
ANALIZA E NGARKESAVE

Përcaktimi i ngarkesave dhe intensiteti i tyre është bërë në harmoni me rregulloren EC1.

1.0- Ngarkesat e përhershme (DL):

- Pesha vetiake e elementeve strukture (edhe e pllakës kompozite) merret parasyshe automatikisht nga softveri.
- Ngarkesa ne kulm panel.....2.5 kN/m²

2.0- Ngarkesat e përkohshme:

- Ngarkesa nga bora.....sk=1.2 kN/m²
- Ngarkesa nga era, v=23m/s.....qp=0.37 kN/m²

DIMENSIONET E OBJEKTIT / BUILDING DIMENSION

Gjatësia / Length = m

Gjersia / Width = m

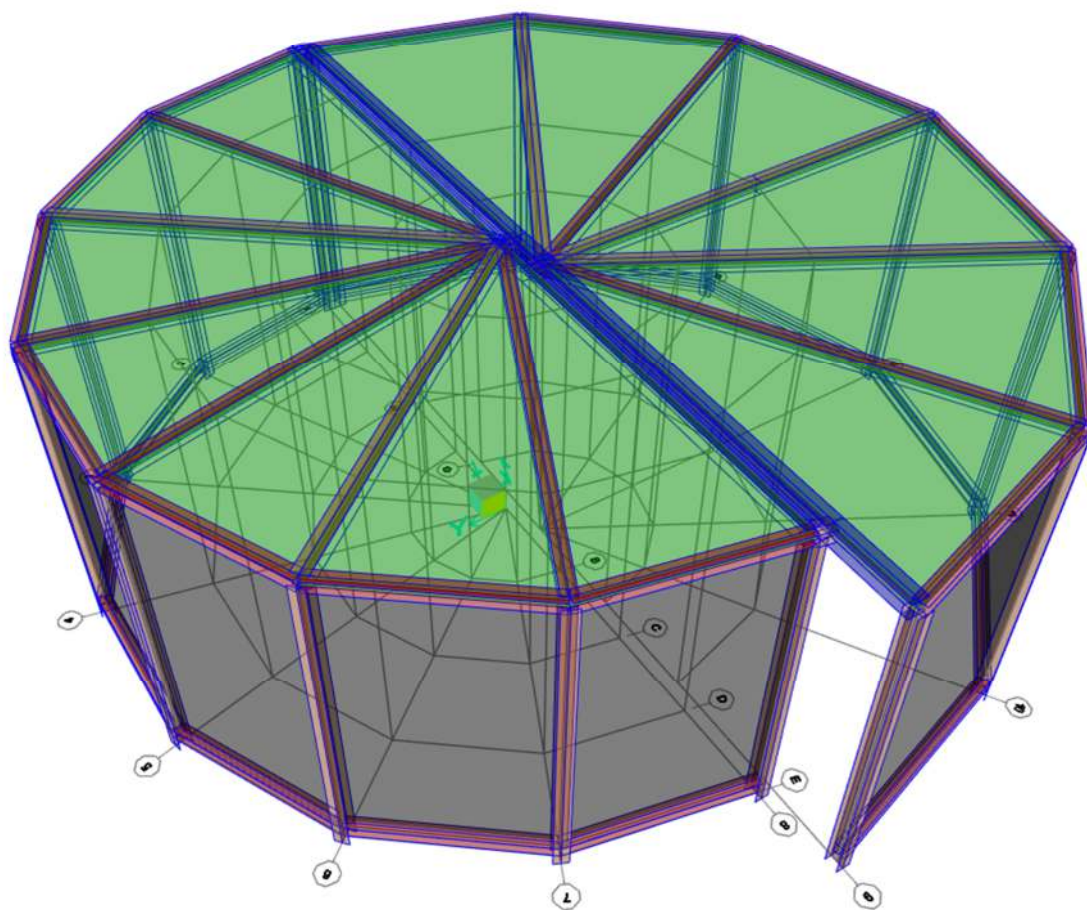
Lartësia / Height = m

Pjerrtësia 1 / Roof slope 1 = °

Pjerrtësia 2 / Roof slope 2 = °

Pjerrtësia 3 / Roof slope 3 = °

Building shape



NGARKESA E ERËS / WIND LOAD

Ngarkesa e erës është llogaritur sipas kësajë procedure / Wind load calculation

SHPEJTËSIA THEMELORE E ERËS / THE BASIC WIND VELOCITY

$$v_b = c_{dir} * c_{season} * v_{b0}$$

→ Vlera themelore e shpejtësisë, (4.1) /
The basic wind velocity

$$v_{b,0} = \underline{23.00} \text{ m/s} \quad \underline{82.80} \text{ km/h}$$

→ Vlera bazë e shpejtësisë së erës (1 P) /
The fundamental value of the basic wind velocity

$$c_{dir} = \underline{1}$$

→ Faktori i drejtimit (Note 2) /
The direction factor

$$c_{season} = \underline{1}$$

→ Faktori sezonal (Note 3) /
The season factor

$$v_b = \underline{23.00} \text{ m/s} \quad \underline{82.80} \text{ km/h}$$

→ Vlera themelore e shpejtësisë, (4.1) /
The basic wind velocity

SHPEJTËSIA MESATARE E ERËS/MAIN WIND SPEED

$$v_m(z) = c_r(z) * c_o(z) * v_b$$

$c_r(z)$ → Faktori i vrazhdësisë (4.3.2) / Roughness factor

$c_o(z)$ → Orography factor (4.3.3)

Koeficienti i vrazhdësisë së terrenit / Terrain roughness

$$c_r(z) = k_r * l_n \left(\frac{z}{Z_0} \right) = \underline{0.893} \rightarrow \text{Për/For } Z_{min} \leq Z$$

$$c_r(z) = c_r(z_{min}) \rightarrow \text{Për/For } Z \leq Z_{min}$$

$$k_r = 0.19 * \left(\frac{z_0}{z_{0,II}} \right)^{0.07} = \underline{0.190} \rightarrow \text{Faktori i terrenit/Terrain factor}$$

Parametrat përkatëse të zonës / Zone parameters (table 4.1)

K_r	$Z_0(m)$	$Z_{min}(m)$	ε	$Z(m)$	$z_{0,II}$
0.19	0.05	2	0.26	5.5	0.05

Kategoria /
Category \underline{II} → Kategoria e terrenit/Terrain category

$z_0 = \underline{0.05}$ → Gjatësia e vrazhdësisë / The roughness length

$z_{min} = \underline{2.00}$ → Lartësia minimale / The minimum height defined in Table 4.1

$z = \underline{5.50}$ → Lartësia efektive e objektit/Efective height

$z_{0,II} = \underline{0.05}$

Orography factor

$$c_{0,z} = \underline{\quad 1 \quad} \rightarrow \text{Orography factor}$$

$$v_m(z) = \underline{\quad 20.541 \quad} \text{ m/s} \quad \underline{\quad 73.95 \quad} \text{ km/h}$$

TURBULENCA E ERËS / WIND TUBULENCE

$$I_v(z) = \frac{k_1}{c_r(z) * \ln(z/z_0)} = \underline{\quad 0.24 \quad} \rightarrow \text{Për } Z_{min} \leq Z \leq 200m(Z_{max})$$

$$I_v(z) = I_v(z_{min}) \rightarrow \text{Për } Z \leq Z_{min}$$

$$k_1 = \underline{\quad 1 \quad} \rightarrow \text{Faktori i turbulencës / Turbulence factor}$$

PRESIONI I SHPEJTËSISË SË ERËS / WIND PRESSURE

$$\rho \rightarrow \underline{\quad 1.25 \quad} \text{ kg/m}^3 \rightarrow \text{Dendësia e ajrit / Air density}$$

$$q_p(z) = [1 + 7 * I_v(z)] * \frac{1}{2} * \rho * \frac{v_m^2(z)}{9.81} = \underline{\quad 71.71 \quad} \text{ kg/m}^2 \quad \underline{\quad 0.72 \quad} \text{ kN/m}^2 \rightarrow \text{Ngarkesa e erës / Wind load}$$

$$q_p = \frac{1}{2 * 9.81} * \rho * v_b^2 = \underline{\quad 33.70 \quad} \text{ kg/m}^2 \quad \underline{\quad 0.34 \quad} \text{ kN/m}^2 \rightarrow \text{Presioni bazë i erës / base wind pressure}$$

$$c_e(z) = \frac{q_p(z)}{q_p} = \underline{\quad 2.13 \quad} \rightarrow \text{Faktori i ekspozimit / expose factor}$$

NGARKESA E ERËS PËR OBJEKTET RRETHORE

Ngarkesa e erës është llogaritur sipas kësajë procedure.

$$F_w = C_s C_d * c_f * q_p(z) * A_{ref} \rightarrow \text{Section 5.3 – 7.11 EN 1991 – 1 – 4}$$

$$C_s C_d = \underline{\quad 1 \quad} \rightarrow \text{Tabela 7.11 EN 1991 – 1 – 4 + A1}$$

$$C_f = C_{f,0} * \psi_\lambda * k$$

$$C_{f,0} = \underline{\quad 2.2 \quad} \rightarrow \text{Figura 7.11, Oktagon}$$

$$\psi_\lambda = \underline{\quad 1.26 \quad} \rightarrow \text{Figura 7.36}$$

$$k = \underline{\quad 1 \quad} \rightarrow \text{Tabela 7.14, Koeicoint për cilindra të renditura}$$

$$C_f = C_{f,0} * \psi_\lambda * k = \underline{\quad 2.772 \quad}$$

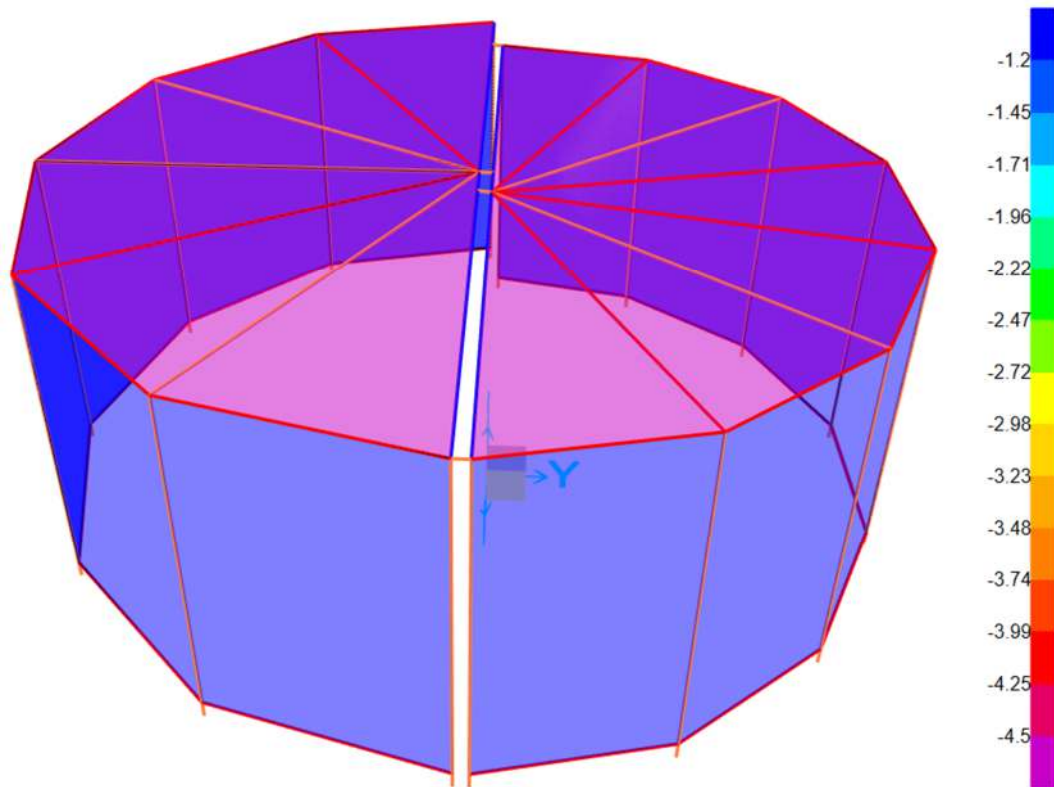
$$q_p(z) = \underline{\quad 0.72 \quad} \text{ kN/m}^2$$

$$A_{ref} = b * l \quad (\text{m}^2) \rightarrow b - \text{gjërsia e shtyllës}, l - \text{gjatësia e shtyllës}$$

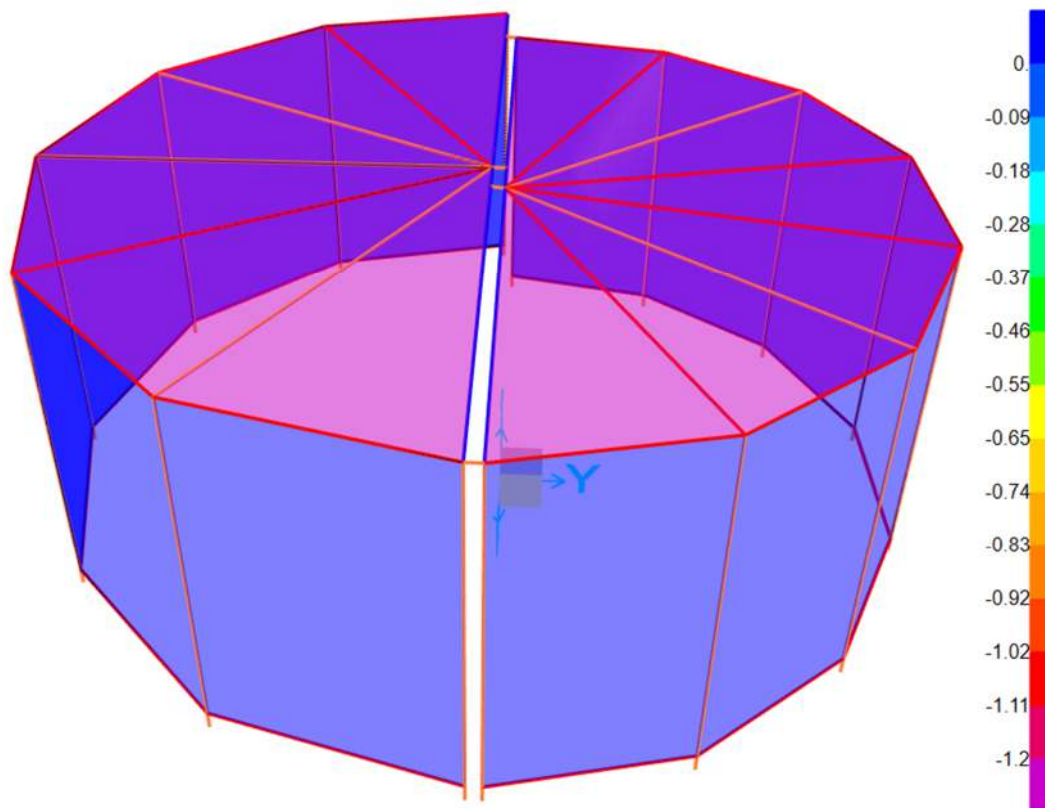
$$F_w = C_s C_d * c_f * q_p(z) * A_{ref} = \underline{\quad 1.99 \quad} \text{ kN/m}^2$$

