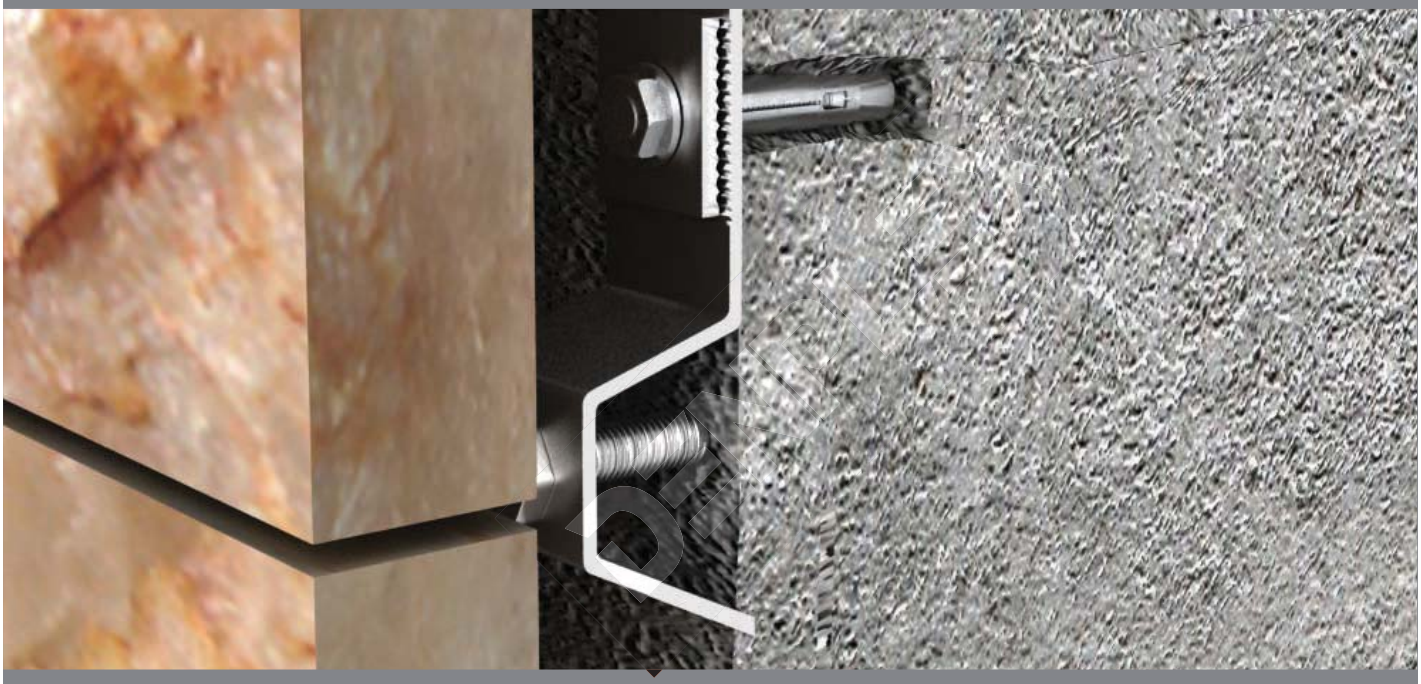


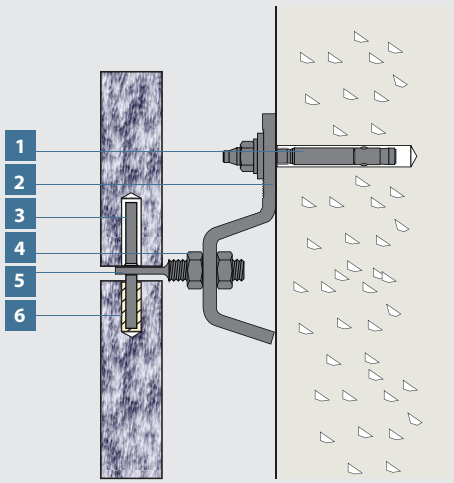
SYSTEM TYPE DZ01 WITH RETURNED LEG

Z-Bracket with Returned Leg

Application
According to DIN 18515 ,all cladding panels which are larger than 0.1 m^2 have to be anchored.

Material
Manufactured from stainless steel AISI 304,316L and 316Ti
Adjustability in two directions.

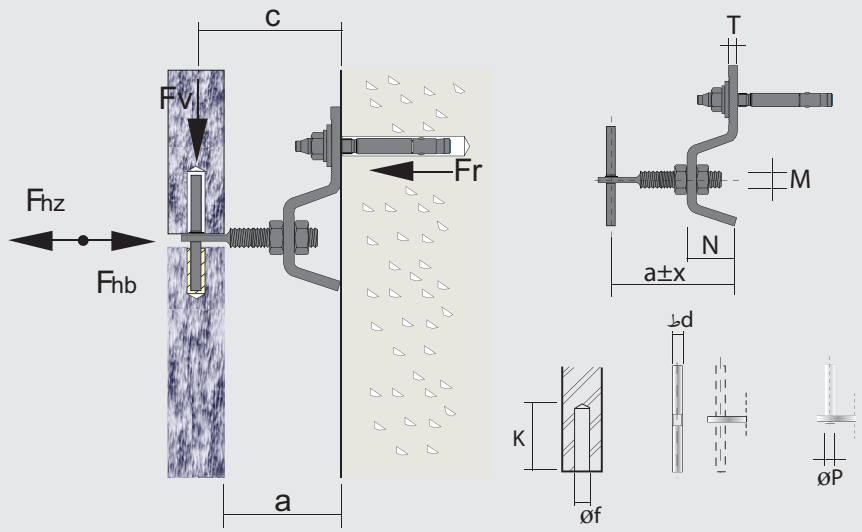
1	Anchor bolt
2	Z-bracket
3	Pin
4	Nut
5	Flat head bolt
6	Plastic tube



Advantages
-The panels are secured to the anchoring base material with absolute safety.
-Manufactured from stainless steel for high corrosion resistance and better durability.
-The support and restraint brackets are adjustable in 2 directions.
-The brackets are fixed into the anchoring base by means of anchors .Due to the small drill hole dimensions of the anchors , the facade can be installed very quickly .The small size of drill hole into the anchoring base material means that heavy drilling equipment is not required.

SYSTEM TYPE DZ01 WITH RETURNED LEG

Z-Bracket with Returned Leg Horizontal Joint Type DZ01V

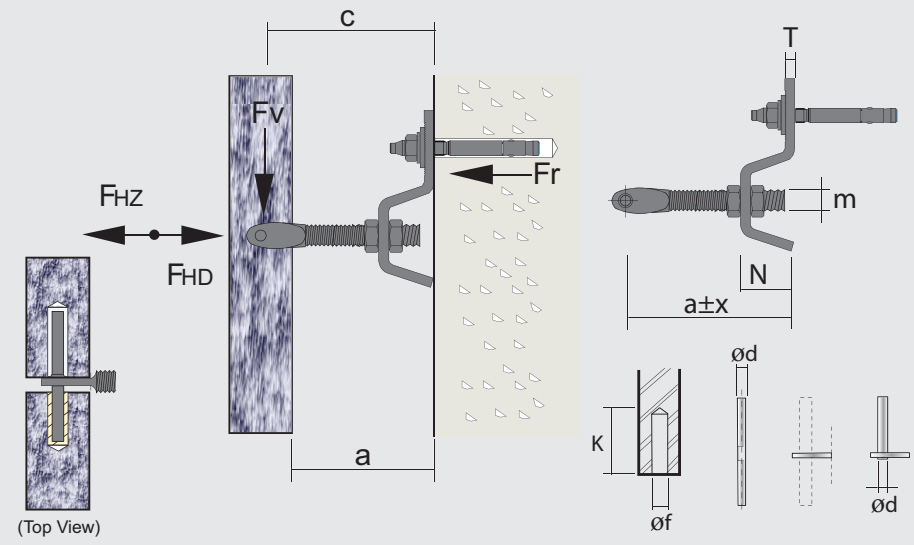


Anchoring base:
According to the anchor bolt.
a = cavity to backside to panel

Adjustibility:
in 2 directions x = ± 10 mm
Z = ± 05 mm

Fv = vertical load
Fhd = horizontal load (wind pressure)
Fhz = horizontal load (wind suction)
Fr = pullout force

