SIGNS PLUS
WOODS COFFEE
PUYALLUP, WA

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

City of Puyallup Development & Permitting Services ISSUED PERMIT
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City of Puyallup Building REVIEWED FOR COMPLIANCE
BSnowden
07/13/2026
3:19:22 PM

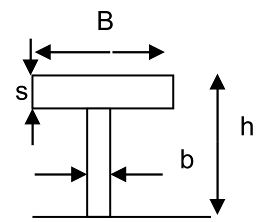
TRAILBLAZE
STRUCTURAL SOLUTIONS LTD

PRSG20260929

ST6

SIGN DIMENSIONS

B =	**0.33**	ft
s =	**17.75**	ft
h =	**17.75**	ft
b =	**1.50**	ft



WIND DESIGN

$q_z = .00256 * k_z * k_{zt} * k_d * V^2 * I$

k_z =	**0.85**	Exp. C (Sec 26.10.1)
k_{zt} =	**1.00**	(Sec 26.8.2)
k_d =	**0.85**	(Sec 26.6)
I =	**1.00**	(Sec 26.10.1)
V =	**97**	PUYALLUP, WA

z (ft)	Exp B	Exp C
15	0.57	0.85
20	0.62	0.9
25	0.66	0.94
30	0.7	0.98
40	0.76	1.04
50	0.81	1.09

q_z = 17.40 PSF

$F = q_z * G * C_f * A_s$ (Eq 29.3-1)

G =	0.85	
C_f =	1.80	
A_s =	5.86	ft^2

B =	0.33
s =	17.75
h =	17.75
s/h =	1.00
B/s =	0.02

C_f	B/s								
s/h	0.05	0.1	0.2	0.5	1	2	4	5	10
1	1.8	1.7	1.65	1.55	1.45	1.4	1.35	1.35	1.3
0.9	1.85	1.75	1.7	1.6	1.55	1.5	1.45	1.45	1.4
0.7	1.95	1.85	1.75	1.7	1.65	1.6	1.6	1.55	1.55
0.5	1.95	1.85	1.8	1.75	1.75	1.7	1.7	1.7	1.7
0.3	1.95	1.9	1.85	1.8	1.8	1.8	1.8	1.8	1.8
0.2	1.95	1.9	1.85	1.8	1.8	1.8	1.8	1.8	1.85
0.16	1.95	1.9	1.85	1.85	1.8	1.8	1.85	1.85	1.85

F = 27 PSF DESIGN WIND PRESSURE

EFFECTIVE LOAD LOCATION

x_s = 8.88 ft

APPLIED LOAD

ULTIMATE LOAD			SERVICE LOAD		
P =	156	#	P =	94	#
M =	1384	ft-#	M =	831	ft-#

MATTHEW LEE
STATE OF WASHINGTON
20118615
REGISTERED
PROFESSIONAL ENGINEER

CHECK STRUCTURE

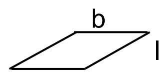
HSS4X4X3/16

d (in)	A (in2)	S (in^3)
4	2.58	3.1

Check Column Bending

HSS Rect	50000
f_b (psi) =	3215
f_{all} (psi) =	30000

Check Plate



l (in) =	10
b (in) =	16
t (in) =	0.5
S (in^3) =	267
Sp (in^3) =	0.667
f_p (psi) =	62
f_{pavg} (psi) =	40
M (#-in) =	2915
f_{bp} (psi) =	4373
f_a (psi) =	21600

Check Anchors

See Hilti PROFIS analysis next page

IBC 1807.3.2.1 Design For Nonconstrained Footing

$d = .5 * A \{ 1 + [1 + (4.36 h / A)]^{1/2} \}$ EQUATION 18-1

h = 8.88

$A = (2.34 * P) / (S_1 * b)$

P =	94	#
b =	2.50	ft

USING TABLE 1806.2 : ALLOWABLE FOUNDATION AND LATERAL PRESSURE

P (psf)	S_1 (psf/ft)	**IBC 2021 1806.3.4**
3000	200	400
2000	150	300
1000	100	200

