SULLAWAY ENGINEERING

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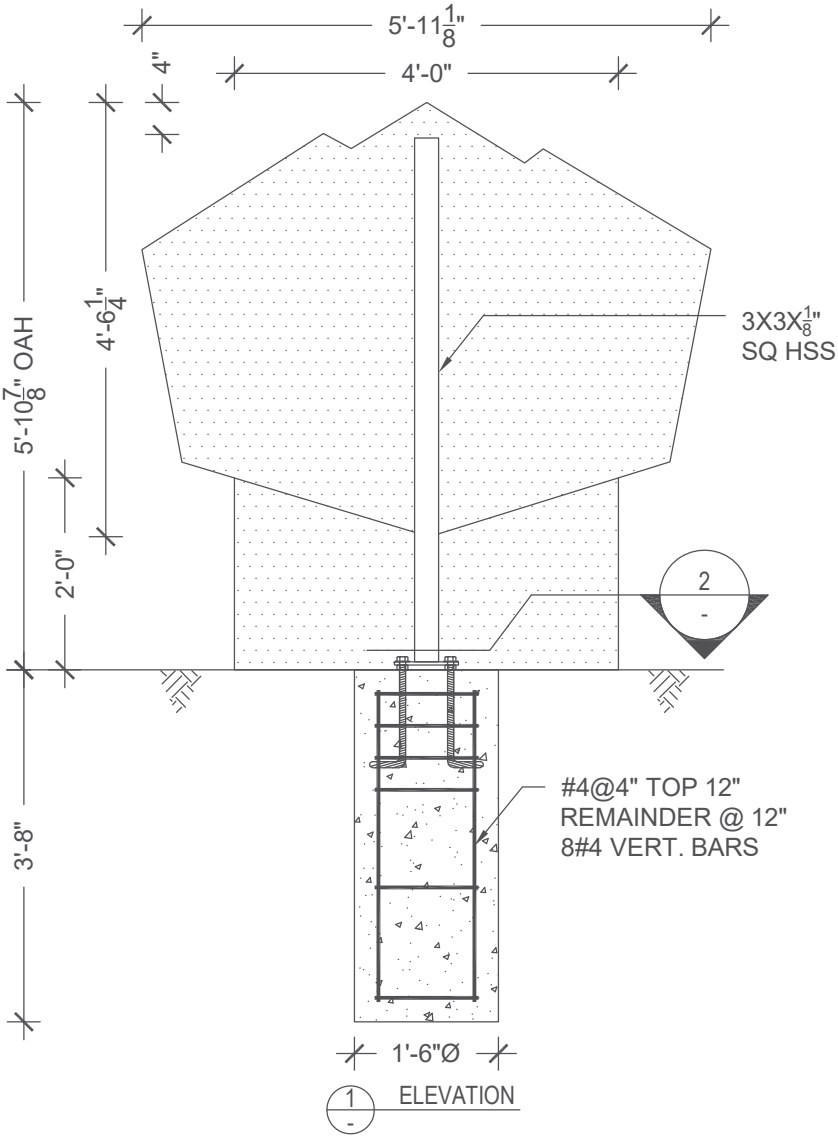
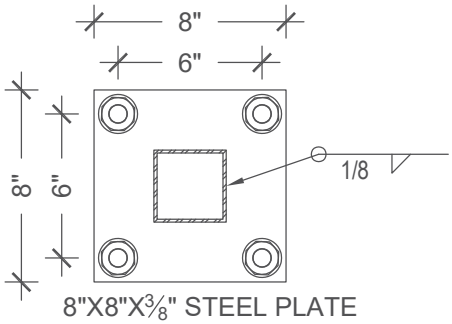
PROJECT: MONSTER GARAGE CONDOS, 4081 SR-970, CLE ELUM, WA
PROJECT #: 54841
CLIENT: SIGNCRAFT, LLC.

DATE: 01/12/2026
ENGINEER: IH
LAST REVISED:





01-13-2026

GENERAL NOTES

1. DESIGN CODE: IBC 2021 & WASHINGTON SBCC 20211
2. DESIGN LOADS: ASCE 7-16
3. WIND VELOCITY 110 MPH EXPOSURE C
4. CONCRETE 2500 PSI MINIMUM
5. SQ. HSS STEEL ASTM A500 GR. B, F_y = 46 KSI MIN.
6. PLATE STEEL ASTM A36
7. J OR L-BOLT STEEL ASTM F1554 GR. 36, Fu= 58 KSI MIN.
8. STEEL REINFORCEMENT IN CONCRETE ASTM A615 GR 60
9. WELDING STRENGTH, Fexx = 70 KSI MIN.
10. PROVIDE MIN. 3" CLEAR COVER ON ALL STEEL EMBEDDED IN CONCRETE WHEN CAST AGAINST SOIL
11. LATERAL SOIL BEARING PER IBC CLASS 4 (150 PSF/FT)
12. PROVIDE PROTECTION AGAINST DISSIMILAR METALS
13. ALL DIMENSIONS TO BE VERIFIED PRIOR TO FABRICATION