Z-Bracket with Returned Leg Vertical joint Type DZ01H



SYSTEM TYPE DZ01 WITH RETURNED LEG

Z-Bracket with Returned Leg DZ01

Materials SS304,SS316,SS316L ,SS316TI ,S235JR-MG ,S235JR-HDG 50°C 24h average temperature
Standard items:

Item No .	Width (W)	Thickness (T)	O set(N)	FHB	Ø Pin	Slot
DZ01-35.3.20	35	3	20	M8	4	6.5 x 22
DZ01-40.3.30	40	3	30	M8	4	6.5 x 22
DZ01-45.3.40	45	3	40	M8	4	6.5 x 22
DZ01-50.3.50	50	3	50	M8	4	6.5 x 22
DZ01-40.4.20	40	4	20	M10	5	8.5 x 22
DZ01-40.4.30	40	4	30	M10	5	8.5 x 22
DZ01-45.4.40	45	4	40	M10	5	8.5 x 22
DZ01-50.4.50	50	4	50	M10	5	8.5 x 22
DZ01-40.5.20	40	5	20	M12	6	8.5 x 22
DZ01-45.5.30	45	5	30	M12	6	8.5 x 22
DZ01-45.5.40	45	5	40	M12	6	8.5 x 22
DZ01-50.5.50	50	5	50	M12	6	8.5 x 22

Load Table of Z-Bracket with Returned Leg

Materials SS304,SS316,SS316L ,SS316TI ,S235JR-MG ,S235JR-HDG 50°C 24h average temperature

Bracket Offset mm	Cavity to Pin min - max mm (e)	Dead load max DL kN	Wind load max WL ± kN	Bracket Width mm	Bracket Thickness (T) mm	Ø Pin mm	FHB A2-70 A4-70	Anchor Comb . Force kN *
20	50-60	0.16	0.21	35	3	4	M8	1.90
30	60-70			40	3	4	M8	2.00
40	70-80			45	3	4	M8	2.10
50	80-90			50	3	4	M8	2.10
60	90-100			40	4	4	M8	2.10
70	100-110			40	4	4	M8	2.10
20	50-60	0.28	0.37	40	4	5	M10	3.40
30	60-70			40	4	5	M10	3.60
40	70-80			45	4	5	M10	3.60
50	80-90			50	4	5	M10	3.70
60	90-100			50	4	5	M10	3.70
70	100-110			55	4	5	M10	3.80
20	50-60	0.45	0.66	40	5	6	M12	6.00
30	60-70			45	5	6	M12	6.00
40	70-80			45	5	6	M12	6.10
50	80-90			50	5	6	M12	6.20
60	90-100			55	5	6	M12	6.30
70	100-110			60	5	6	M12	6.30

Loads per 1 bracket
If loads are bigger or dimensions are different ,individual calculation is necessary
*with safety 3.0

SYSTEM TYPE DZ01 WITH RETURNED LEG

Z-Bracket with Returned Leg Horizontal Joint

The structural analysis fully considers the dead load of the panel ,imposed wind loads and thermal stresses ,in accordance with relevant DIN standards.

Loads caused by earthquakes can be transferred into the anchoring base .

The support and restraint brackets are fixed using expansion anchors ,chemical anchors , etc...

The support and restraint brackets are adjustable in 2 directions.

Due to the adjustability of the brackets and the small drill hole dimensions of the anchors , the façade can be installed very quickly.

The restraint anchors of the system 1 to 5are interchangeable so that any problem in the fixing can be solved optimally.

SYSTEM TYPE DZ01 WITH RETURNED LEG

Z-Bracket with Returned Leg Vertical Joint

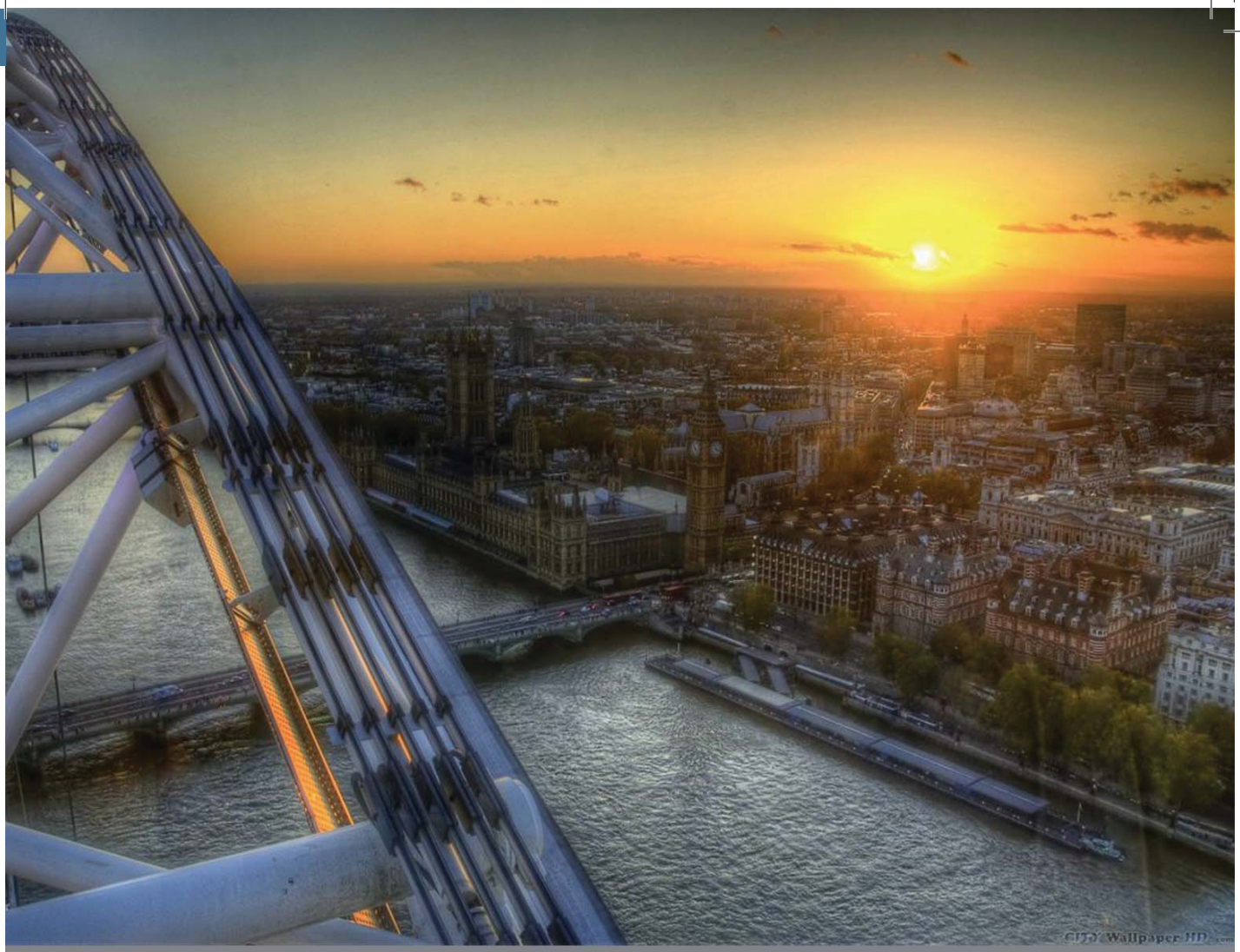
The structural analysis fully considers the dead load of panel ,imposed wind loads and thermal stresses ,in accordance with relevant DIN standards.

Loads caused by earthquakes can be transferred into the anchoring base .

The support and restraint brackets are fixed using expansion anchors ,chemical anchors , etc.

The support and restraint brackets are adjustable in 2 directions.