LATERAL SOIL BEARING PRESSURE BASED ON 1/3 THE DEPTH OF EMBEDMENT

d (start)	S_1	A	d (calc)	OK
3	250	0.35	2.02	GOOD
2.02	169	0.52	2.52	
2.52	210	0.42	2.23	GOOD
2.23	186	0.47	2.38	
2.38	199	0.44	2.30	GOOD
2.30	191	0.46	2.34	
2.34	195	0.45	2.32	GOOD
2.32	193	0.45	2.33	
2.33	194	0.45	2.32	GOOD
2.32	194	0.45	2.33	
2.33	194	0.45	2.33	GOOD
2.33	194	0.45	2.33	
2.33	194	0.45	2.33	GOOD
2.33	194	0.45	2.33	
2.33	194	0.45	2.33	GOOD
2.33	194	0.45	2.33	
2.33	194	0.45	2.33	GOOD
2.33	194	0.45	2.33	
2.33	194	0.45	2.33	GOOD
2.33	194	0.45	2.33	

USE FOOTING DEPTH = 2.50 FT BELOW GRADE IS GOOD

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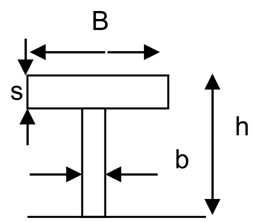
ST7

SIGN DIMENSIONS

B =	**3.00**	ft
s =	**10.50**	ft
h =	**10.50**	ft
b =	**0.00**	ft



WIND DESIGN
$q_z = .00256 * k_z * k_{zt} * k_d * V^2 * I$

k_z =	**0.85**	Exp. C	(Sec 26.10.1)
k_{zt} =	**1.00**	(Sec 26.8.2)	
k_d =	**0.85**	(Sec 26.6)	
I =	**1.00**	(Sec 26.10.1)	
V =	**97**	PUYALLUP, WA	

q_z = 17.40 PSF

z (ft)	Exp B	Exp C
15	0.57	0.85
20	0.62	0.9
25	0.66	0.94
30	0.7	0.98
40	0.76	1.04
50	0.81	1.09

$F = q_z * G * C_f * A_s$ (Eq 29.3-1)

			B =	3.00
			s =	10.50
G =	0.85		h =	10.50
C_f =	1.62			
			s/h =	1.00
A_s =	31.50	ft^2	B/s =	0.29

C_f	B/s								
s/h	0.05	0.1	0.2	0.5	1	2	4	5	10
1	1.8	1.7	1.65	1.55	1.45	1.4	1.35	1.35	1.3
0.9	1.85	1.75	1.7	1.6	1.55	1.5	1.45	1.45	1.4
0.7	1.95	1.85	1.75	1.7	1.65	1.6	1.6	1.55	1.55
0.5	1.95	1.85	1.8	1.75	1.75	1.7	1.7	1.7	1.7
0.3	1.95	1.9	1.85	1.8	1.8	1.8	1.8	1.8	1.8
0.2	1.95	1.9	1.85	1.8	1.8	1.8	1.8	1.8	1.85
0.16	1.95	1.9	1.85	1.85	1.8	1.8	1.85	1.85	1.85

F = 24 PSF DESIGN WIND PRESSURE

EFFECTIVE LOAD LOCATION

x_s = 5.25 ft

APPLIED LOAD

ULTIMATE LOAD			SERVICE LOAD		
P =	756	#	P =	453	#
M =	3967	ft-#	M =	2380	ft-#

CHECK STRUCTURE

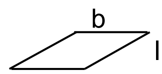
HSS4X4X3/16

d (in)	A (in2)	S (in^3)
4	2.58	3.1

Check Column Bending

HSS Rect	50000
f_b (psi) =	9213
f_{all} (psi) =	30000

Check Plate



l (in) =	10
b (in) =	16
t (in) =	0.5
S (in^3) =	267
Sp (in^3) =	0.667
f_p (psi) =	178
f_{pavg} (psi) =	116
M (#-in) =	8353
f_{bp} (psi) =	12530
f_a (psi) =	21600