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V5.8.1 units; pounds, feet unless noted otherwise

Applied Wind Loads; from ASCE 7-16 (LRFD):

$F=q_z*G*C_f*A_f$ with $q_z = 0.00256K_zK_{zt}K_dV^2$ (29.3.2 & 29.4)

C_f= 1.51 (Fig. 29.3-1) 1.00 0 max. height= 5.91

K_{zt}= 1.0 (26.8.2) (=1.0 unless unusual landscape)

K_z= from table 28.3-1 Exposure= c

K_d= 0.85 for signs (table 26.6-1)

V= 110 mph

G= 0.85 (26.9) weight= 0.052 kips

s/h= 1.000 M_{DL}= 0.00 k-ft

B/s= 0.68

Pole Loads	structure component	height at section c.g.	K_z	q_z	pressure q_z*G*C_f	A_f	shear	Wind Moment M_W
	1	1.00	0.850	22.4	28.81	8.00	231	231
	2	3.96	0.850	22.4	28.81	17.77	512	2025
					sums:	25.77	742	2.26 (M_w) k-ft arm= 3.0
		for s/h=1, add 10% (asce fig. 29.4-1):			x 1.10			2.48

P_u= 0.06 kip M= 2.48 k-ft $M=\sqrt{M_{DL}^2+M_w^2}$

$M_u=\sqrt{1.2M_{DL}^2+1.0M_W^2}$ = 2.48 k-ft

Pole Design section; Rectangular HSS

$M_u \le \phi M_n$ with $M_n = f_yZ$ f_y= 46 ksi ϕ= 0.9

H	M_u(k-ft)	Z req'd. (in)	Size(in)	t (in)	Z	Use
at grade	2.48	0.719	2	0.25	1.0	3x3x1/8" SQ. HSS, ϕMn=4.83 k-ft

Footing Design footprint: round

ω= 1 IBC Table 1806.2, sections 1806.3.4, 1807.3.2 S=(2x150psf)

P= 0.45 kip S1 = S x d / 3 A = 2.34 x P / (S1 x b) S= 300

S1= 364 A= 1.9 d =0.5xA (1+ (1+4.36x h/A) ^.5) IBC 1807.3.2.1

footing: **1' - 6" dia.** **3' - 8" deep**

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V5.8.1

units; pounds, feet unless noted otherwise

Check 8x8x0.375" Steel Base Plate, A36 (LRFD):

arm =	1.575	in	b =	8.00	in	t =	0.375	in	n= 2
Mplate =			T per bolt * n * arm =				7.686	k-in	(Tu=2.440k, From Simpson)
Z=			bt^2/4=				0.281	in^3	
ϕMn =			ϕ*Fy*Z = 0.9*36ksi*Z =				9.113	k-in	
Ratio check=			Mplate/ϕMn=				0.843	<1	**OK**

SIMPSON Strong-Tie

Anchor Designer™ for Concrete Software
Version 3.4.2512.1

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1.Project information

Project description:
Location:
Design name: Design

Comment:

2. Input Data & Anchor Parameters

General
Design method:ACI 318-19
Units: Imperial units

Anchor Information:
Anchor type: Cast-in-place
Material: F1554 Grade 36
Diameter (inch): 0.750
Effective Embedment depth, h_{ef} (inch): 12.000
Anchor category: -
Anchor ductility: Yes
h_{min} (inch): 13.50
C_{min} (inch): 4.50
S_{min} (inch): 4.50

Base Material
Concrete: Normal-weight
Concrete thickness, h (inch): 44.00
State: Cracked
Compressive strength, f'_c (psi): 2500
$\Psi_{c,V}$: 1.0
Reinforcement condition: B tension, B shear
Supplemental edge reinforcement: Not applicable
Reinforcement provided at corners: No
Ignore concrete breakout in tension: No
Ignore concrete breakout in shear: No
Ignore 6do requirement: No
Build-up grout pad: No

Base Plate
Length x Width x Thickness (inch): 8.00 x 8.00 x 0.38
Yield stress: 36000 psi

