UAB „Kima group“

UAB "Kima group"
Gėlių g. 24, Pageležių k., LT-20278 Ukmergės r.
Mob.: +370 611 26097
El. paštas: info@kima.lt

Statinio projekto etapas	TECHNINIS DARBO PROJEKTAS
Statinio Kategorija	YPATINGASIS
Statytojas (Užsakovas)	AB „KLAIPĖDOS VANDUO“
Statinio projekto numeris	KIMA-23/2-DRE-TDP-SK
Statybos rūšis	REKONSTRUKCIJA
Statinio projekto pavadinimas	KITOS PASKIRTIES INŽINERINIO STATINIO (NUOTEKŲ VALYKLOS) PIEVŲ G. 17, DREVERNOS K., PRIEKULĖS SEN., KLAIPĖDOS R. SAV., REKONSTRUKCIJOS PROJEKTAS
Statinio (satininių) pavadinimas	KITOS PASKIRTIES INŽINERINIAI STATINIAI (12.) NUOTEKŲ ŠALINIMO TINKLAI (9.5)

Projekto dalis	STATINIO KONSTRUKCIJŲ DALIS (SK)	Byla (tomas) Laida	**4** **0**

Pareigos	Vardas, pavardė Kvalifikacijos atestato Nr.	Data	Parašas
DIREKTORĖ	RŪTA RAUDYTĖ	2023-09	[redacted]
PROJEKTO VADOVAS	VILIJA KALADINSKIENĖ NR.326346	2023-09	
PROJEKTO DALIES VADOVAS	JULIUS ZARECKAS NR.22738	2023-09	

Vilnius, 2023 m.

STATINIO PROJEKTO SUDĖTIES ŽINIARAŠTIS

Eil. Nr.	Bylos (segtuvo) žymuo	Laida	Projekto dalies pavadinimas	Pastabos
1	KIMA-23/2-DRE-TDP-BD	0	Bendroji dalis	
2	KIMA-23/2-DRE-TDP-SP,SA	0	Sklypo sutvarkymo (sklypo plano) dalis	
3	KIMA-23/2-DRE-TDP-SA		Architektūros dalis	
4	**KIMA-23/2-DRE-TDP-SK**	**0**	**Statinio konstrukcijų dalis**	
5	KIMA-23/2-DRE-TDP-VN,TN	0	Vandentiekio ir nuotekų šalinimo, nuotekų valymo dalis	
6	KIMA-23/2-DRE-TDP-ŠVOK	0	Šildymo, vėdinimo ir oro kondicionavimo dalis	
7	KIMA-23/2-DRE-TDP-E,PVA,AS/GAS	0	Elektrotechnikos, Procesų valdymo ir automatizavimo, Apsauginės, gaisro aptikimo signalizacijos dalis	
8	KIMA-23/2-DRE-TDP-SO	0	Pasirengimo statybai ir statybos darbų organizavimo dalis	

0	2023-08	Statybai.		
Laida	Data	Laidos statusas. Keitimo priežastis (jei taikoma)		
Atestato Nr.	UAB "Kima group"		Statinio projekto pavadinimas: KITOS PASKIRTIES INŽINIERINIO STATINIO (NUOTEKŲ VALYKLOS) PIEVŲ G. 17, DREVERNOS K., PRIEKULĖS SEN., KLAIPĖDOS R. SAV., REKONSTRUKCIJOS PROJEKTAS	
26346	PV	V. Kaladinskienė	Dokumento pavadinimas: PROJEKTO SUDĖTIES ŽINIARAŠTIS	LAIDA 0
22738	PDV	J. Zareckas		
	Inž.	T. Sirusas		
Kalbos trumpinys	Užsakovas: AB „KLAIPĖDOS VANDUO“		Dokumento žymuo: KIMA-23/2-DRE-TDP-SK-PSŽ	LAPAS 1 / LAPŲ 1
LT				

PROJEKTO DALIES SUDĖTIS

STATINIO KONSTRUKCIJŲ DALIS
TECHNINIS DARBO PROJEKTAS
BENDRAS BYLŲ ŽINIARAŠTIS

Eil. Nr.	Dokumento žymuo bylos	Laida	Pavadinimas	Rengia	Bylų sk.
1.	KIMA-23/2-DRE-TDP-SK-1	0	Statinio konstrukcijos	UAB „SOSTINĖS KONSTRUKTORIAI"	1
2.	KIMA-23/2-DRE-TDP-SK-IS	0	Inžineriniai skaičiavimai	UAB „SOSTINĖS KONSTRUKTORIAI"	1

0	2023-08	Statybai.			
Laida	Data	Laidos statusas. Keitimo priežastis (jei taikoma)			
Atestato Nr.	UAB "Kima group"		Statinio projekto pavadinimas: KITOS PASKIRTIES INŽINIERINIO STATINIO (NUOTEKŲ VALYKLOS) PIEVŲ G. 17, DREVERNOS K., PRIEKULĖS SEN., KLAIPĖDOS R. SAV., REKONSTRUKCIJOS PROJEKTAS		
26346	PV	V. Kaladinskienė	Dokumento pavadinimas: PROJEKTO SUDĖTIES ŽINIARAŠTIS	LAIDA	
22738	PDV	J. Zareckas		0	
	Inž.	T.Sirusas			
Kalbos trumpinys	Užsakovas: AB „KLAIPĖDOS VANDUO"		Dokumento žymuo: KIMA-23/2-DRE-TDP-SK-PDBŽ	LAPAS	LAPŲ
LT				1	1

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UAB "Kima group"
Gėlių g. 24, Pageležių k., LT-20278 Ukmergės r.
Mob.: +370 611 26097
El. paštas: info@kima.lt

Statinio projekto etapas	TECHNINIS DARBO PROJEKTAS
Statinio Kategorija	YPATINGASIS
Statytojas (Užsakovas)	AB „KLAIPĖDOS VANDUO“
Statinio projekto numeris	KIMA-23/2-DRE-TDP-SK
Statybos rūšis	REKONSTRUKCIJA
Statinio projekto pavadinimas	KITOS PASKIRTIES INŽINERINIO STATINIO (NUOTEKŲ VALYKLOS) PIEVŲ G. 17, DREVERNOS K., PRIEKULĖS SEN., KLAIPĖDOS R. SAV., REKONSTRUKCIJOS PROJEKTAS
Statinio (satininių) pavadinimas	KITOS PASKIRTIES INŽINERINIAI STATINIAI (12.) NUOTEKŲ ŠALINIMO TINKLAI (9.5)

Projekto dalis	STATINIO KONSTRUKCIJŲ DALIS (SK) **INŽINERINIAI SKAIČIAVIMAI (BYLA: SK-IS)**	Byla (tomas) Laida	**4** **0**

Pareigos	Vardas, pavardė Kvalifikacijos atestato Nr.	Data	Parašas
DIREKTORĖ	RŪTA RAUDYTĖ	2023-09	
PROJEKTO VADOVAS	VILIJA KALADINSKIENĖ NR.326346	2023-09	
PROJEKTO DALIES VADOVAS	JULIUS ZARECKAS NR.22738	2023-09	

Vilnius, 2023 m.

...SK-IS DALIES BYLOS (SEGTUVO) DOKUMENTŲ SUDĖTIES ŽINIARAŠTIS

Dokumento žymuo	Lapų sk.	Laida	Dokumento pavadinimas	Pastabos
a	b	c	d	e
TEKSTINIAI DOKUMENTAI				
KIMA-23/2-DRE-TDP-SK-IS-T	1	0	TITULINIS LAPAS	
KIMA-23/2-DRE-TDP-SK-IS-BDŽ	2	0	BRĖŽINIŲ IR DOKUMENTŲ ŽINIARAŠTIS	
KIMA-23/2-DRE-TDP-SK-IS-AR	27	0	AIŠKINAMASIS RAŠTAS	
KIMA-23/2-DRE-TDP-SK-IS-S	400	0	SKAIČIAVIMŲ ATASKAITOS	
PRIEDAI				
KIMA-23/2-DRE-TDP-SK-IS-P-001	3	0	SNIEGO DETALĮS SKAIČIAVIMAI	
KIMA-23/2-DRE-TDP-SK-IS-P-002	8	0	VĖJO DETALĮS SKAIČIAVIMAI	
KIMA-23/2-DRE-TDP-SK-IS-P-003	12	0	SAVOJO SVORIO DETALĮS SKAIČIAVIMAI	
KIMA-23/2-DRE-TDP-SK-IS-P-004	8	0	TALPŲ IR PLOKŠČIŲ IŠKĖLIMO SKAIČIAVIMAS	
KIMA-23/2-DRE-TDP-SK-IS-P-005	18	0	ILGINIŲ SKAIČIAVIMAS	
KIMA-23/2-DRE-TDP-SK-IS-P-006	20	0	SW PANELIŲ SKAIČIAVIMAS	
KIMA-23/2-DRE-TDP-SK-IS-P-007	6	0	GROTELIŲ SKAIČIAVIMAS	
KIMA-23/2-DRE-TDP-SK-IS-P-008	16	0	VARŽTŲ SKAIČIAVIMAS	

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0	2023-08	Statybai.			
Laida	Data	Laidos statusas. Keitimo priežastis (jei taikoma)			
Atestato Nr.	UAB "Kima group"		Statinio projekto pavadinimas: KITOS PASKIRTIES INŽINIERINIO STATINIO (NUOTEKŲ VALYKLOS) PIEVŲ G. 17, DREVERNOS K., PRIEKULĖS SEN., KLAIPĖDOS R. SAV., REKONSTRUKCIJOS PROJEKTAS		
26346	PV	V. Kaladinskienė	Dokumento pavadinimas: AIŠKINAMASIS RAŠTAS		LAIDA 0
22738	PDV	J. Zareckas			
	Inž.	T. Sirusas			
Kalbos trumpinys	Užsakovas: AB „KLAIPĖDOS VANDUO“		Dokumento žymuo: KIMA-23/2-DRE-TDP-SK-IS-AR	LAPAS 1	LAPŲ 27
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PROJEKTINIAI DUOMENYS

UAB „Sostinės konstruktoriai" parengė nuotekų valyklos konstrukcijų (SK) dalies darbo projektą (DP). Projektas parengtas vadovaujantis UAB „Inžinerinė vizija" reikalavimais.

1.1. Normatyviniai, kiti dokumentai ir duomenys bei naudota programinė įranga

1.1.1. Normatyviniai, kiti dokumentai ir duomenys

- Statinio projektavimo techinė užduotis;
- Projekto architektūrinė dalies užduotis;
- UBA „RAPASTA" geologinė užduotis;
- Lietuvos Respublikos statybos normos bei Lietuvos Respublikoje galiojančios Europos Sąjungos statybos projektavimo normos ir taisyklės, kurių sąrašas pateiktas sekančioje lentelėje.

Projektavimą reglamentuojantys normatyviniai dokumentai

Dokumento šifras	**Dokumento pavadinimas**
RSN 156-94	Statybinė klimatologija
STR 1.01.03:2017	Statinių klasifikavimas
STR 1.04.02:2011	Inžineriniai geologiniai ir geotechniniai tyrimai
STR 1.04.04:2017	Statinio projektavimas, projekto ekspertizė
STR 1.12.06:2002	Statinio naudojimo paskirtis ir gyvavimo trukmė
STR 2.01.01(1):2005	Esminiai statinio reikalavimai. Mechaninis patvarumas ir pastovumas
STR 2.01.01(2):1999	Esminiai statinio reikalavimai. Gaisrinė sauga
STR 2.01.01(3):1999	Esminiai statinio reikalavimai. Higiena, sveikata, aplinkos apsauga
STR 2.01.01(4):2008	Esminiai statinio reikalavimai. Naudojimo sauga.
STR 2.01.01(6):2008	Esminis statinio reikalavimas. Energijos taupymas ir šilumos išsaugojimas.
STR 2.01.02:2016	Pastatų energinio naudingumo projektavimas ir sertifikavimas
STR 2.04.01:2018	Pastatų atitvaros, sienos, stogai, langai ir išorinės įėjimo durys.
STR 2.05.21:2016	Geotechninis projektavimas. Bendrieji reikalavimai.
STR 2.05.13:2004	Statinių konstrukcijos. Grindys
STR 2.05.21:2016	Geotechninis projektavimas. Bendrieji reikalavimai.
LST EN 1990:2004	Eurokodas. Konstrukcijų projektavimo pagrindai
LST EN 1991-1-1:2004	Eurokodas 1. Poveikiai konstrukcijoms. 1-1 dalis. Bendrieji poveikiai. Tankiai, savasis svoris, pastatų naudojimo apkrovos.
LST EN 1992-1-1:2005/AC:2010	Eurokodas 2. Gelžbetoninių konstrukcijų projektavimas. 1-1 dalis. Bendrosios ir pastatų taisyklės
LST EN 1993-1-1:2005+AC:2006	Eurokodas 3. Plieninių konstrukcijų projektavimas. 1-1 dalis. Bendrosios ir pastatų taisyklės

LST EN 1993-1-8:2005+AC:2006	Eurokodas 3. Plieninių konstrukcijų projektavimas. 1-8 dalis. Mazgų projektavimas
LST EN 1997-1:2006	Eurokodas 7. Geotechninis projektavimas. 1 dalis. Pagrindinės taisyklės.

1.1.2. Naudota programinė įranga

Skaičiavimams naudota programinė įranga:

- Dlubal RFEM 5.28;
- Microsot Excel 2016.

Tekstinių bei grafinių dokumentų ruošimui naudota programinė įranga:

- Microsot Excel 2016;
- Microsot Word 2016;
- Tekla structures 2020;
- BricsCad V22 (x64).

1.2. Bendrieji pažintiniai duomenys apie vietovę

1.2.1. Statinio geografinė vieta

Nuotekų valyklos, Pievų g. 17 Drevernos k. Priekulės sen. Klaipėdos r. sav. rekonstravimo projektas.

1.2.2. Geologinės sąlygos

Pagrindo fizinės mechaninės sąvybės nurodytos geologinių tyrinėjimnų byloje paruoštoje UAB „Geoconsulting". Lauko darbai atlikti 2023 birželio mėnesį.

Tyrimų metu 2 – iose vietose sraigtiniu būdu išgręžti gręžiniai, paimti 6 grunto mėginiai ir šalia atliktas geotechninis zondavimas (CPT – TE1). Sklypo geologinę sandarą iki 9,3 – 10,0m gylio sudaro: technogeniniai (tIV) dariniai, Holoceno Postlitorinos jūros (mIVPL) bei Viršutinio Pleistoceno Baltijos posvitės limnoglacialiniai (lgIIIbl) dariniai.

Atlikus lauko ir laboratorinių tyrimų medžiagos interpretaciją, išskirti 6 inžineriniai geologiniai sluoksniai (IGS), kurių pagrindinių savybių vertės pateiktos 1 lentelėje.

1 lentelė. Sluoksnių pagrindinių savybių vertės.

IGS Nr.	Grunto tipas	Stratigrafinis indeksas	Grunto pavadinimas	q_c, MPa	γ, kN/m³	ϕ', °	E_o, MPa
1	Mg	t IV	Mg	1.0	Netinkamas pagrindams		
2	SiO	m IV PL	saSiLO	1.1	18.6	-	1.1
3	Sa		siSa	3.8	-	-	11.4
4			siSa	7.0	-	31.0	31.0
5		lg III bl	Sa-F	12.8	-	35.0	45.5
6			Sa-F	26.1	-	40.0	78.8

1.2.3. Hidrologinės sąlygos

Hidrogeologinės statybos sklypo sąlygos charakterizuojamos remiantis požeminio vandens lygio stebėjimais gręžiniuose lauko darbų vykdymo metu.

Tyrimų metu vandeningas sluoksnis buvo pasiektas visoje nagrinėtoje aplinkoje ir slūgsojo 1,1 – 1,5m gylyje nuo žemės paviršiaus.

1.2.4. Klimato sąlygos

Pagal www.meteo.lt duomenis, sklypas yra vidutinių platumų klimato zonoje ir priklauso pietinės Baltijos posričio Pajūrio rajono Jūros pakrantės parajoniui. Vidutinė metinė oro temperatūra 6,0-6,5 C0, absoliutinių temperatūros

minimumų vidurkis > -21-22 C0. Kritulių kiekis per metus 700-800 mm. Laikotarpio su sniego danga trukmė 75-80 dienų, be šalnų 160 – 170 dienų. Svarbiausieji veiksniai ir procesai, sąlygojantys tarprajoninius klimato skirtumus, jūrinio oro pernaša į žemyna, pakrantės brizinė cirkuliacija. Norminis sezoninio įšalo gylis smėliui iki 1.2 m, moliui iki 1.5 m.

1.2.5. Gamtinė ar technogeninė tarša

Gamtinė ar technologinė tarša nenustatyta.

1.2.6. Greta išdėstyti statiniai ir inžineriniai tinklai

Šalia nuotekų valyklos yra veikianti nuotekų valykla ir apleisti seni dumblo sodinimo rezervuarai

1.3. Bendrieji pažintiniai duomenys apie statinį

1.3.1. Statinio kategorija

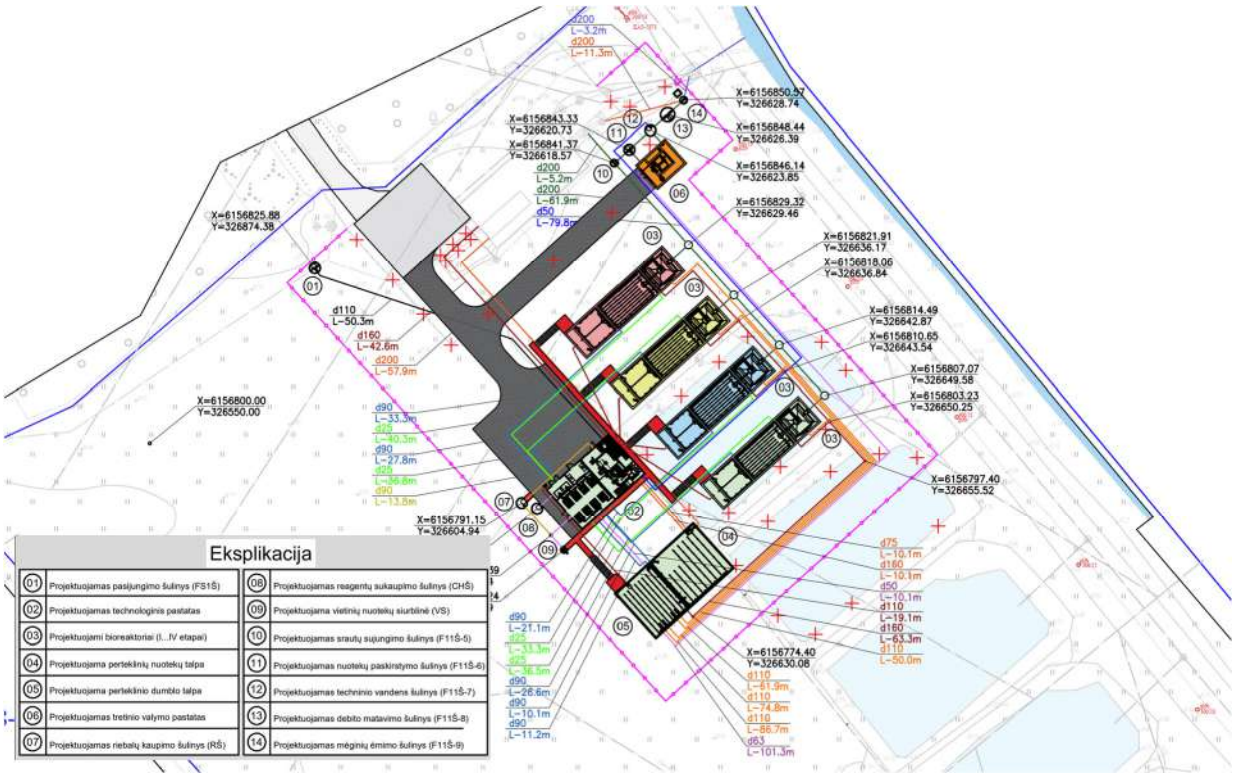
Statinys priskiriamas neypatingų statinių kategorijai.

1.3.2. Statinio paskirtis

Nuotekų valymo įrenginių statiniai priskiriami prie kitų inžinierinių statinių iš metalo ir gelžbetoninio konstrukcijų.

Projektuojami komplekso statiniai (pavadinimas, numeris):

- Technologinis pastatas (02);
- Bioreaktoriai (4 vienetai) (03);
- Perteklinių nuotekų talpa (04) ir perteklinio dumblo talpa (05);
- Tretinio valymo pastatas (06);



pav. 1 Pastatų schema

PROJEKTINIAI SPRENDINIAI

1.4. *Technologinis pastatas (02)*

1.4.1. Statinio konstruktyvinė schema

Suprojektuotas metalinis karkasinis pastatas.

Statinio matmenys plane – 7,780 m x 12,310 m, aukštis – 6,18 m. Statomas 1-o aukšto dviejų dalių aukštesnis ir mažesnis pastatas.

Konstruktyvinė schema – Pastato laikančioji pagrindinė dalis tarpatramio rėmai – metalinės kolonos sujungta kartu su sija. Kolonos su sija jungiamos lanksčiai, prie pamato - lanksčiai. Pastato stabilumą užtikrina vertikalūs ryšiai. Standumą stogo plokštumoje užtikrina horizontalūs ryšiai.

Projektuojamos tokios pastato konstrukcijos:

Pamatai

Gežbetoninė plokštė su sroverku remiama ant D400 polių.

Kolonos

Suprojektuotos kvadratinio/ dėžinio vamzdžio skerspjūvio metalinės kolonos.

Ryšiai

Metaliniai ryšiai suprojektuoti iš kvadratinių vamzdžių.

Sijos

Suprojektuotos HEA skerspjūvio metalinės sijos. Sijos su kolonomis jungiamos lanksčiai.

Sienos

SIENA (DAUGIASLUOKNĖS PAN.) : D-1		Paskirtis: Pramonės statiniai		Klasė: B	U= 0,300
Medžiagos pavadinimas	**Simbolis**	**Sluoksnio storis d, [mm]**	**Medžiagos šilumos laidumo koeficientas λd.s., [W/(mK)]**	**Sluoksnio šiluminė varža R, [m2K/W]**	
Daugiasluoknė plokštė SP2B 100 E-PIR LF/MF 0.6/0.6	**R1**	**100,0**	**0,022**	**4,545**	
Visuminė šiluminė atitvaros varža	Rf	**100**	**-**	**4,545**	
Atitvaros šilumos perdavimo koef.		**U_0=**	**0,220**	**[W/(m2K)]**	
Pataisos koeficientas		ΔU=	-	[W/(m2K)]	
Galutinis šilumos perdavimo koef.		**U_{GAL}=**	**0,22**	**[W/(m2K)]**	
Pastabos:					
1) Daugiasluoksnių plokščių storis ir laidumo koef. nustatomas pagal gamintojo duomenis					

Išorinės sienos iš horizontaliai montuojamų „sendvič" tipo plokščių 100 mm storio su poliuretano užpildu.

Plokščių šilumos perdavimo koeficientas U= 0,22 w/m^2·K, kuris yra mažesnis už norminį.

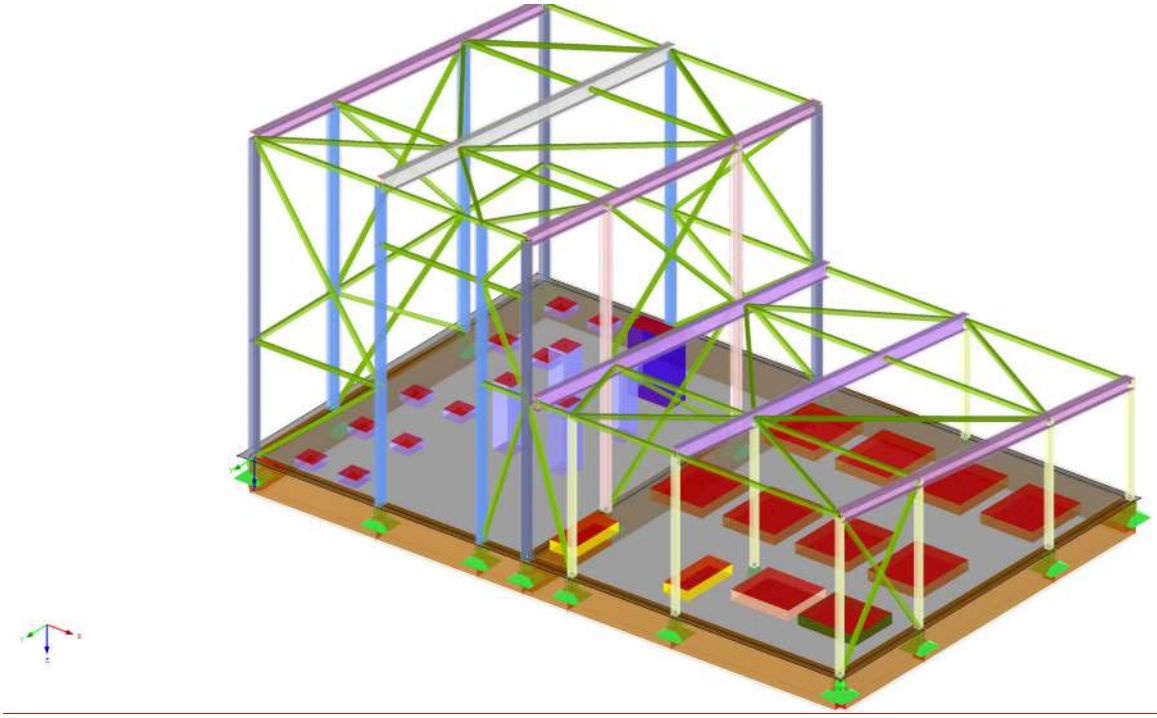
Denginys

Denginys montuojamas iš „sendvič" tipo plokščių 120/160 mm įrengtu ant sijų. Plokščių šilumos perdavimo koeficientas U= 0,18 w/m^2·K, kuris yra mažesnis už norminį

STOGAS (DAUGIASLUOKNĖS PAN.) : D-2		Paskirtis: Pramonės statiniai		Klasė: B	U= 0,250
Medžiagos pavadinimas	Simbolis	Sluoksnio storis d, [mm]	Medžiagos šilumos laidumo koeficientas λd.s., [W/(mK)]	Sluoksnio šiluminė varža R, [m2K/W]	
Daugiasluoknė plokštė SP2C 160/120 E-PIR TL 0.5/0.4	R1	120,0	0,018	6,667	
Visuminė šiluminė atitvaros varža	Rf	120	-	6,667	
Atitvaros šilumos perdavimo koef.		U_0=	0,150	[W/(m2K)]	
Pataisos koeficientas		ΔU=	-	[W/(m2K)]	
Galutinis šilumos perdavimo koef.		U_{GAL}=	0,15	[W/(m2K)]	
Pastabos:					
1) Daugiasluoksnių plokščių storis ir laidumo koef. nustatomas pagal gamintojo duomenis					

Grindys

Grindys ant grunto numatomos 200mm C30/37 armuoto betono storio. Grindys perduoda apkrovą pamatų sijoms.



Skaičiuojamoji schema

1.4.2. *Apkrovos*

Charakteristinės apkrovos parinktos pagal STR 2.05.04:2003 "Poveikiai ir apkrovos" ir projektinę užduotį.

Statybos metu atsirandančios apkrovos nuo statybinių mechanizmų, medžiagų sandėliavimo ir kt. neturi viršyti pagrindinių laikančiųjų konstrukcijų leistinų apkrovų, kurios betarpiškai veikia jas eksploatacijos metu.

Nuolatiniai poveikiai

Savasis konstrukcijų svoris (SKS).

Laikančių konstrukcijų charakteristinė apkrova nuo savojo konstrukcijų svorio įvertinama priimant:

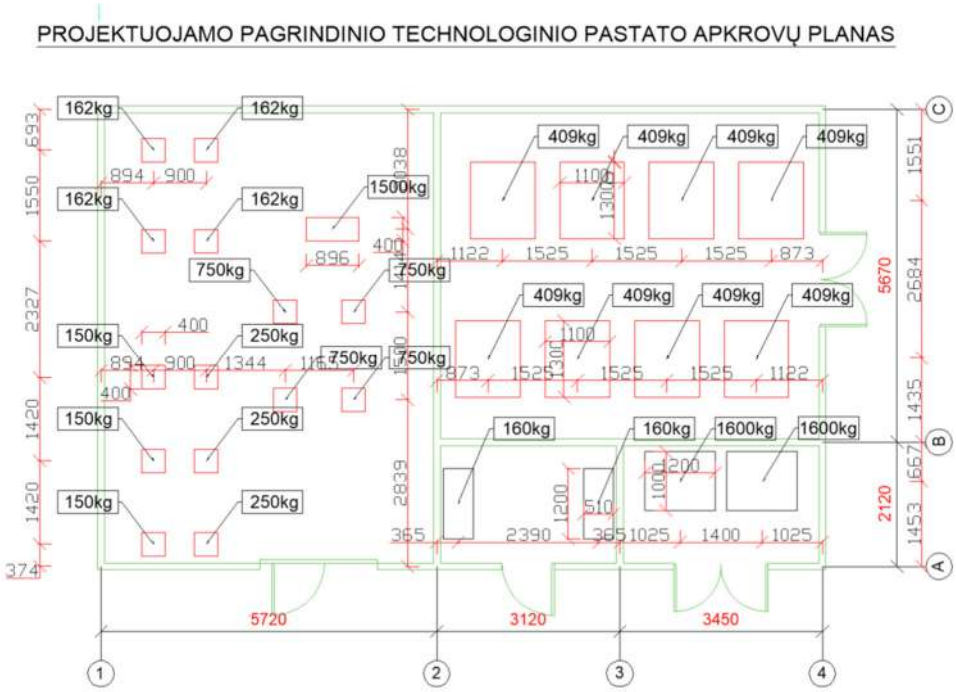
- betono svorį – 25kN/m³;
- plieno svorį – 78,5kN/m³.

Sienų „sendvič" plokščių sąvojo svorio charakteristinė reikšmė – gk = 0,15 kN/m².

Stogo „sendvič" plokščių sąvojo svorio charakteristinė reikšmė – gk = 0,15 kN/m².

Kintamieji poveikiai

Naudojimo apkrovos nuo įrenginių:



Sniego apkrovų (SA) charakteristinės reikšmės:

Pagal projekto užduotį pastatas yra statomas Drevernos k., Priekulės sen., Klaipėdos r. sav teritorijoje, kuris pagal LST EN 1991-1-3 priskiriamas I sniego apkrovos rajonui. Sniego dangos ant 1 m² horizontaliojo žemės paviršiaus svorio charakteristinė reikšmė – s_k = 1,2 kN/m².

Nustatome sniego apkrovos į horizontaliąją projekciją dydį:

· Apkrova ant technologinio pastato stogo, kai μ_i = 1,0 – s = 1,20 kN/m².

Sniego apkrovų skaičiavimą žiūrėti Priede Nr.2 Sniego apkrovų skaičiavimas.

Vėjo apkrovos (VA)

Kadangi pastatas statomas Drevernos k., Priekulės sen., Klaipėdos r. sav teritorijoje, tai pagal statybos techninį reglamentą LST EN 1991-1-4 tai yra I (pirmasis) vėjo greičio rajonas – $v_{ref,0}$ = 32 m/s.

Koeficientas, įvertinantis vėjo slėgio pokytį pagal aukštį, II tipo vietovei.

Vėjo apkrovų skaičiavimas pateiktas Priede Nr.1 VĖJO DETALŲS SKAIČIAVIMAI

Temperatūrinės apkrovos (TA)

Pagal techninę užduotį vidaus temperatūra – +8°.

Skaičiuojant technologinį pastatą temperatūrinės apkrovos nevertinamos.

Apkrovų deriniai

Apkrovų deriniai sudaromi remiantis STR 2.05.04:2003 VI skyriumi ir 10 priedu. Įvertinami saugos bei tinkamumo ribiniai būviai.

Poveikių derinių koeficientų Ψ reikšmės parenkamos pagal STR 2.05.04:2003 "Poveikiai ir apkrovos", 10 priedo reikalavimus.

1.4.3. Medžiagų patikimumo koeficientai

Medžiagų patikimumo koeficientai priimti vadovaujantis atitinkamais statybos techniniais reglamentais ir yra lygūs:

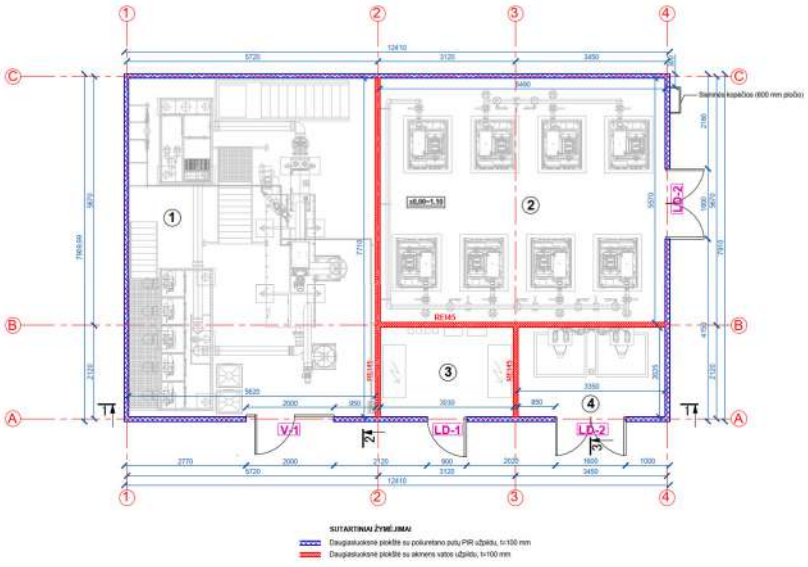
- gelžbetoninėms konstrukcijoms saugos ribiniam būviui γ_c=1,5;
- betoninėms konstrukcijoms saugos ribiniam būviui γ_c=1,8;
- plieninėms konstrukcijoms saugos ribiniam būviui γ_u=1,3;
- gelžbetoninėms ir betoninėms konstrukcijoms tinkamumo ribiniam būviui γ_c=1,0;
- armatūros plieno dalinio patikimumo koeficientas:
  strypinei armatūrai γ_s=1,1;
  vielinei armatūrai γ_s=1,2;
- plieniniams lakštiniams, ilgiesiems valcuotiems ir tuščiaviduriams statybiniams profiliams γ_M=1,1.

1.4.4. Konstrukcijų apsauga nuo gaisro

Pastatas priskiriamas P.3 statinių grupei. Projektuojamas pastatas yra III atsparumo ugniai laipsnio (gaisriniai reikalavimai nekeliami).

Pagal Gaisrinės saugos pagrindinius reikalavimus statinys priskiriamas P.3 Kita – kiti pastatai, kurių negalima priskirti jokiai nurodytai pastatų paskirčiai gaisro grėsmės grupėms.

Statinys priskiriamas III atsparumo ugniai laipsnio.



1.4.5. Konstrukcijų apsauga nuo korozijos

Siekiant užtikrinti metalinių konstrukcijų apsaugą nuo korozijos, jei nenurodyta kitaip, metaliniai gaminiai esantys:

- pastato viduje, dengiami pasirinkta dažų sistema užtikrinant apsaugą nuo C2 (žemo patvarumo) kategorijos atmosferos korozijos;
- pastato išorėje, dengiami pasirinkta dažų sistema užtikrinant apsaugą nuo C4 (vidutinio patvarumo) kategorijos atmosferos korozijos.

Konstrukcijų apsauginio padengimo klasė turi atitikti reikalavimus, ne žemesnius nei reikalavimai, pateikiami LST EN ISO 12944-1:2000.

Konstrukcijų paviršių paruošimas dažymui parenkamas pagal parinktą dažų sistemą ir turi atitikti reikalavimus pateikiamus LST EN ISO 12944-4:2000.

1.4.6. Konstrukcijų aplinkos sąlygų klasifikacija, atsparumui šalčiui ir vandeniui markės

- Paruošiamasis sluoksnis ..... Nereglamentuojama;
- Rezervuaro dugnas XC4-XF3-XA2-W8-F200;
- Rezervuaro sienos XC4-XF3-XA2-W8;
- Rezervuaro denginys ..... XC3-XF3-XA2-W8-F200.
- Pamatai XC2-F100;
- Pamatų sijos XC2-F100;
- Vidaus grindys ..... XC1.

1.4.7. Konstrukcijos patikimumo klasė

Projektuojamas statinys pagal patikimumą ir paskirtį turi būti priskirtas – RC1 patikimumo klasei bei CC1 pasekmių klasei, todėl daugiklis KFI = 1.

1.4.8. Konstrukcijos ilgaamžiškumas

Pagal STR 1.12.06:2002 „Statinio naudojimo paskirtis ir gyvenimo trukmė" technologinio pastato gyvavimo trukmė priklausomai nuo statinio naudojimo paskirties ir statybos produktų, iš kurių jis pastatytas – 50 metų. Pagal užduotį, statinių gyvavimo trukmė 30 m.

1.4.9. Ribiniai įlinkiai ir poslinkiai

Ribiniai įlinkiai

Pagal STR 2.05.05:2005 17.1 lentelę priimtas lemiantis ribinis įlinkis pagal estetinius – psichologinius reikalavimus – l/200.

Pagal STR 2.05.05:2005 17.1 lentelę priimtas lemiantis ribinis kransijos įlinkis pagal technologinius reikalavimus – l/250.

Ribiniai horizontalūs poslinkiai

Pagal STR 2.05.05:2005 17.4 lentelę ribinis horizontalus poslinkis $h_s/150$.

1.4.10. Atitvarų garso izoliavimo sprendiniai

Pastato konstrukcijoms triukšmo izoliavimo reikalavimai nėra taikomi.

1.4.11. Konstrukcijų apsaugos priemonės nuo klimatologinio, technogeninio, drėgmės poveikio

Rostverkas iš šonų dengiamas dviem sluoksniais teptinės hidroizoliacijos. Virš rostverkų įrengiama horizontali klijuojama hidroizoliacija.

Metalinės konstrukcijos nuo klimatologinės drėgmės apsaugotos atitvarinėmis konstrukcijomis ir stogo konstrukcija. Nuo technologinės drėgmės konstrukcijos apsaugomos antikoroziniu padengimu.

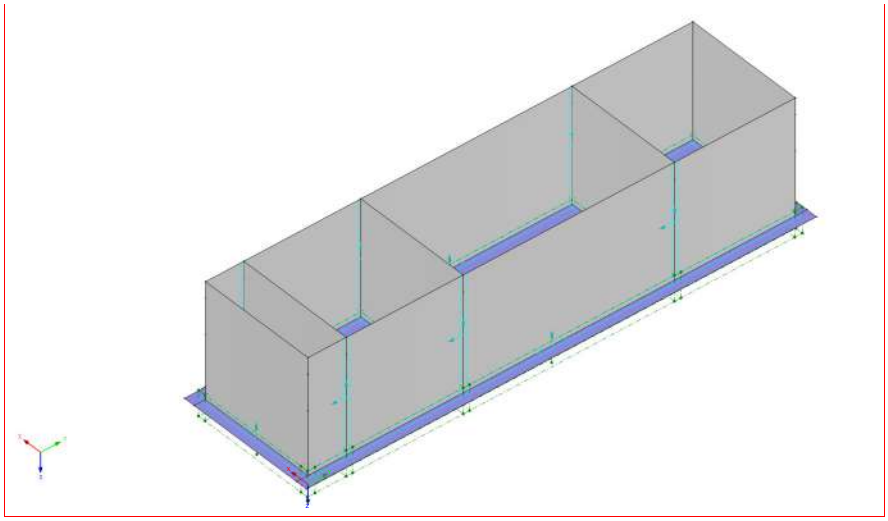
1.5. ***Bioreaktoriai (03) 4 vnt.***

Statinio matmenys plane – 19,6 m x 5,28 m, aukštis – 4,70 m. Rezervuaras įgilintas į žemę iki pusės dėl aukšto gruntinio vandens aplink jį supilamas pylimas.

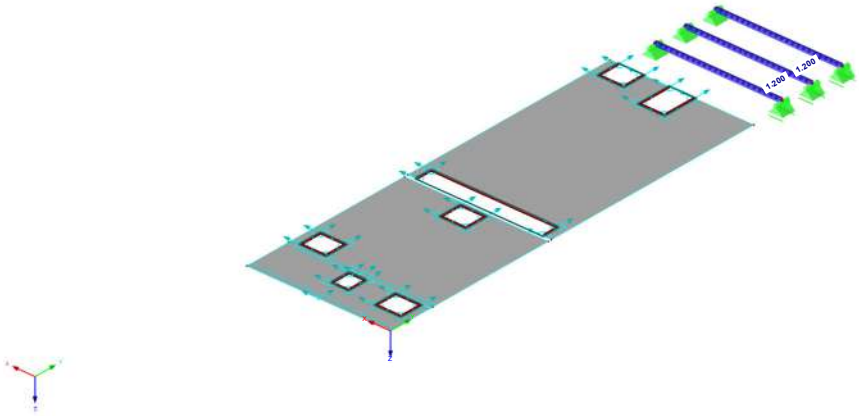
1.5.1. Statinio konstruktyvinė schema

Suprojektuotas monolitinis rezervuaras.

Konstruktyvinė schema – monolitinių sienų ir plokščių sistema su standžiais mazgais, dangtis nuo rezervuaro atskirtas, saugantis dėl plyšių susidarymo.



pav. 2 Biorektoriaus apatinė skaičiuojamoji schema



pav. 3 Biorektoriaus dangčio skaičiuojamoji schema

Projektuojamos tokios pastato konstrukcijos:

Pamatai

Projektuojama gelžbetoninės rezervuaro dugno plokštė ant tampraus pagrindo 350 mm storio. Betonas – C35/45

Sienos

Sienos gelžbetoninės monolitinės 300 mm storio. Betonas – C35/45

Denginys

Denginys yra gelžbetoninė monolitinė plokštė 200 mm storio su angomis. Betonas – C35/45

1.5.2. *Deformacinės siūlės*

Deformacinių siūlių nėra. Dangtis atskirtas nuo rezervuaro ir ties didžiausia anga dangtis perjautus dėl plyšių prevencijos.

1.5.3. *Apkrovos*

Charakteristinės apkrovos parinktos pagal LST EN 1991-1-1 ir projektinę užduotį.

Statybos metu atsirandančios apkrovos nuo statybinių mechanizmų, medžiagų sandėliavimo ir kt. neturi viršyti pagrindinių laikančiųjų konstrukcijų leistinų apkrovų, kurios betarpiškai veikia jas eksploatacijos metu.

Nuolatiniai poveikiai:
Savasis konstrukcijų svoris [G]:

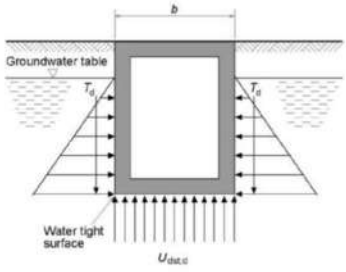
Laikančių konstrukcijų charakteristinė apkrova nuo savojo konstrukcijų svorio įvertinama priimant:

- betono svorį – 25kN/m^3;
- grunto apkrovos skaičiuojamos priimant grunto svorį 20 kN/m^3, bei 30 % natūralaus byrėjimo kampą;
- valomų nuotekų ir vandens apkrovos skaičiuojamos priimant svorį 10 kN/m^3;

Išorinis vandens slėgio diagrama:

Geometrija:

Aukštis, h_v=	4,90 m
Žingsnis, cc =	1,0 m
Medžiagos koeficientas, $g_{m,G}$ =	1,0
Apkrova vanduo, q=	10,00 kN/m^2



Vandens spaudimas į dugną, U_h= $g_{m,G}$*cc*q*h_v = 49,0 kN/m^2

Priimama, kad vanduo vistiek spaus per visą rezervuaro aukštį nors jo aukštis tik 1 m žemiau rezervuaro, kadangi padaryta sankasa traktuojama kad joje vandens slėgis nesusidarys ir bus spaudžiama tik įkasta rezervaro dalis. Dugno kėlimo apkrova bus tokia pati kaip maksimali šoninio spaudimo apkrova.

Grunto slėgio diagrama:

Geometrija:

Aukštis, h_g=	4,55 m
Žingsnis, cc =	1,0 m
Apkrova ant grunto, q=	0,00 kN/m²
Apkrovos koeficientas, γ_f=	1,0
Medžiagos koeficientas, $\gamma_{m,G}$ =	1,0

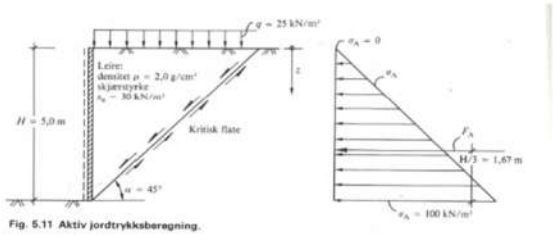


Fig. 5.11 Aktiv jordtrykksberegning.

20

Grunto tipas ir charakteristikos:

Grunn =	GEW("Fund/Gruntai"; Typ;)	=	Smėlis (piltinis)
a_{GR} =	1,0*TAB("Fund/Gruntai"; a; Typ=Grunn)+0	=	20 kN/m²
$r_{max,GR}$ =	1,0*TAB("Fund/Gruntai"; r_{max}; Typ=Grunn)	=	0,90
φ_{GR} =	1,0*TAB("Fund/Gruntai";φ; Typ=Grunn)+-6	=	30,00 °
ρ_{GR}=	ATAN(TAN(φ_{GR})/$\gamma_{m,G}$)	=	30,00 °

Aktyvus grunto slėgis, K_a= (1-SIN(ρ_{GR}))/(1+SIN(ρ_{GR})) = 0,33

σz= (a_{GR}*h_g*γ_f)+q*γ_f = 91,0 kN/m²

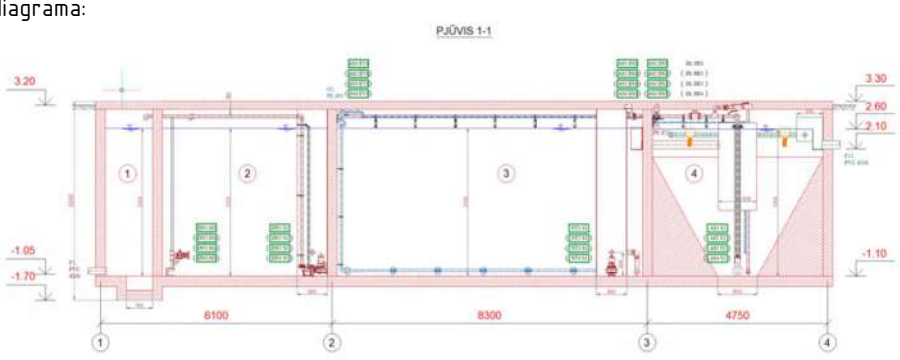
Apkrovos į sieną:

Grunto spaudimas sienos viršuje, σ_0= K_a*q*γ_f = 0,00 kN/m²

Grunto spaudimas sienos apačioje, σ_α= K_a*σ_z = 30,03 kN/m²

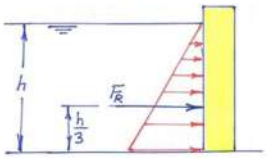
Priimama kad sankasos grunto apkorva bus pilna, kaip pilnai užkasto rezervuaro.

Vidinio vandens slėgio diagrama:



Geometrija:

Aukštis, h_v=	3,90 m
Žingsnis, cc =	1,0 m
Medžiagos koeficientas, $g_{m,G}$ =	1,0



Vandens spaudimas sienos apačioje, q_h= $g_{m,G}$*cc*10*1000*h_v/1000 = 39,0 kN/m²

Dugno spaudimo apkrova bus tokia pati kaip maksimali šoninio spaudimo apkrova.
Visų rezervuarų vidiniai slėgiai vienodi.

Savojo svorio skaičiavimą žiūrėti Priede Nr.1 SAVOJO SVORIO DETALĮS SKAIČIAVIMAI.

Kintamieji poveikiai:

Naudojimo apkrovų charakteristinės reikšmės [L]:

- Rezervuaro denginio naudojimo apkrova – 2,0 kN/m^2;
- Dumblo svoris 10,0 kN/m^3;
- Technologinio pastato įrangos apkrova pagal užduotį.

Sniego apkrovų charakteristinės reikšmės [S]:

Pagal projekto užduotį pastatas yra statomas Drevernos k., Priekulės sen., Klaipėdos r. sav teritorijoje, kuris pagal LST EN 1991-1-3 priskiriamas I sniego apkrovos rajonui. Sniego dangos ant 1 m^2 horizontaliojo žemės paviršiaus svorio charakteristinė reikšmė – s_k = 1,2 kN/m^2.

Sniego apkrovų skaičiavimą žiūrėti Priede Nr.1 SNIEGO DETALŲS SKAIČIAVIMAI.

Temperatūrinės apkrovos [T]:

Techniniam pastatui temperatūrinės apkrovos netaikomos.
Skaičiuojant rezervuarą įvertinamos sekančio temperatūrinės apkrovos:

Denginiui

- Šiltuoju metu laiku:
  - Vidutinių temperatūrų pokyčio elemento skerspjūvyje charakteristinė reikšmė Δt_w=18,4°C;
  - Temperatūrų pokyčio elemento skerspjūvyje (skirtumas tarp temperatūros plokštės viršutinėje plokštumoje ir temperatūros plokštės apatinėje plokštumoje) charakteristinė reikšmė ϑ_w=22,5°C.
- Šaltuoju metu laiku:
  - Vidutinių temperatūrų pokyčio elemento skerspjūvyje charakteristinė reikšmė Δt_c= -30,0°C;
  - Temperatūrų pokyčio elemento skerspjūvyje (skirtumas tarp temperatūros plokštės viršutinėje plokštumoje ir temperatūros plokštės apatinėje plokštumoje) charakteristinė reikšmė ϑ_c=-8°C.

Apkrovų deriniai

Apkrovų deriniai sudaromi remiantis LST EN 1990 Įvertinami saugos bei tinkamumo ribiniai būviai. Poveikių derinių koeficientų Ψ reikšmės parenkamos pagal LST EN 1990 reikalavimus.

1.5.4. *Ribiniai plyšių atsivėrimo pločiai betone*

Pagal STR 2.05.05:2005 24 lentelę, XA2 aplinkos sąlygų klasei, elementams veikiamiems skystos aplinkos, ribiniai plyšių atsivėrimo pločiai: w_{lim1}=0,1, w_{lim2}=0,1. Zonoje virš rezervuaro turinio, XA2- XF3 aplinkos sąlygų klasei, elementams veikiamiems dujinės aplinkos, ribiniai plyšių atsivėrimo pločiai: w_{lim1}=0,1, w_{lim2}=0,1.

Pagal LST EN 1992-3 7 skyrių, priimta 1 Nelaidumo klasė (Nuotėkis turi būti apribotas iki labai mažo kiekio. Priimtini nedideli drėgni paviršiaus lopai.). Išorinėms sienoms leistinas plyšių plotis rezervuaro apačioje - w_{k1}=0,1 mm, rezervuaro viršuje - w_{k1}=0,1 mm.

1.5.5. *Ribiniai įlinkiai ir poslinkiai*

Ribiniai įlinkiai

Pagal STR 2.05.05:2005 17.1 lentelę priimtas lemiantis ribinis įlinkis pagal estetinius – psichologinius reikalavimus – l/200. Talės kelio sijų įlinkis priimamas l/250.

1.5.6. *Atitvarų garso izoliavimo sprendiniai*

Pastato konstrukcijoms triukšmo izoliavimo reikalavimai nėra taikomi.

1.5.7. *Medžiagų patikimumo koeficientai*

Medžiagų patikimumo koeficientai priimti vadovaujantis atitinkamais statybos techniniais reglamentais ir yra lygūs:

- gelžbetoninėms konstrukcijoms saugos ribiniam būviui γ_c=1,5;
- betoninėms konstrukcijoms saugos ribiniam būviui γ_c=1,8;
- plieninėms konstrukcijoms saugos ribiniam būviui γ_u=1,3;
- gelžbetoninėms ir betoninėms konstrukcijoms tinkamumo ribiniam būviui γ_c=1,0;
- armatūros plieno dalinio patikimumo koeficientas:
  strypinei armatūrai γ_s=1,1;
  vielinei armatūrai γ_s=1,2;
- plieniniams lakštiniams, ilgiesiems valcuotiems ir tuščiaviduriams statybiniams profiliams γ_M=1,1.

1.5.8. *Konstrukcijų apsauga nuo gaisro*

Gaisriniai reikalavimai nekeliami.

1.5.9. *Konstrukcijų apsauga nuo korozijos*

Siekiant užtikrinti metalinių konstrukcijų apsaugą nuo korozijos, jei nenurodyta kitaip, metaliniai gaminiai esantys:

- pastato viduje, dengiami pasirinkta dažų sistema užtikrinant apsaugą nuo C2 (žemo patvarumo) kategorijos atmosferos korozijos;
- pastato išorėje, dengiami pasirinkta dažų sistema užtikrinant apsaugą nuo C4 (vidutinio patvarumo) kategorijos atmosferos korozijos.

Konstrukcijų apsauginio padengimo klasė turi atitikti reikalavimus, ne žemesnius nei reikalavimai, pateikiami LST EN ISO 12944-1:2000.

Konstrukcijų paviršių paruošimas dažymui parenkamas pagal parinktą dažų sistemą ir turi atitikti reikalavimus pateikiamus LST EN ISO 12944-4:2000.

1.5.10. *Konstrukcijų aplinkos sąlygų klasifikacija, atsparumui šalčiui ir vandeniui markės*

- Paruošiamasis sluoksnis ..... Nereglamentuojama;
- Rezervuaro dugnas XC4-XF3-XA2-W8-F200;
- Rezervuaro sienos XC4-XF3-XA2-W8-F200;
- Rezervuaro denginys ..... XC3-XF3-XA2-W8-F200.
- Pamatai XC2-F100;
- Pamatų sijos XC2-F100;
- Vidaus grindys ..... XC1.

1.5.11. *Konstrukcijos patikimumo klasė*

Projektuojamas statinys pagal patikimumą ir paskirtį turi būti priskirtas – RC1 patikimumo klasei bei CC1 pasekmių klasei, todėl daugiklis KFI = 0,9.

1.5.12. *Konstrukcijos ilgaamžiškumas*

Pagal STR 1.12.06:2002 „Statinio naudojimo paskirtis ir gyvenimo trukmė" technologinio pastato gyvavimo trukmė priklausomai nuo statinio naudojimo paskirties ir statybos produktų, iš kurių jis pastatytas – 50 metų. Pagal užduotį, statinių gyvavimo trukmė 30 m.

1.5.13. *Ribiniai įlinkiai ir poslinkiai*

Ribiniai įlinkiai

Pagal STR 2.05.05:2005 17.1 lentelę priimtas lemiantis ribinis įlinkis pagal estetinius – psichologinius reikalavimus – l/200.

Pagal STR 2.05.05:2005 17.1 lentelę priimtas lemiantis ribinis kransijos įlinkis pagal technologinius reikalavimus – l/250.

Ribiniai horizontalūs poslinkiai

Pagal STR 2.05.05:2005 17.4 lentelę ribinis horizontalus poslinkis $h_s/150$.

1.5.14. Atitvarų garso izoliavimo sprendiniai

Pastato konstrukcijoms triukšmo izoliavimo reikalavimai nėra taikomi.

1.5.15. Konstrukcijų apsaugos priemonės nuo klimatologinio, technogeninio, drėgmės poveikio

Rostverkas iš šonų dengiamas dviem sluoksniais teptinės hidroizoliacijos. Virš rostverkų įrengiama horizontali klijuojama hidroizoliacija.

Metalinės konstrukcijos nuo klimatologinės drėgmės apsaugotos atitvarinėmis konstrukcijomis ir stogo konstrukcija. Nuo technologinės drėgmės konstrukcijos apsaugomos antikoroziniu padengimu.

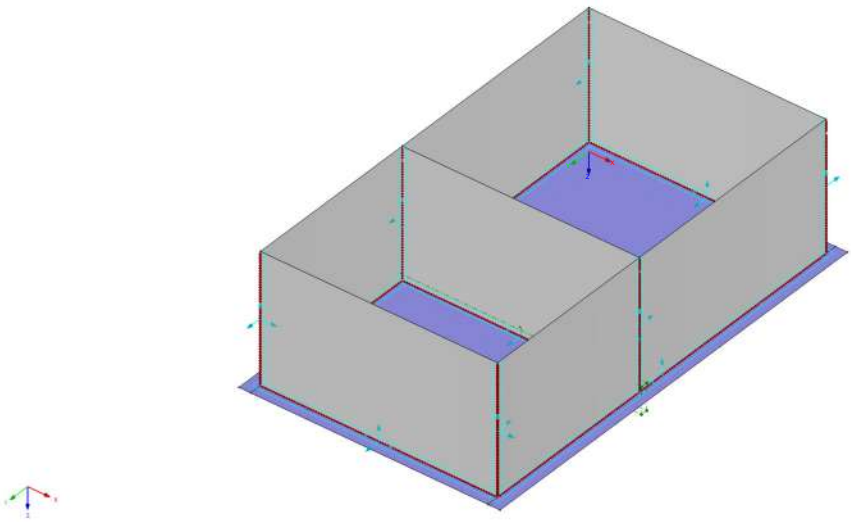
1.6. ***Perteklinių nuotekų talpa (04) ir perteklinio dumblo talpa (05)***

Statinio matmenys plane – 15,85 m x 9,30 m, aukštis – 5,20 m. Rezervuaras įgilintas į žemę iki pusės dėl aukšto gruntinio vandens aplink jį supilamas pylimas.

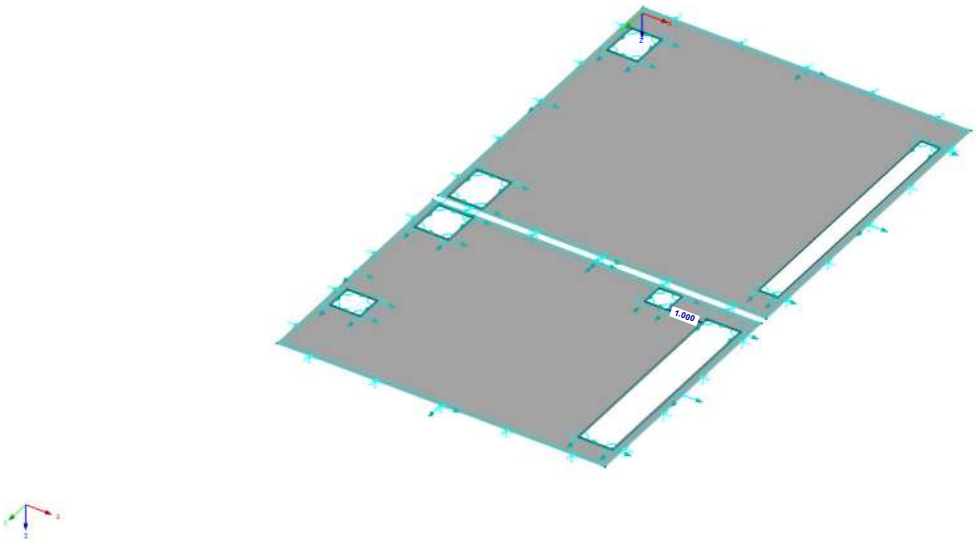
1.6.1. Statinio konstruktyvinė schema

Suprojektuotas monolitinis rezervuaras.

Konstruktyvinė schema – monolitinių sienų ir plokščių sistema su standžiais mazgais, dangtis nuo rezervuaro atskirtas, saugantis dėl plyšių susidarymo.



pav. 4 Perteklinių nuotekų talpa (04) ir perteklinio dumblo talpa (05) apatinė skaičiuojamoji schema



pav. 5 Perteklinių nuotekų talpa (04) ir perteklinio dumblo talpa (05) dangčio skaičiuojamoji schema

Projektuojamos tokios pastato konstrukcijos:

Pamatai

Projektuojama gelžbetoninės rezervuaro dugno plokštė ant tampraus pagrindo 350 mm storio. Betonas – C35/45

Sienos

Sienos gelžbetoninės monolitinės 300 mm storio. Betonas – C35/45

Denginys

Denginys yra gelžbetoninė monolitinė plokštė 200 mm storio su angomis. Betonas – C35/45

1.6.2. *Deformacinės siūlės*

Deformacinių siūlių nėra. Dangtis atskirtas nuo rezervuaro ir ties didžiausia anga dangtis perjautus dėl plyšių prevencijos.

1.6.3. *Apkrovos*

Charakteristinės apkrovos parinktos pagal LST EN 1991-1-1 ir projektinę užduotį.

Statybos metu atsirandančios apkrovos nuo statybinių mechanizmų, medžiagų sandėliavimo ir kt. neturi viršyti pagrindinių laikančiųjų konstrukcijų leistinų apkrovų, kurios betarpiškai veikia jas eksploatacijos metu.

Nuolatiniai poveikiai:
Savasis konstrukcijų svoris [G]:

Laikančių konstrukcijų charakteristinė apkrova nuo savojo konstrukcijų svorio įvertinama priimant:

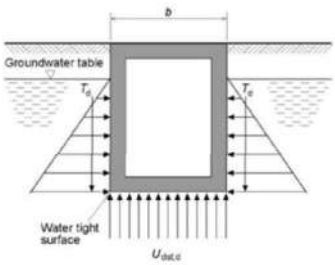
- betono svorį – 25kN/m^3;

- grunto apkrovos skaičiuojamos priimant grunto svorį 20 kN/m^3, bei 30 % natūralaus byrėjimo kampą;
- valomų nuotekų ir vandens apkrovos skaičiuojamos priimant svorį 10 kN/m^3;

Išorinis vandens slėgio diagrama:

Geometrija:

Aukštis, h_v=	3,00 m
Žingsnis, cc =	1,0 m
Medžiagos koeficientas, $g_{m,G}$ =	1,0



Vandens spaudimas sienos apačioje, q_h= $g_{m,G}$*cc*10*1000*h_v/1000 = 30,0 kN/m^2

Priimama, kad vanduo vistiek spaus per visą rezervuaro aukštį nors jo aukštis tik 1 m žemiau rezervuaro, kadangi padaryta sankasa traktuojama kad joje vandens slėgis nesusidarys ir bus psaudžiama tik įkasta rezervarro dalis. Dugno kėlimo apkrova bus tokia pati kaip maksimali šoninio spaudimo apkrova.

Grunto slėgio diagrama:

Geometrija:

Aukštis, h_g=	5,10 m
Žingsnis, cc =	1,0 m
Apkrova ant grunto, q=	0,00 kN/m^2
Apkrovos koeficientas, γ_f=	1,0
Medžiagos koeficientas, $\gamma_{m,G}$ =	1,0

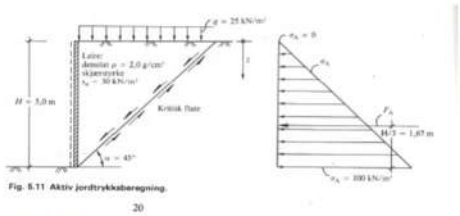


Fig. 5.11 Aktiv jordtrykksberegning.

20

Grunto tipas ir charakteristikos:

Grunn =	**GEW("Fund/Gruntai"; Typ;)**	=	**Smėlis (piltinis)**
a_{GR} =	1,0*TAB("Fund/Gruntai"; a; Typ=Grunn)+0	=	20 kN/m^2
$r_{max,GR}$ =	1,0*TAB("Fund/Gruntai"; r_{max}; Typ=Grunn)	=	0,90
φ_{GR} =	1,0*TAB("Fund/Gruntai";φ; Typ=Grunn)+-6	=	30,00 °
ρ_{GR}=	ATAN(TAN(φ_{GR})/$\gamma_{m,G}$)	=	30,00 °

Aktyvus grunto slėgis, K_a= (1-SIN(ρ_{GR}))/(1+SIN(ρ_{GR})) = 0,33

σ_z= (a_{GR}*h_g*γ_f)+q*γ_f = 102,0 kN/m^2

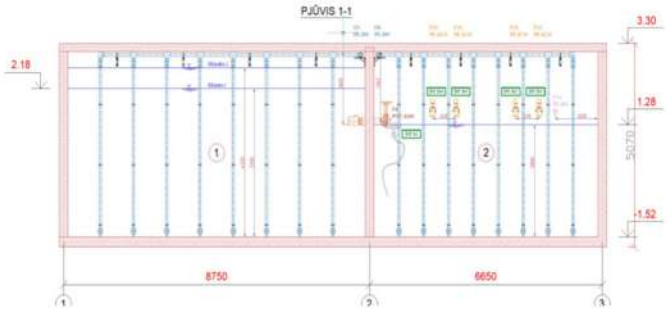
Apkrovos į sieną:

Grunto spaudimas sienos viršuje, σ_0= K_a*q*γ_f = 0,00 kN/m^2

Grunto spaudimas sienos apačioje, σ_α= K_a*σ_z = 33,66 kN/m^2

Priimama kad sankasos grunto apkorva bus pilna, kaip pilnai užkasto rezervuaro.

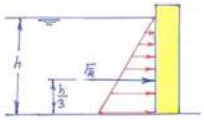
Vidinio vandens slėgio diagrama:



Mažesnis rezervuaras:

Geometrija:

Aukštis, h_v=	3,00 m
Žingsnis, cc =	1,0 m
Medžiagos koeficientas, $g_{m,G}$ =	1,0

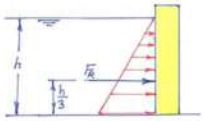


Vandens spaudimas sienos apačioje, $q_h = g_{m,G}*cc*10*1000*h_v/1000$ = 30,0 kN/m²

Didesnis rezervuaras:

Geometrija:

Aukštis, h_v=	4,40 m
Žingsnis, cc =	1,0 m
Medžiagos koeficientas, $g_{m,G}$ =	1,0



Vandens spaudimas sienos apačioje, $q_h = g_{m,G}*cc*10*1000*h_v/1000$ = 44,0 kN/m²

Dugno spaudimo apkrova bus tokia pati kaip maksimali šoninio spaudimo apkrova.

Savojo svorio skaičiavimą žiūrėti Priede Nr.1 SAVOJO SVORIO DETALĮS SKAIČIAVIMAI.

Kintamieji poveikiai:

Naudojimo apkrovų charakteristinės reikšmės [L]:

- Rezervuaro denginio naudojimo apkrova – 2,0 kN/m²;
- Dumblo svoris 10,0 kN/m³;
- Technologinio pastato įrangos apkrova pagal užduotį.

Sniego apkrovų charakteristinės reikšmės [S]:

Pagal projekto užduotį pastatas yra statomas Drevernos k., Priekulės sen., Klaipėdos r. sav teritorijoje, kuris pagal LST EN 1991-1-3 priskiriamas I sniego apkrovos rajonui. Sniego dangos ant 1 m² horizontaliojo žemės paviršiaus svorio charakteristinė reikšmė – s_k = 1,2 kN/m².