Check Anchors

See Hilti PROFIS analysis next page

IBC 1807.3.2.1 Design For Nonconstrained Footing

$d = .5 * A \{ 1 + [1 + (4.36 h / A)]^{1/2} \}$ EQUATION 18-1

h = 5.25

$A = (2.34 * P) / (S_1 * b)$

P =	453	#
b =	2.50	ft

USING TABLE 1806.2 : ALLOWABLE FOUNDATION AND LATERAL PRESSURE

P (psf)	S_1 (psf/ft)	**IBC 2021 1806.3.4**
3000	200	400
2000	150	300
1000	100	200

LATERAL SOIL BEARING PRESSURE BASED ON 1/3 THE DEPTH OF EMBEDMENT

d (start)	S_1	A	d (calc)	OK
3	350	1.21	3.31	
3.31	386	1.10	3.12	GOOD
3.12	364	1.17	3.23	
3.23	377	1.13	3.16	GOOD
3.16	369	1.15	3.20	
3.20	374	1.13	3.18	GOOD
3.18	371	1.14	3.19	
3.19	373	1.14	3.18	GOOD
3.18	372	1.14	3.19	
3.19	372	1.14	3.19	GOOD
3.19	372	1.14	3.19	
3.19	372	1.14	3.19	GOOD
3.19	372	1.14	3.19	
3.19	372	1.14	3.19	GOOD
3.19	372	1.14	3.19	
3.19	372	1.14	3.19	GOOD
3.19	372	1.14	3.19	
3.19	372	1.14	3.19	GOOD
3.19	372	1.14	3.19	
3.19	372	1.14	3.19	GOOD

USE FOOTING DEPTH = 3.50 FT BELOW GRADE IS GOOD

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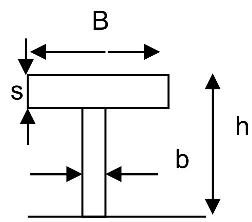
ST8

SIGN DIMENSIONS

B =	**7.04**	ft
s =	**3.75**	ft
h =	**7.00**	ft
b =	**3.00**	ft



WIND DESIGN

$q_z = .00256 * k_z * k_{zt} * k_d * V^2 * I$

k_z =	**0.85**	Exp. C (Sec 26.10.1)
k_{zt} =	**1.00**	(Sec 26.8.2)
k_d =	**0.85**	(Sec 26.6)
I =	**1.00**	(Sec 26.10.1)
V =	**97**	PUYALLUP, WA

z (ft)	Exp B	Exp C
15	0.57	0.85
20	0.62	0.9
25	0.66	0.94
30	0.7	0.98
40	0.76	1.04
50	0.81	1.09

q_z = 17.40 PSF

$F = q_z * G * C_f * A_s$ (Eq 29.3-1)

G =	0.85	
C_f =	1.69	
A_s =	36.16	ft^2

B =	7.04
s =	3.75
h =	7.00
s/h =	0.54
B/s =	1.88

C_f	B/s								
s/h	0.05	0.1	0.2	0.5	1	2	4	5	10
1	1.8	1.7	1.65	1.55	1.45	1.4	1.35	1.35	1.3
0.9	1.85	1.75	1.7	1.6	1.55	1.5	1.45	1.45	1.4
0.7	1.95	1.85	1.75	1.7	1.65	1.6	1.6	1.55	1.55
0.5	1.95	1.85	1.8	1.75	1.75	1.7	1.7	1.7	1.7
0.3	1.95	1.9	1.85	1.8	1.8	1.8	1.8	1.8	1.8
0.2	1.95	1.9	1.85	1.8	1.8	1.8	1.8	1.8	1.85
0.16	1.95	1.9	1.85	1.85	1.8	1.8	1.85	1.85	1.85