Profile type/size: 3X3X1/8

Recommended Anchor
Anchor Name: J- or L-Bolt - 3/4"Ø J- or L-Bolt, F1554 Gr. 36

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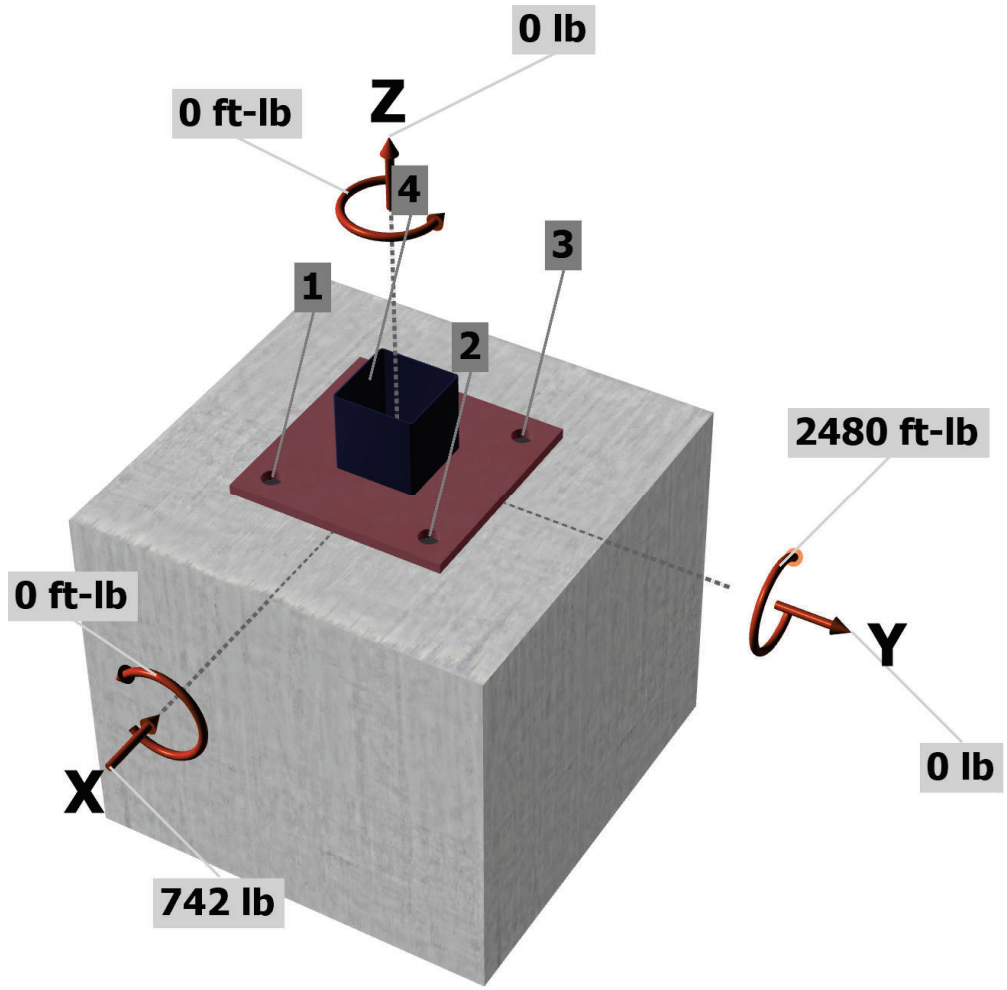
Load and Geometry
Load factor source: ACI 318 Section 5.3
Load combination: not set
Seismic design: No
Anchors subjected to sustained tension: Not applicable
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: No

Strength level loads:

N_{ua} [lb]:	0
V_{uax} [lb]:	-742
V_{uay} [lb]:	0
M_{ux} [ft-lb]:	0
M_{uy} [ft-lb]:	-2480
M_{uz} [ft-lb]:	0

