SAN DIEGO, CA 92101

PREPARED FOR:

ATLAS SIGNS

PROJECT #:

2510045

ULTA BEAUTY
#2133922 WALL SIGNS
3500 MERIDIAN
PUYALLUP, WA 98373

No:	Issue/Revision:	Date:
---	Initial Submittal	10-13-2025
1		
2		
3		
4		

BRETT J. SAUERS
STATE OF WASHINGTON
56893
REGISTERED
PROFESSIONAL ENGINEER

13-Oct-25

SHEET TITLE:

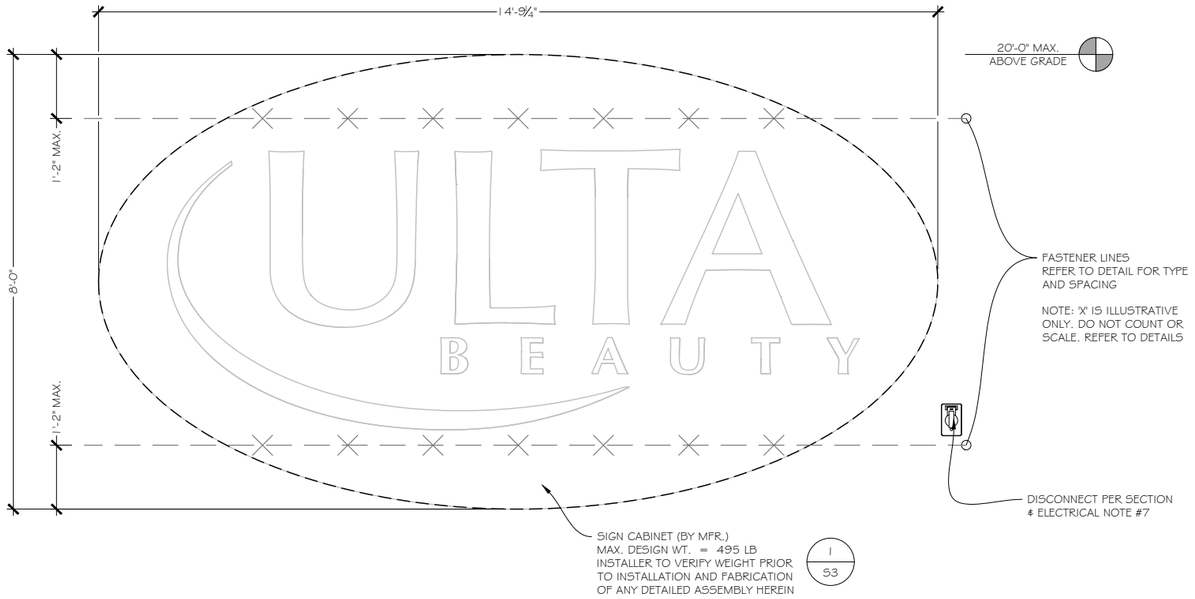
STRUCTURAL

SHEET:

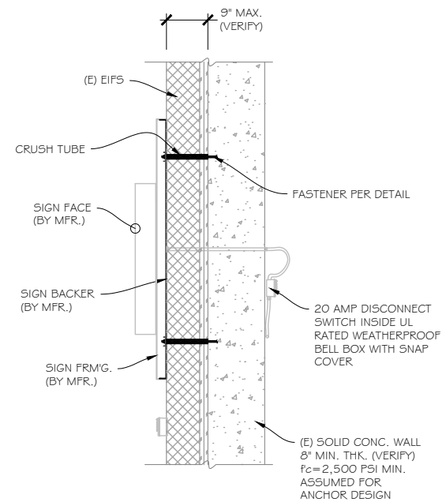
S.1

ORIGINAL SHEET SIZE: 11x17

PRSG20251114



1 SIGN S01 ELEVATION



2 TYP. SECTION

ELECTRICAL DATA	
Volts	120V Primary / 12V Secondary
Total Amps	2.2 Total Amps
Circuits	(1) 120 Amp Dedicated
Visible Disconnects	(1) 20 Amp / 120VAC
Power Supplies	(2) PL-60-12 @ 1.1 Amps

ELECTRICAL NOTES

1. ALL MATERIALS AND FASTENERS MEET 3004.4.
2. ALL ELECTRICAL COMPONENTS LISTED AND APPROVED IN ACCORDANCE WITH UL48 AND NEC NFPA 70.
3. SIGN GROUNDED ACCORDING TO NEC 600.7.
4. SIGNS MANUFACTURED AND LISTED NEC 600.3 AND MARKED PER NEC 600.4.
5. ALL BRANCH CIRCUITS PER NEC 600.5(B).1 OR (B).2.
6. ALL SIGNS CONTROLLED BY PHOTOCELL OR TIME CLOCK PER NEC 600.
7. ONE VISIBLE 20 AMP DISCONNECT PER SIGN PER CIRCUIT PER NEC 600.6(A).1
8. ALL CLASS 2 RATED LED MODULES AND LED POWER SUPPLIES WILL BE IN COMPLIANCE WITH A NATIONALLY RECOGNIZED TEST LABORATORY AND NEC 600.33 (A) THRU (D).
9. REFERENCE CODE IS NFPA 70 NEC 2023.

City of Puyallup
Development & Permitting Services
ISSUED PERMIT

Building	Planning
Engineering	Public Works
Fire	Traffic

LISTED MET us SNF 821

Complies with UL48 Sign Certification E212706

REVERENCE ENGINEERING
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501 W BROADWAY, STE 425
SAN DIEGO, CA 92101

PREPARED FOR:
ATLAS SIGNS

PROJECT #:
2510045

ULTA BEAUTY
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2		
3		
4		

BRETT J. SAUERS
STATE OF WASHINGTON
56893
REGISTERED
PROFESSIONAL ENGINEER

13-Oct-25

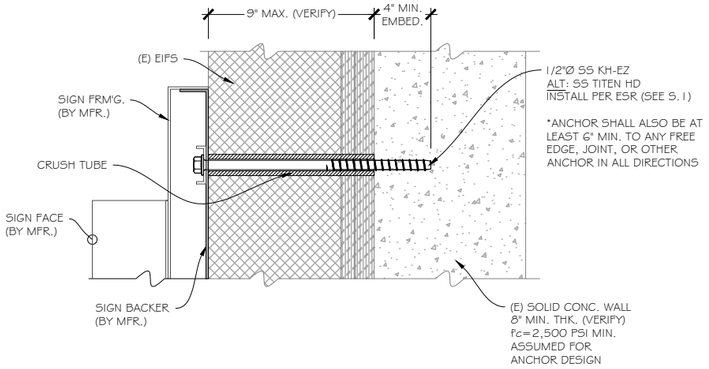
SHEET TITLE:
STRUCTURAL

SHEET:
S.2

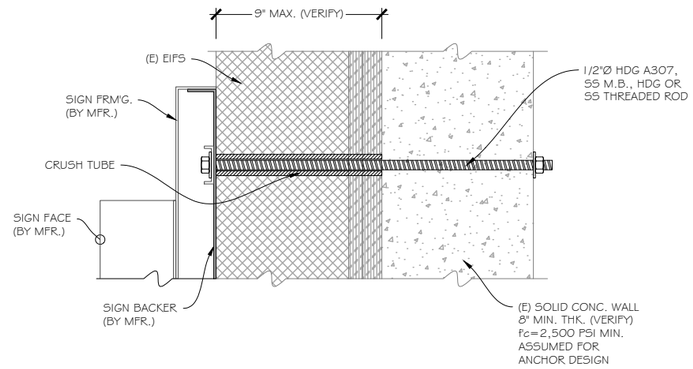
ORIGINAL SHEET SIZE: 11x17

PRSG20251114

USE EITHER FASTENER DETAIL @ 12" MAX. O.C.