RAPORTI I STRUKTURËS

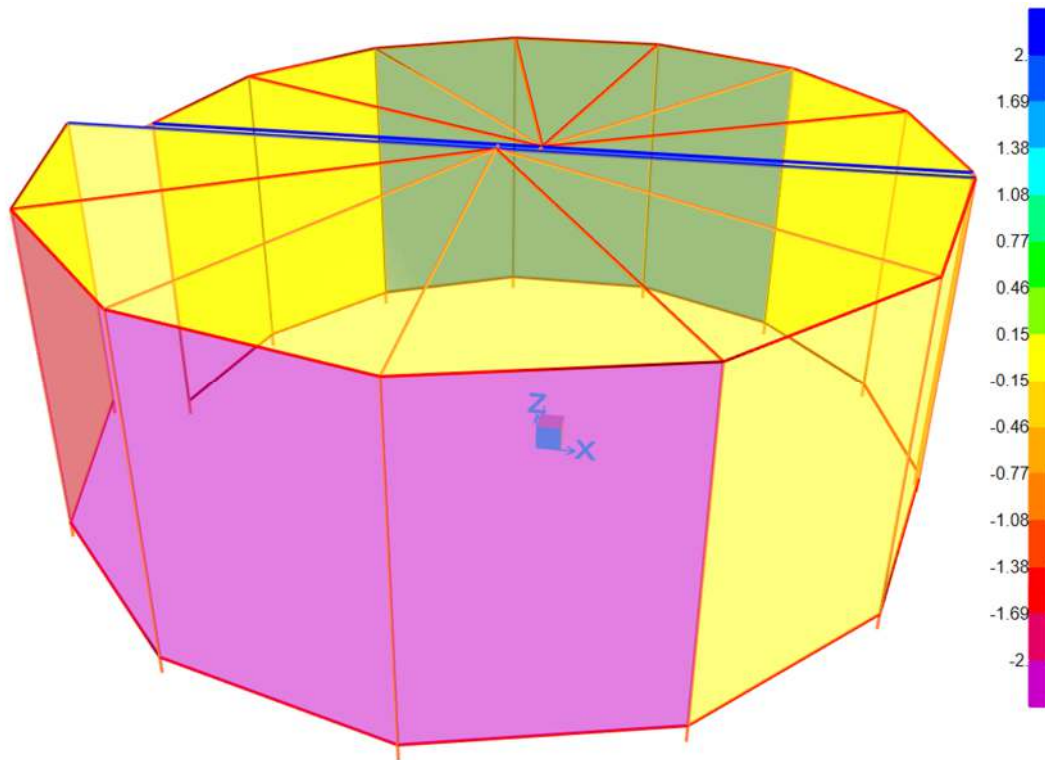
Aplikimi i ngarkesës DL, drejtimi i ngarkesës – Vertikal $\left[\frac{kN}{m^2}\right]$



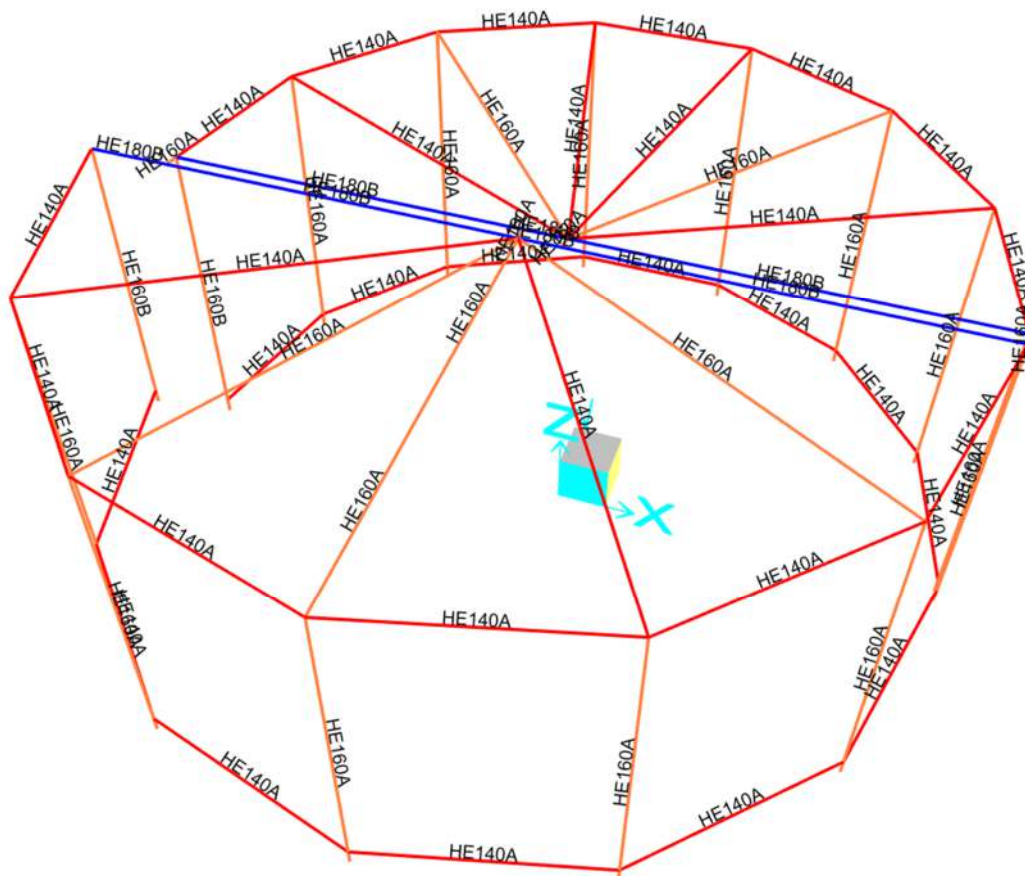
Aplikimi i ngarkesës S1 (bora), drejtimi i ngarkesës – Vertikal $\left[\frac{kN}{m^2}\right]$



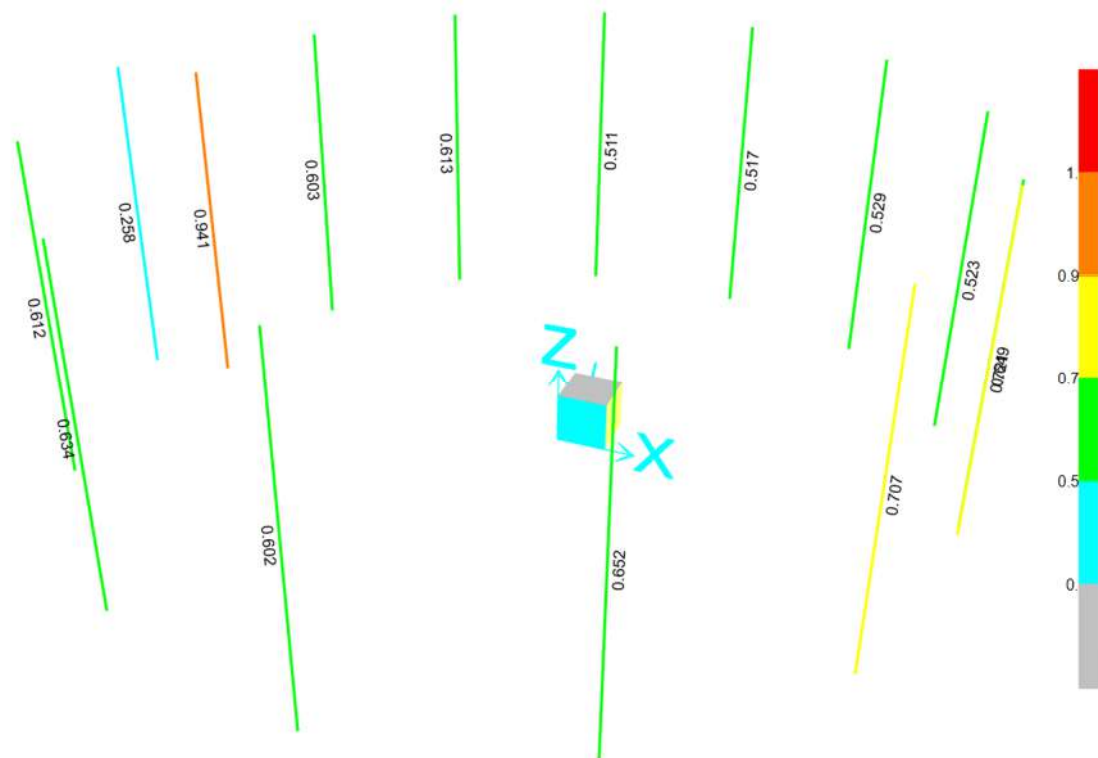
Aplikimi i ngarkesës Wx (Era drejtimi X) $\left[\frac{kN}{m^2}\right]$



Profilat e përvetësuar

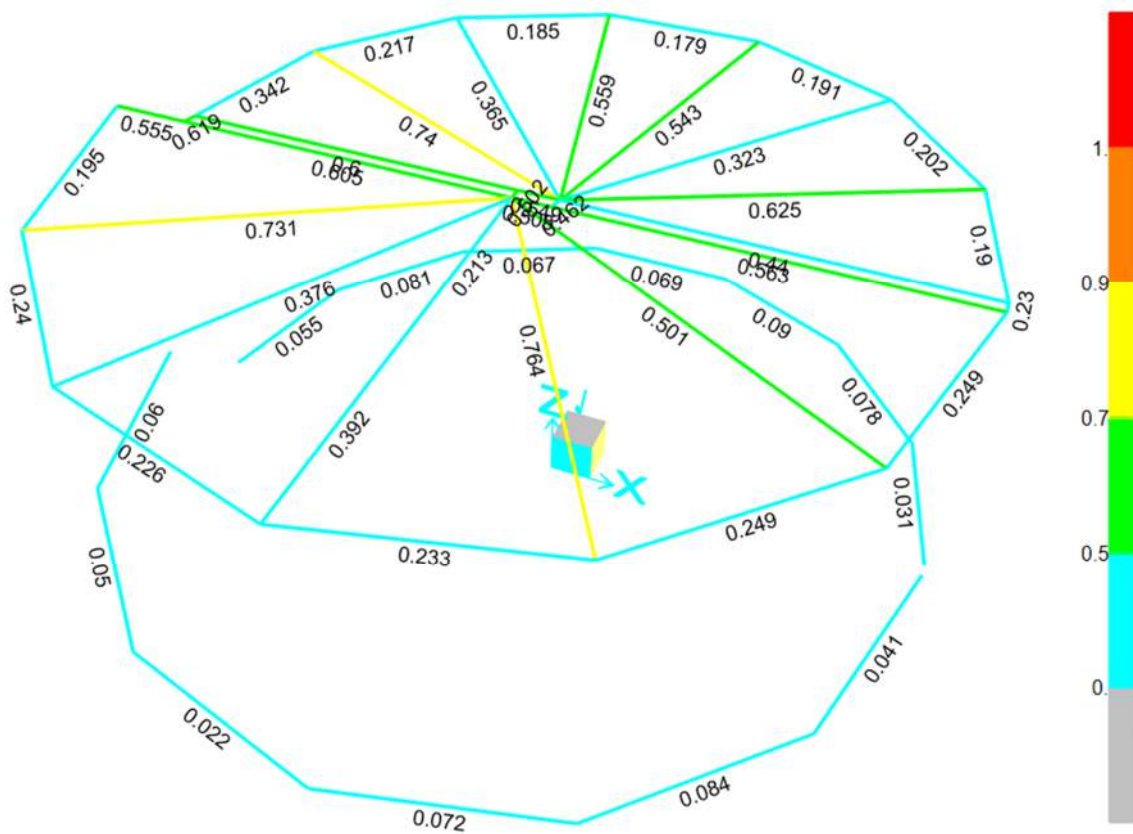


Shfrytëzueshmëria e materialit-Shtyllat



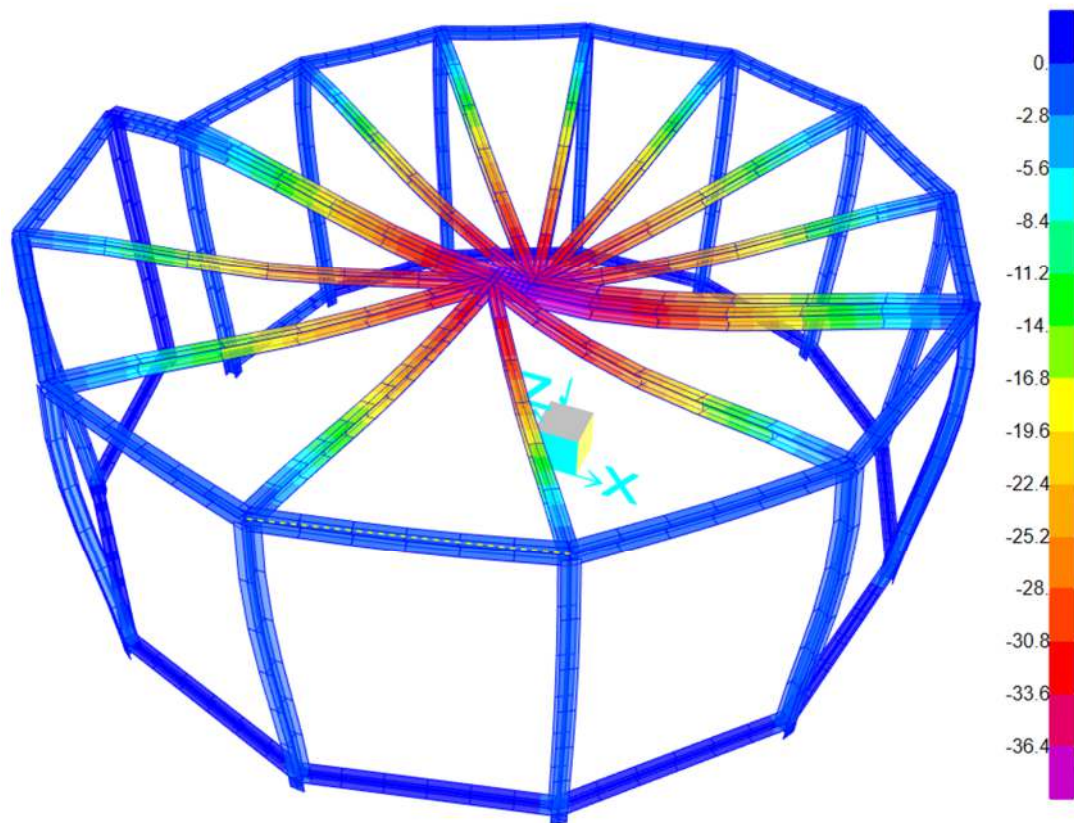
$0.941 < 1.0 \rightarrow$ kushti plotësohet