Sniego apkrovų skaičiavimą žiūrėti Priede Nr.1 SNIEGO DETALĮS SKAIČIAVIMAI.

Temperatūrinės apkrovos [T]:

Techniniam pastatui temperatūrinės apkrovos netaikomos.
Skaičiuojant rezervuarą įvertinamos sekančio temperatūrinės apkrovos:

Denginiui

- Šiltuoju metu laiku:
  - Vidutinių temperatūrų pokyčio elemento skerspjūvyje charakteristinė reikšmė Δt_w=18,4°C;
  - Temperatūrų pokyčio elemento skerspjūvyje (skirtumas tarp temperatūros plokštės viršutinėje plokštumoje ir temperatūros plokštės apatinėje plokštumoje) charakteristinė reikšmė ϑ_w=22,5°C.
- Šaltuoju metu laiku:
  - Vidutinių temperatūrų pokyčio elemento skerspjūvyje charakteristinė reikšmė Δt_c= -30,0°C;
  - Temperatūrų pokyčio elemento skerspjūvyje (skirtumas tarp temperatūros plokštės viršutinėje plokštumoje ir temperatūros plokštės apatinėje plokštumoje) charakteristinė reikšmė ϑ_c=-8°C.

Apkrovų deriniai

Apkrovų deriniai sudaromi remiantis LST EN 1990 Įvertinami saugos bei tinkamumo ribiniai būviai.

Poveikių derinių koeficientų Ψ reikšmės parenkamos pagal LST EN 1990 reikalavimus.

1.6.4. *Ribiniai plyšių atsivėrimo pločiai betone*

Pagal STR 2.05.05:2005 24 lentelę, XA2 aplinkos sąlygų klasei, elementams veikiamiems skystos aplinkos, ribiniai plyšių atsivėrimo pločiai: w_{lim1}=0,1, w_{lim2}=0,1. Zonoje virš rezervuaro turinio, XA2- XF3 aplinkos sąlygų klasei, elementams veikiamiems dujinės aplinkos, ribiniai plyšių atsivėrimo pločiai: w_{lim1}=0,1, w_{lim2}=0,1.

Pagal LST EN 1992-3 7 skyrių, priimta 1 Nelaidumo klasė (Nuotėkis turi būti apribotas iki labai mažo kiekio. Priimtini nedideli drėgni paviršiaus lopai.). Išorinėms sienoms leistinas plyšių plotis rezervuaro apačioje - w_{k1}=0,1 mm, rezervuaro viršuje - w_{k1}=0,1 mm.

1.6.5. *Ribiniai įlinkiai ir poslinkiai*

Ribiniai įlinkiai

Pagal STR 2.05.05:2005 17.1 lentelę priimtas lemiantis ribinis įlinkis pagal estetinius – psichologinius reikalavimus – l/200. Talės kelio sijų įlinkis priimamas l/250.

1.6.6. *Atitvarų garso izoliavimo sprendiniai*

Pastato konstrukcijoms triukšmo izoliavimo reikalavimai nėra taikomi.

1.6.7. *Medžiagų patikimumo koeficientai*

Medžiagų patikimumo koeficientai priimti vadovaujantis atitinkamais statybos techniniais reglamentais ir yra lygūs:

- gelžbetoninėms konstrukcijoms saugos ribiniam būviui γ_c=1,5;
- betoninėms konstrukcijoms saugos ribiniam būviui γ_c=1,8;
- plieninėms konstrukcijoms saugos ribiniam būviui γ_u=1,3;
- gelžbetoninėms ir betoninėms konstrukcijoms tinkamumo ribiniam būviui γ_c=1,0;
- armatūros plieno dalinio patikimumo koeficientas:
  strypinei armatūrai γ_s=1,1;
  vielinei armatūrai γ_s=1,2;
- plieniniams lakštiniams, ilgiesiems valcuotiems ir tuščiaviduriams statybiniams profiliams γ_M=1,1.

1.6.8. *Konstrukcijų apsauga nuo gaisro*

Gaisriniai reikalavimai nekeliami.

1.6.9. *Konstrukcijų apsauga nuo korozijos*

Siekiant užtikrinti metalinių konstrukcijų apsaugą nuo korozijos, jei nenurodyta kitaip, metaliniai gaminiai esantys:

- pastato viduje, dengiami pasirinkta dažų sistema užtikrinant apsaugą nuo C2 (žemo patvarumo) kategorijos atmosferos korozijos;
- pastato išorėje, dengiami pasirinkta dažų sistema užtikrinant apsaugą nuo C4 (vidutinio patvarumo) kategorijos atmosferos korozijos.

Konstrukcijų apsauginio padengimo klasė turi atitikti reikalavimus, ne žemesnius nei reikalavimai, pateikiami LST EN ISO 12944-1:2000.

Konstrukcijų paviršių paruošimas dažymui parenkamas pagal parinktą dažų sistemą ir turi atitikti reikalavimus pateikiamus LST EN ISO 12944-4:2000.

1.6.10. *Konstrukcijų aplinkos sąlygų klasifikacija, atsparumui šalčiui ir vandeniui markės*

- Paruošiamasis sluoksnis .....Nereglamentuojama;
- Rezervuaro dugnas XC4-XF3-XA2-W8-F200;
- Rezervuaro sienos XC4-XF3-XA2-W8-F200;
- Rezervuaro denginys.....XC3-XF3-XA2-W8-F200.
- Pamatai XC2-F100;
- Pamatų sijos XC2-F100;
- Vidaus grindys .....XC1.

1.6.11. *Konstrukcijos patikimumo klasė*

Projektuojamas statinys pagal patikimumą ir paskirtį turi būti priskirtas – RC1 patikimumo klasei bei CC1 pasekmių klasei, todėl daugiklis KFI = 0,9.

1.6.12. *Konstrukcijos ilgaamžiškumas*

Pagal STR 1.12.06:2002 „Statinio naudojimo paskirtis ir gyvenimo trukmė" technologinio pastato gyvavimo trukmė priklausomai nuo statinio naudojimo paskirties ir statybos produktų, iš kurių jis pastatytas – 50 metų. Pagal užduotį, statinių gyvavimo trukmė 30 m.

1.6.13. *Ribiniai įlinkiai ir poslinkiai*

Ribiniai įlinkiai

Pagal STR 2.05.05:2005 17.1 lentelę priimtas lemiantis ribinis įlinkis pagal estetinius – psichologinius reikalavimus – l/200.

Pagal STR 2.05.05:2005 17.1 lentelę priimtas lemiantis ribinis kransijos įlinkis pagal technologinius reikalavimus – l/250.

Ribiniai horizontalūs poslinkiai

Pagal STR 2.05.05:2005 17.4 lentelę ribinis horizontalus poslinkis h_s/150.

1.6.14. *Atitvarų garso izoliavimo sprendiniai*

Pastato konstrukcijoms triukšmo izoliavimo reikalavimai nėra taikomi.

1.6.15. *Konstrukcijų apsaugos priemonės nuo klimatologinio, technogeninio, drėgmės poveikio*

Rostverkas iš šonų dengiamas dviem sluoksniais teptinės hidroizoliacijos. Virš rostverkų įrengiama horizontali klijuojama hidroizoliacija.

Metalinės konstrukcijos nuo klimatologinės drėgmės apsaugotos atitvarinėmis konstrukcijomis ir stogo konstrukcija. Nuo technologinės drėgmės konstrukcijos apsaugomos antikoroziniu padengimu.

1.7. *Tretinio valymo pastatas (06)*

1.7.1. Statinio konstruktyvinė schema

Suprojektuotas metalinis karkasinis pastatas.

Statinio matmenys plane – 5,90 m x 4,80 m, aukštis – 3,2 m. Statomas 1-o aukšto pastatas su rezervuaru po juo.

Konstruktyvinė schema – Pastato laikančioji pagrindinė dalis tarpatramio rėmai – metalinės kolonos sujungta kartu su sija. Kolonos su sija jungiamos lanksčiai, prie pamato - lanksčiai. Pastato stabilumą užtikrina vertikalūs ryšiai. Standumą stogo plokštumoje užtikrina horizontalūs ryšiai.

Projektuojamos tokios pastato konstrukcijos:

Kolonos

Suprojektuotos kvadratinio/ dėžinio vamzdžio skerspjūvio metalinės kolonos.

Ryšiai

Metaliniai ryšiai suprojektuoti iš kvadratinių vamzdžių.

Sijos

Suprojektuotos HEA skerspjūvio metalinės sijos. Sijos su kolonomis jungiamos lanksčiai.

Sienos

Sienos gelžbetoninės monolitinės 300 mm storio. Betonas - C35/45

SIENA (DAUGIASLUOKNĖS PAN.) : D-1		Paskirtis: Pramonės statiniai		Klasė: B	U= 0,300
Medžiagos pavadinimas	**Simbolis**	**Sluoksnio storis d, [mm]**	**Medžiagos šilumos laidumo koeficientas λd.s., [W/(mK)]**	**Sluoksnio šiluminė varža R, [m2K/W]**	
Daugiasluoknė plokštė SP2B 100 E-PIR LF/MF 0.6/0.6	**R1**	**100,0**	**0,022**	**4,545**	
Visuminė šiluminė atitvaros varža	Rf	**100**	**-**	**4,545**	
Atitvaros šilumos perdavimo koef.		**U_0=**	**0,220**	**[W/(m2K)]**	
Pataisos koeficientas		ΔU=	-	[W/(m2K)]	
Galutinis šilumos perdavimo koef.		**U_{GAL}=**	**0,22**	**[W/(m2K)]**	
Pastabos:					
1) Daugiasluoksnių plokščių storis ir laidumo koef. nustatomas pagal gamintojo duomenis					

Išorinės sienos iš horizontaliai montuojamų „sendvič" tipo plokščių 100 mm storio su poliuretano užpildu.

Plokščių šilumos perdavimo koeficientas U= 0,22 w/m^2·K, kuris yra mažesnis už norminį.

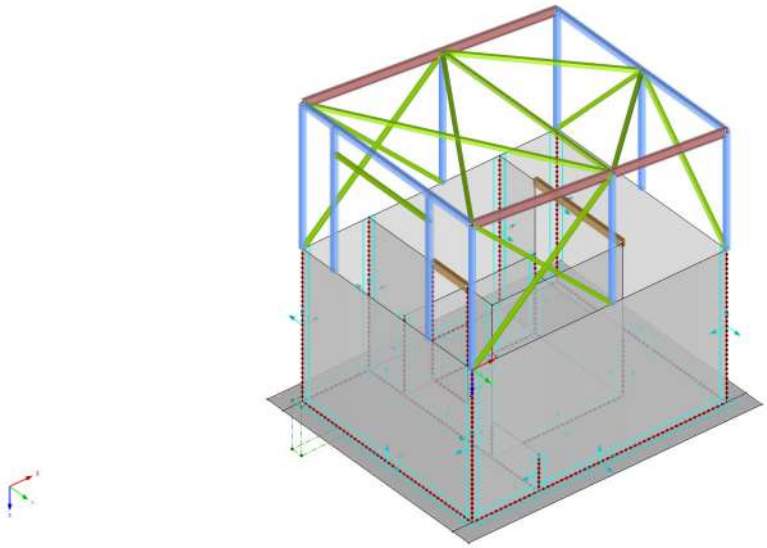
Denginys

Denginys montuojamas iš „sendvič" tipo plokščių 120/160 mm įrengtu ant sijų. Plokščių šilumos perdavimo koeficientas U= 0,18 w/m^2·K, kuris yra mažesnis už norminį

STOGAS (DAUGIASLUOKNĖS PAN.) : D-2		Paskirtis: Pramonės statiniai		Klasė: B	U= 0,250
Medžiagos pavadinimas	Simbolis	Sluoksnio storis d, [mm]	Medžiagos šilumos laidumo koeficientas λd.s., [W/(mK)]	Sluoksnio šiluminė varža R, [m2K/W]	
Daugiasluoknė plokštė SP2C 160/120 E-PIR TL 0.5/0.4	R1	120,0	0,018	6,667	
Visuminė šiluminė atitvaros varža	Rf	120	-	6,667	
Atitvaros šilumos perdavimo koef.		U_0=	0,150	[W/(m2K)]	
Pataisos koeficientas		ΔU=	-	[W/(m2K)]	
Galutinis šilumos perdavimo koef.		U_{GAL}=	0,15	[W/(m2K)]	
Pastabos:					
1) Daugiasluoksnių plokščių storis ir laidumo koef. nustatomas pagal gamintojo duomenis					

Grindys

Cinkuotos grotelės ant rezervuaro sienų.



pav. 6 Skaičiuojamoji schema

1.7.2. *Apkrovos*

Charakteristinės apkrovos parinktos pagal STR 2.05.04:2003 "Poveikiai ir apkrovos" ir projektinę užduotį.

Statybos metu atsirandančios apkrovos nuo statybinių mechanizmų, medžiagų sandėliavimo ir kt. neturi viršyti pagrindinių laikančiųjų konstrukcijų leistinų apkrovų, kurios betarpiškai veikia jas eksploatacijos metu.

Nuolatiniai poveikiai

Savasis konstrukcijų svoris [G]:

Laikančių konstrukcijų charakteristinė apkrova nuo savojo konstrukcijų svorio įvertinama priimant:

- betono svorį – 25kN/m^3;
- plieno svorį – 78,5kN/m^3.

Sienų „sendvič" plokščių savojo svorio charakteristinė reikšmė – gk = 0,15 kN/m^2.

Stogo „sendvič" plokščių sąvojo svorio charakteristinė reikšmė – gk = 0,15 kN/m².

Kintamieji poveikiai

Sniego apkrovų charakteristinės reiksmės [S]:

Pagal projekto užduotį pastatas yra statomas Drevernos k., Priekulės sen., Klaipėdos r. sav teritorijoje, kuris pagal LST EN 1991-1-3 priskiriamas I sniego apkrovos rajonui. Sniego dangos ant 1 m² horizontaliojo žemės paviršiaus svorio charakteristinė reikšmė – s_k = 1,2 kN/m².

Nustatome sniego apkrovos į horizontaliąją projekciją dydį:

- Apkrova ant technologinio pastato stogo, kai μ_i = 1,0 – s = 1,20 kN/m².

Sniego apkrovų skaičiavimą žiūrėti Priede Nr.2 Sniego apkrovų skaičiavimas.

Vėjo apkrovos [W]:

Kadangi pastatas statomas Drevernos k., Priekulės sen., Klaipėdos r. sav teritorijoje, tai pagal statybos techninį reglamentą LST EN 1991-1-4 tai yra I (pirmasis) vėjo greičio rajonas – $v_{ref,0}$ = 32 m/s.

Koeficientas, įvertinantis vėjo slėgio pokytį pagal aukštį, II tipo vietovei.

Vėjo apkrovų skaičiavimas pateiktas Priede Nr.1 VĖJO DETALŲS SKAIČIAVIMAI

Temperatūrinės apkrovos [T]:

Pagal techninę užduotį vidaus temperatūra – +8°.

Skaičiuojant technologinį pastatą temperatūrinės apkrovos nevertinamos.

Apkrovų deriniai

Apkrovų deriniai sudaromi remiantis STR 2.05.04:2003 VI skyriumi ir 10 priedu. Įvertinami saugos bei tinkamumo ribiniai būviai.

Poveikių derinių koeficientų Ψ reikšmės parenkamos pagal STR 2.05.04:2003 "Poveikiai ir apkrovos", 10 priedo reikalavimus.

1.7.3. Medžiagų patikimumo koeficientai

Medžiagų patikimumo koeficientai priimti vadovaujantis atitinkamais statybos techniniais reglamentais ir yra lygūs:

- gelžbetoninėms konstrukcijoms saugos ribiniam būviui γ_c=1,5;
- betoninėms konstrukcijoms saugos ribiniam būviui γ_c=1,8;
- plieninėms konstrukcijoms saugos ribiniam būviui γ_u=1,3;
- gelžbetoninėms ir betoninėms konstrukcijoms tinkamumo ribiniam būviui γ_c=1,0;
- armatūros plieno dalinio patikimumo koeficientas:
  strypinei armatūrai γ_s=1,1;
  vielinei armatūrai γ_s=1,2;
- plieniniams lakštiniams, ilgiesiems valcuotiems ir tuščiaviduriams statybiniams profiliams γ_M=1,1.

1.7.4. Konstrukcijų apsauga nuo gaisro

Gaisriniai reikalavimai nekeliami.

1.7.5. Konstrukcijų apsauga nuo korozijos

Siekiant užtikrinti metalinių konstrukcijų apsaugą nuo korozijos, jei nenurodyta kitaip, metaliniai gaminiai esantys:

- pastato viduje, dengiami pasirinkta dažų sistema užtikrinant apsaugą nuo C2 (žemo patvarumo) kategorijos atmosferos korozijos;
- pastato išorėje, dengiami pasirinkta dažų sistema užtikrinant apsaugą nuo C4 (vidutinio patvarumo) kategorijos atmosferos korozijos.

Konstrukcijų apsauginio padengimo klasė turi atitikti reikalavimus, ne žemesnius nei reikalavimai, pateikiami LST EN ISO 12944-1:2000.

Konstrukcijų paviršių paruošimas dažymui parenkamas pagal parinktą dažų sistemą ir turi atitikti reikalavimus pateikiamus LST EN ISO 12944-4:2000.

1.7.6. Konstrukcijų aplinkos sąlygų klasifikacija, atsparumui šalčiui ir vandeniui markės

- Paruošiamasis sluoksnis .....Nereglamentuojama;
- Rezervuaro dugnas XC4-XF3-XA2-W8-F200;
- Rezervuaro sienos XC4-XF3-XA2-W8-F200;
- Rezervuaro denginys.....XC3-XF3-XA2-W8-F200.
- Pamatai XC2-F100;
- Pamatų sijos XC2-F100;
- Vidaus grindys .....XC1.

1.7.7. Konstrukcijos patikimumo klasė

Projektuojamas statinys pagal patikimumą ir paskirtį turi būti priskirtas – RC1 patikimumo klasei bei CC1 pasekmių klasei, todėl daugiklis KFI = 0,9.

1.7.8. Konstrukcijos ilgaamžiškumas

Pagal STR 1.12.06:2002 „Statinio naudojimo paskirtis ir gyvenimo trukmė" technologinio pastato gyvavimo trukmė priklausomai nuo statinio naudojimo paskirties ir statybos produktų, iš kurių jis pastatytas – 50 metų. Pagal užduotį, statinių gyvavimo trukmė 30 m.

1.7.9. Ribiniai įlinkiai ir poslinkiai

Ribiniai įlinkiai

Pagal STR 2.05.05:2005 17.1 lentelę priimtas lemiantis ribinis įlinkis pagal estetinius – psichologinius reikalavimus – l/200.

Pagal STR 2.05.05:2005 17.1 lentelę priimtas lemiantis ribinis kransijos įlinkis pagal technologinius reikalavimus – l/250.

Ribiniai horizontalūs poslinkiai

Pagal STR 2.05.05:2005 17.4 lentelę ribinis horizontalus poslinkis $h_s/150$.

1.7.10. Atitvarų garso izoliavimo sprendiniai

Pastato konstrukcijoms triukšmo izoliavimo reikalavimai nėra taikomi.

1.7.11. Konstrukcijų apsaugos priemonės nuo klimatologinio, technogeninio, drėgmės poveikio

Rostverkas iš šonų dengiamas dviem sluoksniais tepamos hidroizoliacijos. Virš rostverkų įrengiama horizontali klijuojama hidroizoliacija.

Metalinės konstrukcijos nuo klimatologinės drėgmės apsaugotos atitvarinėmis konstrukcijomis ir stogo konstrukcija. Nuo technologinės drėgmės konstrukcijos apsaugomos antikoroziniu padengimu.

2. KITOS PASTABOS IR NURODYMAI

Angų inžineriniams tinklams vietas ir matmenis žiūr. projekto atitinkamose dalyse (konstrukcijų dalies planuose pažymėtos tik didžiausios angos).

Vykdantieji statybos darbus bei statybos darbų priežiūrą atliekantys specialistai turi turėti reikalingus kvalifikaciją patvirtinančius dokumentus.

Jei projekto dokumentuose randama neatitikimų ar prieštaravimų, dokumentų viršenybė nustatoma taip:

- Techninės specifikacijos;
- Aiškinamieji raštai;
- Brėžiniai;
- Sąnaudų kiekių žiniaraščiai.

Radus neatitikimų ar prieštaravimų visais atvejais informuoti projektuotoją, o skaičiuojant statybos kainą vertinti kokybiškesnių ir pažangesnių techninių parametrų gaminį, produktą ir kt. suderinant su Statytoju ir užsakovu.

Prieš vykdant statybos darbus privalo būti parengtas darbo projektas.

3. IŠVADOS

Skaičiavimo rezultatai atitinka normatyvinius statybos techninius dokumentus.

Maksimalūs poslinkiai neviršija leistinų maksimalių reikšmių pagal LST EN 1992-1-1 „Eurokodas 2. Gelžbetoninių konstrukcijų projektavimas. 1-1 dalis. Bendrosios ir pastatų taisyklės." Bei LST EN 1993-1-1 „Eurokodas 3. Plieninių konstrukcijų projektavimas. 1-1 dalis. Bendrosios ir pastatų taisyklės." Erdviniai pastato skaičiavimai parodė, kad pastatai atitinka reikiamą statinio standumą. Grafinis pastato mazgų poslinkis parodytas žemiau esančiuose paveiksluose:

Konstrukcinių elementų bei jungčių laikomosios galios išnaudojimas yra pakankamas ir neviršija 100%.

Maksimalus konstrukcijų išnaudojimas

Pozicija	Maksimalus išnaudojimas, %
Technologinio pastato	
Monolitiniai g/b rostverkai	**63**
Monolitinė g/b grindų plokštė	**83**
Plieninės kolonos	**68**
Plieninės sijos	**94**
Plieniniai vertikalūs/horizontalūs ryšiai	**73**
Plieniniai stogo ilginiai	**70**
Rezervuaro	

Monolitinėi g/b dugmo plokštė	**42**
Monolitinės g/b vidinės sienos	**90**
Monolitinės g/b išorinės sienos	**81**
Rezervuaro perdangos	
Monolitinė g/b perdanga	**93**
Monolitinės g/b sijos	**67**

STRUCTURAL ANALYSIS

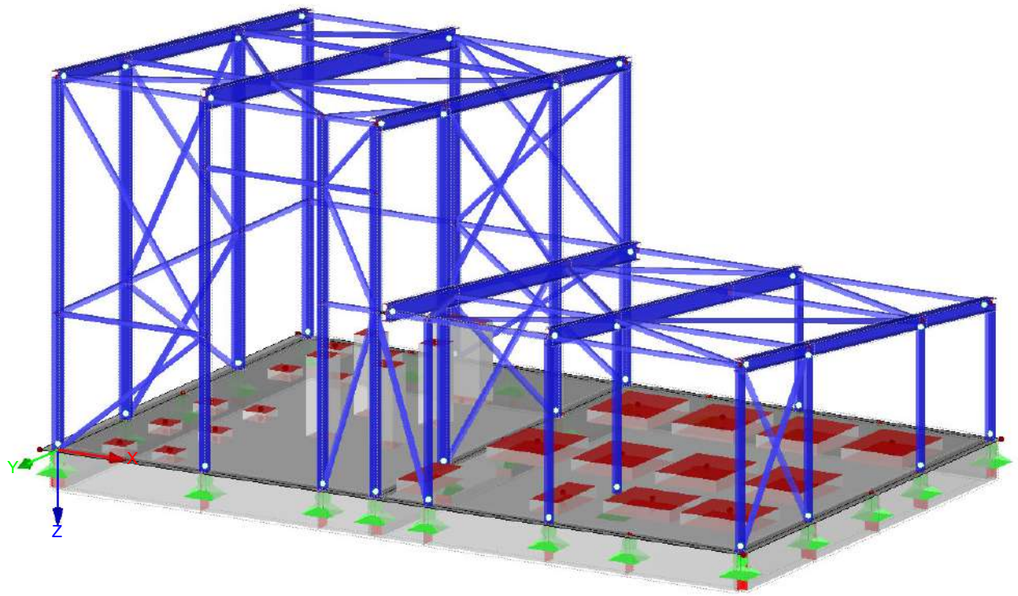
PROJECT

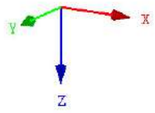
Technologinis pastatas (02);

CLIENT

CREATED BY

Isometric





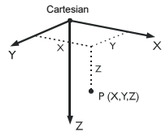
MODEL - GENERAL DATA

General	Model name	:	SK23010_Dreverna_ (02) statinys_ (antzemnine, pamatai) 23.09.05	
	Type of model	:	3D	
	Positive direction of global axis Z	:	Downward	
	Classification of load cases and combinations	:	According to Standard: EN 1990 National Annex: LST - Lithuania	
	☒ Automatically create combinations	:	☒ Load Combinations	
Options	☐ RF-FORM-FINDING - Find initial equilibrium shapes of membrane and cable structures			
	☐ RF-CUTTING-PATTERN			
	☐ Piping analysis			
	☐ Use CQC Rule			
	☐ Enable CAD/BIM model			
	Standard Gravity			
	g	:	10.00 m/s²	

FE MESH SETTINGS

General	Target length of finite elements	l_{FE}	:	200 mm	
	Maximum distance between a node and a line to integrate it into the line	ε	:	1 mm	
	Maximum number of mesh nodes (in thousands)		:	500	
Members	Number of divisions of members with cable, elastic foundation, taper, or plastic characteristic		:	10	
	☒ Activate member divisions for large deformation or post-critical analysis				
	☒ Use division for members with node lying on them				
Surfaces	Maximum ratio of FE rectangle diagonals	Δ_D	:	2	
	Maximum out-of-plane inclination of two finite elements	α	:	0.50 °	
	Shape direction of finite elements		:	Triangles and quadrangles ☒ Same squares where possible	

1.1 NODES



Node No.	Node Type	Reference Node	Coordinate System	Node Coordinates X [mm]	Y [mm]	Z [mm]	Comment
1	Standard	-	Cartesian	0	0	-6000	
2	Standard	-	Cartesian	0	0	0	Supported
3	Standard	-	Cartesian	5720	0	-6000	
4	Standard	-	Cartesian	5720	0	0	Supported
5	Standard	-	Cartesian	0	-7790	-5200	
6	Standard	-	Cartesian	0	-7790	0	Supported
7	Standard	-	Cartesian	5720	-7790	-5200	
8	Standard	-	Cartesian	5720	-7790	0	Supported
9	Standard	-	Cartesian	12290	0	-3000	
10	Standard	-	Cartesian	12290	0	0	Supported
11	Standard	-	Cartesian	8840	0	-3000	
12	Standard	-	Cartesian	10290	0	0	Supported
13	Standard	-	Cartesian	12290	-7790	-2200	
14	Standard	-	Cartesian	12290	-7790	0	Supported
15	Standard	-	Cartesian	8840	-7790	-2200	
16	Standard	-	Cartesian	10290	-7790	0	Supported
17	Standard	-	Cartesian	5720	0	-3000	
18	Standard	-	Cartesian	5720	-7790	-2200	
19	Standard	-	Cartesian	2650	0	-6000	
20	Standard	-	Cartesian	2650	0	0	Supported
21	Standard	-	Cartesian	2650	-7790	-5200	
22	Standard	-	Cartesian	3720	-7790	0	Supported
23	Standard	-	Cartesian	0	-2120	-5782	
24	Standard	-	Cartesian	5720	-5620	0	
25	Standard	-	Cartesian	0	-5620	-5423	
26	Standard	-	Cartesian	8840	-7790	0	Supported
27	Standard	-	Cartesian	12290	-2120	-2782	
28	Standard	-	Cartesian	12290	-2120	0	Supported
29	Standard	-	Cartesian	12290	-5620	-2423	
31	Standard	-	Cartesian	8840	-2120	-2782	
32	Standard	-	Cartesian	8840	-2120	0	Supported
33	Standard	-	Cartesian	5720	-2120	-5782	
34	Standard	-	Cartesian	5720	-2120	0	Supported
35	Standard	-	Cartesian	2650	-7790	-2200	
36	Standard	-	Cartesian	0	-7790	-2200	
37	Standard	-	Cartesian	5720	-5620	-5423	
38	Standard	-	Cartesian	5720	-5790	0	Supported
39	Standard	-	Cartesian	0	-5620	-2200	
40	Standard	-	Cartesian	0	-2120	-2200	
41	Standard	-	Cartesian	0	0	-2200	
42	Standard	-	Cartesian	5720	-2120	-2782	
43	Standard	-	Cartesian	5720	-5620	-2423	
44	Standard	-	Cartesian	2650	0	-2200	
45	Standard	-	Cartesian	4770	0	-6000	
46	Standard	-	Cartesian	4770	0	0	Supported
47	Standard	-	Cartesian	4770	0	-3000	
48	Standard	-	Cartesian	2650	0	-4900	
49	Standard	-	Cartesian	4770	0	-4900	
50	Standard	-	Cartesian	5720	0	-4900	

1.1 NODES

Node No.	Node Type	Reference Node	Coordinate System	Node Coordinates X [mm]	Y [mm]	Z [mm]	Comment
51	Standard	-	Cartesian	6670	0	0	Supported
52	Standard	-	Cartesian	6670	0	-3000	
53	Standard	-	Cartesian	2650	-5620	-5423	
54	Standard	-	Cartesian	2650	-2120	-5782	
55	Standard	-	Cartesian	12290	-5620	0	Supported
56	Standard	-	Cartesian	2650	0	0	
57	Standard	-	Cartesian	2650	0	0	
58	Standard	-	Cartesian	12415	-7915	0	
59	Standard	-	Cartesian	-250	-7915	0	
60	Standard	-	Cartesian	-250	125	0	
61	Standard	-	Cartesian	12415	125	0	
62	Standard	-	Cartesian	894	-380	-150	
63	Standard	-	Cartesian	1794	-380	-150	
64	Standard	-	Cartesian	894	-380	0	
65	Standard	-	Cartesian	1794	-380	0	
66	Standard	-	Cartesian	894	-1800	-150	
67	Standard	-	Cartesian	1794	-1800	-150	
68	Standard	-	Cartesian	894	-1800	0	
69	Standard	-	Cartesian	1794	-1800	0	
70	Standard	-	Cartesian	894	-3220	-150	
71	Standard	-	Cartesian	1794	-3220	-150	
72	Standard	-	Cartesian	894	-3220	0	
73	Standard	-	Cartesian	1794	-3220	0	
74	Standard	-	Cartesian	894	-5547	-150	
75	Standard	-	Cartesian	1794	-5547	-150	
76	Standard	-	Cartesian	894	-5547	0	
77	Standard	-	Cartesian	1794	-5547	0	
78	Standard	-	Cartesian	894	-7097	-150	
79	Standard	-	Cartesian	1794	-7097	-150	
80	Standard	-	Cartesian	894	-7097	0	
81	Standard	-	Cartesian	1794	-7097	0	
82	Standard	-	Cartesian	3139	-2839	-1300	
83	Standard	-	Cartesian	3139	-2839	0	
84	Standard	-	Cartesian	4304	-2839	-1300	
85	Standard	-	Cartesian	4304	-2839	0	
86	Standard	-	Cartesian	3139	-4339	-1300	
87	Standard	-	Cartesian	3139	-4339	0	
88	Standard	-	Cartesian	4304	-4339	-1300	
89	Standard	-	Cartesian	4304	-4339	0	
90	Standard	-	Cartesian	6842	-6239	-200	
91	Standard	-	Cartesian	6842	-6239	0	
92	Standard	-	Cartesian	8367	-6239	-200	
93	Standard	-	Cartesian	8367	-6239	0	
94	Standard	-	Cartesian	9892	-6239	-200	
95	Standard	-	Cartesian	9892	-6239	0	
96	Standard	-	Cartesian	11417	-6239	-200	
97	Standard	-	Cartesian	11417	-6239	0	
98	Standard	-	Cartesian	6593	-3536	-200	
99	Standard	-	Cartesian	6593	-3536	0	
100	Standard	-	Cartesian	8118	-3536	-200	
101	Standard	-	Cartesian	8118	-3536	0	
102	Standard	-	Cartesian	9643	-3536	-200	
103	Standard	-	Cartesian	9643	-3536	0	
104	Standard	-	Cartesian	11168	-3536	-200	
105	Standard	-	Cartesian	11168	-3536	0	
106	Standard	-	Cartesian	3947	-5752	-1300	
107	Standard	-	Cartesian	3947	-5752	0	
108	Standard	-	Cartesian	11265	-1453	-200	
109	Standard	-	Cartesian	11265	-1453	0	
110	Standard	-	Cartesian	9865	-1453	-200	
111	Standard	-	Cartesian	9865	-1453	0	
112	Standard	-	Cartesian	5920	0	-3000	
113	Standard	-	Cartesian	8840	-5620	-2423	
114	Standard	-	Cartesian	5920	-7790	-2200	
115	Standard	-	Cartesian	5920	-2120	-2782	
116	Standard	-	Cartesian	5920	-5620	-2423	
117	Standard	-	Cartesian	6085	-1070	-200	
118	Standard	-	Cartesian	6085	-1070	0	
119	Standard	-	Cartesian	8475	-1070	-200	
120	Standard	-	Cartesian	8475	-1070	0	
121	Standard	-	Cartesian	0	-7790	-5200	
122	Standard	-	Cartesian	0	-3895	0	Supported
123	Standard	-	Cartesian	1860	-7790	0	Supported
124	Standard	-	Cartesian	7220	-7790	0	Supported
126	Standard	-	Cartesian	5720	-4005	0	Supported
127	Standard	-	Cartesian	12290	-4090	0	Supported
130	Standard	-	Cartesian	2650	-7790	0	
131	Standard	-	Cartesian	8840	0	0	Supported
132	Standard	-	Cartesian	0	-2120	0	Supported
133	Standard	-	Cartesian	0	-5620	0	Supported

1.2 LINES

Line No.	Line Type	Nodes No.	Line Length L [mm]		Comment
1	Polyline	122,133	1725	Y	
2	Polyline	50,3	1100	Z	
3	Polyline	36,5	3000	Z	
4	Polyline	18,7	3000	Z	
5	Polyline	10,9	3000	Z	
6	Polyline	131,11	3000	Z	
7	Polyline	14,13	2200	Z	

1.2 LINES

Line No.	Line Type	Nodes No.	Line Length L [mm]		Comment
8	Polyline	26,15	2200	Z	
9	Polyline	1,23	2131	YZ	
10	Polyline	3,33	2131	YZ	
11	Polyline	11,31	2131	YZ	
12	Polyline	9,27	2131	YZ	
13	Polyline	112,115	2131	YZ	
14	Polyline	4,17	3000	Z	
15	Polyline	8,18	2200	Z	
16	Polyline	48,19	1100	Z	
17	Polyline	35,21	3000	Z	
18	Polyline	19,54	2131	YZ	
19	Polyline	40,23	3582	Z	
20	Polyline	23,25	3518	YZ	
21	Polyline	39,25	3223	Z	
22	Polyline	25,5	2181	YZ	
23	Polyline	28,27	2782	Z	
24	Polyline	27,29	3518	YZ	
25	Polyline	55,29	2423	Z	
26	Polyline	29,13	2181	YZ	
27	Polyline	32,31	2782	Z	
28	Polyline	29,113	3450	X	
29	Polyline	42,33	3000	Z	
30	Polyline	9,11	3450	X	
31	Polyline	33,37	3518	YZ	
32	Polyline	43,37	3000	Z	
33	Polyline	37,7	2181	YZ	
34	Polyline	11,52	2170	X	
35	Polyline	13,15	3450	X	
36	Polyline	15,114	2920	X	
37	Polyline	7,21	3070	X	
38	Polyline	21,5	2650	X	
39	Polyline	3,45	950	X	
40	Polyline	19,1	2650	X	
41	Polyline	18,35	3070	X	
42	Polyline	130,35	2200	Z	
43	Polyline	35,36	2650	X	
44	Polyline	6,36	2200	Z	
45	Polyline	36,39	2170	Y	
46	Polyline	133,39	2200	Z	
47	Polyline	39,40	3500	Y	
48	Polyline	132,40	2200	Z	
49	Polyline	40,41	2120	Y	
50	Polyline	2,41	2200	Z	
51	Polyline	133,40	4134	YZ	
52	Polyline	40,25	4758	YZ	
53	Polyline	132,39	4134	YZ	
54	Polyline	39,23	5008	YZ	
55	Polyline	24,42	4471	YZ	
56	Polyline	115,116	3518	YZ	
57	Polyline	34,42	2782	Z	
58	Polyline	42,37	4384	YZ	
59	Polyline	33,43	4851	YZ	
60	Polyline	24,43	2423	Z	
61	Polyline	116,114	2181	YZ	
62	Polyline	43,34	4257	YZ	
63	Polyline	130,18	3777	XZ	
64	Polyline	18,21	4292	XZ	
65	Polyline	8,35	3777	XZ	
66	Polyline	35,7	4292	XZ	
67	Polyline	10,27	3498	YZ	
68	Polyline	28,9	3673	YZ	
69	Polyline	41,44	2650	X	
70	Polyline	20,44	2200	Z	
71	Polyline	49,45	1100	Z	
72	Polyline	46,47	3000	Z	
73	Polyline	46,20	2120	X	
74	Polyline	45,19	2120	X	
75	Polyline	48,49	2120	X	
76	Polyline	44,48	2700	Z	
77	Polyline	47,49	1900	Z	
78	Polyline	17,47	950	X	
79	Polyline	46,17	3147	XZ	
80	Polyline	17,49	2124	XZ	
81	Polyline	49,3	1453	XZ	
82	Polyline	49,50	950	X	
83	Polyline	17,50	1900	Z	
84	Polyline	51,52	3000	Z	
85	Polyline	52,112	750	X	
86	Polyline	17,51	3147	XZ	
87	Polyline	25,53	2650	X	
88	Polyline	53,21	2181	YZ	
89	Polyline	53,37	3070	X	
90	Polyline	23,54	2650	X	
91	Polyline	54,53	3518	YZ	
92	Polyline	54,33	3070	X	
93	Polyline	25,21	3432		
94	Polyline	21,37	3766		
95	Polyline	27,31	3450	X	
96	Polyline	31,115	2920	X	
97	Polyline	9,31	4055		
98	Polyline	31,52	3041		
100	Polyline	59,60	8040	Y	
101	Polyline	60,61	12665	X	
102	Polyline	61,58	8040	Y	

1.2 LINES

Line No.	Line Type	Nodes No.	Line Length L [mm]		Comment
103	Polyline	52,115	2259		
104	Polyline	45,54	3006		
105	Polyline	54,1	3401		
106	Polyline	33,45	2333		
107	Polyline	2,132	2120	Y	
108	Polyline	64,62	150	Z	
109	Polyline	65,63	150	Z	
110	Polyline	68,66	150	Z	
111	Polyline	69,67	150	Z	
112	Polyline	72,70	150	Z	
113	Polyline	73,71	150	Z	
114	Polyline	76,74	150	Z	
115	Polyline	77,75	150	Z	
116	Polyline	80,78	150	Z	
117	Polyline	81,79	150	Z	
118	Polyline	83,82	1300	Z	
119	Polyline	85,84	1300	Z	
120	Polyline	87,86	1300	Z	
121	Polyline	89,88	1300	Z	
122	Polyline	91,90	200	YZ	
123	Polyline	93,92	200	YZ	
124	Polyline	95,94	200	YZ	
125	Polyline	97,96	200	YZ	
126	Polyline	99,98	200	YZ	
127	Polyline	101,100	200	YZ	
128	Polyline	103,102	200	YZ	
129	Polyline	105,104	200	YZ	
130	Polyline	107,106	1300	Z	
131	Polyline	109,108	200	YZ	
132	Polyline	111,110	200	YZ	
133	Polyline	24,38	170	Y	
134	Polyline	133,6	2170	Y	
135	Polyline	118,117	200	YZ	
136	Polyline	120,119	200	YZ	
137	Polyline	6,123	1860	X	
138	Polyline	22,8	2000	X	
139	Polyline	8,124	1500	X	
140	Polyline	16,14	2000	X	
141	Polyline	14,55	2170	Y	
142	Polyline	26,16	1450	X	
143	Polyline	28,10	2120	Y	
144	Polyline	10,12	2000	X	
145	Polyline	12,131	1450	X	
146	Polyline	51,4	950	X	
147	Polyline	4,46	950	X	
148	Polyline	38,8	2000	Y	
149	Polyline	20,2	2650	X	
150	Polyline	34,126	1885	Y	
151	Polyline	4,34	2120	Y	
152	Polyline	113,15	2181	YZ	
153	Polyline	31,113	3518	YZ	
154	Polyline	31,29	4928		
155	Polyline	29,15	4082		
156	Polyline	114,18	200	X	
157	Polyline	112,17	200	X	
158	Polyline	115,42	200	X	
159	Polyline	116,43	200	X	
160	Polyline	42,43	3518	YZ	
161	Polyline	113,116	2920	X	
162	Polyline	15,116	3645		
163	Polyline	37,54	4669		
164	Polyline	54,25	4405		
165	Polyline	2,44	3444	XZ	
166	Polyline	31,116	4572		
167	Polyline	126,24	1615	Y	
168	Polyline	41,1	3800	Z	
169	Polyline	44,1	4633	XZ	
170	Polyline	127,28	1970	Y	
171	Polyline	124,26	1620	X	
173	Polyline	123,130	790	X	
174	Polyline	131,51	2170	X	
175	Polyline	58,59	12665	X	
176	Polyline	130,22	1070	X	
177	Polyline	55,127	1530	Y	
179	Polyline	132,122	1775	Y	

1.3 MATERIALS

Matl. No.	Modulus E [kN/cm²]	Modulus G [kN/cm²]	Poisson's Ratio ν [-]	Spec. Weight γ [kN/m³]	Coeff. of Th. Exp. α [1/°C]	Partial Factor γ_M [-]	Material Model
1	Steel S 355 J2 | LST EN 10025-2:2004-11 21000.00 Sijos, kolonos	8076.92	0.300	78.50	1.20E-05	1.00	Isotropic Linear Elastic
2	Steel S 275 J2 | LST EN 10025-2:2004-11 21000.00 Ryðiai, rėmai	8076.92	0.300	78.50	1.20E-05	1.00	Isotropic Linear Elastic
3	Concrete C30/37 | EN 1992-1-1:2004/A1:2014 3300.00 Pamatai, plokštė	1375.00	0.200	25.00	1.00E-05	1.00	Isotropic Linear Elastic
4	Steel S 275 J2 | LST EN 10025-2:2004-11 21000.00 Ryðiai, rėmai	8076.92	0.300	78.50	1.20E-05	1.00	Isotropic Linear Elastic

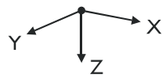
1.4 SURFACES

Surface No.	Surface Type Geometry	Stiffness	Boundary Lines No.	Matl. No.	Thickness Type	d [mm]	Area A [mm²]	Weight W [kg]
1	Plane	Standard	175,100-102	3	Constant	250	1.01827E+08	63641.60

1.4.2 SURFACES - INTEGRATED OBJECTS

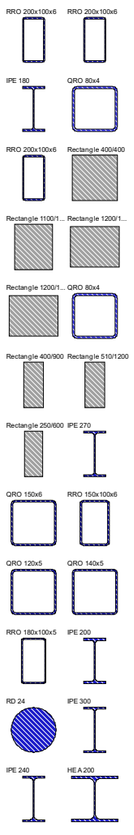
Surface No.	Integrated Objects No. Nodes	Lines	Openings	Comment
1	32,56,57,64,65,68,69,72,73,76, 77,80,81,83,85,87,89,91,93,95, 97,99,101,103,105,107,109,111, 118,120	1,73,107,133,134,137-151,167,170,171,173,174,176,177,179		

1.7 NODAL SUPPORTS



Support No.	Nodes No.	Axis System	Column in Z	Support Conditions u_X	u_Y	u_Z	φ_X	φ_Y	φ_Z
1	2,4,6,8,10,12,14,16,20,22,26,28,32,34,38,46,51,55, 122-124,126,127,131-133	Global X,Y,Z	☐	☒	☒	☒	☐	☐	☒

1.13 CROSS-SECTIONS



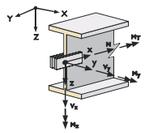
Section No.	Matl. No.	J [cm⁴] / A [cm²]	I_y [cm⁴] / A_y [cm²]	I_z [cm⁴] / A_z [cm²]	Principal Axes α [°]	Rotation α' [°]	Overall Dimensions [mm] Width b	Height h
1	RRO 200x100x6 | EN 10219-2:2006							
	1	1417.00 / 33.60	1703.00 / 7.58	577.00 / 21.43	0.00	0.00	100	200
2	RRO 200x100x6 | EN 10219-2:2006							
	1	1417.00 / 33.60	1703.00 / 7.58	577.00 / 21.43	0.00	90.00	100	200
3	IPE 180 | Euronorm 19-57							
	1	4.80 / 23.90	1320.00 / 12.19	101.00 / 8.76	0.00	0.00	91	180
4	QRO 80x4 | EN 10219-2:2006							
	2	180.00 / 11.70	111.00 / 5.13	111.00 / 5.13	0.00	0.00	80	80
5	RRO 200x100x6 | EN 10219-2:2006							
	1	1417.00 / 33.60	1703.00 / 7.58	577.00 / 21.43	0.00	0.00	100	200
6	Rectangle 400/400							
	3	360106.66 / 1600.00	213333.34 / 1333.33	213333.34 / 1333.33	0.00	0.00	400	400
7	Rectangle 1100/1300							
	3	28231486.00 / 14300.00	20139166.00 / 11916.67	14419166.82 / 11916.67	0.00	0.00	1100	1300
8	Rectangle 1200/1000							
	3	19835906.00 / 12000.00	10000000.00 / 10000.00	14400000.82 / 10000.00	0.00	0.00	1200	1000
9	Rectangle 1200/1000							
	3	19835906.00 / 12000.00	10000000.00 / 10000.00	14400000.82 / 10000.00	0.00	0.00	1200	1000
10	QRO 80x4 | EN 10219-2:2006							
	4	180.00 / 11.70	111.00 / 5.13	111.00 / 5.13	0.00	0.00	80	80
16	Rectangle 400/900							
	3	1384131.38 / 3600.00	2430000.25 / 3000.00	480000.00 / 3000.00	0.00	0.00	400	900
17	Rectangle 510/1200							
	3	3889173.50 / 6120.00	7344000.00 / 5100.00	1326509.98 / 5100.00	0.00	0.00	510	1200
18	Rectangle 250/600							
	3	230672.83 / 1500.00	450000.03 / 1250.00	78125.00 / 1250.00	0.00	0.00	250	600
19	IPE 270 | Euronorm 19-57							
	1	16.00 / 45.90	5790.00 / 23.00	420.00 / 16.57	0.00	0.00	135	270
20	QRO 150x6 | EN 10219-2:2006							
	1	1833.00 / 33.60	1146.00 / 14.55	1146.00 / 14.55	0.00	0.00	150	150
21	RRO 150x100x6 | EN 10219-2:2006							
	1	948.00 / 27.60	835.00 / 8.49	444.00 / 15.57	0.00	0.00	100	150
22	QRO 120x5 | EN 10219-2:2006							
	1	778.00 / 22.40	485.00 / 9.69	485.00 / 9.69	0.00	0.00	120	120
23	QRO 140x5 | EN 10219-2:2006							
	1	1256.00 / 26.40	791.00 / 11.36	791.00 / 11.36	0.00	0.00	140	140
24	RRO 180x100x5 | EN 10219-2:2006							
	1	1045.00 / 26.40	1124.00 / 6.67	452.00 / 16.00	0.00	0.00	100	180
25	IPE 200 | Euronorm 19-57							
	1	7.02 / 28.50	1940.00 / 14.23	142.00 / 10.35	0.00	0.00	100	200
26	RD 24 | ArcelorMittal (EN 10060:2003)							
	1	3.26 / 4.52	1.63 / 3.80	1.63 / 3.80	0.00	0.00	24	24

1.13 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
27	IPE 300 | Euronorm 19-57							
	1	20.20 / 53.80	8360.00 / 26.81	604.00 / 19.82	0.00	0.00	150	300
28	IPE 240 | Euronorm 19-57							
	1	12.90 / 39.10	3890.00 / 19.65	284.00 / 13.82	0.00	0.00	120	240
29	HE A 200 | Euronorm 53-62							
	1	21.10 / 53.80	3690.00 / 33.30	1340.00 / 10.77	0.00	0.00	200	190

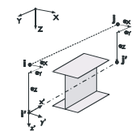
1.13.1 CROSS-SECTIONS - CROSS-SECTION ROTATION

Section No.	Description	Angle α [°]	Mirroring About Axis y	Mirroring About Axis z
2	RRO 200x100x6 | EN 10219-2:2006	90.00	☐	☐



1.14 MEMBER HINGES

Release No.	Reference System	Axial/Shear Release or Spring[kN/m] u_x	u_y	u_z	Moment Release or Spring[kNm/rad] φ_x	φ_y	φ_z	Comment
1	Local x,y,z	☐	☐	☐	☐	☒	☐	Paprastas lankstas My
2	Local x,y,z	☐	☐	☐	☐	☒	☒	Kolonos lankstine jungtis



1.15/1 MEMBER ECCENTRICITIES - ABSOLUTE

Ecc. No.	Reference System	Member Start - Eccentricity [mm] $e_{i,X}$	$e_{i,Y}$	$e_{i,Z}$	Member End - Eccentricity $e_{j,X}$	$e_{j,Y}$	$e_{j,Z}$	Member hinge location Member Start	Member End
1	Global	0	0	0	0	0	0	at member	at member

1.15/2 MEMBER ECCENTRICITIES - RELATIVE

Ecc. No.	Cross-Section Alignment y-Axis	z-Axis	Transverse offset from cross-section of another obj. Object Type	Object No.	y-Axis	z-Axis	Axial offset from adjacent Member Sta	Member End
1	Middle	Top (-z)	None	0	Middle	Middle	☐	☐

1.21 SETS OF MEMBERS

Set No.	Set of Members Description	Type	Member No.	Length [mm]	Comment
1	Continuous Members 1	Contin. member	87,90,26	7831	
2	Continuous Members 2	Contin. member	22,32,33	7831	
3	Continuous Members 3	Contin. member	21,27,28	7831	
10	Continuous Members 10	Contin. member	3,44	5200	
12	Continuous Members 12	Contin. member	4,10	5200	
13	Continuous Members 13	Contin. member	20,60	5423	
14	Continuous Members 14	Contin. member	18,56	5782	
15	Continuous Members 15	Contin. member	9,82,2	6000	
18	Group of Members 18	Contin. member	50,148	6000	
19	Continuous Members 19	Contin. member	12,19	5200	
20	Continuous Members 20	Contin. member	14,46	5423	
21	Continuous Members 21	Contin. member	13,48	5782	
22	Continuous Members 22	Contin. member	72,75,71	6000	
23	Continuous Members 23	Contin. member	70,73,11	6000	
24	Continuous Members 24	Contin. member	35,84	2920	
25	Continuous Members 25	Contin. member	25,57,61	7831	
26	Continuous Members 26	Contin. member	139,140,169,141-144	12290	
27	Continuous Members 27	Contin. member	136,172,168,138	7790	
28	Continuous Members 28	Contin. member	133,150,171,129,134,156,137,135	12290	
29	Continuous Members 29	Contin. member	147,146,170,102,145	7790	
30	Continuous Members 30	Contin. member	132,174,1,128	7790	
31	Continuous Members 31	Contin. member	23,149,31	7831	
32	Continuous Members 32	Contin. member	24,29,30	7831	

2.1 LOAD CASES

Load Case	Load Case Description	EN 1990 | LST Action Category	Self-Weight - Factor in Direction Active	X	Y	Z
LC1	[G]	Permanent	☒	0.000	0.000	1.000
LC2	[S]	Snow / ice	☐			
LC3	[W+x]	Wind	☐			
LC4	[W-x]	Wind	☐			
LC5	[W+y]	Wind	☐			
LC6	[W-y]	Wind	☐			
LC7	[W+siurb]	Wind	☐			
LC8	[T]	Imposed - Category A: domestic, residential areas	☐			

2.1.1 LOAD CASES - CALCULATION PARAMETERS

Load Case	Load Case Description	Calculation Parameters		
LC1	[G]	Method of analysis	:	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	:	Newton-Raphson
		Activate stiffness factors of:	:	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC2	[S]	Method of analysis	:	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	:	Newton-Raphson
		Activate stiffness factors of:	:	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC3	[W+x]	Method of analysis	:	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	:	Newton-Raphson
		Activate stiffness factors of:	:	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC4	[W-x]	Method of analysis	:	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	:	Newton-Raphson
		Activate stiffness factors of:	:	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC5	[W+y]	Method of analysis	:	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	:	Newton-Raphson
		Activate stiffness factors of:	:	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC6	[W-y]	Method of analysis	:	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	:	Newton-Raphson
		Activate stiffness factors of:	:	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC7	[W+siurb]	Method of analysis	:	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	:	Newton-Raphson
		Activate stiffness factors of:	:	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC8	[T]	Method of analysis	:	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	:	Newton-Raphson
		Activate stiffness factors of:	:	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)

2.5 LOAD COMBINATIONS

Load Combin.	DS	Load Combination Description	No.	Factor	Load Case	
CO1	STR	1.35*LC1	1	1.35	LC1	[G]
CO2	STR	1.35*LC1 + 1.3*LC2	1	1.35	LC1	[G]
			2	1.30	LC2	[S]
CO3	STR	1.35*LC1 + 1.3*LC2 + 0.78*LC3	1	1.35	LC1	[G]
			2	1.30	LC2	[S]
			3	0.78	LC3	[W+x]
CO4	STR	1.35*LC1 + 1.3*LC2 + 0.78*LC4	1	1.35	LC1	[G]
			2	1.30	LC2	[S]
			3	0.78	LC4	[W-x]
CO5	STR	1.35*LC1 + 1.3*LC2 + 0.78*LC5	1	1.35	LC1	[G]
			2	1.30	LC2	[S]
			3	0.78	LC5	[W+y]
CO6	STR	1.35*LC1 + 1.3*LC2 + 0.78*LC6	1	1.35	LC1	[G]
			2	1.30	LC2	[S]
			3	0.78	LC6	[W-y]
CO7	STR	1.35*LC1 + 1.3*LC2 + 0.78*LC7	1	1.35	LC1	[G]
			2	1.30	LC2	[S]
			3	0.78	LC7	[W+siurb]
CO8	STR	1.35*LC1 + 1.3*LC2 + 0.78*LC3 + 0.91*LC8	1	1.35	LC1	[G]
			2	1.30	LC2	[S]
			3	0.78	LC3	[W+x]
			4	0.91	LC8	[T]
CO9	STR	1.35*LC1 + 1.3*LC2 + 0.78*LC4 + 0.91*LC8	1	1.35	LC1	[G]
			2	1.30	LC2	[S]
			3	0.78	LC4	[W-x]
			4	0.91	LC8	[T]
CO10	STR	1.35*LC1 + 1.3*LC2 + 0.78*LC5 + 0.91*LC8	1	1.35	LC1	[G]
			2	1.30	LC2	[S]
			3	0.78	LC5	[W+y]
			4	0.91	LC8	[T]
CO11	STR	1.35*LC1 + 1.3*LC2 + 0.78*LC6 + 0.91*LC8	1	1.35	LC1	[G]
			2	1.30	LC2	[S]
			3	0.78	LC6	[W-y]
			4	0.91	LC8	[T]
CO12	STR	1.35*LC1 + 1.3*LC2 + 0.78*LC7 + 0.91*LC8	1	1.35	LC1	[G]
			2	1.30	LC2	[S]
			3	0.78	LC7	[W+siurb]
			4	0.91	LC8	[T]
CO13	STR	1.35*LC1 + 1.3*LC2 + 0.91*LC8	1	1.35	LC1	[G]
			2	1.30	LC2	[S]
			3	0.91	LC8	[T]
CO14	STR	1.35*LC1 + 1.3*LC3	1	1.35	LC1	[G]
			2	1.30	LC3	[W+x]
CO15	STR	1.35*LC1 + 1.3*LC4	1	1.35	LC1	[G]
			2	1.30	LC4	[W-x]
CO16	STR	1.35*LC1 + 1.3*LC5	1	1.35	LC1	[G]
			2	1.30	LC5	[W+y]
CO17	STR	1.35*LC1 + 1.3*LC6	1	1.35	LC1	[G]
			2	1.30	LC6	[W-y]
CO18	STR	1.35*LC1 + 1.3*LC7	1	1.35	LC1	[G]
			2	1.30	LC7	[W+siurb]
CO19	STR	1.35*LC1 + 0.91*LC2 + 1.3*LC3	1	1.35	LC1	[G]
			2	0.91	LC2	[S]
			3	1.30	LC3	[W+x]

2.5 LOAD COMBINATIONS

Load Combin.	DS	Load Combination Description	No.	Factor	Load Case	
CO20	STR	1.35*LC1 + 0.91*LC2 + 1.3*LC4	1	1.35	LC1	[G]
			2	0.91	LC2	[S]
			3	1.30	LC4	[W-x]
CO21	STR	1.35*LC1 + 0.91*LC2 + 1.3*LC5	1	1.35	LC1	[G]
			2	0.91	LC2	[S]
			3	1.30	LC5	[W+y]
CO22	STR	1.35*LC1 + 0.91*LC2 + 1.3*LC6	1	1.35	LC1	[G]
			2	0.91	LC2	[S]
			3	1.30	LC6	[W-y]
CO23	STR	1.35*LC1 + 0.91*LC2 + 1.3*LC7	1	1.35	LC1	[G]
			2	0.91	LC2	[S]
			3	1.30	LC7	[W+siurb]
CO24	STR	1.35*LC1 + 0.91*LC2 + 1.3*LC3 + 0.91*LC8	1	1.35	LC1	[G]
			2	0.91	LC2	[S]
			3	1.30	LC3	[W+x]
			4	0.91	LC8	[T]
CO25	STR	1.35*LC1 + 0.91*LC2 + 1.3*LC4 + 0.91*LC8	1	1.35	LC1	[G]
			2	0.91	LC2	[S]
			3	1.30	LC4	[W-x]
			4	0.91	LC8	[T]
CO26	STR	1.35*LC1 + 0.91*LC2 + 1.3*LC5 + 0.91*LC8	1	1.35	LC1	[G]
			2	0.91	LC2	[S]
			3	1.30	LC5	[W+y]
			4	0.91	LC8	[T]
CO27	STR	1.35*LC1 + 0.91*LC2 + 1.3*LC6 + 0.91*LC8	1	1.35	LC1	[G]
			2	0.91	LC2	[S]
			3	1.30	LC6	[W-y]
			4	0.91	LC8	[T]
CO28	STR	1.35*LC1 + 0.91*LC2 + 1.3*LC7 + 0.91*LC8	1	1.35	LC1	[G]
			2	0.91	LC2	[S]
			3	1.30	LC7	[W+siurb]
			4	0.91	LC8	[T]
CO29	STR	1.35*LC1 + 1.3*LC3 + 0.91*LC8	1	1.35	LC1	[G]
			2	1.30	LC3	[W+x]
			3	0.91	LC8	[T]
CO30	STR	1.35*LC1 + 1.3*LC4 + 0.91*LC8	1	1.35	LC1	[G]
			2	1.30	LC4	[W-x]
			3	0.91	LC8	[T]
CO31	STR	1.35*LC1 + 1.3*LC5 + 0.91*LC8	1	1.35	LC1	[G]
			2	1.30	LC5	[W+y]
			3	0.91	LC8	[T]
CO32	STR	1.35*LC1 + 1.3*LC6 + 0.91*LC8	1	1.35	LC1	[G]
			2	1.30	LC6	[W-y]
			3	0.91	LC8	[T]
CO33	STR	1.35*LC1 + 1.3*LC7 + 0.91*LC8	1	1.35	LC1	[G]
			2	1.30	LC7	[W+siurb]
			3	0.91	LC8	[T]
CO34	STR	1.35*LC1 + 1.3*LC8	1	1.35	LC1	[G]
			2	1.30	LC8	[T]
CO35	STR	1.35*LC1 + 0.91*LC2 + 1.3*LC8	1	1.35	LC1	[G]
			2	0.91	LC2	[S]
			3	1.30	LC8	[T]
CO36	STR	1.35*LC1 + 0.91*LC2 + 0.78*LC3 + 1.3*LC8	1	1.35	LC1	[G]
			2	0.91	LC2	[S]
			3	0.78	LC3	[W+x]
			4	1.30	LC8	[T]
CO37	STR	1.35*LC1 + 0.91*LC2 + 0.78*LC4 + 1.3*LC8	1	1.35	LC1	[G]
			2	0.91	LC2	[S]
			3	0.78	LC4	[W-x]
			4	1.30	LC8	[T]
CO38	STR	1.35*LC1 + 0.91*LC2 + 0.78*LC5 + 1.3*LC8	1	1.35	LC1	[G]
			2	0.91	LC2	[S]
			3	0.78	LC5	[W+y]
			4	1.30	LC8	[T]
CO39	STR	1.35*LC1 + 0.91*LC2 + 0.78*LC6 + 1.3*LC8	1	1.35	LC1	[G]
			2	0.91	LC2	[S]
			3	0.78	LC6	[W-y]
			4	1.30	LC8	[T]
CO40	STR	1.35*LC1 + 0.91*LC2 + 0.78*LC7 + 1.3*LC8	1	1.35	LC1	[G]
			2	0.91	LC2	[S]
			3	0.78	LC7	[W+siurb]
			4	1.30	LC8	[T]
CO41	STR	1.35*LC1 + 0.78*LC3 + 1.3*LC8	1	1.35	LC1	[G]
			2	0.78	LC3	[W+x]
			3	1.30	LC8	[T]
CO42	STR	1.35*LC1 + 0.78*LC4 + 1.3*LC8	1	1.35	LC1	[G]
			2	0.78	LC4	[W-x]
			3	1.30	LC8	[T]
CO43	STR	1.35*LC1 + 0.78*LC5 + 1.3*LC8	1	1.35	LC1	[G]
			2	0.78	LC5	[W+y]
			3	1.30	LC8	[T]
CO44	STR	1.35*LC1 + 0.78*LC6 + 1.3*LC8	1	1.35	LC1	[G]
			2	0.78	LC6	[W-y]
			3	1.30	LC8	[T]
CO45	STR	1.35*LC1 + 0.78*LC7 + 1.3*LC8	1	1.35	LC1	[G]
			2	0.78	LC7	[W+siurb]
			3	1.30	LC8	[T]
CO46	S Ch	LC1	1	1.00	LC1	[G]
CO47	S Ch	LC1 + LC2	1	1.00	LC1	[G]
			2	1.00	LC2	[S]
CO48	S Ch	LC1 + LC2 + 0.6*LC3	1	1.00	LC1	[G]
			2	1.00	LC2	[S]
			3	0.60	LC3	[W+x]
CO49	S Ch	LC1 + LC2 + 0.6*LC4	1	1.00	LC1	[G]

2.5 LOAD COMBINATIONS

Load Combin.	DS	Load Combination Description	No.	Factor	Load Case	
			2	1.00	LC2	[S]
			3	0.60	LC4	[W-x]
CO50	S Ch	LC1 + LC2 + 0.6*LC5	1	1.00	LC1	[G]
			2	1.00	LC2	[S]
			3	0.60	LC5	[W+y]
CO51	S Ch	LC1 + LC2 + 0.6*LC6	1	1.00	LC1	[G]
			2	1.00	LC2	[S]
			3	0.60	LC6	[W-y]
CO52	S Ch	LC1 + LC2 + 0.6*LC7	1	1.00	LC1	[G]
			2	1.00	LC2	[S]
			3	0.60	LC7	[W+siurb]
CO53	S Ch	LC1 + LC2 + 0.6*LC3 + 0.7*LC8	1	1.00	LC1	[G]
			2	1.00	LC2	[S]
			3	0.60	LC3	[W+x]
			4	0.70	LC8	[T]
CO54	S Ch	LC1 + LC2 + 0.6*LC4 + 0.7*LC8	1	1.00	LC1	[G]
			2	1.00	LC2	[S]
			3	0.60	LC4	[W-x]
			4	0.70	LC8	[T]
CO55	S Ch	LC1 + LC2 + 0.6*LC5 + 0.7*LC8	1	1.00	LC1	[G]
			2	1.00	LC2	[S]
			3	0.60	LC5	[W+y]
			4	0.70	LC8	[T]
CO56	S Ch	LC1 + LC2 + 0.6*LC6 + 0.7*LC8	1	1.00	LC1	[G]
			2	1.00	LC2	[S]
			3	0.60	LC6	[W-y]
			4	0.70	LC8	[T]
CO57	S Ch	LC1 + LC2 + 0.6*LC7 + 0.7*LC8	1	1.00	LC1	[G]
			2	1.00	LC2	[S]
			3	0.60	LC7	[W+siurb]
			4	0.70	LC8	[T]
CO58	S Ch	LC1 + LC2 + 0.7*LC8	1	1.00	LC1	[G]
			2	1.00	LC2	[S]
			3	0.70	LC8	[T]
CO59	S Ch	LC1 + LC3	1	1.00	LC1	[G]
			2	1.00	LC3	[W+x]
CO60	S Ch	LC1 + LC4	1	1.00	LC1	[G]
			2	1.00	LC4	[W-x]
CO61	S Ch	LC1 + LC5	1	1.00	LC1	[G]
			2	1.00	LC5	[W+y]
CO62	S Ch	LC1 + LC6	1	1.00	LC1	[G]
			2	1.00	LC6	[W-y]
CO63	S Ch	LC1 + LC7	1	1.00	LC1	[G]
			2	1.00	LC7	[W+siurb]
CO64	S Ch	LC1 + 0.7*LC2 + LC3	1	1.00	LC1	[G]
			2	0.70	LC2	[S]
			3	1.00	LC3	[W+x]
CO65	S Ch	LC1 + 0.7*LC2 + LC4	1	1.00	LC1	[G]
			2	0.70	LC2	[S]
			3	1.00	LC4	[W-x]
CO66	S Ch	LC1 + 0.7*LC2 + LC5	1	1.00	LC1	[G]
			2	0.70	LC2	[S]
			3	1.00	LC5	[W+y]
CO67	S Ch	LC1 + 0.7*LC2 + LC6	1	1.00	LC1	[G]
			2	0.70	LC2	[S]
			3	1.00	LC6	[W-y]
CO68	S Ch	LC1 + 0.7*LC2 + LC7	1	1.00	LC1	[G]
			2	0.70	LC2	[S]
			3	1.00	LC7	[W+siurb]
CO69	S Ch	LC1 + 0.7*LC2 + LC3 + 0.7*LC8	1	1.00	LC1	[G]
			2	0.70	LC2	[S]
			3	1.00	LC3	[W+x]
			4	0.70	LC8	[T]
CO70	S Ch	LC1 + 0.7*LC2 + LC4 + 0.7*LC8	1	1.00	LC1	[G]
			2	0.70	LC2	[S]
			3	1.00	LC4	[W-x]
			4	0.70	LC8	[T]
CO71	S Ch	LC1 + 0.7*LC2 + LC5 + 0.7*LC8	1	1.00	LC1	[G]
			2	0.70	LC2	[S]
			3	1.00	LC5	[W+y]
			4	0.70	LC8	[T]
CO72	S Ch	LC1 + 0.7*LC2 + LC6 + 0.7*LC8	1	1.00	LC1	[G]
			2	0.70	LC2	[S]
			3	1.00	LC6	[W-y]
			4	0.70	LC8	[T]
CO73	S Ch	LC1 + 0.7*LC2 + LC7 + 0.7*LC8	1	1.00	LC1	[G]
			2	0.70	LC2	[S]
			3	1.00	LC7	[W+siurb]
			4	0.70	LC8	[T]
CO74	S Ch	LC1 + LC3 + 0.7*LC8	1	1.00	LC1	[G]
			2	1.00	LC3	[W+x]
			3	0.70	LC8	[T]
CO75	S Ch	LC1 + LC4 + 0.7*LC8	1	1.00	LC1	[G]
			2	1.00	LC4	[W-x]
			3	0.70	LC8	[T]
CO76	S Ch	LC1 + LC5 + 0.7*LC8	1	1.00	LC1	[G]
			2	1.00	LC5	[W+y]
			3	0.70	LC8	[T]
CO77	S Ch	LC1 + LC6 + 0.7*LC8	1	1.00	LC1	[G]
			2	1.00	LC6	[W-y]
			3	0.70	LC8	[T]
CO78	S Ch	LC1 + LC7 + 0.7*LC8	1	1.00	LC1	[G]
			2	1.00	LC7	[W+siurb]
			3	0.70	LC8	[T]