OPTION 'A'



OPTION 'B'

1 CONNECTION DETAIL

City of Puyallup
Development & Permitting Services
ISSUED PERMIT

Building	Planning
Engineering	Public Works
Fire	Traffic

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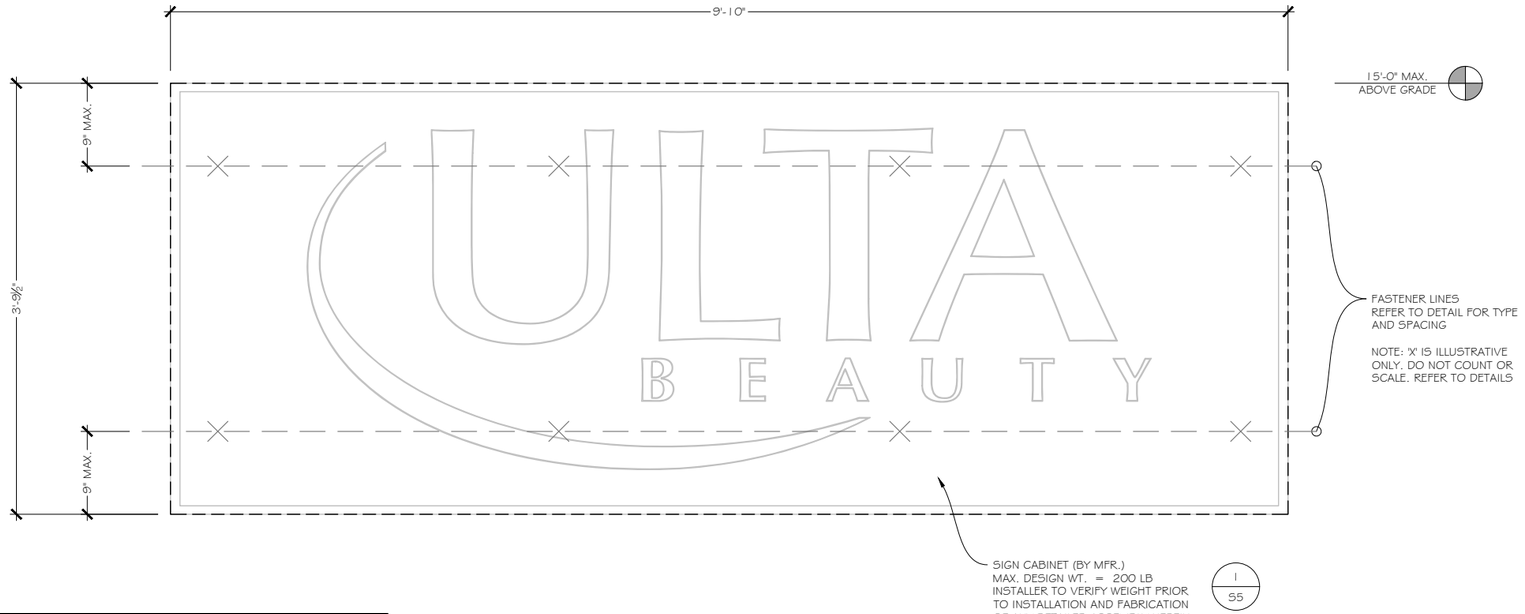
13-Oct-25

SHEET TITLE:
STRUCTURAL

SHEET:
S.3

ORIGINAL SHEET SIZE: 11x17

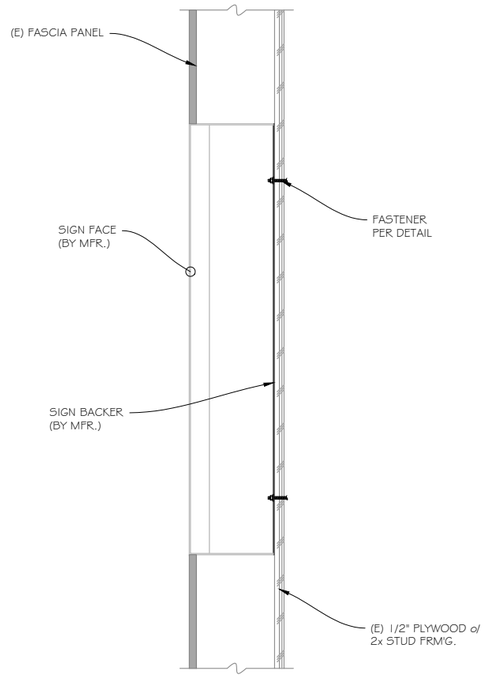
PRSG20251114



1 SIGN S03, S04, & S05 ELEVATION

INTERIOR FEATURE NOTE

DETAILED ASSEMBLY IS DESIGNED FOR INSTALLATION INTERIOR TO AN ENCLOSED STRUCTURE AND SHALL NOT BE INSTALLED DIRECTLY IN THE PATH OF AIR FLOW FROM A DOOR OR WINDOW OPENING. IF CONDITIONS DIFFER, CONTACT E.O.R IMMEDIATELY.



2 TYP. SECTION

ELECTRICAL DATA	
Volts	120V Primary / 12V Secondary
Total Amps	0.7 Total Amps
Circuits	(1) 120VAC/20 amp Dedicated
Visible Disconnects	(1) 120 VAC 20 Amp
Power Supplies	(1) PS-12 60W C1 @ 0.70A each

ELECTRICAL NOTES

1. ALL MATERIALS AND FASTENERS MEET 3004.4.
2. ALL ELECTRICAL COMPONENTS LISTED AND APPROVED IN ACCORDANCE WITH UL48 AND NEC NFPA 70.
3. SIGN GROUNDED ACCORDING TO NEC 600.7.
4. SIGNS MANUFACTURED AND LISTED NEC 600.3 AND MARKED PER NEC 600.4.
5. ALL BRANCH CIRCUITS PER NEC 600.5(B). 1 OR (B).2.
6. ALL SIGNS CONTROLLED BY PHOTOCELL OR TIME CLOCK PER NEC 600.
7. ONE VISIBLE 20 AMP DISCONNECT PER SIGN PER CIRCUIT PER NEC 600.6(A). 1
8. ALL CLASS 2 RATED LED MODULES AND LED POWER SUPPLIES WILL BE IN COMPLIANCE WITH A NATIONALLY RECOGNIZED TEST LABORATORY AND NEC 600.33 (A) THRU (D).
9. REFERENCE CODE IS NFPA 70 NEC 2023.