Shfrytëzueshmëria e materialit-Trarët

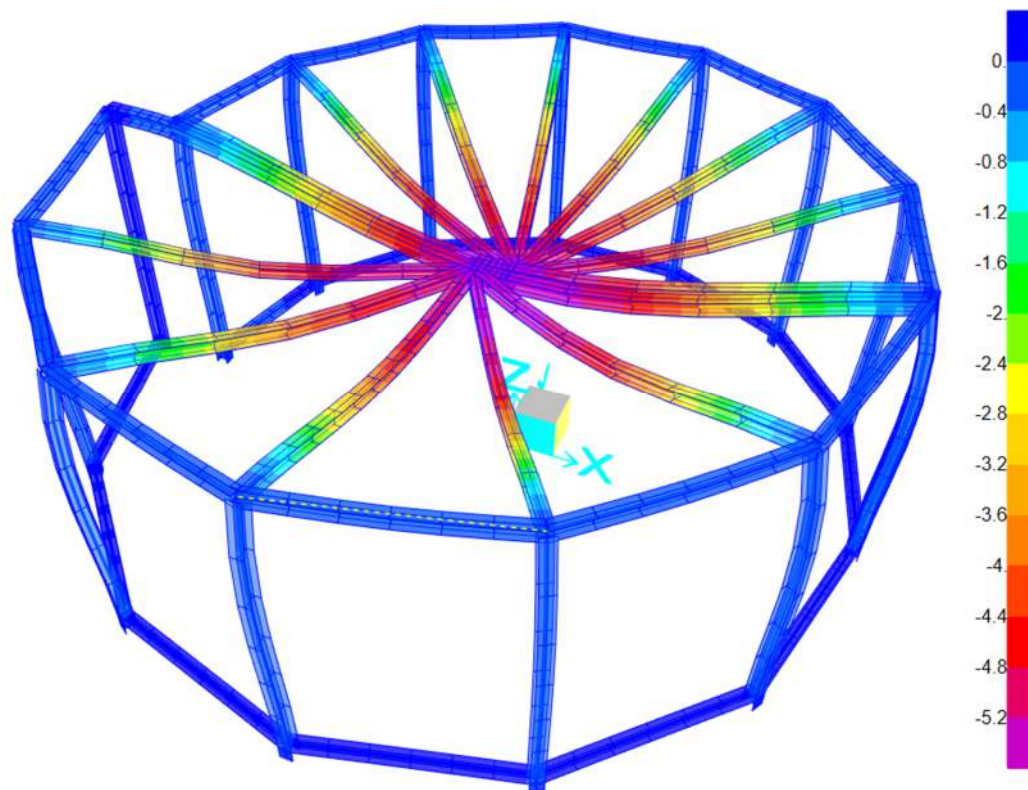


$0.76 < 1.0 \rightarrow$ kushti plotësohet

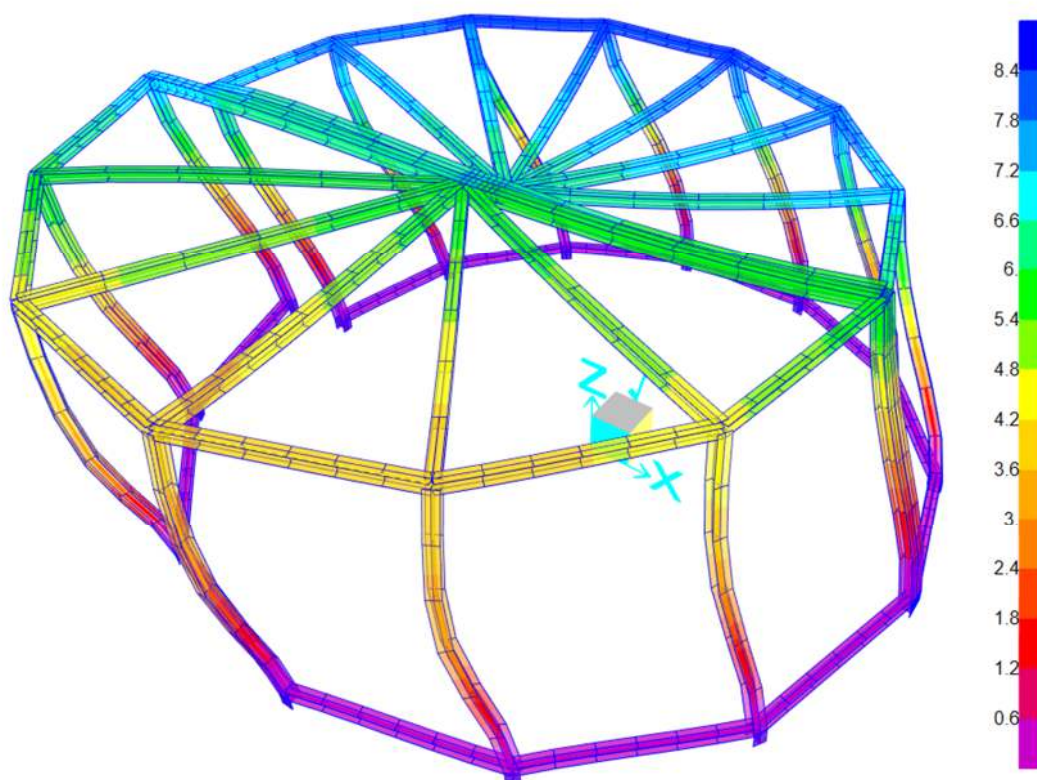
Zhvendosjet vertikale rasti 1.0DL



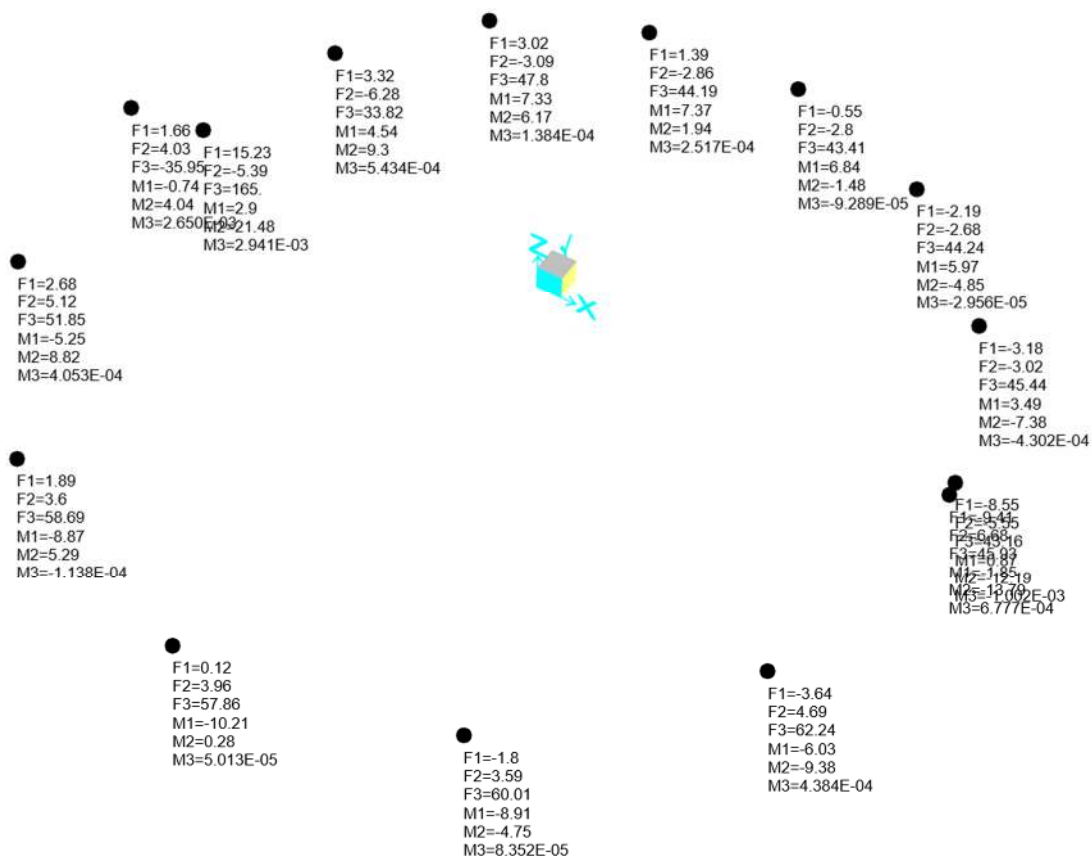
Zhvendosjet vertikale rasti 1.0S1



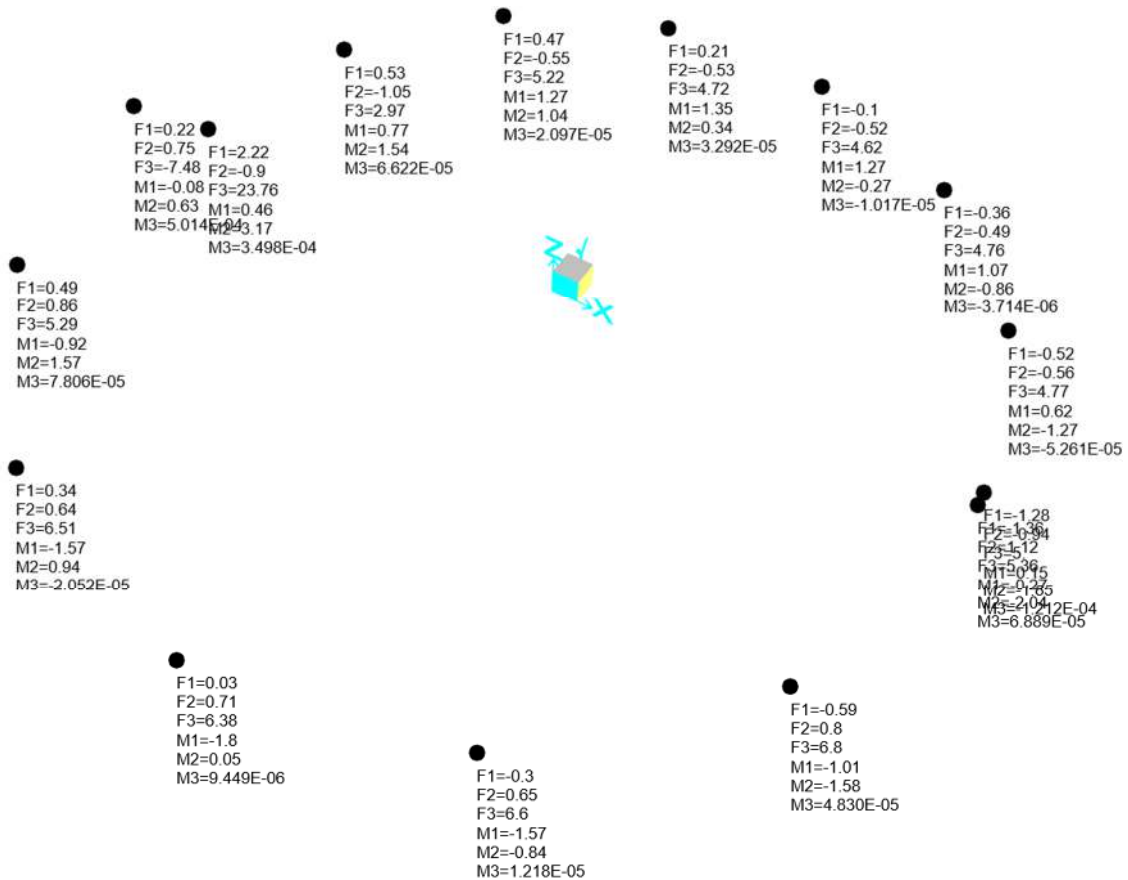
Zhvendosjet nga rasti 1.0Wx



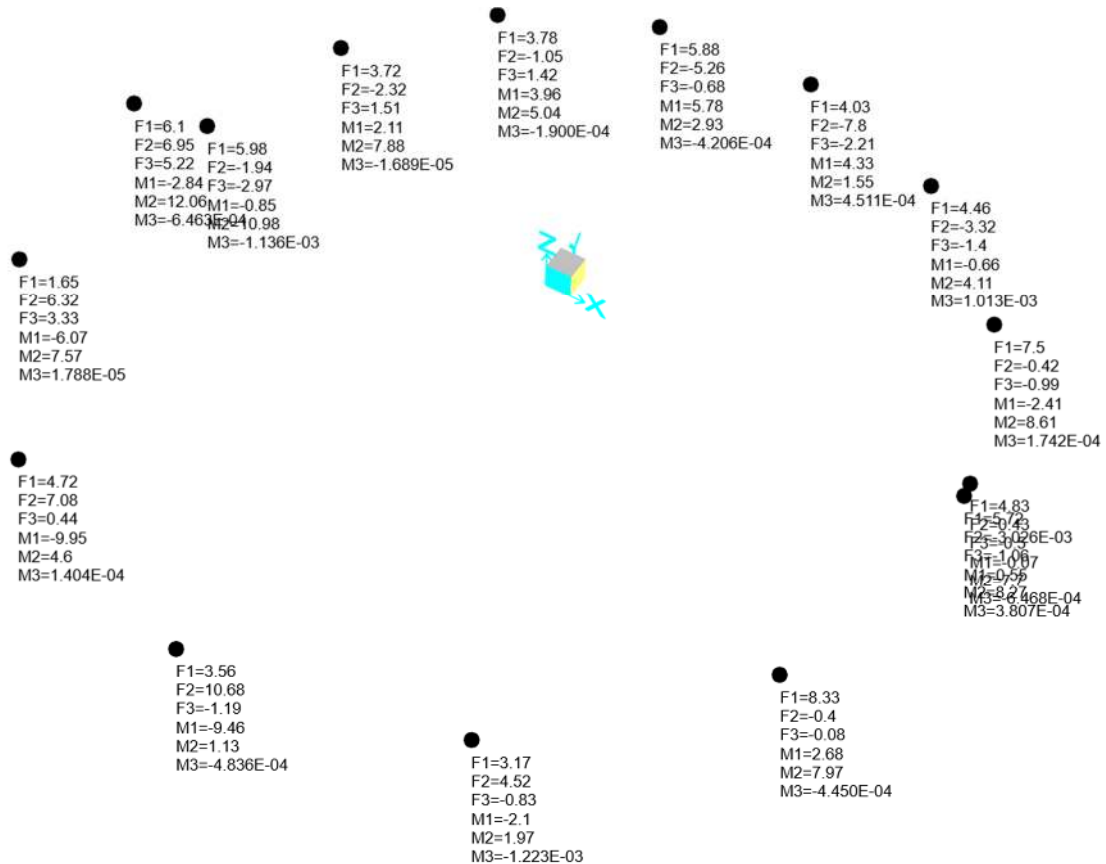
Reaksionet në mbështetësa Rasti 1.0DL



Reaksionet në mbështetësa Rasti 1.0S1



Reaksionet në mbështetësa Rasti 1.0Wx



Projektimi i lidhjeve

TABLE: Joint Reactions / Reaksionet per dimensionimin e ankerëve								
Joint	OutputCase	CaseType	F1	F2	F3	M1	M2	M3
Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
16	1.35D-1.5Wx	Combination	-21.3	9	63.6	-3.3	-31	0
30	1.35D+0.75S1+1.5Wx	Combination	31.2	-10.9	236.1	3	47.9	0
10	1.35D+0.75S1+1.5Wx	Combination	5.5	21.9	81.1	-29.3	2.1	0
28	1.35D+0.75S1+1.5Wx	Combination	5.2	-15.9	58.8	16.7	0.1	0
4	1.35D+1.5S1	Combination	2.6	6.6	-59.7	-1.1	6.4	0
30	1.35D+1.5S1	Combination	23.9	-8.6	258.4	4.6	33.8	0
10	1.35D+0.75S1+1.5Wx	Combination	5.5	21.9	81.1	-29.3	2.1	0
29	1.35D+0.75S1+1.5Wx	Combination	10.8	-12.2	62.2	19.6	7.3	0
16	1.35D-1.5Wx	Combination	-21.3	9	63.6	-3.3	-31	0
30	1.35D+0.75S1+1.5Wx	Combination	31.2	-10.9	236.1	3	47.9	0

TABLE: Joint Reactions / Reaksionet per dimensionimin e lidhjes shtyllë-tra								
Joint	OutputCase	CaseType	F1	F2	F3	M1	M2	M3
Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
39	1.35D+0.75S1+1.5Wx	Combination	17.9	-6.3	-71.1	-17.5	-32.2	0
47	1.35D+1.5S1+0.9Wx	Combination	-26.9	2.2	-246.3	6.9	72.5	0
37	1.35D-1.5Wx	Combination	0.9	-24.4	-62.3	-34.1	-1.7	0
45	1.35D-1.5Wx	Combination	0.9	20.1	-46.1	29.2	-0.4	0
34	1.35D+1.5S1	Combination	-4.4	0.2	70.7	0.6	10.7	0
47	1.35D+1.5S1	Combination	-25.1	3.3	-249.9	9	66.6	0
37	1.35D+1.5S1	Combination	-0.5	-13.4	-68.5	-35.5	0.8	0
45	1.35D-1.5Wx	Combination	0.9	20.1	-46.1	29.2	-0.4	0
40	1.35D+1.5S1	Combination	17.4	-0.6	-60.1	-1.4	-47.6	0
47	1.35D+1.5S1+0.9Wx	Combination	-26.9	2.2	-246.3	6.9	72.5	0

TABLE: Element Joint Forces - Frames / Forcat per vazhdimin montues								