2.5 LOAD COMBINATIONS

Load Combin.	DS	Load Combination Description	No.	Factor	Load Case	
CO79	S Ch	LC1 + LC8	1	1.00	LC1	[G]
			2	1.00	LC8	[T]
CO80	S Ch	LC1 + 0.7*LC2 + LC8	1	1.00	LC1	[G]
			2	0.70	LC2	[S]
			3	1.00	LC8	[T]
CO81	S Ch	LC1 + 0.7*LC2 + 0.6*LC3 + LC8	1	1.00	LC1	[G]
			2	0.70	LC2	[S]
			3	0.60	LC3	[W+x]
			4	1.00	LC8	[T]
CO82	S Ch	LC1 + 0.7*LC2 + 0.6*LC4 + LC8	1	1.00	LC1	[G]
			2	0.70	LC2	[S]
			3	0.60	LC4	[W-x]
			4	1.00	LC8	[T]
CO83	S Ch	LC1 + 0.7*LC2 + 0.6*LC5 + LC8	1	1.00	LC1	[G]
			2	0.70	LC2	[S]
			3	0.60	LC5	[W+y]
			4	1.00	LC8	[T]
CO84	S Ch	LC1 + 0.7*LC2 + 0.6*LC6 + LC8	1	1.00	LC1	[G]
			2	0.70	LC2	[S]
			3	0.60	LC6	[W-y]
			4	1.00	LC8	[T]
CO85	S Ch	LC1 + 0.7*LC2 + 0.6*LC7 + LC8	1	1.00	LC1	[G]
			2	0.70	LC2	[S]
			3	0.60	LC7	[W+siurb]
			4	1.00	LC8	[T]
CO86	S Ch	LC1 + 0.6*LC3 + LC8	1	1.00	LC1	[G]
			2	0.60	LC3	[W+x]
			3	1.00	LC8	[T]
CO87	S Ch	LC1 + 0.6*LC4 + LC8	1	1.00	LC1	[G]
			2	0.60	LC4	[W-x]
			3	1.00	LC8	[T]
CO88	S Ch	LC1 + 0.6*LC5 + LC8	1	1.00	LC1	[G]
			2	0.60	LC5	[W+y]
			3	1.00	LC8	[T]
CO89	S Ch	LC1 + 0.6*LC6 + LC8	1	1.00	LC1	[G]
			2	0.60	LC6	[W-y]
			3	1.00	LC8	[T]
CO90	S Ch	LC1 + 0.6*LC7 + LC8	1	1.00	LC1	[G]
			2	0.60	LC7	[W+siurb]
			3	1.00	LC8	[T]
CO91	S Fr	LC1	1	1.00	LC1	[G]
CO92	S Fr	LC1 + 0.5*LC2	1	1.00	LC1	[G]
			2	0.50	LC2	[S]
CO93	S Fr	LC1 + 0.5*LC2 + 0.3*LC8	1	1.00	LC1	[G]
			2	0.50	LC2	[S]
			3	0.30	LC8	[T]
CO94	S Fr	LC1 + 0.2*LC3	1	1.00	LC1	[G]
			2	0.20	LC3	[W+x]
CO95	S Fr	LC1 + 0.2*LC4	1	1.00	LC1	[G]
			2	0.20	LC4	[W-x]
CO96	S Fr	LC1 + 0.2*LC5	1	1.00	LC1	[G]
			2	0.20	LC5	[W+y]
CO97	S Fr	LC1 + 0.2*LC6	1	1.00	LC1	[G]
			2	0.20	LC6	[W-y]
CO98	S Fr	LC1 + 0.2*LC7	1	1.00	LC1	[G]
			2	0.20	LC7	[W+siurb]
CO99	S Fr	LC1 + 0.2*LC2 + 0.2*LC3	1	1.00	LC1	[G]
			2	0.20	LC2	[S]
			3	0.20	LC3	[W+x]
CO100	S Fr	LC1 + 0.2*LC2 + 0.2*LC4	1	1.00	LC1	[G]
			2	0.20	LC2	[S]
			3	0.20	LC4	[W-x]
CO101	S Fr	LC1 + 0.2*LC2 + 0.2*LC5	1	1.00	LC1	[G]
			2	0.20	LC2	[S]
			3	0.20	LC5	[W+y]
CO102	S Fr	LC1 + 0.2*LC2 + 0.2*LC6	1	1.00	LC1	[G]
			2	0.20	LC2	[S]
			3	0.20	LC6	[W-y]
CO103	S Fr	LC1 + 0.2*LC2 + 0.2*LC7	1	1.00	LC1	[G]
			2	0.20	LC2	[S]
			3	0.20	LC7	[W+siurb]
CO104	S Fr	LC1 + 0.2*LC2 + 0.2*LC3 + 0.3*LC8	1	1.00	LC1	[G]
			2	0.20	LC2	[S]
			3	0.20	LC3	[W+x]
			4	0.30	LC8	[T]
CO105	S Fr	LC1 + 0.2*LC2 + 0.2*LC4 + 0.3*LC8	1	1.00	LC1	[G]
			2	0.20	LC2	[S]
			3	0.20	LC4	[W-x]
			4	0.30	LC8	[T]
CO106	S Fr	LC1 + 0.2*LC2 + 0.2*LC5 + 0.3*LC8	1	1.00	LC1	[G]
			2	0.20	LC2	[S]
			3	0.20	LC5	[W+y]
			4	0.30	LC8	[T]
CO107	S Fr	LC1 + 0.2*LC2 + 0.2*LC6 + 0.3*LC8	1	1.00	LC1	[G]
			2	0.20	LC2	[S]
			3	0.20	LC6	[W-y]
			4	0.30	LC8	[T]
CO108	S Fr	LC1 + 0.2*LC2 + 0.2*LC7 + 0.3*LC8	1	1.00	LC1	[G]
			2	0.20	LC2	[S]
			3	0.20	LC7	[W+siurb]
			4	0.30	LC8	[T]
CO109	S Fr	LC1 + 0.2*LC3 + 0.3*LC8	1	1.00	LC1	[G]
			2	0.20	LC3	[W+x]
			3	0.30	LC8	[T]

2.5 LOAD COMBINATIONS

Load Combin.	DS	Load Combination Description	No.	Factor	Load Case	
CO110	S Fr	LC1 + 0.2*LC4 + 0.3*LC8	1	1.00	LC1	[G]
			2	0.20	LC4	[W-x]
			3	0.30	LC8	[T]
CO111	S Fr	LC1 + 0.2*LC5 + 0.3*LC8	1	1.00	LC1	[G]
			2	0.20	LC5	[W+y]
			3	0.30	LC8	[T]
CO112	S Fr	LC1 + 0.2*LC6 + 0.3*LC8	1	1.00	LC1	[G]
			2	0.20	LC6	[W-y]
			3	0.30	LC8	[T]
CO113	S Fr	LC1 + 0.2*LC7 + 0.3*LC8	1	1.00	LC1	[G]
			2	0.20	LC7	[W+siurb]
			3	0.30	LC8	[T]
CO114	S Fr	LC1 + 0.5*LC8	1	1.00	LC1	[G]
			2	0.50	LC8	[T]
CO115	S Fr	LC1 + 0.2*LC2 + 0.5*LC8	1	1.00	LC1	[G]
			2	0.20	LC2	[S]
			3	0.50	LC8	[T]
CO116	S Qp	LC1	1	1.00	LC1	[G]
CO117	S Qp	LC1 + 0.2*LC2	1	1.00	LC1	[G]
			2	0.20	LC2	[S]
CO118	S Qp	LC1 + 0.2*LC2 + 0.3*LC8	1	1.00	LC1	[G]
			2	0.20	LC2	[S]
			3	0.30	LC8	[T]
CO119	S Qp	LC1 + 0.3*LC8	1	1.00	LC1	[G]
			2	0.30	LC8	[T]

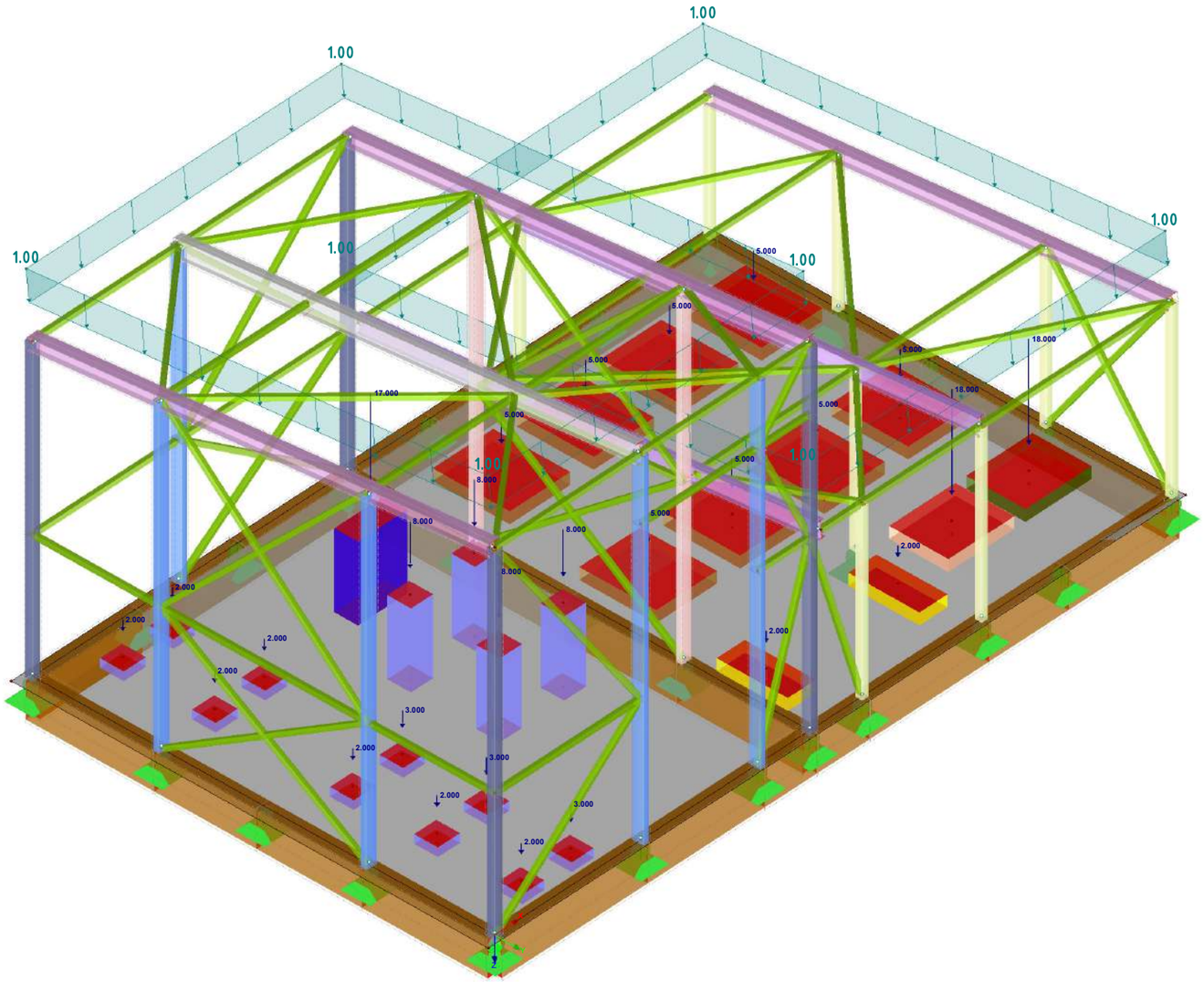
2.7 RESULT COMBINATIONS

Result Combin	Description	Loading
RC1	ULS (STR/GEO)	CO1/p or to CO45
RC2	SLS - Characteristic	CO46/p or to CO90
RC3	SLS - Frequent	CO91/p or to CO115
RC4	SLS - Quasi-permanent	CO116/p or to CO119

LC1: [G]

LC1 : [G]
Loads [kN/m^2], [kN]

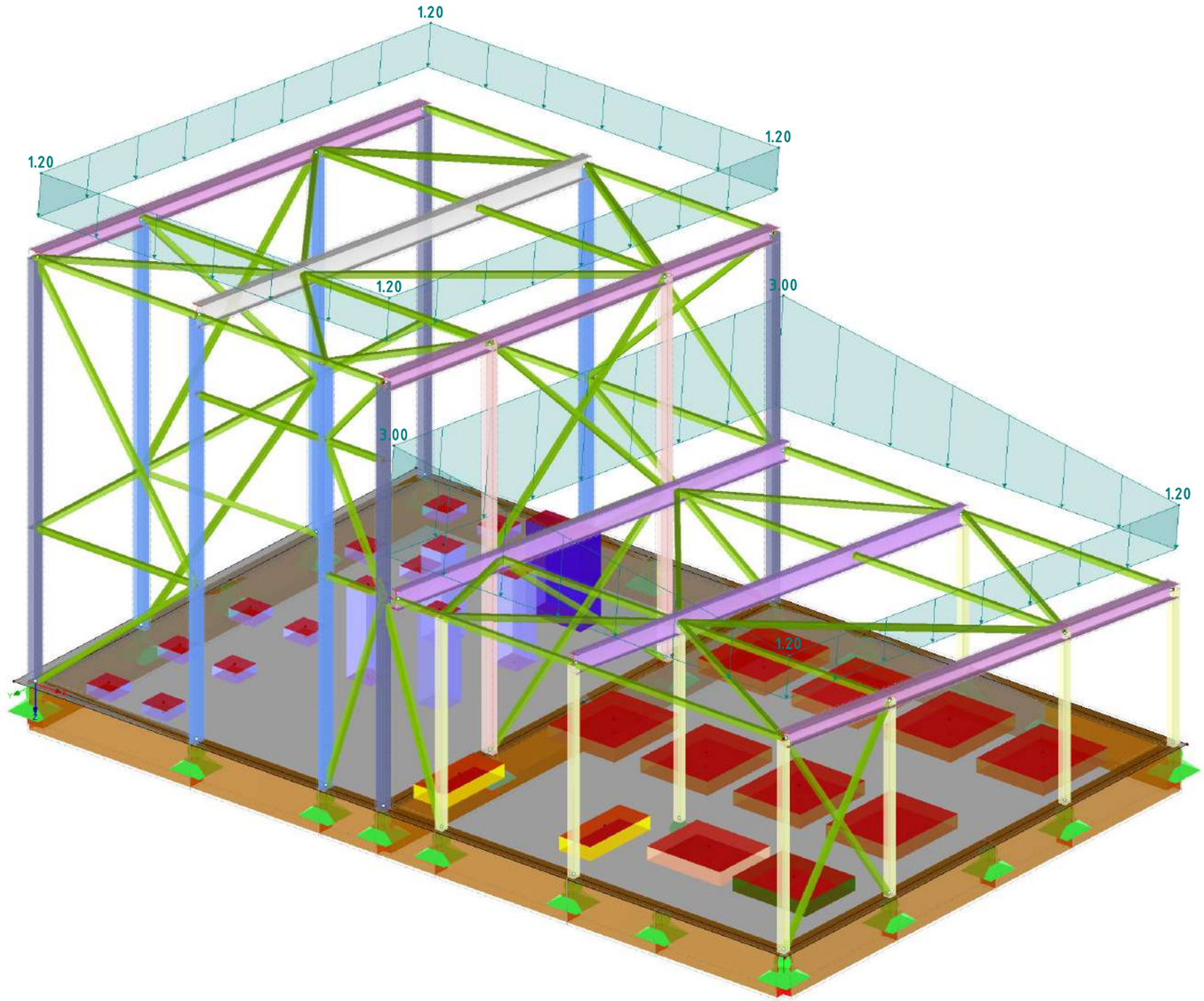
Isometric



LC2: [S]

LC2 : [S]
Loads [kN/m^2]

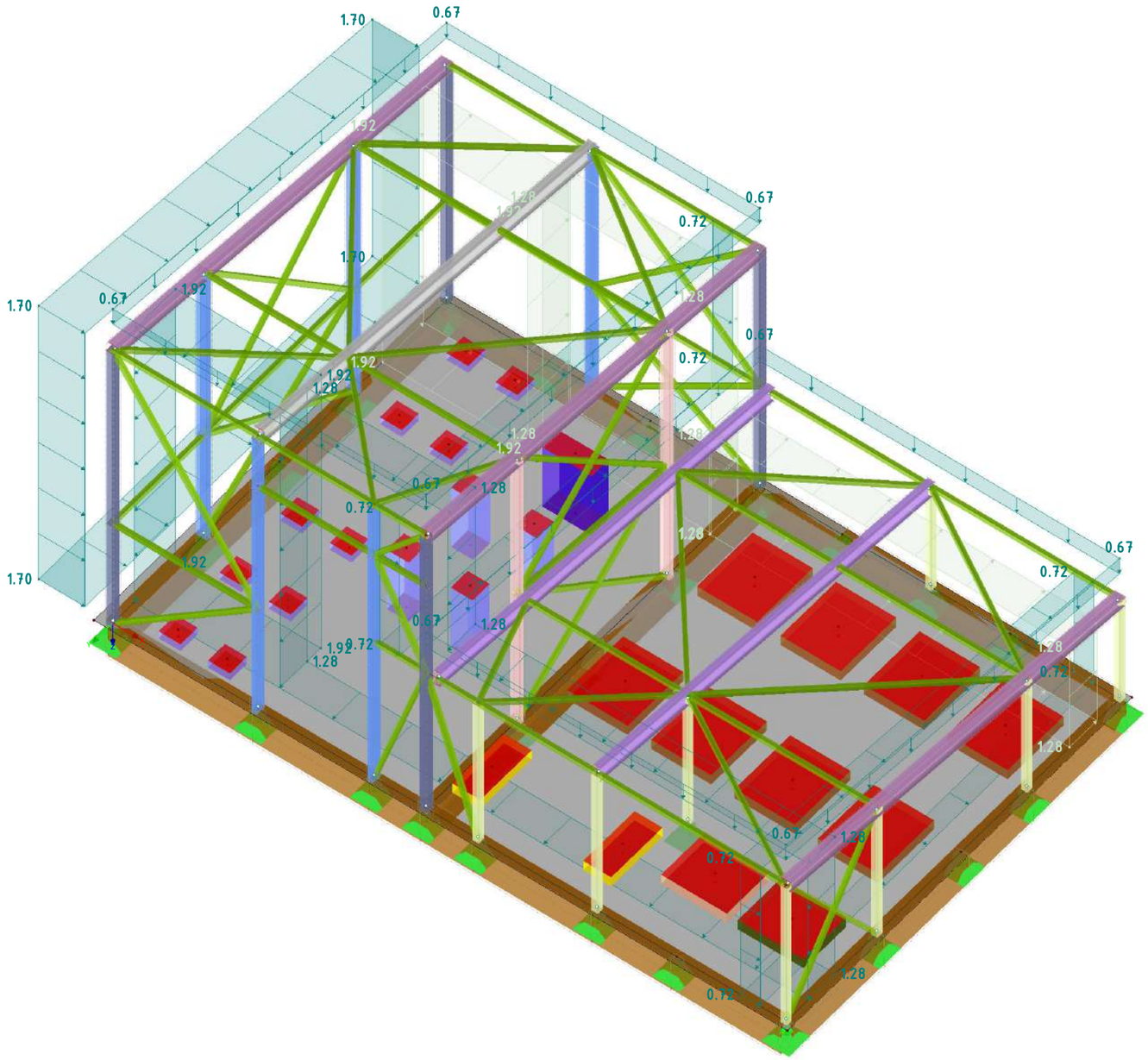
Isometric



LC3: [W+X]

LC3 : [W+x]
Loads [kN/m^2]

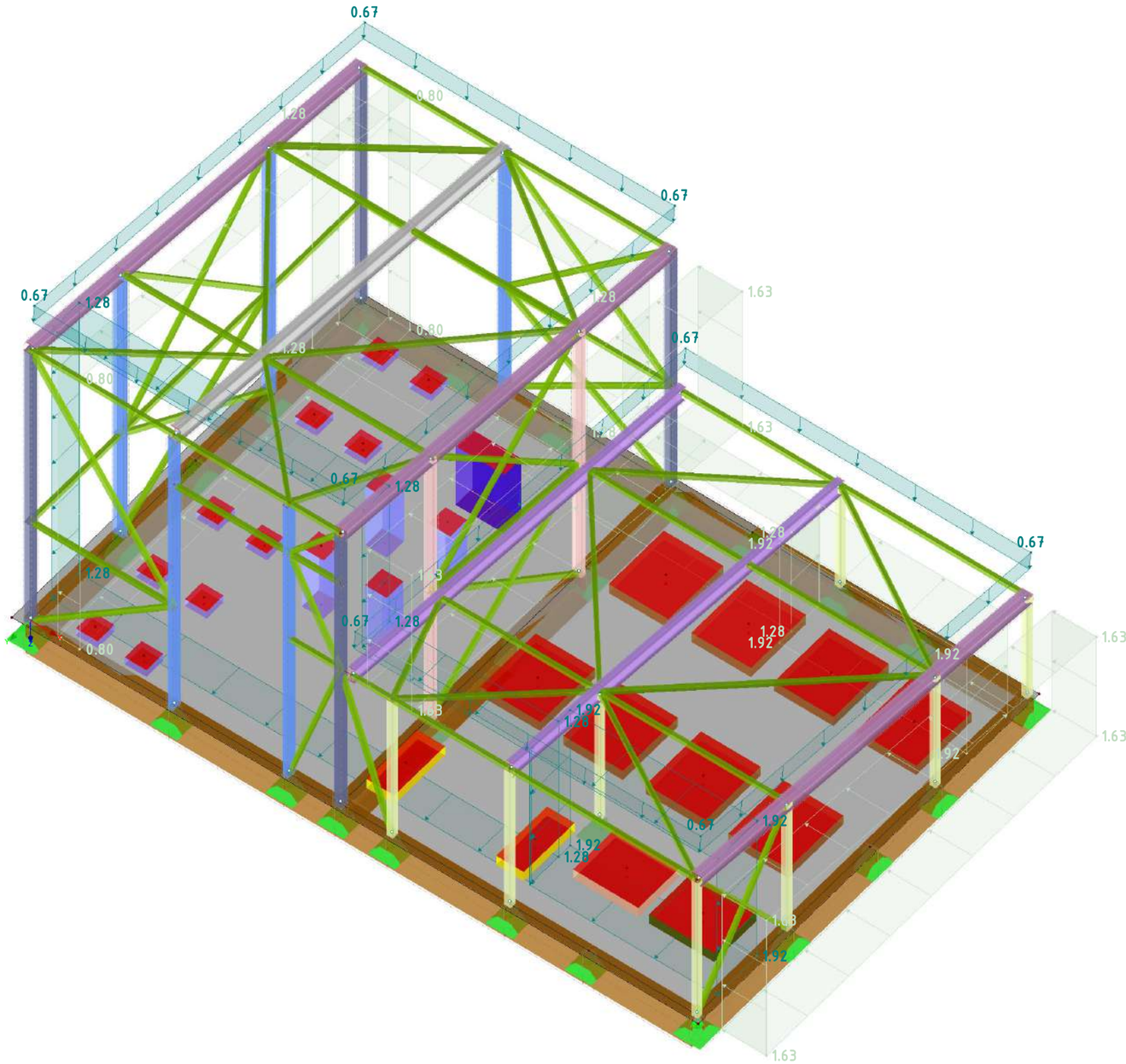
Isometric



LC4: [W-X]

LC4 : [W-x]
Loads [kN/m^2]

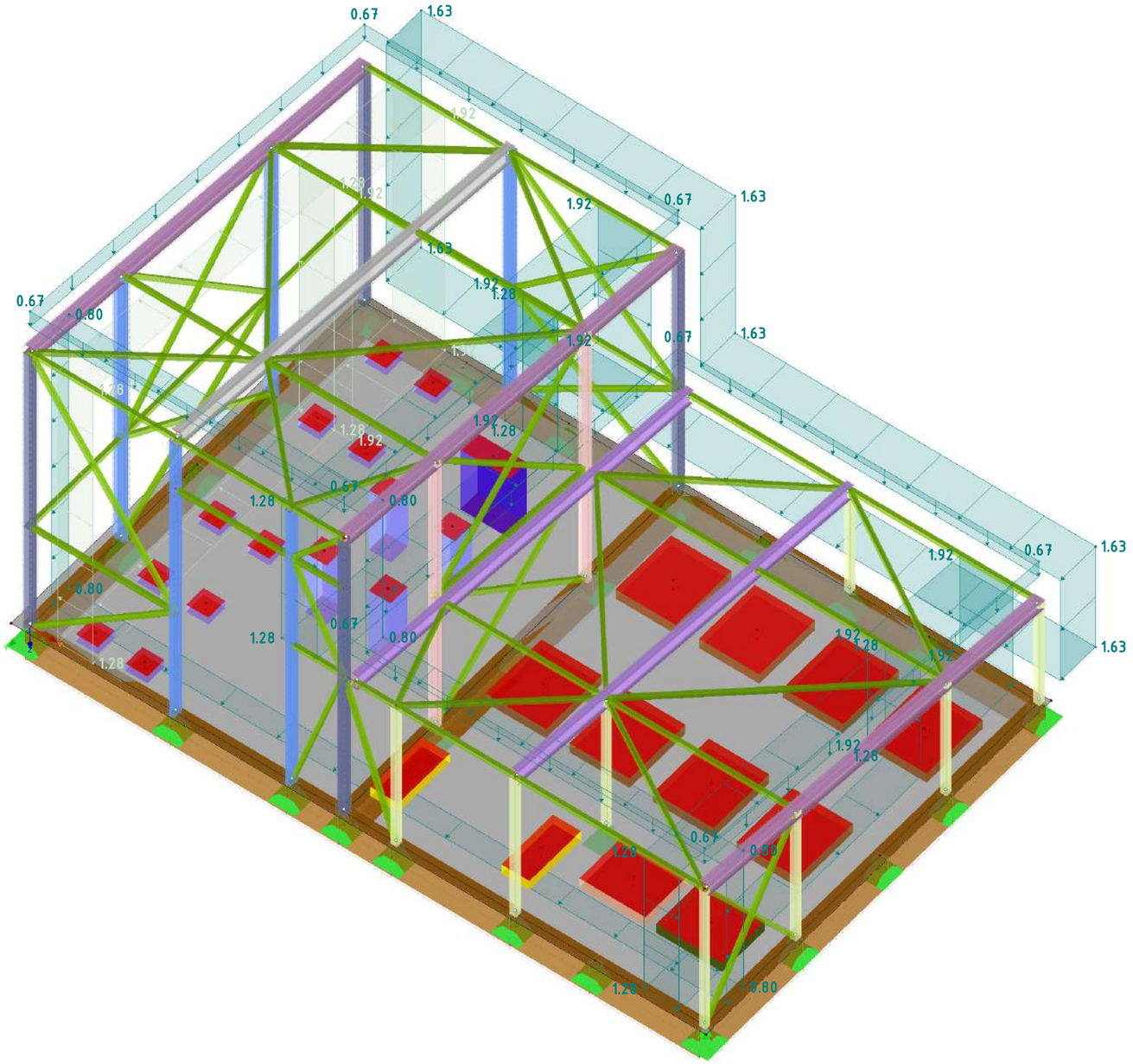
Isometric



LC5: [W+Y]

LC5 : [W+y]
Loads [kN/m^2]

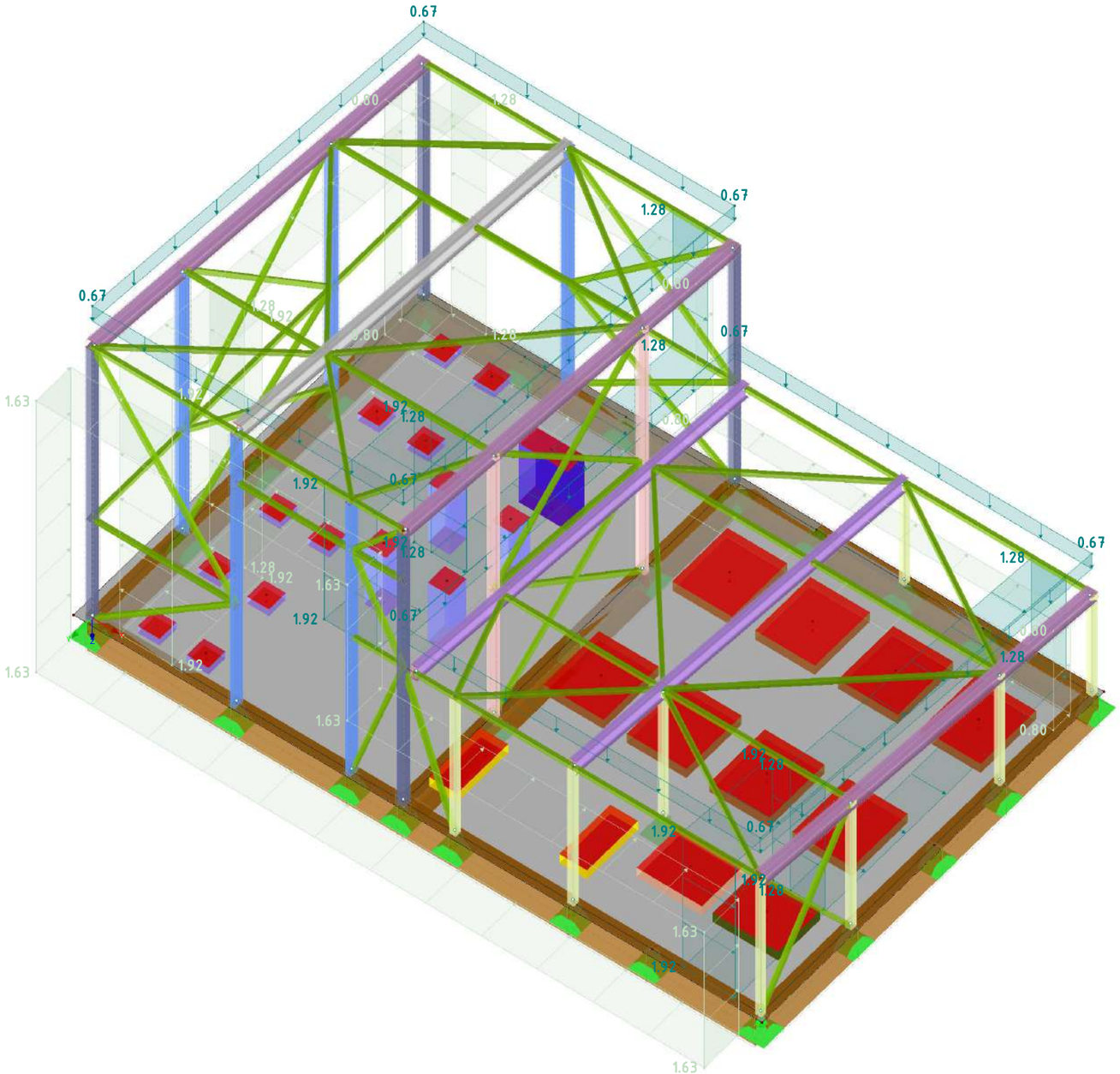
Isometric



LC6: [W-Y]

LC6 : [W-y]
Loads [kN/m^2]

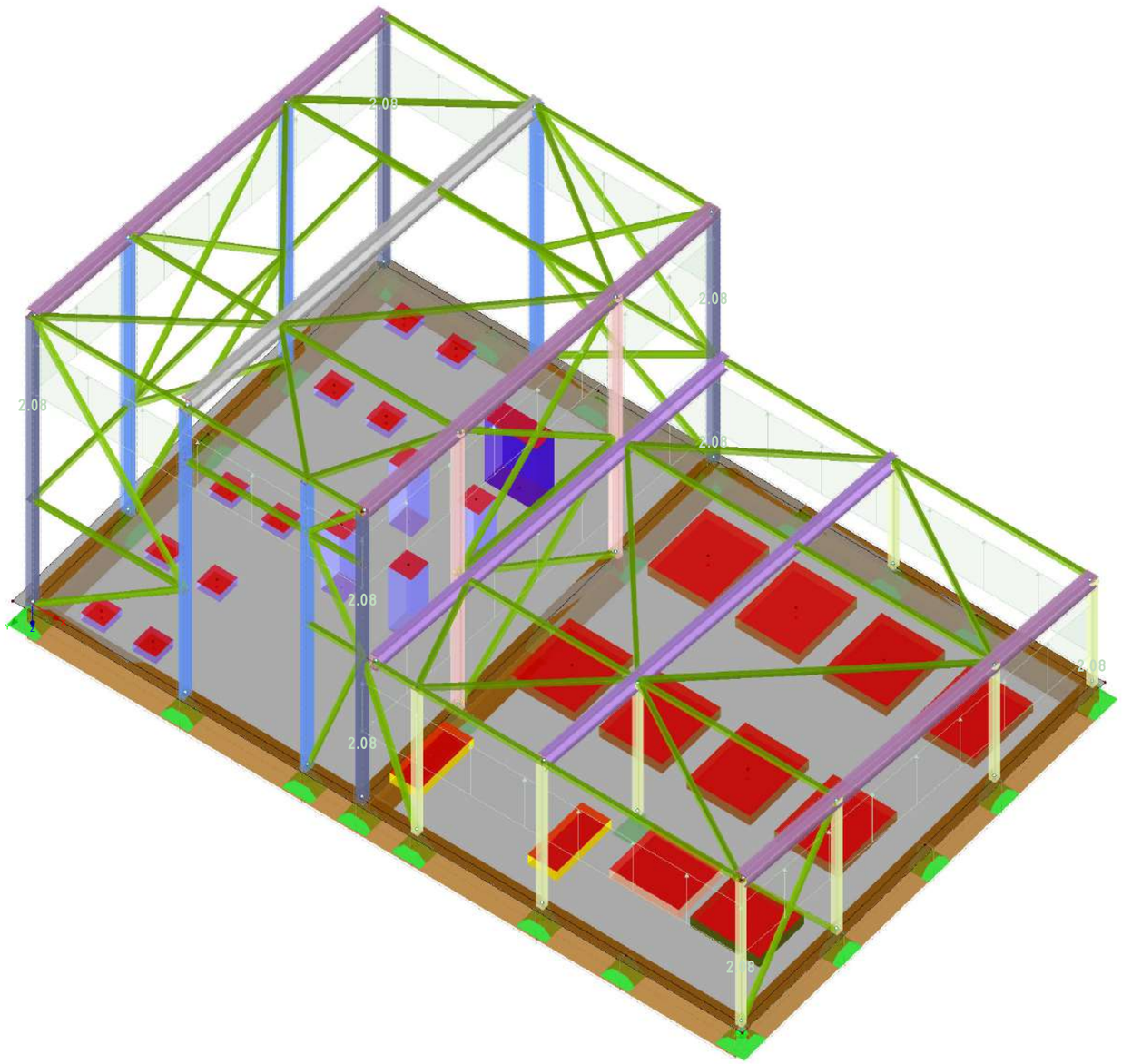
Isometric



LC7: [W+SIURB]

LC7 : [W+siurb]
Loads [kN/m^2]

Isometric



4.1 NODES - SUPPORT FORCES

Result Combinations

Node No.	RC		Support Forces [kN] P_X	P_Y	P_Z	Support Moments [kNm] M_X	M_Y	M_Z	
2	RC1	Max	54.40	-7.83	52.95	0.00	0.00	-1.33	ULS (STR/GEO)
		Min	6.05	-17.21	-32.33	0.00	0.00	-1.36	ULS (STR/GEO)
	RC2	Max	41.05	-5.68	40.44	0.00	0.00	-0.98	SLS - Characteristic
		Min	3.87	-12.91	-25.14	0.00	0.00	-1.01	SLS - Characteristic
	RC3	Max	24.67	-8.29	13.92	0.00	0.00	-1.00	SLS - Frequent
		Min	17.22	-9.75	0.70	0.00	0.00	-1.00	SLS - Frequent
	RC4	Max	20.57	-8.95	7.51	0.00	0.00	-1.00	SLS - Quasi-permanent
		Min	20.52	-8.95	7.16	0.00	0.00	-1.00	SLS - Quasi-permanent
4	RC1	Max	3.93	-7.88	26.31	0.00	0.00	-5.11	ULS (STR/GEO)
		Min	3.53	-12.43	-0.53	0.00	0.00	-5.59	ULS (STR/GEO)
	RC2	Max	2.92	-5.78	19.96	0.00	0.00	-3.77	SLS - Characteristic
		Min	2.61	-9.28	-0.68	0.00	0.00	-4.15	SLS - Characteristic
	RC3	Max	2.81	-6.89	9.87	0.00	0.00	-3.95	SLS - Frequent
		Min	2.74	-7.59	5.60	0.00	0.00	-4.03	SLS - Frequent
	RC4	Max	2.78	-7.16	7.67	0.00	0.00	-4.00	SLS - Quasi-permanent
		Min	2.76	-7.16	7.16	0.00	0.00	-4.00	SLS - Quasi-permanent
6	RC1	Max	20.40	15.32	-2.86	0.00	0.00	0.68	ULS (STR/GEO)
		Min	-1.80	10.47	-12.36	0.00	0.00	0.26	ULS (STR/GEO)
	RC2	Max	15.38	11.43	-1.99	0.00	0.00	0.51	SLS - Characteristic
		Min	-1.69	7.70	-9.29	0.00	0.00	0.18	SLS - Characteristic
	RC3	Max	9.51	9.75	-4.79	0.00	0.00	0.46	SLS - Frequent
		Min	6.02	9.00	-6.27	0.00	0.00	0.39	SLS - Frequent
	RC4	Max	8.04	9.34	-5.45	0.00	0.00	0.45	SLS - Quasi-permanent
		Min	7.79	9.32	-5.52	0.00	0.00	0.45	SLS - Quasi-permanent
8	RC1	Max	23.59	27.09	82.11	0.00	0.00	0.94	ULS (STR/GEO)
		Min	-22.11	11.73	-56.09	0.00	0.00	-0.59	ULS (STR/GEO)
	RC2	Max	18.16	20.32	62.85	0.00	0.00	0.72	SLS - Characteristic
		Min	-16.98	8.50	-43.41	0.00	0.00	-0.46	SLS - Characteristic
	RC3	Max	3.37	14.82	18.71	0.00	0.00	0.32	SLS - Frequent
		Min	-3.78	12.42	-2.89	0.00	0.00	0.08	SLS - Frequent
	RC4	Max	-0.08	13.44	8.44	0.00	0.00	0.22	SLS - Quasi-permanent
		Min	-0.48	13.35	7.24	0.00	0.00	0.22	SLS - Quasi-permanent
10	RC1	Max	-13.39	6.72	42.30	0.00	0.00	1.43	ULS (STR/GEO)
		Min	-20.51	-26.23	-11.74	0.00	0.00	1.37	ULS (STR/GEO)
	RC2	Max	-9.81	5.42	32.03	0.00	0.00	1.06	SLS - Characteristic
		Min	-15.29	-19.92	-9.52	0.00	0.00	1.01	SLS - Characteristic
	RC3	Max	-12.17	-4.10	17.19	0.00	0.00	1.04	SLS - Frequent
		Min	-13.27	-9.37	8.40	0.00	0.00	1.04	SLS - Frequent
	RC4	Max	-12.76	-6.06	14.49	0.00	0.00	1.04	SLS - Quasi-permanent
		Min	-12.76	-6.73	12.88	0.00	0.00	1.04	SLS - Quasi-permanent
12	RC1	Max	20.27	-0.37	56.59	0.00	0.00	2.64	ULS (STR/GEO)
		Min	20.15	-0.54	56.59	0.00	0.00	2.63	ULS (STR/GEO)
	RC2	Max	15.02	-0.27	41.92	0.00	0.00	1.95	SLS - Characteristic
		Min	14.93	-0.40	41.92	0.00	0.00	1.95	SLS - Characteristic
	RC3	Max	14.98	-0.32	41.92	0.00	0.00	1.95	SLS - Frequent
		Min	14.96	-0.34	41.92	0.00	0.00	1.95	SLS - Frequent
	RC4	Max	14.97	-0.33	41.92	0.00	0.00	1.95	SLS - Quasi-permanent
		Min	14.97	-0.33	41.92	0.00	0.00	1.95	SLS - Quasi-permanent
14	RC1	Max	-11.68	21.58	4.42	0.00	0.00	0.04	ULS (STR/GEO)
		Min	-17.36	12.81	-2.18	0.00	0.00	-0.18	ULS (STR/GEO)
	RC2	Max	-8.57	16.10	3.37	0.00	0.00	0.03	SLS - Characteristic
		Min	-12.93	9.35	-1.71	0.00	0.00	-0.13	SLS - Characteristic
	RC3	Max	-10.44	13.61	1.75	0.00	0.00	-0.06	SLS - Frequent
		Min	-11.32	12.26	0.31	0.00	0.00	-0.09	SLS - Frequent
	RC4	Max	-10.91	12.99	1.19	0.00	0.00	-0.08	SLS - Quasi-permanent
		Min	-10.91	12.99	0.82	0.00	0.00	-0.08	SLS - Quasi-permanent
16	RC1	Max	12.67	-0.20	64.16	0.00	0.00	8.51	ULS (STR/GEO)
		Min	12.44	-2.27	63.86	0.00	0.00	8.46	ULS (STR/GEO)
	RC2	Max	9.39	-0.15	47.52	0.00	0.00	6.30	SLS - Characteristic
		Min	9.21	-1.74	47.29	0.00	0.00	6.27	SLS - Characteristic
	RC3	Max	9.33	-0.20	47.52	0.00	0.00	6.28	SLS - Frequent
		Min	9.30	-0.52	47.48	0.00	0.00	6.27	SLS - Frequent
	RC4	Max	9.32	-0.22	47.52	0.00	0.00	6.27	SLS - Quasi-permanent
		Min	9.32	-0.22	47.52	0.00	0.00	6.27	SLS - Quasi-permanent
20	RC1	Max	-26.55	18.26	179.00	0.00	0.00	0.13	ULS (STR/GEO)
		Min	-27.04	-13.76	82.03	0.00	0.00	0.10	ULS (STR/GEO)
	RC2	Max	-19.66	13.98	134.46	0.00	0.00	0.10	SLS - Characteristic
		Min	-20.04	-10.64	59.92	0.00	0.00	0.07	SLS - Characteristic
	RC3	Max	-19.78	4.39	93.87	0.00	0.00	0.09	SLS - Frequent
		Min	-19.85	-0.53	78.20	0.00	0.00	0.08	SLS - Frequent
	RC4	Max	-19.81	1.99	85.36	0.00	0.00	0.08	SLS - Quasi-permanent
		Min	-19.81	1.99	82.77	0.00	0.00	0.08	SLS - Quasi-permanent
22	RC1	Max	8.00	5.25	94.30	0.00	0.00	10.74	ULS (STR/GEO)
		Min	-52.04	-5.61	33.66	0.00	0.00	9.67	ULS (STR/GEO)
	RC2	Max	6.68	4.02	70.87	0.00	0.00	7.97	SLS - Characteristic
		Min	-39.49	-4.34	24.24	0.00	0.00	7.15	SLS - Characteristic
	RC3	Max	-9.77	1.24	48.96	0.00	0.00	7.58	SLS - Frequent
		Min	-19.21	-0.45	39.33	0.00	0.00	7.41	SLS - Frequent
	RC4	Max	-13.88	0.54	44.13	0.00	0.00	7.48	SLS - Quasi-permanent
		Min	-14.58	0.48	43.10	0.00	0.00	7.46	SLS - Quasi-permanent
26	RC1	Max	-2.18	11.61	85.86	0.00	0.00	-5.01	ULS (STR/GEO)
		Min	-2.55	-3.93	41.21	0.00	0.00	-5.09	ULS (STR/GEO)
	RC2	Max	-1.61	8.83	64.30	0.00	0.00	-3.71	SLS - Characteristic
		Min	-1.89	-3.12	29.96	0.00	0.00	-3.77	SLS - Characteristic
	RC3	Max	-1.73	3.95	53.16	0.00	0.00	-3.73	SLS - Frequent
		Min	-1.79	1.56	42.28	0.00	0.00	-3.74	SLS - Frequent
	RC4	Max	-1.76	2.73	48.48	0.00	0.00	-3.74	SLS - Quasi-permanent
		Min	-1.76	2.73	45.36	0.00	0.00	-3.74	SLS - Quasi-permanent
28	RC1	Max	9.38	14.36	107.97	0.00	0.00	9.21	ULS (STR/GEO)
		Min	-6.39	-3.79	54.88	0.00	0.00	9.15	ULS (STR/GEO)
	RC2	Max	7.16	10.83	81.05	0.00	0.00	6.82	SLS - Characteristic
		Min	-4.96	-3.13	40.22	0.00	0.00	6.78	SLS - Characteristic
	RC3	Max	2.50	6.64	57.76	0.00	0.00	6.81	SLS - Frequent
		Min	0.07	3.76	49.50	0.00	0.00	6.80	SLS - Frequent

4.1 NODES - SUPPORT FORCES

Result Combinations

Node No.	RC		Support Forces [kN] P_X	P_Y	P_Z	Support Moments [kNm] M_X	M_Y	M_Z	
28	RC4	Max	1.33	5.78	52.16	0.00	0.00	6.80	SLS - Quasi-permanent
		Min	1.33	5.48	51.82	0.00	0.00	6.80	SLS - Quasi-permanent
32	RC1	Max	-1.42	2.47	265.83	0.00	0.00	0.12	ULS (STR/GEO)
		Min	-1.81	1.16	156.21	0.00	0.00	0.10	ULS (STR/GEO)
	RC2	Max	-1.04	1.87	198.61	0.00	0.00	0.09	SLS - Characteristic
		Min	-1.34	0.85	114.30	0.00	0.00	0.08	SLS - Characteristic
	RC3	Max	-1.15	1.37	171.78	0.00	0.00	0.09	SLS - Frequent
		Min	-1.21	1.11	144.82	0.00	0.00	0.08	SLS - Frequent
	RC4	Max	-1.18	1.26	160.18	0.00	0.00	0.08	SLS - Quasi-permanent
		Min	-1.18	1.18	152.45	0.00	0.00	0.08	SLS - Quasi-permanent
34	RC1	Max	-0.96	42.42	221.73	0.00	0.00	5.09	ULS (STR/GEO)
		Min	-3.10	-4.21	117.13	0.00	0.00	4.65	ULS (STR/GEO)
	RC2	Max	-0.70	32.26	166.33	0.00	0.00	3.78	SLS - Characteristic
		Min	-2.34	-3.60	85.90	0.00	0.00	3.44	SLS - Characteristic
	RC3	Max	-1.05	14.43	122.26	0.00	0.00	3.61	SLS - Frequent
		Min	-1.41	6.91	104.64	0.00	0.00	3.54	SLS - Frequent
	RC4	Max	-1.14	10.71	114.48	0.00	0.00	3.57	SLS - Quasi-permanent
		Min	-1.24	9.53	109.32	0.00	0.00	3.56	SLS - Quasi-permanent
38	RC1	Max	0.02	-3.50	244.90	0.00	0.00	-5.50	ULS (STR/GEO)
		Min	-1.31	-21.70	148.80	0.00	0.00	-5.82	ULS (STR/GEO)
	RC2	Max	0.03	-2.24	183.12	0.00	0.00	-4.07	SLS - Characteristic
		Min	-1.00	-16.23	109.22	0.00	0.00	-4.32	SLS - Characteristic
	RC3	Max	-0.20	-9.87	146.84	0.00	0.00	-4.20	SLS - Frequent
		Min	-0.43	-12.86	131.27	0.00	0.00	-4.25	SLS - Frequent
	RC4	Max	-0.25	-11.37	139.41	0.00	0.00	-4.23	SLS - Quasi-permanent
		Min	-0.32	-12.01	136.78	0.00	0.00	-4.24	SLS - Quasi-permanent
46	RC1	Max	-1.89	2.61	78.00	0.00	0.00	-15.69	ULS (STR/GEO)
		Min	-21.36	-14.85	-9.47	0.00	0.00	-15.71	ULS (STR/GEO)
	RC2	Max	-1.18	2.15	59.08	0.00	0.00	-11.62	SLS - Characteristic
		Min	-16.14	-11.29	-8.16	0.00	0.00	-11.64	SLS - Characteristic
	RC3	Max	-6.05	-2.43	30.51	0.00	0.00	-11.63	SLS - Frequent
		Min	-9.06	-5.12	17.02	0.00	0.00	-11.63	SLS - Frequent
	RC4	Max	-7.27	-3.57	23.50	0.00	0.00	-11.63	SLS - Quasi-permanent
		Min	-7.31	-3.58	23.31	0.00	0.00	-11.63	SLS - Quasi-permanent
51	RC1	Max	15.40	8.54	39.19	0.00	0.00	-1.40	ULS (STR/GEO)
		Min	-6.65	-0.43	-30.36	0.00	0.00	-1.41	ULS (STR/GEO)
	RC2	Max	11.68	6.44	29.91	0.00	0.00	-1.03	SLS - Characteristic
		Min	-5.27	-0.47	-23.55	0.00	0.00	-1.04	SLS - Characteristic
	RC3	Max	5.66	4.07	10.59	0.00	0.00	-1.04	SLS - Frequent
		Min	2.24	2.69	-0.18	0.00	0.00	-1.04	SLS - Frequent
	RC4	Max	4.21	3.48	5.93	0.00	0.00	-1.04	SLS - Quasi-permanent
		Min	4.12	3.48	5.66	0.00	0.00	-1.04	SLS - Quasi-permanent
55	RC1	Max	7.76	-19.02	94.28	0.00	0.00	-8.41	ULS (STR/GEO)
		Min	-6.58	-20.08	64.94	0.00	0.00	-8.51	ULS (STR/GEO)
	RC2	Max	5.95	-14.09	70.24	0.00	0.00	-6.23	SLS - Characteristic
		Min	-5.09	-14.90	47.67	0.00	0.00	-6.30	SLS - Characteristic
	RC3	Max	1.71	-14.15	63.53	0.00	0.00	-6.26	SLS - Frequent
		Min	-0.50	-14.31	56.98	0.00	0.00	-6.27	SLS - Frequent
	RC4	Max	0.64	-14.16	61.00	0.00	0.00	-6.26	SLS - Quasi-permanent
		Min	0.64	-14.17	59.31	0.00	0.00	-6.26	SLS - Quasi-permanent
122	RC1	Max	4.26	1.36	59.58	0.00	0.00	0.34	ULS (STR/GEO)
		Min	3.09	-0.71	59.50	0.00	0.00	0.31	ULS (STR/GEO)
	RC2	Max	3.17	1.03	44.14	0.00	0.00	0.25	SLS - Characteristic
		Min	2.27	-0.56	44.07	0.00	0.00	0.23	SLS - Characteristic
	RC3	Max	2.72	0.52	44.13	0.00	0.00	0.25	SLS - Frequent
		Min	2.54	0.20	44.11	0.00	0.00	0.24	SLS - Frequent
	RC4	Max	2.60	0.40	44.12	0.00	0.00	0.24	SLS - Quasi-permanent
		Min	2.60	0.39	44.12	0.00	0.00	0.24	SLS - Quasi-permanent
123	RC1	Max	13.95	4.84	139.98	0.00	0.00	-8.48	ULS (STR/GEO)
		Min	-10.68	-7.39	45.98	0.00	0.00	-10.18	ULS (STR/GEO)
	RC2	Max	10.74	3.72	105.24	0.00	0.00	-6.26	SLS - Characteristic
		Min	-8.20	-5.67	32.96	0.00	0.00	-7.56	SLS - Characteristic
	RC3	Max	2.18	0.68	71.67	0.00	0.00	-6.76	SLS - Frequent
		Min	-1.84	-1.21	56.79	0.00	0.00	-7.03	SLS - Frequent
	RC4	Max	0.53	-0.09	64.18	0.00	0.00	-6.87	SLS - Quasi-permanent
		Min	-0.25	-0.12	62.74	0.00	0.00	-6.90	SLS - Quasi-permanent
124	RC1	Max	14.69	-0.60	21.21	0.00	0.00	-13.05	ULS (STR/GEO)
		Min	13.84	-3.34	20.23	0.00	0.00	-13.23	ULS (STR/GEO)
	RC2	Max	10.90	-0.43	15.72	0.00	0.00	-9.67	SLS - Characteristic
		Min	10.24	-2.53	14.97	0.00	0.00	-9.81	SLS - Characteristic
	RC3	Max	10.59	-0.91	15.51	0.00	0.00	-9.67	SLS - Frequent
		Min	10.46	-1.33	15.36	0.00	0.00	-9.70	SLS - Frequent
	RC4	Max	10.52	-1.03	15.46	0.00	0.00	-9.68	SLS - Quasi-permanent
		Min	10.51	-1.04	15.45	0.00	0.00	-9.68	SLS - Quasi-permanent
126	RC1	Max	-0.98	4.36	164.14	0.00	0.00	-3.00	ULS (STR/GEO)
		Min	-1.94	-7.40	155.74	0.00	0.00	-3.03	ULS (STR/GEO)
	RC2	Max	-0.72	3.37	121.74	0.00	0.00	-2.22	SLS - Characteristic
		Min	-1.46	-5.66	115.28	0.00	0.00	-2.24	SLS - Characteristic
	RC3	Max	-0.87	0.13	118.48	0.00	0.00	-2.22	SLS - Frequent
		Min	-1.02	-1.74	117.10	0.00	0.00	-2.23	SLS - Frequent
	RC4	Max	-0.91	-0.69	117.82	0.00	0.00	-2.22	SLS - Quasi-permanent
		Min	-0.92	-0.88	117.56	0.00	0.00	-2.22	SLS - Quasi-permanent
127	RC1	Max	-2.53	4.70	50.24	0.00	0.00	2.02	ULS (STR/GEO)
		Min	-2.69	4.46	50.23	0.00	0.00	1.97	ULS (STR/GEO)
	RC2	Max	-1.87	3.48	37.21	0.00	0.00	1.50	SLS - Characteristic
		Min	-1.99	3.30	37.20	0.00	0.00	1.46	SLS - Characteristic
	RC3	Max	-1.91	3.47	37.21	0.00	0.00	1.47	SLS - Frequent
		Min	-1.93	3.43	37.21	0.00	0.00	1.46	SLS - Frequent
	RC4	Max	-1.92	3.46	37.21	0.00	0.00	1.46	SLS - Quasi-permanent
		Min	-1.92	3.46	37.21	0.00	0.00	1.46	SLS - Quasi-permanent
131	RC1	Max	-0.32	11.29	11.30	0.00	0.00	6.16	ULS (STR/GEO)
		Min	-0.50	-6.91	5.75	0.00	0.00	6.12	ULS (STR/GEO)
	RC2	Max	-0.23	8.62	8.43	0.00	0.00	4.56	SLS - Characteristic
		Min	-0.37	-5.38	4.17	0.00	0.00	4.53	SLS - Characteristic

4.1 NODES - SUPPORT FORCES

Result Combinations

Node No.	RC		Support Forces [kN] P_X	P_Y	P_Z	Support Moments [kNm] M_X	M_Y	M_Z	
131	RC3	Max	-0.29	3.00	7.06	0.00	0.00	4.55	SLS - Frequent
		Min	-0.32	0.20	5.85	0.00	0.00	4.54	SLS - Frequent
	RC4	Max	-0.31	1.60	6.72	0.00	0.00	4.55	SLS - Quasi-permanent
		Min	-0.31	1.59	6.37	0.00	0.00	4.55	SLS - Quasi-permanent
132	RC1	Max	15.78	30.45	142.08	0.00	0.00	-13.49	ULS (STR/GEO)
		Min	-18.12	-6.42	48.73	0.00	0.00	-13.53	ULS (STR/GEO)
	RC2	Max	12.21	23.13	106.77	0.00	0.00	-9.99	SLS - Characteristic
		Min	-13.85	-5.23	34.99	0.00	0.00	-10.02	SLS - Characteristic
	RC3	Max	1.11	10.95	74.22	0.00	0.00	-10.00	SLS - Frequent
		Min	-4.09	5.15	59.19	0.00	0.00	-10.01	SLS - Frequent
	RC4	Max	-1.66	8.18	67.48	0.00	0.00	-10.01	SLS - Quasi-permanent
		Min	-1.66	7.74	65.24	0.00	0.00	-10.01	SLS - Quasi-permanent
133	RC1	Max	18.50	6.81	123.87	0.00	0.00	13.76	ULS (STR/GEO)
		Min	-16.40	-30.25	34.80	0.00	0.00	13.65	ULS (STR/GEO)
	RC2	Max	14.24	5.58	93.15	0.00	0.00	10.20	SLS - Characteristic
		Min	-12.58	-22.92	24.66	0.00	0.00	10.11	SLS - Characteristic
	RC3	Max	2.52	-6.05	62.80	0.00	0.00	10.17	SLS - Frequent
		Min	-2.84	-11.87	49.02	0.00	0.00	10.15	SLS - Frequent
	RC4	Max	-0.41	-8.72	55.21	0.00	0.00	10.16	SLS - Quasi-permanent
		Min	-0.42	-9.11	54.94	0.00	0.00	10.16	SLS - Quasi-permanent

4.5 MEMBERS - GLOBAL DEFORMATIONS

Result Combinations

Member No.	RC	Node No.	Location x [mm]		Displacements [mm] u_x	u_y	u_z	Rotations [mrad] φ_x	φ_y	φ_z	Section
21	RC2	23	2131	Max u_x	2	1	0	-0.2	0.8	-0.1	
											29 - HE A 200 | Euronorm 53-62
21	RC2	23	2131	Min u_x	-2	0	0	-0.0	-0.3	-0.0	CO 60
21	RC2		1066	Max u_y	-0	1	0	-0.1	-1.0	0.1	CO 66
21	RC2	1	0	Min u_y	-0	-1	0	0.0	-1.8	0.1	CO 62
21	RC2		533	Max u_z	-2	0	0	0.0	-0.4	-0.1	CO 65
21	RC2	1	0	Min u_z	2	0	-0	-0.2	1.3	0.0	CO 59
22	RC2		1598	Max u_x	2	0	0	-0.0	-0.8	0.1	
											29 - HE A 200 | Euronorm 53-62
22	RC2	33	2131	Min u_x	-2	0	0	-0.1	0.3	-0.0	CO 60
22	RC2	33	2131	Max u_y	-0	1	0	-0.2	-1.9	0.2	CO 66
22	RC2	3	0	Min u_y	-0	-1	-0	-0.1	0.3	0.0	CO 62
22	RC2	33	2131	Max u_z	-0	1	0	-0.2	-1.9	0.2	CO 66
22	RC2	3	0	Min u_z	-0	-1	-0	-0.1	0.3	0.0	CO 62
23	RC2		1776	Max u_x	1	0	-0	-0.9	-0.3	0.0	
											19 - IPE 270 | Euronorm 19-57
23	RC2	31	2131	Min u_x	-1	0	0	-0.9	0.3	-0.0	CO 60
23	RC2	31	2131	Max u_y	1	1	0	-1.6	-0.2	0.0	CO 66
23	RC2		710	Min u_y	1	-1	-0	0.1	-0.2	0.1	CO 62
23	RC2	31	2131	Max u_z	-1	0	0	-1.8	0.2	-0.0	CO 49
23	RC2		1066	Min u_z	0	-0	-0	-0.1	-0.1	0.0	CO 51
24	RC2	9	0	Max u_x	1	0	0	-0.1	1.2	-0.1	
											29 - HE A 200 | Euronorm 53-62
24	RC2	27	2131	Min u_x	-1	0	0	-0.1	-0.8	0.1	CO 60
24	RC2		533	Max u_y	1	0	0	-0.0	1.0	-0.1	CO 66
24	RC2	9	0	Min u_y	1	-0	-0	-0.2	2.0	-0.1	CO 62
24	RC2	27	2131	Max u_z	1	-0	0	-0.2	1.2	-0.1	CO 67
24	RC2	9	0	Min u_z	1	-0	-0	-0.2	2.0	-0.1	CO 62
25	RC2		1421	Max u_x	1	-0	0	-0.1	-1.0	0.0	
											19 - IPE 270 | Euronorm 19-57
25	RC2		1421	Min u_x	-1	0	0	-0.0	0.4	-0.0	CO 65
25	RC2	115	2131	Max u_y	1	1	1	-0.2	-1.6	0.8	CO 66
25	RC2	112	0	Min u_y	1	-0	0	-0.2	-0.2	0.7	CO 62
25	RC2	115	2131	Max u_z	1	1	1	-0.2	-1.6	0.8	CO 66
25	RC2	112	0	Min u_z	-1	0	-0	-0.0	0.3	-0.4	CO 60
26	RC2		1776	Max u_x	2	2	15	-6.5	-0.3	0.0	
											27 - IPE 300 | Euronorm 19-57
26	RC2	54	2131	Min u_x	-2	1	12	-3.9	0.1	-0.0	CO 60
26	RC2	54	2131	Max u_y	-0	3	17	-5.7	0.3	-0.1	CO 66
26	RC2	19	0	Min u_y	-0	-1	0	-6.2	0.4	-0.1	CO 62
26	RC2	54	2131	Max u_z	1	2	18	-5.8	-0.2	0.0	CO 48
26	RC2	54	2131	Min u_z	-0	-0	-5	1.8	0.0	0.0	CO 63
27	RC2	23	0	Max u_x	2	1	0	-0.2	0.8	-0.1	
											29 - HE A 200 | Euronorm 53-62
27	RC2		503	Min u_x	-2	0	0	-0.1	-0.2	0.0	CO 60
27	RC2		1508	Max u_y	-0	1	0	0.0	-0.8	0.1	CO 66
27	RC2	23	0	Min u_y	-0	-1	-0	-0.1	-1.2	0.1	CO 62
27	RC2		1508	Max u_z	1	1	1	-0.0	0.3	-0.1	CO 48
27	RC2		2011	Min u_z	-0	0	-0	-0.0	0.0	0.0	CO 63
28	RC2	25	0	Max u_x	2	1	0	0.2	0.3	-0.2	
											29 - HE A 200 | Euronorm 53-62
28	RC2	25	0	Min u_x	-2	0	0	0.1	-0.0	0.1	CO 60
28	RC2	5	2181	Max u_y	-0	1	0	0.0	-0.8	0.1	CO 66
28	RC2	5	2181	Min u_y	-0	-1	0	0.2	-0.5	0.1	CO 62
28	RC2	25	0	Max u_z	-0	-1	0	0.1	-0.6	0.1	CO 67
28	RC2		364	Min u_z	-0	1	-0	0.0	-0.7	0.1	CO 61
29	RC2	27	0	Max u_x	1	0	0	-0.2	0.3	-0.0	
											29 - HE A 200 | Euronorm 53-62
29	RC2	27	0	Min u_x	-1	0	0	-0.1	-0.8	0.1	CO 60
29	RC2		2011	Max u_y	1	0	1	0.1	0.5	-0.1	CO 66
29	RC2	29	3518	Min u_y	1	-0	0	0.1	0.4	-0.1	CO 62
29	RC2		1759	Max u_z	0	-0	1	0.0	0.5	-0.1	CO 51

