

CONEXIÓN IPE 200 A CONCRETO

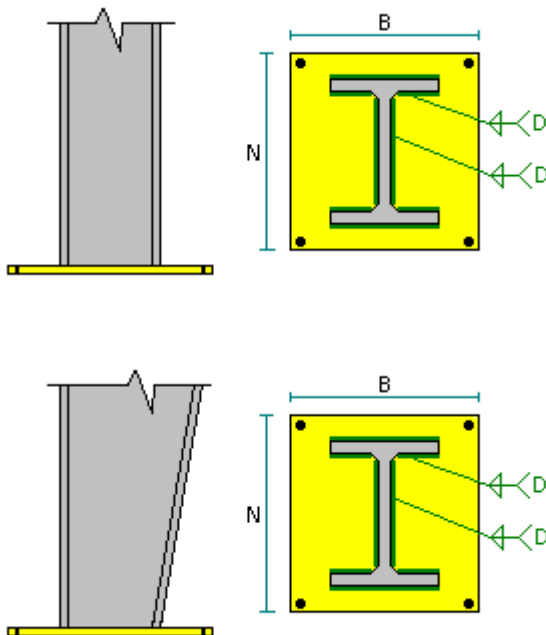
Data

Connection name : Fixed uniaxial major axis BP
Connection ID : 4

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

GENERAL INFORMATION

Connector



MEMBERS

Column

Column type : Prismatic member
Section : IPE 200
Material : A572 Gr50
Longitudinal offset : 0 mm

CONNECTOR

Base plate

Connection type : Unstiffened
Position on the support : Center
N: Longitudinal dimension : 300 mm
B: Transversal dimension : 160 mm
Thickness : 10 mm
Material : A36
Column weld : E70XX
Outer welds flanges only : No
D: Column weld size (1/16 in) : 5
Override A2/A1 ratio : Yes
Value for A2/A1 ratio : 1
Include shear lug : No

Support

With pedestal : No
Longitudinal dimension : 500 mm

Transversal dimension	:	3000 mm
Thickness	:	400 mm
Material	:	C 4-60
Include grouting	:	No
<u>Anchor</u>		
Anchor position	:	Longitudinal position
Rows number per side	:	1
Anchors per row	:	3
Longitudinal edge distance on the plate	:	30 mm
Transverse edge distance on the plate	:	40 mm
Anchor type	:	Headed
Head type	:	Hexagonal
Include lock nut	:	No
Anchor	:	1/2"
Effective embedment depth	:	250 mm
Total length	:	276.76 mm
Material	:	A36 (anchor)
Fy	:	0.248 kN/mm ²
Fu	:	0.4 kN/mm ²
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 uniaxial major axis
Connection ID : 4

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
Wu	-2.00	0.00	-3.50	-3.50	0.00	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]	23.65	6.35	--	✓	
Weld size	[1/16in]	5	2	--	✓	table J2.4

DESIGN CHECK

Verification	Unit	Capacity	Demand	Ctrl EQ	Ratio	References
<u>Concrete base</u>						
Axial bearing	[KN/mm ²]	0.02	0.00	DL	0.12	DG1 3.1.1;
<u>Base plate</u>						
Flexural yielding (bearing interface)	[KN*m/m]	5.58	2.66	DL	0.48	DG1 Eq. 3.3.13, DG1 Sec 3.1.2
Flexural yielding (tension interface)	[KN*m/m]	5.58	2.85	DL	0.51	DG1 Eq. 3.3.13
<u>Column</u>						
Weld capacity	[KN/m]	1828.47	142.31	DL	0.08	p. 8-9,

Elastic method weld shear capacity	[KN/m]	1218.98	11.01	DL	0.01	Sec. J2.5, Sec. J2.4, DG1 p. 35 p. 8-9, Sec. J2.5, Sec. J2.4
Elastic method weld axial capacity	[KN/m]	1828.47	90.94	DL	0.05	p. 8-9, Sec. J2.5, Sec. J2.4

Ratio	0.51
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Major axis Anchors

GEOMETRIC CONSIDERATIONS

Dimensions	Unit	Value	Min. value	Max. value	Sta.	References
<u>Anchors</u>						
Anchor spacing	[mm]	80.00	50.80	--	✓	Sec. D.8.1
Concrete cover	[mm]	123.65	76.20	--	✓	Sec. 7.7.1
Effective length	[mm]	258.26	--	391.75	✓	

