

PLACA BASE COLUMNA Ø6"x6mm

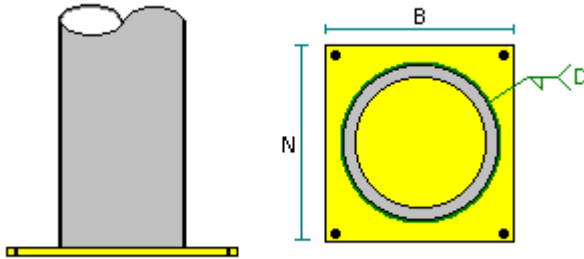
Data

Connection name : Fixed biaxial BP
Connection ID : 2

Family: Column - Base (CB)
Type: Base plate

GENERAL INFORMATION

Connector



MEMBERS

Column

Column type : Prismatic member
Section : HSS_RND 6.000X0.250
Material : A500 GrC rounded
Longitudinal offset : 0 mm
Transversal offset : 0 mm

CONNECTOR

Base plate

Position on the support : Center
N: Longitudinal dimension : 250 mm
B: Transversal dimension : 250 mm
Thickness : 12 mm
Material : A36
Column weld : E70XX
D: Column weld size (1/16 in) : 3
Override A2/A1 ratio : No
Include shear lug : No

Support

With pedestal : No
Longitudinal dimension : 300 mm
Transversal dimension : 300 mm
Thickness : 1000 mm
Material : C 4-60
Include grouting : Yes
Grout thickness : 50.8 mm

Anchor

Anchor position : Longitudinal position
Rows number per side : 1
Anchors per row : 2
Longitudinal edge distance on the plate : 40 mm
Transverse edge distance on the plate : 40 mm
Anchor type : Headed
Head type : Hexagonal
Include lock nut : No
Anchor : 5/8"
Effective embedment depth : 304.8 mm
Total length : 388.56 mm

Material	:	F1554 Gr36
Fy	:	0.248 kN/mm2
Fu	:	0.4 kN/mm2
Cracked concrete	:	No
Brittle steel	:	No
Anchors welded to base plate	:	No
<u>Anchor reinforcement</u>		
Type of reinforcement	:	Primary
Tension reinforcement	:	No
Shear reinforcement	:	No

Results

Connection name : Fixed biaxial BP
Connection ID : 2

Family: Column - Base (CB)
Type: Base plate
Design code: AISC 360-16 LRFD, ACI 318-08

DEMANDS

Description	Pu [KN]	Mu22 [KN*m]	Mu33 [KN*m]	Vu2 [KN]	Vu3 [KN]	Load type
DL	-15.70	-5.20	-2.40	-1.15	3.00	Design

Design for major axis Base plate (AISC 360-16 LRFD)

GEOMETRIC CONSIDERATIONS

Dimensions	Unit	Value	Min. value	Max. value	Sta.	References
<u>Base plate</u>						
Distance from anchor to edge	[mm]	32.06	6.35	--	✓	
Weld size	[1/16in]	3	2	--	✓	table J2.4

DESIGN CHECK

Verification	Unit	Capacity	Demand	Ctrl EQ	Ratio	References
<u>Concrete base</u>						
Axial bearing	[KN/mm2]	0.02	0.00	DL	0.20	DG1 3.1.1;
<u>Base plate</u>						
Flexural yielding (bearing interface)	[KN*m/m]	8.04	5.69	DL	0.71	DG1 Eq. 3.3.13, DG1 Sec 3.1.2
Flexural yielding (tension interface)	[KN*m/m]	8.04	6.24	DL	0.78	DG1 Eq. 3.3.13
<u>Column</u>						
Weld capacity	[KN/m]	1097.08	98.31	DL	0.09	p. 8-9, Sec. J2.5, Sec. J2.4, HSS Manual p. 7-10
Elastic method weld shear capacity	[KN/m]	731.39	4.80	DL	0.01	p. 8-9, Sec. J2.5, Sec. J2.4
Elastic method weld axial capacity	[KN/m]	1097.08	131.57	DL	0.12	p. 8-9, Sec. J2.5, Sec. J2.4
Ratio		0.78				