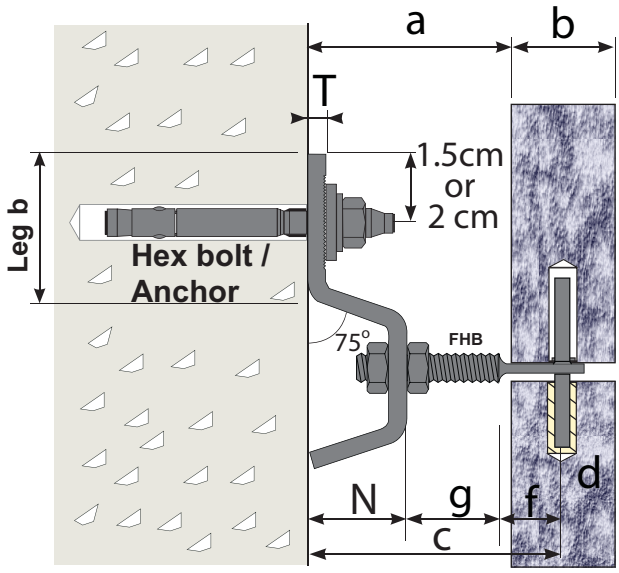
Due to the adjustability of the brackets and the small drill hole dimensions of the anchors ,the façade can be installed very quickly.



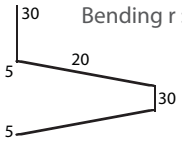
CASE STUDY

PROOF FOR Z-RETURNED BRACKET ACCORDING TO DIN 18.800

Z-returned bracket	
a	Cavity to back side panel
b	Panel thickness
T	Bracket thickness
d	Diameter of pin
c	Cavity to pin
f	Flat head parts
g	Threaded part
N	Bracket offset



Bending detail:



Bending r :6 mm min.

Facade panel:

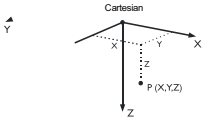
	Width=	500 mm
	Height=	500 mm
	Thickness=	30 mm
	Cavity a=	40 ± 15 mm
	Offset N=	20 mm
	Cavity to Pin=	55 ± 15 mm

Facade bracket

Sec: 1	min .w1 =	8 mm
	t1=	3 mm
Sec : 2	thread=	M8
Sec : 3	w3=	30 mm
	t3=	3 mm
Sec : 4	d=	4.0 mm
	l=	>= 40 mm
pieces in 1 joint:		2

MODEL - GENERAL DATA

	General	Model name	:	
		Project name	:	
		Folder	:	
		Type of model	:	3D
		Positive direction of global axis Z	:	Downward
		Classification of load cases and combinations	:	According to Standard :DIN 18800 National annex :None

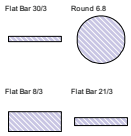


1.1 NODES

Node No.	Reference Node	Coordinate System	Node Coordinates X [cm]	Y [cm]	Z [cm]	Comment
1	-	Cartesian	0.00	0.00	0.00	
2	-	Cartesian	0.00	0.00	-1.60	
3	-	Cartesian	0.00	0.00	1.40	
4	-	Cartesian	2.00	0.00	1.90	
6	-	Cartesian	0.00	0.00	5.40	
7	-	Cartesian	2.00	0.00	3.40	
9	-	Cartesian	5.50	0.00	3.40	
10	-	Cartesian	0.00	0.00	-1.10	
11	-	Cartesian	0.00	0.00	0.90	
14	-	Cartesian	3.50	0.00	3.40	
15	-	Cartesian	2.00	0.00	4.90	

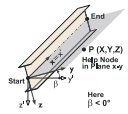
1.2 MATERIALS

Matl. No.	Modulus E [kN/cm²]	Modulus G [kN/cm²]	Spec .Weight γ [kN/m³]	Therm .Coeff. α [1°/C]	Partial Factor γ_M [-]	Material Model
1	A-70 | DIN EN 1993-1-4:2007-02					
	17000.00	6540.00	78.50	1.2000E-05	1.000	Standard
	User-Defined Material					
2	SS 304 | DIN EN 1993-1-4:2007-02					
	17000.00	6540.00	80.00	1.6000E-05	1.000	Standard
	User-Defined Material					



1.3 CROSS-SECTIONS

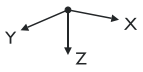
Section No.	Matl. No.	J [cm⁴] A [cm²]	I_y [cm⁴] A_y [cm²]	I_z [cm⁴] A_z [cm²]	Principal Axes α [°]	Rotation α'[°]	Overall Dimensions [mm] Width b	Height h
1	Flat Bar 30/3							
	2	0.03	0.01	0.68	0.00	0.00	30.0	3.0
		0.90	0.75	0.75				
2	Round 6.8							
	1	0.02	0.01	0.01	0.00	0.00	6.8	6.8
		0.36	0.31	0.31				
3	Flat Bar 8/3							
	1	0.01	0.00	0.01	0.00	0.00	8.0	3.0
		0.24	0.20	0.20				
4	Flat Bar 21/3							
	2	0.02	0.00	0.23	0.00	0.00	21.0	3.0
		0.63	0.52	0.52				



1.7 MEMBERS

Mbr. No.	Member	Node Start	Node End	Rotation Type	Rotation β[°]	Cross-Section Start	Cross-Section End	Release No. Start	Release No. End	Ecc. No.	Div. No.	Length L [cm]	
1	Beam	2	10	Angle	0.00	1	1	-	-	-	-	0.50	Z
3	Beam	3	4	Angle	0.00	1	1	-	-	-	-	2.06	XZ
4	Beam	4	7	Angle	0.00	1	1	-	-	-	-	1.50	Z
5	Beam	7	15	Angle	0.00	1	1	-	-	-	-	1.50	Z
6	Beam	15	6	Angle	0.00	1	1	-	-	-	-	2.06	XZ
7	Beam	7	14	Angle	0.00	2	2	-	-	-	-	1.50	X
8	Beam	14	9	Angle	0.00	3	3	-	-	-	-	2.00	X
9	Beam	11	3	Angle	0.00	1	1	-	-	-	-	0.50	Z
10	Beam	10	1	Angle	0.00	4	4	-	-	-	-	1.10	Z
11	Beam	1	11	Angle	0.00	4	4	-	-	-	-	0.90	Z

1.8 NODAL SUPPORTS



Support No.	Nodes No.	Sequen.	Rotation[°] about X	about Y	about Z	Support Conditions $u_{X'}$	$u_{Y'}$	$u_{Z'}$	$\varphi_{X'}$	$\varphi_{Y'}$	$\varphi_{Z'}$
1	2,3,6	XYZ	0.00	270.00	0.00	☐	☒	Ineffective	☐	☐	☐
2	1	XYZ	0.00	0.00	0.00	☒	☒	☒	☒	Spring	☒

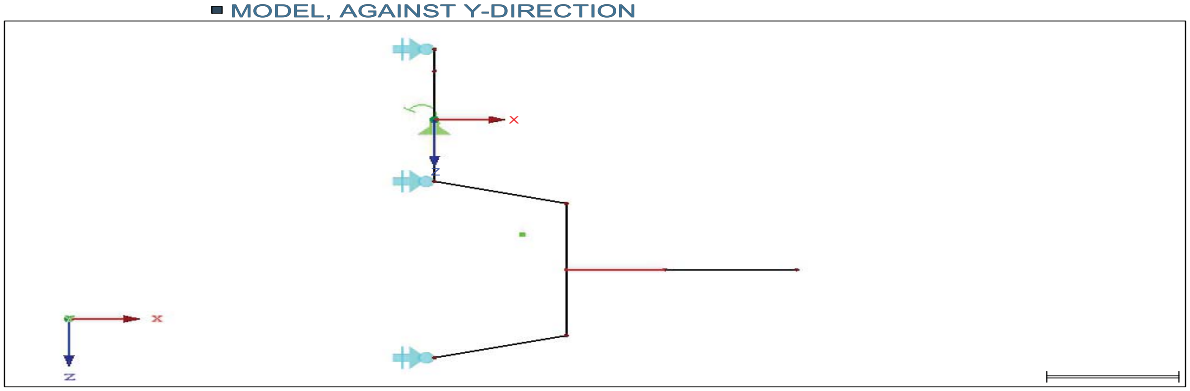
1.8.1 NODAL SUPPORTS - SPRINGS

Support No.	Nodes No.	Translation Spring]kN/m[$C_{u,X'}$	$C_{u,Y'}$	$C_{u,Z'}$	Rotation Spring [kNm/rad] $C_{\varphi,X'}$	$C_{\varphi,Y'}$	$C_{\varphi,Z'}$
2	1	-	-	-	-	0.002	-