4.5 MEMBERS - GLOBAL DEFORMATIONS

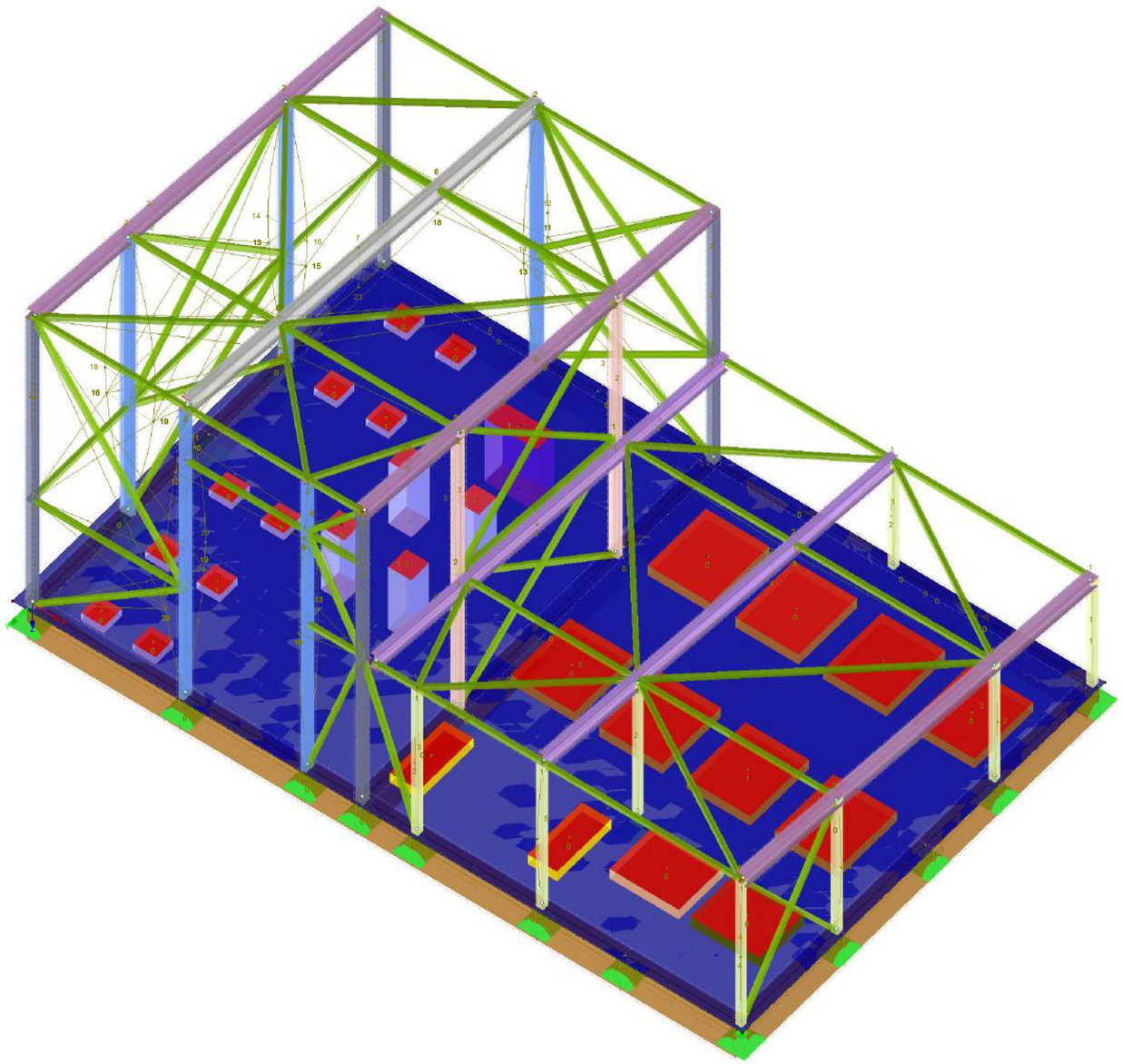
Result Combinations

Member No.	RC	Node No.	Location x [mm]		Displacements [mm] u_x	u_y	u_z	Rotations [mrad] φ_x	φ_y	φ_z	Section
29	RC2		1759	Min u_z	-0	0	-0	-0.0	-0.0	0.0	CO 63
30	RC2	29	0	Max u_x	1	0	0	0.2	0.0	-0.0	
											29 - HE A 200 | Euronorm 53-62
30	RC2	29	0	Min u_x	-1	0	0	0.1	-0.2	0.1	CO 60
30	RC2		1454	Max u_y	0	0	0	0.1	0.6	-0.2	CO 66
30	RC2	13	2181	Min u_y	0	-0	0	0.1	0.4	-0.1	CO 62
30	RC2		1091	Max u_z	0	0	0	0.0	0.3	-0.1	CO 50
30	RC2		1091	Min u_z	-0	0	-0	-0.0	0.0	-0.0	CO 63
31	RC2	113	0	Max u_x	1	1	7	1.0	-0.3	-0.0	
											19 - IPE 270 | Euronorm 19-57
31	RC2	113	0	Min u_x	-1	1	4	0.6	0.4	0.1	CO 60
31	RC2	113	0	Max u_y	1	1	7	1.0	-0.2	-0.1	CO 66
31	RC2	15	2181	Min u_y	0	-1	0	2.4	-0.2	-0.1	CO 62
31	RC2	113	0	Max u_z	0	1	8	1.1	-0.1	-0.0	CO 51
31	RC2	113	0	Min u_z	-0	-0	-2	-0.3	0.0	-0.0	CO 63
32	RC2	33	0	Max u_x	2	0	0	-0.1	-0.9	0.1	
											29 - HE A 200 | Euronorm 53-62
32	RC2	33	0	Min u_x	-2	0	0	-0.1	0.3	-0.0	CO 60
32	RC2		1508	Max u_y	-0	1	1	0.0	-2.0	0.2	CO 66
32	RC2	33	0	Min u_y	-0	-1	0	-0.2	1.1	-0.1	CO 62
32	RC2		1759	Max u_z	-1	0	1	0.0	-0.5	0.1	CO 49
32	RC2		2011	Min u_z	-0	0	-0	-0.0	-0.1	0.0	CO 63
33	RC2	37	0	Max u_x	2	0	0	0.1	-1.0	-0.1	
											29 - HE A 200 | Euronorm 53-62
33	RC2	37	0	Min u_x	-2	0	0	0.2	0.2	0.1	CO 60
33	RC2		1636	Max u_y	-0	1	0	0.0	0.4	-0.1	CO 66
33	RC2	7	2181	Min u_y	-0	-1	0	0.2	0.9	-0.0	CO 62
33	RC2	37	0	Max u_z	-0	-1	0	0.2	0.8	-0.1	CO 67
33	RC2	7	2181	Min u_z	-1	0	-0	0.2	-0.7	0.3	CO 60
57	RC2		503	Max u_x	1	1	1	-0.3	-1.7	0.2	
											19 - IPE 270 | Euronorm 19-57
57	RC2	115	0	Min u_x	-1	0	-0	-0.0	1.0	-0.1	CO 60
57	RC2		1759	Max u_y	1	1	1	0.1	-1.8	-0.3	CO 66
57	RC2	115	0	Min u_y	1	-0	0	-0.2	-1.4	-0.4	CO 62
57	RC2		1759	Max u_z	0	-0	1	-0.0	-1.5	0.1	CO 51
57	RC2		2011	Min u_z	-0	0	-0	-0.0	0.2	-0.1	CO 63
61	RC2		1091	Max u_x	1	1	0	0.1	-1.3	-0.1	
											19 - IPE 270 | Euronorm 19-57
61	RC2		727	Min u_x	-1	0	-0	0.0	0.8	-0.1	CO 60
61	RC2		1636	Max u_y	1	1	0	0.1	-1.1	-0.8	CO 66
61	RC2	114	2181	Min u_y	0	-0	0	0.2	-0.5	0.4	CO 62
61	RC2	116	0	Max u_z	1	-0	1	0.2	-1.6	-0.1	CO 67
61	RC2	114	2181	Min u_z	-1	0	-0	0.1	0.7	0.9	CO 60
87	RC2	53	0	Max u_x	2	2	17	5.6	-0.2	-0.1	
											27 - IPE 300 | Euronorm 19-57
87	RC2	53	0	Min u_x	-2	1	12	3.8	0.2	0.1	CO 60
87	RC2	53	0	Max u_y	-0	3	17	5.5	0.2	0.0	CO 66
87	RC2	21	2181	Min u_y	-0	-1	0	6.1	0.1	0.0	CO 62
87	RC2	53	0	Max u_z	-1	2	18	5.7	0.1	0.0	CO 49
87	RC2	53	0	Min u_z	0	-0	-5	-1.7	-0.0	0.0	CO 63
90	RC2	54	0	Max u_x	2	2	17	-5.6	-0.3	0.0	
											27 - IPE 300 | Euronorm 19-57
90	RC2		503	Min u_x	-2	2	14	-2.9	0.1	-0.0	CO 60
90	RC2		1759	Max u_y	-0	4	22	-0.1	0.2	-0.0	CO 66
90	RC2		1759	Min u_y	-0	-1	-7	0.0	0.0	0.0	CO 63
90	RC2		1759	Max u_z	-1	3	23	-0.1	0.1	-0.0	CO 49
90	RC2		1759	Min u_z	-0	-1	-7	0.0	0.0	0.0	CO 63
149	RC2	31	0	Max u_x	1	0	0	-1.7	-0.2	0.0	
											19 - IPE 270 | Euronorm 19-57
149	RC2	31	0	Min u_x	-1	0	0	-0.9	0.3	-0.0	CO 60
149	RC2		3016	Max u_y	1	2	7	-0.2	-0.2	-0.1	CO 66
149	RC2	31	0	Min u_y	1	-0	0	-0.9	-0.1	0.0	CO 62
149	RC2		3016	Max u_z	0	1	8	-0.2	-0.1	-0.0	CO 51
149	RC2		3016	Min u_z	-0	-0	-2	0.0	0.0	-0.0	CO 63

GLOBAL DEFORMATIONS u

RC2 : SLS - Characteristic
Global Deformations u [mm]
Result Combinations: Max and Min Values

Isometric

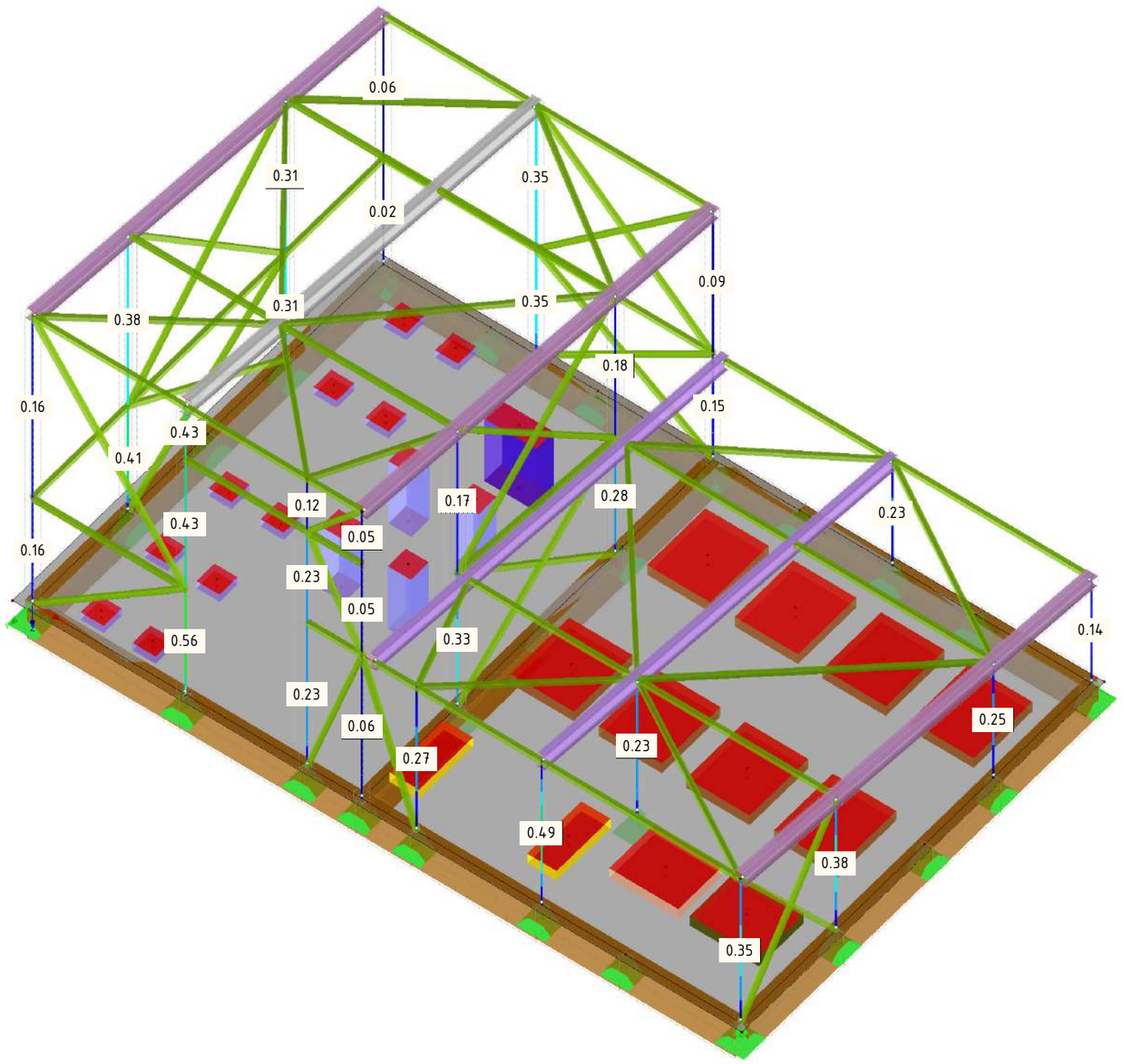


Factor of deformations: 23.00
Max u: 23, Min u: 0 mm

DESIGN RATIO

RF-STEEL EC3 CA1
Ultimate Limit State: Cross-Section Design, Stability Design, Weld Design, Pressure Design, Plastic Design
Serviceability Limit State: Deformations, Web Breathing

Isometric

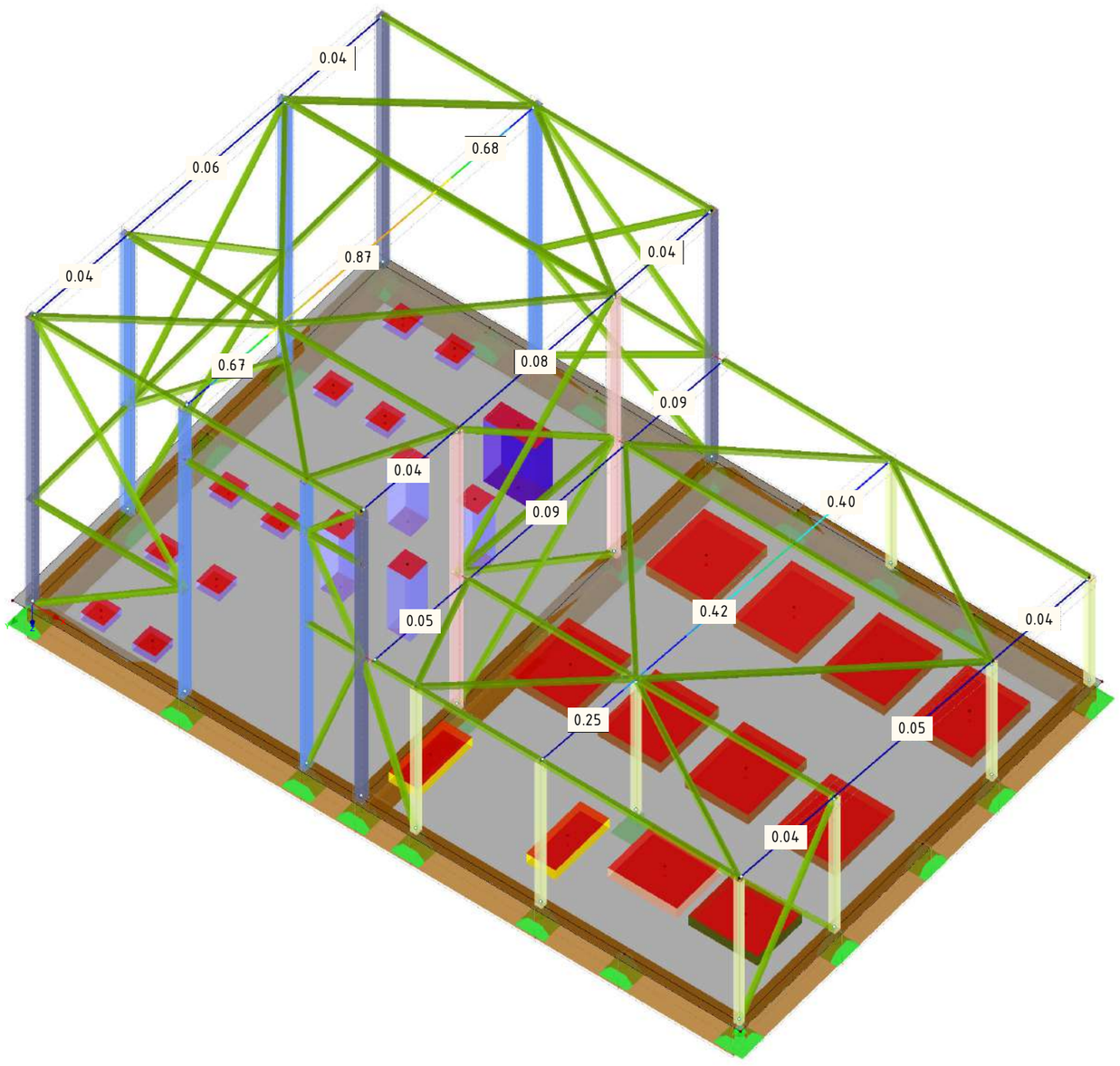


Members Max Design Ratio: 0.56

DESIGN RATIO

RF-STEEL EC3 CA2
Ultimate Limit State: Cross-Section Design, Stability Design, Weld Design, Pressure Design, Plastic Design
Serviceability Limit State: Deformations, Web Breathing

Isometric

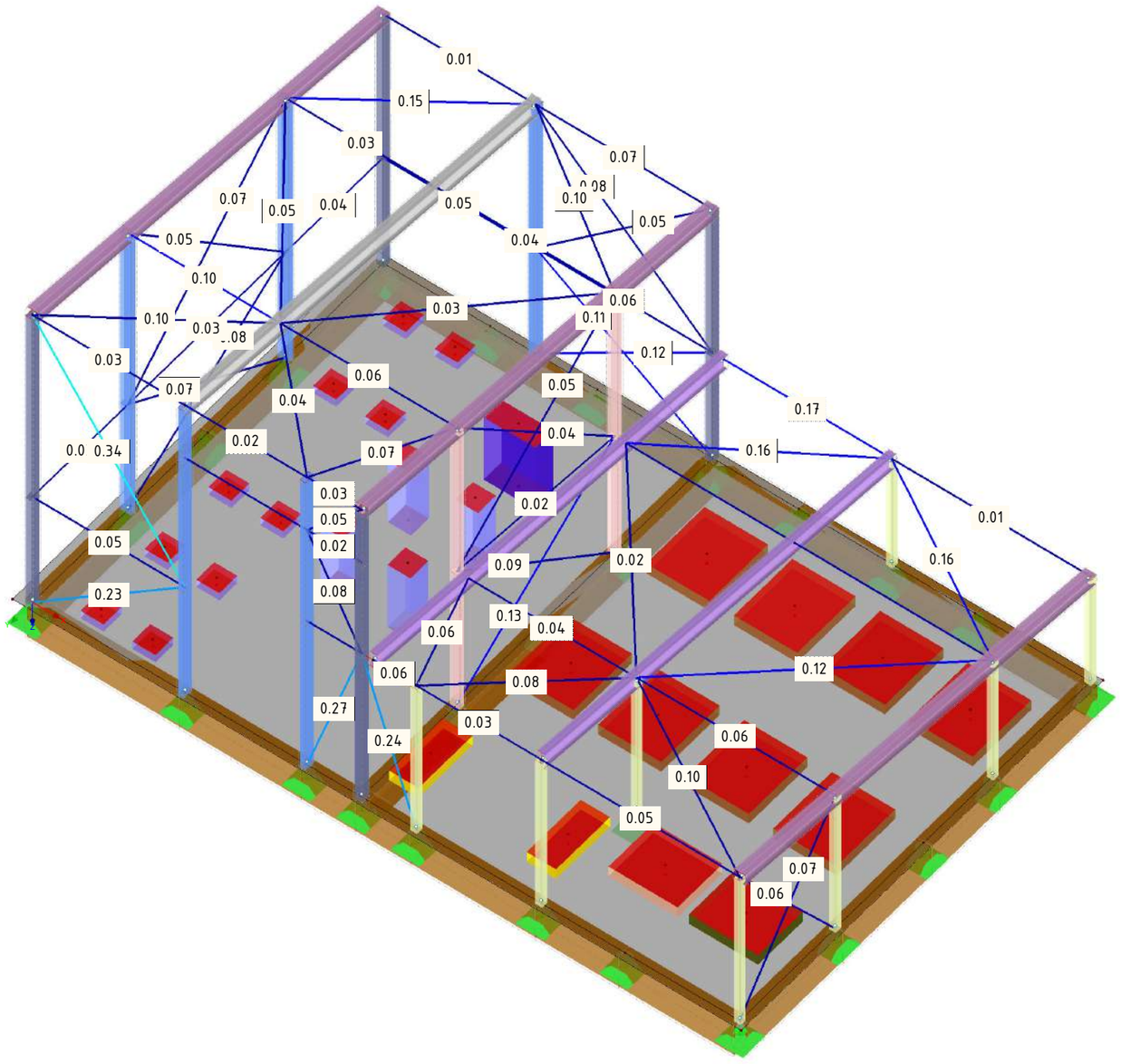


Members Max Design Ratio: 0.87

DESIGN RATIO

RF-STEEL EC3 CA3
Ultimate Limit State: Cross-Section Design, Stability Design, Weld Design, Pressure Design, Plastic Design
Serviceability Limit State: Deformations, Web Breathing

Isometric



Members Max Design Ratio: 0.34

1.1 GENERAL DATA

Design according to Standard:	LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
ULTIMATE LIMIT STATE		
Load combinations for design:	CO1	1.35*LC1
		Persistent and Transient
	CO2	1.35*LC1 + 1.3*LC2
		Persistent and Transient
	CO3	1.35*LC1 + 1.3*LC2 + 0.78*LC3
		Persistent and Transient
	CO4	1.35*LC1 + 1.3*LC2 + 0.78*LC4
		Persistent and Transient
	CO5	1.35*LC1 + 1.3*LC2 + 0.78*LC5
		Persistent and Transient
	CO6	1.35*LC1 + 1.3*LC2 + 0.78*LC6
		Persistent and Transient
	CO7	1.35*LC1 + 1.3*LC2 + 0.78*LC7
		Persistent and Transient
	CO8	1.35*LC1 + 1.3*LC2 + 0.78*LC3 + 0.91*LC8
		Persistent and Transient
	CO9	1.35*LC1 + 1.3*LC2 + 0.78*LC4 + 0.91*LC8
		Persistent and Transient
	CO10	1.35*LC1 + 1.3*LC2 + 0.78*LC5 + 0.91*LC8
		Persistent and Transient
	CO11	1.35*LC1 + 1.3*LC2 + 0.78*LC6 + 0.91*LC8
		Persistent and Transient
	CO12	1.35*LC1 + 1.3*LC2 + 0.78*LC7 + 0.91*LC8
		Persistent and Transient
	CO13	1.35*LC1 + 1.3*LC2 + 0.91*LC8
		Persistent and Transient
	CO14	1.35*LC1 + 1.3*LC3
		Persistent and Transient
	CO15	1.35*LC1 + 1.3*LC4
		Persistent and Transient
	CO16	1.35*LC1 + 1.3*LC5
		Persistent and Transient
	CO17	1.35*LC1 + 1.3*LC6
		Persistent and Transient
	CO18	1.35*LC1 + 1.3*LC7
		Persistent and Transient
	CO19	1.35*LC1 + 0.91*LC2 + 1.3*LC3
		Persistent and Transient
	CO20	1.35*LC1 + 0.91*LC2 + 1.3*LC4
		Persistent and Transient
	CO21	1.35*LC1 + 0.91*LC2 + 1.3*LC5
		Persistent and Transient
	CO22	1.35*LC1 + 0.91*LC2 + 1.3*LC6
		Persistent and Transient
	CO23	1.35*LC1 + 0.91*LC2 + 1.3*LC7
		Persistent and Transient
	CO24	1.35*LC1 + 0.91*LC2 + 1.3*LC3 + 0.91*LC8
		Persistent and Transient
	CO25	1.35*LC1 + 0.91*LC2 + 1.3*LC4 + 0.91*LC8
		Persistent and Transient
	CO26	1.35*LC1 + 0.91*LC2 + 1.3*LC5 + 0.91*LC8
		Persistent and Transient
	CO27	1.35*LC1 + 0.91*LC2 + 1.3*LC6 + 0.91*LC8
		Persistent and Transient
	CO28	1.35*LC1 + 0.91*LC2 + 1.3*LC7 + 0.91*LC8
		Persistent and Transient
	CO29	1.35*LC1 + 1.3*LC3 + 0.91*LC8
		Persistent and Transient
	CO30	1.35*LC1 + 1.3*LC4 + 0.91*LC8
		Persistent and Transient
	CO31	1.35*LC1 + 1.3*LC5 + 0.91*LC8
		Persistent and Transient
	CO32	1.35*LC1 + 1.3*LC6 + 0.91*LC8
		Persistent and Transient
	CO33	1.35*LC1 + 1.3*LC7 + 0.91*LC8
		Persistent and Transient
	CO34	1.35*LC1 + 1.3*LC8
		Persistent and Transient
	CO35	1.35*LC1 + 0.91*LC2 + 1.3*LC8
		Persistent and Transient
	CO36	1.35*LC1 + 0.91*LC2 + 0.78*LC3 + 1.3*LC8
		Persistent and Transient
	CO37	1.35*LC1 + 0.91*LC2 + 0.78*LC4 + 1.3*LC8
		Persistent and Transient
	CO38	1.35*LC1 + 0.91*LC2 + 0.78*LC5 + 1.3*LC8
		Persistent and Transient
	CO39	1.35*LC1 + 0.91*LC2 + 0.78*LC6 + 1.3*LC8
		Persistent and Transient
	CO40	1.35*LC1 + 0.91*LC2 + 0.78*LC7 + 1.3*LC8
		Persistent and Transient
	CO41	1.35*LC1 + 0.78*LC3 + 1.3*LC8
		Persistent and Transient
	CO42	1.35*LC1 + 0.78*LC4 + 1.3*LC8
		Persistent and Transient
	CO43	1.35*LC1 + 0.78*LC5 + 1.3*LC8
		Persistent and Transient
	CO44	1.35*LC1 + 0.78*LC6 + 1.3*LC8
		Persistent and Transient
	CO45	1.35*LC1 + 0.78*LC7 + 1.3*LC8
		Persistent and Transient
SERVICEABILITY LIMIT STATE		
Load combinations for design:	CO1	1.35*LC1

1.1 GENERAL DATA

		Quasi-permanent, kᵩ 0.600
	CO2	1.35*LC1 + 1.3*LC2
		Quasi-permanent, kᵩ 0.498
	CO3	1.35*LC1 + 1.3*LC2 + 0.78*LC3
		Quasi-permanent, kᵩ 0.521
	CO4	1.35*LC1 + 1.3*LC2 + 0.78*LC4
		Quasi-permanent, kᵩ 0.521
	CO5	1.35*LC1 + 1.3*LC2 + 0.78*LC5
		Quasi-permanent, kᵩ 0.521
	CO6	1.35*LC1 + 1.3*LC2 + 0.78*LC6
		Quasi-permanent, kᵩ 0.521
	CO7	1.35*LC1 + 1.3*LC2 + 0.78*LC7
		Quasi-permanent, kᵩ 0.521
	CO8	1.35*LC1 + 1.3*LC2 + 0.78*LC3 + 0.91*LC8
		Quasi-permanent, kᵩ 0.538
	CO9	1.35*LC1 + 1.3*LC2 + 0.78*LC4 + 0.91*LC8
		Quasi-permanent, kᵩ 0.538
	CO10	1.35*LC1 + 1.3*LC2 + 0.78*LC5 + 0.91*LC8
		Quasi-permanent, kᵩ 0.538
	CO11	1.35*LC1 + 1.3*LC2 + 0.78*LC6 + 0.91*LC8
		Quasi-permanent, kᵩ 0.538
	CO12	1.35*LC1 + 1.3*LC2 + 0.78*LC7 + 0.91*LC8
		Quasi-permanent, kᵩ 0.538
	CO13	1.35*LC1 + 1.3*LC2 + 0.91*LC8
		Quasi-permanent, kᵩ 0.524
	CO14	1.35*LC1 + 1.3*LC3
		Quasi-permanent, kᵩ 0.498
	CO15	1.35*LC1 + 1.3*LC4
		Quasi-permanent, kᵩ 0.498
	CO16	1.35*LC1 + 1.3*LC5
		Quasi-permanent, kᵩ 0.498
	CO17	1.35*LC1 + 1.3*LC6
		Quasi-permanent, kᵩ 0.498
	CO18	1.35*LC1 + 1.3*LC7
		Quasi-permanent, kᵩ 0.498
	CO19	1.35*LC1 + 0.91*LC2 + 1.3*LC3
		Quasi-permanent, kᵩ 0.524
	CO20	1.35*LC1 + 0.91*LC2 + 1.3*LC4
		Quasi-permanent, kᵩ 0.524
	CO21	1.35*LC1 + 0.91*LC2 + 1.3*LC5
		Quasi-permanent, kᵩ 0.524
	CO22	1.35*LC1 + 0.91*LC2 + 1.3*LC6
		Quasi-permanent, kᵩ 0.524
	CO23	1.35*LC1 + 0.91*LC2 + 1.3*LC7
		Quasi-permanent, kᵩ 0.524
	CO24	1.35*LC1 + 0.91*LC2 + 1.3*LC3 + 0.91*LC8
		Quasi-permanent, kᵩ 0.540
	CO25	1.35*LC1 + 0.91*LC2 + 1.3*LC4 + 0.91*LC8
		Quasi-permanent, kᵩ 0.540
	CO26	1.35*LC1 + 0.91*LC2 + 1.3*LC5 + 0.91*LC8
		Quasi-permanent, kᵩ 0.540
	CO27	1.35*LC1 + 0.91*LC2 + 1.3*LC6 + 0.91*LC8
		Quasi-permanent, kᵩ 0.540
	CO28	1.35*LC1 + 0.91*LC2 + 1.3*LC7 + 0.91*LC8
		Quasi-permanent, kᵩ 0.540
	CO29	1.35*LC1 + 1.3*LC3 + 0.91*LC8
		Quasi-permanent, kᵩ 0.524
	CO30	1.35*LC1 + 1.3*LC4 + 0.91*LC8
		Quasi-permanent, kᵩ 0.524
	CO31	1.35*LC1 + 1.3*LC5 + 0.91*LC8
		Quasi-permanent, kᵩ 0.524
	CO32	1.35*LC1 + 1.3*LC6 + 0.91*LC8
		Quasi-permanent, kᵩ 0.524
	CO33	1.35*LC1 + 1.3*LC7 + 0.91*LC8
		Quasi-permanent, kᵩ 0.524
	CO34	1.35*LC1 + 1.3*LC8
		Quasi-permanent, kᵩ 0.498
	CO35	1.35*LC1 + 0.91*LC2 + 1.3*LC8
		Quasi-permanent, kᵩ 0.524
	CO36	1.35*LC1 + 0.91*LC2 + 0.78*LC3 + 1.3*LC8
		Quasi-permanent, kᵩ 0.538
	CO37	1.35*LC1 + 0.91*LC2 + 0.78*LC4 + 1.3*LC8
		Quasi-permanent, kᵩ 0.538
	CO38	1.35*LC1 + 0.91*LC2 + 0.78*LC5 + 1.3*LC8
		Quasi-permanent, kᵩ 0.538
	CO39	1.35*LC1 + 0.91*LC2 + 0.78*LC6 + 1.3*LC8
		Quasi-permanent, kᵩ 0.538
	CO40	1.35*LC1 + 0.91*LC2 + 0.78*LC7 + 1.3*LC8
		Quasi-permanent, kᵩ 0.538
	CO41	1.35*LC1 + 0.78*LC3 + 1.3*LC8
		Quasi-permanent, kᵩ 0.521
	CO42	1.35*LC1 + 0.78*LC4 + 1.3*LC8
		Quasi-permanent, kᵩ 0.521
	CO43	1.35*LC1 + 0.78*LC5 + 1.3*LC8
		Quasi-permanent, kᵩ 0.521
	CO44	1.35*LC1 + 0.78*LC6 + 1.3*LC8
		Quasi-permanent, kᵩ 0.521
	CO45	1.35*LC1 + 0.78*LC7 + 1.3*LC8
		Quasi-permanent, kᵩ 0.521
Definition of Provided Additional Reinforcement		Automatic arrangement according to the specifications in Table 1.4
Type of SLS method:		Analytical Method

1.1 GENERAL DATA

	By assuming an identical deformation ratio of the longitudinal reinforcement
Design of	
Concrete Stress Analysis	☐
Steel Stress Analysis	☒
Crack widths	☒
Deformation Analysis	☐
Layout of longitudinal reinforcement	
Required longitudinal reinforcement automatically increased for serviceability limit state design:	☒
DETAILS	
Analysis Method for Reinforcement Envelope	Mixed
Apply the internal forces without the rib components	☐
Design Situation Settings for Serviceability Limit State Checks	
Load combination:	
Characteristic with direct load	Checks: k_1*f_{ck}, k_3*f_{yk}
Characteristic with imposed deformation	Checks: k_1*f_{ck}, k_4*f_{yk}
Frequent	Checks: w_k
Quasi-permanent	Checks: k_2*f_{ck}, w_k, u_l

1.2 MATERIALS

Material No.	Material Description: Concrete Strength Class	Material Description: Steel Description	Comment
3	Concrete C30/37	B 500 S (A)	

1.2.1 MATERIAL PARAMETERS

Material No.	Description	Name	Size	Unit
3	**Concrete Strength Class: Concrete C30/37**			
	Characteristic Cylinder Compressive Strength	f_{ck}	30.00	N/mm^2
	5 % Fractile of Axial Tensile Strength	$f_{ctk,0.05}$	2.00	N/mm^2
	Characteristic for Nonlinear Calculations			
	Mean Secant Modulus of Elasticity	E_{cm}	33000.00	N/mm^2
	Mean Cylinder Compressive Strength	f_{cm}	38.00	N/mm^2
	Mean Axial Tensile Strength	f_{ctm}	2.90	N/mm^2
	Ultimate Strain for Pure Compression	ε_{c1}	-2.200	‰
	Ultimate Strain at Failure	ε_{c1u}	-3.500	‰
	Shear Modulus	G	13750.00	N/mm^2
	Poisson's Ratio	ν	0.200	-
	Characteristic Strains for Parabolic-Rectangular Diagram			
	Ultimate Strain for Pure Compression	ε_{c2}	-2.000	‰
	Ultimate Strain at Failure	ε_{cu2}	-3.500	‰
	Parabola Exponent	n	2.000	-
	Specific Weight	γ	25.00	kN/m^3
	Reinforcing Steel: B 500 S (A)			
	Modulus of Elasticity	E_s	200000.00	N/mm^2
	Yield Stress Mean Value	f_{ym}	550.00	N/mm^2
	Characteristic Yield Stress	f_{yk}	500.00	N/mm^2
	Tensile Strength Mean Value	f_{tm}	551.25	N/mm^2
	Characteristic Tensile Strength	f_{tk}	525.00	N/mm^2
	Limiting Strain	ε_{uk}	25.000	‰

1.3 SURFACES

Surface No.	Matl. No.	$f_{ct,eff,wk}$ [N/mm²]	$f_{ct,eff,As,min}$ [N/mm²]	$w_{k,+z\ (top)}$ [mm] / $w_{k,-z\ (bottom)}$ [mm]	Effects due to Restraint: Apply	Effects due to Restraint: k_c [-]	Notes
1	Thickness Type: Constant, Thickness: 250.00 mm						
	3	2.90	2.90	0.300 0.300	☒	var.	6)

Notes:
6) Calculation of minimum reinforcement for effects due to restraint

1.4 REINFORCEMENT GROUP NO. 1 - PLOKSTE

Applied to surfaces:	All
REINFORCEMENT RATIO	
Minimum secondary reinforcement	20.0 %
Basic minimum reinforcement	0.0 %
Minimum compression reinforcement	0.0 %
Minimum tension reinforcement	0.0 %
Maximum reinforcement percentage	4.0 %
Minimum shear reinforcement percentage	0.0 %
REINFORCEMENT AREA FOR DESIGN OF SLS	
Use provided basic reinforcement and required additional reinforcement acc. to Tables 2.1, 2.2, 2.3	
Concrete cover acc. to Standard	☐
BASIC REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.00, c-2: 52.00 mm
Bar diameter	ds-1: 12.00, ds-2: 12.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,-z (top): 7.54, As-2,-z (top): 7.54 cm²/m

1.4 REINFORCEMENT GROUP NO. 1 - PLOKSTE

BASIC REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.00, c-2: 52.00 mm
Bar diameter	ds-1: 12.00, ds-2: 12.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,+z (bottom): 7.54, As-2,+z (bottom): 7.54 cm²/m
ADDITIONAL REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.00, c-2: 52.00 mm
Bar diameter	ds-1: 12.00, ds-2: 12.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
ADDITIONAL REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.00, c-2: 52.00 mm
Bar diameter	ds-1: 12.00, ds-2: 12.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
LONGITUDINAL REINFORCEMENT FOR SHEAR FORCE DESIGN	
Apply the greater value resulting from either the required or provided reinforcement (basic and add. reinforcement) per reinforcement direction	
OPTIONS FOR LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
Minimum longitudinal reinforcement for plates acc. to 9.3.1	☒
Direction of minimum reinforcement	
Reinforcement direction with the main tensile force from top (-z) and bottom (+z) surfaces together:	☒
Minimum longitudinal reinforcement for walls acc. to 9.6	☐
Minimum shear reinforcement	☒
Neutral axis depth limitation	☒
Variable strut inclination - min	21.801 °
Variable concrete strut inclination - max	45.000 °
Partial safety factor γ_s	PT 1.15, AC 1.00, SLS 1.00
Partial safety factor γ_c	PT 1.50, AC 1.20, SLS 1.00
Consideration of long-term effects Alpha-cc	PT 0.90, AC 0.90, SLS 1.00
Consideration of long-term effects Alpha-ct	SLS 1.00

2.2 REQUIRED REINFORCEMENT BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Symbol	Required Reinforcement ULS	SLS	ULS/SLS	Basic Reinf.	Additional Reinforcement Required	Provided	Unit	Notes
1	M32 - E1602	8.840	-2.120	0.000	$a_{s,1,-z\ (top)}$	8.50	12.24	12.24	7.54	4.70	4.70	cm²/m	
	M32 - E1602	8.840	-2.120	0.000	$a_{s,2,-z\ (top)}$	7.89	12.60	12.60	7.54	5.06	5.06	cm²/m	
	M133 - E2511	0.000	-5.620	0.000	$a_{s,1,+z\ (bottom)}$	0.00	10.46	10.46	7.54	2.92	2.92	cm²/m	
	M2596	-0.250	-5.704	0.000	$a_{s,2,+z\ (bottom)}$	0.48	12.19	12.19	7.54	4.65	4.65	cm²/m	
	M32 - E1603	8.840	-2.120	0.000	a_{sw}	27.82	-	27.82	-	-	-	cm²/m²	

3.2 SERVICEABILITY CHECK BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Load Case	Type	Design Exist. Value	Design Limit Value	Unit	Ratio	Notes
1	M2 - E313	0.000	0.000	0.000		σ_s	Not designable	0.00	N/mm²	0.0	236) 239)
	M2570	2.765	-7.915	0.000	Envelope Qp	$a_{s,min}$	12.14	12.14	cm²/m	1.0	
	M2159	8.847	-2.326	0.000	Envelope Qp	lim d_s	12.00	12.66	mm	1.0	213) 235) 236)
	M126 - E384	5.720	-4.005	0.000	Envelope Qp	lim s_l	0.125	0.125	m	1.0	235) 236)
	M3149 - E395	5.720	-4.409	0.000	Envelope Qp	w_k	0.296	0.300	mm	1.0	235) 236)

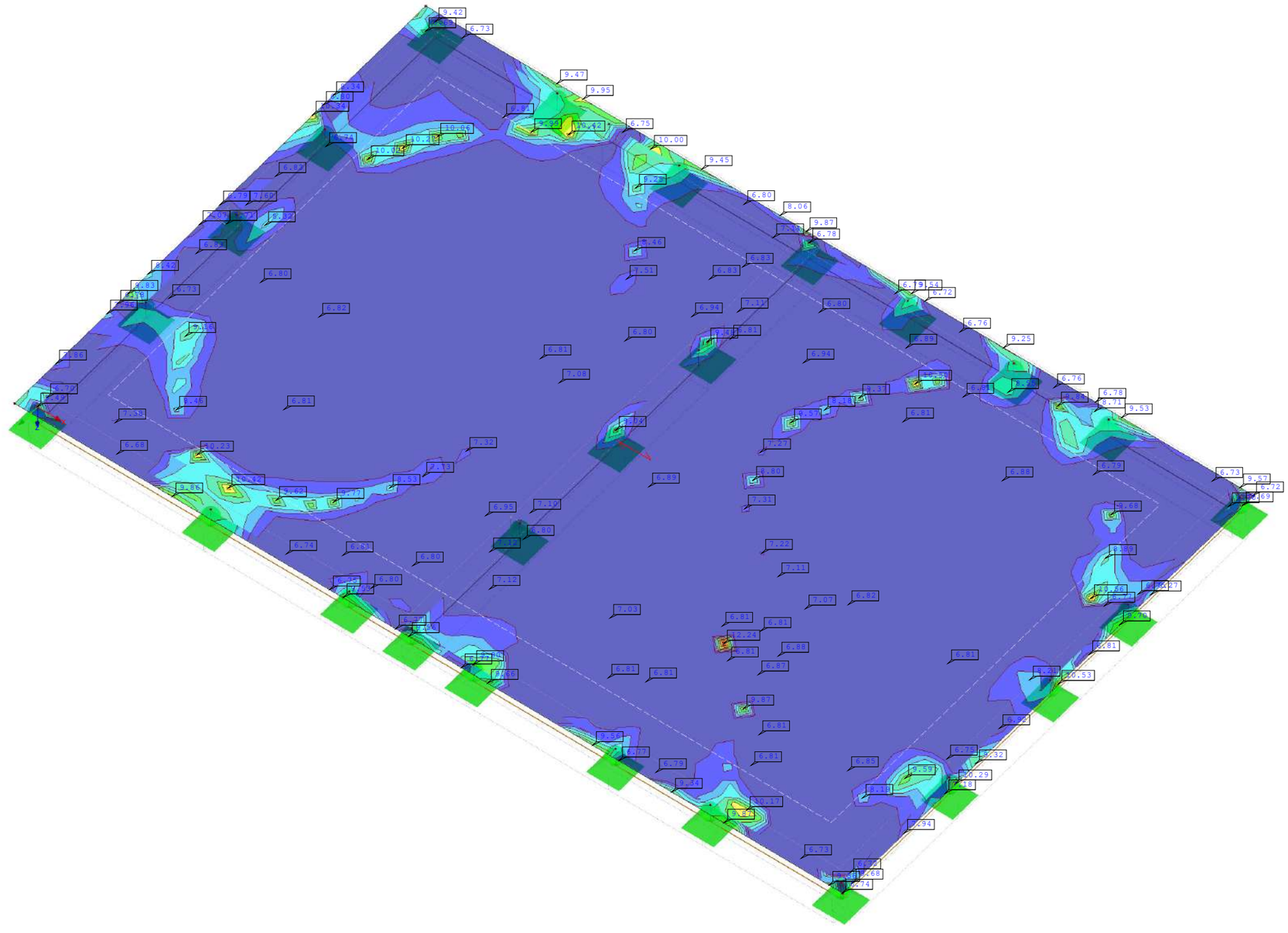
SERVICEABILITY CHECK NOTES

No.	Description
213)	Allowable member diameters at the top (-z) surface of the plate into reinforcement direction Φ_1 exceeded.
235)	The check restricts increase of reinforcement for economic reasons.
236)	The check of the reinforcing layer need not to be fulfilled for economic reasons.
239)	The design is not possible! The specified loads (LC/CO/RC) with the selected types of load combinations (characteristic/frequent/quasi-permanent) do not contain the required checks (stress/crack width/deflection).

REQUIRED REINFORCEMENT $a_{s,1,-z\ (top)}$

RF-CONCRETE Surfaces CA1
Reinforced concrete design
Surfaces Required Reinforcement a-s,1,-z (top) [cm²/m]
Values: a-s,1,-z (top) [cm^2/m]

Isometric

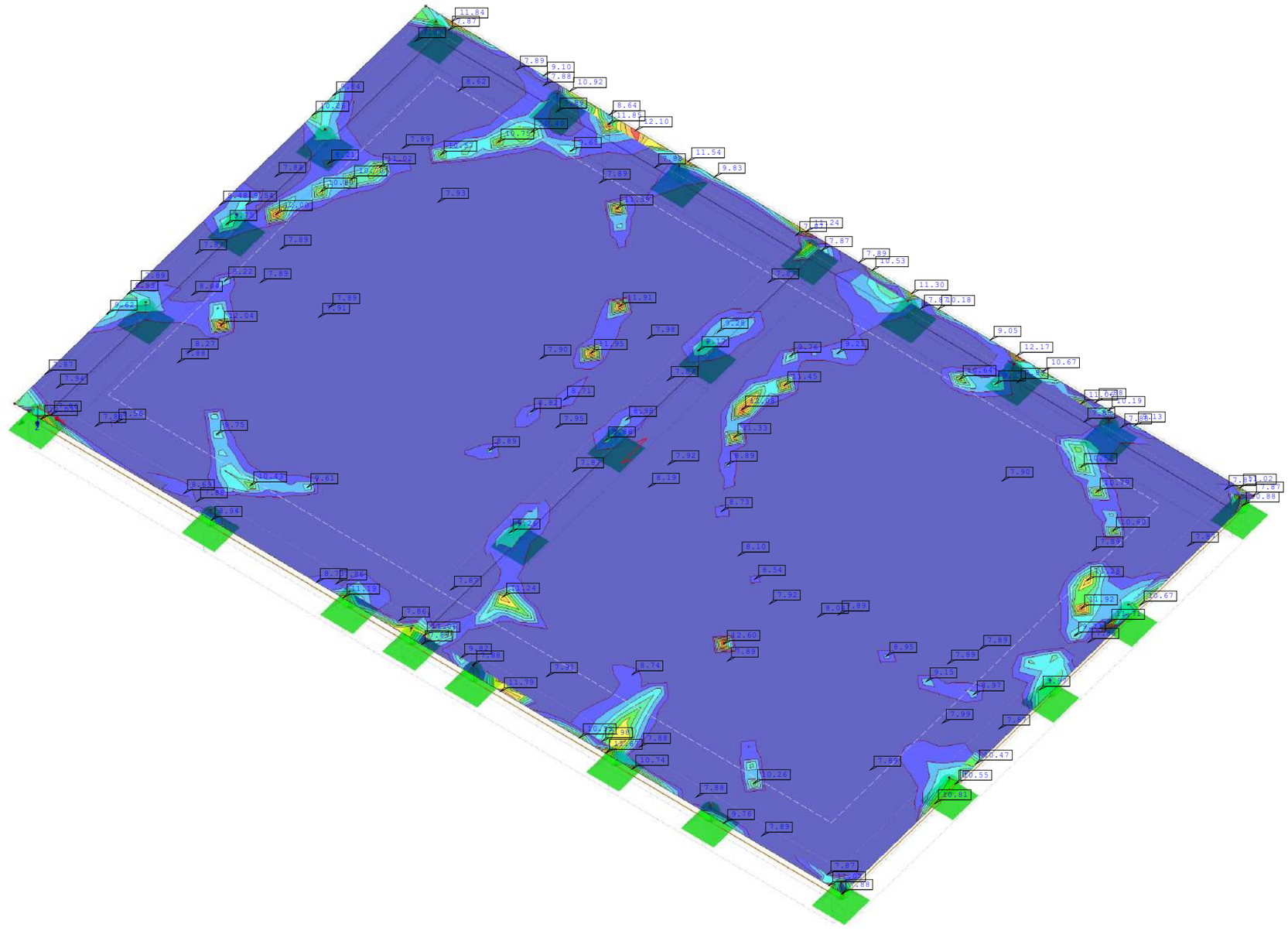


Max a-s,1,-z (top): 12.24, Min a-s,1,-z (top): 6.68 cm²/m

REQUIRED REINFORCEMENT $a_{s,2,-z\ (top)}$

RF-CONCRETE Surfaces CA1
Reinforced concrete design
Surfaces Required Reinforcement a-s,2,-z (top) [cm²/m]
Values: a-s,2,-z (top) [cm^2/m]

Isometric

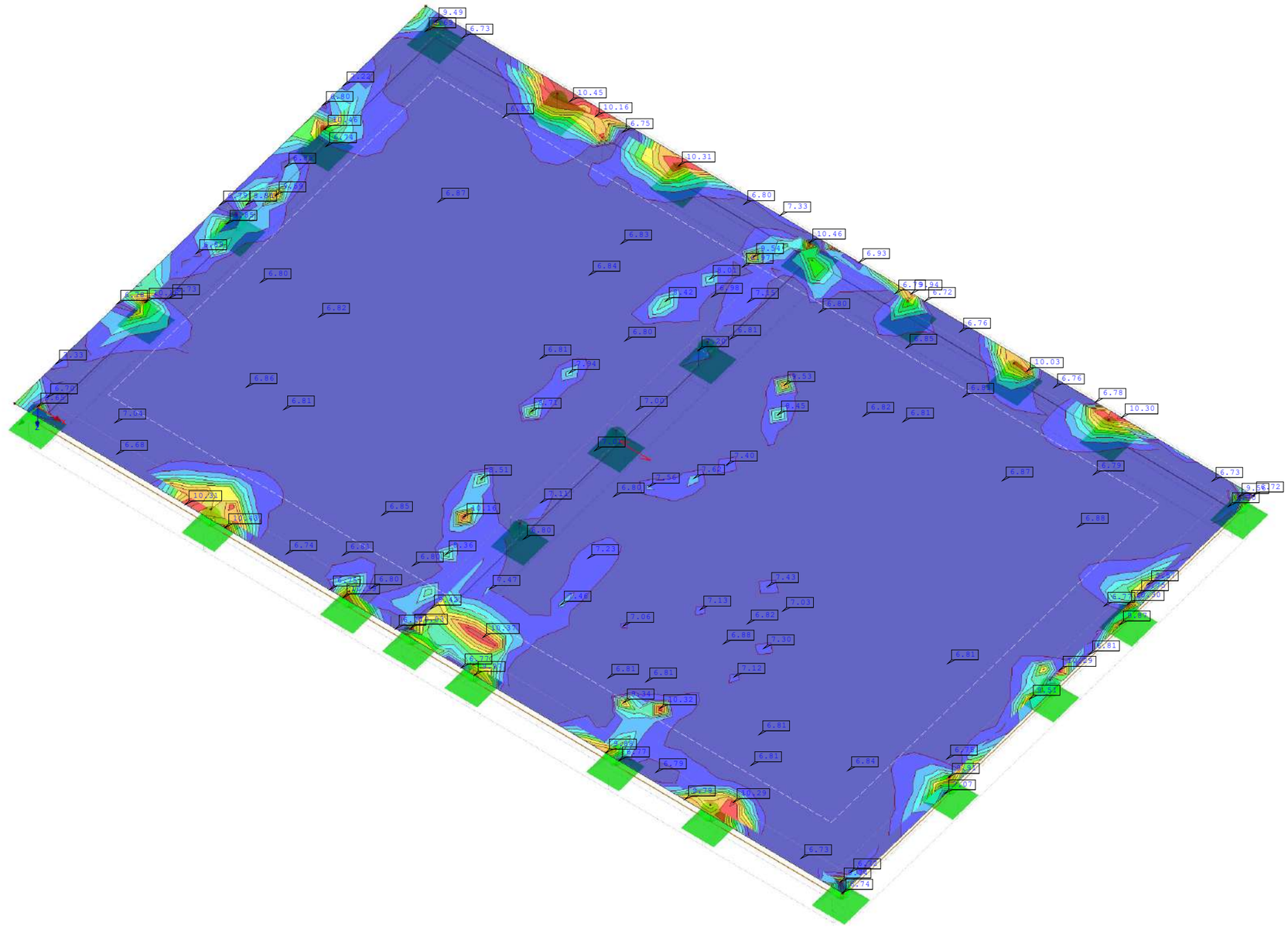


Max a-s,2,-z (top): 12.60, Min a-s,2,-z (top): 7.86 cm²/m

REQUIRED REINFORCEMENT $a_{s,1,+z\ (bottom)}$

RF-CONCRETE Surfaces CA1
Reinforced concrete design
Surfaces Required Reinforcement a-s,1,+z (bottom) [cm ²/m]
Values: a-s,1,+z (bottom) [cm^2/m]

Isometric

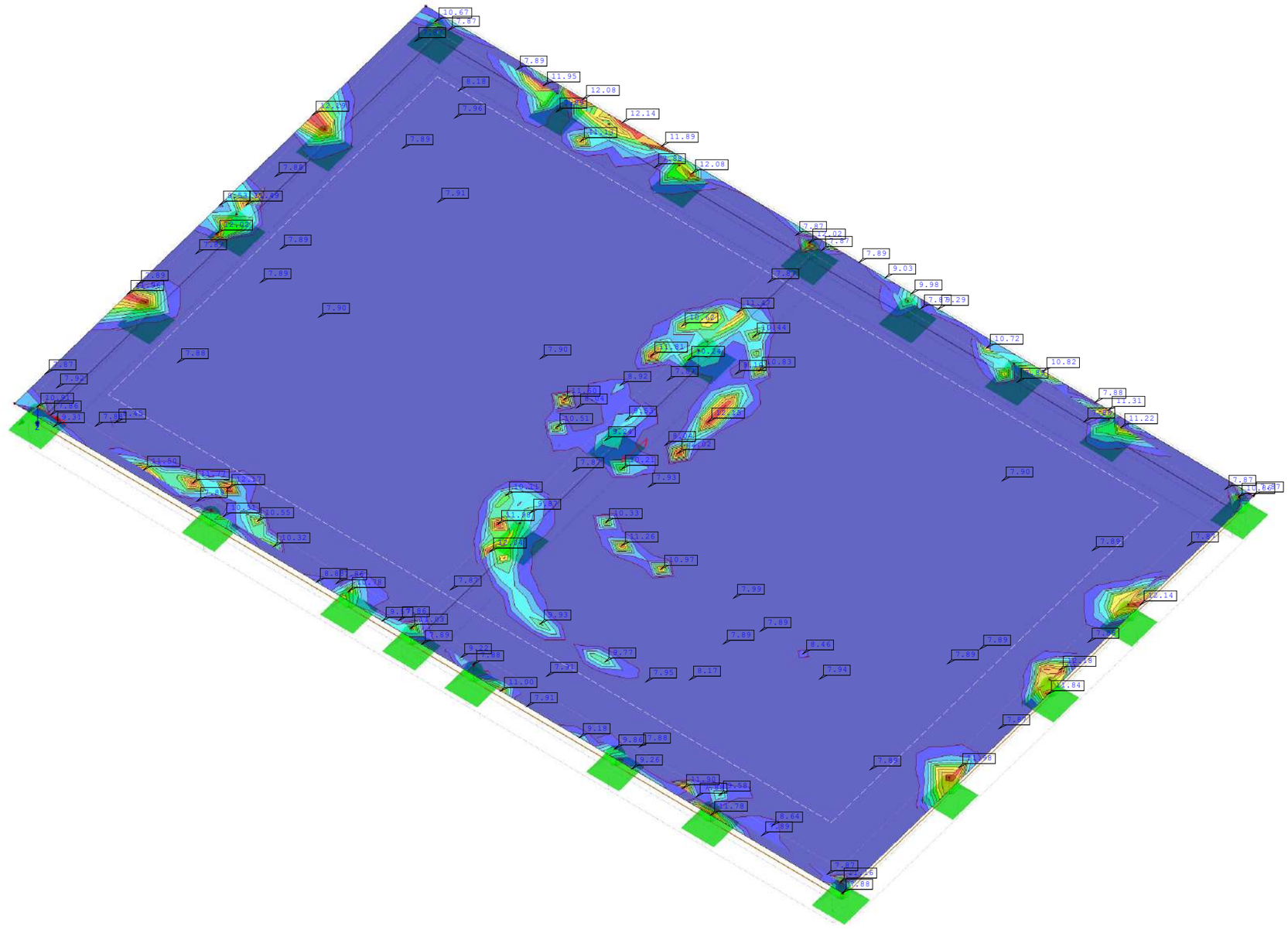


Max a-s,1,+z (bottom): 10.46, Min a-s,1,+z (bottom): 6.68 cm ²/m

REQUIRED REINFORCEMENT $a_{s,2,+z\ (bottom)}$

RF-CONCRETE Surfaces CA1
Reinforced concrete design
Surfaces Required Reinforcement a-s,2,+z (bottom) [cm ²/m]
Values: a-s,2,+z (bottom) [cm^2/m]

Isometric



Max a-s,2,+z (bottom): 12.19, Min a-s,2,+z (bottom): 7.86 cm ²/m

STRUCTURAL ANALYSIS

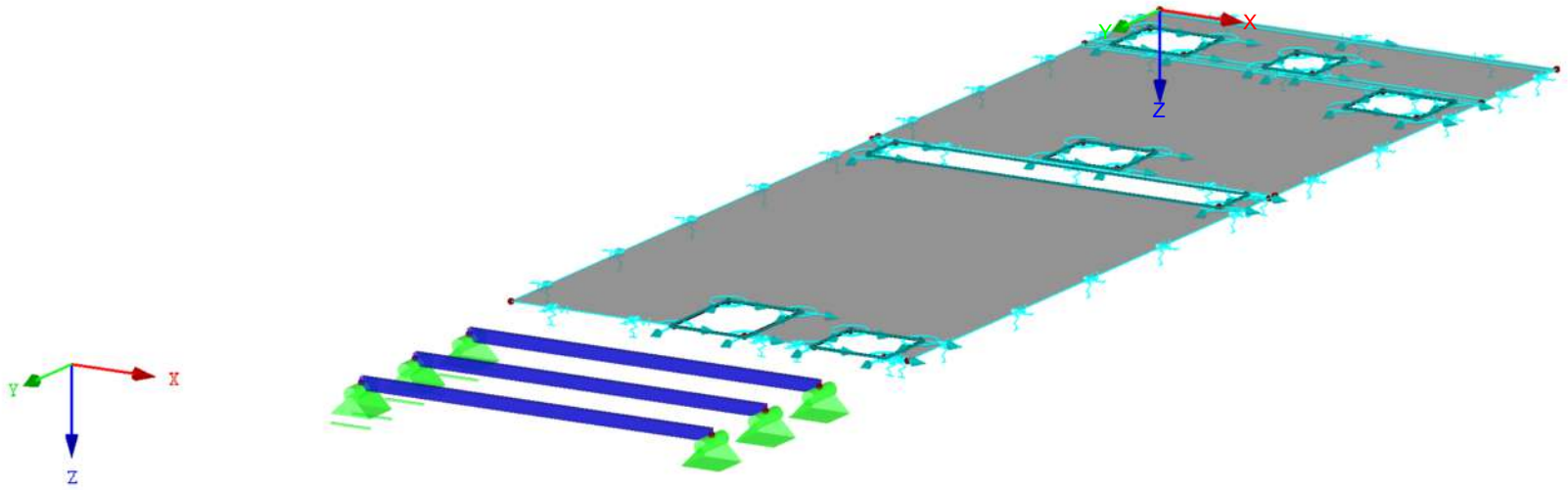
PROJECT

Bioreaktoriai (4 vienetai) (03);

CLIENT

CREATED BY

Isometric



MODEL - GENERAL DATA

General	Model name	:	SK23010_Dreverna_ (03) statinys_ (talpos denginys) 23.07.21
	Project name	:	1
	Project description	:	1
	Type of model	:	3D
	Positive direction of global axis Z	:	Downward
	Classification of load cases and combinations	:	According to Standard: EN 1990 National Annex: LST - Lithuania
	☒ Automatically create combinations	:	☒ Load Combinations

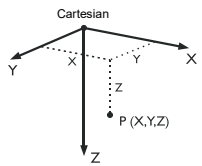
Options	☐ RF-FORM-FINDING - Find initial equilibrium shapes of membrane and cable structures
	☐ RF-CUTTING-PATTERN
	☐ Piping analysis
	☐ Use CQC Rule
	☐ Enable CAD/BIM model

Standard Gravity			
g	:	10.00 m/s²	

FE MESH SETTINGS

General	Target length of finite elements	l_{FE}	:	200 mm
	Maximum distance between a node and a line to integrate it into the line	ε	:	1 mm
	Maximum number of mesh nodes (in thousands)		:	500
Members	Number of divisions of members with cable, elastic foundation, taper, or plastic characteristic		:	10
	☒ Activate member divisions for large deformation or post-critical analysis			
	☒ Use division also for straight members, which are not integrated in surfaces, with		:	Target length LFE of finite elements
	Minimum number of member divisions		:	2
	☒ Use division for members with node lying on them			
Surfaces	Maximum ratio of FE rectangle diagonals	Δ_D	:	2
	Maximum out-of-plane inclination of two finite elements	α	:	0.50 °
	☒ Integrate also unutilized objects into surfaces			
	Shape direction of finite elements		:	Triangles and quadrangles ☒ Same squares where possible

1.1 NODES



Node No.	Node Type	Reference Node	Coordinate System	Node Coordinates X [mm]	Y [mm]	Z [mm]	Comment
3	Standard	-	Cartesian	5100	6270	0	
4	Standard	-	Cartesian	0	14445	0	
5	Standard	-	Cartesian	5100	14445	0	
10	Standard	-	Cartesian	300	15895	0	Supported
11	Standard	-	Cartesian	4800	15895	0	Supported
12	Standard	-	Cartesian	300	17095	0	Supported
13	Standard	-	Cartesian	4800	17095	0	Supported

1.1 NODES

Node No.	Node Type	Reference Node	Coordinate System	Node Coordinates X [mm]	Y [mm]	Z [mm]	Comment
14	Standard	-	Cartesian	300	18295	0	Supported
15	Standard	-	Cartesian	4800	18295	0	Supported
79	Standard	-	Cartesian	0	6270	0	
147	Standard	-	Cartesian	0	0	0	
150	Standard	-	Cartesian	5100	0	0	
151	Standard	-	Cartesian	300	745	0	
152	Standard	-	Cartesian	1200	745	0	
153	Standard	-	Cartesian	1200	1545	0	
154	Standard	-	Cartesian	300	1545	0	
155	Standard	-	Cartesian	4800	1795	0	
156	Standard	-	Cartesian	4800	2595	0	
157	Standard	-	Cartesian	3900	2595	0	
158	Standard	-	Cartesian	3900	1795	0	
159	Standard	-	Cartesian	4800	13645	0	
160	Standard	-	Cartesian	4800	14445	0	
161	Standard	-	Cartesian	3900	14445	0	
162	Standard	-	Cartesian	3900	13645	0	
163	Standard	-	Cartesian	0	1670	0	
164	Standard	-	Cartesian	5100	1670	0	
171	Standard	-	Cartesian	3000	13245	0	
172	Standard	-	Cartesian	3000	14445	0	
173	Standard	-	Cartesian	2100	14445	0	
174	Standard	-	Cartesian	2100	13245	0	
175	Standard	-	Cartesian	3000	5345	0	
176	Standard	-	Cartesian	3000	6145	0	
177	Standard	-	Cartesian	2100	6145	0	
178	Standard	-	Cartesian	2100	5345	0	
179	Standard	-	Cartesian	2250	1545	0	
180	Standard	-	Cartesian	2850	1545	0	
181	Standard	-	Cartesian	2850	845	0	
182	Standard	-	Cartesian	2250	845	0	
183	Standard	-	Cartesian	300	6995	0	
184	Standard	-	Cartesian	4800	6995	0	
185	Standard	-	Cartesian	4800	6395	0	
186	Standard	-	Cartesian	300	6395	0	
191	Standard	-	Cartesian	0	6395	0	
192	Standard	-	Cartesian	5100	6395	0	

1.2 LINES

Line No.	Line Type	Nodes No.	Line Length L [mm]		Comment
1	Polyline	79,3	5100	X	
2	Polyline	163,164	5100	X	
3	Polyline	164,150	1670	Y	
4	Polyline	163,79	4600	Y	
8	Polyline	191,186	300	X	
10	Polyline	4,173	2100	X	
11	Polyline	192,192	0		
12	Polyline	10,11	4500	X	
13	Polyline	185,192	300	X	
14	Polyline	172,161	900	X	
15	Polyline	12,13	4500	X	
16	Polyline	160,5	300	X	
19	Polyline	10,10	0		
20	Polyline	11,11	0		

1.2 LINES

Line No.	Line Type	Nodes No.	Line Length L [mm]		Comment
23	Polyline	14,15	4500	X	
27	Polyline	5,192	8050	Y	
28	Polyline	191,4	8050	Y	
87	Polyline	3,164	4600	Y	
90	Polyline	79,79	0		
144	Polyline	147,163	1670	Y	
147	Polyline	150,147	5100	X	
148	Polyline	151,152	900	X	
149	Polyline	152,153	800	Y	
150	Polyline	153,154	900	X	
151	Polyline	154,151	800	Y	
152	Polyline	155,156	800	Y	
153	Polyline	156,157	900	X	
154	Polyline	157,158	800	Y	
155	Polyline	158,155	900	X	
156	Polyline	159,160	800	Y	
157	Polyline	160,161	900	X	
158	Polyline	161,162	800	Y	
159	Polyline	162,159	900	X	
168	Polyline	171,172	1200	Y	
169	Polyline	172,173	900	X	
170	Polyline	173,174	1200	Y	
171	Polyline	174,171	900	X	
172	Polyline	175,176	800	Y	
173	Polyline	176,177	900	X	
174	Polyline	177,178	800	Y	
175	Polyline	178,175	900	X	
176	Polyline	179,180	600	X	
177	Polyline	180,181	700	Y	
178	Polyline	181,182	600	X	
179	Polyline	182,179	700	Y	
180	Polyline	183,184	4500	X	
181	Polyline	184,185	600	Y	
182	Polyline	185,186	4500	X	
183	Polyline	186,183	600	Y	
189	Polyline	191,191	0		

1.3 MATERIALS

Matl. No.	Modulus E [kN/cm²]	Modulus G [kN/cm²]	Poisson's Ratio ν [-]	Spec. Weight γ [kN/m³]	Coeff. of Th. Exp. α [1/°C]	Partial Factor γ_M [-]	Material Model
4	Concrete C35/45 | EN 1992-1-1:2004/A1:2014						
	3400.00	1416.67	0.200	25.00	1.00E-05	1.00	Isotropic Linear Elastic
5	Steel S 355 J2 | LST EN 10025-2:2004-11						
	21000.00	8076.92	0.300	78.50	1.20E-05	1.00	Isotropic Linear Elastic

1.4 SURFACES

Surface No.	Surface Type		Boundary Lines No.	Matl. No.	Thickness		Area	Weight
	Geometry	Stiffness			Type	d [mm]	A [mm²]	W [kg]
2	Plane	Standard	4,1,87,2	4	Constant	200.0	22020000	11010.00
5	Plane	Standard	144,2,3,147	4	Constant	200.0	7376990	3688.49
6	Plane	Standard	28,10,169,14,157,16,27,13,182,8	4	Constant	200.0	36555000	18277.50

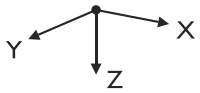
1.4.2 SURFACES - INTEGRATED OBJECTS

Surface No.	Integrated Objects No.			Comment
	Nodes	Lines	Openings	
2			24,29	
5			23,30	
6			25,28,31	

1.6 OPENINGS

Opening No.	Boundary Lines No.	In Surface No.	Area A [mm²]	Comment
23	148-151	5	720000	
24	152-155	2	720000	
25	156-159	6	719999	
28	168-171	6	1080000	
29	172-175	2	720000	
30	176-179	5	420000	
31	180-183	6	2700000	

1.7 NODAL SUPPORTS



Support No.	Nodes No.	Axis System	Column in Z	Support Conditions					
				u_X	u_Y	u_Z	φ_X	φ_Y	φ_Z
1	11,13,15	Global X,Y,Z	☐	☒	☒	☒	☒	☐	☒
2	10,12,14	Global X,Y,Z	☐	☐	☒	☒	☒	☐	☒

1.8 LINE SUPPORTS

Support No.	Lines No.	Reference System	Rotation β [°]	Wall in Z	Support Conditions					
					C_{ux}	C_{uy}	C_{uz}	φ_x	φ_y	φ_z
1	1-4,8,10,13,14,16,27,28,87,144, 147	Local		☐	Spring	Spring	Ineffective	☐	☐	☐