Frame	Joint	OutputCase	CaseType	F1	F2	F3	M1	M2
Text	Text	Text	Text	KN	KN	KN	KN-m	KN-m
83	49	1.35D+1.5S1	Combination	-1.1	-0.6	13.7	-5.4	9.4
61	49	1.35D+1.5S1+0.9Wx	Combination	1.5	-0.9	8	6.3	11
61	49	1.35D+0.75S1+1.5Wx	Combination	1.5	-0.8	6.8	6.4	11.00

Project data

Project name

Project number

Author

Description

Date 1/31/2023

Design code EN

Material

Steel S 355 (EN 10025-2)

Concrete C25/30

Project item: Dimensionimi i ankerëve

Design

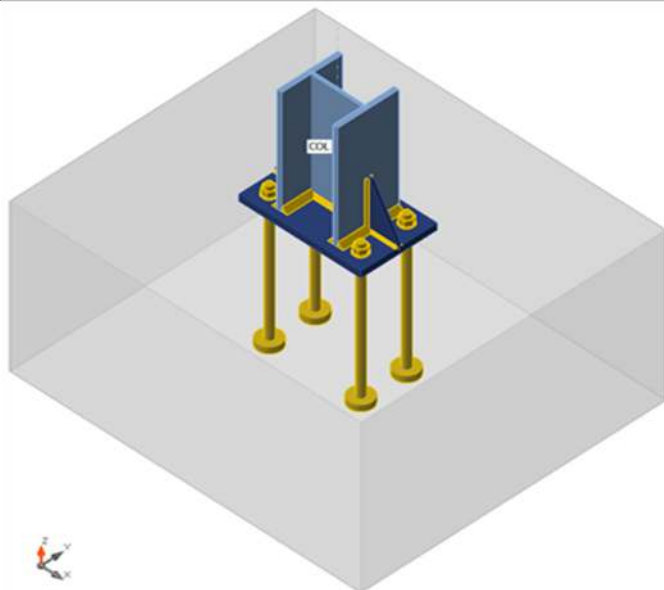
Name Dimensionimi i ankerëve

Description

Analysis Stress, strain/ simplified loading

Beams and columns

Name	Cross-section	β - Direction [°]	γ - Pitch [°]	α - Rotation [°]	Offset ex [mm]	Offset ey [mm]	Offset ez [mm]	Forces in
COL	1 - Projektimi i ankerëve(HEB160)	0.0	-90.0	0.0	0	0	0	Node



Cross-sections

Name	Material
1 - Projektimi i ankerëve(HEB160)	S 355 (EN 10025-2)

Anchors

Name	Bolt assembly	Diameter [mm]	fu [MPa]	Gross area [mm ²]
M20 8.8	M20 8.8	20	800.0	314

Load effects (equilibrium not required)

Name	Member	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
LE1	COL	-259.0	0.0	-24.0	0.0	34.0	0.0
LE2	COL	60.0	0.0	-6.0	0.0	0.0	0.0
LE3	COL	-237.0	0.0	-32.0	0.0	48.0	0.0

Foundation block

Item	Value	Unit
CB 1		
Dimensions	800 x 920	mm
Depth	500	mm
Anchor	M20 8.8	
Anchoring length	400	mm
Shear force transfer	Anchors	

Check

Summary

Name	Value	Status
Analysis	100.0%	OK
Plates	0.0 < 5.0%	OK
Anchors	54.1 < 100%	OK
Welds	98.0 < 100%	OK
Concrete block	47.6 < 100%	OK
Buckling	Not calculated	

Plates

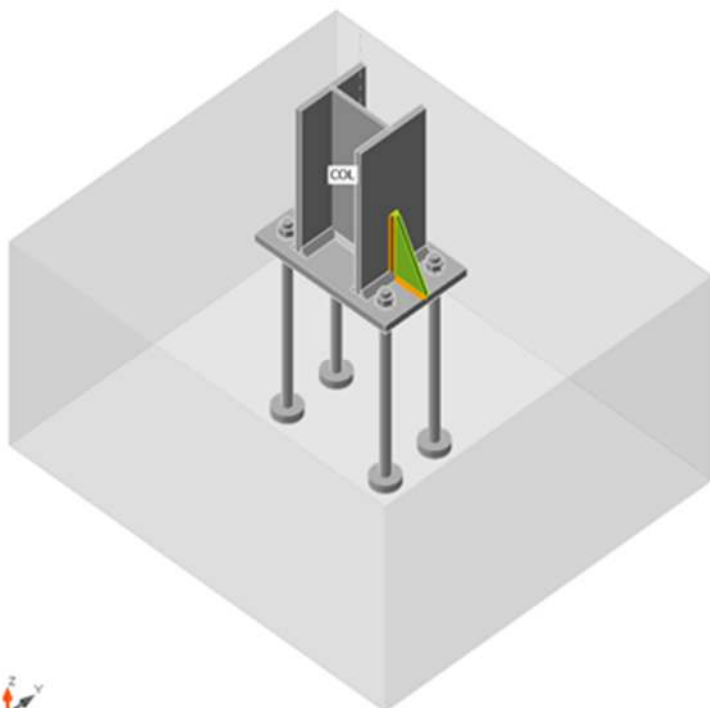
Name	Material	Thickness [mm]	Loads	σ_{Ed} [MPa]	ϵ_{Pl} [%]	σ_{CEd} [MPa]	Status
COL-bfl 1	S 355 (EN 10025-2)	13.0	LE3	233.8	0.0	0.0	OK
COL-tfl 1	S 355 (EN 10025-2)	13.0	LE3	157.0	0.0	0.0	OK
COL-w 1	S 355 (EN 10025-2)	8.0	LE3	174.9	0.0	0.0	OK
BP1	S 355 (EN 10025-2) - 1	20.0	LE3	209.4	0.0	0.0	OK
RIB1	S 355 (EN 10025-2)	8.0	LE3	297.8	0.0	0.0	OK
RIB2	S 355 (EN 10025-2)	8.0	LE3	185.5	0.0	0.0	OK

Design data

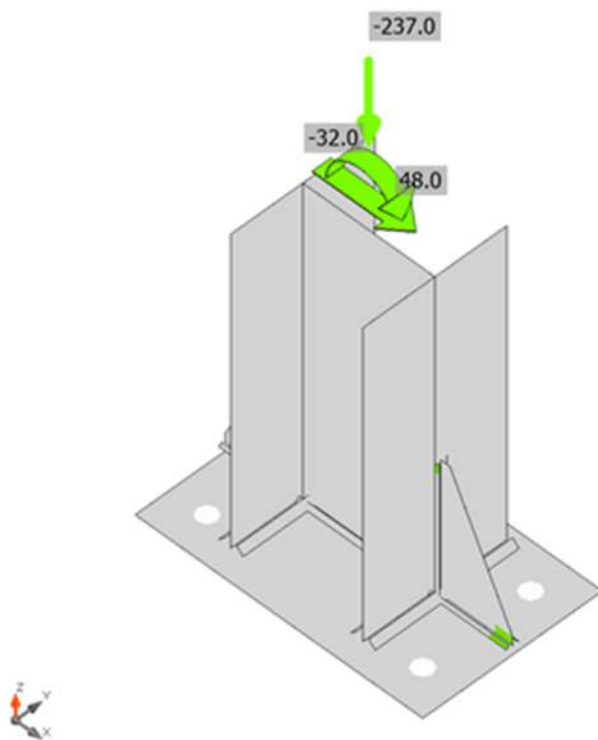
Material	f_y [MPa]	ϵ_{lim} [%]
S 355 (EN 10025-2)	355.0	5.0
S 355 (EN 10025-2) - 1	345.0	5.0