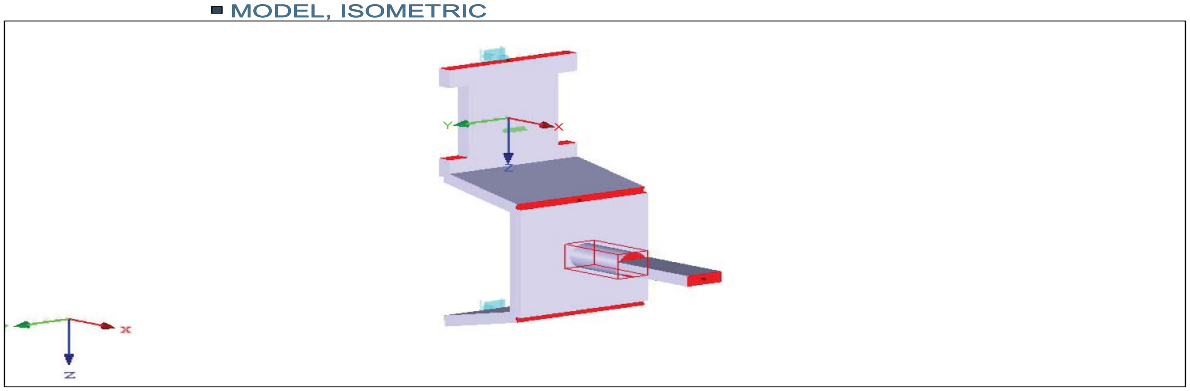
1.8.2 NODAL SUPPORTS - INEFFECTIVE

Support No.	Nodes No.	Ineffective Support Under $P_{X'}$	$P_{Y'}$	$P_{Z'}$	$M_{X'}$	$M_{Y'}$	$M_{Z'}$
1	2,3,6	-	-	Tension	-	-	-

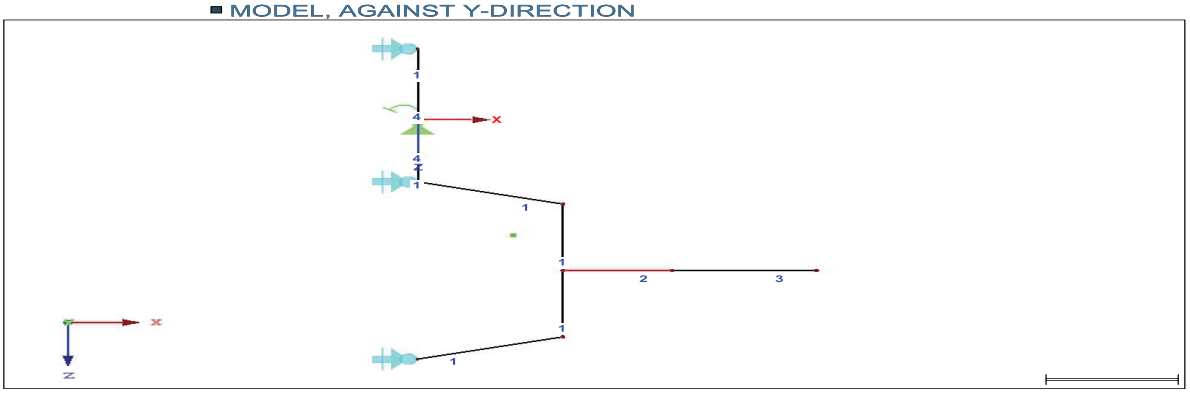
■ MODEL, AGAINST Y-DIRECTION



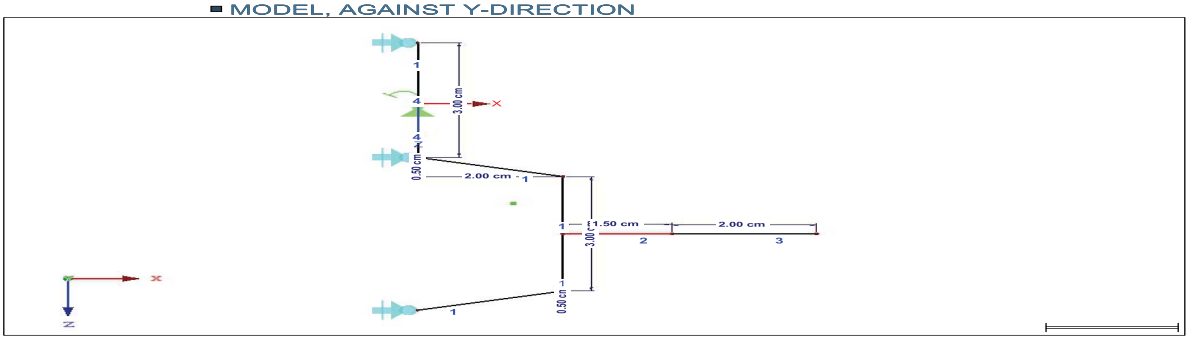
■ MODEL, ISOMETRIC



■ MODEL, AGAINST Y-DIRECTION



■ MODEL, AGAINST Y-DIRECTION



2.1 LOAD CASES

Load Case	Load Case Description	DIN 18800 Action Category	Self-Weight - Factor in Direction Active	X	Y	Z
LC1	proper-wight	Permanent	☒	0.000	0.000	1.000
LC2	Wind pressure	Variable	☐			
LC3	Wind-suction	Variable	☐			
LC4	Seismic	Accidental	☐			

2.1.1 LOAD CASES - CALCULATION PARAMETERS

Load Case	Load Case Description	Calculation parameters	
LC1	proper-wight	Method of analysis	: ⊙ Geometrically linear static analysis
		Options	: ☒ Modify loading by factor: 0.500
LC2	Wind pressure	Method of analysis	: ⊙ Geometrically linear static analysis
		Options	: ☒ Modify loading by factor: 0.500
LC3	Wind-suction	Method of analysis	: ⊙ Geometrically linear static analysis
		Options	: ☒ Modify loading by factor: 0.500
LC4	Seismic	Method of analysis	: ⊙ Geometrically linear static analysis
		Options	: ☒ Modify loading by factor: 0.500

2.5 LOAD COMBINATIONS

Load Combin.	Description	No.	Factor	Load Case	
CO1	1.35*LC1 + 1.5*LC2	1	1.35	LC1	proper-wight
		2	1.50	LC2	wind pressure
CO2	1.35*LC1 + 1.5*LC3	1	1.35	LC1	proper-wight
		2	1.50	LC3	wind-suction
CO3	LC1 + 1.5*LC3	1	1.00	LC1	proper-wight
		2	1.50	LC3	wind-suction
CO4	1.35*LC1 + LC3	1	1.35	LC1	proper-wight
		2	1.00	LC3	wind-suction
CO5	1.35*LC1	1	1.35	LC1	proper-wight
CO6	LC1 + LC4	1	1.00	LC1	proper-wight
		2	1.00	LC4	Seismic
CO7	LC1 + LC2	1	1.00	LC1	proper-wight
		2	1.00	LC2	wind pressure
CO8	LC1 + LC3	1	1.00	LC1	proper-wight
		2	1.00	LC3	wind-suction

2.5.2 LOAD COMBINATIONS - CALCULATION PARAMETERS

Load Combin.	Description	Calculation parameters	
CO1	1.35*LC1 + 1.5*LC2	Method of analysis	: ⊙ Second order analysis (P-Delta)
		Options	: ☒ Consider favorable effects due to tension
			: ☒ Refer internal forces to deformed system for:
			☒ Normal forces N
			☒ Shear forces V_y and V_z
			☒ Moments M_y, M_z and M_T
CO2	1.35*LC1 + 1.5*LC3	Method of analysis	: ⊙ Second order analysis (P-Delta)
		Options	: ☒ Consider favorable effects due to tension
			: ☒ Refer internal forces to deformed system for:
			☒ Normal forces N
			☒ Shear forces V_y and V_z
			☒ Moments M_y, M_z and M_T
CO3	LC1 + 1.5*LC3	Method of analysis	: ⊙ Second order analysis (P-Delta)
		Options	: ☒ Consider favorable effects due to tension
			: ☒ Refer internal forces to deformed system for:
			☒ Normal forces N
			☒ Shear forces V_y and V_z
			☒ Moments M_y, M_z and M_T
CO4	1.35*LC1 + LC3	Method of analysis	: ⊙ Second order analysis (P-Delta)
		Options	: ☒ Consider favorable effects due to tension
			: ☒ Refer internal forces to deformed system for:
			☒ Normal forces N
			☒ Shear forces V_y and V_z
			☒ Moments M_y, M_z and M_T
CO5	1.35*LC1	Method of analysis	: ⊙ Second order analysis (P-Delta)
		Options	: ☒ Consider favorable effects due to tension
			: ☒ Refer internal forces to deformed system for:
			☒ Normal forces N
			☒ Shear forces V_y and V_z
			☒ Moments M_y, M_z and M_T
CO6	LC1 + LC4	Method of analysis	: ⊙ Second order analysis (P-Delta)
		Options	: ☒ Consider favorable effects due to tension