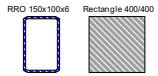
1.8.2 LINE SUPPORTS - SPRINGS

Support No.	Lines No.	Translation Spring [kN/m²]			Rotation Spring [kNm/rad/m]		
		$C_{u,X'}$	$C_{u,Y'}$	$C_{u,Z'}$	$C_{\varphi,X'}$	$C_{\varphi,Y'}$	$C_{\varphi,Z'}$
1	1-4,8,10,13,14,16,27,28,87,144, 147	1.000	1.000	2193550.000	-	-	-

1.8.3 LINE SUPPORTS - INEFFECTIVE

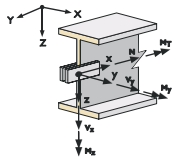
Support No.	Lines No.	Ineffective Support Under [kN/m²]			Comment
		$u_{X'}$	$u_{Y'}$	$u_{Z'}$	
1	1-4,8,10,13,14,16,27,28,87,144,147	-	-	Failure if -P	

1.13 CROSS-SECTIONS



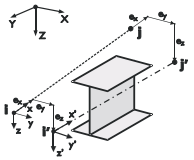
Section No.	Matl. No.	J [cm⁴] / A [cm²]	I_y [cm⁴] / A_y [cm²]	I_z [cm⁴] / A_z [cm²]	Principal Axes α [°]	Rotation α' [°]	Overall Dimensions [mm] Width b	Height h
19	RRO 150x100x6 | EN 10219-2:2006							
	5	948.00 27.60	835.00 8.49	444.00 15.57	0.00	0.00	100.0	150.0
20	Rectangle 400/400							
	4	360106.66 1600.00	213333.34 1333.33	213333.34 1333.33	0.00	0.00	400.0	400.0

1.14 MEMBER HINGES



Release No.	Reference System	Axial/Shear Release or Spring[kN/m] u_x	u_y	u_z	Moment Release or Spring[kNm/rad] φ_x	φ_y	φ_z	Comment
1	Local x,y,z	☐	☐	☐	☐	☐	☒	
2	Local x,y,z	☒	☒	☐	☒	☒	☒	
3	Local x,y,z	☐	☐	☐	☒	☒	☒	
4	Local x,y,z	☐	☐	☐	☐	☒	☒	
5	Local x,y,z	☐	☐	☐	☒	☒	☒	
6	Local x,y,z	☒	☐	☐	☒	☒	☒	
7	Local x,y,z	☐	☐	☐	☐	☐	☒	
8	Local x,y,z	☒	☐	☐	☒	☒	☒	
9	Local x,y,z	☐	☐	☐	☐	☒	☐	

1.15/1 MEMBER ECCENTRICITIES - ABSOLUTE

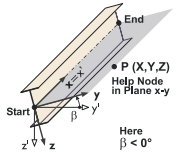


Ecc. No.	Reference System	Member Start - Eccentricity [mm] $e_{i,x}$, $e_{i,X}$	$e_{i,y}$, $e_{i,Y}$	$e_{i,z}$, $e_{i,Z}$	Member End - Eccentricity $e_{j,x}$, $e_{j,X}$	$e_{j,y}$, $e_{j,Y}$	$e_{j,z}$, $e_{j,Z}$	Member hinge location Member Start	Member End
2	Global	0.0	0.0	0.0	0.0	0.0	100.0	at member	at member
3	Local	0.0	0.0	0.0	0.0	0.0	0.0	at member	at member
5	Local	250.0	0.0	0.0	0.0	0.0	0.0	at member	at member
6	Local	250.0	0.0	0.0	0.0	0.0	0.0	at member	at member
7	Local	0.0	0.0	0.0	0.0	0.0	0.0	at member	at member
10	Local	250.0	0.0	0.0	0.0	0.0	0.0	at member	at member
11	Local	0.0	0.0	0.0	-100.0	0.0	0.0	at member	at member
22	Local	0.0	0.0	0.0	-100.0	0.0	0.0	at member	at member
25	Global	0.0	0.0	0.0	0.0	0.0	120.0	at member	at member
29	Global	0.0	0.0	0.0	0.0	0.0	0.0	at member	at member

1.15/2 MEMBER ECCENTRICITIES - RELATIVE

Ecc. No.	Cross-Section Alignment y-Axis	Cross-Section Alignment z-Axis	Transverse offset from cross-section of another obj. Object Type	Object No.	y-Axis	z-Axis	Axial offset from adjacent Member Sta	Member End
2	Middle	Middle	None	0	Middle	Middle	☐	☐
3	Middle	Top (-z)	None	0	Middle	Top (-z)	☐	☐
5	Left (-y)	Middle	None	0	Left (-y)	Middle	☐	☐
6	Middle	Bottom (+z)	None	0	Middle	Bottom (+z)	☐	☐
7	Middle	Bottom (+z)	None	0	Middle	Bottom (+z)	☐	☐
10	Right (+y)	Middle	None	0	Right (+y)	Middle	☐	☐
11	Right (+y)	Middle	None	0	Right (+y)	Middle	☐	☐
22	Middle	Middle	None	0	Middle	Middle	☐	☐
25	Middle	Middle	None	0	Middle	Middle	☐	☐
29	Middle	Middle	None	0	Middle	Middle	☐	☐

1.17 MEMBERS



Mbr. No.	Line No.	Member	Rotation Type	Rotation β [°]	Cross-Section Start	Cross-Section End	Hinge No. Start	Hinge No. End	Ecc. No.	Div. No.	Length L [mm]	
1	12	Beam	Angle	0.00	19	19	-	-	-	-	4500	X
2	15	Beam	Angle	0.00	19	19	-	-	-	-	4500	X
3	23	Beam	Angle	0.00	19	19	-	-	-	-	4500	X

1.23 FE MESH REFINEMENTS

Refinem. No.	FE Mesh Refinement applied to	Nodes No.	Number Divisions	Sphere Radius [mm]	Target FE Length [mm] Inner	Target FE Length [mm] Outer	Comment
1	Lines via FE length	19,20,148-156, 158,159,168, 170-181,183		50			

1.25 LINE RELEASE TYPES

Release No.	Axial/Shear Release or Spring [kN/m²] u_x	u_y	u_z	Moment Release or Spring φ_x [kNm/rad/m]	Comment
1	☒	☒	Fixed if positive v_z	☒	
2	☒	☒	☐	☒	
3	☒	☒	Fixed if negative v_z	☒	

2.1 LOAD CASES

Load Case	Load Case Description	EN 1990 | LST Action Category	Self-Weight - Factor in Direction Active	X	Y	Z
LC1	[G]	Permanent	☒	0.000	0.000	1.000
LC2	[Tv]	Temperature (non fire)	☐			
LC3	[Tp]	Temperature (non fire)	☐			
LC4	[S]	Snow / ice	☐			
LC5	[N]	Imposed - Category A: domestic, residential areas	☐			

2.1.1 LOAD CASES - CALCULATION PARAMETERS

Load Case	Load Case Description	Calculation Parameters		
LC1	[G]	Method of analysis	: ⊙	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	: ⊙	Newton-Raphson
LC2	[Tv]	Method of analysis	: ⊙	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	: ⊙	Newton-Raphson
		Activate stiffness factors of:	: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC3	[Tþ]	Method of analysis	: ⊙	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	: ⊙	Newton-Raphson
		Activate stiffness factors of:	: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC4	[S]	Method of analysis	: ⊙	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	: ⊙	Newton-Raphson
LC5	[N]	Method of analysis	: ⊙	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	: ⊙	Newton-Raphson
		Activate stiffness factors of:	: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)

2.5 LOAD COMBINATIONS

Load Combin.	Load Combination DS	Description	No.	Factor	Load Case	
CO1	STR	1.35*LC1	1	1.35	LC1	[G]
CO2	STR	1.35*LC1 + 1.3*LC2	1	1.35	LC1	[G]
			2	1.30	LC2	[Tv]
CO3	STR	1.35*LC1 + 1.3*LC3	1	1.35	LC1	[G]
			2	1.30	LC3	[Tþ]
CO4	STR	1.35*LC1 + 1.3*LC3 + 0.91*LC4	1	1.35	LC1	[G]
			2	1.30	LC3	[Tþ]
			3	0.91	LC4	[S]
CO5	STR	1.35*LC1 + 1.3*LC3 + 0.91*LC4 + 0.91*LC5	1	1.35	LC1	[G]
			2	1.30	LC3	[Tþ]
			3	0.91	LC4	[S]
			4	0.91	LC5	[N]
CO6	STR	1.35*LC1 + 1.3*LC2 + 0.91*LC5	1	1.35	LC1	[G]
			2	1.30	LC2	[Tv]
			3	0.91	LC5	[N]
CO7	STR	1.35*LC1 + 1.3*LC3 + 0.91*LC5	1	1.35	LC1	[G]
			2	1.30	LC3	[Tþ]
			3	0.91	LC5	[N]
CO8	STR	1.35*LC1 + 1.3*LC4	1	1.35	LC1	[G]
			2	1.30	LC4	[S]
CO9	STR	1.35*LC1 + 0.78*LC3 + 1.3*LC4	1	1.35	LC1	[G]
			2	0.78	LC3	[Tþ]
			3	1.30	LC4	[S]
CO10	STR	1.35*LC1 + 0.78*LC3 + 1.3*LC4 + 0.91*LC5	1	1.35	LC1	[G]
			2	0.78	LC3	[Tþ]
			3	1.30	LC4	[S]
			4	0.91	LC5	[N]
CO11	STR	1.35*LC1 + 1.3*LC4 + 0.91*LC5	1	1.35	LC1	[G]
			2	1.30	LC4	[S]

2.5 LOAD COMBINATIONS

Load Combin.	DS	Load Combination Description	No.	Factor	Load Case	
			3	0.91	LC5	[N]
CO12	S Ch	LC1	1	1.00	LC1	[G]
CO13	S Ch	LC1 + LC2	1	1.00	LC1	[G]
			2	1.00	LC2	[Tv]
CO14	S Ch	LC1 + LC3	1	1.00	LC1	[G]
			2	1.00	LC3	[Tþ]
CO15	S Ch	LC1 + LC3 + 0.7*LC4	1	1.00	LC1	[G]
			2	1.00	LC3	[Tþ]
			3	0.70	LC4	[S]
CO16	S Ch	LC1 + LC3 + 0.7*LC4 + 0.7*LC5	1	1.00	LC1	[G]
			2	1.00	LC3	[Tþ]
			3	0.70	LC4	[S]
			4	0.70	LC5	[N]
CO17	S Ch	LC1 + LC2 + 0.7*LC5	1	1.00	LC1	[G]
			2	1.00	LC2	[Tv]
			3	0.70	LC5	[N]
CO18	S Ch	LC1 + LC3 + 0.7*LC5	1	1.00	LC1	[G]
			2	1.00	LC3	[Tþ]
			3	0.70	LC5	[N]
CO19	S Ch	LC1 + LC4	1	1.00	LC1	[G]
			2	1.00	LC4	[S]
CO20	S Ch	LC1 + 0.6*LC3 + LC4	1	1.00	LC1	[G]
			2	0.60	LC3	[Tþ]
			3	1.00	LC4	[S]
CO21	S Ch	LC1 + 0.6*LC3 + LC4 + 0.7*LC5	1	1.00	LC1	[G]
			2	0.60	LC3	[Tþ]
			3	1.00	LC4	[S]
			4	0.70	LC5	[N]
CO22	S Ch	LC1 + LC4 + 0.7*LC5	1	1.00	LC1	[G]
			2	1.00	LC4	[S]
			3	0.70	LC5	[N]
CO23	S Fr	LC1	1	1.00	LC1	[G]
CO24	S Fr	LC1 + 0.5*LC2	1	1.00	LC1	[G]
			2	0.50	LC2	[Tv]
CO25	S Fr	LC1 + 0.5*LC3	1	1.00	LC1	[G]
			2	0.50	LC3	[Tþ]
CO26	S Fr	LC1 + 0.5*LC3 + 0.2*LC4	1	1.00	LC1	[G]
			2	0.50	LC3	[Tþ]
			3	0.20	LC4	[S]
CO27	S Fr	LC1 + 0.5*LC3 + 0.2*LC4 + 0.3*LC5	1	1.00	LC1	[G]
			2	0.50	LC3	[Tþ]
			3	0.20	LC4	[S]
			4	0.30	LC5	[N]
CO28	S Fr	LC1 + 0.5*LC2 + 0.3*LC5	1	1.00	LC1	[G]
			2	0.50	LC2	[Tv]
			3	0.30	LC5	[N]
CO29	S Fr	LC1 + 0.5*LC3 + 0.3*LC5	1	1.00	LC1	[G]
			2	0.50	LC3	[Tþ]
			3	0.30	LC5	[N]
CO30	S Fr	LC1 + 0.5*LC4	1	1.00	LC1	[G]
			2	0.50	LC4	[S]
CO31	S Fr	LC1 + 0.5*LC4 + 0.3*LC5	1	1.00	LC1	[G]
			2	0.50	LC4	[S]
			3	0.30	LC5	[N]
CO32	S Qp	LC1	1	1.00	LC1	[G]
CO33	S Qp	LC1 + 0.2*LC4	1	1.00	LC1	[G]
			2	0.20	LC4	[S]
CO34	S Qp	LC1 + 0.2*LC4 + 0.3*LC5	1	1.00	LC1	[G]

2.5 LOAD COMBINATIONS

Load Combin.	DS	Load Combination Description	No.	Factor	Load Case	
			2	0.20	LC4	[S]
			3	0.30	LC5	[N]
CO35	S Qp	LC1 + 0.3*LC5	1	1.00	LC1	[G]
			2	0.30	LC5	[N]

2.5.2 LOAD COMBINATIONS - CALCULATION PARAMETERS

Load Combin.	Description	Calculation Parameters	
CO1	1.35*LC1	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM)
			: ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO2	1.35*LC1 + 1.3*LC2	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM)
			: ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO3	1.35*LC1 + 1.3*LC3	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM)
			: ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO4	1.35*LC1 + 1.3*LC3 + 0.91*LC4	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM)
			: ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO5	1.35*LC1 + 1.3*LC3 + 0.91*LC4 + 0.91*LC5	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM)
			: ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)

2.5.2 LOAD COMBINATIONS - CALCULATION PARAMETERS

Load Combin.	Description	Calculation Parameters	
CO6	1.35*LC1 + 1.3*LC2 + 0.91*LC5	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM)
			: ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO7	1.35*LC1 + 1.3*LC3 + 0.91*LC5	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM)
			: ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO8	1.35*LC1 + 1.3*LC4	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM)
			: ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO9	1.35*LC1 + 0.78*LC3 + 1.3*LC4	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM)
			: ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO10	1.35*LC1 + 0.78*LC3 + 1.3*LC4 + 0.91*LC5	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM)
			: ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO11	1.35*LC1 + 1.3*LC4 + 0.91*LC5	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM)
			: ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO12	LC1	Method of analysis	: ◉ Geometrically linear analysis

2.5.2 LOAD COMBINATIONS - CALCULATION PARAMETERS

Load Combin.	Description	Calculation Parameters	
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO13	LC1 + LC2	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ 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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO14	LC1 + LC3	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ 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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO15	LC1 + LC3 + 0.7*LC4	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ 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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO16	LC1 + LC3 + 0.7*LC4 + 0.7*LC5	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ 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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO17	LC1 + LC2 + 0.7*LC5	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ 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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO18	LC1 + LC3 + 0.7*LC5	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ 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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO19	LC1 + LC4	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO20	LC1 + 0.6*LC3 + LC4	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO21	LC1 + 0.6*LC3 + LC4 + 0.7*LC5	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO22	LC1 + LC4 + 0.7*LC5	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO23	LC1	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO24	LC1 + 0.5*LC2	Method of analysis	: ◉ Geometrically linear analysis
		Options	: ☒ Consider favorable effects due to tension : ☒ Refer internal forces to deformed system for:

2.5.2 LOAD COMBINATIONS - CALCULATION PARAMETERS

Load Combin.	Description	Calculation Parameters	
			☒ Normal forces N ☒ Shear forces V_y and V_z ☒ Moments M_y, M_z and M_T
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO25	LC1 + 0.5*LC3	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ 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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO26	LC1 + 0.5*LC3 + 0.2*LC4	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ 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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO27	LC1 + 0.5*LC3 + 0.2*LC4 + 0.3*LC5	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ 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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO28	LC1 + 0.5*LC2 + 0.3*LC5	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ 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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO29	LC1 + 0.5*LC3 + 0.3*LC5	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ 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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO30	LC1 + 0.5*LC4	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ Consider favorable effects due to tension : ☒ Refer internal forces to deformed system for: ☒ Normal forces N

2.5.2 LOAD COMBINATIONS - CALCULATION PARAMETERS

Load Combin.	Description	Calculation Parameters		
			☒	Shear forces V_y and V_z
			☒	Moments M_y, M_z and M_T
		Activate stiffness factors of:	: ☒	Materials (partial factor γM)
			: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO31	LC1 + 0.5*LC4 + 0.3*LC5	Method of analysis	: ⊙	Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒	Materials (partial factor γM)
			: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO32	LC1	Method of analysis	: ⊙	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	: ⊙	Picard
		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
		Activate stiffness factors of:	: ☒	Materials (partial factor γM)
			: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO33	LC1 + 0.2*LC4	Method of analysis	: ⊙	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	: ⊙	Picard
		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
		Activate stiffness factors of:	: ☒	Materials (partial factor γM)
			: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO34	LC1 + 0.2*LC4 + 0.3*LC5	Method of analysis	: ⊙	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	: ⊙	Picard
		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
		Activate stiffness factors of:	: ☒	Materials (partial factor γM)
			: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO35	LC1 + 0.3*LC5	Method of analysis	: ⊙	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	: ⊙	Picard
		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
		Activate stiffness factors of:	: ☒	Materials (partial factor γM)

2.5.2 LOAD COMBINATIONS - CALCULATION PARAMETERS

Load Combin.	Description	Calculation Parameters
		: ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)

2.7 RESULT COMBINATIONS

Result Combin	Description	Loading
RC1	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	CO1/p or to CO11
RC2	SLS - Characteristic	CO12/p or to CO22
RC3	SLS - Frequent	CO23/p or to CO31
RC4	SLS - Quasi-permanent	CO32/p or to CO35

LC1
[G]

3.4 SURFACE LOADS

LC1: [G]

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	2,5,6	Force	Uniform	ZL	p	1.00	kN/m²

3.15 GENERATED LOADS

LC1: [G]

No.	Load Description					
1	**From Area Loads via Plane**					
	Area load direction	Perpendicular to the plane		:	☒z	
	Member load direction	Direction of generated member loads:		:	☒Local in x, y, z	
	Area of load application	☒Fully closed plane				
	Load distribution type:	☒Combined				
	Area load magnitude	☒Constant		:	1.00	kN/m²
	Boundary of the area load plane	Corner nodes		:	14,15,11,10	
		Note		:	Each row in the drop down list box denotes one plane	
	Generating total loads in direction	ΣP_{Areas}	X	:	0.000	kN
			Y	:	0.000	kN
			Z	:	10.800	kN
		$\Sigma P_{Members}$	X	:	0.000	kN
			Y	:	0.000	kN
			Z	:	16.200	kN
	Total moment to the origin	ΣM_{Areas}	X	:	184.626	kNm
			Y	:	-27.540	kNm
			Z	:	0.000	kNm
		$\Sigma M_{Members}$	X	:	276.939	kNm
			Y	:	-41.310	kNm
			Z	:	0.000	kNm
	Cells selected for generating	Σ number of cells		:	2	
		Σ cell area		:	10799998	mm²

3.15 GENERATED LOADS

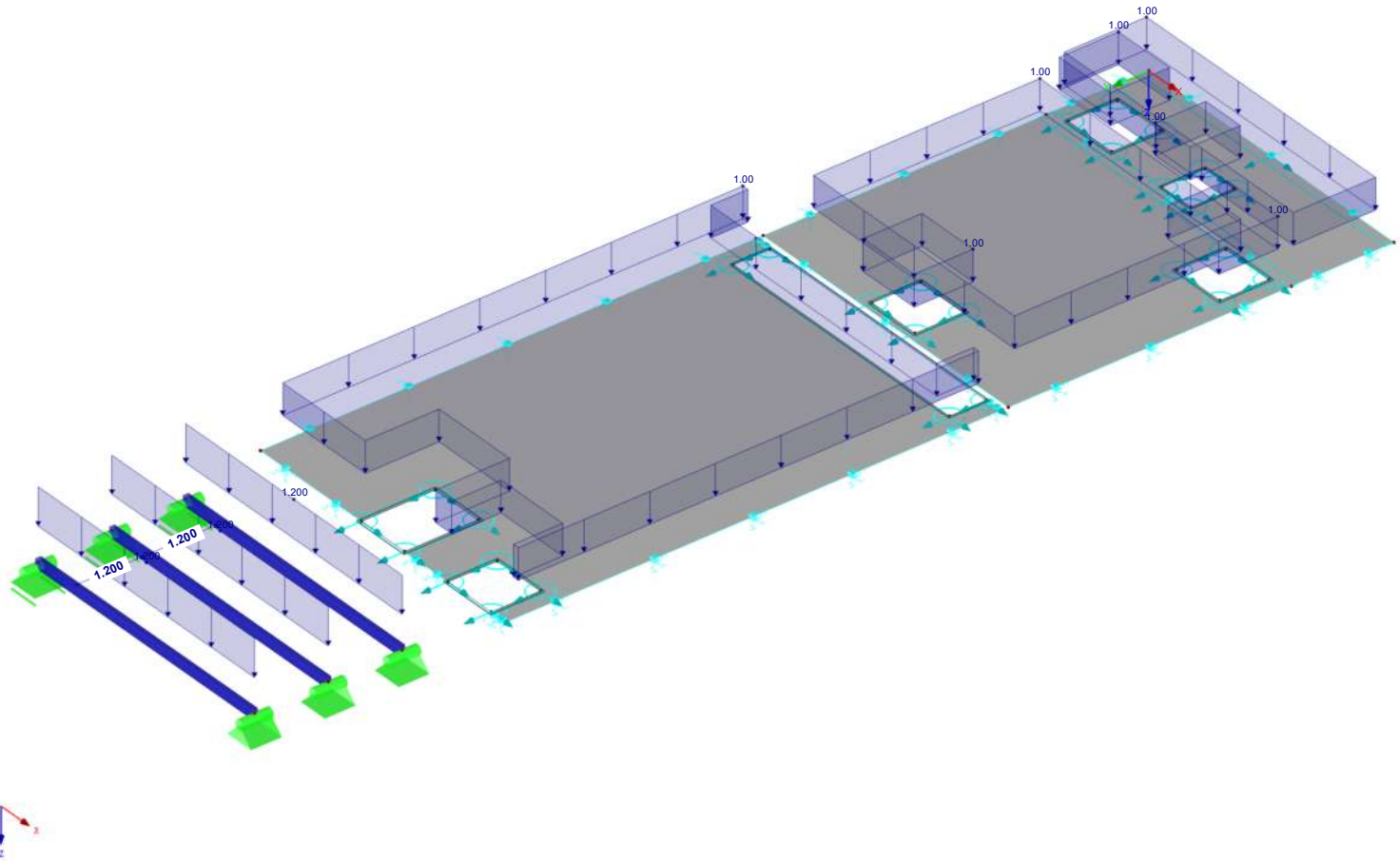
LC1: [G]

No.	Load Description				
	Convert loads to members No.			:	1-3
	Correction factors for loaded members	Members	1,3	:	2

LC1: [G]

LC1 : [G]
Loads [kN/m], [kN/m^2]

Isometric



LC2
[Tv]

3.4 SURFACE LOADS

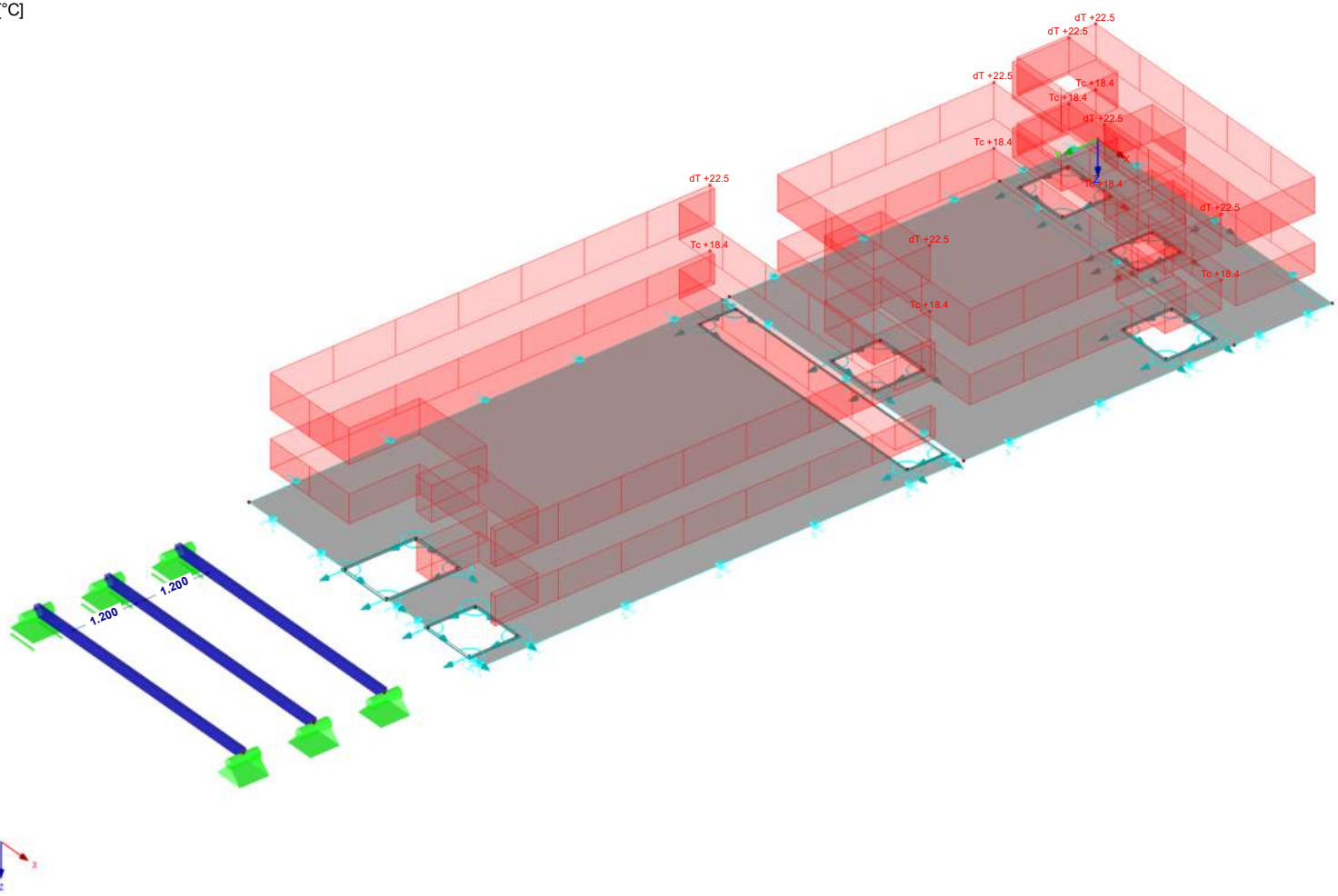
LC2: [Tv]

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	2,5,6	Temperature	Uniform		T_c	18.4	°C
					ΔT	22.5	°C

LC2: [TV]

LC2 : [Tv]
Loads [°C]

Isometric



LC3
[Tþ]

3.4 SURFACE LOADS

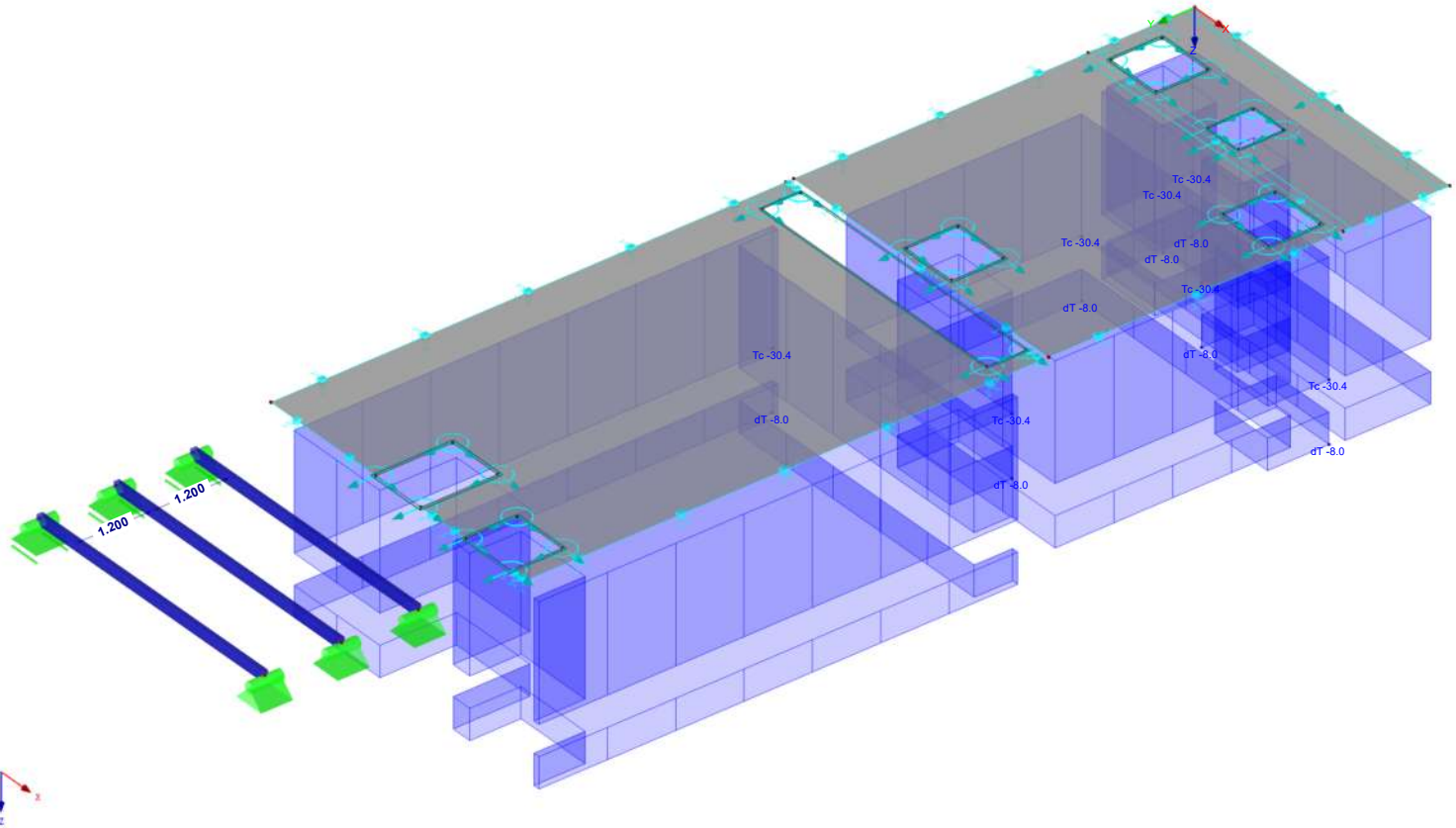
LC3: [Tþ]

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	2,5,6	Temperature	Uniform		T_c	-30.4	°C
					ΔT	-8.0	°C

LC3: [TÞ]

LC3 : [Tž]
Loads [°C]

Isometric



LC4
[S]

3.4 SURFACE LOADS

LC4: [S]

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	2,5,6	Force	Uniform	ZL	p	1.20	kN/m²

3.15 GENERATED LOADS

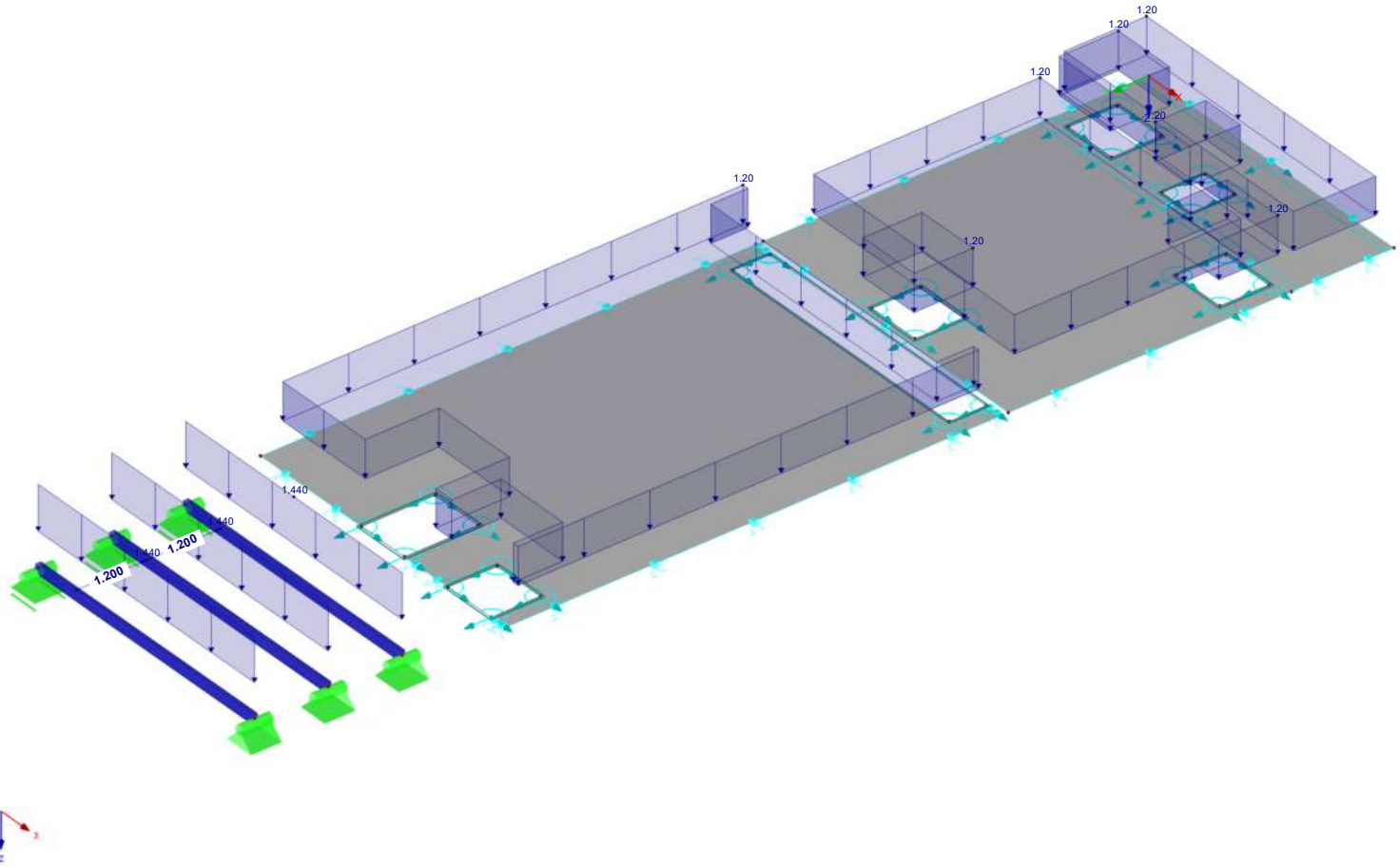
LC4: [S]

No.	Load Description					
1	**From Area Loads via Plane**					
	Area load direction	Perpendicular to the plane		:	☒z	
	Member load direction	Direction of generated member loads:		:	☒Local in x, y, z	
	Area of load application	☒Fully closed plane				
	Load distribution type:	☒Combined				
	Area load magnitude	☒Constant		:	1.20	kN/m²
	Boundary of the area load plane	Corner nodes		:	14,15,11,10	
		Note		:	Each row in the drop down list box denotes one plane	
	Generating total loads in direction	ΣP_{Areas}	X	:	0.000	kN
			Y	:	0.000	kN
			Z	:	12.960	kN
		$\Sigma P_{Members}$	X	:	0.000	kN
			Y	:	0.000	kN
			Z	:	19.440	kN
	Total moment to the origin	ΣM_{Areas}	X	:	221.551	kNm
			Y	:	-33.048	kNm
			Z	:	0.000	kNm
		$\Sigma M_{Members}$	X	:	332.327	kNm
			Y	:	-49.572	kNm
			Z	:	0.000	kNm
	Cells selected for generating	Σ number of cells		:	2	
		Σ cell area		:	10799998	mm²
	Convert loads to members No.			:	1-3	
	Correction factors for loaded members	Members	1,3	:	2	

LC4: [S]

LC4 : [S]
Loads [kN/m^2]

Isometric



LC5
[N]

3.4 SURFACE LOADS

LC5: [N]

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	2,5,6	Force	Uniform	ZL	p	2.00	kN/m²

3.15 GENERATED LOADS

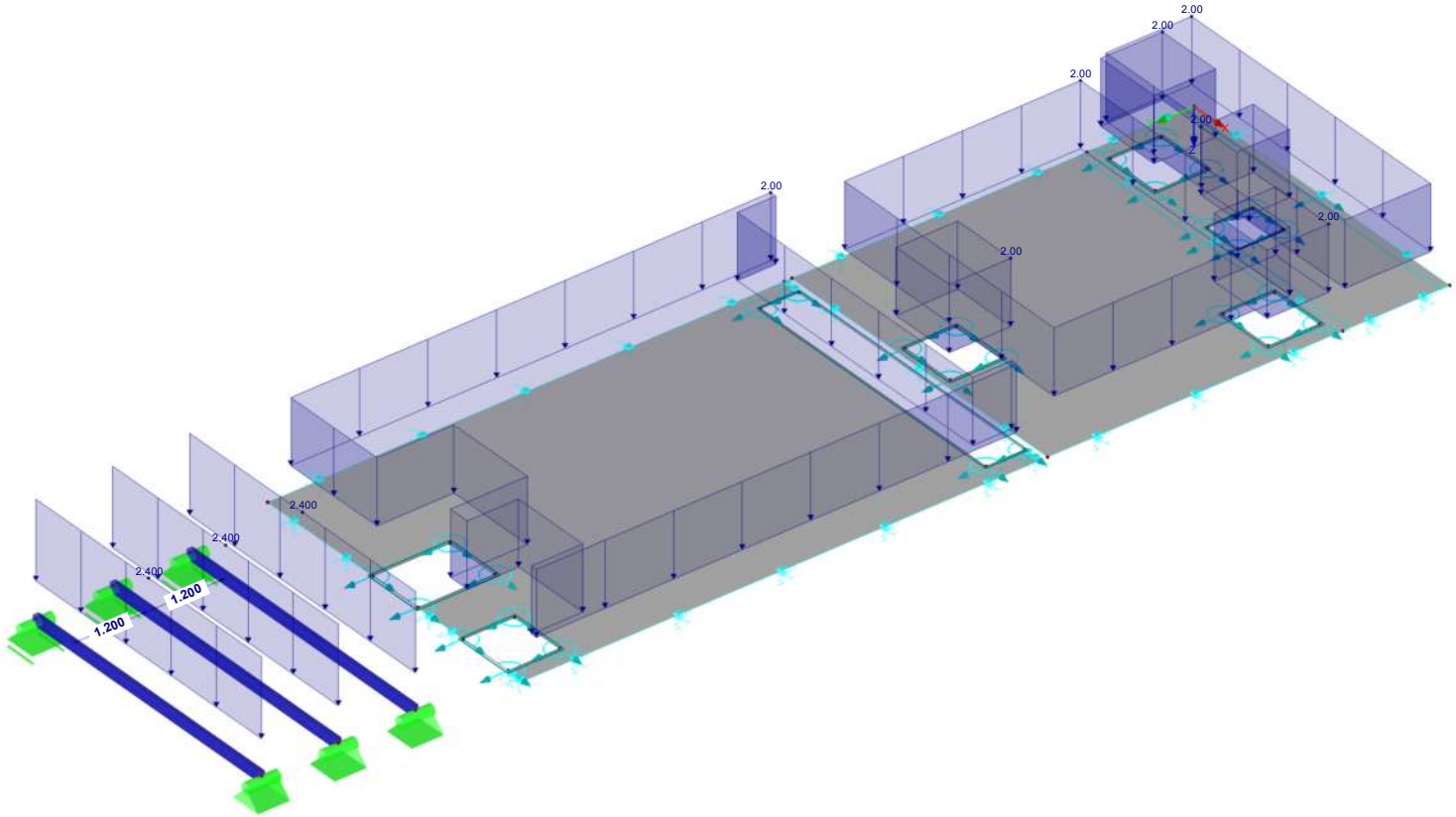
LC5: [N]

No.	Load Description					
1	**From Area Loads via Plane**					
	Area load direction	Perpendicular to the plane		:	☒z	
	Member load direction	Direction of generated member loads:		:	☒Local in x, y, z	
	Area of load application	☒Fully closed plane				
	Load distribution type:	☒Combined				
	Area load magnitude	☒Constant		:	2.00	kN/m²
	Boundary of the area load plane	Corner nodes		:	14,15,11,10	
		Note		:	Each row in the drop down list box denotes one plane	
	Generating total loads in direction	ΣP_{Areas}	X	:	0.000	kN
			Y	:	0.000	kN
			Z	:	21.600	kN
		$\Sigma P_{Members}$	X	:	0.000	kN
			Y	:	0.000	kN
			Z	:	32.400	kN
	Total moment to the origin	ΣM_{Areas}	X	:	369.252	kNm
			Y	:	-55.080	kNm
			Z	:	0.000	kNm
		$\Sigma M_{Members}$	X	:	553.878	kNm
			Y	:	-82.620	kNm
			Z	:	0.000	kNm
	Cells selected for generating	Σ number of cells		:	2	
		Σ cell area		:	10799998	mm²
	Convert loads to members No.			:	1-3	
	Correction factors for loaded members	Members	1,3	:	2	

LC5: [N]

LC5 : [N]
Loads [kN/m^2]

Isometric



4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
Load Combination CO1 - 1.35*LC1				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	560.03	kN	
	Sum of support reactions in Z	560.03	kN	Deviation 0.00%
	Resultant of reactions about X	205.80	kNm	At center of gravity of model (X:2530.52, Y:7332.11, Z:0.00 mm)
	Resultant of reactions about Y	-0.41	kNm	At center of gravity of model
	Resultant of reactions about Z	0.00	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	5.9	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	5.9	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-1.2	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-4.1	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	7		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	4.666E+285510		
	Infinity Norm	4.808E+10		
Load Combination CO2 - 1.35*LC1 + 1.3*LC2				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	560.03	kN	
	Sum of support reactions in Z	560.51	kN	Deviation -0.09%
	Resultant of reactions about X	203.6	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-1.7	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.6	mm	FE Mesh Node No. 2938 (X: 5100, Y: 13640, Z: 0 mm)
	Max. displacement in Y	-1.1	mm	FE Mesh Node No. 191 (X: 0, Y: 6395, Z: 0 mm)
	Max. displacement in Z	5.9	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	5.9	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-2.5	mrad	FE Mesh Node No. 3149 (X: 2550, Y: 6995, Z: 0 mm)
	Max. rotation about Y	-4.1	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 4752, Y: 7097, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	7		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	3.533E+285488		
	Infinity Norm	4.808E+10		
Load Combination CO3 - 1.35*LC1 + 1.3*LC3				
	Sum of loads in X	0.00	kN	

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	560.03	kN	
	Sum of support reactions in Z	560.03	kN	Deviation 0.00%
	Resultant of reactions about X	205.8	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.4	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-1.0	mm	FE Mesh Node No. 2939 (X: 5100, Y: 13539, Z: 0 mm)
	Max. displacement in Y	1.8	mm	FE Mesh Node No. 191 (X: 0, Y: 6395, Z: 0 mm)
	Max. displacement in Z	5.9	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	5.9	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-2.5	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-4.1	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	-0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	8		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	1.377E+285476		
	Infinity Norm	4.808E+10		
Load Combination CO4 - 1.35*LC1 + 1.3*LC3 + 0.91*LC4				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	649.74	kN	
	Sum of support reactions in Z	649.74	kN	Deviation 0.00%
	Resultant of reactions about X	372.3	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.7	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-1.0	mm	FE Mesh Node No. 2939 (X: 5100, Y: 13539, Z: 0 mm)
	Max. displacement in Y	1.8	mm	FE Mesh Node No. 191 (X: 0, Y: 6395, Z: 0 mm)
	Max. displacement in Z	9.9	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	9.9	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-2.7	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-7.0	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	-0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	8		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	6.115E+285476		
	Infinity Norm	4.808E+10		
Load Combination CO5 - 1.35*LC1 + 1.3*LC3 + 0.91*LC4 + 0.91*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	799.26	kN	
	Sum of support reactions in Z	799.26	kN	Deviation 0.00%
	Resultant of reactions about X	649.7	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-1.3	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-1.0	mm	FE Mesh Node No. 2939 (X: 5100, Y: 13539, Z: 0 mm)
	Max. displacement in Y	1.8	mm	FE Mesh Node No. 191 (X: 0, Y: 6395, Z: 0 mm)
	Max. displacement in Z	16.6	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	16.6	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-3.0	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-11.7	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	-0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	9		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	1.245E+285479		
	Infinity Norm	4.808E+10		
Load Combination CO6 - 1.35*LC1 + 1.3*LC2 + 0.91*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	709.55	kN	
	Sum of support reactions in Z	709.61	kN	Deviation -0.01%
	Resultant of reactions about X	483.0	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-1.1	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.6	mm	FE Mesh Node No. 2938 (X: 5100, Y: 13640, Z: 0 mm)
	Max. displacement in Y	-1.1	mm	FE Mesh Node No. 191 (X: 0, Y: 6395, Z: 0 mm)
	Max. displacement in Z	12.6	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	12.6	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-2.5	mrad	FE Mesh Node No. 3149 (X: 2550, Y: 6995, Z: 0 mm)
	Max. rotation about Y	-8.9	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 4752, Y: 7097, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	7		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	1.197E+285500		
	Infinity Norm	4.808E+10		
Load Combination CO7 - 1.35*LC1 + 1.3*LC3 + 0.91*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	709.55	kN	

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Sum of support reactions in Z	709.55	kN	Deviation 0.00%
	Resultant of reactions about X	483.3	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-1.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-1.0	mm	FE Mesh Node No. 2939 (X: 5100, Y: 13539, Z: 0 mm)
	Max. displacement in Y	1.8	mm	FE Mesh Node No. 191 (X: 0, Y: 6395, Z: 0 mm)
	Max. displacement in Z	12.6	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	12.6	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-2.8	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-8.9	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	-0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	8		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	6.221E+285477		
	Infinity Norm	4.808E+10		
Load Combination CO8 - 1.35*LC1 + 1.3*LC4				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	688.19	kN	
	Sum of support reactions in Z	688.19	kN	Deviation 0.00%
	Resultant of reactions about X	443.6	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.9	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	11.6	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	11.6	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-1.5	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-8.2	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	7		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	4.666E+285510		
	Infinity Norm	4.808E+10		
Load Combination CO9 - 1.35*LC1 + 0.78*LC3 + 1.3*LC4				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	688.19	kN	
	Sum of support reactions in Z	688.19	kN	Deviation 0.00%
	Resultant of reactions about X	443.6	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Resultant of reactions about Y	-0.9	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-0.6	mm	FE Mesh Node No. 2939 (X: 5100, Y: 13539, Z: 0 mm)
	Max. displacement in Y	1.1	mm	FE Mesh Node No. 185 (X: 4800, Y: 6395, Z: 0 mm)
	Max. displacement in Z	11.6	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	11.6	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-2.3	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-8.2	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	-0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	8		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	1.699E+285481		
	Infinity Norm	4.808E+10		
Load Combination CO10 - 1.35*LC1 + 0.78*LC3 + 1.3*LC4 + 0.91*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	837.70	kN	
	Sum of support reactions in Z	837.70	kN	Deviation 0.00%
	Resultant of reactions about X	721.1	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-1.4	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-0.6	mm	FE Mesh Node No. 2939 (X: 5100, Y: 13539, Z: 0 mm)
	Max. displacement in Y	1.1	mm	FE Mesh Node No. 185 (X: 4800, Y: 6395, Z: 0 mm)
	Max. displacement in Z	18.3	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	18.3	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-2.6	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-12.9	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	-0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	8		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	5.512E+285484		
	Infinity Norm	4.808E+10		
Load Combination CO11 - 1.35*LC1 + 1.3*LC4 + 0.91*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	837.70	kN	
	Sum of support reactions in Z	837.70	kN	Deviation 0.00%
	Resultant of reactions about X	721.1	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-1.4	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	18.3	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	18.3	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-1.8	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-12.9	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	7		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	4.666E+285510		
	Infinity Norm	4.808E+10		
Load Combination CO12 - LC1				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	414.84	kN	
	Sum of support reactions in Z	414.84	kN	Deviation 0.00%
	Resultant of reactions about X	152.4	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.3	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	4.3	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	4.3	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-0.9	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-3.1	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	7		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	4.666E+285510		
	Infinity Norm	4.808E+10		
Load Combination CO13 - LC1 + LC2				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	414.84	kN	
	Sum of support reactions in Z	415.17	kN	Deviation -0.08%
	Resultant of reactions about X	150.0	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.2	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.5	mm	FE Mesh Node No. 2938 (X: 5100, Y: 13640, Z: 0 mm)
	Max. displacement in Y	-0.8	mm	FE Mesh Node No. 192 (X: 5100, Y: 6395, Z: 0 mm)

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Max. displacement in Z	4.3	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	4.3	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-1.9	mrad	FE Mesh Node No. 3149 (X: 2550, Y: 6995, Z: 0 mm)
	Max. rotation about Y	-3.1	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 4752, Y: 7097, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	7		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	2.493E+285486		
	Infinity Norm	4.808E+10		
Load Combination CO14 - LC1 + LC3				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	414.84	kN	
	Sum of support reactions in Z	415.07	kN	Deviation -0.06%
	Resultant of reactions about X	152.6	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.4	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-0.8	mm	FE Mesh Node No. 2939 (X: 5100, Y: 13539, Z: 0 mm)
	Max. displacement in Y	1.4	mm	FE Mesh Node No. 185 (X: 4800, Y: 6395, Z: 0 mm)
	Max. displacement in Z	4.3	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	4.3	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-1.9	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-3.1	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	-0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	8		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	1.377E+285476		
	Infinity Norm	4.808E+10		
Load Combination CO15 - LC1 + LC3 + 0.7*LC4				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	483.84	kN	
	Sum of support reactions in Z	483.84	kN	Deviation 0.00%
	Resultant of reactions about X	280.5	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.6	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-0.8	mm	FE Mesh Node No. 2939 (X: 5100, Y: 13539, Z: 0 mm)
	Max. displacement in Y	1.4	mm	FE Mesh Node No. 185 (X: 4800, Y: 6395, Z: 0 mm)
	Max. displacement in Z	7.4	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	7.4	mm	Member No. 2, x: 2250 mm

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Max. rotation about X	-2.1	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-5.3	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	-0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	8		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	6.115E+285476		
	Infinity Norm	4.808E+10		
Load Combination CO16 - LC1 + LC3 + 0.7*LC4 + 0.7*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	598.86	kN	
	Sum of support reactions in Z	598.86	kN	Deviation 0.00%
	Resultant of reactions about X	493.9	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-1.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-0.8	mm	FE Mesh Node No. 2939 (X: 5100, Y: 13539, Z: 0 mm)
	Max. displacement in Y	1.4	mm	FE Mesh Node No. 185 (X: 4800, Y: 6395, Z: 0 mm)
	Max. displacement in Z	12.6	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	12.6	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-2.3	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-8.9	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	-0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	9		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	1.245E+285479		
	Infinity Norm	4.808E+10		
Load Combination CO17 - LC1 + LC2 + 0.7*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	529.85	kN	
	Sum of support reactions in Z	529.85	kN	Deviation 0.00%
	Resultant of reactions about X	365.9	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.7	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.5	mm	FE Mesh Node No. 2938 (X: 5100, Y: 13640, Z: 0 mm)
	Max. displacement in Y	-0.8	mm	FE Mesh Node No. 192 (X: 5100, Y: 6395, Z: 0 mm)
	Max. displacement in Z	9.5	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	9.5	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-1.9	mrad	FE Mesh Node No. 3149 (X: 2550, Y: 6995, Z: 0 mm)
	Max. rotation about Y	-6.7	mrad	Member No. 2, x: 0 mm

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Max. rotation about Z	0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 4752, Y: 7097, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	7		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	1.405E+285497		
	Infinity Norm	4.808E+10		
Load Combination CO18 - LC1 + LC3 + 0.7*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	529.85	kN	
	Sum of support reactions in Z	529.85	kN	Deviation 0.00%
	Resultant of reactions about X	365.9	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.7	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-0.8	mm	FE Mesh Node No. 2939 (X: 5100, Y: 13539, Z: 0 mm)
	Max. displacement in Y	1.4	mm	FE Mesh Node No. 185 (X: 4800, Y: 6395, Z: 0 mm)
	Max. displacement in Z	9.5	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	9.5	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-2.1	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-6.7	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	-0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	8		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	8.962E+285476		
	Infinity Norm	4.808E+10		
Load Combination CO19 - LC1 + LC4				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	513.42	kN	
	Sum of support reactions in Z	513.42	kN	Deviation 0.00%
	Resultant of reactions about X	335.4	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.7	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	8.8	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	8.8	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-1.1	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-6.2	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	7		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	4.666E+285510		
	Infinity Norm	4.808E+10		
Load Combination CO20 - LC1 + 0.6*LC3 + LC4				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	513.42	kN	
	Sum of support reactions in Z	513.42	kN	Deviation 0.00%
	Resultant of reactions about X	335.4	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.7	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-0.5	mm	FE Mesh Node No. 2937 (X: 5100, Y: 13741, Z: 0 mm)
	Max. displacement in Y	0.8	mm	FE Mesh Node No. 185 (X: 4800, Y: 6395, Z: 0 mm)
	Max. displacement in Z	8.8	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	8.8	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-1.7	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-6.2	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	-0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	8		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	1.699E+285481		
	Infinity Norm	4.808E+10		
Load Combination CO21 - LC1 + 0.6*LC3 + LC4 + 0.7*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	628.43	kN	
	Sum of support reactions in Z	628.43	kN	Deviation 0.00%
	Resultant of reactions about X	548.8	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-1.1	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-0.5	mm	FE Mesh Node No. 2937 (X: 5100, Y: 13741, Z: 0 mm)
	Max. displacement in Y	0.8	mm	FE Mesh Node No. 185 (X: 4800, Y: 6395, Z: 0 mm)
	Max. displacement in Z	13.9	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	13.9	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-1.9	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-9.8	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	-0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	8		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	4.456E+285484		
	Infinity Norm	4.808E+10		
Load Combination CO22 - LC1 + LC4 + 0.7*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	628.43	kN	
	Sum of support reactions in Z	628.43	kN	Deviation 0.00%
	Resultant of reactions about X	548.8	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-1.1	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	13.9	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	13.9	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-1.3	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-9.8	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	7		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	4.666E+285510		
	Infinity Norm	4.808E+10		
Load Combination CO23 - LC1				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	414.84	kN	
	Sum of support reactions in Z	414.84	kN	Deviation 0.00%
	Resultant of reactions about X	152.4	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.3	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	4.3	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	4.3	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-0.9	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-3.1	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Number of iterations	7		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	4.666E+285510		
	Infinity Norm	4.808E+10		
Load Combination CO24 - LC1 + 0.5*LC2				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	414.84	kN	
	Sum of support reactions in Z	415.24	kN	Deviation -0.10%
	Resultant of reactions about X	149.9	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-1.1	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.2	mm	FE Mesh Node No. 2937 (X: 5100, Y: 13741, Z: 0 mm)
	Max. displacement in Y	-0.4	mm	FE Mesh Node No. 185 (X: 4800, Y: 6395, Z: 0 mm)
	Max. displacement in Z	4.3	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	4.3	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-1.0	mrad	FE Mesh Node No. 3149 (X: 2550, Y: 6995, Z: 0 mm)
	Max. rotation about Y	-3.1	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 4752, Y: 7097, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	5		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	4.923E+285511		
	Infinity Norm	4.808E+10		
Load Combination CO25 - LC1 + 0.5*LC3				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	414.84	kN	
	Sum of support reactions in Z	414.84	kN	Deviation 0.00%
	Resultant of reactions about X	152.4	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.3	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-0.4	mm	FE Mesh Node No. 2938 (X: 5100, Y: 13640, Z: 0 mm)
	Max. displacement in Y	0.7	mm	FE Mesh Node No. 191 (X: 0, Y: 6395, Z: 0 mm)
	Max. displacement in Z	4.3	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	4.3	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-1.4	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-3.1	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	-0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	8		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	1.699E+285481		
	Infinity Norm	4.808E+10		
Load Combination CO26 - LC1 + 0.5*LC3 + 0.2*LC4				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	434.55	kN	
	Sum of support reactions in Z	434.55	kN	Deviation 0.00%
	Resultant of reactions about X	189.0	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.4	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-0.4	mm	FE Mesh Node No. 2938 (X: 5100, Y: 13640, Z: 0 mm)
	Max. displacement in Y	0.7	mm	FE Mesh Node No. 191 (X: 0, Y: 6395, Z: 0 mm)
	Max. displacement in Z	5.2	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	5.2	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-1.5	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-3.7	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	-0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	8		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	2.089E+285481		
	Infinity Norm	4.808E+10		
Load Combination CO27 - LC1 + 0.5*LC3 + 0.2*LC4 + 0.3*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	483.84	kN	
	Sum of support reactions in Z	483.84	kN	Deviation 0.00%
	Resultant of reactions about X	280.5	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.6	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-0.4	mm	FE Mesh Node No. 2938 (X: 5100, Y: 13640, Z: 0 mm)
	Max. displacement in Y	0.7	mm	FE Mesh Node No. 191 (X: 0, Y: 6395, Z: 0 mm)
	Max. displacement in Z	7.4	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	7.4	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-1.6	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-5.3	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	-0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	8		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	4.301E+285483		

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Infinity Norm	4.808E+10		
Load Combination CO28 - LC1 + 0.5*LC2 + 0.3*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	464.13	kN	
	Sum of support reactions in Z	464.29	kN	Deviation -0.04%
	Resultant of reactions about X	243.0	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.9	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.2	mm	FE Mesh Node No. 2937 (X: 5100, Y: 13741, Z: 0 mm)
	Max. displacement in Y	-0.4	mm	FE Mesh Node No. 185 (X: 4800, Y: 6395, Z: 0 mm)
	Max. displacement in Z	6.5	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	6.5	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-1.0	mrad	FE Mesh Node No. 3149 (X: 2550, Y: 6995, Z: 0 mm)
	Max. rotation about Y	-4.6	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 4752, Y: 7097, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	5		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	2.266E+285513		
	Infinity Norm	4.808E+10		
Load Combination CO29 - LC1 + 0.5*LC3 + 0.3*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	464.13	kN	
	Sum of support reactions in Z	464.13	kN	Deviation 0.00%
	Resultant of reactions about X	243.9	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.5	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-0.4	mm	FE Mesh Node No. 2938 (X: 5100, Y: 13640, Z: 0 mm)
	Max. displacement in Y	0.7	mm	FE Mesh Node No. 191 (X: 0, Y: 6395, Z: 0 mm)
	Max. displacement in Z	6.5	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	6.5	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-1.5	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-4.6	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	-0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	8		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	3.490E+285483		
	Infinity Norm	4.808E+10		

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
Load Combination CO30 - LC1 + 0.5*LC4				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	464.13	kN	
	Sum of support reactions in Z	464.13	kN	Deviation 0.00%
	Resultant of reactions about X	243.9	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.5	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	6.5	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	6.5	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-1.0	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-4.6	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	7		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	4.666E+285510		
	Infinity Norm	4.808E+10		
Load Combination CO31 - LC1 + 0.5*LC4 + 0.3*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	513.42	kN	
	Sum of support reactions in Z	513.42	kN	Deviation 0.00%
	Resultant of reactions about X	335.4	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.7	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	8.8	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	8.8	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-1.1	mrad	FE Mesh Node No. 172 (X: 3000, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-6.2	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	7		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	4.666E+285510		
	Infinity Norm	4.808E+10		
Load Combination CO32 - LC1				
	Sum of loads in X	0.00	kN	

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	414.84	kN	
	Sum of support reactions in Z	414.84	kN	Deviation 0.00%
	Resultant of reactions about X	152.4	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.3	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	4.3	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	4.3	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-0.9	mrad	FE Mesh Node No. 2910 (X: 3045, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-3.1	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	2nd Order		Second order analysis (Nonlinear, Timoshenko)
	Internal forces referred to deformed system for...	☒		N, V_y, V_z, M_y, M_z, M_T
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Consider favorable effects of tensile forces	☒		
	Divide results by CO factor	☐		
	Number of load increments	1		
	Number of iterations	7		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	3.049E+286039		
	Infinity Norm	4.808E+10		
Load Combination CO33 - LC1 + 0.2*LC4				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	434.55	kN	
	Sum of support reactions in Z	434.55	kN	Deviation 0.00%
	Resultant of reactions about X	189.0	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.4	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	5.2	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	5.2	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-1.0	mrad	FE Mesh Node No. 2910 (X: 3045, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-3.7	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	2nd Order		Second order analysis (Nonlinear, Timoshenko)
	Internal forces referred to deformed system for...	☒		N, V_y, V_z, M_y, M_z, M_T
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Consider favorable effects of tensile forces	☒		
	Divide results by CO factor	☐		
	Number of load increments	1		
	Number of iterations	7		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	3.049E+286039		

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Infinity Norm	4.808E+10		
Load Combination CO34 - LC1 + 0.2*LC4 + 0.3*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	483.84	kN	
	Sum of support reactions in Z	483.84	kN	Deviation 0.00%
	Resultant of reactions about X	280.5	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.6	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	7.4	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	7.4	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-1.1	mrad	FE Mesh Node No. 2910 (X: 3045, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-5.3	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	2nd Order		Second order analysis (Nonlinear, Timoshenko)
	Internal forces referred to deformed system for...	☒		N, V_y, V_z, M_y, M_z, M_T
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Consider favorable effects of tensile forces	☒		
	Divide results by CO factor	☐		
	Number of load increments	1		
	Number of iterations	7		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	3.049E+286039		
	Infinity Norm	4.808E+10		
Load Combination CO35 - LC1 + 0.3*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	464.13	kN	
	Sum of support reactions in Z	464.13	kN	Deviation 0.00%
	Resultant of reactions about X	243.9	kNm	At center of gravity of model (X:2530.5, Y:7332.1, Z:0.0 mm)
	Resultant of reactions about Y	-0.5	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	6.5	mm	Member No. 2, x: 2250 mm
	Max. vector displacement	6.5	mm	Member No. 2, x: 2250 mm
	Max. rotation about X	-1.0	mrad	FE Mesh Node No. 2910 (X: 3045, Y: 14445, Z: 0 mm)
	Max. rotation about Y	-4.6	mrad	Member No. 2, x: 0 mm
	Max. rotation about Z	0.0	mrad	
	Maximum member strain	0.00000	-	Member No. 0, x: 0 mm
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 3900, Y: 13645, Z: 0 mm)
	Method of analysis	2nd Order		Second order analysis (Nonlinear, Timoshenko)
	Internal forces referred to deformed system for...	☒		N, V_y, V_z, M_y, M_z, M_T
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Consider favorable effects of tensile forces	☒		
	Divide results by CO factor	☐		
	Number of load increments	1		

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Number of iterations	7		
	Maximum value of element of stiffness matrix on diagonal	1.768E+10		
	Minimum value of element of stiffness matrix on diagonal	4.476E+05		
	Stiffness matrix determinant	3.049E+286039		
	Infinity Norm	4.808E+10		
Summary				
	Other Settings:			
	Number of 1D finite elements	69		
	Number of 2D finite elements	5300		
	Number of 3D finite elements	0		
	Number of FE mesh nodes	5561		
	Number of equations	33366		
	Internal forces referred to deformed system for...:			
	Max. number of iterations	100		
	Number of divisions for member results	10		
	Division of cable/foundation/tapered members	10		
	Number of member divisions for searching maximum values	10		
	Subdivisions of FE mesh for graphical results	0		
	Percentage of iterations according to Picard method in combination with Newton-Raphson method	5	%	
	Activate ineffective supports	☒		
	Options:			
	Activate shear stiffness of members (Ay, Az)	☒		
	Activate member divisions for large deformation or post-critical analysis	☒		
	Activate entered stiffness modifications	☒		
	Ignore rotational degrees of freedom	☐		
	Check of critical forces of members	☒		
	Nonsymmetric direct solver if demanded by nonlinear model	☐		
	Method for the system of equations	Direct		
	Plate bending theory	Mindlin		
	Solver version	64-bit		
	Precision and Tolerance:			
	Change default setting	☐		
	Nonlinear effects - Activate:			
	Support and elastic foundations	☒		

4.1 NODES - SUPPORT FORCES

Node No.	LC/CO	Support Forces [kN] $P_{X'}$	$P_{Y'}$	$P_{Z'}$	Support Moments [kNm] $M_{X'}$	$M_{Y'}$	$M_{Z'}$
10	CO1	0.00	0.00	4.30	0.00	0.00	0.00
	CO2	0.00	0.00	4.30	0.00	0.00	0.00
	CO3	0.00	0.00	4.30	0.00	0.00	0.00
	CO4	0.00	0.00	7.25	0.00	0.00	0.00
	CO5	0.00	0.00	12.17	0.00	0.00	0.00
	CO6	0.00	0.00	9.22	0.00	0.00	0.00
	CO7	0.00	0.00	9.22	0.00	0.00	0.00
	CO8	0.00	0.00	8.52	0.00	0.00	0.00
	CO9	0.00	0.00	8.52	0.00	0.00	0.00
	CO10	0.00	0.00	13.43	0.00	0.00	0.00