City of Puyallup
Development & Permitting Services
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LISTED MET us SNF S21 — Complies with UL48 Sign Certification E212706

REVERENCE ENGINEERING
www.reverenceengineering.com
(619) 354-1152
501 W BROADWAY, STE 425
SAN DIEGO, CA 92101

PREPARED FOR:
ATLAS SIGNS

PROJECT #:
2510045

ULTA BEAUTY
#213922 WALL SIGNS
3500 MERIDIAN
PUYALLUP, WA 98373

No:	Issue/Revision:	Date:
----	Initial Submittal	10-13-2025
1		
2		
3		
4		

BRETT J. SAUERS
STATE OF WASHINGTON
56893
REGISTERED
PROFESSIONAL ENGINEER

13-Oct-25

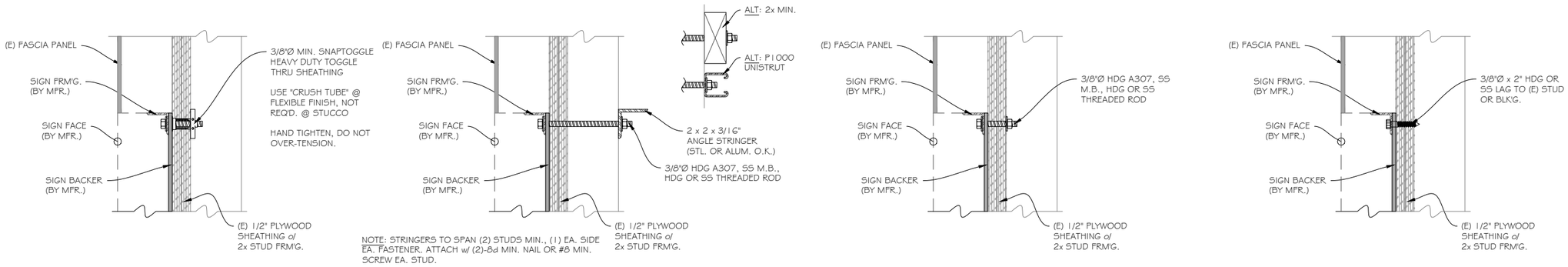
SHEET TITLE:
STRUCTURAL

SHEET:
S.4

ORIGINAL SHEET SIZE: 11x17

PRSG20251114

USE EITHER FASTENER DETAIL @ 36" MAX. O.C.



OPTION 'A' | OPTION 'B' | OPTION 'C' | OPTION 'D'

NOTE: STRINGERS TO SPAN (2) STUDS MIN., (1) EA. SIDE EA. FASTENER. ATTACH w/ (2)-8d MIN. NAIL OR #8 MIN. SCREW EA. STUD.

INTERIOR FEATURE NOTE

DETAILED ASSEMBLY IS DESIGNED FOR INSTALLATION INTERIOR TO AN ENCLOSED STRUCTURE AND SHALL NOT BE INSTALLED DIRECTLY IN THE PATH OF AIR FLOW FROM A DOOR OR WINDOW OPENING. IF CONDITIONS DIFFER, CONTACT E.O.R IMMEDIATELY.

1 CONNECTION DETAIL

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Fire	Traffic

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PREPARED FOR:
ATLAS SIGNS

PROJECT #:
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ULTA BEAUTY
#213922 WALL SIGNS
3500 MERIDIAN
PUYALLUP, WA 98373

No:	Issue/Revision:	Date:
----	Initial Submittal	10-13-2025
1		
2		
3		
4		

13-Oct-25

SHEET TITLE:
STRUCTURAL

SHEET:
S.5

ORIGINAL SHEET SIZE: 11x17

REVERENCE ENGINEERING

STRUCTURAL CALCULATIONS

for

PRSG20251114

Ulta Beauty #213922 Wall Signs

at

3500 Meridian

Puyallup, WA 98373

Prepared for:

Atlas Signs

Package Type:

Initial Submittal

Project #:

2510045

DESIGN SPECIFICATIONS

1. Washington State Building Code (ref. 2021 IBC)
2. ASCE 7-16: Minimum Design Loads for Buildings and Other Structures
3. ACI 318-19: Building Code Requirements for Structural Concrete
4. ANSI/AISC 360-16: Specification for Structural Steel Buildings
5. Aluminum Design Manual (ADM-1) 2020

DESIGN CRITERA

::Wind:: V_{ult} = 100 mph

Exposure: C

::Ground Snow Load:: p_g = 25 psf

These calculations must be on site and made available by the Permittee for all inspections.

City of Puyallup
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Date Signed: 13/10/2025

Reverence Engineering
501 W Broadway, STE 425
San Diego, CA 92101
(o) 619-354-1152
projects@reverenceengineering.com

SIGN S01

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Wind Pressure Calculation

COMPONENT AND CLADDING (C&C) WIND LOADS PER ASCE 7-16 CHAPTER 30, PART 2 ***Applicable for solid attached signs per Section 29.3.2***

Applicable to an enclosed low-rise building or an enclosed building with h ≤ 60 ft

Exposure Category: C

V_{ult} =	100	mph	Basic Wind Speed
A =	10	ft^2	Effective Wind Area (10 sf min. is most cons.)
z =	20	ft	Evaluation Height (15' Min, Higher → conservative)
K_{zt} =	1	-	Topographic Factor [26.8.2]

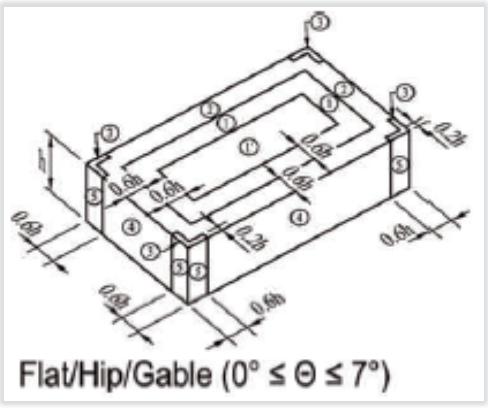
	Interior Zone
x	End Zone (0.6h)

Building Zone: 5

EXCERPT FROM FIGURE 30.4-1

Eff. Area	Basic Wind Speed, V (mph)																	
	95		100		105		110		115		120		130		140		150	
10	16.2	-21.7	18	-24.1	19.8	-26.6	21.8	-29.1	23.8	-31.9	25.9	-34.7	30.4	-40.7	35.3	-47.2	40.5	-54.2
20	15.5	-20.3	17.2	-22.5	18.9	-24.8	20.8	-27.2	22.7	-29.7	24.7	-34.2	29	-38	33.7	-44	38.7	-50.5
50	14.5	-18.3	16.1	-20.3	17.8	-22.4	19.5	-24.6	21.3	-26.9	23.2	-29.3	27.2	-34.3	31.6	-39.8	36.2	-45.7
100	13.8	-16.9	15.3	-18.7	16.9	-20.6	18.5	-22.6	20.2	-24.7	22	-26.9	25.9	-31.6	30	-36.7	34.4	-42.1

Eff. Area	Basic Wind Speed, V (mph)									
	160		170		180		190		200	
10	46.1	-67.1	52	-69.6	58.3	-78	64.9	-87	72	-96.3
20	44	-57.5	49.6	-67.9	55.7	-72.8	62	-81.1	68.7	-89.9
50	41.2	-52	46.6	-58.7	52.2	-68.5	58.1	-73.4	54.4	-81.3
100	39.2	-47.9	44.2	-54.1	49.6	-60.6	55.2	-67.5	61.2	-74.8