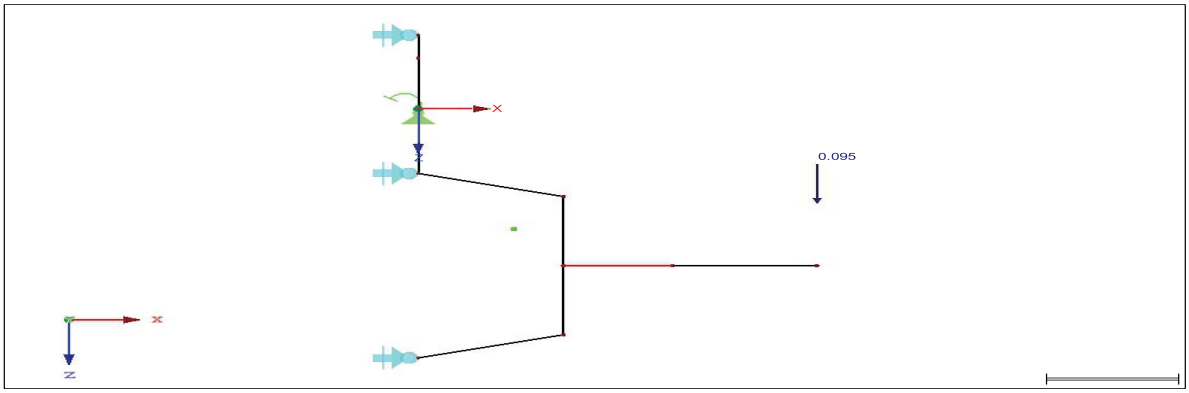
2.5.2 LOAD COMBINATIONS - CALCULATION PARAMETERS

Load Combin.	Description	Calculation parameters	
			: ☒ Refer internal forces to deformed system for: ☒ Normal forces N ☒ Shear forces V_y and V_z ☒ Moments M_y, M_z and M_T
CO7	LC1 + LC2	Method of analysis	: ◉ Second order analysis (P-Delta)
		Options	: ☒ Consider favorable effects due to tension : ☒ Refer internal forces to deformed system for: Normal forces N ☒ Shear forces V_y and V_z ☒ Moments M_y, M_z and M_T
CO8	LC1 + LC3	Method of analysis	: ◉ Second order analysis (P-Delta)
		Options	: ☒ Consider favorable effects due to tension : ☒ Refer internal forces to deformed system for: ☒ Normal forces N ☒ Shear forces V_y and V_z ☒ Moments M_y, M_z and M_T

3.1 NODAL LOADS

No.	On Nodes No.	Force [kN] P_X	P_Y	P_Z	Moment [kNm] M_X	M_Y	M_Z
2	9	0.000	0.000	0.190	0.000	0.000	0.000

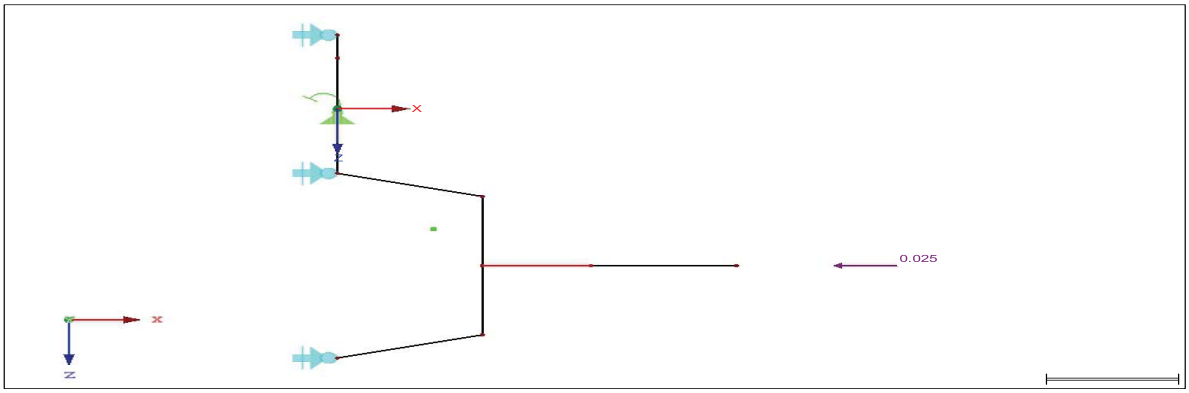
LC1: PROPER-WIGHT, AGAINST Y-DIRECTION



3.1 NODAL LOADS

No.	On Nodes No.	Force [kN] P_X	P_Y	P_Z	Moment [kNm] M_X	M_Y	M_Z
1	9	-0.050	0.000	0.000	0.000	0.000	0.000

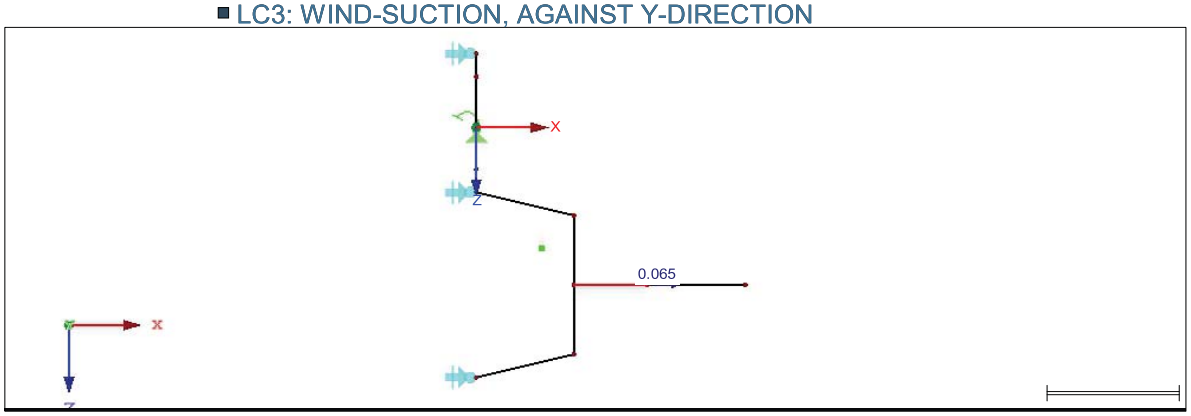
LC2: WIND PRESSURE, AGAINST Y-DIRECTION



3.1 NODAL LOADS

No.	On Nodes No.	Force [kN]			Moment [kNm]		
		P_X	P_Y	P_Z	M_X	M_Y	M_Z
1	9	0.130	0.000	0.000	0.000	0.000	0.000