F = 25 PSF DESIGN WIND PRESSURE

EFFECTIVE LOAD LOCATION

x_s = 4.18 ft

APPLIED LOAD

ULTIMATE LOAD			SERVICE LOAD		
P =	903	#	P =	542	#
M =	3775	ft-#	M =	2265	ft-#

CHECK STRUCTURE

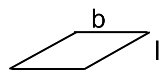
HSS4X4X3/16

d (in)	A (in2)	S (in^3)
4	2.58	3.1

Check Column Bending

HSS Rect	50000
f_b (psi) =	8769
f_{all} (psi) =	30000

Check Plate



l (in) =	10
b (in) =	16
t (in) =	0.5
S (in^3) =	267
Sp (in^3) =	0.667
f_p (psi) =	170
f_{pavg} (psi) =	110
M (#-in) =	7951
f_{bp} (psi) =	11926
f_a (psi) =	21600

Check Anchors

See Hilti PROFIS analysis next page

IBC 1807.3.2.1 Design For Nonconstrained Footing

$d = .5 * A \{ 1 + [1 + (4.36 h / A)]^{1/2} \}$ EQUATION 18-1

h = 4.18

$A = (2.34 * P) / (S_1 * b)$

P = 542 #
b = 2.50 ft

USING TABLE 1806.2 : ALLOWABLE FOUNDATION AND LATERAL PRESSURE

P (psf)	S_1 (psf/ft)	**IBC 2021 1806.3.4**
3000	200	400
2000	150	300
1000	100	200

LATERAL SOIL BEARING PRESSURE BASED ON 1/3 THE DEPTH OF EMBEDMENT

d (start)	S_1	A	d (calc)	OK
3	350	1.45	3.39	
3.39	396	1.28	3.14	GOOD
3.14	366	1.38	3.30	
3.30	385	1.32	3.20	GOOD
3.20	373	1.36	3.26	
3.26	380	1.33	3.22	GOOD
3.22	376	1.35	3.25	
3.25	379	1.34	3.23	GOOD
3.23	377	1.35	3.24	
3.24	378	1.34	3.23	GOOD
3.23	377	1.34	3.24	
3.24	378	1.34	3.23	GOOD
3.23	377	1.34	3.24	
3.24	378	1.34	3.24	GOOD
3.24	377	1.34	3.24	
3.24	378	1.34	3.24	GOOD
3.24	377	1.34	3.24	
3.24	377	1.34	3.24	GOOD
3.24	377	1.34	3.24	
3.24	377	1.34	3.24	GOOD

USE FOOTING DEPTH = 3.50 FT BELOW GRADE IS GOOD

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Company:		Page:	1
Address:		Specifier:	
Phone I Fax:	|	E-Mail:	
Design:	Woods - Puyallup - ST7	Date:	6/28/2026
Fastening point:			

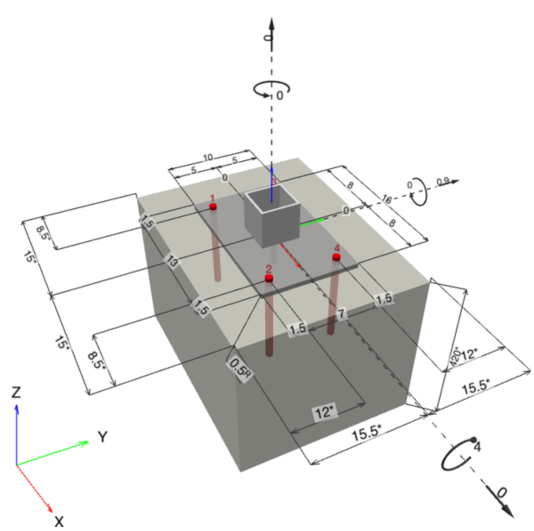
Specifier's comments:

1 Input data

Anchor type and diameter:	**Hex Head ASTM F 1554 GR. 36 3/4**
Item number:	not available
Specification text:	∅ 3/4 IN HEX HEAD ASTM F 1554 GR. 36 WITH 9 IN NOMINAL EMBEDMENT DEPTH PER TECHNICAL DATA , CAST IN PLACE INSTALLATION PER MPII
Effective embedment depth:	h_{ef} = 9.000 in.
Material:	ASTM F 1554
Evaluation Service Report:	Hilti Technical Data
Issued I Valid:	- | -
Proof:	Design Method ACI 318-14 / CIP
Shear edge breakout verification:	Row closest to edge (Case 3 only from ACI 318-14 Fig. R.17.5.2.1b)
Stand-off installation:	e_b = 0.000 in. (no stand-off); t = 0.500 in.
Anchor plate[R] :	l_x x l_y x t = 16.000 in. x 10.000 in. x 0.500 in.; (Recommended plate thickness: not calculated)
Profile:	Square HSS (AISC), HSS4X4X.25; (L x W x T) = 4.000 in. x 4.000 in. x 0.250 in.
Base material:	cracked concrete, 3000, f_c' = 3,000 psi; h = 420.000 in.
Reinforcement:	tension: condition B, shear: condition B;
	edge reinforcement: none or < No. 4 bar