Eff. Area	p_{net30} Interpolation					
	100		105		100	
10	18	-24.1	19.8	-26.6	18	-24.1
20	17.2	-22.5	18.9	-24.8	17.2	-22.5
50	16.1	-20.3	17.8	-22.4	16.1	-20.3
100	15.3	-18.7	16.9	-20.6	15.3	-18.7

Effective Area Interpolation		
Eff. A	10	
10	18	-24.1
20	17.2	-22.5
10	18	-24.1

h	Exposure		
	B	C	D
15	1.00	1.21	1.47
20	1.00	1.29	1.55
25	1.00	1.35	1.61
30	1.00	1.40	1.66
35	1.05	1.45	1.70
40	1.09	1.49	1.74
45	1.12	1.53	1.78
50	1.16	1.56	1.81
55	1.19	1.59	1.84
60	1.22	1.62	1.87
Exposure Interpolation			
20	1	1.29	1.55
25	1	1.35	1.61
20	1	1.29	1.55

p_{net30} = { 18 psf into surface; -24.1 psf out of surface

λ = 1.29 - Adjustment Factor

p_{net} = { 23.22 psf into surface; -31.09 psf out of surface

[Eqn. 30.4-1] $p_{net} = \lambda * K_{zt} * p_{net30}$

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EFFECTIVE WIND AREA, A:

The area used to determine the external pressure coefficient, (GCp) and (GCrn). For C&C elements, the effective wind area in Figs. 30.3-1 through 30.3-7, 30.4-1, 30.5-1, and 30.7-1 through 30.7-3 is the span length multiplied by an effective width that need not be less than one-third the span length. For rooftop solar arrays, the effective wind area in Fig. 29.4-7 is equal to the tributary area for the structural element being considered, except that the width of the effective wind area need not be less than one-third its length. For adding fasteners, the effective wind area shall not be greater than the area that is tributary to an individual fastener.

Loading Analysis

RECTANGULAR WALL SIGN w/ (2) FASTENER ROWS

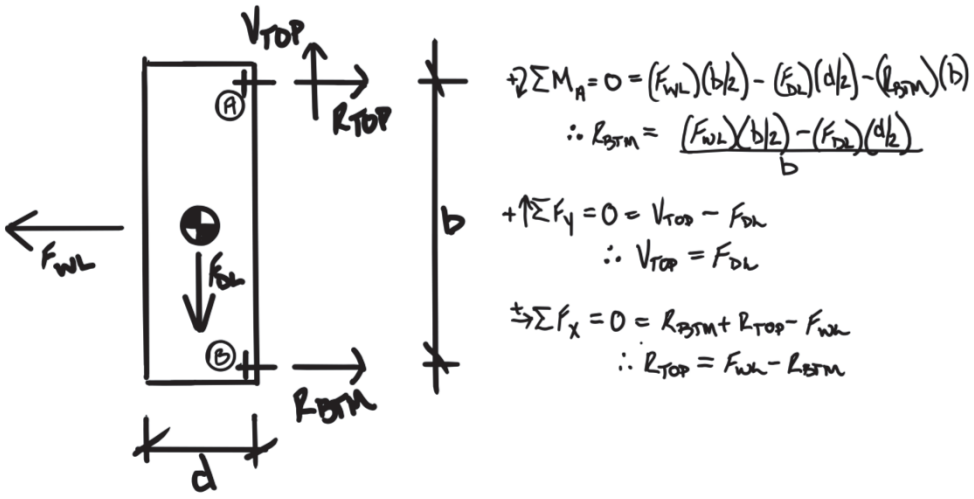
Assumptions:

1. Top row carries dead load

h =	8	ft	Cabinet Height (OK to be conservatively high)	p_{net} =	31.089	psf	Out of surface
l =	11.603	ft	Cabinet Length (OK to be conservatively high)	w =	8	psf	Presumed dead load (Max.)
d =	6.125	in	Cabinet Depth (max.)		33%	-	Percent Open (Negative Space)
s =	12	in	Horiz. Fastener O.C. Spacing (max.)	A_{net} =	62	ft²	Net Design Area
b =	5.6667	ft	Vert. Fastener Row Spacing (min.)	n =	12	-	# Fasteners per row

PERPENDICULAR LOADING OUT OF WALL (SUCTION)

	LRFD LOADING			ASD LOADING		
	LC #	4	= 1.2D + 1.0W	LC #	5	= D + 0.6W
Total Wind Force	F_{WL} =	1927.5	lb	F_{WL} =	1156.5	lb
Total Dead Load	F_{DL} =	595.2	lb	F_{DL} =	496	lb
Top Row Force (T/C)	R_{TOP} =	990.56	lb	R_{TOP} =	600.59	lb
Bottom Row Force (T/C)	R_{BTM} =	936.95	lb	R_{BTM} =	555.92	lb
Top Row Shear (vert.)	V_{TOP} =	595.2	lb	V_{TOP} =	496	lb
Tension per fastener	R_u =	82.547	lb	R_a =	50.049	lb
Shear per fastener	V_u =	49.6	lb	V_a =	41.333	lb



$+\circlearrowleft \Sigma M_A = 0 = (F_{WL})(b/2) - (F_{DL})(d/2) - (R_{BTM})(b)$

$\therefore R_{BTM} = \dfrac{(F_{WL})(b/2) - (F_{DL})(d/2)}{b}$

$+\uparrow \Sigma F_y = 0 = V_{TOP} - F_{DL}$

$\therefore V_{TOP} = F_{DL}$

$\pm\rightarrow \Sigma F_x = 0 = R_{BTM} + R_{TOP} - F_{WL}$

$\therefore R_{TOP} = F_{WL} - R_{BTM}$

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Fastener Design

Steel Fastener & Threaded Part Check per AISC

T_u =	0.0825	kip	Fastener Tension
V_u =	0.0496	kip	Fastener Shear
d_{bolt} =	0.5	in	Bolt diameter

A36 Rod			← Threaded Part Grade
F_u =	36	ksi	← Tensile Ult. Strength per AISC T

A_{bolt} =	0.20	in^2	Area of Bolt
F_{nt} =	27	ksi	Nom. Tensile Stress per AISC Table J3.2
F_{nv} =	16.2	ksi	Nom. Shear Stress per AISC Table J3.2

f_{rv} =	0.25	ksi		Required Shear Stress
F'_{nt} =	27.00	ksi		Modified Nominal Tensile Stress (J3-3a)
φ =	0.75	-		Strength Reduction Factor
φT_n =	4.0	kip		Tensile Rupture Capacity
D/C:	0.02		OK	
φV_n =	2.4	kip		Shear Rupture Capacity
D/C:	0.02		OK	
φR_n =	4.0	kip		Modified Tensile Rupture Capacity
D/C:	0.02		OK	

See HILTI Calculation for Post-Installed Anchors

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SIGN S03, S04, & S05

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Wind Pressure Calculation

Wind Load on Interior Features

Per Chapter 16 of the building code, interior walls and partitions shall be able to resis a minumim horizontal ASD load of 5 psf live load. In lieu of specific guidance for interior signs and other elements, the ASD 5 psf shall be treated as wind load and factored by 1.6 (LRFD) to create an "ultimate" pressure.