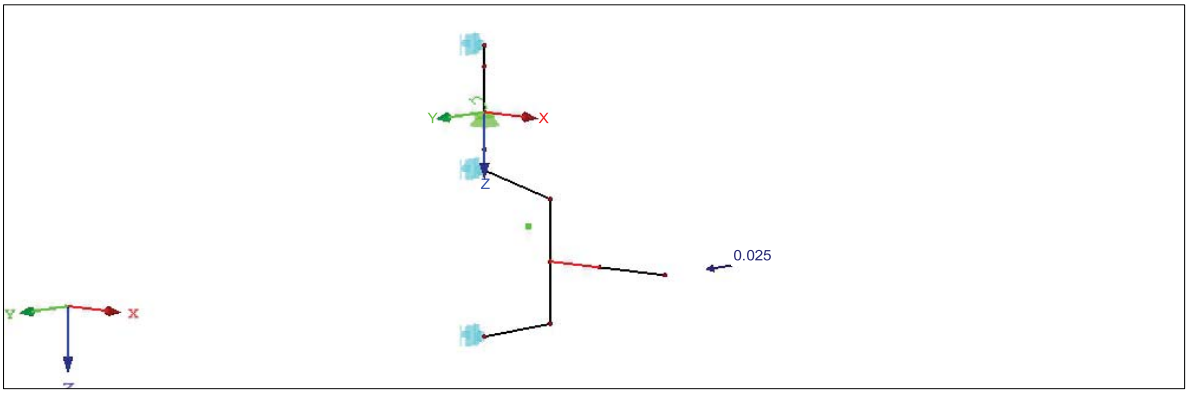
LC3: WIND-SUCTION, AGAINST Y-DIRECTION



3.1 NODAL LOADS

No.	On Nodes No.	Force [kN]			Moment [kNm]		
		P_X	P_Y	P_Z	M_X	M_Y	M_Z
1	9	0.000	0.050	0.000	0.000	0.000	0.000

LC4: SEISMIC, ISOMETRIC

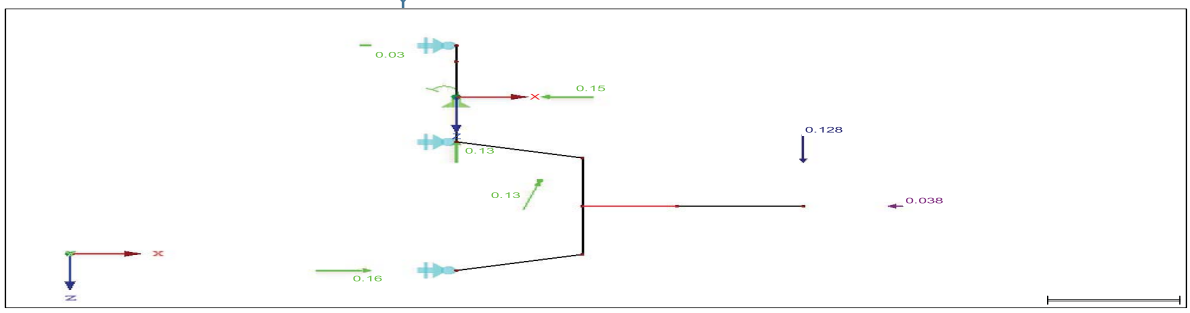


4.0 RESULTS - SUMMARY

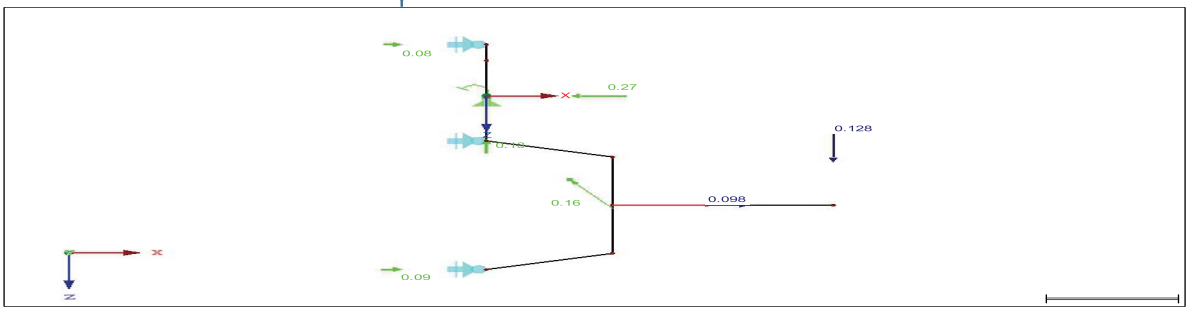
Description	Value	Unit	Comment
Summary			
Number of 1D finite elements (member elements)	10		
Number of FE nodes	11		
Number of equations	66		
Max number of iterations	100		
Divisions of members for member results	10		
Divisions of cable, foundation, or tapered members	10		
Activate shear rigidity (A-y, A-z) of members	☒		
Activate Support Nonlinearities	☒		

Other Settings	Max number of iterations	:	100
	Number of divisions for member results	:	10
	Member divisions, cables, foundation or tapered members	:	10
	Number of member divisions for searching maximum values	:	10
Options	☒ Activate shear stiffness of members (Ay, Az)		
Precision and Tolerance	☐ Change default setting		
Nonlinear effects - Activate	☐ Support and elastic foundations ☐ Failing members due to member type ☐ Member end releases ☐ Member elastic foundation ☐ Member nonlinearities		