Symbol explanation

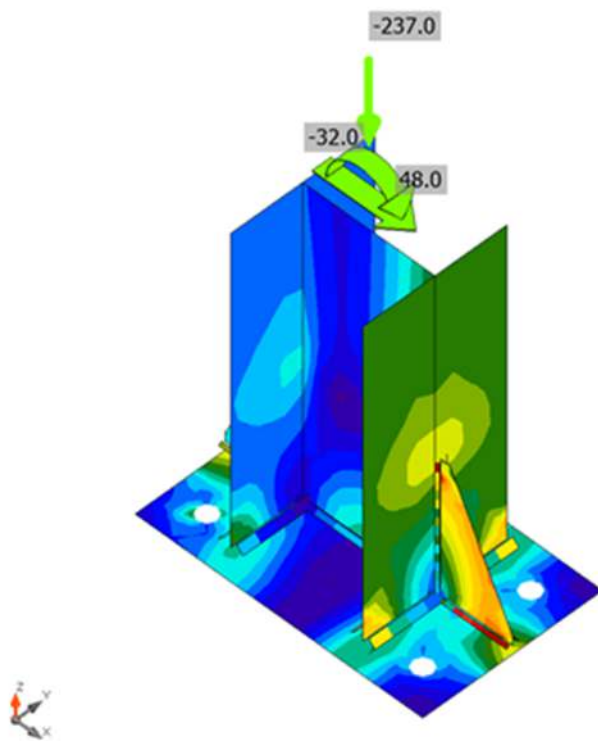
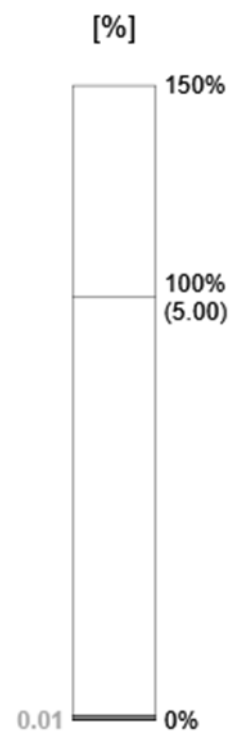
ϵ_{Pl}	Strain
σ_{Ed}	Eq. stress
σ_{CEd}	Contact stress
f_y	Yield strength
ϵ_{lim}	Limit of plastic strain



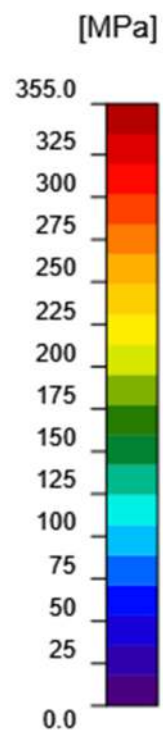
Overall check, LE3



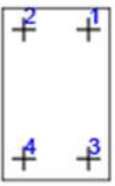
Strain check, LE3



Equivalent stress, LE3



Anchors

Shape	Item	Loads	N _{Ed} [kN]	V _{Ed} [kN]	N _{Rd,p} [kN]	N _{Rd,cb} [kN]	U _t [%]	U _{t,s} [%]	U _{t,s} [%]	Status
	A1	LE3	60.1	7.8	261.8	-	54.1	10.0	30.3	OK
	A2	LE3	60.1	7.8	261.8	-	54.1	10.0	30.3	OK
	A3	LE2	15.1	1.4	261.8	-	13.6	1.7	1.9	OK
	A4	LE2	15.1	1.4	261.8	-	13.6	1.7	1.9	OK

Design data

Grade	N _{Rd,s} [kN]	V _{Rd,s} [kN]
M20 8.8 - 1	111.1	78.4

Symbol explanation

- N_{Ed} Tension force
 V_{Ed} Resultant of shear forces V_y, V_z in bolt
 N_{Rd,p} Design resistance in case of pull-out failure - EN1992-4 - Cl. 7.2.1.5
 N_{Rd,cb} Design resistance in case of concrete blow-out failure - EN1992-4 - Cl. 7.2.1.8
 U_t Utilization in tension
 U_{t,s} Utilization in shear
 U_{t,s} Utilization in tension and shear
 N_{Rd,s} Design tensile resistance of a fastener in case of steel failure - EN1992-4 - Cl. 7.2.1.3
 V_{Rd,s} Design shear resistance in case of steel failure - EN1992-4 - Cl.7.2.2.3.1

Welds (Plastic redistribution)

Item	Edge	Throat th. [mm]	Length [mm]	Loads	σ _{w,Ed} [MPa]	ε _{Pl} [%]	σ _⊥ [MPa]	τ [MPa]	τ _⊥ [MPa]	U _t [%]	U _{t,c} [%]	Status
BP1	COL-bfl 1	▲10.0▲	160	LE3	194.5	0.0	-77.2	-44.0	-93.2	46.6	27.0	OK
		▲10.0▲	160	LE3	213.2	0.0	-101.4	-66.7	85.3	51.0	31.8	OK
BP1	COL-tfl 1	▲10.0▲	160	LE3	116.2	0.0	63.8	44.1	34.6	27.8	18.8	OK
		▲10.0▲	160	LE3	94.0	0.0	22.9	-6.8	-52.2	22.5	13.7	OK
BP1	COL-w 1	▲6.0▲	147	LE3	94.0	0.0	-16.3	50.9	-16.3	22.5	17.5	OK
		▲6.0▲	147	LE3	93.9	0.0	-16.3	-50.8	16.3	22.5	17.5	OK
BP1	RIB1	▲4.0▲	80	LE3	409.5	0.0	-180.8	110.6	-181.0	98.0	71.9	OK
		▲4.0▲	80	LE3	409.5	0.0	-181.0	-110.8	180.8	98.0	71.9	OK
COL-bfl 1	RIB1	▲4.0▲	150	LE3	409.6	0.1	-102.3	-204.9	-102.2	98.0	41.3	OK
		▲4.0▲	150	LE3	409.6	0.1	-102.2	204.9	102.2	98.0	41.3	OK
BP1	RIB2	▲4.0▲	80	LE3	191.5	0.0	83.9	-53.2	84.0	45.8	34.3	OK
		▲4.0▲	80	LE3	191.3	0.0	84.0	52.9	-83.9	45.8	34.3	OK

COL-tfl 1	RIB2	▲4.0▲	150	LE3	280.8	0.0	72.3	139.0	72.3	67.2	20.1	OK
		▲4.0▲	150	LE3	280.9	0.0	72.4	-139.0	-72.3	67.2	20.1	OK

Design data

	β_w [-]	$\sigma_{w,Rd}$ [MPa]	0.9σ [MPa]
S 355 (EN 10025-2)	0.90	417.8	338.4

Symbol explanation

ε_{PI}	Strain
$\sigma_{w,Ed}$	Equivalent stress
$\sigma_{w,Rd}$	Equivalent stress resistance
σ_{\perp}	Perpendicular stress
$\tau_{ }$	Shear stress parallel to weld axis
τ_{\perp}	Shear stress perpendicular to weld axis
0.9σ	Perpendicular stress resistance - $0.9 \cdot f_u / \gamma_{M2}$
β_w	Corelation factor EN 1993-1-8 tab. 4.1
U_t	Utilization
U_{tc}	Weld capacity utilization

Concrete block

Item	Loads	c [mm]	A_{eff} [mm ²]	σ [MPa]	k_j [-]	F_{jd} [MPa]	U_t [%]	Status
CB 1	LE3	37	22521	15.9	3.00	33.5	47.6	OK

Symbol explanation

c	Bearing width
A_{eff}	Effective area
σ	Average stress in concrete
k_j	Concentration factor
F_{jd}	The ultimate bearing strength of the concrete block
U_t	Utilization

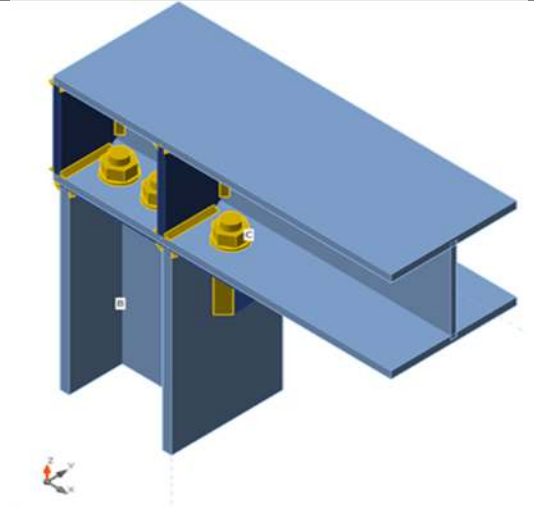
Project item: Lidhja tra-shtyllë

Design

Name	Lidhja tra-shtyllë
Description	
Analysis	Stress, strain/ simplified loading

Beams and columns

Name	Cross-section	β - Direction [°]	γ - Pitch [°]	α - Rotation [°]	Offset ex [mm]	Offset ey [mm]	Offset ez [mm]	Forces in	X [mm]
C	2 - HEB180	0.0	0.0	0.0	-80	0	0	Bolts	123
B	1 - Projektimi i ankerëve(HEB160)	0.0	90.0	0.0	0	0	0	Node	0



Cross-sections

Name	Material
2 - HEB180	S 355 (EN 10025-2)
1 - Projektimi i ankerëve(HEB160)	S 355 (EN 10025-2)

Bolts

Name	Bolt assembly	Diameter [mm]	fu [MPa]	Gross area [mm ²]
M24 8.8	M24 8.8	24	800.0	452

Load effects (equilibrium not required)

Name	Member	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
LE1	C	0.0	0.0	-250.0	0.0	67.0	0.0
LE2	C	0.0	0.0	-246.0	0.0	72.5	0.0

Check

Summary

Name	Value	Status
Analysis	100.0%	OK
Plates	3.5 < 5.0%	OK
Bolts	91.7 < 100%	OK
Welds	98.5 < 100%	OK

Buckling	Not calculated	
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Plates

Name	Material	Thickness [mm]	Loads	σ_{Ed} [MPa]	ϵ_{Pl} [%]	σ_{CEd} [MPa]	Status
C-bfl 1	S 355 (EN 10025-2)	14.0	LE2	358.2	1.5	135.0	OK
C-tfl 1	S 355 (EN 10025-2)	14.0	LE2	355.0	0.0	0.0	OK
C-w 1	S 355 (EN 10025-2)	8.5	LE2	356.9	0.9	0.0	OK
B-bfl 1	S 355 (EN 10025-2)	13.0	LE2	356.3	0.6	0.0	OK
B-tfl 1	S 355 (EN 10025-2)	13.0	LE2	355.6	0.3	0.0	OK
B-w 1	S 355 (EN 10025-2)	8.0	LE2	356.7	0.8	0.0	OK
EP1	S 355 (EN 10025-2) - 1	18.0	LE2	346.9	0.9	182.5	OK
STIFF1a	S 355 (EN 10025-2)	10.0	LE2	355.7	0.3	0.0	OK
STIFF1b	S 355 (EN 10025-2)	10.0	LE2	355.7	0.3	0.0	OK
STIFF1c	S 355 (EN 10025-2)	10.0	LE2	355.4	0.2	0.0	OK
STIFF1d	S 355 (EN 10025-2)	10.0	LE2	355.4	0.2	0.0	OK
WID1	S 355 (EN 10025-2)	12.0	LE2	362.4	3.5	0.0	OK

Design data

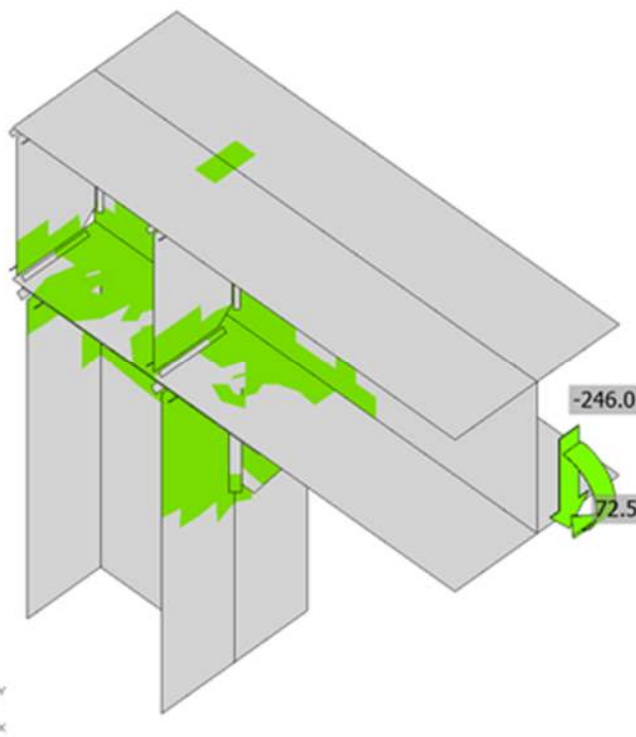
Material	f_y [MPa]	ϵ_{lim} [%]
S 355 (EN 10025-2)	355.0	5.0
S 355 (EN 10025-2) - 1	345.0	5.0

Symbol explanation

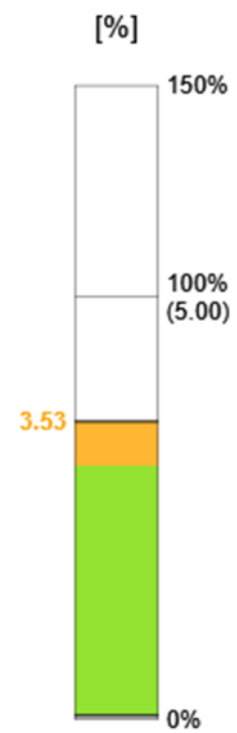
ϵ_{Pl}	Strain
σ_{Ed}	Eq. stress
σ_{CEd}	Contact stress
f_y	Yield strength
ϵ_{lim}	Limit of plastic strain