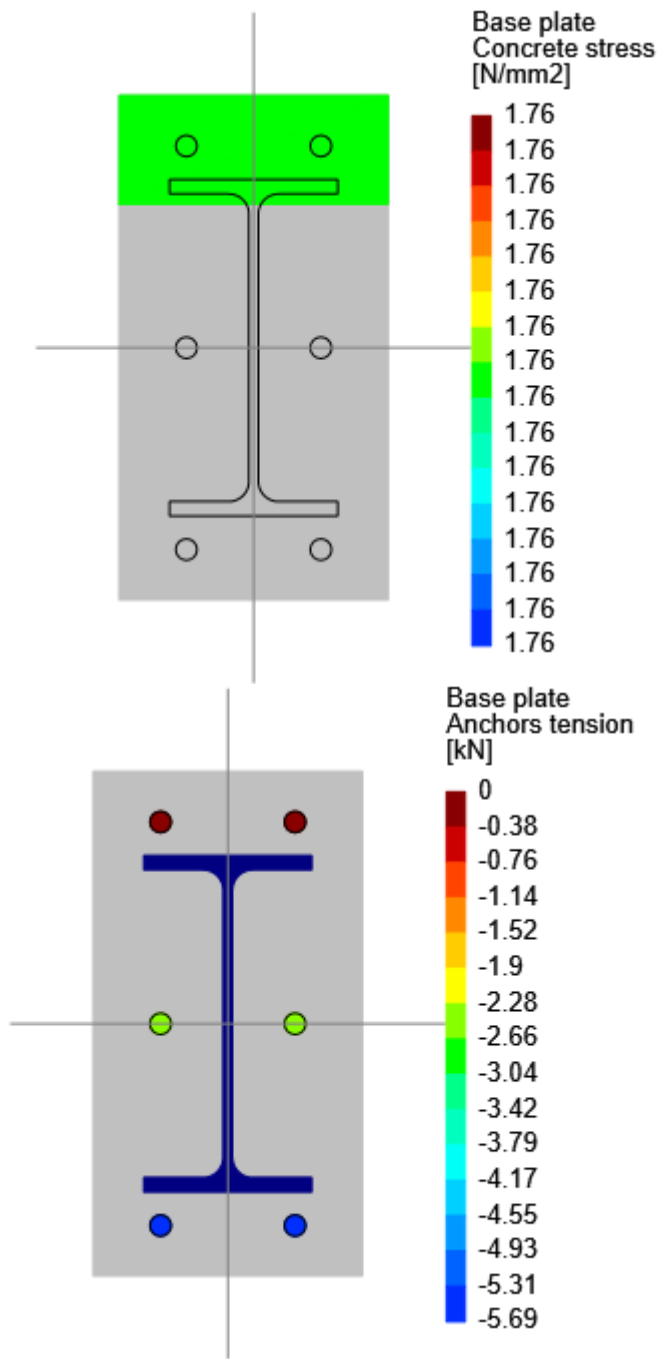
DESIGN CHECK

Verification	Unit	Capacity	Demand	Ctrl EQ	Ratio	References
Anchor tension	[KN]	27.46	5.69	DL	0.21	Eq. D-3
Breakout of anchor in tension	[KN]	97.78	5.69	DL	0.06	Eq. D-4, Sec. D.4.1.1
Breakout of group of anchors in tension	[KN]	101.51	16.12	DL	0.16	Eq. D-5, Sec. D.4.1.1
Pullout of anchor in tension	[KN]	40.61	5.69	DL	0.14	Sec. D.4.1.1
Anchor shear	[KN]	14.28	0.58	DL	0.04	Eq. D-20
Breakout of anchor in shear	[KN]	23.95	0.58	DL	0.02	Sec. D.4.1.1
Breakout of group of anchors in shear	[KN]	28.86	1.17	DL	0.04	Sec. D.4.1.1
Pryout of anchor in shear	[KN]	195.56	0.58	DL	0.00	Eq. D-4, Sec. D.4.1.1
Pryout of group of anchors in shear	[KN]	203.03	2.33	DL	0.01	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, Eq. D-20, Sec. D.7

Ratio	0.21
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Global critical strength ratio	0.51
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Major axis
Maximum compression and tension (Wu)



Maximum bearing pressure	1.76	[N/mm2]
Minimum bearing pressure	1.76	[N/mm2]
Maximum anchor tension	5.69	[kN]
Minimum anchor tension	0.00	[kN]
Neutral axis angle	0.00	
Bearing length	64.49	[mm]

Anchors tensions

Anchor	Transverse [mm]	Longitudinal [mm]	Shear [kN]	Tension [kN]
1	-40.00	-120.00	-0.58	5.69
2	-40.00	0.00	-0.58	2.37
3	-40.00	120.00	-0.58	0.00
4	40.00	120.00	-0.58	0.00
5	40.00	0.00	-0.58	2.37
6	40.00	-120.00	-0.58	5.69

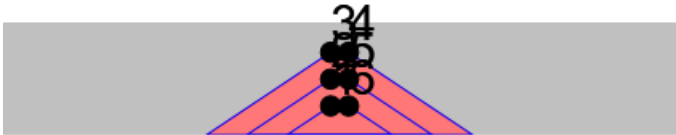
Major axis

Results for tensile breakout (DL)



Group	Area [mm2]	Tension [KN]	Anchors
1	415000.00	16.12	1, 2, 5, 6

Results for shear breakout (DL)



Group	Area [mm2]	Shear [KN]	Anchors
1	91650.00	1.17	1, 6
2	311250.00	2.33	1, 2, 5, 6
3	476000.00	3.50	1, 2, 3, 4, 5, 6