4.1 NODES - SUPPORT FORCES

Node No.	LC/CO	Support Forces [kN] $P_{X'}$	$P_{Y'}$	$P_{Z'}$	Support Moments [kNm] $M_{X'}$	$M_{Y'}$	$M_{Z'}$
10	CO11	0.00	0.00	13.43	0.00	0.00	0.00
	CO12	0.00	0.00	3.19	0.00	0.00	0.00
	CO13	0.00	0.00	3.19	0.00	0.00	0.00
	CO14	0.00	0.00	3.19	0.00	0.00	0.00
	CO15	0.00	0.00	5.46	0.00	0.00	0.00
	CO16	0.00	0.00	9.24	0.00	0.00	0.00
	CO17	0.00	0.00	6.97	0.00	0.00	0.00
	CO18	0.00	0.00	6.97	0.00	0.00	0.00
	CO19	0.00	0.00	6.43	0.00	0.00	0.00
	CO20	0.00	0.00	6.43	0.00	0.00	0.00
	CO21	0.00	0.00	10.21	0.00	0.00	0.00
	CO22	0.00	0.00	10.21	0.00	0.00	0.00
	CO23	0.00	0.00	3.19	0.00	0.00	0.00
	CO24	0.00	0.00	3.19	0.00	0.00	0.00
	CO25	0.00	0.00	3.19	0.00	0.00	0.00
	CO26	0.00	0.00	3.84	0.00	0.00	0.00
	CO27	0.00	0.00	5.46	0.00	0.00	0.00
	CO28	0.00	0.00	4.81	0.00	0.00	0.00
	CO29	0.00	0.00	4.81	0.00	0.00	0.00
	CO30	0.00	0.00	4.81	0.00	0.00	0.00
	CO31	0.00	0.00	6.43	0.00	0.00	0.00
	CO32	0.00	0.00	3.19	0.00	0.00	0.00
	CO33	0.00	0.00	3.84	0.00	0.00	0.00
	CO34	0.00	0.00	5.46	0.00	0.00	0.00
	CO35	0.00	0.00	4.81	0.00	0.00	0.00
11	CO1	0.00	0.00	4.30	0.00	0.00	0.00
	CO2	0.00	0.00	4.30	0.00	0.00	0.00
	CO3	0.00	0.00	4.30	0.00	0.00	0.00
	CO4	0.00	0.00	7.25	0.00	0.00	0.00
	CO5	0.00	0.00	12.17	0.00	0.00	0.00
	CO6	0.00	0.00	9.22	0.00	0.00	0.00
	CO7	0.00	0.00	9.22	0.00	0.00	0.00
	CO8	0.00	0.00	8.52	0.00	0.00	0.00
	CO9	0.00	0.00	8.52	0.00	0.00	0.00
	CO10	0.00	0.00	13.43	0.00	0.00	0.00
	CO11	0.00	0.00	13.43	0.00	0.00	0.00
	CO12	0.00	0.00	3.19	0.00	0.00	0.00
	CO13	0.00	0.00	3.19	0.00	0.00	0.00
	CO14	0.00	0.00	3.19	0.00	0.00	0.00
	CO15	0.00	0.00	5.46	0.00	0.00	0.00
	CO16	0.00	0.00	9.24	0.00	0.00	0.00
	CO17	0.00	0.00	6.97	0.00	0.00	0.00
	CO18	0.00	0.00	6.97	0.00	0.00	0.00
	CO19	0.00	0.00	6.43	0.00	0.00	0.00
	CO20	0.00	0.00	6.43	0.00	0.00	0.00
	CO21	0.00	0.00	10.21	0.00	0.00	0.00
	CO22	0.00	0.00	10.21	0.00	0.00	0.00
	CO23	0.00	0.00	3.19	0.00	0.00	0.00
	CO24	0.00	0.00	3.19	0.00	0.00	0.00
	CO25	0.00	0.00	3.19	0.00	0.00	0.00
	CO26	0.00	0.00	3.84	0.00	0.00	0.00
	CO27	0.00	0.00	5.46	0.00	0.00	0.00
	CO28	0.00	0.00	4.81	0.00	0.00	0.00
	CO29	0.00	0.00	4.81	0.00	0.00	0.00
	CO30	0.00	0.00	4.81	0.00	0.00	0.00
	CO31	0.00	0.00	6.43	0.00	0.00	0.00
	CO32	0.00	0.00	3.19	0.00	0.00	0.00
	CO33	0.00	0.00	3.84	0.00	0.00	0.00

4.1 NODES - SUPPORT FORCES

Node No.	LC/CO	Support Forces [kN] $P_{X'}$	$P_{Y'}$	$P_{Z'}$	Support Moments [kNm] $M_{X'}$	$M_{Y'}$	$M_{Z'}$
11	CO34	0.00	0.00	5.46	0.00	0.00	0.00
	CO35	0.00	0.00	4.81	0.00	0.00	0.00
12	CO1	0.00	0.00	4.30	0.00	0.00	0.00
	CO2	0.00	0.00	4.30	0.00	0.00	0.00
	CO3	0.00	0.00	4.30	0.00	0.00	0.00
	CO4	0.00	0.00	7.25	0.00	0.00	0.00
	CO5	0.00	0.00	12.17	0.00	0.00	0.00
	CO6	0.00	0.00	9.22	0.00	0.00	0.00
	CO7	0.00	0.00	9.22	0.00	0.00	0.00
	CO8	0.00	0.00	8.52	0.00	0.00	0.00
	CO9	0.00	0.00	8.52	0.00	0.00	0.00
	CO10	0.00	0.00	13.43	0.00	0.00	0.00
	CO11	0.00	0.00	13.43	0.00	0.00	0.00
	CO12	0.00	0.00	3.19	0.00	0.00	0.00
	CO13	0.00	0.00	3.19	0.00	0.00	0.00
	CO14	0.00	0.00	3.19	0.00	0.00	0.00
	CO15	0.00	0.00	5.46	0.00	0.00	0.00
	CO16	0.00	0.00	9.24	0.00	0.00	0.00
	CO17	0.00	0.00	6.97	0.00	0.00	0.00
	CO18	0.00	0.00	6.97	0.00	0.00	0.00
	CO19	0.00	0.00	6.43	0.00	0.00	0.00
	CO20	0.00	0.00	6.43	0.00	0.00	0.00
	CO21	0.00	0.00	10.21	0.00	0.00	0.00
	CO22	0.00	0.00	10.21	0.00	0.00	0.00
	CO23	0.00	0.00	3.19	0.00	0.00	0.00
	CO24	0.00	0.00	3.19	0.00	0.00	0.00
	CO25	0.00	0.00	3.19	0.00	0.00	0.00
	CO26	0.00	0.00	3.84	0.00	0.00	0.00
	CO27	0.00	0.00	5.46	0.00	0.00	0.00
	CO28	0.00	0.00	4.81	0.00	0.00	0.00
	CO29	0.00	0.00	4.81	0.00	0.00	0.00
	CO30	0.00	0.00	4.81	0.00	0.00	0.00
	CO31	0.00	0.00	6.43	0.00	0.00	0.00
	CO32	0.00	0.00	3.19	0.00	0.00	0.00
	CO33	0.00	0.00	3.84	0.00	0.00	0.00
	CO34	0.00	0.00	5.46	0.00	0.00	0.00
	CO35	0.00	0.00	4.81	0.00	0.00	0.00
13	CO1	0.00	0.00	4.30	0.00	0.00	0.00
	CO2	0.00	0.00	4.30	0.00	0.00	0.00
	CO3	0.00	0.00	4.30	0.00	0.00	0.00
	CO4	0.00	0.00	7.25	0.00	0.00	0.00
	CO5	0.00	0.00	12.17	0.00	0.00	0.00
	CO6	0.00	0.00	9.22	0.00	0.00	0.00
	CO7	0.00	0.00	9.22	0.00	0.00	0.00
	CO8	0.00	0.00	8.52	0.00	0.00	0.00
	CO9	0.00	0.00	8.52	0.00	0.00	0.00
	CO10	0.00	0.00	13.43	0.00	0.00	0.00
	CO11	0.00	0.00	13.43	0.00	0.00	0.00
	CO12	0.00	0.00	3.19	0.00	0.00	0.00
	CO13	0.00	0.00	3.19	0.00	0.00	0.00
	CO14	0.00	0.00	3.19	0.00	0.00	0.00
	CO15	0.00	0.00	5.46	0.00	0.00	0.00
	CO16	0.00	0.00	9.24	0.00	0.00	0.00
	CO17	0.00	0.00	6.97	0.00	0.00	0.00
	CO18	0.00	0.00	6.97	0.00	0.00	0.00
	CO19	0.00	0.00	6.43	0.00	0.00	0.00
	CO20	0.00	0.00	6.43	0.00	0.00	0.00
	CO21	0.00	0.00	10.21	0.00	0.00	0.00

4.1 NODES - SUPPORT FORCES

Node No.	LC/CO	Support Forces [kN] $P_{X'}$	$P_{Y'}$	$P_{Z'}$	Support Moments [kNm] $M_{X'}$	$M_{Y'}$	$M_{Z'}$
13	CO22	0.00	0.00	10.21	0.00	0.00	0.00
	CO23	0.00	0.00	3.19	0.00	0.00	0.00
	CO24	0.00	0.00	3.19	0.00	0.00	0.00
	CO25	0.00	0.00	3.19	0.00	0.00	0.00
	CO26	0.00	0.00	3.84	0.00	0.00	0.00
	CO27	0.00	0.00	5.46	0.00	0.00	0.00
	CO28	0.00	0.00	4.81	0.00	0.00	0.00
	CO29	0.00	0.00	4.81	0.00	0.00	0.00
	CO30	0.00	0.00	4.81	0.00	0.00	0.00
	CO31	0.00	0.00	6.43	0.00	0.00	0.00
	CO32	0.00	0.00	3.19	0.00	0.00	0.00
	CO33	0.00	0.00	3.84	0.00	0.00	0.00
	CO34	0.00	0.00	5.46	0.00	0.00	0.00
	CO35	0.00	0.00	4.81	0.00	0.00	0.00
14	CO1	0.00	0.00	4.30	0.00	0.00	0.00
	CO2	0.00	0.00	4.30	0.00	0.00	0.00
	CO3	0.00	0.00	4.30	0.00	0.00	0.00
	CO4	0.00	0.00	7.25	0.00	0.00	0.00
	CO5	0.00	0.00	12.17	0.00	0.00	0.00
	CO6	0.00	0.00	9.22	0.00	0.00	0.00
	CO7	0.00	0.00	9.22	0.00	0.00	0.00
	CO8	0.00	0.00	8.52	0.00	0.00	0.00
	CO9	0.00	0.00	8.52	0.00	0.00	0.00
	CO10	0.00	0.00	13.43	0.00	0.00	0.00
	CO11	0.00	0.00	13.43	0.00	0.00	0.00
	CO12	0.00	0.00	3.19	0.00	0.00	0.00
	CO13	0.00	0.00	3.19	0.00	0.00	0.00
	CO14	0.00	0.00	3.19	0.00	0.00	0.00
	CO15	0.00	0.00	5.46	0.00	0.00	0.00
	CO16	0.00	0.00	9.24	0.00	0.00	0.00
	CO17	0.00	0.00	6.97	0.00	0.00	0.00
	CO18	0.00	0.00	6.97	0.00	0.00	0.00
	CO19	0.00	0.00	6.43	0.00	0.00	0.00
	CO20	0.00	0.00	6.43	0.00	0.00	0.00
	CO21	0.00	0.00	10.21	0.00	0.00	0.00
	CO22	0.00	0.00	10.21	0.00	0.00	0.00
	CO23	0.00	0.00	3.19	0.00	0.00	0.00
	CO24	0.00	0.00	3.19	0.00	0.00	0.00
	CO25	0.00	0.00	3.19	0.00	0.00	0.00
	CO26	0.00	0.00	3.84	0.00	0.00	0.00
	CO27	0.00	0.00	5.46	0.00	0.00	0.00
	CO28	0.00	0.00	4.81	0.00	0.00	0.00
	CO29	0.00	0.00	4.81	0.00	0.00	0.00
	CO30	0.00	0.00	4.81	0.00	0.00	0.00
	CO31	0.00	0.00	6.43	0.00	0.00	0.00
	CO32	0.00	0.00	3.19	0.00	0.00	0.00
	CO33	0.00	0.00	3.84	0.00	0.00	0.00
	CO34	0.00	0.00	5.46	0.00	0.00	0.00
	CO35	0.00	0.00	4.81	0.00	0.00	0.00
15	CO1	0.00	0.00	4.30	0.00	0.00	0.00
	CO2	0.00	0.00	4.30	0.00	0.00	0.00
	CO3	0.00	0.00	4.30	0.00	0.00	0.00
	CO4	0.00	0.00	7.25	0.00	0.00	0.00
	CO5	0.00	0.00	12.17	0.00	0.00	0.00
	CO6	0.00	0.00	9.22	0.00	0.00	0.00
	CO7	0.00	0.00	9.22	0.00	0.00	0.00
	CO8	0.00	0.00	8.52	0.00	0.00	0.00
	CO9	0.00	0.00	8.52	0.00	0.00	0.00

4.1 NODES - SUPPORT FORCES

Node No.	LC/CO	Support Forces [kN] $P_{X'}$	$P_{Y'}$	$P_{Z'}$	Support Moments [kNm] $M_{X'}$	$M_{Y'}$	$M_{Z'}$
15	CO10	0.00	0.00	13.43	0.00	0.00	0.00
	CO11	0.00	0.00	13.43	0.00	0.00	0.00
	CO12	0.00	0.00	3.19	0.00	0.00	0.00
	CO13	0.00	0.00	3.19	0.00	0.00	0.00
	CO14	0.00	0.00	3.19	0.00	0.00	0.00
	CO15	0.00	0.00	5.46	0.00	0.00	0.00
	CO16	0.00	0.00	9.24	0.00	0.00	0.00
	CO17	0.00	0.00	6.97	0.00	0.00	0.00
	CO18	0.00	0.00	6.97	0.00	0.00	0.00
	CO19	0.00	0.00	6.43	0.00	0.00	0.00
	CO20	0.00	0.00	6.43	0.00	0.00	0.00
	CO21	0.00	0.00	10.21	0.00	0.00	0.00
	CO22	0.00	0.00	10.21	0.00	0.00	0.00
	CO23	0.00	0.00	3.19	0.00	0.00	0.00
	CO24	0.00	0.00	3.19	0.00	0.00	0.00
	CO25	0.00	0.00	3.19	0.00	0.00	0.00
	CO26	0.00	0.00	3.84	0.00	0.00	0.00
	CO27	0.00	0.00	5.46	0.00	0.00	0.00
	CO28	0.00	0.00	4.81	0.00	0.00	0.00
	CO29	0.00	0.00	4.81	0.00	0.00	0.00
	CO30	0.00	0.00	4.81	0.00	0.00	0.00
	CO31	0.00	0.00	6.43	0.00	0.00	0.00
	CO32	0.00	0.00	3.19	0.00	0.00	0.00
	CO33	0.00	0.00	3.84	0.00	0.00	0.00
	CO34	0.00	0.00	5.46	0.00	0.00	0.00
	CO35	0.00	0.00	4.81	0.00	0.00	0.00
Σ Supp.	CO1	0.00	0.00	25.82			
Σ Supp.	CO1	0.00	0.00	560.03			
Σ Supp.	CO2	0.00	0.00	25.82			
Σ Supp.	CO2	0.00	0.00	560.03			
Σ Supp.	CO3	0.00	0.00	25.82			
Σ Supp.	CO3	0.00	0.00	560.03			
Σ Supp.	CO4	0.00	0.00	43.51			
Σ Supp.	CO4	0.00	0.00	649.74			
Σ Supp.	CO5	0.00	0.00	72.99			
Σ Supp.	CO5	0.00	0.00	799.26			
Σ Supp.	CO6	0.00	0.00	55.30			
Σ Supp.	CO6	0.00	0.00	709.55			
Σ Supp.	CO7	0.00	0.00	55.30			
Σ Supp.	CO7	0.00	0.00	709.55			
Σ Supp.	CO8	0.00	0.00	51.09			
Σ Supp.	CO8	0.00	0.00	688.19			
Σ Supp.	CO9	0.00	0.00	51.09			
Σ Supp.	CO9	0.00	0.00	688.19			
Σ Supp.	CO10	0.00	0.00	80.57			
Σ Supp.	CO10	0.00	0.00	837.70			
Σ Supp.	CO11	0.00	0.00	80.57			
Σ Supp.	CO11	0.00	0.00	837.70			
Σ Supp.	CO12	0.00	0.00	19.12			
Σ Supp.	CO12	0.00	0.00	414.84			
Σ Supp.	CO13	0.00	0.00	19.12			
Σ Supp.	CO13	0.00	0.00	414.84			
Σ Supp.	CO14	0.00	0.00	19.12			
Σ Supp.	CO14	0.00	0.00	414.84			
Σ Supp.	CO15	0.00	0.00	32.73			
Σ Supp.	CO15	0.00	0.00	483.84			
Σ Supp.	CO16	0.00	0.00	55.41			
Σ Supp.	CO16	0.00	0.00	598.86			

4.1 NODES - SUPPORT FORCES

Node No.	LC/CO	Support Forces [kN] $P_{X'}$	$P_{Y'}$	$P_{Z'}$	Support Moments [kNm] $M_{X'}$	$M_{Y'}$	$M_{Z'}$
Σ Supp.	CO17	0.00	0.00	41.80			
Σ Supp.	CO17	0.00	0.00	529.85			
Σ Supp.	CO18	0.00	0.00	41.80			
Σ Supp.	CO18	0.00	0.00	529.85			
Σ Supp.	CO19	0.00	0.00	38.56			
Σ Supp.	CO19	0.00	0.00	513.42			
Σ Supp.	CO20	0.00	0.00	38.56			
Σ Supp.	CO20	0.00	0.00	513.42			
Σ Supp.	CO21	0.00	0.00	61.24			
Σ Supp.	CO21	0.00	0.00	628.43			
Σ Supp.	CO22	0.00	0.00	61.24			
Σ Supp.	CO22	0.00	0.00	628.43			
Σ Supp.	CO23	0.00	0.00	19.12			
Σ Supp.	CO23	0.00	0.00	414.84			
Σ Supp.	CO24	0.00	0.00	19.12			
Σ Supp.	CO24	0.00	0.00	414.84			
Σ Supp.	CO25	0.00	0.00	19.12			
Σ Supp.	CO25	0.00	0.00	414.84			
Σ Supp.	CO26	0.00	0.00	23.01			
Σ Supp.	CO26	0.00	0.00	434.55			
Σ Supp.	CO27	0.00	0.00	32.73			
Σ Supp.	CO27	0.00	0.00	483.84			
Σ Supp.	CO28	0.00	0.00	28.84			
Σ Supp.	CO28	0.00	0.00	464.13			
Σ Supp.	CO29	0.00	0.00	28.84			
Σ Supp.	CO29	0.00	0.00	464.13			
Σ Supp.	CO30	0.00	0.00	28.84			
Σ Supp.	CO30	0.00	0.00	464.13			
Σ Supp.	CO31	0.00	0.00	38.56			
Σ Supp.	CO31	0.00	0.00	513.42			
Σ Supp.	CO32	0.00	0.00	19.12			
Σ Supp.	CO32	0.00	0.00	414.84			
Σ Supp.	CO33	0.00	0.00	23.01			
Σ Supp.	CO33	0.00	0.00	434.55			
Σ Supp.	CO34	0.00	0.00	32.73			
Σ Supp.	CO34	0.00	0.00	483.84			
Σ Supp.	CO35	0.00	0.00	28.84			
Σ Supp.	CO35	0.00	0.00	464.13			

4.12 CROSS-SECTIONS - INTERNAL FORCES

Member No.	LC/CO	Node No.	Location x [mm]	Forces [kN] N	V_y	V_z	Moments [kNm] M_T	M_y	M_z
	Section No. 19: RRO 150x100x6 | EN 10219-2:2006								
1	CO1	10	0	0.00	0.00	4.30	0.00	0.00	0.00
		11	4500	0.00	0.00	-4.30	0.00	0.00	0.00
	CO2	10	0	0.00	0.00	4.30	0.00	0.00	0.00
		11	4500	0.00	0.00	-4.30	0.00	0.00	0.00
	CO3	10	0	0.00	0.00	4.30	0.00	0.00	0.00
		11	4500	0.00	0.00	-4.30	0.00	0.00	0.00
	CO4	10	0	0.00	0.00	7.25	0.00	0.00	0.00
		11	4500	0.00	0.00	-7.25	0.00	0.00	0.00
	CO5	10	0	0.00	0.00	12.17	0.00	0.00	0.00
		11	4500	0.00	0.00	-12.17	0.00	0.00	0.00
	CO6	10	0	0.00	0.00	9.22	0.00	0.00	0.00

4.12 CROSS-SECTIONS - INTERNAL FORCES

Member No.	LC/CO	Node No.	Location x [mm]	Forces [kN] N	V_y	V_z	Moments [kNm] M_T	M_y	M_z	
1	CO6	11	4500	0.00	0.00	-9.22	0.00	0.00	0.00	
	CO7	10	0	0.00	0.00	9.22	0.00	0.00	0.00	
		11	4500	0.00	0.00	-9.22	0.00	0.00	0.00	
	CO8	10	0	0.00	0.00	8.52	0.00	0.00	0.00	
		11	4500	0.00	0.00	-8.52	0.00	0.00	0.00	
	CO9	10	0	0.00	0.00	8.52	0.00	0.00	0.00	
		11	4500	0.00	0.00	-8.52	0.00	0.00	0.00	
	CO10	10	0	0.00	0.00	13.43	0.00	0.00	0.00	
		11	4500	0.00	0.00	-13.43	0.00	0.00	0.00	
	CO11	10	0	0.00	0.00	13.43	0.00	0.00	0.00	
		11	4500	0.00	0.00	-13.43	0.00	0.00	0.00	
	CO12	10	0	0.00	0.00	3.19	0.00	0.00	0.00	
		11	4500	0.00	0.00	-3.19	0.00	0.00	0.00	
	CO13	10	0	0.00	0.00	3.19	0.00	0.00	0.00	
		11	4500	0.00	0.00	-3.19	0.00	0.00	0.00	
	CO14	10	0	0.00	0.00	3.19	0.00	0.00	0.00	
		11	4500	0.00	0.00	-3.19	0.00	0.00	0.00	
	CO15	10	0	0.00	0.00	5.46	0.00	0.00	0.00	
		11	4500	0.00	0.00	-5.46	0.00	0.00	0.00	
	CO16	10	0	0.00	0.00	9.24	0.00	0.00	0.00	
		11	4500	0.00	0.00	-9.24	0.00	0.00	0.00	
	CO17	10	0	0.00	0.00	6.97	0.00	0.00	0.00	
		11	4500	0.00	0.00	-6.97	0.00	0.00	0.00	
	CO18	10	0	0.00	0.00	6.97	0.00	0.00	0.00	
		11	4500	0.00	0.00	-6.97	0.00	0.00	0.00	
	CO19	10	0	0.00	0.00	6.43	0.00	0.00	0.00	
		11	4500	0.00	0.00	-6.43	0.00	0.00	0.00	
	CO20	10	0	0.00	0.00	6.43	0.00	0.00	0.00	
		11	4500	0.00	0.00	-6.43	0.00	0.00	0.00	
	CO21	10	0	0.00	0.00	10.21	0.00	0.00	0.00	
		11	4500	0.00	0.00	-10.21	0.00	0.00	0.00	
	CO22	10	0	0.00	0.00	10.21	0.00	0.00	0.00	
		11	4500	0.00	0.00	-10.21	0.00	0.00	0.00	
	CO23	10	0	0.00	0.00	3.19	0.00	0.00	0.00	
		11	4500	0.00	0.00	-3.19	0.00	0.00	0.00	
	CO24	10	0	0.00	0.00	3.19	0.00	0.00	0.00	
		11	4500	0.00	0.00	-3.19	0.00	0.00	0.00	
	CO25	10	0	0.00	0.00	3.19	0.00	0.00	0.00	
		11	4500	0.00	0.00	-3.19	0.00	0.00	0.00	
	CO26	10	0	0.00	0.00	3.84	0.00	0.00	0.00	
		11	4500	0.00	0.00	-3.84	0.00	0.00	0.00	
	CO27	10	0	0.00	0.00	5.46	0.00	0.00	0.00	
		11	4500	0.00	0.00	-5.46	0.00	0.00	0.00	
	CO28	10	0	0.00	0.00	4.81	0.00	0.00	0.00	
		11	4500	0.00	0.00	-4.81	0.00	0.00	0.00	
	CO29	10	0	0.00	0.00	4.81	0.00	0.00	0.00	
		11	4500	0.00	0.00	-4.81	0.00	0.00	0.00	
	CO30	10	0	0.00	0.00	4.81	0.00	0.00	0.00	
		11	4500	0.00	0.00	-4.81	0.00	0.00	0.00	
	CO31	10	0	0.00	0.00	6.43	0.00	0.00	0.00	
		11	4500	0.00	0.00	-6.43	0.00	0.00	0.00	
	CO32	10	0	0.01	0.00	3.19	0.00	0.00	0.00	
		11	4500	0.01	-0.00	-3.19	0.00	0.00	0.00	
	CO33	10	0	0.01	0.00	3.84	0.00	0.00	0.00	
		11	4500	0.01	0.00	-3.84	0.00	0.00	0.00	
	CO34	10	0	0.03	0.00	5.46	0.00	0.00	0.00	
		11	4500	0.03	0.00	-5.46	0.00	0.00	0.00	
	CO35	10	0	0.02	0.00	4.81	0.00	0.00	0.00	

4.12 CROSS-SECTIONS - INTERNAL FORCES

Member No.	LC/CO	Node No.	Location x [mm]	Forces [kN] N	V_y	V_z	Moments [kNm] M_T	M_y	M_z
1	CO35	11	4500	0.02	-0.00	-4.81	0.00	0.00	0.00
2	CO1	12	0	0.00	0.00	4.30	0.00	0.00	0.00
		13	4500	0.00	0.00	-4.30	0.00	0.00	0.00
	CO2	12	0	0.00	0.00	4.30	0.00	0.00	0.00
		13	4500	0.00	0.00	-4.30	0.00	0.00	0.00
	CO3	12	0	0.00	0.00	4.30	0.00	0.00	0.00
		13	4500	0.00	0.00	-4.30	0.00	0.00	0.00
	CO4	12	0	0.00	0.00	7.25	0.00	0.00	0.00
		13	4500	0.00	0.00	-7.25	0.00	0.00	0.00
	CO5	12	0	0.00	0.00	12.17	0.00	0.00	0.00
		13	4500	0.00	0.00	-12.17	0.00	0.00	0.00
	CO6	12	0	0.00	0.00	9.22	0.00	0.00	0.00
		13	4500	0.00	0.00	-9.22	0.00	0.00	0.00
	CO7	12	0	0.00	0.00	9.22	0.00	0.00	0.00
		13	4500	0.00	0.00	-9.22	0.00	0.00	0.00
	CO8	12	0	0.00	0.00	8.52	0.00	0.00	0.00
		13	4500	0.00	0.00	-8.52	0.00	0.00	0.00
	CO9	12	0	0.00	0.00	8.52	0.00	0.00	0.00
		13	4500	0.00	0.00	-8.52	0.00	0.00	0.00
	CO10	12	0	0.00	0.00	13.43	0.00	0.00	0.00
		13	4500	0.00	0.00	-13.43	0.00	0.00	0.00
	CO11	12	0	0.00	0.00	13.43	0.00	0.00	0.00
		13	4500	0.00	0.00	-13.43	0.00	0.00	0.00
	CO12	12	0	0.00	0.00	3.19	0.00	0.00	0.00
		13	4500	0.00	0.00	-3.19	0.00	0.00	0.00
	CO13	12	0	0.00	0.00	3.19	0.00	0.00	0.00
		13	4500	0.00	0.00	-3.19	0.00	0.00	0.00
	CO14	12	0	0.00	0.00	3.19	0.00	0.00	0.00
		13	4500	0.00	0.00	-3.19	0.00	0.00	0.00
	CO15	12	0	0.00	0.00	5.46	0.00	0.00	0.00
		13	4500	0.00	0.00	-5.46	0.00	0.00	0.00
	CO16	12	0	0.00	0.00	9.24	0.00	0.00	0.00
		13	4500	0.00	0.00	-9.24	0.00	0.00	0.00
	CO17	12	0	0.00	0.00	6.97	0.00	0.00	0.00
		13	4500	0.00	0.00	-6.97	0.00	0.00	0.00
	CO18	12	0	0.00	0.00	6.97	0.00	0.00	0.00
		13	4500	0.00	0.00	-6.97	0.00	0.00	0.00
	CO19	12	0	0.00	0.00	6.43	0.00	0.00	0.00
		13	4500	0.00	0.00	-6.43	0.00	0.00	0.00
	CO20	12	0	0.00	0.00	6.43	0.00	0.00	0.00
		13	4500	0.00	0.00	-6.43	0.00	0.00	0.00
	CO21	12	0	0.00	0.00	10.21	0.00	0.00	0.00
		13	4500	0.00	0.00	-10.21	0.00	0.00	0.00
	CO22	12	0	0.00	0.00	10.21	0.00	0.00	0.00
		13	4500	0.00	0.00	-10.21	0.00	0.00	0.00
	CO23	12	0	0.00	0.00	3.19	0.00	0.00	0.00
		13	4500	0.00	0.00	-3.19	0.00	0.00	0.00
	CO24	12	0	0.00	0.00	3.19	0.00	0.00	0.00
		13	4500	0.00	0.00	-3.19	0.00	0.00	0.00
	CO25	12	0	0.00	0.00	3.19	0.00	0.00	0.00
		13	4500	0.00	0.00	-3.19	0.00	0.00	0.00
	CO26	12	0	0.00	0.00	3.84	0.00	0.00	0.00
		13	4500	0.00	0.00	-3.84	0.00	0.00	0.00
	CO27	12	0	0.00	0.00	5.46	0.00	0.00	0.00
		13	4500	0.00	0.00	-5.46	0.00	0.00	0.00
	CO28	12	0	0.00	0.00	4.81	0.00	0.00	0.00
		13	4500	0.00	0.00	-4.81	0.00	0.00	0.00
	CO29	12	0	0.00	0.00	4.81	0.00	0.00	0.00

4.12 CROSS-SECTIONS - INTERNAL FORCES

Member No.	LC/CO	Node No.	Location x [mm]	Forces [kN] N	V_y	V_z	Moments [kNm] M_T	M_y	M_z
2	CO29	13	4500	0.00	0.00	-4.81	0.00	0.00	0.00
	CO30	12	0	0.00	0.00	4.81	0.00	0.00	0.00
		13	4500	0.00	0.00	-4.81	0.00	0.00	0.00
	CO31	12	0	0.00	0.00	6.43	0.00	0.00	0.00
		13	4500	0.00	0.00	-6.43	0.00	0.00	0.00
	CO32	12	0	0.01	0.00	3.19	0.00	0.00	0.00
		13	4500	0.01	-0.00	-3.19	0.00	0.00	0.00
	CO33	12	0	0.01	0.00	3.84	0.00	0.00	0.00
		13	4500	0.01	-0.00	-3.84	0.00	0.00	0.00
	CO34	12	0	0.03	0.00	5.46	0.00	0.00	0.00
		13	4500	0.03	0.00	-5.46	0.00	0.00	0.00
	CO35	12	0	0.02	0.00	4.81	0.00	0.00	0.00
		13	4500	0.02	-0.00	-4.81	0.00	0.00	0.00
3	CO1	14	0	0.00	0.00	4.30	0.00	0.00	0.00
		15	4500	0.00	0.00	-4.30	0.00	0.00	0.00
	CO2	14	0	0.00	0.00	4.30	0.00	0.00	0.00
		15	4500	0.00	0.00	-4.30	0.00	0.00	0.00
	CO3	14	0	0.00	0.00	4.30	0.00	0.00	0.00
		15	4500	0.00	0.00	-4.30	0.00	0.00	0.00
	CO4	14	0	0.00	0.00	7.25	0.00	0.00	0.00
		15	4500	0.00	0.00	-7.25	0.00	0.00	0.00
	CO5	14	0	0.00	0.00	12.17	0.00	0.00	0.00
		15	4500	0.00	0.00	-12.17	0.00	0.00	0.00
	CO6	14	0	0.00	0.00	9.22	0.00	0.00	0.00
		15	4500	0.00	0.00	-9.22	0.00	0.00	0.00
	CO7	14	0	0.00	0.00	9.22	0.00	0.00	0.00
		15	4500	0.00	0.00	-9.22	0.00	0.00	0.00
	CO8	14	0	0.00	0.00	8.52	0.00	0.00	0.00
		15	4500	0.00	0.00	-8.52	0.00	0.00	0.00
	CO9	14	0	0.00	0.00	8.52	0.00	0.00	0.00
		15	4500	0.00	0.00	-8.52	0.00	0.00	0.00
	CO10	14	0	0.00	0.00	13.43	0.00	0.00	0.00
		15	4500	0.00	0.00	-13.43	0.00	0.00	0.00
	CO11	14	0	0.00	0.00	13.43	0.00	0.00	0.00
		15	4500	0.00	0.00	-13.43	0.00	0.00	0.00
	CO12	14	0	0.00	0.00	3.19	0.00	0.00	0.00
		15	4500	0.00	0.00	-3.19	0.00	0.00	0.00
	CO13	14	0	0.00	0.00	3.19	0.00	0.00	0.00
		15	4500	0.00	0.00	-3.19	0.00	0.00	0.00
	CO14	14	0	0.00	0.00	3.19	0.00	0.00	0.00
		15	4500	0.00	0.00	-3.19	0.00	0.00	0.00
	CO15	14	0	0.00	0.00	5.46	0.00	0.00	0.00
		15	4500	0.00	0.00	-5.46	0.00	0.00	0.00
	CO16	14	0	0.00	0.00	9.24	0.00	0.00	0.00
		15	4500	0.00	0.00	-9.24	0.00	0.00	0.00
	CO17	14	0	0.00	0.00	6.97	0.00	0.00	0.00
		15	4500	0.00	0.00	-6.97	0.00	0.00	0.00
	CO18	14	0	0.00	0.00	6.97	0.00	0.00	0.00
		15	4500	0.00	0.00	-6.97	0.00	0.00	0.00
	CO19	14	0	0.00	0.00	6.43	0.00	0.00	0.00
		15	4500	0.00	0.00	-6.43	0.00	0.00	0.00
	CO20	14	0	0.00	0.00	6.43	0.00	0.00	0.00
		15	4500	0.00	0.00	-6.43	0.00	0.00	0.00
	CO21	14	0	0.00	0.00	10.21	0.00	0.00	0.00
		15	4500	0.00	0.00	-10.21	0.00	0.00	0.00
	CO22	14	0	0.00	0.00	10.21	0.00	0.00	0.00
		15	4500	0.00	0.00	-10.21	0.00	0.00	0.00
	CO23	14	0	0.00	0.00	3.19	0.00	0.00	0.00

4.12 CROSS-SECTIONS - INTERNAL FORCES

Member No.	LC/CO	Node No.	Location x [mm]	Forces [kN] N	V_y	V_z	Moments [kNm] M_T	M_y	M_z	
3	CO23	15	4500	0.00	0.00	-3.19	0.00	0.00	0.00	
	CO24	14	0	0.00	0.00	3.19	0.00	0.00	0.00	
		15	4500	0.00	0.00	-3.19	0.00	0.00	0.00	
	CO25	14	0	0.00	0.00	3.19	0.00	0.00	0.00	
		15	4500	0.00	0.00	-3.19	0.00	0.00	0.00	
	CO26	14	0	0.00	0.00	3.84	0.00	0.00	0.00	
		15	4500	0.00	0.00	-3.84	0.00	0.00	0.00	
	CO27	14	0	0.00	0.00	5.46	0.00	0.00	0.00	
		15	4500	0.00	0.00	-5.46	0.00	0.00	0.00	
	CO28	14	0	0.00	0.00	4.81	0.00	0.00	0.00	
		15	4500	0.00	0.00	-4.81	0.00	0.00	0.00	
	CO29	14	0	0.00	0.00	4.81	0.00	0.00	0.00	
		15	4500	0.00	0.00	-4.81	0.00	0.00	0.00	
	CO30	14	0	0.00	0.00	4.81	0.00	0.00	0.00	
		15	4500	0.00	0.00	-4.81	0.00	0.00	0.00	
	CO31	14	0	0.00	0.00	6.43	0.00	0.00	0.00	
		15	4500	0.00	0.00	-6.43	0.00	0.00	0.00	
	CO32	14	0	0.01	0.00	3.19	0.00	0.00	0.00	
		15	4500	0.01	-0.00	-3.19	0.00	0.00	0.00	
	CO33	14	0	0.01	0.00	3.84	0.00	0.00	0.00	
		15	4500	0.01	-0.00	-3.84	0.00	0.00	0.00	
	CO34	14	0	0.03	0.00	5.46	0.00	0.00	0.00	
		15	4500	0.03	0.00	-5.46	0.00	0.00	0.00	
	CO35	14	0	0.02	0.00	4.81	0.00	0.00	0.00	
		15	4500	0.02	-0.00	-4.81	0.00	0.00	0.00	

RF-STEEL EC3
CA1
Design of steel members according to Eurocode 3

1.1 GENERAL DATA

Members to design:	1-3	
Sets of members to design:		
National Annex:	LST	
Ultimate Limit State Design		
Load combinations to design:	CO1	1.35*LC1
	CO2	1.35*LC1 + 1.3*LC2
	CO3	1.35*LC1 + 1.3*LC3
	CO4	1.35*LC1 + 1.3*LC3 + 0.91*LC4
	CO5	1.35*LC1 + 1.3*LC3 + 0.91*LC4 + 0.91*LC5
	CO6	1.35*LC1 + 1.3*LC2 + 0.91*LC5
	CO7	1.35*LC1 + 1.3*LC3 + 0.91*LC5
	CO8	1.35*LC1 + 1.3*LC4
	CO9	1.35*LC1 + 0.78*LC3 + 1.3*LC4
	CO10	1.35*LC1 + 0.78*LC3 + 1.3*LC4 + 0.91*LC5
	CO11	1.35*LC1 + 1.3*LC4 + 0.91*LC5
Serviceability Limit State Design		
Load combinations to design:	CO12	LC1
	CO13	LC1 + LC2
	CO14	LC1 + LC3
	CO15	LC1 + LC3 + 0.7*LC4
	CO16	LC1 + LC3 + 0.7*LC4 + 0.7*LC5
	CO17	LC1 + LC2 + 0.7*LC5
	CO18	LC1 + LC3 + 0.7*LC5
	CO19	LC1 + LC4
	CO20	LC1 + 0.6*LC3 + LC4
	CO21	LC1 + 0.6*LC3 + LC4 + 0.7*LC5
	CO22	LC1 + LC4 + 0.7*LC5
	CO23	LC1
	CO24	LC1 + 0.5*LC2
	CO25	LC1 + 0.5*LC3
	CO26	LC1 + 0.5*LC3 + 0.2*LC4
	CO27	LC1 + 0.5*LC3 + 0.2*LC4 + 0.3*LC5
	CO28	LC1 + 0.5*LC2 + 0.3*LC5
	CO29	LC1 + 0.5*LC3 + 0.3*LC5
	CO30	LC1 + 0.5*LC4
	CO31	LC1 + 0.5*LC4 + 0.3*LC5
	CO32	LC1
	CO33	LC1 + 0.2*LC4
	CO34	LC1 + 0.2*LC4 + 0.3*LC5
	CO35	LC1 + 0.3*LC5

1.2 MATERIALS

Matl. No.	Material Description	E- Modulus E [kN/cm²]	Shear Modulus G [kN/cm²]	Poisson's Ratio ν [-]	Yield Stress f_{yk} [kN/cm²]	Max. Thickness t [mm]
5	Steel S 355 J2 | LST EN 10025-2:2004-11	21000.00	8076.92	0.300	35.50	3.0
					35.50	16.0
					34.50	40.0
					33.50	63.0
					32.50	80.0
					31.50	100.0
					29.50	150.0
					28.50	200.0

1.3 CROSS-SECTIONS

Sect. No.	Matl. No.	Cross-Section Description	Cross-Section Type	Max Design Ratio	Comment
19	5	RRO 150x100x6 | EN 10219-2:2006	Box rolled	0.92	

1.5 EFFECTIVE LENGTHS - MEMBERS

Member No.	Buckling Possible	Buckling About Axis y			Buckling About Axis z			Lateral-Torsional Buckling				
		Possible	$k_{cr,y}$	$L_{cr,y}$ [mm]	Possible	$k_{cr,z}$	$L_{cr,z}$ [mm]	Possible	k_z	k_w	L_w [mm]	L_T [mm]
1	☒	☒	1.00	4500	☒	1.00	4500	☐	1.0	1.0	4500	4500
2	☒	☒	1.00	4500	☒	1.00	4500	☐	1.0	1.0	4500	4500
3	☒	☒	1.00	4500	☒	1.00	4500	☐	1.0	1.0	4500	4500

1.9 SERVICEABILITY DATA

No.	Reference to	Members/Sets No.	Reference Length		Direct.	Precamber	Beam Type
			Manually	l [mm]		e_0 [mm]	
1	Member	1	☐	4500	y, z	0.0	Beam
2	Member	2	☐	4500	y, z	0.0	Beam
3	Member	3	☐	4500	y, z	0.0	Beam

1.12 PARAMETERS - MEMBERS

Member No.	Description	Parameter
1	Cross-Section	19 - RRO 150x100x6 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
2	Cross-Section	19 - RRO 150x100x6 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
3	Cross-Section	19 - RRO 150x100x6 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐

2.4 DESIGN BY MEMBER

Member No.	Location x [mm]	LC/CO/ RC	Design		Equation No.	Description
1	**Cross-section No. 19 - RRO 150x100x6 | EN 10219-2:2006**					
	2152	CO10	0.31	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0	CO10	0.04	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0	CO1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	2152	CO10	0.31	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0	CO12	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	2152	CO21	0.92	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	2152	CO31	0.39	≤ 1	SE402)	Serviceability - Combination of actions 'Frequent' - z-direction

2.4 DESIGN BY MEMBER

Member No.	Location x [mm]	LC/CO/ RC	Design		Equation No.	Description
	2152	CO34	0.33	≤ 1	SE403)	Serviceability - Combination of actions 'Quasi-permanent' - z-direction
2	**Cross-section No. 19 - RRO 150x100x6 | EN 10219-2:2006**					
	2152	CO10	0.31	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0	CO10	0.04	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0	CO1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	2152	CO10	0.31	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0	CO12	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	2152	CO21	0.92	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	2152	CO31	0.39	≤ 1	SE402)	Serviceability - Combination of actions 'Frequent' - z-direction
	2152	CO34	0.33	≤ 1	SE403)	Serviceability - Combination of actions 'Quasi-permanent' - z-direction
3	**Cross-section No. 19 - RRO 150x100x6 | EN 10219-2:2006**					
	2152	CO10	0.31	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0	CO10	0.04	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0	CO1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	2152	CO10	0.31	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0	CO12	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	2152	CO21	0.92	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	2152	CO31	0.39	≤ 1	SE402)	Serviceability - Combination of actions 'Frequent' - z-direction
	2152	CO34	0.33	≤ 1	SE403)	Serviceability - Combination of actions 'Quasi-permanent' - z-direction

RF-CONCRETE Surfaces
CA1
Dangtis_1

1.1 GENERAL DATA

Design according to Standard:		LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*
ULTIMATE LIMIT STATE		
Load combinations for design:	CO1	1.35*LC1
		Persistent and Transient
	CO2	1.35*LC1 + 1.3*LC2
		Persistent and Transient
	CO3	1.35*LC1 + 1.3*LC3
		Persistent and Transient
	CO4	1.35*LC1 + 1.3*LC3 + 0.91*LC4
		Persistent and Transient
	CO5	1.35*LC1 + 1.3*LC3 + 0.91*LC4 + 0.91*LC5
		Persistent and Transient
	CO6	1.35*LC1 + 1.3*LC2 + 0.91*LC5
		Persistent and Transient
	CO7	1.35*LC1 + 1.3*LC3 + 0.91*LC5
		Persistent and Transient
	CO8	1.35*LC1 + 1.3*LC4
		Persistent and Transient
	CO9	1.35*LC1 + 0.78*LC3 + 1.3*LC4
		Persistent and Transient
	CO10	1.35*LC1 + 0.78*LC3 + 1.3*LC4 + 0.91*LC5
		Persistent and Transient
	CO11	1.35*LC1 + 1.3*LC4 + 0.91*LC5
		Persistent and Transient
SERVICEABILITY LIMIT STATE		
Load combinations for design:	CO12	LC1
		Characteristic with direct load, k_t 0.400, β 0.500
	CO13	LC1 + LC2
		Characteristic with direct load, k_t 0.500, β 0.500
	CO14	LC1 + LC3
		Characteristic with direct load, k_t 0.500, β 0.500
	CO15	LC1 + LC3 + 0.7*LC4
		Characteristic with direct load, k_t 0.526, β 0.500
	CO16	LC1 + LC3 + 0.7*LC4 + 0.7*LC5
		Characteristic with direct load, k_t 0.541, β 0.500
	CO17	LC1 + LC2 + 0.7*LC5
		Characteristic with direct load, k_t 0.526, β 0.500
	CO18	LC1 + LC3 + 0.7*LC5
		Characteristic with direct load, k_t 0.526, β 0.500
	CO19	LC1 + LC4
		Characteristic with direct load, k_t 0.500, β 0.500
	CO20	LC1 + 0.6*LC3 + LC4
		Characteristic with direct load, k_t 0.523, β 0.500
	CO21	LC1 + 0.6*LC3 + LC4 + 0.7*LC5
		Characteristic with direct load, k_t 0.539, β 0.500
	CO22	LC1 + LC4 + 0.7*LC5
		Characteristic with direct load, k_t 0.526, β 0.500
	CO23	LC1
		Frequent, k_t 0.400, β 0.500
	CO24	LC1 + 0.5*LC2
		Frequent, k_t 0.467, β 0.500
	CO25	LC1 + 0.5*LC3
		Frequent, k_t 0.467, β 0.500
	CO26	LC1 + 0.5*LC3 + 0.2*LC4
		Frequent, k_t 0.482, β 0.500
	CO27	LC1 + 0.5*LC3 + 0.2*LC4 + 0.3*LC5

1.1 GENERAL DATA

		Frequent, k_t 0.500, β 0.500
	CO28	LC1 + 0.5*LC2 + 0.3*LC5
		Frequent, k_t 0.489, β 0.500
	CO29	LC1 + 0.5*LC3 + 0.3*LC5
		Frequent, k_t 0.489, β 0.500
	CO30	LC1 + 0.5*LC4
		Frequent, k_t 0.467, β 0.500
	CO31	LC1 + 0.5*LC4 + 0.3*LC5
		Frequent, k_t 0.489, β 0.500
	CO32	LC1
		Quasi-permanent, k_t 0.400, β 0.500
	CO33	LC1 + 0.2*LC4
		Quasi-permanent, k_t 0.433, β 0.500
	CO34	LC1 + 0.2*LC4 + 0.3*LC5
		Quasi-permanent, k_t 0.467, β 0.500
	CO35	LC1 + 0.3*LC5
		Quasi-permanent, k_t 0.446, β 0.500
Definition of Provided Additional Reinforcement		Automatic arrangement according to the specifications in Table 1.4
Type of SLS method:		Analytical Method
		By assuming an identical deformation ratio of the longitudinal reinforcement
Design of		
Concrete Stress Analysis		☒
Steel Stress Analysis		☒
Crack widths		☒
Deformation Analysis		☒
Consider creeping		☒
Consider shrinkage		☒
Tension stiffening:		☒
Layout of longitudinal reinforcement		
Required longitudinal reinforcement automatically increased for serviceability limit state design:		☒
DETAILS		
Analysis Method for Reinforcement Envelope		Mixed
Apply the averaged internal forces in the defined average region for the ULS calculation and for the analytic method of SLS calculation.		☒
Apply the internal forces without the rib components		☐
Design Situation Settings for Serviceability Limit State Checks		
Load combination:		
Characteristic with direct load		Checks: k_1*f_{ck}, k_3*f_{yk}
Characteristic with imposed deformation		Checks: k_1*f_{ck}, k_4*f_{yk}
Frequent		Checks: w_k
Quasi-permanent		Checks: k_2*f_{ck}, w_k, u_l

1.2 MATERIALS

Material No.	Material Description		Comment
	Concrete Strength Class	Steel Description	
4	Concrete C35/45	B 500 S (A)	

1.2.1 MATERIAL PARAMETERS

Material No.	Description	Name	Size	Unit
4	**Concrete Strength Class: Concrete C35/45**			
	Characteristic Cylinder Compressive Strength	f_{ck}	35.00	N/mm^2
	5 % Fractile of Axial Tensile Strength	$f_{ctk,0.05}$	2.20	N/mm^2
	Characteristic for Nonlinear Calculations			
	Mean Secant Modulus of Elasticity	E_{cm}	34000.00	N/mm^2
	Mean Cylinder Compressive Strength	f_{cm}	43.00	N/mm^2
	Mean Axial Tensile Strength	f_{ctm}	3.20	N/mm^2
	Ultimate Strain for Pure Compression	ε_{c1}	-2.250	‰
	Ultimate Strain at Failure	ε_{c1u}	-3.500	‰
	Shear Modulus	G	14166.70	N/mm^2
	Poisson's Ratio	ν	0.200	-
	Characteristic Strains for Parabolic-Rectangular Diagram			
	Ultimate Strain for Pure Compression	ε_{c2}	-2.000	‰
	Ultimate Strain at Failure	ε_{cu2}	-3.500	‰
	Parabola Exponent	n	2.000	-
	Specific Weight	γ	25.00	kN/m^3
	Reinforcing Steel: B 500 S (A)			
	Modulus of Elasticity	E_s	200000.00	N/mm^2
	Yield Stress Mean Value	f_{ym}	550.00	N/mm^2
	Characteristic Yield Stress	f_{yk}	500.00	N/mm^2
	Tensile Strength Mean Value	f_{tm}	551.25	N/mm^2
	Characteristic Tensile Strength	f_{tk}	525.00	N/mm^2
	Limiting Strain	ε_{uk}	25.000	‰

1.3 SURFACES

Surface No.	Matl. No.	Creep coeff. φ [-]	Shrinkage ε_{cs} [-]	$u_{z,max}$ [mm]	$\sigma_{c,max}$ [N/mm²] / $\sigma_{s,max}$ [N/mm²]	$f_{ct,eff,wk}$ [N/mm²]	$f_{ct,eff,As,min}$ [N/mm²]	$w_{k,+z\ (top)}$ [mm] / $w_{k,-z\ (bottom)}$ [mm]	Effects due to Restraint: Apply	Effects due to Restraint: k_c [-]	Notes
2	Thickness Type: Constant, Thickness: 200.0 mm										
	4	2.07714	-0.00045	20.400	var. var.	3.20	3.20	0.100 0.100	☐	var.	
	Deformation referred to the displaced parallel surface at the point of minimum nodal deformation										
5	Thickness Type: Constant, Thickness: 200.0 mm										
	4	2.07714	-0.00045	6.600	var. var.	3.20	3.20	0.100 0.100	☐	var.	
	Deformation referred to undeformed system										
6	Thickness Type: Constant, Thickness: 200.0 mm										
	4	2.07714	-0.00045	20.400	var. var.	3.20	3.20	0.100 0.100	☐	var.	
	Deformation referred to the displaced parallel surface at the point of minimum nodal deformation										

1.4 REINFORCEMENT GROUP NO. 3 - 1.1 DANGTIS

Applied to surfaces:	2,5,6
REINFORCEMENT RATIO	
Minimum secondary reinforcement	20.0 %
Basic minimum reinforcement	0.0 %
Minimum compression reinforcement	0.0 %
Minimum tension reinforcement	0.0 %
Maximum reinforcement percentage	4.0 %
Minimum shear reinforcement percentage	0.0 %

1.4 REINFORCEMENT GROUP NO. 3 - 1.1 DANGTIS

REINFORCEMENT AREA FOR DESIGN OF SLS	
Use provided basic reinforcement and layout (provided) additional reinforcement acc. to Tables 2.1, 2.2, 2.3	
Concrete cover acc. to Standard	☐
BASIC REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 52.0 mm
Bar diameter	ds-1: 12.0, ds-2: 12.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,-z (top): 7.54, As-2,-z (top): 7.54 cm²/m
BASIC REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 52.0 mm
Bar diameter	ds-1: 12.0, ds-2: 12.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,+z (bottom): 7.54, As-2,+z (bottom): 7.54 cm²/m
ADDITIONAL REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 52.0 mm
Bar diameter	ds-1: 12.0, ds-2: 12.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,-z (top): 0.00, As-2,-z (top): 7.94 cm²/m
ADDITIONAL REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 52.0 mm
Bar diameter	ds-1: 12.0, ds-2: 12.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,+z (bottom): 7.91, As-2,+z (bottom): 14.20 cm²/m
LONGITUDINAL REINFORCEMENT FOR SHEAR FORCE DESIGN	
Apply the greater value resulting from either the required or provided reinforcement (basic and add. reinforcement) per reinforcement direction	
OPTIONS FOR LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
Minimum longitudinal reinforcement for plates acc. to 9.3.1	☒
Direction of minimum reinforcement	
Reinforcement direction with the main tensile force from top (-z) and bottom (+z) surfaces together:	☒
Minimum longitudinal reinforcement for walls acc. to 9.6	☐
Minimum shear reinforcement	☒
Neutral axis depth limitation	☒
Variable strut inclination - min	21.801 °
Variable concrete strut inclination - max	45.000 °
Partial safety factor γ_s	PT 1.15, AC 1.00, SLS 1.00
Partial safety factor γ_c	PT 1.50, AC 1.20, SLS 1.00
Consideration of long-term effects Alpha-cc	PT 0.90, AC 0.90, SLS 1.00
Consideration of long-term effects Alpha-ct	SLS 1.00

■ 2.2 REQUIRED REINFORCEMENT BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Symbol	Required Reinforcement ULS	SLS	ULS/SLS	Basic Reinf.	Additional Reinforcement Required	Provided	Unit	Notes
2	M8	0.000	2.870	0.000	$a_{s,1,-z\ (top)}$	7.54	0.34	7.54	7.54	0.00	0.00	cm^2/m	
	M8	0.000	2.870	0.000	$a_{s,2,-z\ (top)}$	7.54	0.34	7.54	7.54	0.00	0.00	cm^2/m	
	M813	2.948	5.302	0.000	$a_{s,1,+z\ (bottom)}$	9.62	12.94	12.94	7.54	5.40	7.91	cm^2/m	
	M1121	3.858	2.536	0.000	$a_{s,2,+z\ (bottom)}$	9.58	16.41	16.41	7.54	8.87	14.20	cm^2/m	
	M3	5.100	6.270	0.000	a_{sw}	62.60	-	62.60	-	-	-	cm^2/m^2	
5	M1829	5.100	1.357	0.000	$a_{s,1,-z\ (top)}$	7.54	0.30	7.54	7.54	0.00	0.00	cm^2/m	
	M1943	2.850	1.495	0.000	$a_{s,2,-z\ (top)}$	7.73	15.48	15.48	7.54	7.94	7.94	cm^2/m	
	M2603	3.006	1.500	0.000	$a_{s,1,+z\ (bottom)}$	6.26	10.17	10.17	7.54	2.63	7.91	cm^2/m	
	M1943	2.850	1.495	0.000	$a_{s,2,+z\ (bottom)}$	9.93	16.91	16.91	7.54	9.37	14.20	cm^2/m	
	M1835	5.100	0.209	0.000	a_{sw}	19.71	-	19.71	-	-	-	cm^2/m^2	
6	M159 - E3543	4.800	13.645	0.000	$a_{s,1,-z\ (top)}$	7.54	0.45	7.54	7.54	0.00	0.00	cm^2/m	
	M172	3.000	14.445	0.000	$a_{s,2,-z\ (top)}$	7.54	0.23	7.54	7.54	0.00	0.00	cm^2/m	
	M3733	2.153	13.194	0.000	$a_{s,1,+z\ (bottom)}$	10.67	15.44	15.44	7.54	7.91	7.91	cm^2/m	
	M3286	0.251	6.946	0.000	$a_{s,2,+z\ (bottom)}$	14.76	21.74	21.74	7.54	14.20	14.20	cm^2/m	
	M4	0.000	14.445	0.000	a_{sw}	56.05	-	56.05	-	-	-	cm^2/m^2	

■ 3.2 SERVICEABILITY CHECK BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Load Case	Design Type	Exist. Value	Limit Value	Unit	Ratio	Notes
2	M1617	2.550	4.270	0.000	CO34	$u_{z,local}$	1.719	20.400	mm	0.1	
	M1093	3.812	2.330	0.000	Envelope ChD	σ_c	-13.00	-21.00	N/mm^2	0.7	
	M778	2.798	5.256	0.000	Envelope ChD	σ_s	367.60	400.00	N/mm^2	1.0	
	M813	2.948	5.302	0.000	Envelope Fr	w_k	0.083	0.100	mm	0.9	
5	M1974	2.250	1.145	0.000	CO34	$u_{z,local}$	-0.139	6.600	mm	0.1	
	M2498	2.550	0.791	0.000	Envelope ChD	σ_c	-12.19	-21.00	N/mm^2	0.6	
	M2206	1.173	0.406	0.000	Envelope ChD	σ_s	367.55	400.00	N/mm^2	1.0	
	M1943	2.850	1.495	0.000	Envelope Fr	w_k	0.100	0.100	mm	1.1	219) 233)
6	M3149	2.550	6.995	0.000	CO34	$u_{z,local}$	14.639	20.400	mm	0.8	
	M3093	2.450	13.245	0.000	Envelope ChD	σ_c	-12.27	-21.00	N/mm^2	0.6	
	M3319	0.497	7.096	0.000	Envelope ChD	σ_s	363.19	400.00	N/mm^2	1.0	
	M3733	2.153	13.194	0.000	Envelope Fr	w_k	0.105	0.100	mm	1.1	219) 233)

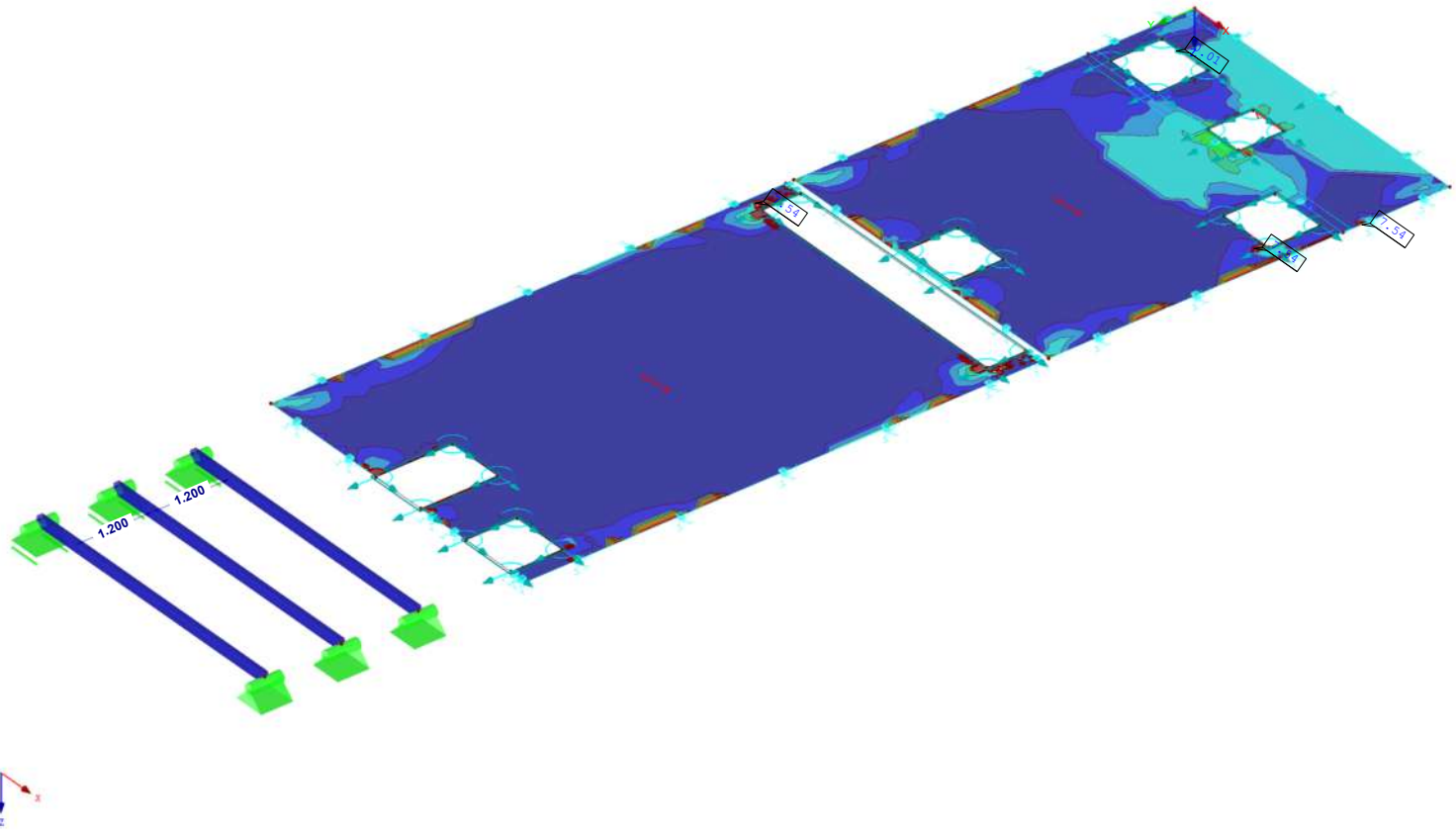
■ SERVICEABILITY CHECK NOTES

No.	Description
219)	Crack width exceeded.
233)	The design is not satisfactory! Because of the required reinforcement for ULS or user-defined reinforcement the defined reinforcement area is different from the required reinforcement for SLS and that negatively affects SLS design.