[R] - The anchor calculation is based on a rigid anchor plate assumption.

Geometry [in.] & Loading [kip, ft.kip]



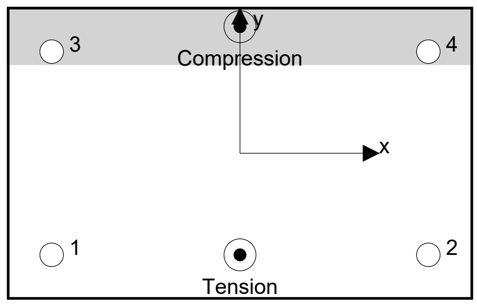
1.1 Design results

Case	Description	Forces [kip] / Moments [ft.kip]	Seismic	Max. Util. Anchor [%]
1	Combination 1	N = 0.000; V_x = 0.000; V_y = 0.900; M_x = -4.00000; M_y = 0.00000; M_z = 0.00000;	no	28

2 Load case/Resulting anchor forces

Anchor reactions [kip]
Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	3.053	0.225	0.000	0.225
2	3.053	0.225	0.000	0.225
3	0.000	0.225	0.000	0.225
4	0.000	0.225	0.000	0.225



Max. concrete compressive strain: 0.09 [‰]
Max. concrete compressive stress: 399 [psi]
Resulting tension force in (x/y)=(-0.000/-3.500): 6.106 [kip]
Resulting compression force in (x/y)=(-0.000/4.362): 6.106 [kip]

Anchor forces are calculated based on the assumption of a rigid anchor plate.

3 Tension load

	Load N_{ua} [kip]	Capacity ϕ N_n [kip]	Utilization $\beta_N = N_{ua}/\phi$ N_n	Status
Steel Strength*	3.053	14.529	22	OK
Pullout Strength*	3.053	10.987	28	OK
Concrete Breakout Failure**	6.106	23.749	26	OK
Concrete Side-Face Blowout, direction **	N/A	N/A	N/A	N/A

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

3.1 Steel Strength

$N_{sa} = A_{se,N}\, f_{uta}$ ACI 318-14 Eq. (17.4.1.2)

$\phi\ N_{sa} \geq N_{ua}$ ACI 318-14 Table 17.3.1.1

Variables

$A_{se,N}$ [in.^{2}]	f_{uta} [psi]
0.33	58,000

Calculations

N_{sa} [kip]
19.372

Results

N_{sa} [kip]	ϕ_{steel}	$\phi\ N_{sa}$ [kip]	N_{ua} [kip]
19.372	0.750	14.529	3.053

3.2 Pullout Strength

$N_{pN} = \psi_{c,p}\, N_p$ ACI 318-14 Eq. (17.4.3.1)

$N_p = 8\, A_{brg}\, f'_c$ ACI 318-14 Eq. (17.4.3.4)

$\phi\ N_{pN} \geq N_{ua}$ ACI 318-14 Table 17.3.1.1

Variables

$\psi_{c,p}$	A_{brg} [in.^{2}]	λ_a	f'_c [psi]
1.000	0.65	1.000	3,000

Calculations

N_p [kip]
15.696

Results

N_{pn} [kip]	$\phi_{concrete}$	$\phi\ N_{pn}$ [kip]	N_{ua} [kip]
15.696	0.700	10.987	3.053