Design for minor axis Base plate (AISC 360-16 LRFD)

GEOMETRIC CONSIDERATIONS

Dimensions	Unit	Value	Min. value	Max. value	Sta.	References
<u>Base plate</u>						
Distance from anchor to edge	[mm]	32.06	6.35	--	✓	
Weld size	[1/16in]	3	2	--	✓	table J2.4

DESIGN CHECK

Verification	Unit	Capacity	Demand	Ctrl EQ	Ratio	References
<u>Concrete base</u>						
Axial bearing	[KN/mm2]	0.02	0.00	DL	0.20	DG1 3.1.1;
<u>Base plate</u>						
Flexural yielding (bearing interface)	[KN*m/m]	8.04	6.70	DL	0.83	DG1 Eq. 3.3.13, DG1 Sec 3.1.2
Flexural yielding (tension interface)	[KN*m/m]	8.04	6.24	DL	0.78	DG1 Eq. 3.3.13
<u>Column</u>						
Weld capacity	[KN/m]	1097.08	98.31	DL	0.09	p. 8-9, Sec. J2.5, Sec. J2.4, HSS Manual p. 7-10
Elastic method weld shear capacity	[KN/m]	731.39	12.53	DL	0.02	p. 8-9, Sec. J2.5, Sec. J2.4
Elastic method weld axial capacity	[KN/m]	1097.08	285.06	DL	0.26	p. 8-9, Sec. J2.5, Sec. J2.4
Ratio	0.83					

Major axis Anchors

GEOMETRIC CONSIDERATIONS

Dimensions	Unit	Value	Min. value	Max. value	Sta.	References
<u>Anchors</u>						
Anchor spacing	[mm]	170.00	63.50	--	✓	Sec. D.8.1
Concrete cover	[mm]	57.06	50.00	--	✓	Sec. 7.7.1
Effective length	[mm]	315.12	--	989.68	✓	

DESIGN CHECK

Verification	Unit	Capacity	Demand	Ctrl EQ	Ratio	References
Anchor tension	[KN]	43.73	12.49	DL	0.29	Eq. D-3
Breakout of anchor in tension	[KN]	28.87	12.49	DL	0.43	Eq. D-4, Sec. D.4.1.1
Breakout of group of anchors in tension	[KN]	27.09	22.70	DL	0.84	Eq. D-5, Sec. D.4.1.1
Pullout of anchor in tension	[KN]	63.35	12.49	DL	0.20	Sec. D.4.1.1
Side-face blowout of anchor in tension	[KN]	27.17	12.49	DL	0.46	Sec. D.5.4.1, Sec. D.4.1.1
Side-face blowout of group of anchors in tension	[KN]	78.03	14.48	DL	0.19	Eq. D-17, Sec. D.4.1.1
Anchor shear	[KN]	18.19	0.80	DL	0.04	Eq. D-20, Sec. D.6.1.3
Breakout of anchor in shear	[KN]	7.10	0.29	DL	0.04	Sec. D.4.1.1
Breakout of group of anchors in shear	[KN]	20.92	1.15	DL	0.05	Sec. D.4.1.1
Pryout of anchor in shear	[KN]	57.74	0.29	DL	0.00	Eq. D-4, Sec. D.4.1.1
Pryout of group of anchors in shear	[KN]	54.19	0.86	DL	0.02	Eq. D-5, Sec. D.4.1.1
Interaction of tensile and shear forces	[KN]	1.20	0.00	DL	0.00	Eq. D-3, Eq. D-4, Sec. D.4.1.1, Eq. D-5, Sec. D.5.4.1, Eq. D-17, Eq. D-20, Sec. D.6.1.3,