p_{asd} =	5.0	psf	Interior Lateral ("wind") Load (ASD)
x	1.6	-	LRFD typical load factor
p_{ult} =	8.00	psf	Interior Lateral ("wind") Load (ULT)

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Loading Analysis

RECTANGULAR WALL SIGN w/ (2) FASTENER ROWS

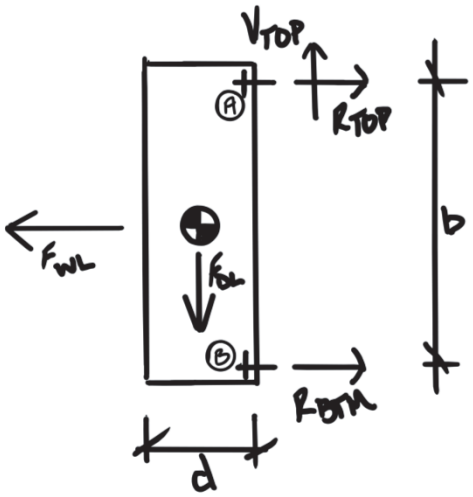
Assumptions:

1. Top row carries dead load

h =	3.7917	ft	Cabinet Height (OK to be conservatively high)	p_{net} =	8.00	psf	Out of surface
l =	9.8333	ft	Cabinet Length (OK to be conservatively high)	w =	5	psf	Presumed dead load (Max.)
d =	9	in	Cabinet Depth (max.)		0%	-	Percent Open (Negative Space)
s =	36	in	Horiz. Fastener O.C. Spacing (max.)	A_{net} =	37.285	ft^2	Net Design Area
b =	2.3333	ft	Vert. Fastener Row Spacing (min.)	n =	4	-	# Fasteners per row

PERPENDICULAR LOADING OUT OF WALL (SUCTION)

	LRFD LOADING LC # 4 = 1.2D + 1.0W			ASD LOADING LC # 5 = D + 0.6W		
Total Wind Force	F_{WL} =	298.28	lb	F_{WL} =	178.97	lb
Total Dead Load	F_{DL} =	240.49	lb	F_{DL} =	200.41	lb
Top Row Force (T/C)	R_{TOP} =	187.79	lb	R_{TOP} =	121.69	lb
Bottom Row Force (T/C)	R_{BTM} =	110.49	lb	R_{BTM} =	57.275	lb
Top Row Shear (vert.)	V_{TOP} =	240.49	lb	V_{TOP} =	200.41	lb
Tension per fastener	R_u =	46.947	lb	R_a =	30.423	lb
Shear per fastener	V_u =	60.122	lb	V_a =	50.101	lb



$+\circlearrowleft \Sigma M_A = 0 = (F_{WL})(b/2) - (F_{DL})(d/2) - (R_{BTM})(b)$

$\therefore R_{BTM} = \dfrac{(F_{WL})(b/2) - (F_{DL})(d/2)}{b}$

$+\uparrow \Sigma F_y = 0 = V_{TOP} - F_{DL}$

$\therefore V_{TOP} = F_{DL}$

$\pm\rightarrow \Sigma F_x = 0 = R_{BTM} + R_{TOP} - F_{WL}$

$\therefore R_{TOP} = F_{WL} - R_{BTM}$

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Fastener Design

Steel Fastener & Threaded Part Check per AISC

T_u =	0.0469	kip	Fastener Tension
V_u =	0.0601	kip	Fastener Shear
d_{bolt} =	0.375	in	Bolt diameter

A36 Rod		← Threaded Part Grade
F_u =	36 ksi	← Tensile Ult. Strength per AISC T

A_{bolt} =	0.11	in^2	Area of Bolt
F_{nt} =	27	ksi	Nom. Tensile Stress per AISC Table J3.2
F_{nv} =	16.2	ksi	Nom. Shear Stress per AISC Table J3.2

f_{rv} =	0.54	ksi	Required Shear Stress
F'_{nt} =	27.00	ksi	Modified Nominal Tensile Stress (J3-3a)
φ =	0.75	-	Strength Reduction Factor
φT_n =	2.2	kip	Tensile Rupture Capacity
D/C:	0.02	OK	
φV_n =	1.3	kip	Shear Rupture Capacity
D/C:	0.04	OK	
φR_n =	2.2	kip	Modified Tensile Rupture Capacity
D/C:	0.02	OK	

TOGGLER SNAPTOGGLES IN 5/8" GYPSUM

T_u =	46.947	lb x 0.6 = T_a =	28.168	lb
V_u =	60.122	lb / 1.2 = V_a =	36.073	lb

Ω = 4

Anchor	Dia.-Thread (in-tpi)	Tension Allow (T/Ω) (lb)	D/C		Shear Allow. (T/Ω) (lb)	D/C		Combined D/C	
BA	3/16"-24	89	0.3165	OK	74.5	0.4842	OK	0.8007	OK
BB	1/4"-20	89	0.3165	OK	81	0.4453	OK	0.7618	OK
BE	5/16"-18	120	0.2347	OK	81	0.4453	OK	0.6801	OK
BC	3/8"-16	144	0.1956	OK	101.5	0.3554	OK	0.551	OK
BD	1/2"-13	144	0.1956	OK	101.5	0.3554	OK	0.551	OK

LAG SCREW IN SINGLE SHEAR - WOOD MAIN MEMBER w/ METAL SIDE PLATE

LOADS

W_u =	46.947	lb	Factored Withdrawal
Z_u =	60.122	lb	Factored Lateral

DOWEL INFORMATION

D =	0.375	in	Dowel Diameter
L =	3	in	Dowel Length
g =	1	in	Gap
w =	0	in	Hardware (washer, etc.)

ADJUSTMENT FACTORS

C_M =	1	Wet Service Factor (11.3.3)
C_t =	1	Temperature Factor (11.3.4)
C_g =	1	Group Action Factor (11.3.6)
C_Δ =	1	Geometry Factor (12.5.1)
C_d =		Penetration Depth Factor
C_{eg} =	1	End Grain Factor (12.5.20
C_{st} =		Metal Side Plate Factor
C_{di} =	1	Diaphragm Factor (12.5.30
C_{tn} =	1	Toe-Nail Factor (12.5.4)
K_F =	3.32	Conversion Factor (11.3.1)
φ =	0.65	Resistance Factor (11.3.1)
λ =	0.8	Time Effect Factor (N.3.3)

0.6	1.4D
0.7	1.2D+1.6L+0.5(Lr or S) - Live Storage
0.8	1.2D+1.6L+0.5(Lr or S) - Live Occupancy
0.8	1.2D+1.6(Lr or S)+(L or 0.5W)
1.0	All others

SIDE MEMBER

Aluminum 6061

F_u =	38	ksi	Ultimate Strength
t_s =	0.125	in	Thickness

Side Member Options	F_u (ksi)
Mild Steel	58
Aluminum 6061	38
Aluminum 6063	22
Manual →	

MAIN MEMBER

Douglas Fir - Larch

G =	0.5	-	Specific Gravity
t_m =	0.5	in	
θ =	0	deg	

(0 deg: load parallel to grain)
(90 deg: load perp. to grain) *Note: 90° is conservative*