3.3 Concrete Breakout Failure

$N_{cbg} = \left(\frac{A_{Nc}}{A_{Nc0}}\right) \psi_{ec,N} \ \psi_{ed,N} \ \psi_{c,N} \ \psi_{cp,N} \ N_b$	ACI 318-14 Eq. (17.4.2.1b)
$\phi \ N_{cbg} \geq N_{ua}$	ACI 318-14 Table 17.3.1.1
A_{Nc} see ACI 318-14, Section 17.4.2.1, Fig. R 17.4.2.1(b)	
$A_{Nc0} = 9 \ h_{ef}^2$	ACI 318-14 Eq. (17.4.2.1c)
$\psi_{ec,N} = \left(\frac{1}{1 + \frac{2 \ e_N'}{3 \ h_{ef}}}\right) \leq 1.0$	ACI 318-14 Eq. (17.4.2.4)
$\psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5h_{ef}}\right) \leq 1.0$	ACI 318-14 Eq. (17.4.2.5b)
$\psi_{cp,N} = \text{MAX}\left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5h_{ef}}{c_{ac}}\right) \leq 1.0$	ACI 318-14 Eq. (17.4.2.7b)
$N_b = k_c \ \lambda_a \ \sqrt{f_c'} \ h_{ef}^{1.5}$	ACI 318-14 Eq. (17.4.2.2a)

Variables

h_{ef} [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$c_{a,min}$ [in.]	$\psi_{c,N}$
8.000	0.000	0.000	8.500	1.000

c_{ac} [in.]	k_c	λ_a	f_c' [psi]
-	24	1.000	3,000

Calculations

A_{Nc} [in.^{2}]	A_{Nc0} [in.^{2}]	$\psi_{ec1,N}$	$\psi_{ec2,N}$	$\psi_{ed,N}$	$\psi_{cp,N}$	N_b [kip]
720.00	576.00	1.000	1.000	0.912	1.000	29.745

Results

N_{cbg} [kip]	$\phi_{concrete}$	$\phi \ N_{cbg}$ [kip]	N_{ua} [kip]
33.927	0.700	23.749	6.106

4 Shear load

	Load V_{ua} [kip]	Capacity ϕ V_n [kip]	Utilization $\beta_V = V_{ua}/\phi\ V_n$	Status
Steel Strength*	0.225	7.555	3	OK
Steel failure (with lever arm)*	N/A	N/A	N/A	N/A
Pryout Strength**	0.900	61.352	2	OK
Concrete edge failure in direction y+**	0.900	10.061	9	OK

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

4.1 Steel Strength

$V_{sa} = 0.6\ A_{se,V}\ f_{uta}$ ACI 318-14 Eq. (17.5.1.2b)
$\phi\ V_{steel} \geq V_{ua}$ ACI 318-14 Table 17.3.1.1

Variables

$A_{se,V}$ [in.^{2}]	f_{uta} [psi]
0.33	58,000

Calculations

V_{sa} [kip]
11.623

Results

V_{sa} [kip]	ϕ_{steel}	$\phi\ V_{sa}$ [kip]	V_{ua} [kip]
11.623	0.650	7.555	0.225

4.2 Pryout Strength

$V_{cpg} = k_{cp} \left[\left(\frac{A_{Nc}}{A_{Nc0}} \right) \psi_{ec,N}\ \psi_{ed,N}\ \psi_{c,N}\ \psi_{cp,N}\ N_b \right]$	ACI 318-14 Eq. (17.5.3.1b)
$\phi\ V_{cpg} \geq V_{ua}$	ACI 318-14 Table 17.3.1.1
A_{Nc} see ACI 318-14, Section 17.4.2.1, Fig. R 17.4.2.1(b)	
$A_{Nc0} = 9\ h_{ef}^2$	ACI 318-14 Eq. (17.4.2.1c)
$\psi_{ec,N} = \left(\frac{1}{1 + \frac{2\ e_N'}{3\ h_{ef}}} \right) \leq 1.0$	ACI 318-14 Eq. (17.4.2.4)
$\psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5h_{ef}} \right) \leq 1.0$	ACI 318-14 Eq. (17.4.2.5b)
$\psi_{cp,N} = \mathrm{MAX}\left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5h_{ef}}{c_{ac}} \right) \leq 1.0$	ACI 318-14 Eq. (17.4.2.7b)
$N_b = k_c\ \lambda_a\ \sqrt{f_c'}\ h_{ef}^{1.5}$	ACI 318-14 Eq. (17.4.2.2a)