<Figure 1>



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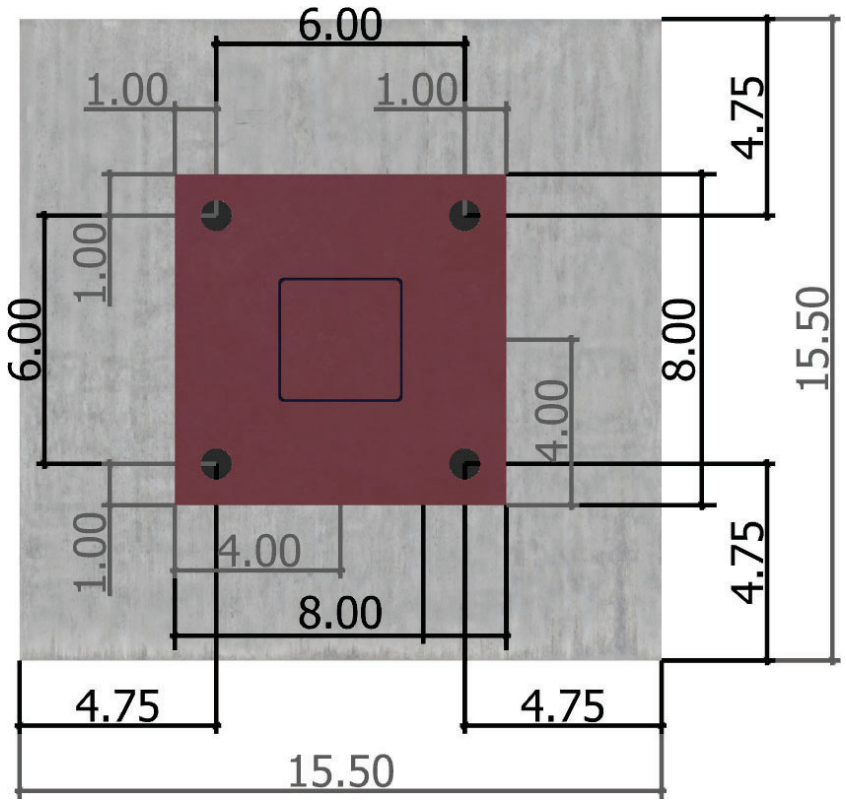
<Figure 2>

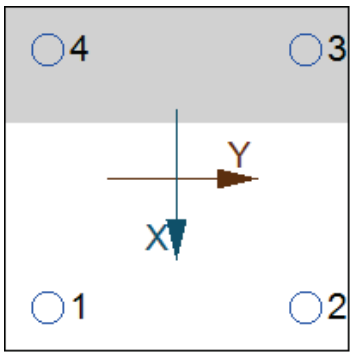


3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2+(V_{uay})^2}$ (lb)
1	2439.2	-185.5	0.0	185.5
2	2439.2	-185.5	0.0	185.5
3	0.0	-185.5	0.0	185.5
4	0.0	-185.5	0.0	185.5
Sum	4878.3	-742.0	0.0	742.0

Maximum concrete compression strain (‰): 0.10
Maximum concrete compression stress (psi): 451
Resultant tension force (lb): 4878
Resultant compression force (lb): 4878
Eccentricity of resultant tension forces in x-axis, e'_{Nx} (inch): 0.00
Eccentricity of resultant tension forces in y-axis, e'_{Ny} (inch): 0.00
Eccentricity of resultant shear forces in x-axis, e'_{Vx} (inch): 0.00
Eccentricity of resultant shear forces in y-axis, e'_{Vy} (inch): 0.00

<Figure 3>



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4. Steel Strength of Anchor in Tension (Sec. 17.6.1)

N_{sa} (lb)	ϕ	ϕN_{sa} (lb)
19370	0.75	14528

5. Concrete Breakout Strength of Anchor in Tension (Sec. 17.6.2)

$N_b = k_c \lambda_a \sqrt{f'_c} h_{ef}^{1.5}$ (Eq. 17.6.2.2.3)

k_c	λ_a	f'_c (psi)	h_{ef} (in)	N_b (lb)
24.0	1.00	2500	7.167	23023

$\phi N_{cbg} = \phi \, (A_{Nc} / A_{Nco}) \Psi_{ec,N} \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b$ (Sec. 17.5.1.2 & Eq. 17.6.2.1a)

A_{Nc} (in^2)	A_{Nco} (in^2)	$c_{a,min}$ (in)	$\Psi_{ec,N}$	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	ϕN_{cbg} (lb)
240.25	462.25	4.75	1.000	0.833	1.00	1.000	23023	0.70	6974

6. Pullout Strength of Anchor in Tension (Sec. 17.6.3)

$fN_{pn} = fY_{c,P} N_p = fY_{c,P} 0.9 f'_c e_h d_a$ (Sec. 17.5.1.2, Eq. 17.6.3.1 & 17.6.3.2.2b)

$\Psi_{c,P}$	f'_c (psi)	d_a (in)	$e_h = 3d_a$ (in)	ϕ	ϕN_{pn} (lb)
1.0	2500	0.75	2.25	0.70	2658