Main Member Options	G (-)
Douglas Fir - Larch	0.5
Southern Pine	0.55
Manual →	

CONNECTION GEOMETRY

L_1 =	1.125	in	Total dowel length before shear plane
L_2 =	1.875	in	Total dowel length after shear plane
L_2' =	1.7656	in	Usable dowel length after shear plane (incl. E/2)
L_3 =	1.375	in	Total dowel length protruding from main member
L_3' =	1.2656	in	Usable dowel length protruding from main member (incl E/2)
L_m =	0.5	in	Total dowel length embedded in main member
L_m' =	0.5	in	Usable dowel length embedded in main member (incl. E/2)
S' =	-0.125	in	Shank into (+) or out of (-) main member
p_t =	0.3906	in	Thread penetration into main member (excl. tip, E)

LAG SCREW REFERENCE TABLE

D =	0.25	0.3125	0.375	0.4375	0.5	0.625	0.75	0.875	1	1.125	1.25
D_r =	0.173	0.227	0.265	0.328	0.371	0.471	0.579	0.683	0.78	0.887	1.012
E =	0.1563	0.1875	0.2188	0.2813	0.3125	0.4063	0.5	0.5	0.6875	0.7813	0.875

DOWEL BEARING CALCULATIONS

$F_{em,II}$ =	5600	psi	Dowel bearing strength, para. to grain [NDS Table 12.3.3 Footnote 2]
$F_{em,perp}$ =	3646	psi	Dowel bearing strength, perp. to grain [NDS Table 12.3.3 Footnote 2]
$F_{em,\theta}$ =	5600	psi	Main member dowel bearing strength (Hankinson formula, NDS Appendix J)
F_{es} =	57000	psi	Side member dowel bearing strength (NDS Appendix I)
F_{yb} =	45000	psi	Dowel Bending Yield Strength (NDS Appendix I)
L_s =	0.125	in	Side member dowel bearing length
L_m =	0.5	in	Main member dowel bearing length

S =	1	in	Shank Length (max).
T =	2	in	Threaded Length (min.)
D_r =	0.265	in	Root Diameter
E =	0.2188	in	Tapered Tip
T-E =	1.7813	in	Thread - Tip
T-E/2 =	1.8906	in	Thread - Tip/2 (NDS Assump.)

YIELD MODE DOWEL EQUATIONS [AWC Technical Report 12 Table 1-1]

q_m =	1484	lbs/in	Main member dowel bearing resistance ($F_{em}D$)
M_m =	139.57	in-lbs	Main member dowel moment resistance
q_s =	15105	lbs/in	Side member dowel bearing resistance ($F_{es}D$)
M_s =	139.57	in-lbs	Side member dowel moment resistance

MODE	A	B	C	P (lb)	R_d (-)	Z (lb)
I_m	-	-	-	742	4	185.5
I_s	-	-	-	1888.1	4	472.03
II	0.0002	1.3125	-151.8	113.8	3.6	31.61
III_m	0.0002	1.25	-232.3	180.6	3.2	56.437
III_s	0.0004	1.0625	-198.6	176.53	3.2	55.165
IV	0.0004	1	-279.1	255.07	3.2	79.709

A, B, C, P: Variables from AWC TR-12
R_d: Reduction Term (NDS Table 12.3.1B)
K_θ = 1

WITHDRAWAL LOADING

W =	304.97	lb/in	Reference Withdrawal Design Value (NDS 12.2-1)
W' =	526.49	lb/in	Adjusted Withdrawal Design Value
$p_{t,req}$ =	0.0892	in	Required thread penetration for withdrawal
$p_{t,actual}$ =	0.391	in	Actual thread penetration for withdrawal
W' =	205.66	lb	Adjusted Withdrawal Design Value
D/C:	0.2283	OK	Demand : Capacity

LATERAL LOADING

p_{min} =	1.06	in	Min. embedment [NDS 12.1.4.6] N.G.
p_{tot} =	0.5	in	Total dowel embedment:
Z =	31.61	lb	Reference Lateral Design Value (from Yield Modes)
Z' =	54.572	lb	Adjusted Lateral Design Value
D/C:	1.1017	N.G.	Demand : Capacity

COMBINED LATERAL AND WITHDRAWAL LOADING [NDS 11.4.1]

α =	0.663	rad =	37.985 deg
R_u' =	76.28	lb	Resultant Force
Z_α' =	75.613	lb	Adjusted Design Value
D/C:	1.0088	N.G.	Demand : Capacity

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Specifier's comments:

1 Input data

Anchor type and diameter:	**KWIK HUS-EZ (KH-EZ)-SS316 1/2 (2 1/4)**
Item number:	2245579 KH-EZ SS316 1/2"x3"
Specification text:	Hilti ∅ 1/2 in KWIK HUS-EZ (KH-EZ)-SS316 with 2.25 in nominal embedment depth per ICC-ES ESR-3027 , Hammer drill bit installation per MPII,
Effective embedment depth:	$h_{ef,act}$ = 1.560 in., h_{nom} = 2.250 in.
Material:	AISI 316
Evaluation Service Report:	ESR-3027
Issued I Valid:	12/1/2023 | 12/1/2025
Proof:	Design Method ACI 318-19 / Mech
Shear edge breakout verification:	Row closest to edge (Case 3 only from ACI 318-19 Fig. R.17.7.2.1b)
Stand-off installation:	
Profile:	
Base material:	cracked concrete, 2500, f_c' = 2,500 psi; h = 420.000 in.
Installation:	**Hammer drilled hole, Installation condition: Dry**
Reinforcement:	tension: not present, shear: not present; no supplemental splitting reinforcement present edge reinforcement: none or < No. 4 bar