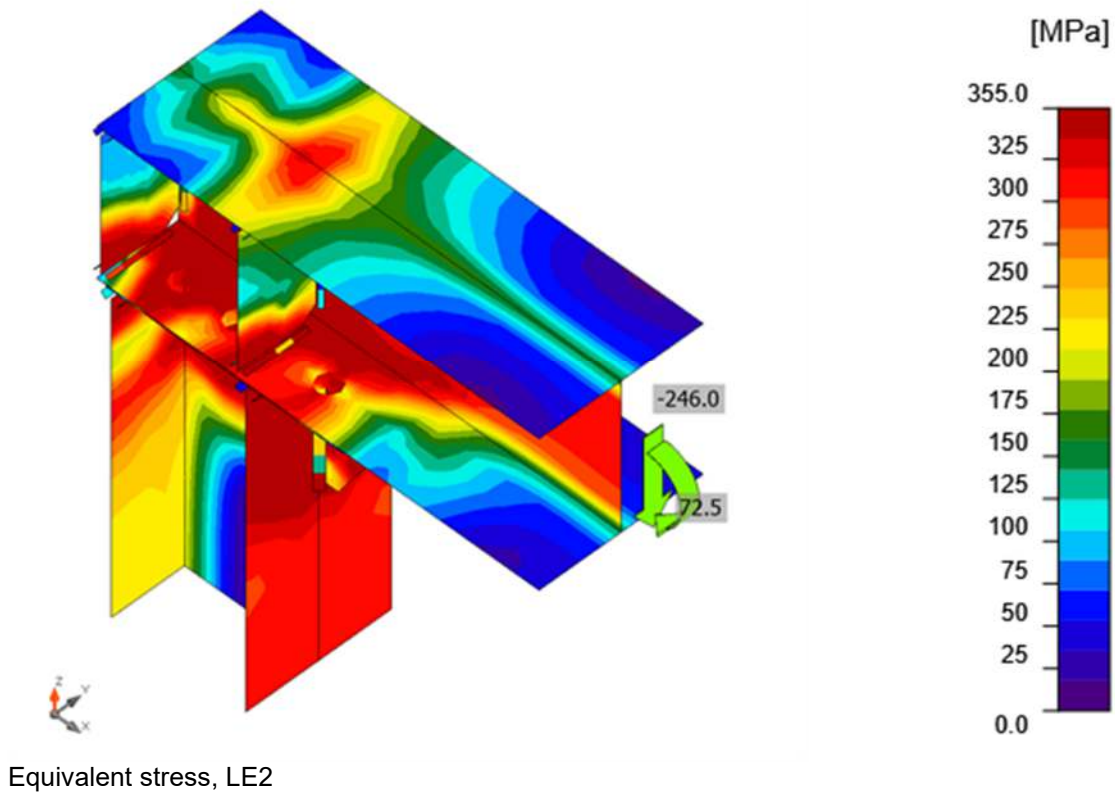


Overall check, LE2

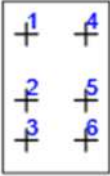


Strain check, LE2





Bolts

	Name	Loads	$F_{t,Ed}$ [kN]	V [kN]	U_{t_t} [%]	$F_{b,Rd}$ [kN]	U_{t_s} [%]	$U_{t_{ts}}$ [%]	Status
	B1	LE2	7.7	24.8	3.8	228.9	18.3	21.0	OK
	B2	LE2	62.4	17.4	30.7	164.0	12.9	34.8	OK
	B3	LE2	186.4	7.3	91.7	175.1	5.4	70.9	OK
	B4	LE2	7.7	24.8	3.8	229.0	18.3	21.0	OK
	B5	LE2	62.3	17.4	30.6	164.0	12.8	34.7	OK
	B6	LE2	186.5	7.3	91.7	175.1	5.4	70.9	OK

Design data

Name	$F_{t,Rd}$ [kN]	$B_{p,Rd}$ [kN]	$F_{v,Rd}$ [kN]
M24 8.8 - 1	203.3	377.0	135.6

Symbol explanation

$F_{t,Rd}$	Bolt tension resistance EN 1993-1-8 tab. 3.4
$F_{t,Ed}$	Tension force
$B_{p,Rd}$	Punching shear resistance
V	Resultant of shear forces V_y , V_z in bolt
$F_{v,Rd}$	Bolt shear resistance EN 1993-1-8 table 3.4
$F_{b,Rd}$	Plate bearing resistance EN 1993-1-8 tab. 3.4
U_{t_t}	Utilization in tension

Ut_s Utilization in shear

Welds (Plastic redistribution)

Item	Edge	Throat th. [mm]	Length [mm]	Loads	$\sigma_{w,Ed}$ [MPa]	ϵ_{Pl} [%]	σ_{\perp} [MPa]	$T_{ }$ [MPa]	T_{\perp} [MPa]	Ut [%]	Ut _c [%]	Status
EP1	B-bfl 1	▲7.0▲	160	LE2	409.5	0.1	223.1	127.5	151.9	98.0	93.6	OK
		▲7.0▲	160	LE2	275.7	0.0	-66.9	-90.6	125.1	66.0	52.3	OK
EP1	B-tfl 1	▲7.0▲	160	LE2	411.5	1.3	-235.3	-11.5	-194.6	98.5	98.3	OK
		▲7.0▲	160	LE2	409.5	0.1	20.4	92.5	217.3	98.0	57.8	OK
EP1	B-w 1	▲7.0▲	147	LE2	345.6	0.0	146.0	-106.4	146.3	82.7	59.7	OK
		▲7.0▲	147	LE2	345.0	0.0	146.0	106.5	-145.7	82.6	59.7	OK
C-bfl 1	STIFF1a	▲5.0▲	71	LE2	409.8	0.2	21.0	-190.2	140.3	98.1	85.8	OK
		▲5.0▲	71	LE2	409.7	0.2	-94.1	21.9	229.2	98.1	54.5	OK
C-w 1	STIFF1a	▲5.0▲	122	LE2	260.8	0.0	-114.0	135.2	7.0	62.4	27.5	OK
		▲5.0▲	122	LE2	185.8	0.0	25.0	88.4	-59.0	44.5	31.1	OK
C-tfl 1	STIFF1a	▲5.0▲	71	LE2	123.7	0.0	61.0	-6.4	61.8	29.6	19.0	OK
		▲5.0▲	71	LE2	118.2	0.0	-22.7	62.7	23.5	28.3	18.4	OK
C-bfl 1	STIFF1b	▲5.0▲	71	LE2	409.8	0.2	-94.1	-22.0	-229.2	98.1	54.6	OK
		▲5.0▲	71	LE2	409.8	0.3	21.4	190.0	-140.5	98.1	85.8	OK
C-w 1	STIFF1b	▲5.0▲	122	LE2	185.8	0.0	25.1	-88.4	59.1	44.5	31.1	OK
		▲5.0▲	122	LE2	261.0	0.0	-114.4	-135.3	-6.8	62.5	27.6	OK
C-tfl 1	STIFF1b	▲5.0▲	71	LE2	118.3	0.0	-22.7	-62.8	-23.6	28.3	18.5	OK
		▲5.0▲	71	LE2	123.7	0.0	60.9	6.4	-61.8	29.6	19.0	OK
C-bfl 1	STIFF1c	▲5.0▲	71	LE2	409.6	0.1	-230.1	41.6	-191.1	98.0	85.0	OK
		▲5.0▲	71	LE2	251.7	0.0	164.7	13.1	-109.0	60.2	28.3	OK
C-w 1	STIFF1c	▲5.0▲	122	LE2	193.5	0.0	-76.1	-100.2	-22.7	46.3	22.8	OK
		▲5.0▲	122	LE2	162.6	0.0	9.0	82.5	44.4	38.9	20.0	OK
C-tfl 1	STIFF1c	▲5.0▲	71	LE1	113.8	0.0	-6.3	61.3	-23.5	27.2	12.3	OK
		▲5.0▲	71	LE2	269.8	0.0	-148.5	-49.5	120.3	64.6	34.6	OK
C-bfl 1	STIFF1d	▲5.0▲	71	LE2	251.8	0.0	164.9	-12.6	109.2	60.3	28.3	OK
		▲5.0▲	71	LE2	409.6	0.1	-230.2	-41.9	191.0	98.0	85.0	OK
C-w 1	STIFF1d	▲5.0▲	122	LE2	162.6	0.0	9.0	-82.6	-44.3	38.9	20.0	OK
		▲5.0▲	122	LE2	193.6	0.0	-76.1	100.2	22.7	46.3	22.8	OK
C-tfl 1	STIFF1d	▲5.0▲	71	LE2	269.8	0.0	-148.5	49.4	-120.3	64.6	34.6	OK
		▲5.0▲	71	LE1	113.8	0.0	-6.3	-61.3	23.5	27.2	12.3	OK
EP1	WID1	▲10.0▲	85	LE2	410.8	0.8	-160.7	147.3	-161.1	98.3	79.3	OK
		▲10.0▲	85	LE2	410.8	0.8	-161.0	-147.8	160.6	98.3	79.3	OK
B-tfl 1	WID1	▲10.0▲	135	LE2	409.5	0.0	-158.4	149.7	158.6	98.0	50.9	OK
		▲10.0▲	135	LE2	409.5	0.0	-158.5	-149.8	-158.3	98.0	51.0	OK

Design data

	β_w [-]	$\sigma_{w,Rd}$ [MPa]	0.9 σ [MPa]
S 355 (EN 10025-2)	0.90	417.8	338.4

Symbol explanation

ε_{Pl}	Strain
$\sigma_{w,Ed}$	Equivalent stress
$\sigma_{w,Rd}$	Equivalent stress resistance
σ_{\perp}	Perpendicular stress
$\tau_{ }$	Shear stress parallel to weld axis
τ_{\perp}	Shear stress perpendicular to weld axis
0.9σ	Perpendicular stress resistance - $0.9 \cdot f_u / \gamma_{M2}$
β_w	Corelation factor EN 1993-1-8 tab. 4.1
U_t	Utilization
U_{tc}	Weld capacity utilization

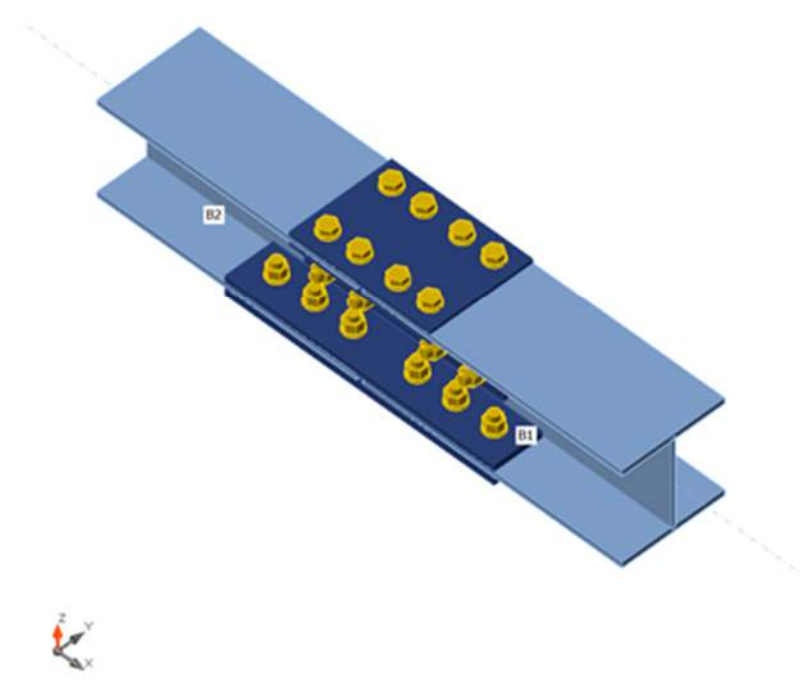
Project item: Vazhdimi montues

Design

Name	Vazhdimi montues
Description	
Analysis	Stress, strain/ simplified loading

Beams and columns

Name	Cross-section	β - Direction [°]	γ - Pitch [°]	α - Rotation [°]	Offset ex [mm]	Offset ey [mm]	Offset ez [mm]	Forces in
B1	4 - HEA160	0.0	0.0	0.0	0	0	0	Node
B2	4 - HEA160	180.0	0.0	0.0	0	0	0	Node



Cross-sections

Name	Material
4 - HEA160	S 355 (EN 10025-2)

Bolts

Name	Bolt assembly	Diameter [mm]	f_u [MPa]	Gross area [mm ²]
M16 8.8	M16 8.8	16	800.0	201

Load effects (equilibrium not required)

Name	Member	N [kN]	V _y [kN]	V _z [kN]	M _x [kNm]	M _y [kNm]	M _z [kNm]
LE1	B1	0.0	0.0	-20.0	0.0	25.0	0.0

Check

Summary

Name	Value	Status
Analysis	100.0%	OK
Plates	0.0 < 5.0%	OK
Bolts	54.5 < 100%	OK
Buckling	Not calculated	

Plates

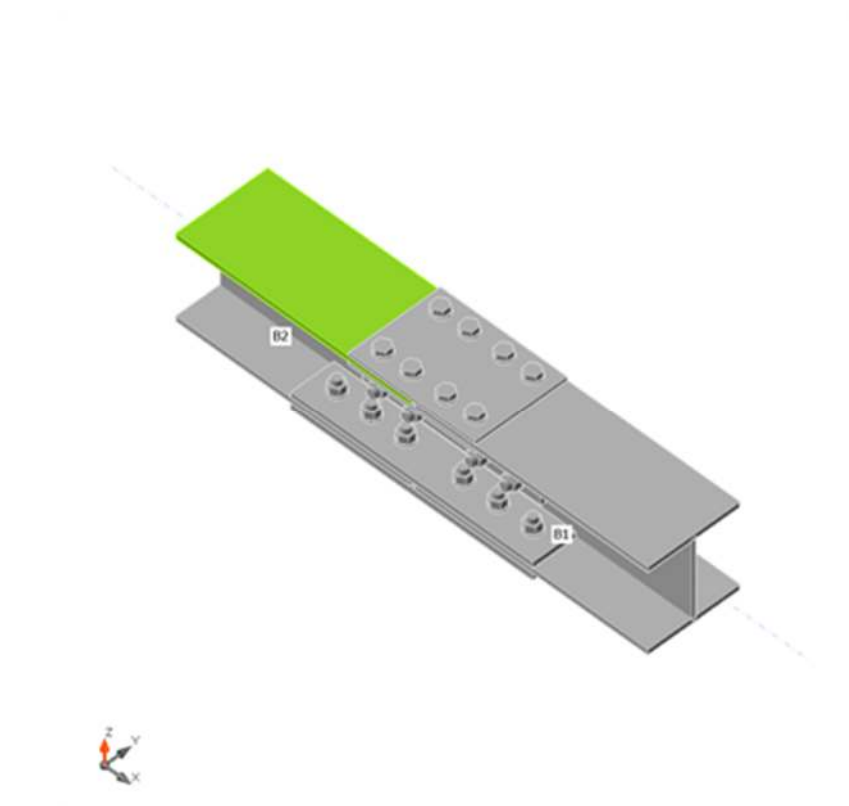
Name	Thickness [mm]	Loads	σ_{Ed} [MPa]	ϵ_{pl} [%]	$\sigma_{C_{Ed}}$ [MPa]	Status
B1-bfl 1	9.0	LE1	180.5	0.0	6.5	OK
B1-tfl 1	9.0	LE1	242.2	0.0	18.5	OK
B1-w 1	6.0	LE1	167.9	0.0	6.5	OK
B2-bfl 1	9.0	LE1	205.5	0.0	29.3	OK
B2-tfl 1	9.0	LE1	291.8	0.0	26.1	OK
B2-w 1	6.0	LE1	258.7	0.0	26.1	OK
SPL1a	6.0	LE1	278.4	0.0	19.4	OK
SPL1b	6.0	LE1	254.3	0.0	16.9	OK
SPL1c	6.0	LE1	254.9	0.0	16.8	OK
SPL2a	12.0	LE1	207.2	0.0	4.4	OK
SPL2b	10.0	LE1	229.1	0.0	8.7	OK
SPL2c	10.0	LE1	229.1	0.0	8.7	OK
SPL3a	8.0	LE1	170.4	0.0	5.2	OK
SPL3b	8.0	LE1	167.3	0.0	5.0	OK