Ratio	0.84
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Minor axis Anchors

GEOMETRIC CONSIDERATIONS

Dimensions	Unit	Value	Min. value	Max. value	Sta.	References
<u>Anchors</u>						
Anchor spacing	[mm]	170.00	63.50	--	✓	Sec. D.8.1
Concrete cover	[mm]	57.06	50.00	--	✓	Sec. 7.7.1
Effective length	[mm]	315.12	--	989.68	✓	

DESIGN CHECK

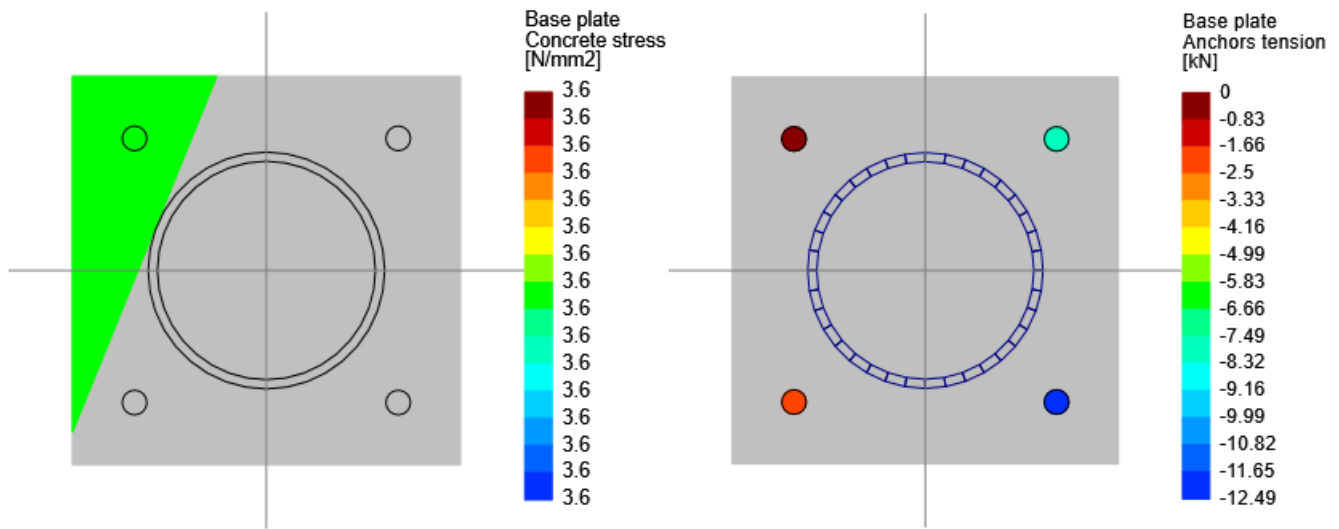
Verification	Unit	Capacity	Demand	Ctrl EQ	Ratio	References
Anchor tension	[KN]	43.73	12.49	DL	0.29	Eq. D-3
Breakout of anchor in tension	[KN]	28.87	12.49	DL	0.43	Eq. D-4, Sec. D.4.1.1
Breakout of group of anchors in tension	[KN]	27.09	22.70	DL	0.84	Eq. D-5, Sec. D.4.1.1
Pullout of anchor in tension	[KN]	63.35	12.49	DL	0.20	Sec. D.4.1.1
Side-face blowout of anchor in tension	[KN]	27.17	12.49	DL	0.46	Sec. D.5.4.1, Sec. D.4.1.1
Side-face blowout of group of anchors in tension	[KN]	78.03	20.71	DL	0.27	Eq. D-17, Sec. D.4.1.1
Anchor shear	[KN]	18.19	0.80	DL	0.04	Eq. D-20, Sec. D.6.1.3
Breakout of anchor in shear	[KN]	7.10	0.75	DL	0.11	Sec. D.4.1.1
Breakout of group of anchors in shear	[KN]	20.92	3.00	DL	0.14	Sec. D.4.1.1
Pryout of anchor in shear	[KN]	57.74	0.75	DL	0.01	Eq. D-4, Sec. D.4.1.1
Pryout of group of anchors in shear	[KN]	54.19	2.25	DL	0.04	Eq. D-5, Sec. D.4.1.1
Interaction of tensile and shear forces	[KN]	1.20	0.00	DL	0.00	Eq. D-3, Eq. D-4, Sec. D.4.1.1, Eq. D-5, Sec. D.5.4.1, Eq. D-17, Eq. D-20, Sec. D.6.1.3, Sec. D.7