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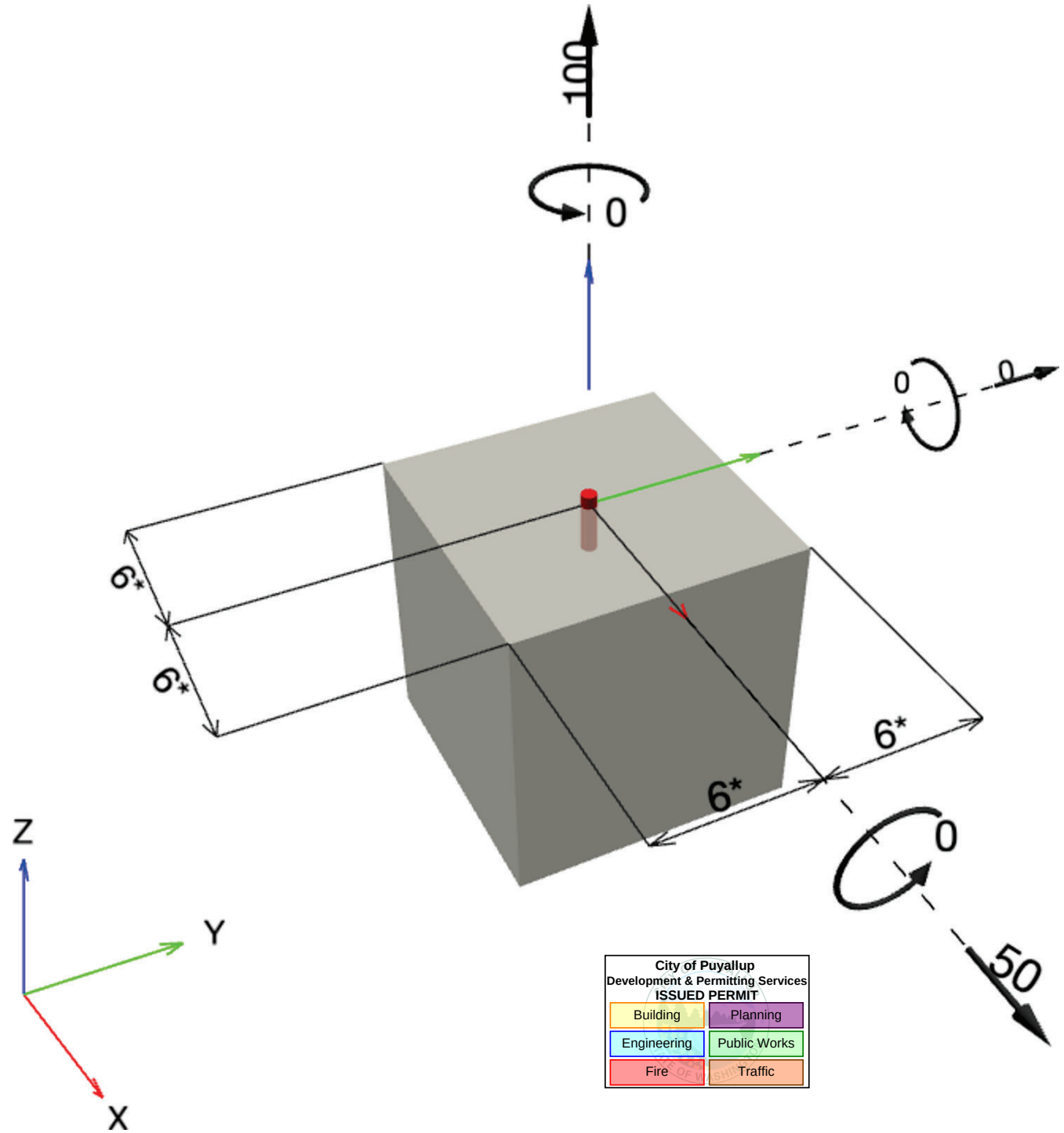
Geometry [in.] & Loading [lb, in.lb]



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1.1 Design results

Case	Description	Forces [lb] / Moments [in.lb]	Seismic	Max. Util. Anchor [%]
1	Combination 1	N = 100; V_x = 50; V_y = 0; M_x = 0; M_y = 0; M_z = 0;	no	9

2 Load case/Resulting anchor forces

Anchor reactions [lb]

Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	100	50	50	0

3 Tension load

	Load N_{ua} [lb]	Capacity ϕ N_n [lb]	Utilization $\beta_N = N_{ua}/\phi$ N_n	Status
Steel Strength*	100	15,491	1	OK
Pullout Strength*	N/A	N/A	N/A	N/A
Concrete Breakout Failure**	100	1,125	9	OK

* highest loaded anchor **anchor group (anchors in tension)

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3.1 Steel Strength

N_{sa} = ESR value — refer to ICC-ES ESR-3027

$\phi\ N_{sa} \geq N_{ua}$ — ACI 318-19 Table 17.5.2

Variables

$A_{se,N}$ [in.^{2}]	f_{uta} [psi]
0.17	120,100

Calculations

N_{sa} [lb]
20,655

Results

N_{sa} [lb]	ϕ_{steel}	$\phi\ N_{sa}$ [lb]	N_{ua} [lb]
20,655	0.750	15,491	100

3.2 Concrete Breakout Failure

$N_{cb} = \left(\frac{A_{Nc}}{A_{Nc0}}\right) \psi_{ed,N}\ \psi_{c,N}\ \psi_{cp,N}\ N_b$ — ACI 318-19 Eq. (17.6.2.1a)

$\phi\ N_{cb} \geq N_{ua}$ — ACI 318-19 Table 17.5.2

A_{Nc} see ACI 318-19, Section 17.6.2.1, Fig. R 17.6.2.1(b)

$A_{Nc0} = 9\ h_{ef}^2$ — ACI 318-19 Eq. (17.6.2.1.4)

$\psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5h_{ef}}\right) \leq 1.0$ — ACI 318-19 Eq. (17.6.2.4.1b)

$\psi_{cp,N} = \text{MAX}\left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5h_{ef}}{c_{ac}}\right) \leq 1.0$ — ACI 318-19 Eq. (17.6.2.6.1b)

$N_b = k_c\ \lambda_a\ \sqrt{f'_c}\ h_{ef}^{1.5}$ — ACI 318-19 Eq. (17.6.2.2.1)

Variables

h_{ef} [in.]	$c_{a,min}$ [in.]	$\psi_{c,N}$	c_{ac} [in.]	k_c	λ_a	f'_c [psi]
1.560	6.000	1.000	6.240	21	1.000	2,500

Calculations

A_{Nc} [in.^{2}]	A_{Nc0} [in.^{2}]	$\psi_{ed,N}$	$\psi_{cp,N}$	N_b [lb]
21.90	21.90	1.000	1.000	2,046

Results

N_{cb} [lb]	$\phi_{concrete}$	$\phi\ N_{cb}$ [lb]	N_{ua} [lb]
2,046	0.550	1,125	100

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4 Shear load

	Load V_{ua} [lb]	Capacity ϕ V_n [lb]	Utilization $\beta_V = V_{ua}/\phi$ V_n	Status
Steel Strength*	50	3,113	2	OK
Steel failure (with lever arm)*	N/A	N/A	N/A	N/A
Pryout Strength**	50	1,432	4	OK
Concrete edge failure in direction x+**	50	1,918	3	OK

* highest loaded anchor **anchor group (relevant anchors)

4.1 Steel Strength

V_{sa} = ESR value refer to ICC-ES ESR-3027
ϕ $V_{steel} \geq V_{ua}$ ACI 318-19 Table 17.5.2

Variables

$A_{se,V}$ [in.^{2}]	f_{uta} [psi]
0.17	120,100

Calculations

V_{sa} [lb]
4,790

Results

V_{sa} [lb]	ϕ_{steel}	ϕ V_{sa} [lb]	V_{ua} [lb]
4,790	0.650	3,113	50

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4.2 Pryout Strength

$V_{cp} = k_{cp} \left[\left(\frac{A_{Nc}}{A_{Nc0}} \right) \psi_{ed,N} \psi_{c,N} \psi_{cp,N} N_b \right]$ ACI 318-19 Eq. (17.7.3.1a)

$\phi V_{cp} \geq V_{ua}$ ACI 318-19 Table 17.5.2

A_{Nc} see ACI 318-19, Section 17.6.2.1, Fig. R 17.6.2.1(b)

$A_{Nc0} = 9 h_{ef}^2$ ACI 318-19 Eq. (17.6.2.1.4)

$\psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5 h_{ef}} \right) \leq 1.0$ ACI 318-19 Eq. (17.6.2.4.1b)