Design data

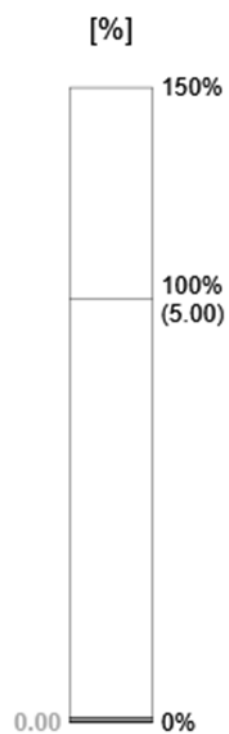
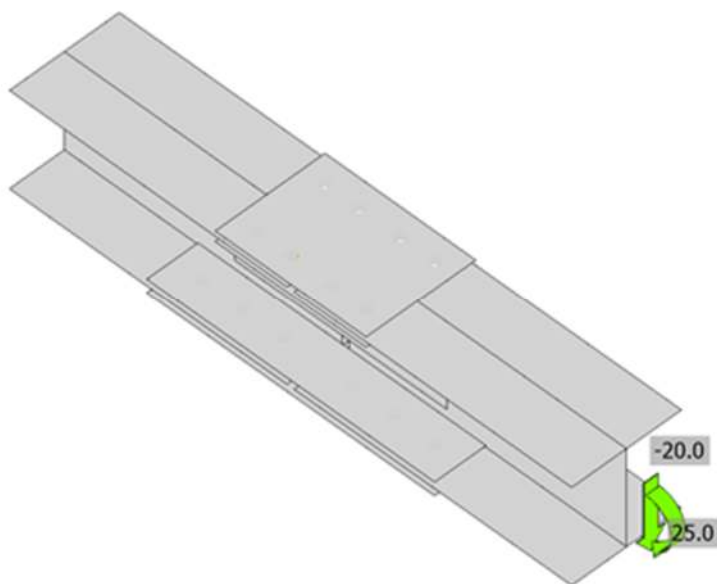
Material	f_y [MPa]	ϵ_{lim} [%]
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Symbol explanation

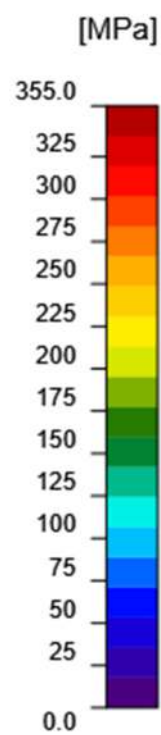
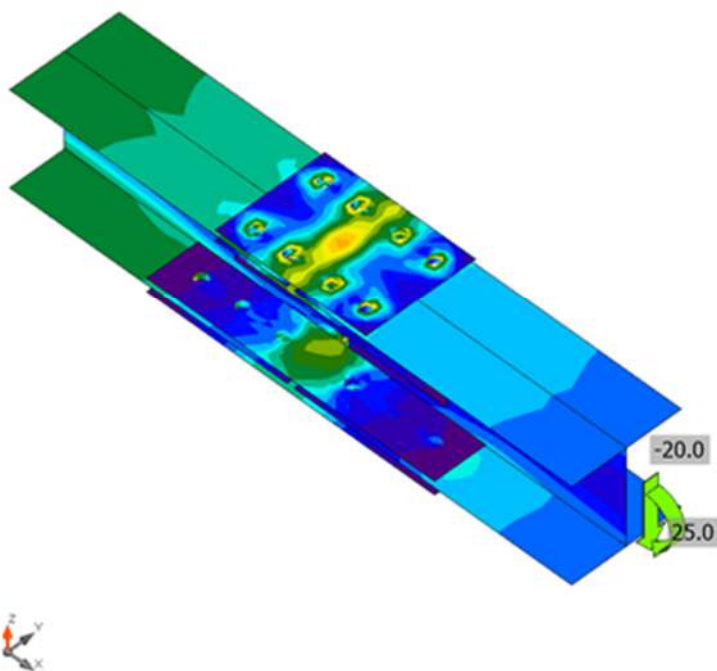
ϵ_{Pl}	Strain
σ_{Ed}	Eq. stress
σ_{cEd}	Contact stress
f_y	Yield strength
ϵ_{lim}	Limit of plastic strain



Overall check, LE1

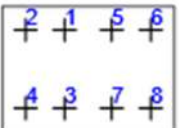
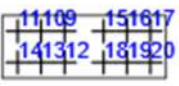
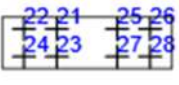


Strain check, LE1



Equivalent stress, LE1

Bolts

	Name	Grade	Loads	$F_{t,Ed}$ [kN]	V [kN]	U_t [%]	$F_{b,Rd}$ [kN]	U_s [%]	U_{ts} [%]	Status
	B1	M16 8.8 - 1	LE1	4.3	18.3	4.8	62.7	54.5	33.8	OK
	B2	M16 8.8 - 1	LE1	4.6	18.6	5.1	91.5	37.6	34.5	OK
	B3	M16 8.8 - 1	LE1	4.3	18.3	4.8	62.7	54.5	33.8	OK
	B4	M16 8.8 - 1	LE1	4.6	18.6	5.1	91.5	37.6	34.5	OK
	B5	M16 8.8 - 1	LE1	3.9	18.1	4.3	62.7	54.5	33.0	OK
	B6	M16 8.8 - 1	LE1	5.0	18.9	5.6	91.5	37.6	35.3	OK
	B7	M16 8.8 - 1	LE1	3.9	18.1	4.3	62.7	54.5	33.0	OK
	B8	M16 8.8 - 1	LE1	5.0	18.9	5.6	91.5	37.6	35.3	OK
	B9	M16 8.8 - 2	LE1	7.3	15.4	8.1	116.6	25.6	31.4	OK
	B10	M16 8.8 - 2	LE1	0.9	16.0	1.0	116.6	26.6	27.3	OK
	B11	M16 8.8 - 2	LE1	1.1	16.9	1.2	135.4	28.0	28.8	OK
	B12	M16 8.8 - 2	LE1	7.3	15.4	8.1	116.6	25.6	31.4	OK
	B13	M16 8.8 - 2	LE1	0.9	16.0	1.0	116.6	26.6	27.3	OK
	B14	M16 8.8 - 2	LE1	1.1	16.9	1.2	135.4	28.0	28.8	OK
	B15	M16 8.8 - 2	LE1	7.8	14.7	8.6	116.6	24.4	30.5	OK
	B16	M16 8.8 - 2	LE1	1.0	16.1	1.1	116.6	26.7	27.5	OK
	B17	M16 8.8 - 2	LE1	1.1	17.5	1.3	135.4	29.1	30.0	OK
	B18	M16 8.8 - 2	LE1	7.8	14.7	8.6	116.6	24.4	30.5	OK
	B19	M16 8.8 - 2	LE1	1.0	16.1	1.1	116.6	26.7	27.5	OK
	B20	M16 8.8 - 2	LE1	1.1	17.5	1.3	135.4	29.1	30.0	OK
	B21	M16 8.8 - 3	LE1	0.9	7.6	1.0	37.4	20.3	13.4	OK
	B22	M16 8.8 - 3	LE1	1.1	8.2	1.2	86.2	18.9	14.4	OK
	B23	M16 8.8 - 3	LE1	0.2	3.4	0.3	77.7	8.8	5.9	OK
	B24	M16 8.8 - 3	LE1	0.8	4.6	0.9	61.0	14.9	8.2	OK
	B25	M16 8.8 - 3	LE1	1.4	10.7	1.6	34.7	30.8	18.8	OK
	B26	M16 8.8 - 3	LE1	1.3	10.1	1.5	89.2	22.6	17.8	OK
	B27	M16 8.8 - 3	LE1	0.5	6.6	0.5	77.7	16.9	11.3	OK
	B28	M16 8.8 - 3	LE1	0.8	5.3	0.9	32.1	16.4	9.3	OK

Design data

Name	$F_{t,Rd}$ [kN]	$B_{p,Rd}$ [kN]	$F_{v,Rd}$ [kN]
M16 8.8 - 1	90.4	107.9	60.3
M16 8.8 - 2	90.4	179.8	60.3
M16 8.8 - 3	90.4	143.9	60.3

Symbol explanation

$F_{t,Rd}$	Bolt tension resistance EN 1993-1-8 tab. 3.4
$F_{t,Ed}$	Tension force
$B_{p,Rd}$	Punching shear resistance
V	Resultant of shear forces V_y , V_z in bolt
$F_{v,Rd}$	Bolt shear resistance EN_1993-1-8 table 3.4
$F_{b,Rd}$	Plate bearing resistance EN 1993-1-8 tab. 3.4
U_t	Utilization in tension
U_s	Utilization in shear

Buckling

Buckling analysis was not calculated.

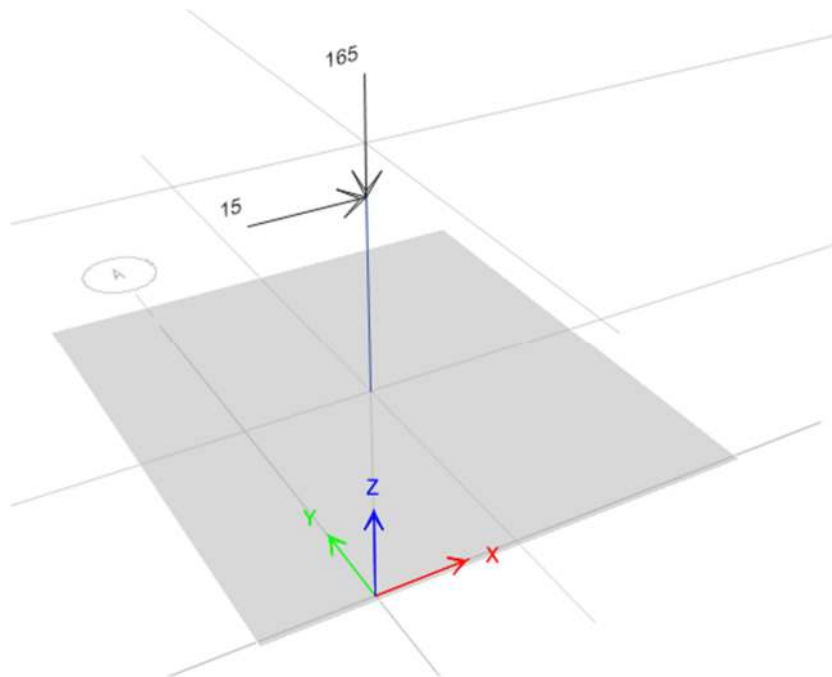
Code settings

Item	Value	Unit	Reference
γ_{M0}	1.00	-	EN 1993-1-1: 6.1
γ_{M1}	1.00	-	EN 1993-1-1: 6.1
γ_{M2}	1.25	-	EN 1993-1-1: 6.1
γ_{M3}	1.25	-	EN 1993-1-8: 2.2
γ_C	1.50	-	EN 1992-1-1: 2.4.2.4
γ_{Inst}	1.20	-	EN 1992-4: Table 4.1
Joint coefficient β_j	0.67	-	EN 1993-1-8: 6.2.5
Effective area - influence of mesh size	0.10	-	
Friction coefficient - concrete	0.25	-	EN 1993-1-8
Friction coefficient in slip-resistance	0.30	-	EN 1993-1-8 tab 3.7
Limit plastic strain	0.05	-	EN 1993-1-5
Weld stress evaluation	Plastic redistribution		
Detailing	No		
Distance between bolts [d]	2.20	-	EN 1993-1-8: tab 3.3
Distance between bolts and edge [d]	1.20	-	EN 1993-1-8: tab 3.3
Concrete breakout resistance check	None		EN 1992-4: 7.2.1.4 and 7.2.2.5
Use calculated α_b in bearing check.	Yes		EN 1993-1-8: tab 3.4
Cracked concrete	Yes		EN 1992-4
Local deformation check	No		CIDECT DG 1, 3 - 1.1
Local deformation limit	0.03	-	CIDECT DG 1, 3 - 1.1
Geometrical nonlinearity (GMNA)	Yes		Analysis with large deformations for hollow section joints
Braced system	No		EN 1993-1-8: 5.2.2.5