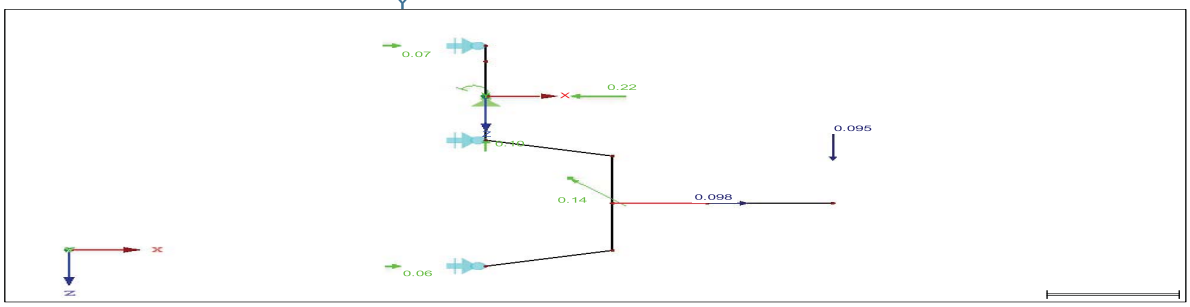
■ MEMBERS M_Y, CO1: 1.35*LC1 + 1.5*LC2, AGAINST Y-DIRECTION



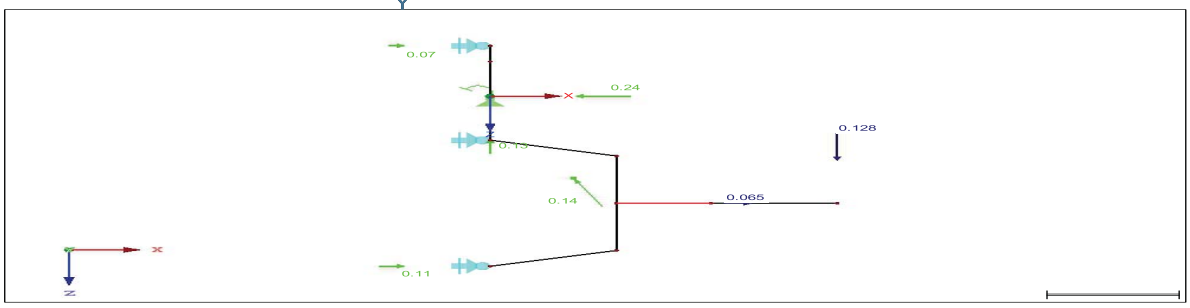
■ MEMBERS M_Y, CO2: 1.35*LC1 + 1.5*LC3, AGAINST Y-DIRECTION



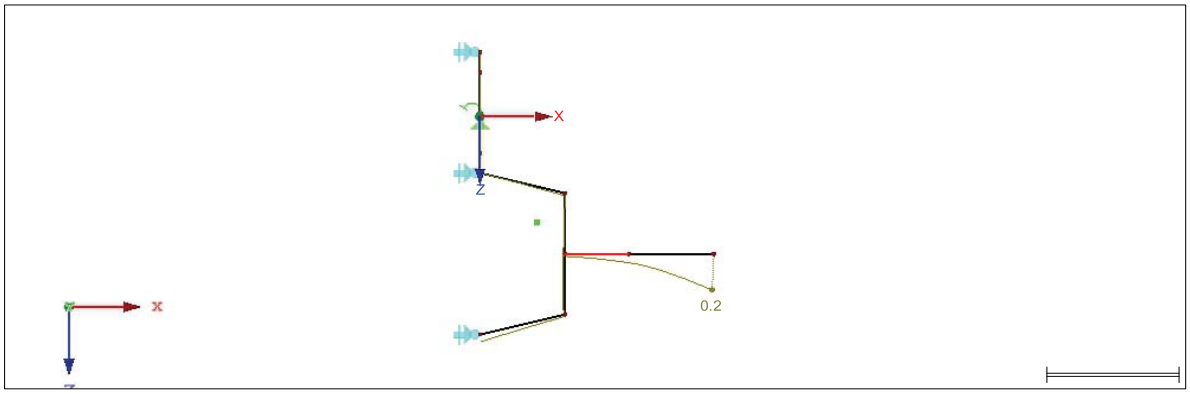
■ MEMBERS M_Y, CO3: LC1 + 1.5*LC3, AGAINST Y-DIRECTION



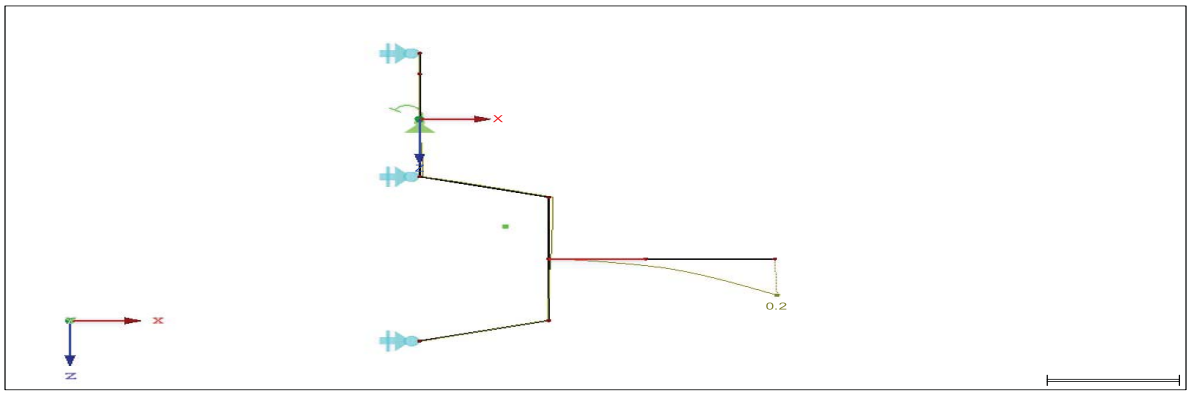
■ MEMBERS M_Y, CO4: 1.35*LC1 + LC3, AGAINST Y-DIRECTION



DEFORMATIONS U, CO7: LC1 + LC2, AGAINST Y-DIRECTION



DEFORMATIONS U, CO8: LC1 + LC3, AGAINST Y-DIRECTION



STEEL
CA1
General stress analysis of steel members

1.1.1 GENERAL DATA

Members to design:	All	
Load combinations to design:	CO1	1.35*LC1 + 1.5*LC2
	CO2	1.35*LC1 + 1.5*LC3
	CO3	LC1 + 1.5*LC3
	CO4	1.35*LC1 + LC3
	CO5	1.35*LC1
	CO6	LC1 + LC4

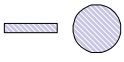
1.1.2 DETAILS

Allow local plastification:	☐
Calculate normal stresses with Alpha-pl:	☐
FACTORS FOR SIGMA-EQV	
Sigma	1.00
Tau	3.00
Simplified consideration of eccentric loading:	☐

1.2.1 MATERIALS

Matl. No.	Material Description	Safety Factor γ_M [-]	Yield Strength f_{yk} [kN/cm²]	Limit Stresses [kN/cm²] Manually	Limit $_x$	Limit	Limit $_{eqv}$
1	A-70	1.00	40.90	☐	40.90	23.61	40.90
2	SS 304	1.00	16.10	☐	16.10	9.30	16.10

1.3.1 CROSS-SECTIONS



Sect. No.	Matl. No.	Cross-Section Description	I_t [cm⁴] / A [cm²]	I_y [cm⁴] / $Alpha_{pl,y}$	I_z [cm⁴] / $Alpha_{pl,z}$	Comment
1	2	Flat Bar 30/3	2.530E-02	6.750E-03	6.750E-01	
			0.90	1.50	1.50	
2	1	Round 6.8	2.099E-02	1.050E-02	1.050E-02	
			3.632E-01	1.698	1.698	
3	1	Flat Bar 8/3	5.502E-03	1.800E-03	1.280E-02	
			0.24	1.50	1.50	
4	2	Flat Bar 21/3	1.720E-02	4.725E-03	2.315E-01	
			0.63	1.50	1.50	

STEEL
CA1
General stress analysis of steel members

STRESS POINTS

S-Point No.	Coordinates mm y	z	Stat. Moments of Area cm³ Q_y	Q_z	Thickness t mm
1	15.0	-1.5	0.00	0.00	3.0
2	-15.0	-1.5	0.00	0.00	3.0
3	-15.0	1.5	0.00	0.00	3.0
4	15.0	1.5	0.00	0.00	3.0

STRESS POINTS

S-Point No.	Coordinates mm y	z	Stat. Moments of Area cm³ Q_y	Q_z	Thickness t mm
1		0.0			
2	3.3	-0.6	0.00	0.00	6.8
3	3.2	-1.2	0.00	0.00	6.8
4	2.9	-1.7	0.00	0.00	6.8
5	2.6	-2.2	0.00	0.00	6.8
6	2.2	-2.6	0.00	0.00	6.8
7	1.7	-2.9	0.00	0.00	6.8
8	1.2	-3.2	0.00	0.00	6.8
9	0.6	-3.3	0.00	0.00	6.8
10	0.0	-3.4	0.00	0.00	6.8
11	-0.6	-3.3	0.00	0.00	6.8
12	-1.2	-3.2	0.00	0.00	6.8
13	-1.7	-2.9	0.00	0.00	6.8
14	-2.2	-2.6	0.00	0.00	6.8
15	-2.6	-2.2	0.00	0.00	6.8
16	-2.9	-1.7	0.00	0.00	6.8
17	-3.2	-1.2	0.00	0.00	6.8
18	-3.3	-0.6	0.00	0.00	6.8
19	-3.4	0.0	0.00	0.00	6.8
20	-3.3	0.6	0.00	0.00	6.8
21	-3.2	1.2	0.00	0.00	6.8

2.1 STRESSES BY CROSS-SECTION

Sect. No.	Member No.	x-Loc. [cm]	S-Point No.	Load Case	Stress Type	Stress [kN/cm²] Existing	Limit	Stress Ratio
1	**Flat Bar 30/3**							
	5	0.00	1	CO1	Sigma Total	-7.23	16.10	0.45
	9	0.50	1	CO6	Tau Total	1.63	9.30	0.18
	5	0.00	1	CO1	Sigma-eqv	7.23	16.10	0.45
2	**Round 6.8**							
	7	0.00	10	CO2	Sigma Total	14.73	40.90	0.36
	7	1.50	37	CO1	Tau Total	0.47	23.61	0.02
	7	0.00	10	CO2	Sigma-eqv	14.73	40.90	0.36
3	**Flat Bar 8/3**							
	8	0.00	1	CO2	Sigma Total	21.62	40.90	0.53
	8	0.00	1	CO6	Tau Total	-0.02	23.61	0.00
	8	0.00	1	CO2	Sigma-eqv	21.62	40.90	0.53
4	**Flat Bar 21/3**							
	11	0.00	3	CO2	Sigma Total	4.23	16.10	0.26
	11	0.00	1	CO6	Tau Total	2.40	9.30	0.26
	11	0.00	3	CO6	Sigma-eqv	4.55	16.10	0.28

3.1 GOVERNING INTERNAL FORCES BY MEMBER

Member No.	x-Loc. [cm]	Load Case	Forces [kN] N	V_y	V_z	Moments [kNm] M_T	M_y	M_z
1	0.50	CO2	0.00	0.00	0.08	0.00	0.00	0.00
3	0.00	CO2	0.22	0.00	0.08	0.00	0.00	0.00
4	1.50	CO2	0.13	0.00	-0.19	0.00	0.00	0.00
5	0.00	CO1	0.00	0.00	-0.16	0.00	0.00	0.00
6	0.00	CO1	-0.16	0.00	0.04	0.00	0.00	0.00
7	0.00	CO2	0.10	0.00	0.13	0.00	0.00	0.00
8	0.00	CO2	0.10	0.00	0.13	0.00	0.00	0.00
9	0.50	CO6	0.10	-0.02	-0.11	0.00	0.00	0.00
10	1.10	CO2	0.00	0.00	0.08	0.00	0.00	0.00