$\psi_{cp,N} = MAX \left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5 h_{ef}}{c_{ac}} \right) \leq 1.0$ ACI 318-19 Eq. (17.6.2.6.1b)

$N_b = k_c \lambda_a \sqrt{f'_c} h_{ef}^{1.5}$ ACI 318-19 Eq. (17.6.2.2.1)

Variables

k_{cp}	h_{ef} [in.]	$c_{a,min}$ [in.]	$\psi_{c,N}$
1	1.560	6.000	1.000

c_{ac} [in.]	k_c	λ_a	f'_c [psi]
6.240	21	1.000	2,500

Calculations

A_{Nc} [in.^{2}]	A_{Nc0} [in.^{2}]	$\psi_{ed,N}$	$\psi_{cp,N}$	N_b [lb]
21.90	21.90	1.000	1.000	2,046

Results

V_{cp} [lb]	$\phi_{concrete}$	ϕV_{cp} [lb]	V_{ua} [lb]
2,046	0.700	1,432	50

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4.3 Concrete edge failure in direction x+

$V_{cb} = \left(\frac{A_{Vc}}{A_{Vc0}}\right) \psi_{ed,V} \psi_{c,V} \psi_{h,V} \psi_{parallel,V} V_b$ — ACI 318-19 Eq. (17.7.2.1a)

$\phi V_{cb} \geq V_{ua}$ — ACI 318-19 Table 17.5.2

A_{Vc} see ACI 318-19, Section 17.7.2.1, Fig. R 17.7.2.1(b)*

$A_{Vc0} = 4.5 c_{a1}^2$ — ACI 318-19 Eq. (17.7.2.1.3)

$\psi_{ed,V} = 0.7 + 0.3\left(\frac{c_{a2}}{1.5c_{a1}}\right) \leq 1.0$ — ACI 318-19 Eq. (17.7.2.4.1b)

$\psi_{h,V} = \sqrt{\frac{1.5c_{a1}}{h_a}} \geq 1.0$ — ACI 318-19 Eq. (17.7.2.6.1)

$V_b = \left(7\left(\frac{l_e}{d_a}\right)^{0.2}\sqrt{d_a}\right) \lambda_a \sqrt{f'_c} c_{a1}^{1.5}$ — ACI 318-19 Eq. (17.7.2.2.1a)

Variables

c_{a1} [in.]	c_{a2} [in.]	$\psi_{c,V}$	h_a [in.]	l_e [in.]
6.000	6.000	1.000	420.000	1.560

λ_a	d_a [in.]	f'_c [psi]	$\psi_{parallel,V}$
1.000	0.500	2,500	1.000

Calculations

A_{Vc} [in.^{2}]	A_{Vc0} [in.^{2}]	$\psi_{ed,V}$	$\psi_{h,V}$	V_b [lb]
108.00	162.00	0.900	1.000	4,567

Results

V_{cb} [lb]	$\phi_{concrete}$	ϕV_{cb} [lb]	V_{ua} [lb]
2,740	0.700	1,918	50

*Anchor row defined by: Anchor 1; Case 3 controls

5 Combined tension and shear loads, per ACI 318-19 section 17.8

β_N	β_V	ζ	Utilization $\beta_{N,V}$ [%]	Status
0.089	0.035	5/3	3	OK

$\beta_{NV} = \beta_N^{\zeta} + \beta_V^{\zeta} <= 1$

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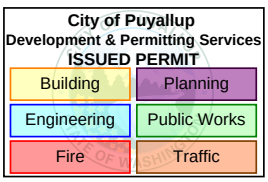
6 Warnings

- The anchor design methods in PROFIS Engineering require rigid anchor plates per current regulations (EN1992-4, AS5216, etc.). This means load re-distribution on the anchors due to elastic deformations of the anchor plate are not considered - the anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Engineering calculates the minimum required anchor plate thickness with FEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid anchor plate assumption is valid is not carried out by PROFIS Engineering. Input data and results must be checked for agreement with the existing conditions and for plausibility!
- The equations presented in this report are based on imperial units. When inputs are displayed in metric units, the user should be aware that the equations remain in their imperial format.
- Condition A applies where the potential concrete failure surfaces are crossed by supplementary reinforcement proportioned to tie the potential concrete failure prism into the structural member. Condition B applies where such supplementary reinforcement is not provided, or where pullout or pryout strength governs.
- Refer to the manufacturer's product literature for cleaning and installation instructions.
- For additional information about ACI 318 strength design provisions, please go to https://viewer.joomag.com/profis-design-guide-us-en-summer-2021/0841849001625154758?short&/
- Hilti post-installed anchors shall be installed in accordance with the Hilti Manufacturer's Printed Installation Instructions (MPII). Reference ACI 318-19, Section 26.7.

Fastening meets the design criteria!



7 Installation data

Anchor type and diameter: KWIK HUS-EZ (KH-EZ)-SS316 1/2 (2 1/4)

Profile: -

Item number: 2245579 KH-EZ SS316 1/2"x3"

Hole diameter in the fixture: -

Maximum installation torque: 540 in.lb

Plate thickness (input): -

Hole diameter in the base material: 0.500 in.

Hole depth in the base material: 2.625 in.

Minimum thickness of the base material: 4.500 in.

Drilling method: Hammer drilled
Cleaning: Manual cleaning of the drilled hole according to instructions for use is required.

Hilti ∅ 1/2 in KWIK HUS-EZ (KH-EZ)-SS316 with 2.25 in nominal embedment depth per ICC-ES ESR-3027 , Hammer drill bit installation per MPII

7.1 Recommended accessories

Drilling	Cleaning	Setting
• Suitable Rotary Hammer • Properly sized drill bit	• Manual blow-out pump	• Torque wrench

Coordinates Anchor in.

Anchor	x	y	c_{-x}	c_{+x}	c_{-y}	c_{+y}
1	0.000	0.000	6.000	6.000	6.000	6.000

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8 Remarks; Your Cooperation Duties

- Any and all information and data contained in the Software concern solely the use of Hilti products and are based on the principles, formulas and security regulations in accordance with Hilti's technical directions and operating, mounting and assembly instructions, etc., that must be strictly complied with by the user. All figures contained therein are average figures, and therefore use-specific tests are to be conducted prior to using the relevant Hilti product. The results of the calculations carried out by means of the Software are based essentially on the data you put in. Therefore, you bear the sole responsibility for the absence of errors, the completeness and the relevance of the data to be put in by you. Moreover, you bear sole responsibility for having the results of the calculation checked and cleared by an expert, particularly with regard to compliance with applicable norms and permits, prior to using them for your specific facility. The Software serves only as an aid to interpret norms and permits without any guarantee as to the absence of errors, the correctness and the relevance of the results or suitability for a specific application.
- You must take all necessary and reasonable steps to prevent or limit damage caused by the Software. In particular, you must arrange for the regular backup of programs and data and, if applicable, carry out the updates of the Software offered by Hilti on a regular basis. If you do not use the AutoUpdate function of the Software, you must ensure that you are using the current and thus up-to-date version of the Software in each case by carrying out manual updates via the Hilti Website. Hilti will not be liable for consequences, such as the recovery of lost or damaged data or programs, arising from a culpable breach of duty by you.