REQUIRED REINFORCEMENT $a_{s,1,-z\ (top)}$

RF-CONCRETE Surfaces CA1
Dangtis_1
Surfaces Required Reinforcement a-s,1,-z (top) [cm²/m]
Values: a-s,1,-z (top) [cm^2/m]

Isometric

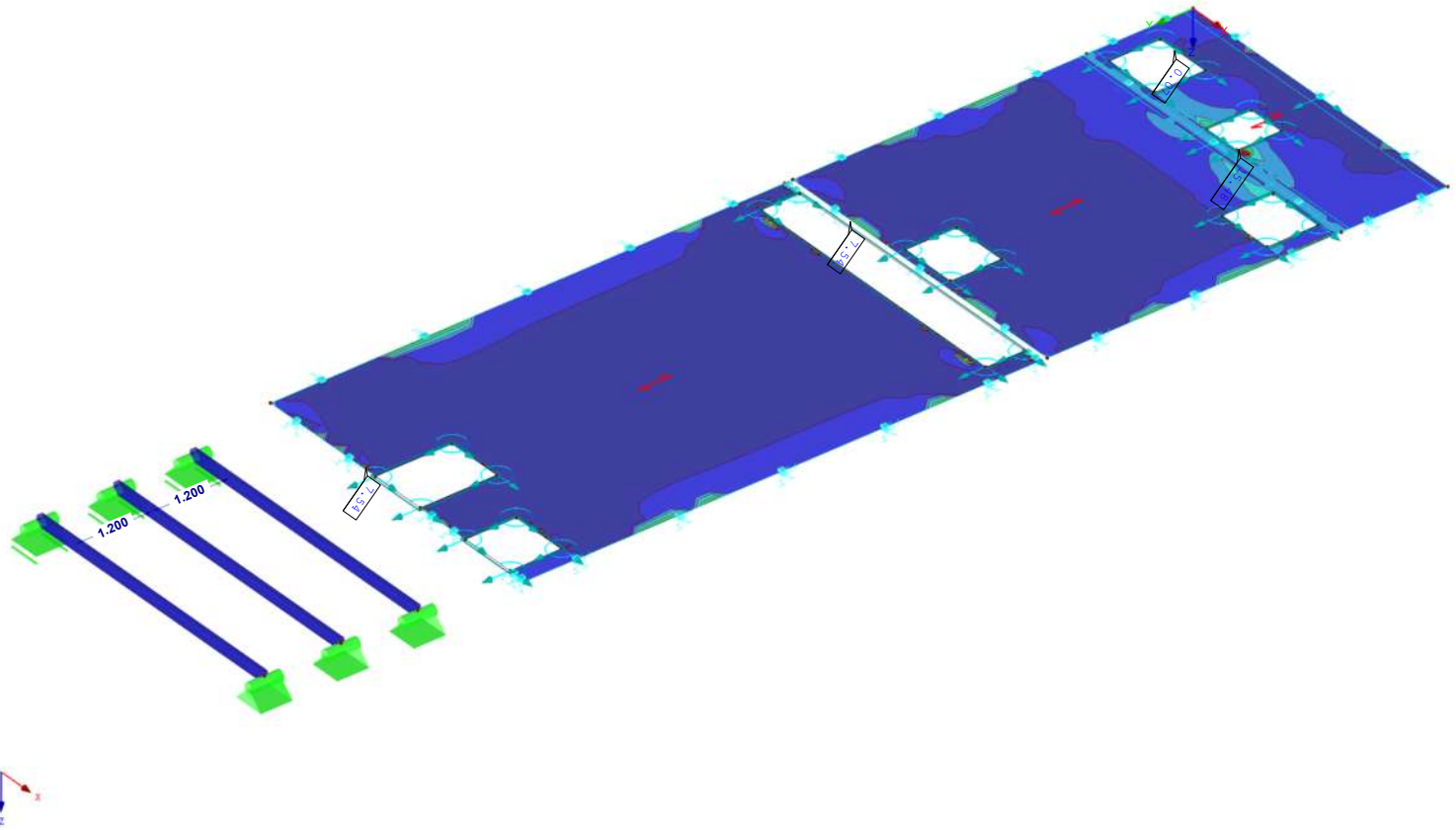


Max a-s,1,-z (top): 7.54, Min a-s,1,-z (top): 0.00 cm²/m

REQUIRED REINFORCEMENT $a_{s,2,-z\ (top)}$

RF-CONCRETE Surfaces CA1
Dangtis_1
Surfaces Required Reinforcement a-s,2,-z (top) [cm²/m]
Values: a-s,2,-z (top) [cm^2/m]

Isometric

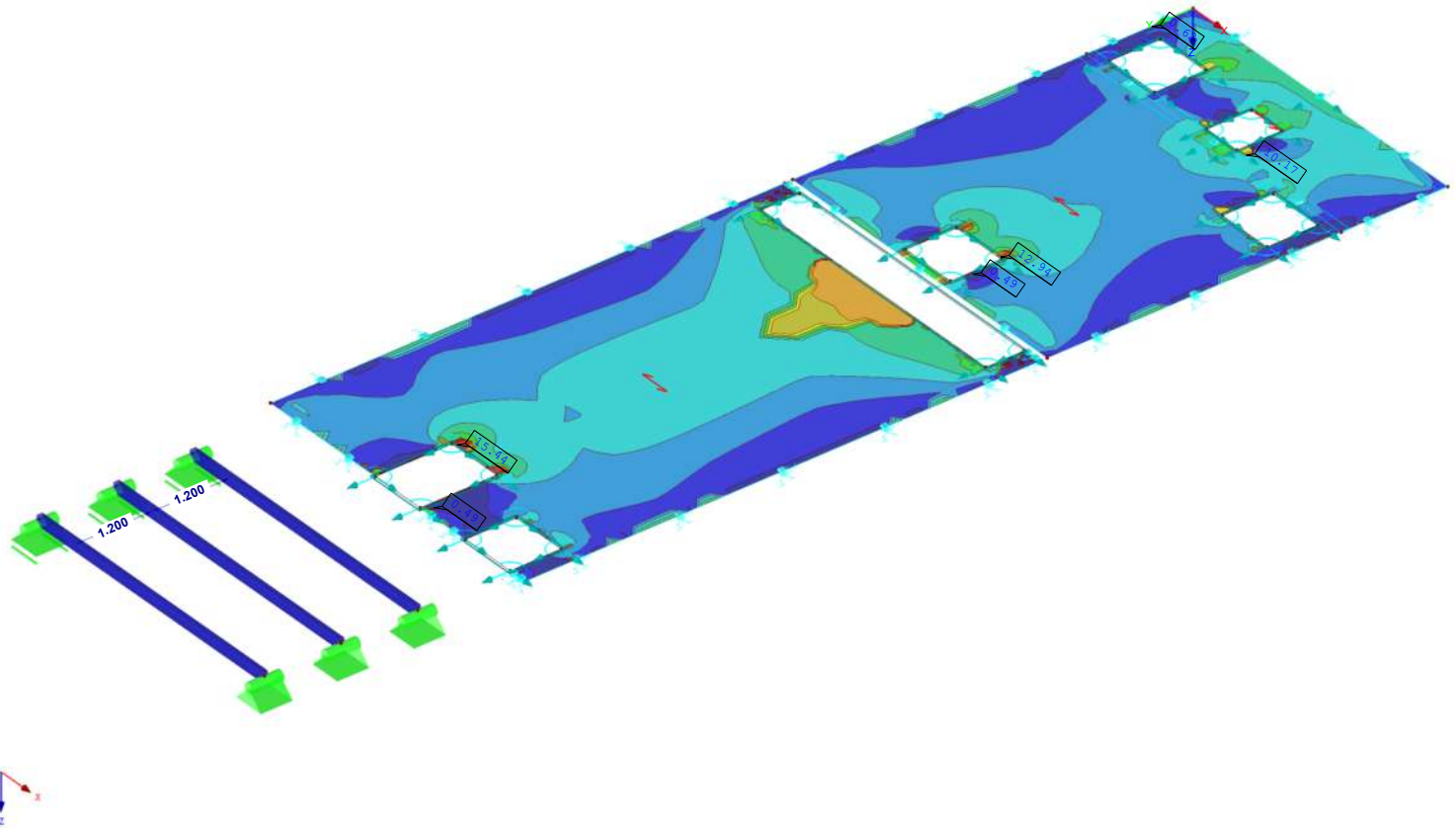


Max a-s,2,-z (top): 15.48, Min a-s,2,-z (top): 0.00 cm²/m

REQUIRED REINFORCEMENT $a_{s,1,+z}$ (bottom)

RF-CONCRETE Surfaces CA1
Dangtis_1
Surfaces Required Reinforcement a-s,1,+z (bottom) [cm²/m]
Values: a-s,1,+z (bottom) [cm^2/m]

Isometric

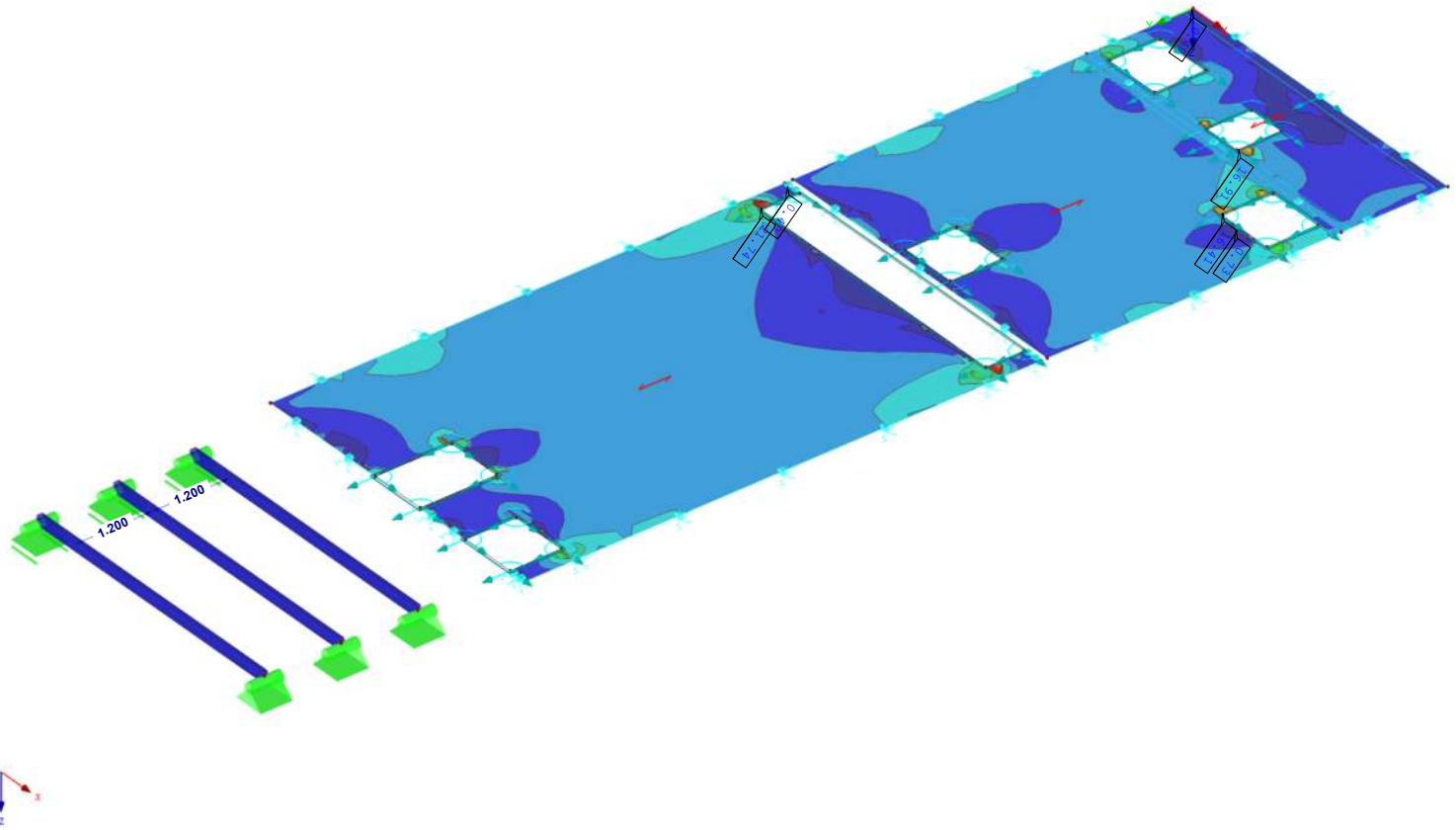


Max a-s,1,+z (bottom): 15.44, Min a-s,1,+z (bottom): 0.49 cm²/m

REQUIRED REINFORCEMENT $a_{s,2,+z}$ (bottom)

RF-CONCRETE Surfaces CA1
Dangtis_1
Surfaces Required Reinforcement a-s,2,+z (bottom) [cm²/m]
Values: a-s,2,+z (bottom) [cm^2/m]

Isometric

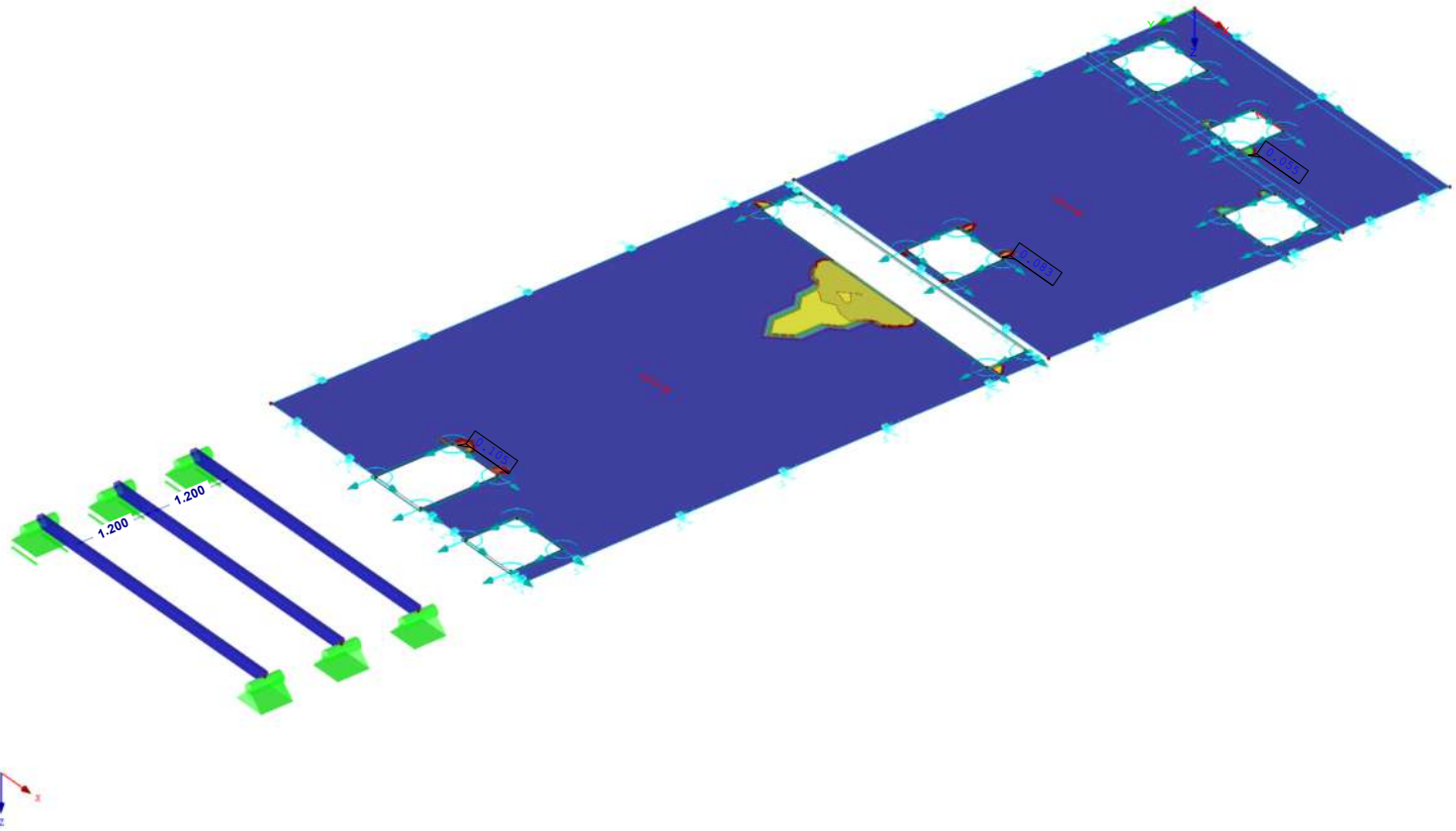


Max a-s,2,+z (bottom): 21.74, Min a-s,2,+z (bottom): 0.49 cm²/m

CRACK WIDTH $w_{k,1,+z}$ (bottom)

RF-CONCRETE Surfaces CA1
Dangtis_1
Surfaces Crack width w-k,1,+z (bottom) [mm]
Values: w-k,1,+z (bottom) [mm]

Isometric

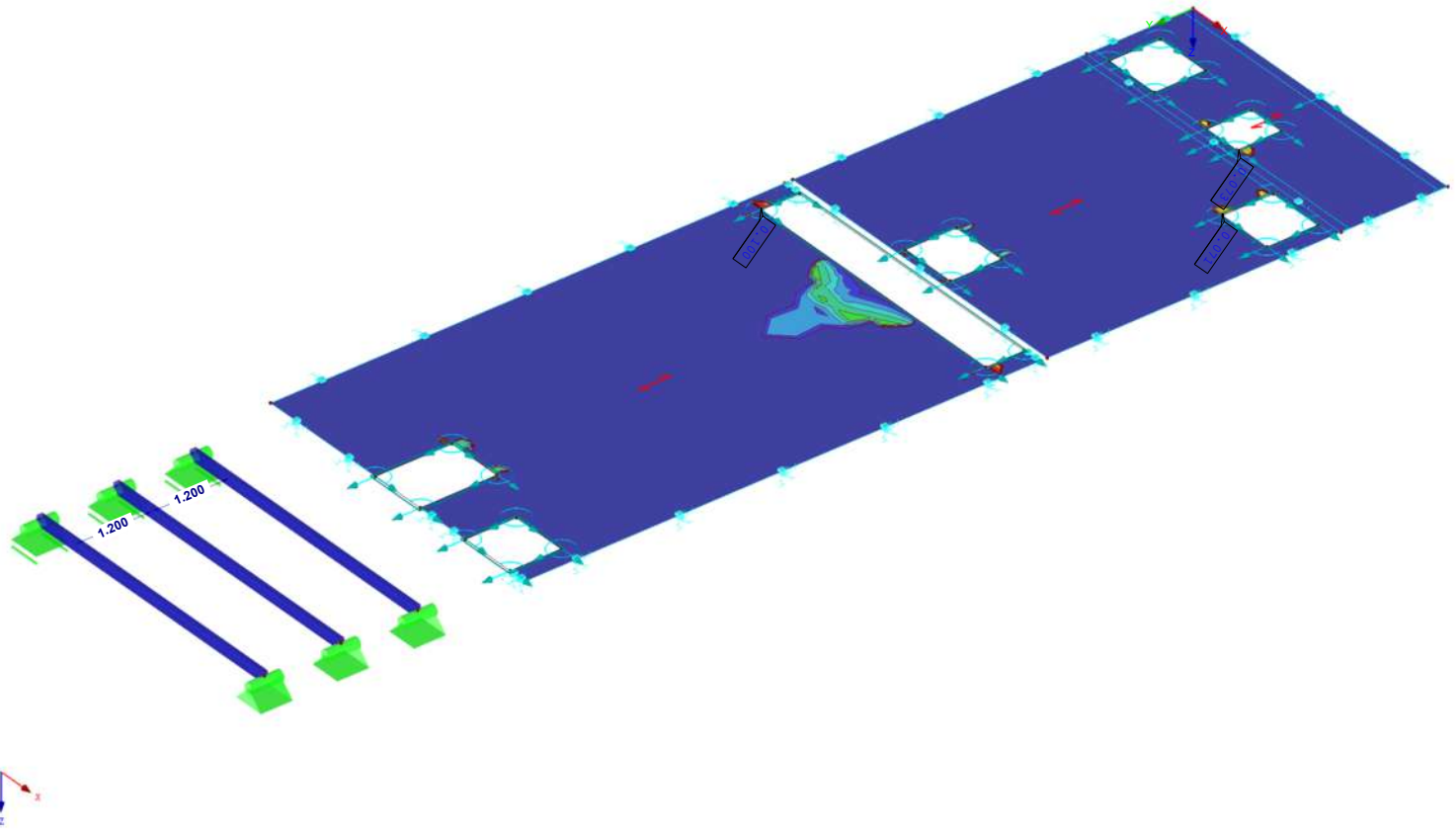


Max w-k,1,+z (bottom): 0.105, Min w-k,1,+z (bottom): 0.000 mm

CRACK WIDTH $w_{k,2,+z}$ (bottom)

RF-CONCRETE Surfaces CA1
Dangtis_1
Surfaces Crack width w-k,2,+z (bottom) [mm]
Values: w-k,2,+z (bottom) [mm]

Isometric

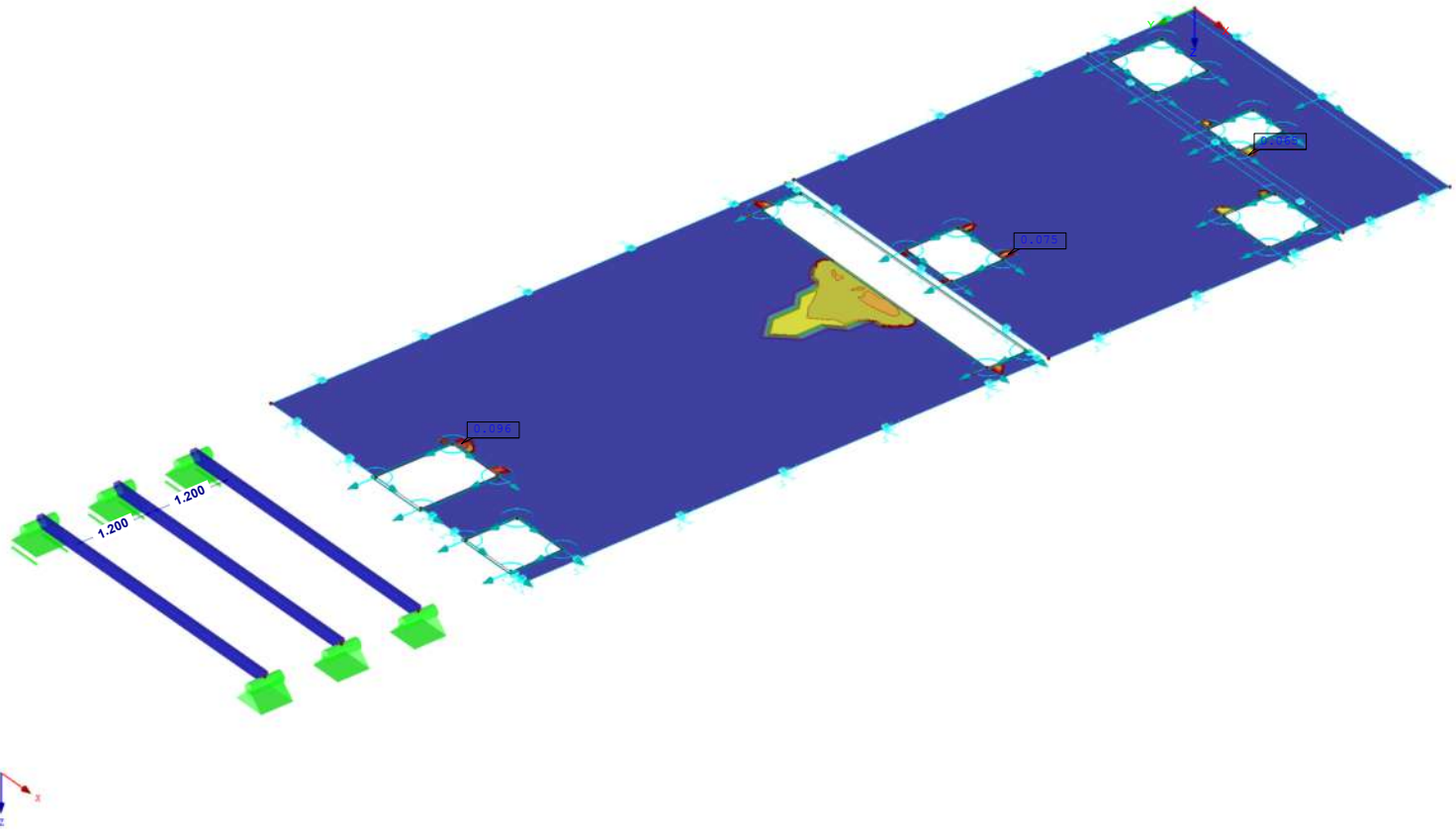


Max w-k,2,+z (bottom): 0.100, Min w-k,2,+z (bottom): 0.000 mm

CRACK WIDTH $w_{k,res,+z\ (bottom)}$

RF-CONCRETE Surfaces CA1
Dangtis_1
Surfaces Crack width w-k,res,+z (bottom) [mm]
Values: w-k,res,+z (bottom) [mm]

Isometric

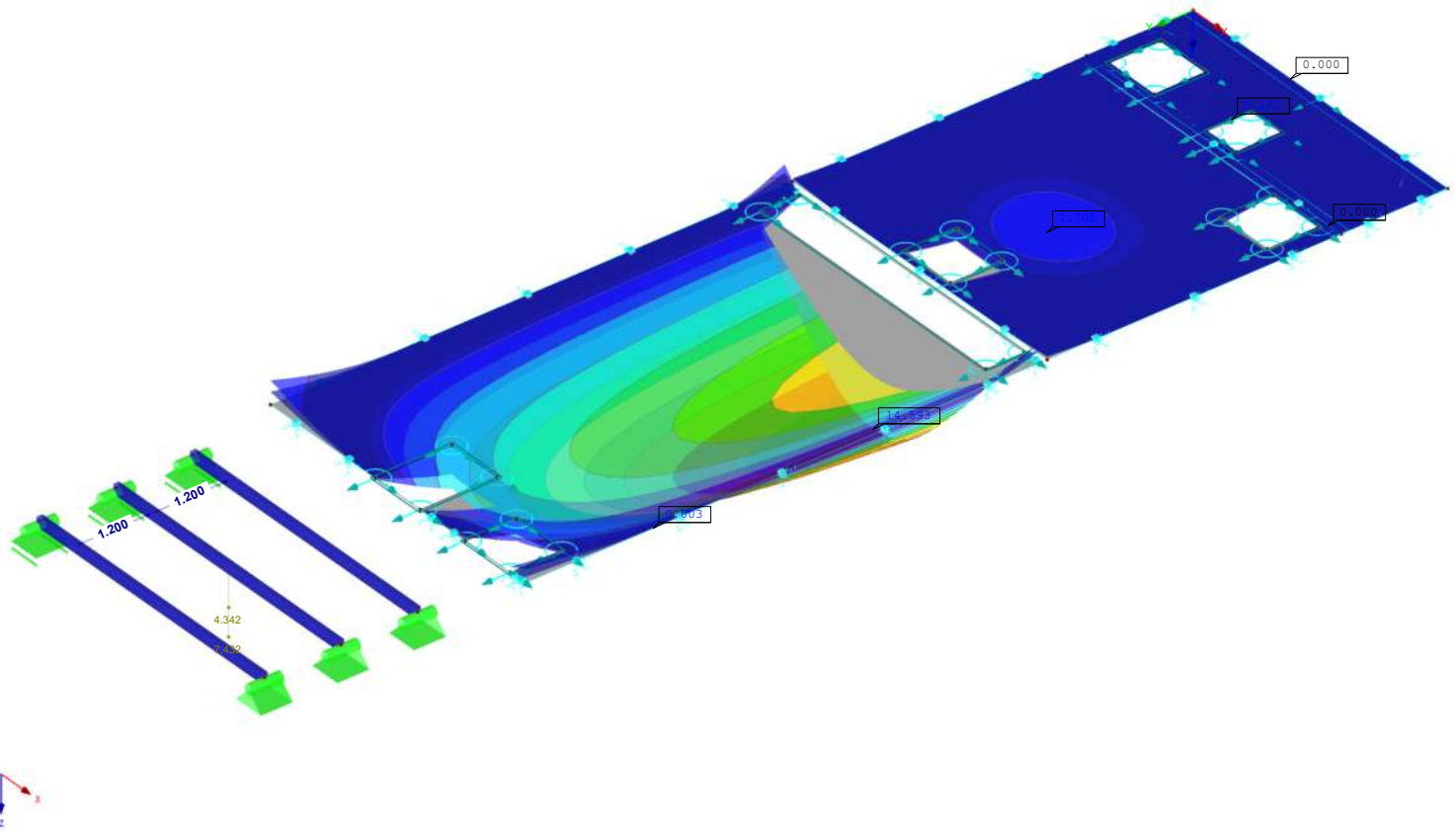


Max w-k,res,+z (bottom): 0.096, Min w-k,res,+z (bottom): 0.000 mm

DEFORMATIONS u

RF-CONCRETE Surfaces CA1
Dangtis_1
Deformations u [mm]
Values: u [mm]

Isometric



Factor of deformations: 140.00
Max u: - Min u: -

STRUCTURAL ANALYSIS

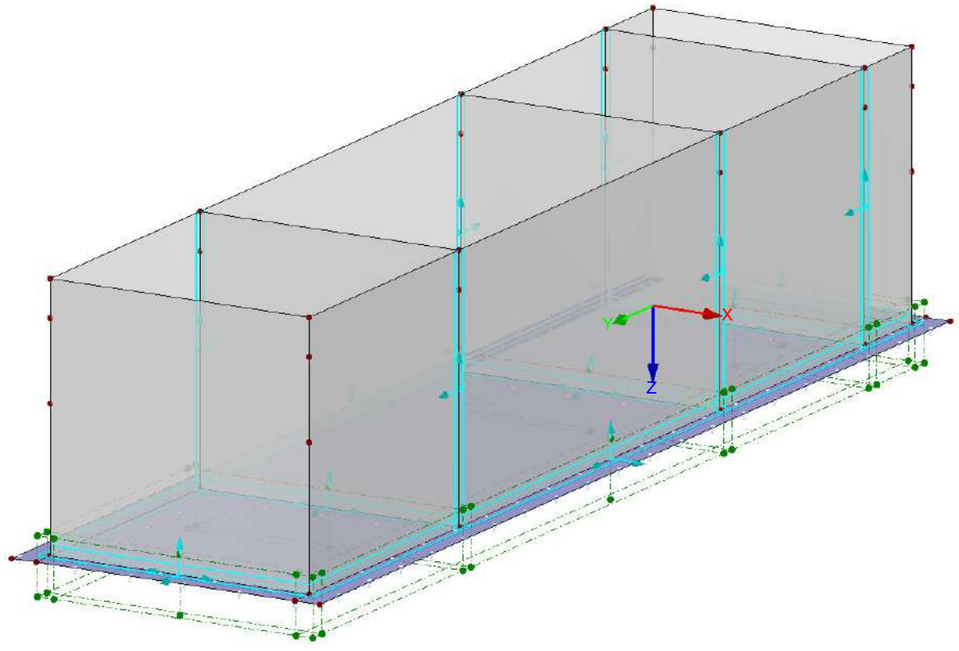
PROJECT

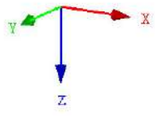
Bioreaktoriai (4 vienetai) (03);

CLIENT

CREATED BY

Isometric





MODEL - GENERAL DATA

General	Model name		:	SK23010_Dreverna_ (03) statinys_ (pozemines talpos) 23.07.17	
	Project name		:	1	
	Project description		:	1	
	Type of model		:	3D	
	Positive direction of global axis Z		:	Downward	
	Classification of load cases and combinations		:	According to Standard: EN 1990 National Annex: LST - Lithuania	
Options	☐ RF-FORM-FINDING - Find initial equilibrium shapes of membrane and cable structures				
	☐ RF-CUTTING-PATTERN				
	☐ Piping analysis				
	☐ Use CQC Rule				
	☐ Enable CAD/BIM model				
	Standard Gravity				
	g		:	10.00 m/s^2	

FE MESH SETTINGS

General	Target length of finite elements	l_{FE}	:	200 mm	
	Maximum distance between a node and a line to integrate it into the line	ε	:	1 mm	
	Maximum number of mesh nodes (in thousands)		:	500	
Members	Number of divisions of members with cable, elastic foundation, taper, or plastic characteristic		:	10	
	☒ Activate member divisions for large deformation or post-critical analysis				
	☒ Use division also for straight members, which are not integrated in surfaces, with		:	Target length LFE of finite elements	
	Minimum number of member divisions		:	2	
	☒ Use division for members with node lying on them				
Surfaces	Maximum ratio of FE rectangle diagonals	Δ_D	:	2	
	Maximum out-of-plane inclination of two finite elements	α	:	0.50 °	
	☒ Integrate also unutilized objects into surfaces				
	Shape direction of finite elements		:	Triangles and quadrangles ☒ Same squares where possible	

1.3 MATERIALS

Matl. No.	Modulus E [MPa]	Modulus G [MPa]	Poisson's Ratio ν [-]	Spec. Weight γ [kN/m³]	Coeff. of Th. Exp. α [1/°C]	Partial Factor γ_M [-]	Material Model
2	Concrete C35/45*0,7 23800.0 User-Defined Material	9916.7	0.200	25.00	1.00E-05	1.00	Isotropic Linear Elastic
3	Concrete C35/45 | EN 1992-1-1:2004/A1:2014 34000.0	14166.7	0.200	25.00	1.00E-05	1.00	Isotropic Linear Elastic

1.4 SURFACES

Surface No.	Surface Type Geometry	Surface Type Stiffness	Boundary Lines No.	Matl. No.	Thickness Type	Thickness d [mm]	Area A [mm²]	Weight W [kg]
1	Plane	Standard	150,161,3,165	3	Constant	350	39424900	34496.80
2	Plane	Standard	1,165,8,178	3	Constant	350	21849900	19118.70
3	Plane	Standard	1,198,196,7,192,194	2	Constant	300	20930000	15697.50
4	Plane	Standard	5,183,200,149,152,196,198	2	Constant	300	6825000	5118.75
5	Plane	Standard	3,189,185,170,191,193	2	Constant	300	37765000	28323.80
6	Plane	Standard	8,193,191,4,195,197	2	Constant	300	20930000	15697.50
38	Plane	Standard	146,147,201,184,148,149,200,183	2	Constant	300	21612400	16209.30
39	Plane	Standard	150,194,192,2,186,190	2	Constant	300	37765000	28323.80
40	Plane	Standard	154,155,199,188,156,186,190	2	Constant	300	21612600	16209.40
41	Plane	Standard	188,199,155,158,159,202,187,160	2	Constant	250	21612400	13507.80
42	Plane	Standard	161,189,185,163,186,190	2	Constant	250	21612400	13507.80
43	Plane	Standard	164,187,202,159,166,189,185	2	Constant	300	21612500	16209.40
44	Plane	Standard	184,201,147,168,197,195,6	2	Constant	300	6825000	5118.75
45	Plane	Standard	165,193,191,169,192,194	2	Constant	250	21612400	13507.80
46	Plane	Standard	178,197,195,180,196,198	2	Constant	250	21612400	13507.80
53	Plane	Standard	146,5,178,168	3	Constant	350	7124980	6234.36
54	Plane	Standard	161,154,158,166	3	Constant	350	22562500	19742.20
55	Plane	Standard	171,172,168,8,3,166,56,173,53	3	Constant	350	9022360	7894.57
56	Plane	Standard	174,154,150,1,5,57,175,54,177	3	Constant	350	9022560	7894.74
57	Plane	Standard	174,158,56,181	3	Constant	350	2137470	1870.29
58	Plane	Standard	182,172,146,57	3	Constant	350	2137500	1870.32

1.9 SURFACE SUPPORTS

Found. No.	On Surfaces No.	Spring Constants RF-SOILIN	Translation Support or Spring [kN/m³] u_x	u_y	u_z	Shear Spring [kN/m] v_{xz}	v_{yz}
1	1,2,53-58	+	50.000	50.000			

1.9.1 SURFACE SUPPORTS - INEFFECTIVE

Found. No.	On Surfaces No.	Ineffective support under σ_z	Yielding from contact stress $\sigma_{z'}$ [kN/m²]	Coefficient of friction μ_z [-]
1	1,2,53-58	Negative		

2.1 LOAD CASES

Load Case	Load Case Description	EN 1990 | LST Action Category	Self-Weight - Factor in Direction Active	X	Y	Z
LC1	Savas svoris	Permanent	☒	0.000	0.000	1.000
LC2	Savas svoris su grunto apkrova	Permanent	☒	0.000	0.000	1.000
LC3	Vanduo1	Imposed - Category E: storage areas	☐			
LC4	Vanduo2	Imposed - Category E: storage areas	☐			
LC5	Vanduo3	Imposed - Category E: storage areas	☐			
LC6	Vanduo4	Imposed - Category E: storage areas	☐			
LC7	Vanduo keliantis	Imposed - Category E: storage areas	☐			
LC8	Susitraukimas	Permanent/Imposed	☐			
LC9	Snow	Snow / ice	☐			

2.1.1 LOAD CASES - CALCULATION PARAMETERS

Load Case	Load Case Description	Calculation Parameters		
LC1	Savas svoris	Method of analysis	:	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	:	Newton-Raphson
LC2	Savas svoris su grunto apkrova	Method of analysis	:	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	:	Newton-Raphson
LC3	Vanduo1	Method of analysis	:	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	:	Newton-Raphson
LC4	Vanduo2	Method of analysis	:	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	:	Newton-Raphson
LC5	Vanduo3	Method of analysis	:	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	:	Newton-Raphson
LC6	Vanduo4	Method of analysis	:	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	:	Newton-Raphson
LC7	Vanduo keliantis	Method of analysis	:	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	:	Newton-Raphson
		Activate stiffness factors of:	:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC8	Susitraukimas	Method of analysis	:	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	:	Newton-Raphson
		Activate stiffness factors of:	:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC9	Snow	Method of analysis	:	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	:	Newton-Raphson

2.5 LOAD COMBINATIONS

Load Combin.	DS	Load Combination Description	No.	Factor	Load Case	
CO1	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC1	Savas svoris
			2	1.30	LC3	Vanduo1
			3	1.30	LC8	Susitraukimas
			4	1.30	LC9	Snow
CO2	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC1	Savas svoris
			2	1.30	LC4	Vanduo2
			3	1.30	LC8	Susitraukimas
CO3	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC1	Savas svoris
			2	1.30	LC5	Vanduo3
			3	1.30	LC8	Susitraukimas
CO4	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC1	Savas svoris
			2	1.30	LC6	Vanduo4
			3	1.30	LC8	Susitraukimas
CO5	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC1	Savas svoris
			2	1.30	LC3	Vanduo1
			3	1.30	LC4	Vanduo2
			4	1.30	LC8	Susitraukimas
CO6	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC1	Savas svoris
			2	1.30	LC3	Vanduo1
			3	1.30	LC4	Vanduo2
			4	1.30	LC5	Vanduo3
			5	1.30	LC8	Susitraukimas
CO7	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC1	Savas svoris
			2	1.30	LC3	Vanduo1
			3	1.30	LC4	Vanduo2
			4	1.30	LC5	Vanduo3
			5	1.30	LC6	Vanduo4
			6	1.30	LC8	Susitraukimas
CO8	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC1	Savas svoris
			2	1.30	LC3	Vanduo1
			3	1.30	LC5	Vanduo3
			4	1.30	LC8	Susitraukimas
CO9	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC1	Savas svoris
			2	1.30	LC4	Vanduo2
			3	1.30	LC6	Vanduo4
			4	1.30	LC8	Susitraukimas
CO10	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC1	Savas svoris
			2	1.30	LC4	Vanduo2
			3	1.30	LC5	Vanduo3
			4	1.30	LC8	Susitraukimas
CO11	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC1	Savas svoris
			2	1.30	LC5	Vanduo3
			3	1.30	LC6	Vanduo4
			4	1.30	LC8	Susitraukimas
CO12	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC1	Savas svoris
			2	1.30	LC3	Vanduo1
			3	1.30	LC4	Vanduo2
			4	1.30	LC8	Susitraukimas
CO13	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC2	Savas svoris su grunto apkrova

2.5 LOAD COMBINATIONS

Load Combin.	DS	Load Combination Description	No.	Factor	Load Case
			2	1.30	LC3 Vanduo1
			3	1.30	LC8 Susitraukimas
			4	1.30	LC9 Snow
CO14	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC2 Savas svoris su grunto apkrova
			2	1.30	LC4 Vanduo2
			3	1.30	LC8 Susitraukimas
			4	1.30	LC9 Snow
CO15	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC2 Savas svoris su grunto apkrova
			2	1.30	LC5 Vanduo3
			3	1.30	LC8 Susitraukimas
			4	1.30	LC9 Snow
CO16	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC2 Savas svoris su grunto apkrova
			2	1.30	LC6 Vanduo4
			3	1.30	LC8 Susitraukimas
			4	1.30	LC9 Snow
CO17	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC2 Savas svoris su grunto apkrova
			2	1.30	LC9 Snow
			3	1.30	LC8 Susitraukimas
CO18	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC2 Savas svoris su grunto apkrova
			2	1.30	LC3 Vanduo1
			3	1.30	LC4 Vanduo2
			4	1.30	LC8 Susitraukimas
			5	1.30	LC9 Snow
CO19	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC2 Savas svoris su grunto apkrova
			2	1.30	LC3 Vanduo1
			3	1.30	LC4 Vanduo2
			4	1.30	LC5 Vanduo3
			5	1.30	LC8 Susitraukimas
			6	1.30	LC9 Snow
CO20	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC2 Savas svoris su grunto apkrova
			2	1.30	LC3 Vanduo1
			3	1.30	LC4 Vanduo2
			4	1.30	LC5 Vanduo3
			5	1.30	LC6 Vanduo4
			6	1.30	LC8 Susitraukimas
			7	1.30	LC9 Snow
CO21	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC2 Savas svoris su grunto apkrova
			2	1.30	LC3 Vanduo1
			3	1.30	LC5 Vanduo3
			4	1.30	LC8 Susitraukimas
			5	1.30	LC9 Snow
CO22	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC2 Savas svoris su grunto apkrova
			2	1.30	LC4 Vanduo2
			3	1.30	LC6 Vanduo4
			4	1.30	LC8 Susitraukimas
			5	1.30	LC9 Snow
CO23	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC2 Savas svoris su grunto apkrova
			2	1.30	LC4 Vanduo2
			3	1.30	LC5 Vanduo3
			4	1.30	LC8 Susitraukimas
			5	1.30	LC9 Snow
CO24	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC2 Savas svoris su grunto apkrova
			2	1.30	LC5 Vanduo3
			3	1.30	LC6 Vanduo4
			4	1.30	LC8 Susitraukimas
			5	1.30	LC9 Snow
CO25	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC2 Savas svoris su grunto apkrova
			2	1.30	LC3 Vanduo1
			3	1.30	LC4 Vanduo2
			4	1.30	LC8 Susitraukimas
			5	1.30	LC9 Snow
CO26	STR	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	1	1.35	LC2 Savas svoris su grunto apkrova
			2	1.30	LC7 Vanduo keliantis
			3	1.30	LC3 Vanduo1
			4	1.30	LC8 Susitraukimas

2.5.2 LOAD COMBINATIONS - CALCULATION PARAMETERS

Load Combin.	Description	Calculation Parameters		
CO1	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	: ☒	Materials (partial factor γM)
			: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO2	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	: ☒	Materials (partial factor γM)
			: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO3	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)

2.5.2 LOAD COMBINATIONS - CALCULATION PARAMETERS

Load Combin.	Description	Calculation Parameters		
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO4	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO5	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO6	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO7	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO8	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO9	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO10	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO11	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO12	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)

2.5.2 LOAD COMBINATIONS - CALCULATION PARAMETERS

Load Combin.	Description	Calculation Parameters		
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO13	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO14	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO15	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO16	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO17	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO18	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO19	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO20	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO21	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)

2.5.2 LOAD COMBINATIONS - CALCULATION PARAMETERS

Load Combin.	Description	Calculation Parameters		
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO22	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO23	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO24	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO25	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO26	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	Method of analysis	:	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	:	Picard
		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
		Activate stiffness factors of:	:	☒ Materials (partial factor γM)
			:	☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			:	☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)

LC1
Savas svoris

3.3 LINE LOADS

LC1: Savas svoris

No.	Reference to	On Lines No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	Lines	180	Force	Parabolic	ZL	p_1	6.000	kN/m
						p_2	6.000	kN/m
						p_3	30.000	kN/m
2	Lines	169	Force	Parabolic	ZL	p_1	17.000	kN/m
						p_2	17.000	kN/m
						p_3	43.000	kN/m
3	Lines	163	Force	Parabolic	ZL	p_1	10.000	kN/m
						p_2	10.000	kN/m
						p_3	45.000	kN/m
4	Lines	160	Force	Parabolic	ZL	p_1	10.000	kN/m
						p_2	10.000	kN/m
						p_3	18.000	kN/m
5	Lines	148	Force	Parabolic	ZL	p_1	3.000	kN/m
						p_2	3.000	kN/m
						p_3	6.000	kN/m
6	Lines	2,4,6,7,152,156,164,170	Force	Uniform	ZL	p	17.500	kN/m

3.4 SURFACE LOADS

LC1: Savas svoris

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
2	3-6,38-41,43,44	Axial Strain	Uniform		ε_1	-0.00025	-
3	42,45,46	Axial Strain	Uniform		ε_1	-0.00026	-
4	1,2,53-58	Axial Strain	Uniform		ε_1	-0.00024	-

3.10 FREE POLYGON LOADS

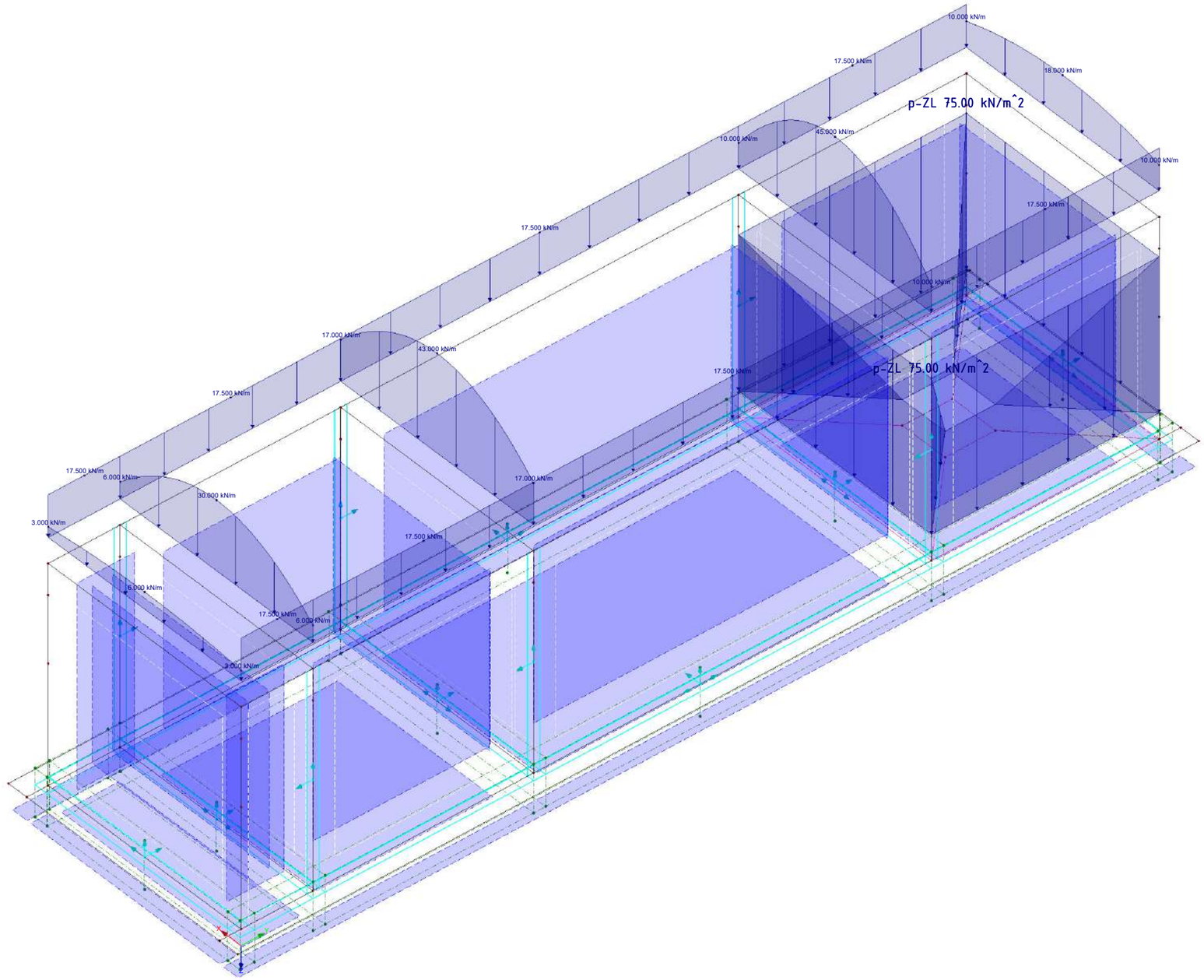
LC1: Savas svoris

No.	On Surfaces No.	Project.	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit	Load Position X [mm]	Y [mm]	Z [mm]
1	54	XY	Linear	ZL	p1	75.00	kN/m²	0	14400	0
					p2	0.00	kN/m²	1850	16250	0
					p3	0.00	kN/m²	2900	16250	0
								4750	14400	0
2	54	XY	Linear	ZL	p1	75.00	kN/m²	0	19150	-340
					p2	0.00	kN/m²	1850	17300	-340
					p3	0.00	kN/m²	1850	16250	-340
								0	14400	-340
3	54	XY	Linear	ZL	p1	75.00	kN/m²	0	19150	-340
					p2	0.00	kN/m²	1850	17300	-340
					p3	0.00	kN/m²	2900	17300	-340
								4750	19150	-340
4	54	XY	Linear	ZL	p1	75.00	kN/m²	4750	14400	-340
					p2	0.00	kN/m²	2900	16250	-340
					p3	0.00	kN/m²	2900	17300	-340
								4750	19150	-340

LC1: SAVAS SVORIS

LC1 : Savas svoris

Isometric



LC2
Savas svoris su grunto apkrova

3.3 LINE LOADS

LC2: Savas svoris su grunto apkrova

No.	Reference to	On Lines No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
6	Lines	180	Force	Parabolic	ZL	p_1	6.000	kN/m
						p_2	6.000	kN/m
						p_3	30.000	kN/m
7	Lines	169	Force	Parabolic	ZL	p_1	17.000	kN/m
						p_2	17.000	kN/m
						p_3	43.000	kN/m
8	Lines	163	Force	Parabolic	ZL	p_1	10.000	kN/m
	-							
						p_2	10.000	kN/m
						p_3	45.000	kN/m
9	Lines	160	Force	Parabolic	ZL	p_1	10.000	kN/m
	-							
						p_2	10.000	kN/m
						p_3	18.000	kN/m
10	Lines	148	Force	Parabolic	ZL	p_1	3.000	kN/m
	-							
						p_2	3.000	kN/m
						p_3	6.000	kN/m
11	Lines	2,4,6,7,152,156,164,170	Force	Uniform	ZL	p	17.500	kN/m
	-							

3.4 SURFACE LOADS

LC2: Savas svoris su grunto apkrova

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
2	55-58	Force	Uniform	ZL	p	34.00	kN/m²
3	3-6,38-41,43,44	Axial Strain	Uniform		ε_1	-0.00025	-
4	42,45,46	Axial Strain	Uniform		ε_1	-0.00026	-
5	1,2,53-58	Axial Strain	Uniform		ε_1	-0.00024	-

3.8 FREE RECTANGULAR LOADS

LC2: Savas svoris su grunto apkrova

No.	On Surfaces No.	Project.	Load Distribution	Load Direction	Magnitude Symbol	Value	Unit	Load Position X [mm]	Y [mm]	Z [mm]
1	5,6,43,44	YZ	Linear Z	XL	p_1	34.00	kN/m²		0	-340
					p_2	3.30	kN/m²		19150	-4890
3	3,4,39,40	YZ	Linear Z	XL	p_1	-34.00	kN/m²		19150	-340
					p_2	-3.30	kN/m²		0	-4890
5	41	XZ	Linear Z	YL	p_1	-34.00	kN/m²	4750		-340
					p_2	-3.30	kN/m²	0		-4890
6	38	XZ	Linear Z	YL	p_1	34.00	kN/m²	4750		-340
					p_2	3.30	kN/m²	0		-4890

3.10 FREE POLYGON LOADS

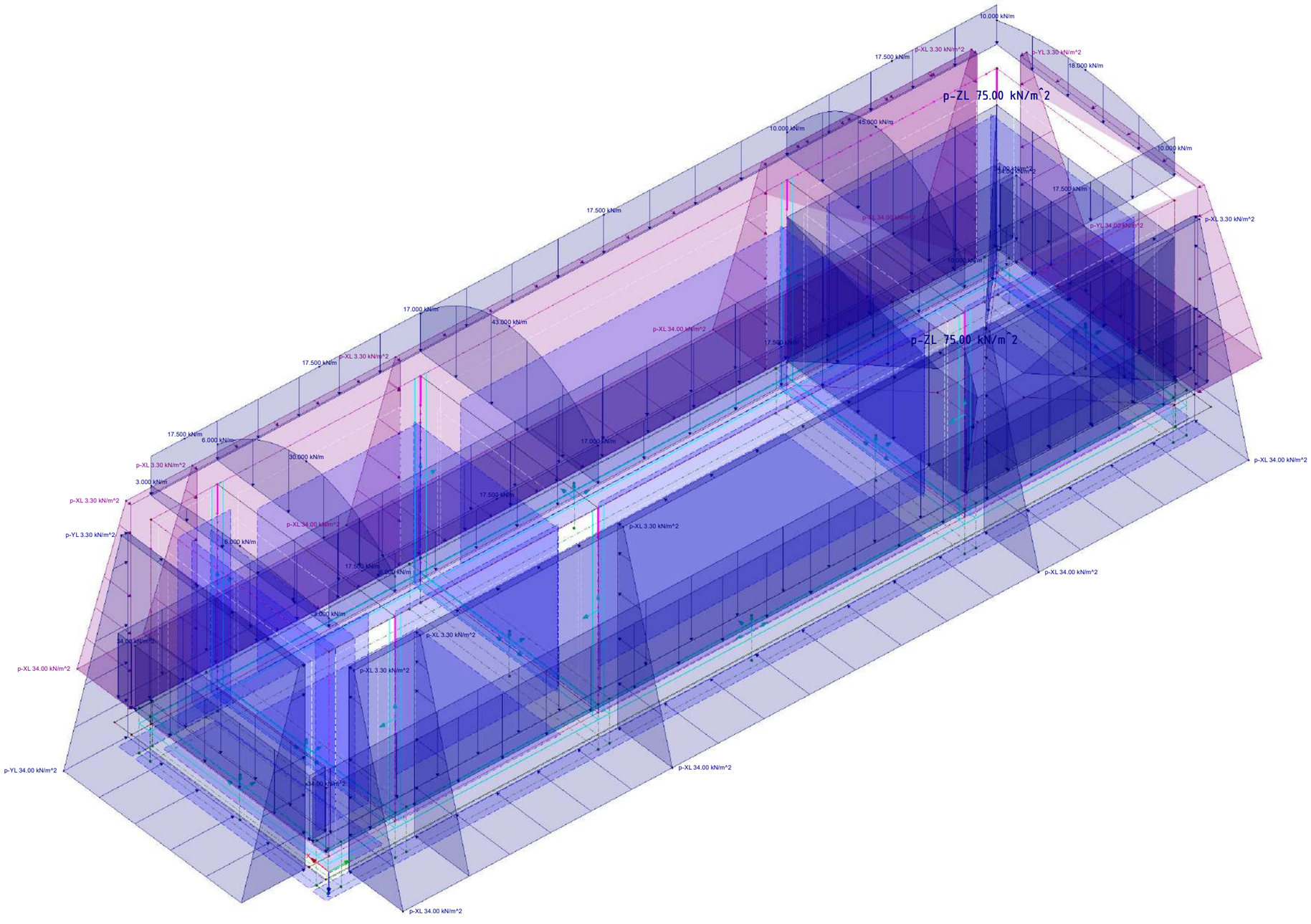
LC2: Savas svoris su grunto apkrova

No.	On Surfaces No.	Project.	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit	Load Position X [mm]	Y [mm]	Z [mm]
4	54	XY	Linear	ZL	p1	75.00	kN/m²	0	14400	0
					p2	0.00	kN/m²	1850	16250	0
					p3	0.00	kN/m²	2900	16250	0
								4750	14400	0
5	54	XY	Linear	ZL	p1	75.00	kN/m²	0	19150	0
					p2	0.00	kN/m²	1850	17300	0
					p3	0.00	kN/m²	1850	16250	0
								0	14400	0
6	54	XY	Linear	ZL	p1	75.00	kN/m²	0	19150	0
					p2	0.00	kN/m²	1850	17300	0
					p3	0.00	kN/m²	2900	17300	0
								4750	19150	0
7	54	XY	Linear	ZL	p1	75.00	kN/m²	4750	14400	0
					p2	0.00	kN/m²	2900	16250	0
					p3	0.00	kN/m²	2900	17300	0
								4750	19150	0

LC2: SAVAS SVORIS SU GRUNTO APKROVA

LC2 : Savas svoris su grunto apkrova

Isometric



LC3
Vanduo1

3.4 SURFACE LOADS

LC3: Vanduo1

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	53	Force	Uniform	ZL	p	40.00	kN/m²

3.8 FREE RECTANGULAR LOADS

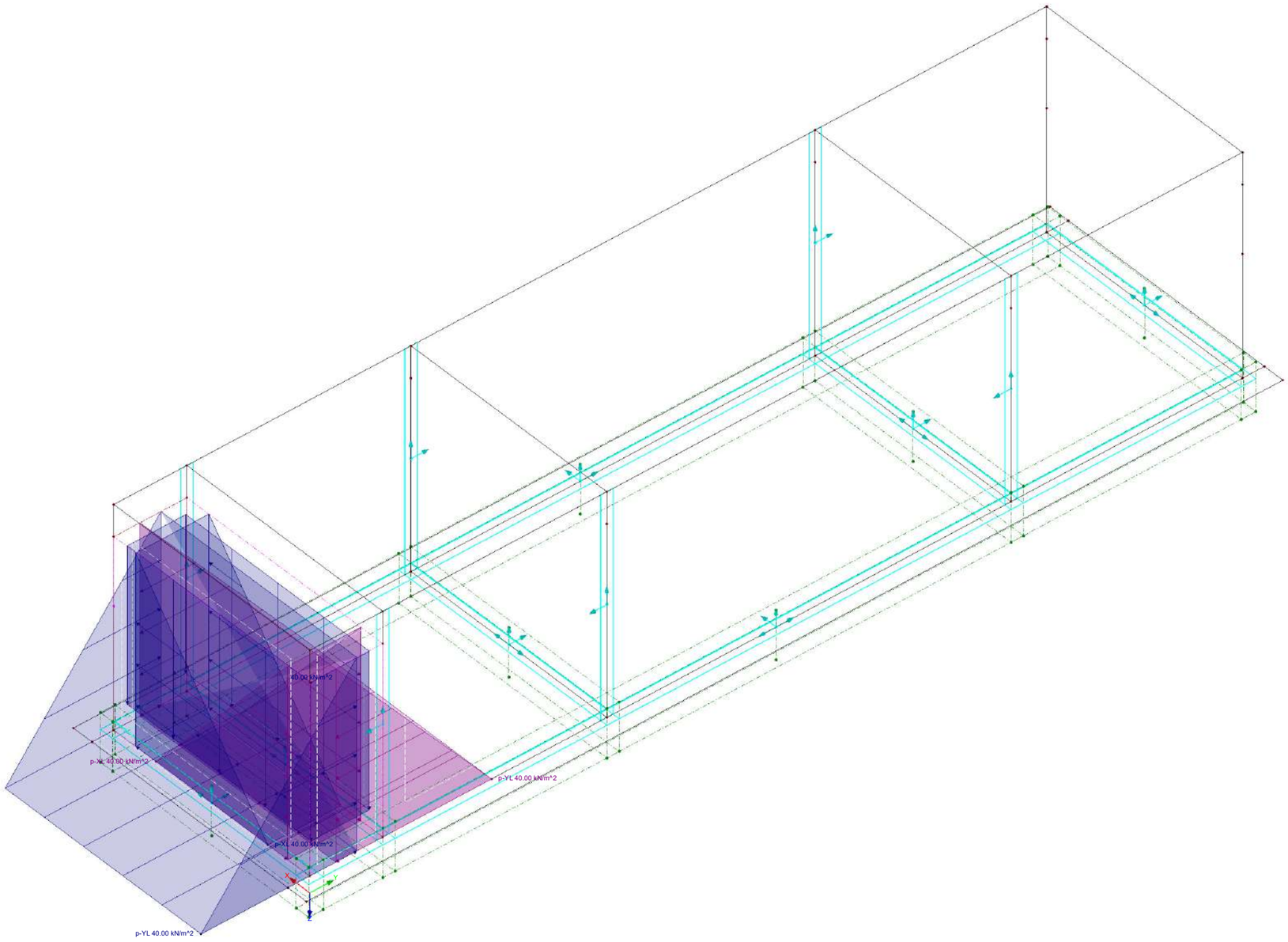
LC3: Vanduo1

No.	On Surfaces No.	Project.	Load Distribution	Load Direction	Magnitude Symbol	Value	Unit	Load Position X [mm]	Y [mm]	Z [mm]
1	4	YZ	Linear Z	XL	p_1	40.00	kN/m²		0	-340
					p_2	0.00	kN/m²		1500	-4240
2	38	XZ	Linear Z	YL	p_1	-40.00	kN/m²	0		-340
					p_2	0.00	kN/m²	4750		-4240
3	44	YZ	Linear Z	XL	p_1	-40.00	kN/m²		0	-340
					p_2	0.00	kN/m²		1500	-4240
4	46	XZ	Linear Z	YL	p_1	40.00	kN/m²	0		-340
					p_2	0.00	kN/m²	4750		-4240

LC3: VANDUO1

LC3 : Vanduo1

Isometric



LC4
Vanduo2

3.4 SURFACE LOADS

LC4: Vanduo2

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	2	Force	Uniform	ZL	p	40.00	kN/m²

3.8 FREE RECTANGULAR LOADS

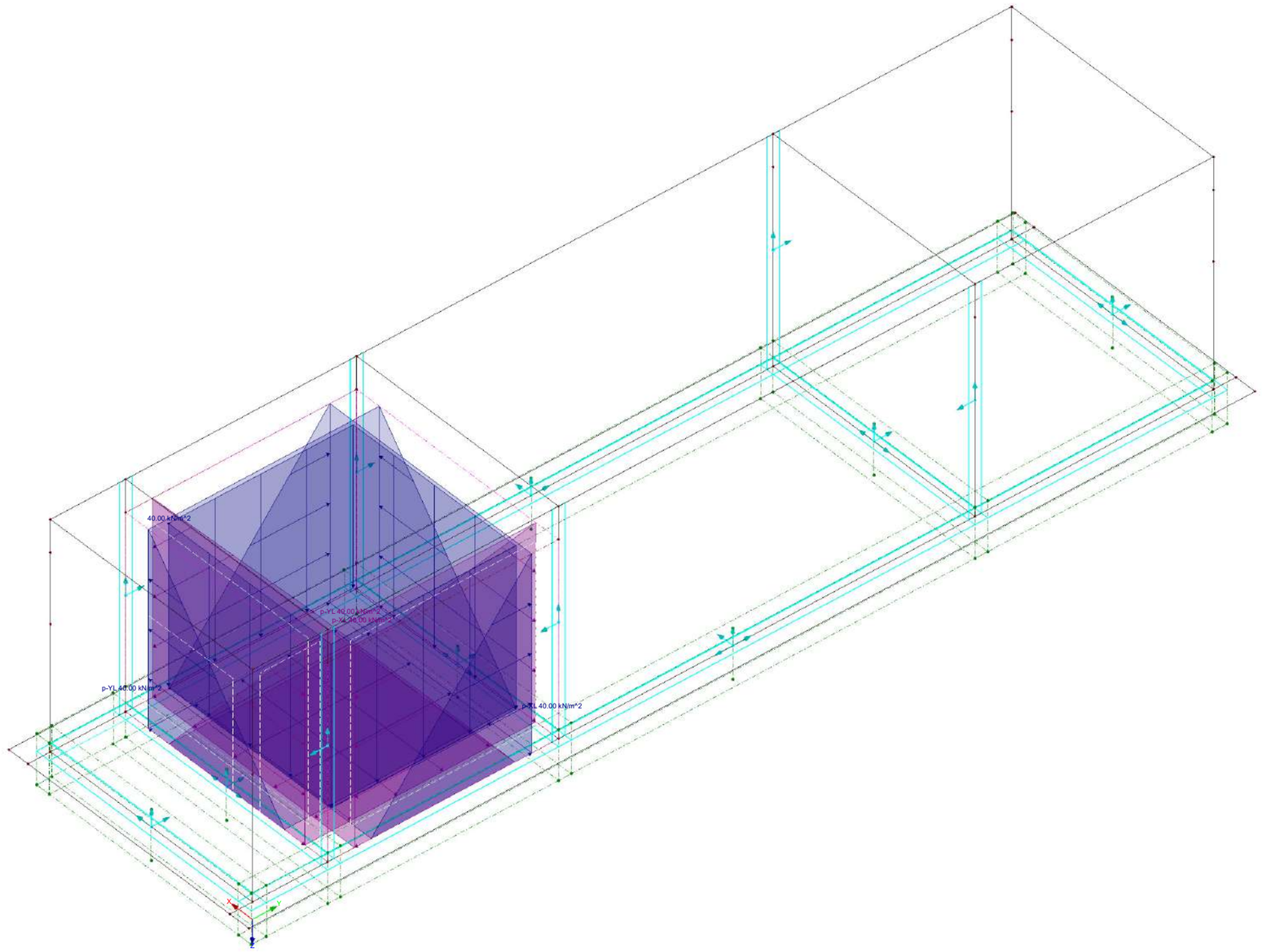
LC4: Vanduo2

No.	On Surfaces No.	Project.	Load Distribution	Load Direction	Magnitude Symbol	Value	Unit	Load Position X [mm]	Y [mm]	Z [mm]
1	3	YZ	Linear Z	XL	p_1	40.00	kN/m²		6100	-340
					p_2	0.00	kN/m²		1500	-4240
2	6	YZ	Linear Z	XL	p_1	-40.00	kN/m²		6100	-340
					p_2	0.00	kN/m²		1500	-4240
3	46	XZ	Linear Z	YL	p_1	-40.00	kN/m²	4750		-340
					p_2	0.00	kN/m²	0		-4240
4	45	XZ	Linear Z	YL	p_1	40.00	kN/m²	4750		-340
					p_2	0.00	kN/m²	0		-4240

LC4: VANDUO2

LC4 : Vanduo2

Isometric



LC5
Vanduo3

3.4 SURFACE LOADS

LC5: Vanduo3

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	1	Force	Uniform	ZL	p	40.00	kN/m²

3.8 FREE RECTANGULAR LOADS

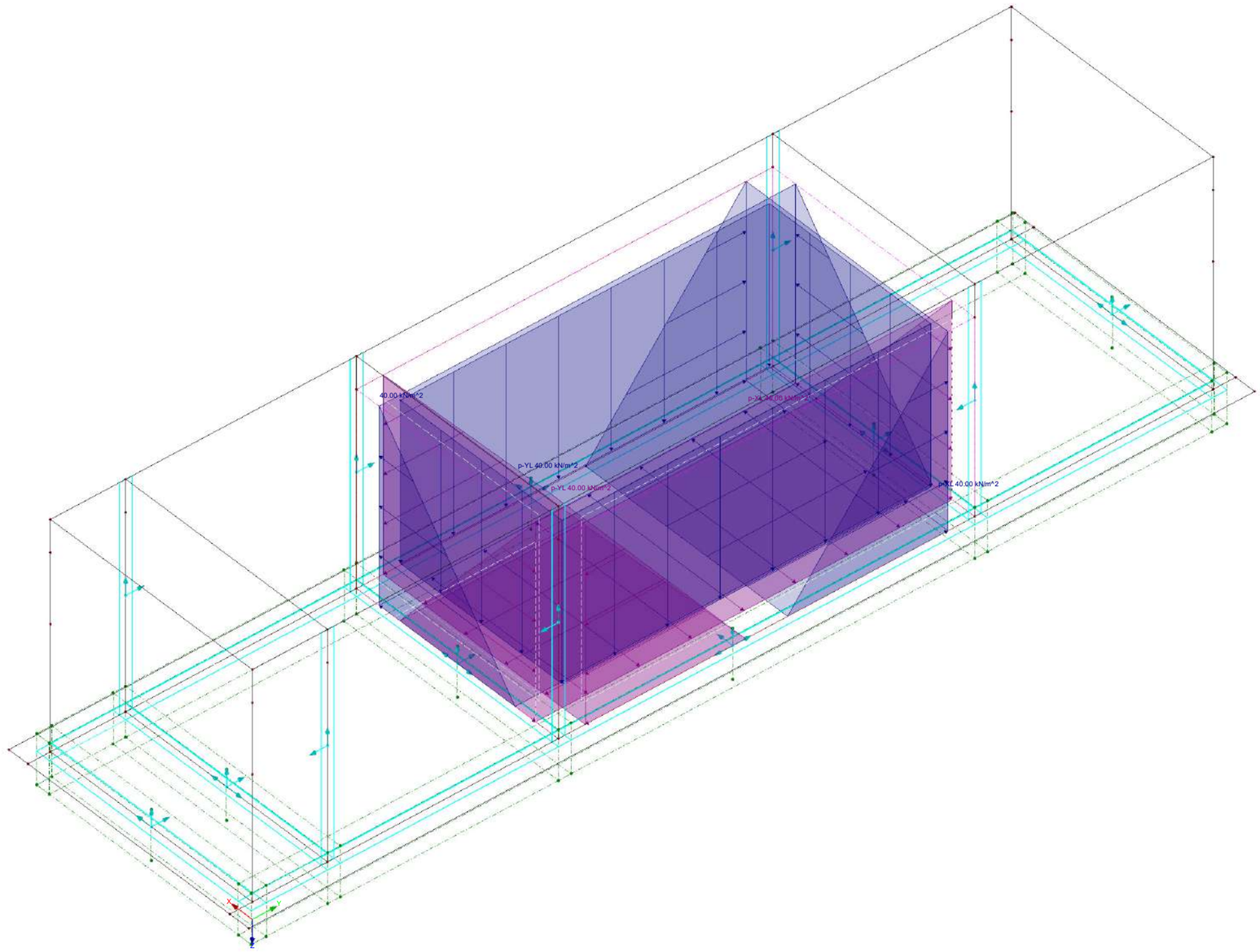
LC5: Vanduo3

No.	On Surfaces No.	Project.	Load Distribution	Load Direction	Magnitude Symbol	Value	Unit	Load Position X [mm]	Y [mm]	Z [mm]
1	39	YZ	Linear Z	XL	p_1	40.00	kN/m²		14400	-340
					p_2	0.00	kN/m²		6100	-4240
2	5	YZ	Linear Z	XL	p_1	-40.00	kN/m²		14400	-340
					p_2	0.00	kN/m²		6100	-4240
3	45	XZ	Linear Z	YL	p_1	-40.00	kN/m²	4750		-340
					p_2	0.00	kN/m²	0		-4240
4	42	XZ	Linear Z	YL	p_1	40.00	kN/m²	4750		-340
					p_2	0.00	kN/m²	0		-4240

LC5: VANDUO3

LC5 : Vanduo3

Isometric



LC6
Vanduo4

3.4 SURFACE LOADS

LC6: Vanduo4

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	54	Force	Uniform	ZL	p	40.00	kN/m²