3.1 GOVERNING INTERNAL FORCES BY MEMBER

Member No.	x-Loc. [cm]	Load Case	Forces [kN] N	V_y	V_z	Moments [kNm] M_T	M_y	M_z
11	0.00	CO6	0.10	-0.02	-0.11	0.00	0.00	0.00

4.1 PARTS LIST BY MEMBER

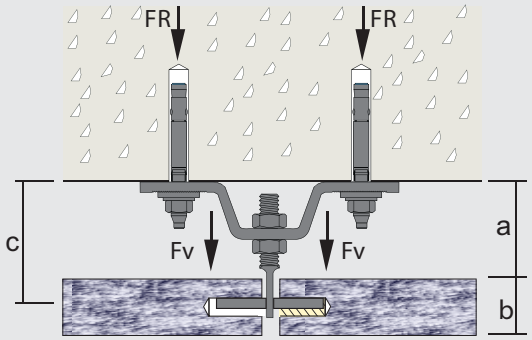
Part No.	Cross-Section Description	No. of Members	Length [m]	Tot. Len [m]	Surf. Area [m²]	Volume [m³]	Unit Wt. [kg/m]	Weight [kg]	Total Wt. [t]
1	1 - Flat Bar 30/3	2	0.01	0.01	0.00	0.00	0.72	0.00	0.000
2	1 - Flat Bar 30/3	2	0.02	0.04	0.00	0.00	0.72	0.01	0.000
3	1 - Flat Bar 30/3	2	0.02	0.03	0.00	0.00	0.72	0.01	0.000
4	2 - Round 6.8	1	0.02	0.02	0.00	0.00	0.29	0.00	0.000
5	3 - Flat Bar 8/3	1	0.02	0.02	0.00	0.00	0.19	0.00	0.000
6	4 - Flat Bar 21/3	1	0.01	0.01	0.00	0.00	0.50	0.01	0.000
7	4 - Flat Bar 21/3	1	0.01	0.01	0.00	0.00	0.50	0.00	0.000
Sum		10		0.14	0.01	0.00			0.000

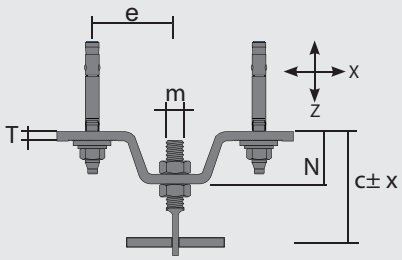
OMEGA BRACKETS

OMEGA BRACKET TYPE DO01

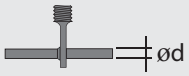
It is designed for fastening the natural stone panel beneath a concrete floor slab.

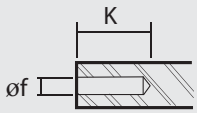
Horizontal Installation





FV = vertical load
FR = pullout force





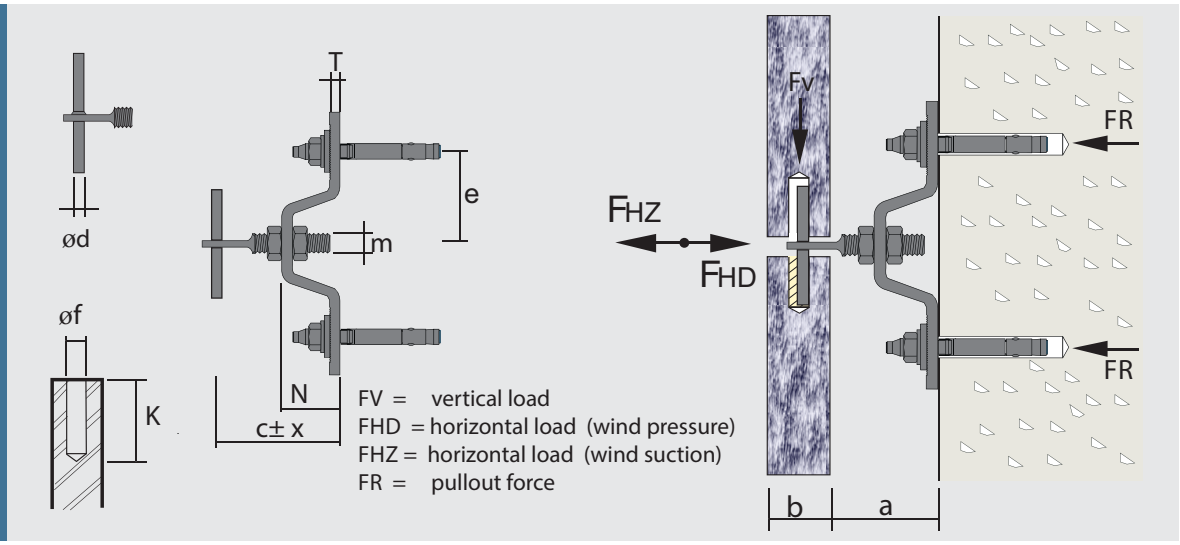
Anchoring base:
according to the anchor bolt chosen.

Adjustibility:
in 2 directions x = ± 05 mm
Z = ± 10 mm

Omega Brackets Load Table

Materials SS304,SS316,SS316L ,SS316TI ,S235JR-MG ,S235JR-HDG ⩽ 50°C 24h average temperature

Vertical Installation



Item No.	Bracket O fset (N) mm	Cavity to Pin min - max (C) mm	Dead load max DL kN	Wind load max WL ± kN	Bracket Width mm	Bracket Thickness (T) mm	Ø Pin (dz) mm	FHB A2-70 A4-70	Anchor Comb .Force kN *
700 1100-70.30.3	70	100-110	0.16	0.22	30	3	4	M8	2.30
700 1100-80.30.3	80	110-120			30	3	4	M8	2.40
700 1100-90.35.3	90	120-130			35	3	4	M8	2.50
700 1100-100.35.3	100	130-140			35	3	4	M8	2.50
700 1100-110.40.3	110	140-150			40	3	4	M8	2.50
700 1100-120.40.3	120	150-160			40	3	4	M8	2.60
700 1100-70.55.3	70	100-110	0.28	0.39	55	3	5	M10	4.10
700 1100-80.55.3	80	110-120			55	3	5	M10	4.20
700 1100-90.50.4	90	120-130			50	4	5	M10	4.30
700 1100-100.50.4	100	130-140			50	4	5	M10	4.40
700 1100-110.55.4	110	140-150			55	4	5	M10	4.50
700 1100-120.55.4	120	150-160			55	4	5	M10	4.60
700 1100-70.50.5	70	100-120	0.55	0.77	50	5	6	M12	8.80
700 1100-80.50.5	80	110-130			50	5	6	M12	9.00
700 1100-90.55.5	90	120-140			55	5	6	M12	9.20
700 1100-100.55.5	100	130-150			55	5	6	M12	9.40
700 1100-110.60.5	110	140-160			60	5	6	M12	9.60
700 1100-120.60.5	120	150-170			60	5	6	M12	9.80

Loads per 1 bracket
If loads are bigger or dimensions are different ,an individual calculation is needed
*with safety 3.0

FLAT HEAD BOLT TECHNICAL DETAILS

Flat Head Bolt

Materials A2-70 , A4-70 50°C 24h average temperature
Fixing in reinforced concrete vertical wall ,or steel substructure

Cavity to Pin min - max mm	Dead load max DL kN	Wind load max WL ± kN	FHB A2-70 A4-70	Ø Pin mm
20-30	0.08	0.11	M8	4
30-40			M8	4
40-50			M8	4
50-60			M8	4
30-40	0.16	0.22	M10	4
40-50			M10	4
50-60			M10	4
60-70			M10	4
30-40	0.23	0.32	M10	5
40-50			M10	5
50-60			M10	5
60-70			M10	5
30-40	0.45	0.63	M12	6
40-50			M12	6
50-60			M12	6
60-70			M12	6

According to DIN 18515 part 3
Pins :pin hole shall be mm bigger than pin diameter.
Pin distances (d<30) :distance between panel corner and middle pin hole is minimum 2.5 times larger than the panel thickness .