Variables

k_{cp}	h_{ef} [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$c_{a,min}$ [in.]
2	8.000	0.000	0.000	8.500

$\psi_{c,N}$	c_{ac} [in.]	k_c	λ_a	f_c' [psi]
1.000	-	24	1.000	3,000

Calculations

A_{Nc} [in.^{2}]	A_{Nc0} [in.^{2}]	$\psi_{ec1,N}$	$\psi_{ec2,N}$	$\psi_{ed,N}$	$\psi_{cp,N}$	N_b [kip]
930.00	576.00	1.000	1.000	0.912	1.000	29.745

Results

V_{cpg} [kip]	$\phi_{concrete}$	$\phi\ V_{cpg}$ [kip]	V_{ua} [kip]
87.646	0.700	61.352	0.900

4.3 Concrete edge failure in direction y+

$V_{cbg} = \left(\frac{A_{Vc}}{A_{Vc0}}\right) \psi_{ec,V}\ \psi_{ed,V}\ \psi_{c,V}\ \psi_{h,V}\ \psi_{parallel,V}\ V_b$ — ACI 318-14 Eq. (17.5.2.1b)

$\phi\ V_{cbg} \geq V_{ua}$ — ACI 318-14 Table 17.3.1.1

A_{Vc} see ACI 318-14, Section 17.5.2.1, Fig. R 17.5.2.1(b)*

$A_{Vc0} = 4.5\ c_{a1}^2$ — ACI 318-14 Eq. (17.5.2.1c)

$\psi_{ec,V} = \left(\frac{1}{1 + \frac{2e_V'}{3c_{a1}}}\right) \leq 1.0$ — ACI 318-14 Eq. (17.5.2.5)

$\psi_{ed,V} = 0.7 + 0.3\left(\frac{c_{a2}}{1.5c_{a1}}\right) \leq 1.0$ — ACI 318-14 Eq. (17.5.2.6b)

$\psi_{h,V} = \sqrt{\frac{1.5c_{a1}}{h_a}} \geq 1.0$ — ACI 318-14 Eq. (17.5.2.8)

$V_b = 9\ \lambda_a\ \sqrt{f_c'}\ c_{a1}^{1.5}$ — ACI 318-14 Eq. (17.5.2.2b)

Variables

c_{a1} [in.]	c_{a2} [in.]	e_{cV} [in.]	$\psi_{c,V}$	h_a [in.]
12.000	8.500	0.000	1.000	420.000

l_e [in.]	λ_a	d_a [in.]	f_c' [psi]	$\psi_{parallel,V}$
6.000	1.000	0.750	3,000	1.000

Calculations

A_{Vc} [in.^{2}]	A_{Vc0} [in.^{2}]	$\psi_{ec,V}$	$\psi_{ed,V}$	$\psi_{h,V}$	V_b [kip]
540.00	648.00	1.000	0.842	1.000	20.492

Results

V_{cbg} [kip]	$\phi_{concrete}$	$\phi\ V_{cbg}$ [kip]	V_{ua} [kip]
14.373	0.700	10.061	0.900

*Anchor row defined by: Anchor 3, 4; Case 3 controls

5 Combined tension and shear loads

β_N	β_V	ζ	Utilization $\beta_{N,V}$ [%]	Status
0.278	0.089	5/3	14	OK

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

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.
- 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&/

Fastening meets the design criteria!

Company:		Page:	9
Address:		Specifier:	
Phone I Fax:	|	E-Mail:	
Design:	Woods - Puyallup - ST7	Date:	6/28/2026
Fastening point:			

7 Installation data

Profile: Square HSS (AISC), HSS4X4X.25; (L x W x T) = 4.000 in. x 4.000 in. x 0.250 in.

Hole diameter in the fixture: d_f = 0.812 in.

Plate thickness (input): 0.500 in.