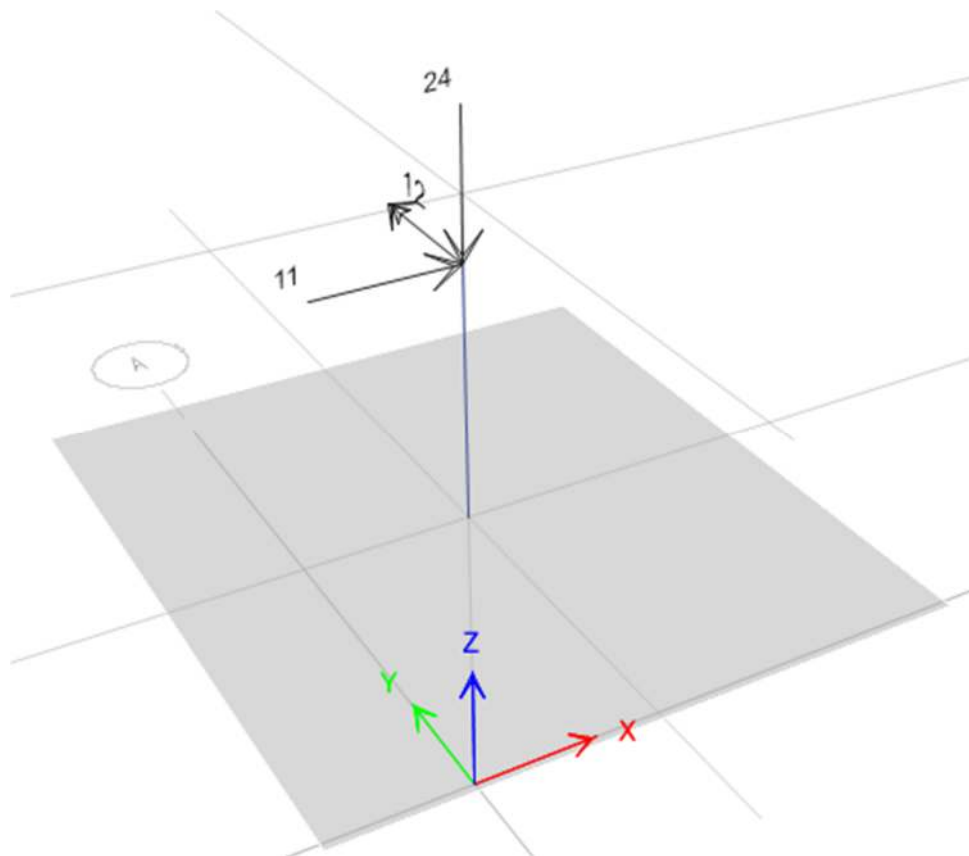
Projektimi i themelit

TABLE: Joint Reactions / Reaksionet per dimensionimin e themelit (D)								
Joint	OutputCase	CaseType	F1	F2	F3	M1	M2	M3
Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
16	D	LinStatic	-9.4	6.7	45.9	-1.9	-13.8	0
30	D	LinStatic	15.2	-5.4	165	2.9	21.5	0
16	D	LinStatic	-9.4	6.7	45.9	-1.9	-13.8	0
24	D	LinStatic	3.3	-6.3	33.8	4.5	9.3	0
4	D	LinStatic	1.7	4	-35.9	-0.7	4	0
30	D	LinStatic	15.2	-5.4	165	2.9	21.5	0
10	D	LinStatic	0.1	4	57.9	-10.2	0.3	0
29	D	LinStatic	1.4	-2.9	44.2	7.4	1.9	0
16	D	LinStatic	-9.4	6.7	45.9	-1.9	-13.8	0
30	D	LinStatic	15.2	-5.4	165	2.9	21.5	0
TABLE: Joint Reactions / Reaksionet per dimensionimin e themelit (S1)								
Joint	OutputCase	CaseType	F1	F2	F3	M1	M2	M3
Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
16	S1	LinStatic	-1.4	1.1	5.4	-0.3	-2	0
30	S1	LinStatic	2.2	-0.9	23.8	0.5	3.2	0
16	S1	LinStatic	-1.4	1.1	5.4	-0.3	-2	0
24	S1	LinStatic	0.5	-1.1	3	0.8	1.5	0
4	S1	LinStatic	0.2	0.7	-7.5	-0.1	0.6	0
30	S1	LinStatic	2.2	-0.9	23.8	0.5	3.2	0
TABLE: Joint Reactions / Reaksionet per dimensionimin e themelit (Wx)								
Joint	OutputCase	CaseType	F1	F2	F3	M1	M2	M3
Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
6	Wx	LinStatic	1.6	6.3	3.3	-6.1	7.6	0
14	Wx	LinStatic	8.3	-0.4	-0.1	2.7	8	0
10	Wx	LinStatic	3.6	10.7	-1.2	-9.5	1.1	0
28	Wx	LinStatic	4	-7.8	-2.2	4.3	1.6	0
4	Wx	LinStatic	6.1	7	5.2	-2.8	12.1	0
30	Wx	LinStatic	6	-1.9	-3	-0.8	11	0
8	Wx	LinStatic	4.7	7.1	0.4	-10	4.6	0
29	Wx	LinStatic	5.9	-5.3	-0.7	5.8	2.9	0
4	Wx	LinStatic	6.1	7	5.2	-2.8	12.1	0
10	Wx	LinStatic	3.6	10.7	-1.2	-9.5	1.1	0

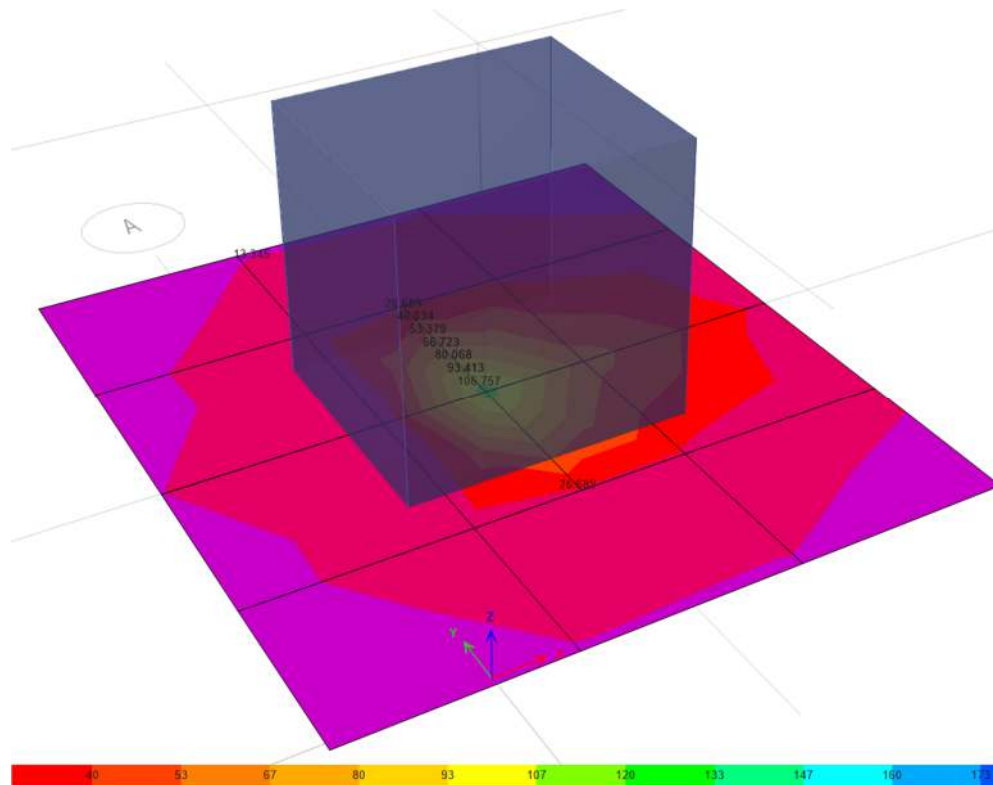
Aplikimi i ngarkesës DL



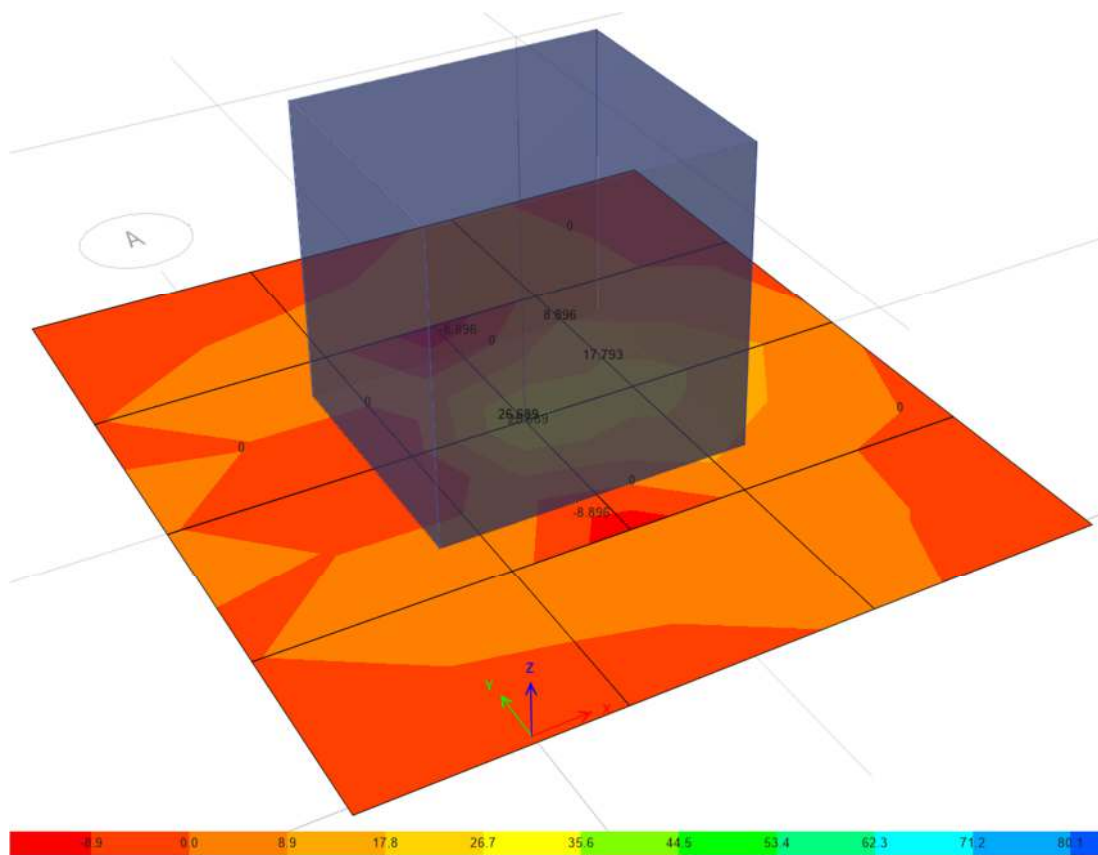
Aplikimi i ngarkesës LL (S1 dhe Wx)



Ndikimet statike Mmax (1.35DL+1.5LL)



Ndikimet statike Mmax (1.35DL+1.5LL)



A

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Specifikimi i materialeve – Konstruksioni Metalik

Project name:	Pika informuese për turist
Subject:	Lista e profileve- Metalika
Date:	Shtator 2023

Profile/Thickness	Materiale	Qty	Length (mm)	Area(m ²) tot.	Weight(kg) tot.
HEA140	S355JR	28	38805.41		975.10
HEA160	S355JR	33	88559.95		2746.78
HEA160	S355JR	3	8468.46		262.66
HEA180	S355JR	2	17022.96		616.23
HEB160	S355JR	4	15680.00		680.51
CHS101.6*4	S235JR	3	12714.00		122.71
SHS100x4	S235JR	25	88000.50		1150.00
RHS 150x100x4	S235JR		80000.00		1220.00
ANCHOR_M20	8.8	72	28541.95		72.38
10 mm	S355JR	38		0.34	26.95
10 mm	S355JR	55		1.06	84.88
12 mm	S355JR	30		0.50	80.00
12 mm	S355JR	6		0.17	15.98
16 mm	S355JR	15		0.85	108.73
20 mm	S355JR	33		1.84	294.66
Pesha e pa prashikuar dhe bulona shese	S235JR			6%	507.45
Total					8965.02

Project name:	Pika informuese për turist
Subject:	Lista e bulonave - Metalika
Date:	Shkurt 2023

Bolt				
Standard	Cant./Off.	Dimension	Qty	Name
EN15048, SB, zink	Site	BOLT 24.0 X 65.0	96	BOLT
EN15048, SB, zink	Site	BOLT 20.0 X 60.0	16	BOLT
EN15048, SB, zink	Site	BOLT 20.0 X 55.0	44	BOLT
EN15048, SB, zink	Site	BOLT 20.0 X 50.0	8	BOLT
EN15048, SB, zink	Site	BOLT 16.0 X 50.0	20	BOLT
EN15048, SB, zink	Site	BOLT 16.0 X 45.0	100	BOLT
EN15048, SB, zink	Site	BOLT 16.0 X 40.0	4	BOLT

Nut				
Standard		Dimension	Qty	Name
EN15048, SB, zink		NUT 24.0	96	NUT-M24-4032
EN15048, SB, zink		NUT 20.0	68	NUT-M20-4032
EN15048, SB, zink		NUT 16.0	124	NUT-M16-4032

Washer				
Standard		Dimension	Qty	Name
7089		WASHER 25.0	96	WASHER-M24-7089
7089		WASHER 21.0	68	WASHER-M20-7089
7089		WASHER 17.0	124	WASHER-M16-7089
7089		WASHER 25.0	96	WASHER-M24-7089
7089		WASHER 21.0	68	WASHER-M20-7089
7089		WASHER 17.0	124	WASHER-M16-7089

Specifikimi i betonit

SASIA E BETONIT THEMELET	
EMERTIMI	SASIA
TRA-THEMELI HARKOR 01	7.00
XOKLLA HARKORE 01	3.50
TRA-THEMELI HARKOR 02	2.50
XOKLLA HARKORE 02	1.50
PLLAKA E DYSHEMESË	0.00
PLLAKA E RAMPES	0.00
PLLAKA E PODESTIT	0.00
SHPUTAT 01	0.50
TOTALI	15.00

Specifikimi i armatures

Bars - recapitulation			
Ø [mm]	lgn [m]	Unit weight [kg/m]	Weight [kg]
B500C			
10	2053.92	0.62	1267.27
12	518.50	0.89	460.43
Total (B500C)			1727.70
Total			1727.70