7. Steel Strength of Anchor in Shear (Sec. 17.7.1)

V_{sa} (lb)	ϕ_{grout}	ϕ	$\phi_{grout} \phi V_{sa}$ (lb)
11625	1.0	0.65	7556

8. Concrete Breakout Strength of Anchor in Shear (Sec. 17.7.2)

Shear perpendicular to edge in x-direction:

$V_{bx} = \min\left|7 (l_e / d_a)^{0.2} \sqrt{d_a} \lambda_a \sqrt{f'_c} c_{a1}^{1.5};\ 9 \lambda_a \sqrt{f'_c} c_{a1}^{1.5}\right|$ (Eq. 17.7.2.2.1a & Eq. 17.7.2.2.1b)

l_e (in)	d_a (in)	λ_a	f'_c (psi)	c_{a1} (in)	V_{bx} (lb)
6.00	0.750	1.00	2500	10.75	15861

$\phi V_{cbgx} = \phi \, (A_{Vc} / A_{Vco}) \Psi_{ec,V} \Psi_{ed,V} \Psi_{c,V} \Psi_{h,V} V_{bx}$ (Sec. 17.5.1.2 & Eq. 17.7.2.1b)

A_{Vc} (in^2)	A_{Vco} (in^2)	$\Psi_{ec,V}$	$\Psi_{ed,V}$	$\Psi_{c,V}$	$\Psi_{h,V}$	V_{bx} (lb)	ϕ	ϕV_{cbgx} (lb)
249.94	520.03	1.000	0.788	1.000	1.000	15861	0.70	4207

Shear parallel to edge in y-direction:

$V_{bx} = \min\left|7 (l_e / d_a)^{0.2} \sqrt{d_a} \lambda_a \sqrt{f'_c} c_{a1}^{1.5};\ 9 \lambda_a \sqrt{f'_c} c_{a1}^{1.5}\right|$ (Eq. 17.7.2.2.1a & Eq. 17.7.2.2.1b)

l_e (in)	d_a (in)	λ_a	f'_c (psi)	c_{a1} (in)	V_{bx} (lb)
6.00	0.750	1.00	2500	4.75	4659

$\phi V_{cbgy} = \phi \, (2) (A_{Vc} / A_{Vco}) \Psi_{ec,V} \Psi_{ed,V} \Psi_{c,V} \Psi_{h,V} V_{bx}$ (Sec. 17.5.1.2, 17.7.2.1(c) & Eq. 17.7.2.1b)

A_{Vc} (in^2)	A_{Vco} (in^2)	$\Psi_{ec,V}$	$\Psi_{ed,V}$	$\Psi_{c,V}$	$\Psi_{h,V}$	V_{bx} (lb)	ϕ	ϕV_{cbgy} (lb)
110.44	101.53	1.000	1.000	1.000	1.000	4659	0.70	7094

9. Concrete Pryout Strength of Anchor in Shear (Sec. 17.7.3)

$\phi V_{cpg} = \phi k_{cp} N_{cbg} = \phi k_{cp} (A_{Nc} / A_{Nco}) \Psi_{ec,N} \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b$ (Sec. 17.5.1.2 & Eq. 17.7.3.1b)

k_{cp}	A_{Nc} (in^2)	A_{Nco} (in^2)	$\Psi_{ec,N}$	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	ϕV_{cpg} (lb)
2.0	240.25	90.25	1.000	1.000	1.000	1.000	23023	0.70	25202

10. Results

Interaction of Tensile and Shear Forces (Sec. 17.8)

Tension	Factored Load, N_{ua} (lb)	Design Strength, ϕN_n (lb)	Ratio	Status
Steel	2439	14528	0.17	Pass
Concrete breakout	4878	6974	0.70	Pass

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Pullout	**2439**	**2658**	**0.92**	**Pass (Governs)**

Shear	Factored Load, V_{ua} (lb)	Design Strength, ϕV_n (lb)	Ratio	Status
Steel	186	7556	0.02	Pass
T Concrete breakout x-	**742**	**4207**	**0.18**	**Pass (Governs)**
|| Concrete breakout y+	371	7094	0.05	Pass
Pryout	742	25202	0.03	Pass

Interaction check	$N_{ua}/\phi N_n$	$V_{ua}/\phi V_n$	Utilization Ratio	Permissible	Status
Sec. 17.8.3	0.92	0.18	91.2%	1.0	Pass

3/4"Ø J- or L-Bolt, F1554 Gr. 36 with hef = 12.000 inch meets the selected design criteria.

11. Warnings

- Designer must exercise own judgement to determine if this design is suitable.