Recommended plate thickness: not calculated

Anchor type and diameter: Hex Head ASTM F 1554 GR. 36 3/4

Item number: not available

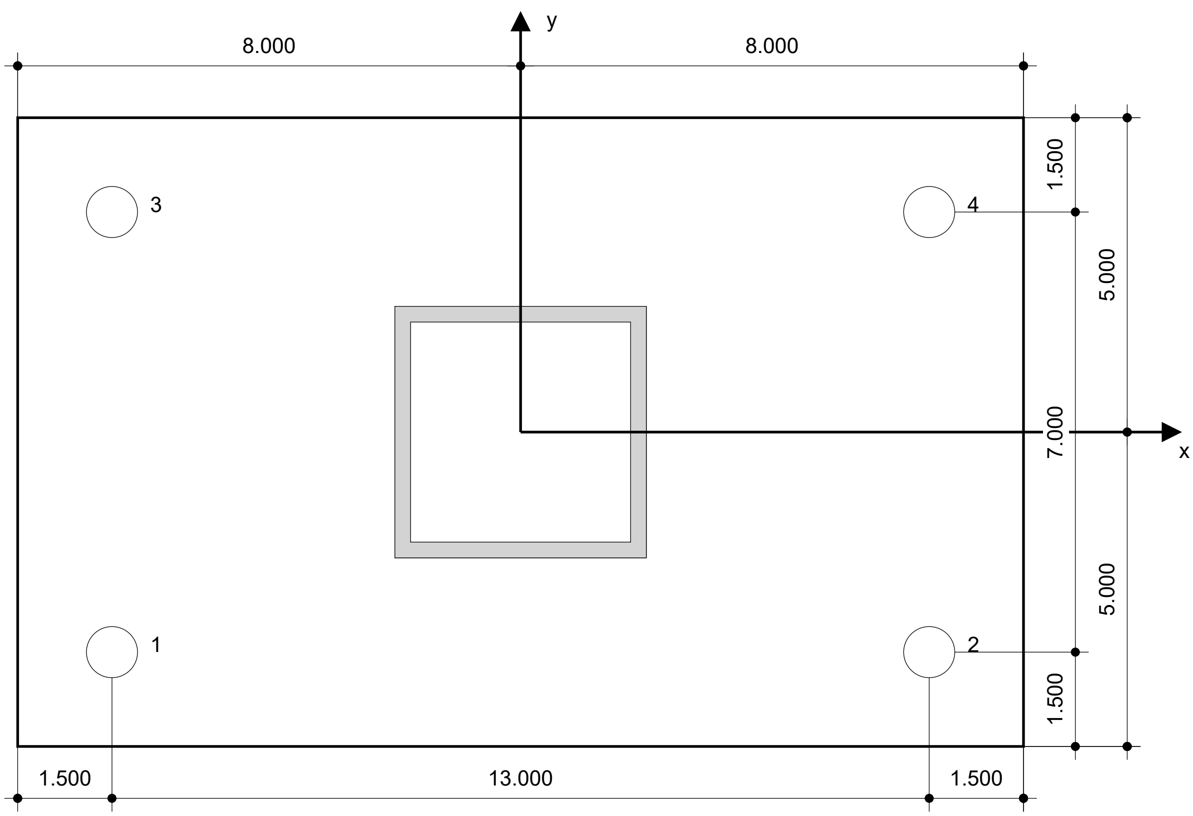
Maximum installation torque: -

Hole diameter in the base material: - in.

Hole depth in the base material: 9.000 in.

Minimum thickness of the base material: 10.000 in.

∅ 3/4 in Hex Head ASTM F 1554 GR. 36 with 9 in nominal embedment depth per Technical data , cast in place installation per MPII



Coordinates Anchor [in.]

Anchor	x	y	c_{-x}	c_{+x}	c_{-y}	c_{+y}
1	-6.500	-3.500	8.500	21.500	12.000	19.000
2	6.500	-3.500	21.500	8.500	12.000	19.000
3	-6.500	3.500	8.500	21.500	19.000	12.000
4	6.500	3.500	21.500	8.500	19.000	12.000