Ratio	0.84
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Global critical strength ratio	0.84
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Biaxial

Maximum compression and tension (DL)



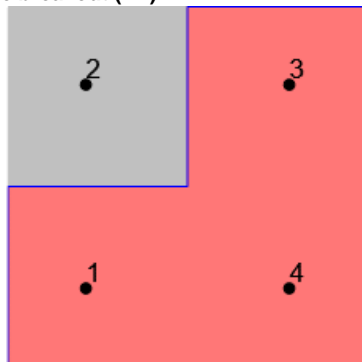
Maximum bearing pressure	3.60	[N/mm2]
Minimum bearing pressure	3.60	[N/mm2]
Maximum anchor tension	12.49	[kN]
Minimum anchor tension	0.00	[kN]
Neutral axis angle	0.00	
Bearing length	86.20	[mm]

Anchors tensions

Anchor	Transverse [mm]	Longitudinal [mm]	Shear [kN]	Tension [kN]
1	-85.00	-85.00	-0.29	1.99
2	-85.00	85.00	-0.29	0.00
3	85.00	85.00	-0.29	8.22
4	85.00	-85.00	-0.29	12.49

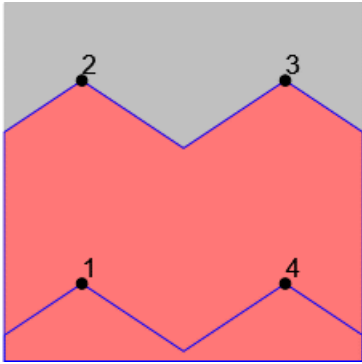
Major axis

Results for tensile breakout (DL)



Group	Area [mm2]	Tension [kN]	Anchors
1	67500.00	22.70	1, 3, 4

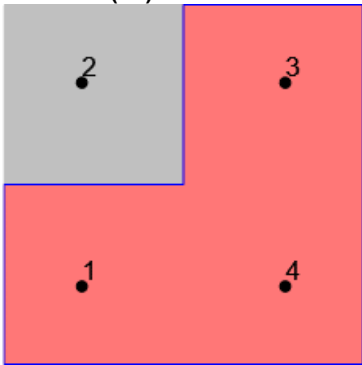
Results for shear breakout (DL)



Group	Area [mm ²]	Shear [kN]	Anchors
1	29250.00	0.57	1, 4
2	105750.00	1.15	1, 2, 3, 4

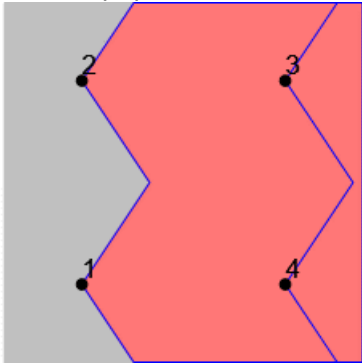
Minor axis

Results for tensile breakout (DL)



Group	Area [mm ²]	Tension [kN]	Anchors
1	67500.00	22.70	1, 3, 4

Results for shear breakout (DL)



Group	Area [mm ²]	Shear [kN]	Anchors
1	105750.00	3.00	1, 2, 3, 4
2	29250.00	1.50	3, 4