3.8 FREE RECTANGULAR LOADS

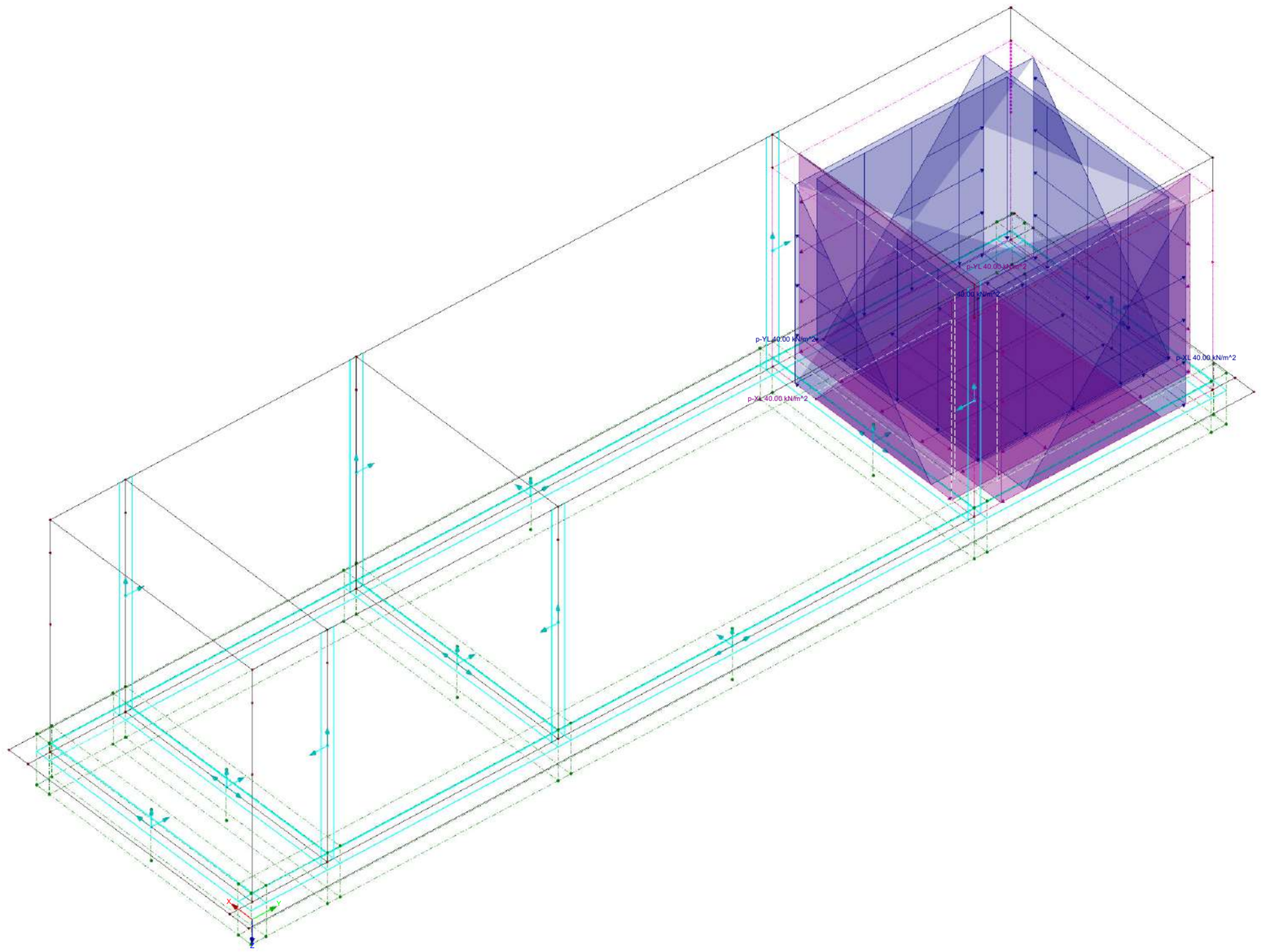
LC6: Vanduo4

No.	On Surfaces No.	Project.	Load Distribution	Load Direction	Magnitude Symbol	Value	Unit	Load Position X [mm]	Y [mm]	Z [mm]
1	40	YZ	Linear Z	XL	p_1	40.00	kN/m²		19150	-340
					p_2	0.00	kN/m²		14400	-4240
2	43	YZ	Linear Z	XL	p_1	-40.00	kN/m²		14400	-340
					p_2	0.00	kN/m²		19150	-4240
3	42	XZ	Linear Z	YL	p_1	-40.00	kN/m²	4750		-340
					p_2	0.00	kN/m²	0		-4240
4	41	XZ	Linear Z	YL	p_1	40.00	kN/m²	4750		-340
					p_2	0.00	kN/m²	0		-4240

LC6: VANDUO4

LC6 : Vanduo4

Isometric



LC7
Vanduo keliantis

3.4 SURFACE LOADS

LC7: Vanduo keliantis

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	1,2,53-58	Force	Uniform	ZL	p	-25.00	kN/m²

3.8 FREE RECTANGULAR LOADS

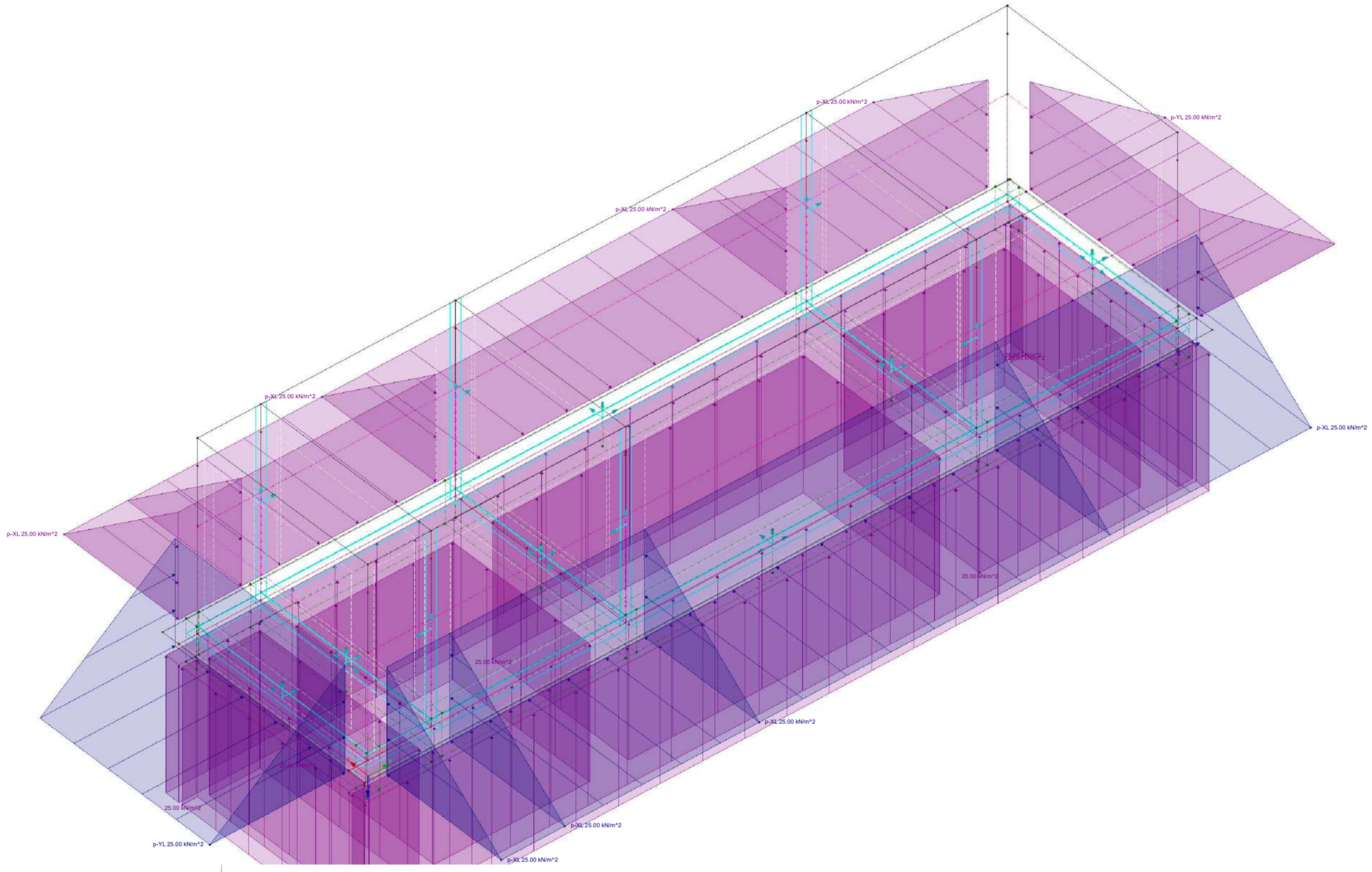
LC7: Vanduo keliantis

No.	On Surfaces No.	Project.	Load Distribution	Load Direction	Magnitude Symbol	Value	Unit	Load Position X [mm]	Y [mm]	Z [mm]
1	3,4,39,40	YZ	Linear Z	XL	p_1	-25.00	kN/m²		19150	-340
					p_2	0.00	kN/m²		0	-2840
2	5,6,43,44	YZ	Linear Z	XL	p_1	25.00	kN/m²		19150	-340
					p_2	0.00	kN/m²		0	-2840
3	38	XZ	Linear Z	YL	p_1	25.00	kN/m²	0		-340
					p_2	0.00	kN/m²	4750		-2840
4	41	XZ	Linear Z	YL	p_1	-25.00	kN/m²	4750		-340
					p_2	0.00	kN/m²	0		-2840

LC7: VANDUO KELIANTIS

LC7 : Vanduo keliantis

Isometric



LC8
Susitraukimas

3.4 SURFACE LOADS

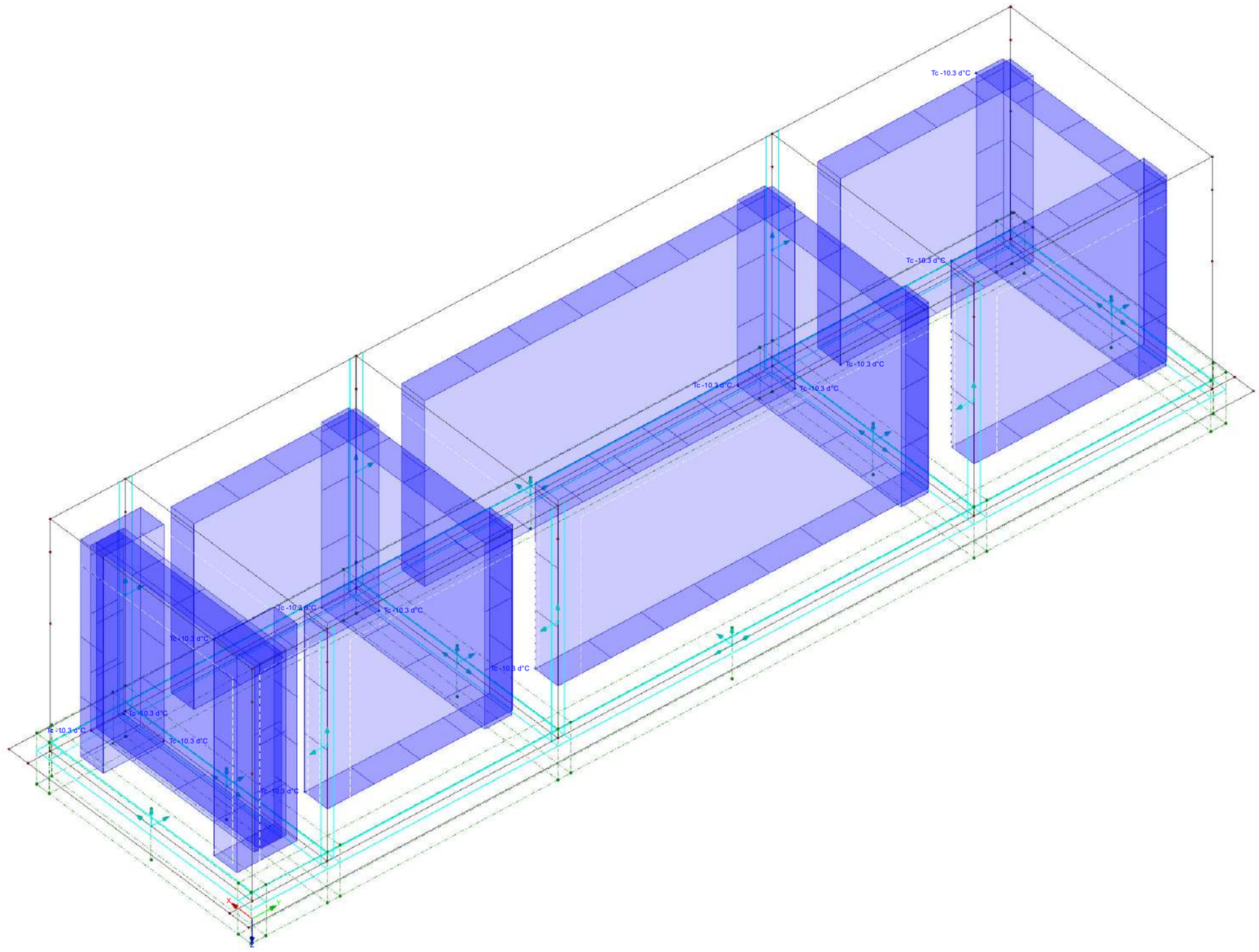
LC8: Susitraukimas

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	3-6,38-46	Temperature	Uniform		T_c	-10.3	°C
					ΔT	0.0	°C

LC8: SUSITRAUKIMAS

LC8 : Susitraukimas

Isometric



LC9
Snow

3.3 LINE LOADS

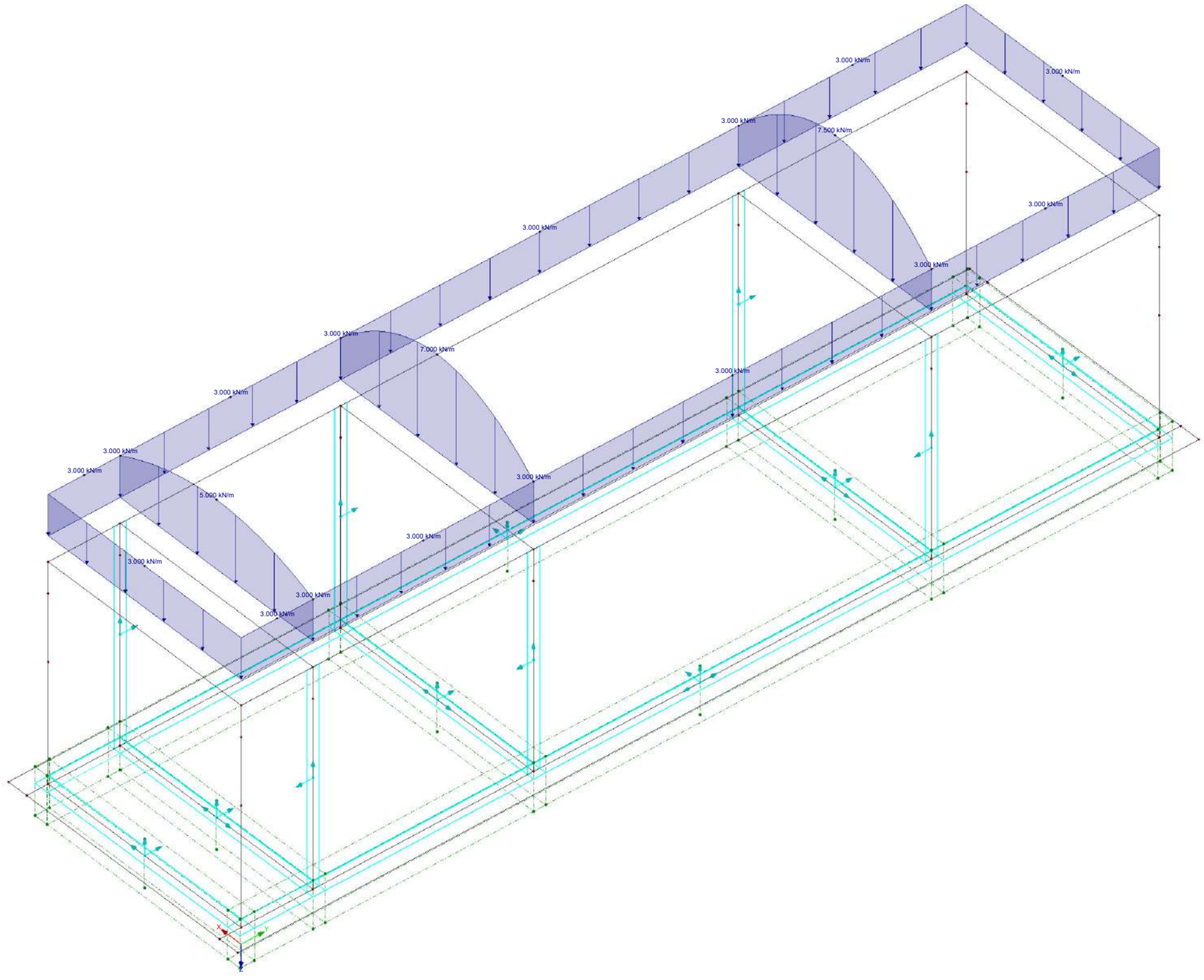
LC9: Snow

No.	Reference to	On Lines No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	Lines	2,4,6,7,152,156,164,170	Force	Uniform	ZL	p	3.000	kN/m
2	Lines	160	Force	Uniform	ZL	p	3.000	kN/m
3	Lines	163	Force	Parabolic	ZL	p_1	3.000	kN/m
						p_2	3.000	kN/m
						p_3	7.500	kN/m
4	Lines	169	Force	Parabolic	ZL	p_1	3.000	kN/m
						p_2	3.000	kN/m
						p_3	7.000	kN/m
5	Lines	180	Force	Parabolic	ZL	p_1	3.000	kN/m
						p_2	3.000	kN/m
						p_3	5.000	kN/m
6	Lines	148	Force	Uniform	ZL	p	3.000	kN/m

LC9: SNOW

LC9 : Snow

Isometric



RF-CONCRETE Surfaces
CA1
Pagrindo plokštė

Project: 1
1
Model: SK23010_Dreverna_ (03) statinys_ ..
Date: 2023-09-06

1.1 GENERAL DATA

Design according to Standard:	LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
ULTIMATE LIMIT STATE		
Load combinations for design:	CO1	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO2	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO3	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO4	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO5	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO6	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO7	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO8	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO9	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO10	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO11	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO12	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO13	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO14	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO15	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO16	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO17	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO18	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO19	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO20	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO21	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO22	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO23	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO24	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO25	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO26	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
SERVICEABILITY LIMIT STATE		
Load combinations for design:	CO1	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.600
	CO2	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO3	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO4	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO5	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO6	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO7	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO8	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.559
	CO9	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.559
	CO10	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.574
	CO11	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.577
	CO12	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.600
	CO13	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO14	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO15	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO16	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO17	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO18	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO19	ULS (STR/GEO) - Permanent / transient - Eq. 6.10

1.1 GENERAL DATA

		Quasi-permanent, k$_t$ 0.559
	CO20	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
		Quasi-permanent, k$_t$ 0.559
	CO21	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
		Quasi-permanent, k$_t$ 0.574
	CO22	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
		Quasi-permanent, k$_t$ 0.577
	CO23	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
		Quasi-permanent, k$_t$ 0.532
	CO24	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
		Quasi-permanent, k$_t$ 0.549
	CO25	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
		Quasi-permanent, k$_t$ 0.498
	CO26	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
		Quasi-permanent, k$_t$ 0.532
Definition of Provided Additional Reinforcement		Automatic arrangement according to the specifications in Table 1.4
Type of SLS method:		Analytical Method
		By assuming an identical deformation ratio of the longitudinal reinforcement
Design of		
Concrete Stress Analysis		☒
Steel Stress Analysis		☒
Crack widths		☒
Deformation Analysis		☐
Layout of longitudinal reinforcement		
Required longitudinal reinforcement automatically increased for serviceability limit state design:		☒
DETAILS		
Analysis Method for Reinforcement Envelope		Mixed
Apply the averaged internal forces in the defined average region for the ULS calculation and for the analytic method of SLS calculation.		☒
Apply the internal forces without the rib components		☐
Design Situation Settings for Serviceability Limit State Checks		
Load combination:		
Characteristic with direct load		Checks: w_k, u_l
Characteristic with imposed deformation		Checks: -
Frequent		Checks: -
Quasi-permanent		Checks: k_1*f_{ck}, k_2*f_{ck}, k_3*f_{yk}, k_4*f_{yk}, w_k, u_l

1.2 MATERIALS

Material No.	Material Description: Concrete Strength Class	Material Description: Steel Description	Comment
2	Concrete C35/45*0,7	B 500 S (A)	
3	Concrete C35/45	B 500 S (A)	

1.2.1 MATERIAL PARAMETERS

Material No.	Description	Name	Size	Unit
2	**Concrete Strength Class: Concrete C35/45*0,7**			
	Characteristic Cylinder Compressive Strength	f_{ck}	35.00	N/mm^2
	5 % Fractile of Axial Tensile Strength	$f_{ctk,0.05}$	2.20	N/mm^2
	Characteristic for Nonlinear Calculations			
	Mean Secant Modulus of Elasticity	E_{cm}	34000.00	N/mm^2
	Mean Cylinder Compressive Strength	f_{cm}	43.00	N/mm^2
	Mean Axial Tensile Strength	f_{ctm}	3.20	N/mm^2
	Ultimate Strain for Pure Compression	ε_{c1}	-2.250	‰
	Ultimate Strain at Failure	ε_{c1u}	-3.500	‰
	Shear Modulus	G	9916.70	N/mm^2
	Poisson's Ratio	ν	0.200	-
	Characteristic Strains for Parabolic-Rectangular Diagram			
	Ultimate Strain for Pure Compression	ε_{c2}	-2.000	‰
	Ultimate Strain at Failure	ε_{cu2}	-3.500	‰
	Parabola Exponent	n	2.000	-
	Specific Weight	γ	25.00	kN/m^3
	Reinforcing Steel: B 500 S (A)			
	Modulus of Elasticity	E_s	200000.00	N/mm^2
	Yield Stress Mean Value	f_{ym}	550.00	N/mm^2
	Characteristic Yield Stress	f_{yk}	500.00	N/mm^2
	Tensile Strength Mean Value	f_{tm}	551.25	N/mm^2
	Characteristic Tensile Strength	f_{tk}	525.00	N/mm^2
	Limiting Strain	ε_{uk}	25.000	‰
3	**Concrete Strength Class: Concrete C35/45**			
	Characteristic Cylinder Compressive Strength	f_{ck}	35.00	N/mm^2
	5 % Fractile of Axial Tensile Strength	$f_{ctk,0.05}$	2.20	N/mm^2
	Characteristic for Nonlinear Calculations			
	Mean Secant Modulus of Elasticity	E_{cm}	34000.00	N/mm^2
	Mean Cylinder Compressive Strength	f_{cm}	43.00	N/mm^2
	Mean Axial Tensile Strength	f_{ctm}	3.20	N/mm^2
	Ultimate Strain for Pure Compression	ε_{c1}	-2.250	‰
	Ultimate Strain at Failure	ε_{c1u}	-3.500	‰
	Shear Modulus	G	14166.70	N/mm^2
	Poisson's Ratio	ν	0.200	-
	Characteristic Strains for Parabolic-Rectangular Diagram			
	Ultimate Strain for Pure Compression	ε_{c2}	-2.000	‰
	Ultimate Strain at Failure	ε_{cu2}	-3.500	‰

1.2.1 MATERIAL PARAMETERS

Material No.	Description	Name	Size	Unit
	Parabola Exponent	n	2.000	-
	Specific Weight	γ	25.00	kN/m^3
	Reinforcing Steel: B 500 S (A)			
	Modulus of Elasticity	E_s	200000.00	N/mm^2
	Yield Stress Mean Value	f_{ym}	550.00	N/mm^2
	Characteristic Yield Stress	f_{yk}	500.00	N/mm^2
	Tensile Strength Mean Value	f_{tm}	551.25	N/mm^2
	Characteristic Tensile Strength	f_{tk}	525.00	N/mm^2
	Limiting Strain	ε_{uk}	25.000	‰

1.3 SURFACES

Surface No.	Matl. No.	$\sigma_{c,max}$ [N/mm²] $\sigma_{s,max}$ [N/mm²]	$f_{ct,eff,wk}$ [N/mm²]	$f_{ct,eff,As,min}$ [N/mm²]	$w_{k,+z\ (top)}$ [mm] $w_{k,-z\ (bottom)}$ [mm]	Effects due to Restraint Apply	 k_c [-]	Notes
1	Thickness Type: Constant, Thickness: 350.0 mm							
	3	var. var.	3.20	3.20	0.100 0.100	☐	var.	
2	Thickness Type: Constant, Thickness: 350.0 mm							
	3	var. var.	3.20	3.20	0.100 0.100	☐	var.	
53	Thickness Type: Constant, Thickness: 350.0 mm							
	3	var. var.	3.20	3.20	0.100 0.100	☐	var.	
54	Thickness Type: Constant, Thickness: 350.0 mm							
	3	var. var.	3.20	3.20	0.100 0.100	☐	var.	
55	Thickness Type: Constant, Thickness: 350.0 mm							
	3	var. var.	3.20	3.20	0.100 0.100	☐	var.	
56	Thickness Type: Constant, Thickness: 350.0 mm							
	3	var. var.	3.20	3.20	0.100 0.100	☐	var.	
57	Thickness Type: Constant, Thickness: 350.0 mm							
	3	var. var.	3.20	3.20	0.100 0.100	☐	var.	
58	Thickness Type: Constant, Thickness: 350.0 mm							
	3	var. var.	3.20	3.20	0.100 0.100	☐	var.	

1.4 REINFORCEMENT GROUP NO. 1 - DUGNO PLOKĐTĖS ARMAVIMAS

Applied to surfaces:	1,2,53-58
REINFORCEMENT RATIO	
Minimum secondary reinforcement	20.0 %
Basic minimum reinforcement	0.0 %
Minimum compression reinforcement	0.0 %
Minimum tension reinforcement	0.0 %
Maximum reinforcement percentage	4.0 %
Minimum shear reinforcement percentage	0.0 %
REINFORCEMENT AREA FOR DESIGN OF SLS	
Use provided basic reinforcement and required additional reinforcement acc. to Tables 2.1, 2.2, 2.3	
Concrete cover acc. to Standard	☐
BASIC REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 52.0 mm
Bar diameter	ds-1: 12.0, ds-2: 12.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,-z (top): 7.54, As-2,-z (top): 7.54 cm²/m
BASIC REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 52.0 mm
Bar diameter	ds-1: 12.0, ds-2: 12.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,+z (bottom): 7.54, As-2,+z (bottom): 7.54 cm²/m
ADDITIONAL REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 52.0 mm
Bar diameter	ds-1: 12.0, ds-2: 12.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
ADDITIONAL REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 52.0 mm
Bar diameter	ds-1: 12.0, ds-2: 12.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
LONGITUDINAL REINFORCEMENT FOR SHEAR FORCE DESIGN	
Apply the greater value resulting from either the required or provided reinforcement (basic and add. reinforcement) per reinforcement direction	
OPTIONS FOR LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
Minimum longitudinal reinforcement for plates acc. to 9.3.1	☒

1.4 REINFORCEMENT GROUP NO. 1 - DUGNO PLOKĐTĖS ARMAVIMAS

Direction of minimum reinforcement	
Reinforcement direction with the main tensile force from top (-z) and bottom (+z) surfaces together:	☒
Minimum longitudinal reinforcement for walls acc. to 9.6	☐
Minimum shear reinforcement	☒
Neutral axis depth limitation	☒
Variable strut inclination - min	21.801 °
Variable concrete strut inclination - max	45.000 °
Partial safety factor γ_s	PT 1.15, AC 1.00, SLS 1.00
Partial safety factor γ_c	PT 1.50, AC 1.20, SLS 1.00
Consideration of long-term effects Alpha-cc	PT 0.90, AC 0.90, SLS 1.00
Consideration of long-term effects Alpha-ct	SLS 1.00

2.2 REQUIRED REINFORCEMENT BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Symbol	Required Reinforcement ULS	SLS	ULS/SLS	Basic Reinf.	Additional Reinforcement Required	Provided	Unit	Notes
1	M360	0.197	12.708	-0.340	$a_{s,1,-z\ (top)}$	4.96	0.75	4.96	7.54	0.00	0.00	cm²/m	
	M360	0.197	12.708	-0.340	$a_{s,2,-z\ (top)}$	0.99	0.00	0.99	7.54	0.00	0.00	cm²/m	
	M383	0.198	10.429	-0.340	$a_{s,1,+z\ (bottom)}$	5.67	21.38	21.38	7.54	13.84	13.84	cm²/m	
	M383	0.198	10.429	-0.340	$a_{s,2,+z\ (bottom)}$	1.13	0.00	1.13	7.54	0.00	0.00	cm²/m	
	M3	4.750	6.300	-0.340	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	
2	M3053	0.802	3.300	-0.340	$a_{s,1,-z\ (top)}$	4.96	0.22	4.96	7.54	0.00	0.00	cm²/m	
	M2485	0.805	1.701	-0.340	$a_{s,2,-z\ (top)}$	4.96	0.56	4.96	7.54	0.00	0.00	cm²/m	
	M2108 - E2404	4.750	1.700	-0.340	$a_{s,1,+z\ (bottom)}$	4.96	2.27	4.96	7.54	0.00	0.00	cm²/m	
	M142	4.750	1.500	-0.340	$a_{s,2,+z\ (bottom)}$	4.96	0.26	4.96	7.54	0.00	0.00	cm²/m	
	M122	4.750	6.100	-0.340	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	
53	M16033	2.754	0.276	-0.340	$a_{s,1,-z\ (top)}$	0.99	0.00	0.99	7.54	0.00	0.00	cm²/m	
	M16033	2.754	0.276	-0.340	$a_{s,2,-z\ (top)}$	4.96	0.51	4.96	7.54	0.00	0.00	cm²/m	
	M107	4.750	0.000	-0.340	$a_{s,1,+z\ (bottom)}$	4.96	2.08	4.96	7.54	0.00	0.00	cm²/m	
	M108	0.000	0.000	-0.340	$a_{s,2,+z\ (bottom)}$	4.96	2.09	4.96	7.54	0.00	0.00	cm²/m	
	M107	4.750	0.000	-0.340	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	
54	M16577	0.198	17.171	-0.340	$a_{s,1,-z\ (top)}$	1.57	1.37	1.57	7.54	0.00	0.00	cm²/m	
	M16273	3.245	18.953	-0.340	$a_{s,2,-z\ (top)}$	0.51	0.44	0.51	7.54	0.00	0.00	cm²/m	
	M16260	4.551	18.952	-0.340	$a_{s,1,+z\ (bottom)}$	6.35	25.11	25.11	7.54	17.57	17.57	cm²/m	
	M16304	0.199	18.952	-0.340	$a_{s,2,+z\ (bottom)}$	6.54	29.17	29.17	7.54	21.63	21.63	cm²/m	
	M84 - E17105	1.920	14.400	-0.340	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	
55	M94	-0.450	19.600	-0.340	$a_{s,1,-z\ (top)}$	4.96	0.26	4.96	7.54	0.00	0.00	cm²/m	
	M94	-0.450	19.600	-0.340	$a_{s,2,-z\ (top)}$	4.96	0.26	4.96	7.54	0.00	0.00	cm²/m	
	M94	-0.450	19.600	-0.340	$a_{s,1,+z\ (bottom)}$	4.96	0.26	4.96	7.54	0.00	0.00	cm²/m	
	M108	0.000	0.000	-0.340	$a_{s,2,+z\ (bottom)}$	4.96	2.09	4.96	7.54	0.00	0.00	cm²/m	
	M94	-0.450	19.600	-0.340	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	
56	M1	5.200	-0.450	-0.340	$a_{s,1,-z\ (top)}$	4.96	0.27	4.96	7.54	0.00	0.00	cm²/m	
	M1	5.200	-0.450	-0.340	$a_{s,2,-z\ (top)}$	4.96	0.29	4.96	7.54	0.00	0.00	cm²/m	
	M3	4.750	6.300	-0.340	$a_{s,1,+z\ (bottom)}$	4.96	2.08	4.96	7.54	0.00	0.00	cm²/m	
	M142	4.750	1.500	-0.340	$a_{s,2,+z\ (bottom)}$	4.96	0.41	4.96	7.54	0.00	0.00	cm²/m	
	M1	5.200	-0.450	-0.340	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	
57	M18998	0.198	19.600	-0.340	$a_{s,1,-z\ (top)}$	0.99	0.00	0.99	7.54	0.00	0.00	cm²/m	
	M18998	0.198	19.600	-0.340	$a_{s,2,-z\ (top)}$	4.96	0.05	4.96	7.54	0.00	0.00	cm²/m	
	M113	4.750	19.150	-0.340	$a_{s,1,+z\ (bottom)}$	4.96	2.08	4.96	7.54	0.00	0.00	cm²/m	
	M115	-0.000	19.150	-0.340	$a_{s,2,+z\ (bottom)}$	4.96	2.58	4.96	7.54	0.00	0.00	cm²/m	
	M113	4.750	19.150	-0.340	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	
58	M2	4.750	-0.450	-0.340	$a_{s,1,-z\ (top)}$	0.99	0.00	0.99	7.54	0.00	0.00	cm²/m	
	M2	4.750	-0.450	-0.340	$a_{s,2,-z\ (top)}$	4.96	0.01	4.96	7.54	0.00	0.00	cm²/m	
	M107	4.750	0.000	-0.340	$a_{s,1,+z\ (bottom)}$	4.96	2.08	4.96	7.54	0.00	0.00	cm²/m	
	M108	0.000	0.000	-0.340	$a_{s,2,+z\ (bottom)}$	4.96	2.32	4.96	7.54	0.00	0.00	cm²/m	
	M2	4.750	-0.450	-0.340	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	

3.2 SERVICEABILITY CHECK BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Load Case	Design Type	Exist. Value	Limit Value	Unit	Ratio	Notes
1	M383	0.198	10.429	-0.340	Envelope Qp	σ_c	-9.86	-15.75	N/mm²	0.7	
	M383	0.198	10.429	-0.340	Envelope Qp	σ_s	151.11	400.00	N/mm²	0.4	
	M397	0.198	9.088	-0.340	Envelope Qp	w_k	0.100	0.100	mm	1.1	219) 233)
2	M2332	0.199	1.700	-0.340	Envelope Qp	σ_c	-3.27	-15.75	N/mm²	0.3	
	M122	4.750	6.100	-0.340	Envelope Qp	σ_s	0.00	400.00	N/mm²	0.0	226)
	M122	4.750	6.100	-0.340	Envelope Qp	w_k	0.000	0.100	mm	0.0	226)
53	M16106	0.201	0.195	-0.340	Envelope Qp	σ_c	-3.74	-15.75	N/mm²	0.3	
	M107	4.750	0.000	-0.340	Envelope Qp	σ_s	0.00	400.00	N/mm²	0.0	226)
	M107	4.750	0.000	-0.340	Envelope Qp	w_k	0.000	0.100	mm	0.0	226)
54	M16304	0.199	18.952	-0.340	Envelope Qp	σ_c	-5.46	-15.75	N/mm²	0.4	
	M16260	4.551	18.952	-0.340	Envelope Qp	σ_s	118.56	400.00	N/mm²	0.3	
	M16304	0.199	18.952	-0.340	Envelope Qp	w_k	0.100	0.100	mm	1.0	
55	M18165	-0.225	18.876	-0.340	Envelope Qp	σ_c	-2.76	-15.75	N/mm²	0.2	
	M94	-0.450	19.600	-0.340	Envelope Qp	σ_s	0.00	400.00	N/mm²	0.0	226)
	M94	-0.450	19.600	-0.340	Envelope Qp	w_k	0.000	0.100	mm	0.0	226)
56	M18605	4.975	18.876	-0.340	Envelope Qp	σ_c	-2.76	-15.75	N/mm²	0.2	
	M1	5.200	-0.450	-0.340	Envelope Qp	σ_s	0.00	400.00	N/mm²	0.0	226)
	M1	5.200	-0.450	-0.340	Envelope Qp	w_k	0.000	0.100	mm	0.0	226)
57	M19051	4.451	19.375	-0.340	Envelope Qp	σ_c	-2.56	-15.75	N/mm²	0.2	
	M113	4.750	19.150	-0.340	Envelope Qp	σ_s	0.00	400.00	N/mm²	0.0	226)
	M113	4.750	19.150	-0.340	Envelope Qp	w_k	0.000	0.100	mm	0.0	226)
58	M107	4.750	0.000	-0.340	Envelope Qp	σ_c	-2.22	-15.75	N/mm²	0.2	
	M2	4.750	-0.450	-0.340	Envelope Qp	σ_s	0.00	400.00	N/mm²	0.0	226)
	M2	4.750	-0.450	-0.340	Envelope Qp	w_k	0.000	0.100	mm	0.0	226)

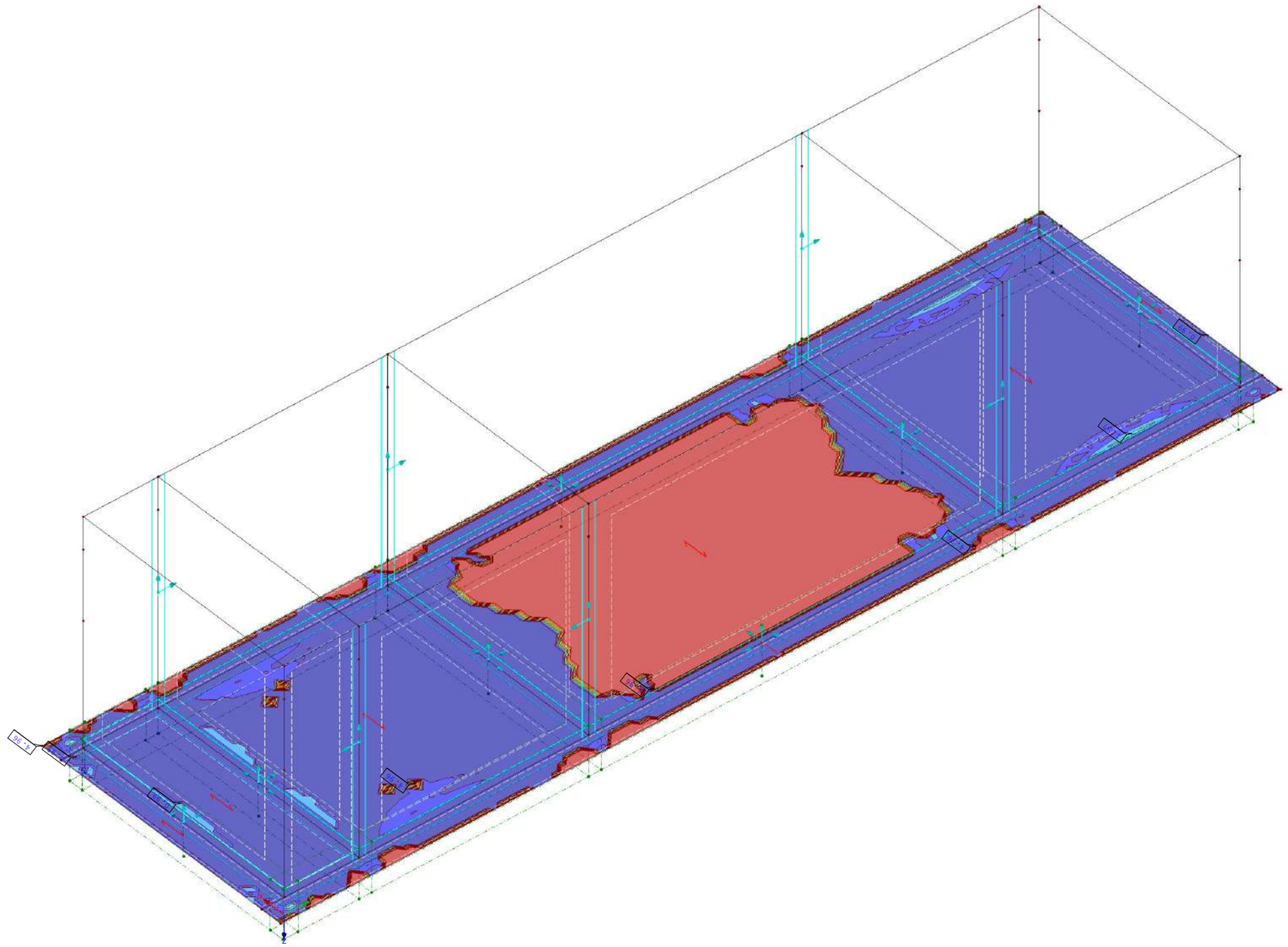
SERVICEABILITY CHECK NOTES

No.	Description
219)	Crack width exceeded.
226)	Concrete cracks on neither side.
233)	The design is not satisfactory! Because of the required reinforcement for ULS or user-defined reinforcement the defined reinforcement area is different from the required reinforcement for SLS and that negatively affects SLS design.

REQUIRED REINFORCEMENT $a_{s,1,-z\ (top)}$

RF-CONCRETE Surfaces CA1
Pagrindo plokštė
Required Reinforcement a-s,1,-z (top) [cm²/m]
Values: a-s,1,-z (top) [cm^2/m]

Isometric

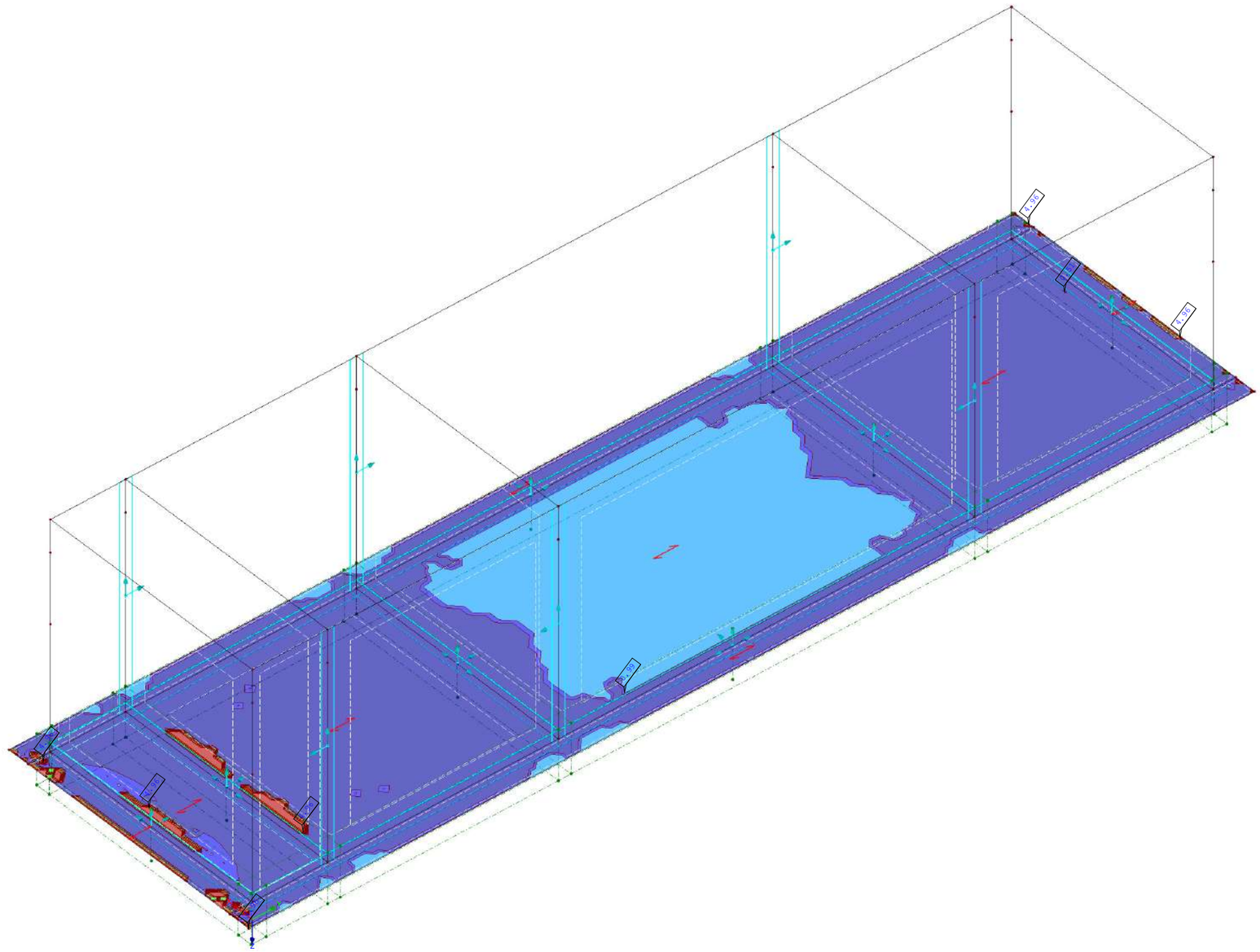


Max a-s,1,-z (top): 4.96, Min a-s,1,-z (top): 0.00 cm²/m

REQUIRED REINFORCEMENT $a_{s,2,-z\ (top)}$

RF-CONCRETE Surfaces CA1
Pagrindo plokštė
Required Reinforcement a-s,2,-z (top) [cm²/m]
Values: a-s,2,-z (top) [cm^2/m]

Isometric

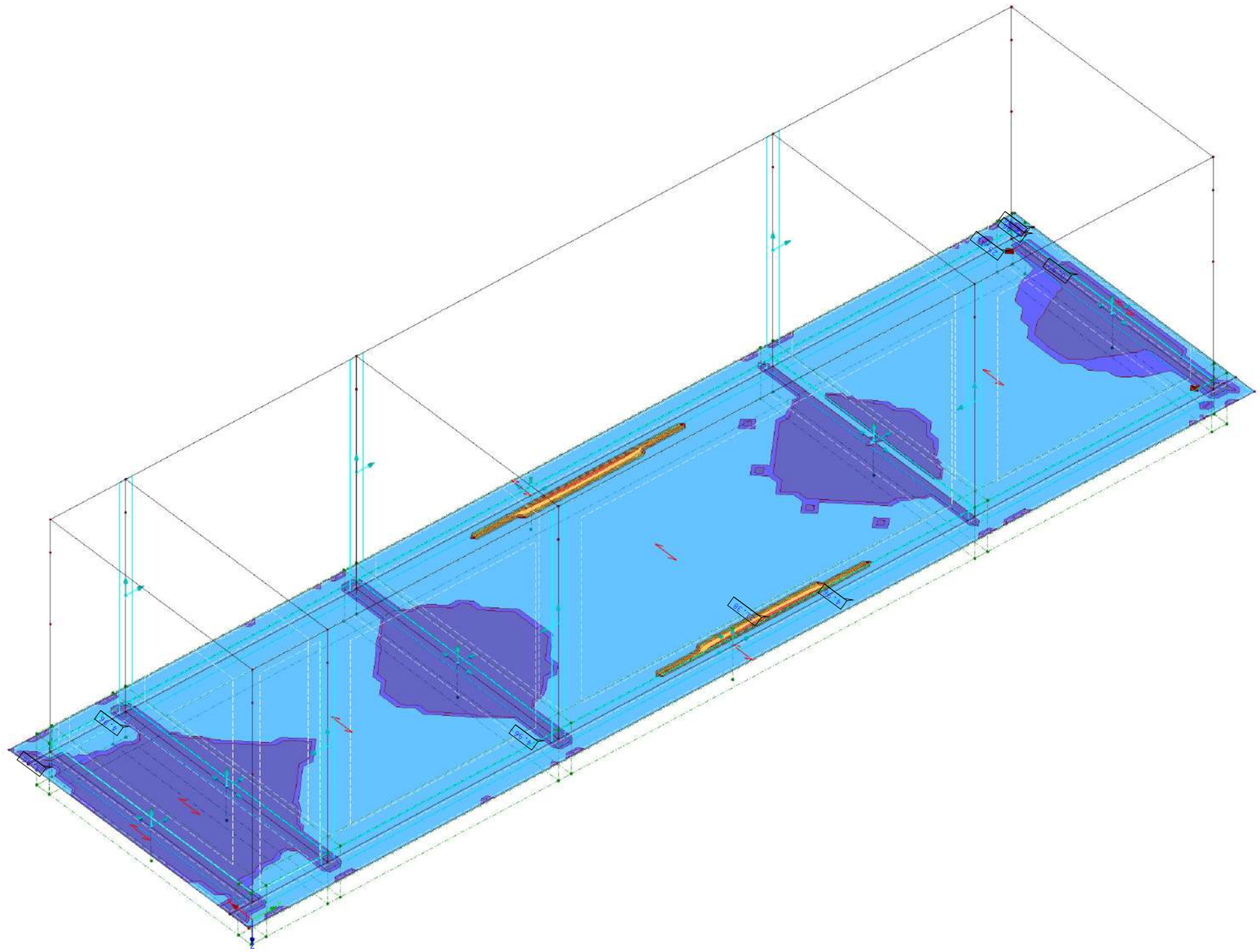


Max a-s,2,-z (top): 4.96, Min a-s,2,-z (top): 0.00 cm²/m

REQUIRED REINFORCEMENT $a_{s,1,+z}$ (bottom)

RF-CONCRETE Surfaces CA1
Pagrindo plokštė
Required Reinforcement a-s,1,+z (bottom) [cm²/m]
Values: a-s,1,+z (bottom) [cm^2/m]

Isometric

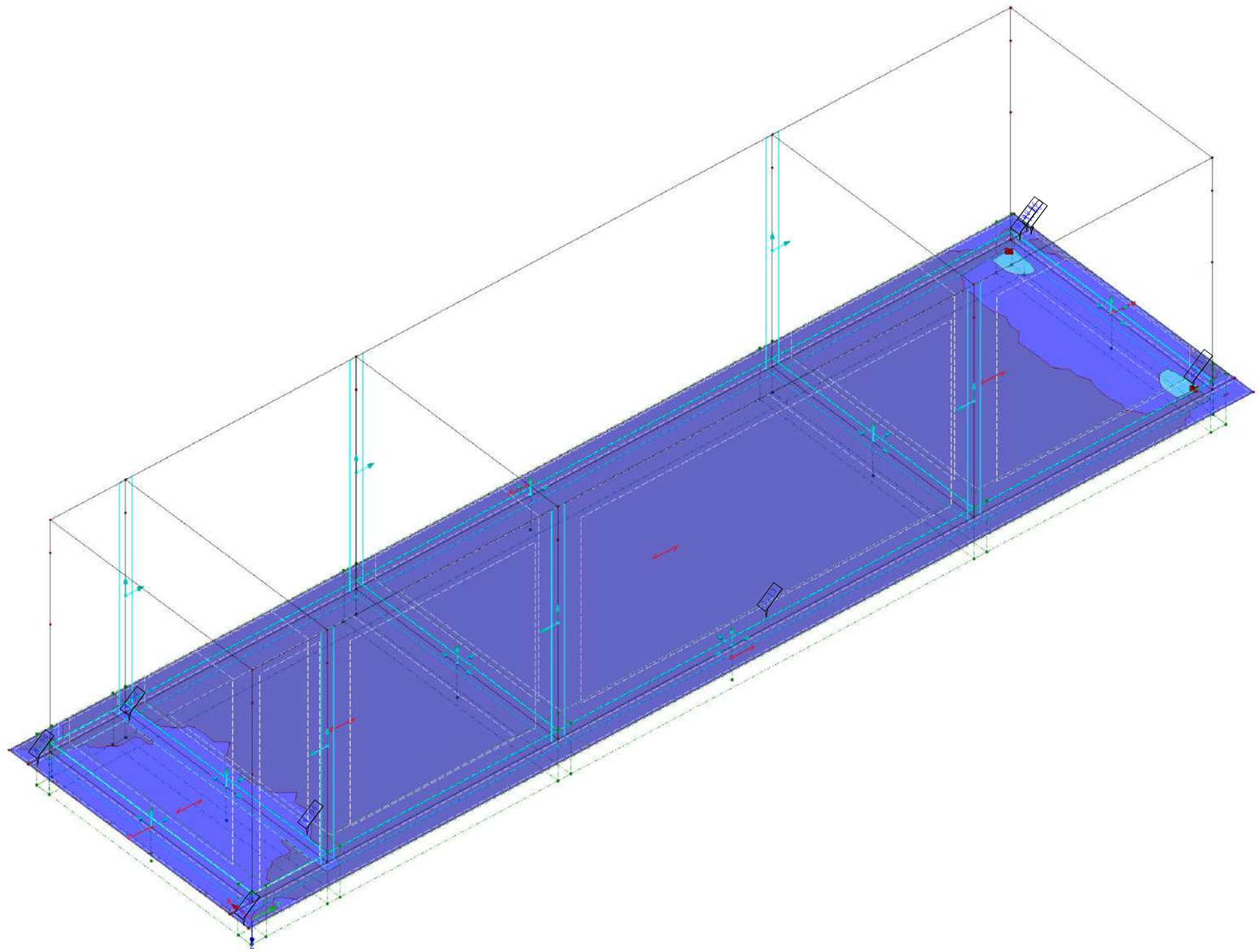


Max a-s,1,+z (bottom): 25.11, Min a-s,1,+z (bottom): 0.00 cm²/m

REQUIRED REINFORCEMENT $a_{s,2,+z}$ (bottom)

RF-CONCRETE Surfaces CA1
Pagrindo plokštė
Required Reinforcement a-s,2,+z (bottom) [cm²/m]
Values: a-s,2,+z (bottom) [cm^2/m]

Isometric

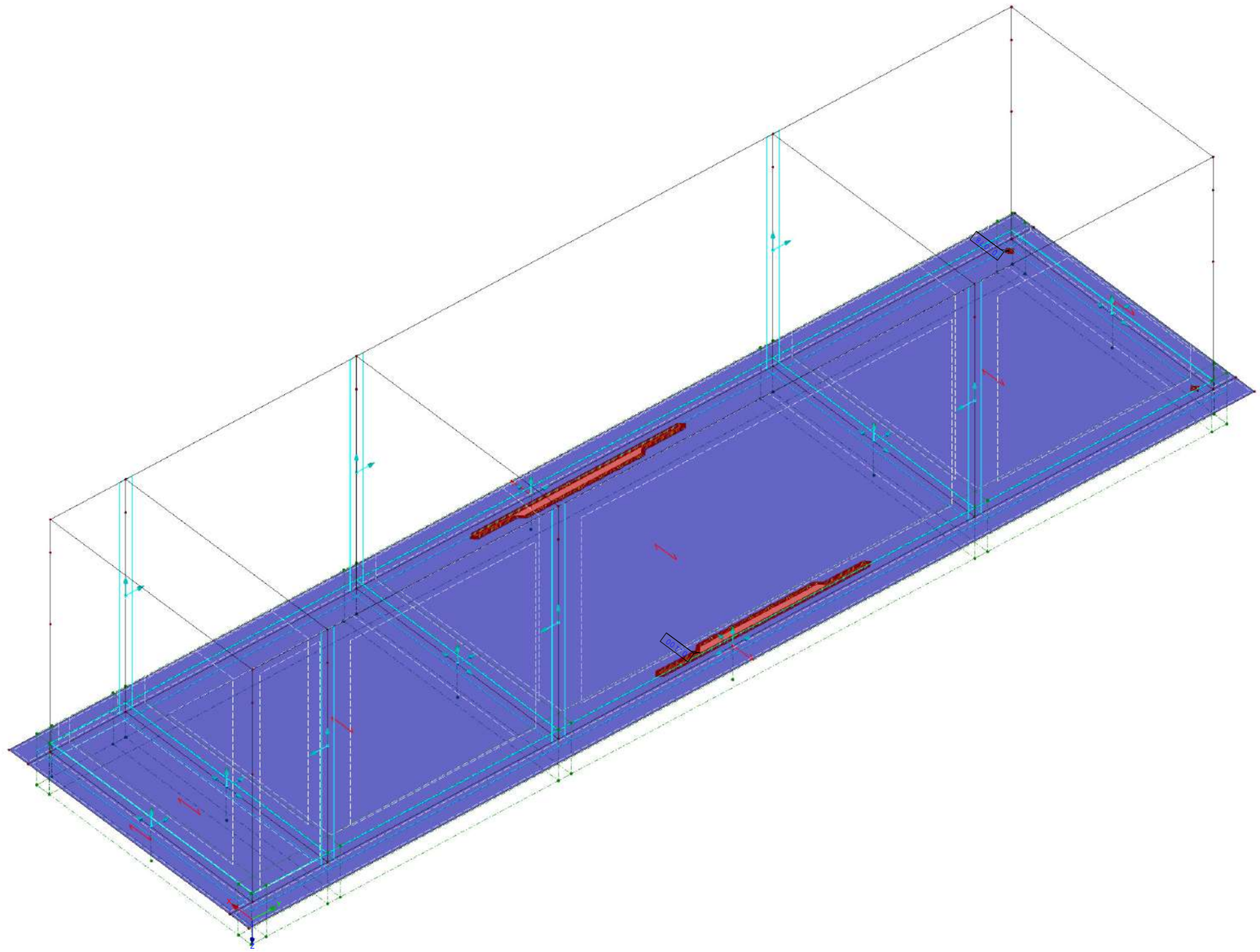


Max a-s,2,+z (bottom): 29.17, Min a-s,2,+z (bottom): 0.00 cm²/m

CRACK WIDTH $w_{k,1,+z\ (bottom)}$

RF-CONCRETE Surfaces CA1
Pagrindo plokštė
Crack width w-k,1,+z (bottom) [mm]
Values: w-k,1,+z (bottom) [mm]

Isometric

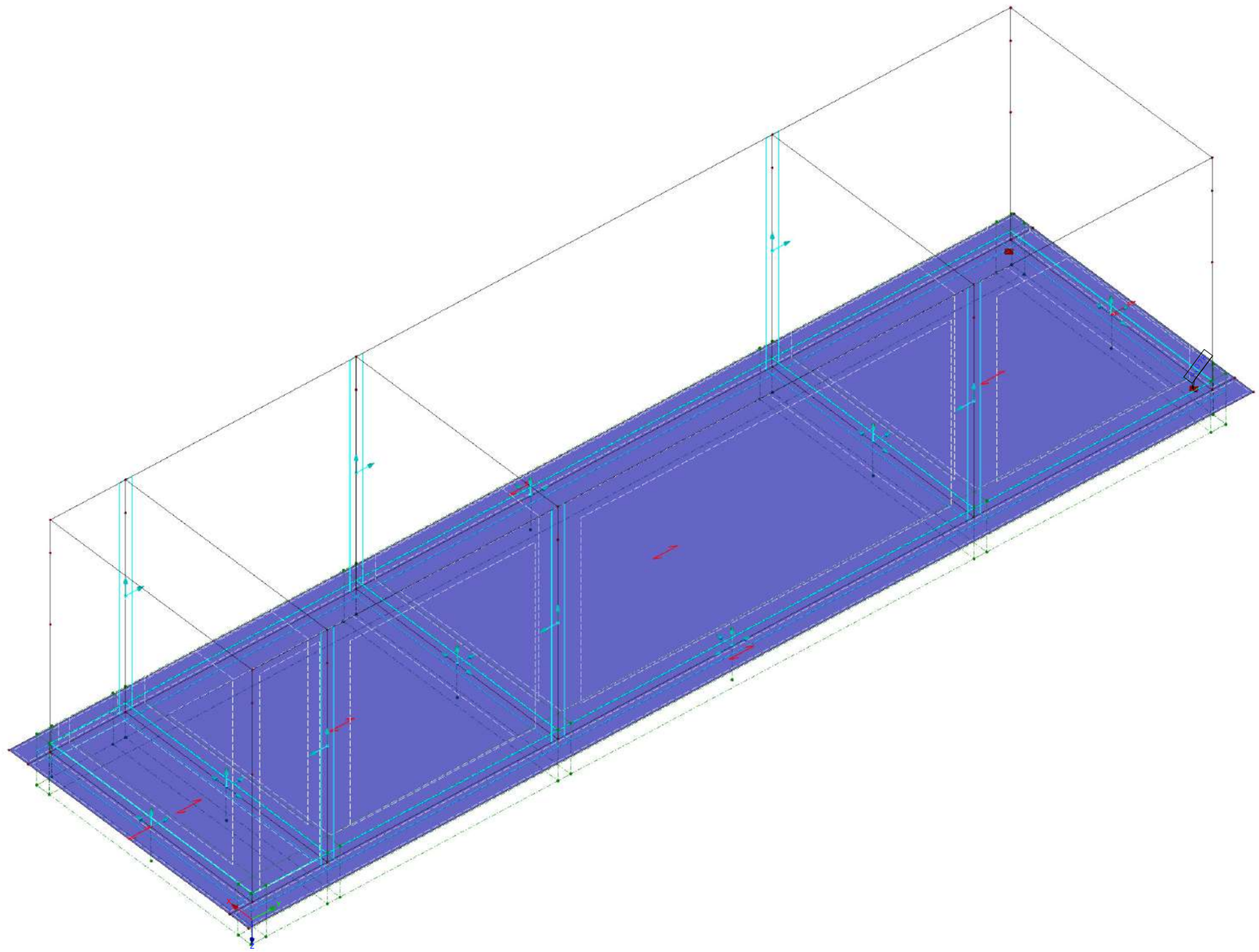


Max w-k,1,+z (bottom): 0.100, Min w-k,1,+z (bottom): 0.000 mm

CRACK WIDTH $w_{k,2,+z\ (bottom)}$

RF-CONCRETE Surfaces CA1
Pagrindo plokštė
Crack width w-k,2,+z (bottom) [mm]
Values: w-k,2,+z (bottom) [mm]

Isometric

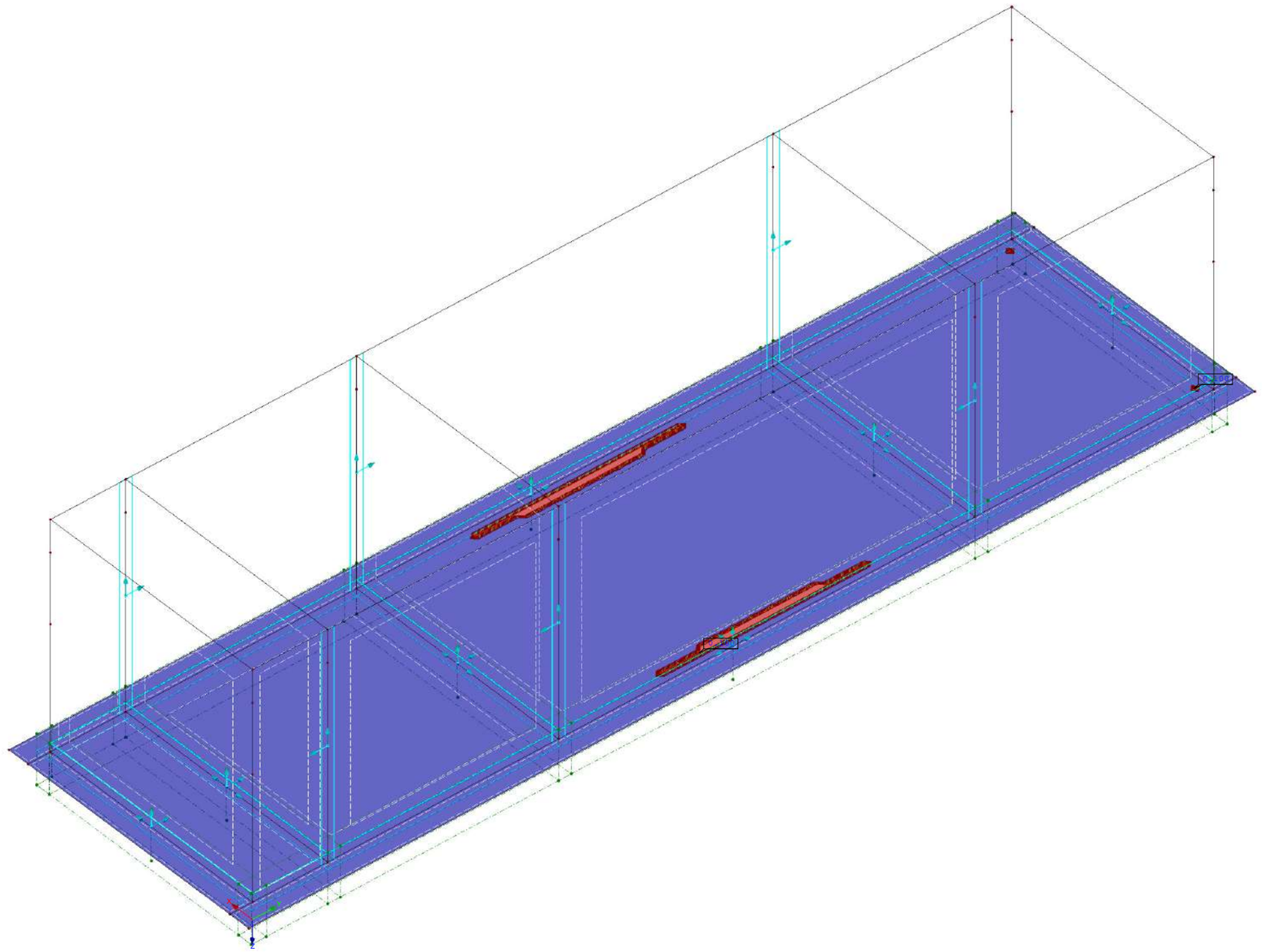


Max w-k,2,+z (bottom): 0.078, Min w-k,2,+z (bottom): 0.000 mm

CRACK WIDTH $w_{k,res,+z\ (bottom)}$

RF-CONCRETE Surfaces CA1
Pagrindo plokštė
Crack width w-k,res,+z (bottom) [mm]
Values: w-k,res,+z (bottom) [mm]

Isometric



Max w-k,res,+z (bottom): 0.100, Min w-k,res,+z (bottom): 0.000 mm

RF-CONCRETE Surfaces
CA2
Išorinės sienos

Project: 1
1

Model: SK23010_Dreverna_ (03) statinys_ ..

Date: 2023-09-06

1.1 GENERAL DATA

Design according to Standard:	LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
ULTIMATE LIMIT STATE		
Load combinations for design:	CO1	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO2	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO3	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO4	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO5	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO6	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO7	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO8	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO9	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO10	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO11	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO12	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO13	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO14	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO15	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO16	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO17	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO18	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO19	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO20	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO21	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO22	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO23	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO24	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO25	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO26	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
SERVICEABILITY LIMIT STATE		
Load combinations for design:	CO1	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.600
	CO2	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO3	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO4	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO5	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO6	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO7	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO8	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.559
	CO9	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.559
	CO10	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.574
	CO11	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.577
	CO12	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.600
	CO13	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO14	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO15	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO16	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO17	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO18	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO19	ULS (STR/GEO) - Permanent / transient - Eq. 6.10

1.1 GENERAL DATA

		Quasi-permanent, k$_t$ 0.559
	CO20	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
		Quasi-permanent, k$_t$ 0.559
	CO21	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
		Quasi-permanent, k$_t$ 0.574
	CO22	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
		Quasi-permanent, k$_t$ 0.577
	CO23	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
		Quasi-permanent, k$_t$ 0.532
	CO24	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
		Quasi-permanent, k$_t$ 0.549
	CO25	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
		Quasi-permanent, k$_t$ 0.498
	CO26	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
		Quasi-permanent, k$_t$ 0.532
Definition of Provided Additional Reinforcement		Manual definition of the reinforcement areas
Type of SLS method:		Analytical Method
		By assuming an identical deformation ratio of the longitudinal reinforcement
Design of		
Concrete Stress Analysis		☒
Steel Stress Analysis		☒
Crack widths		☒
Deformation Analysis		☐
Layout of longitudinal reinforcement		
Required longitudinal reinforcement automatically increased for serviceability limit state design:		☒
DETAILS		
Analysis Method for Reinforcement Envelope		Mixed
Apply the averaged internal forces in the defined average region for the ULS calculation and for the analytic method of SLS calculation.		☒
Apply the internal forces without the rib components		☐
Design Situation Settings for Serviceability Limit State Checks		
Load combination:		
Characteristic with direct load		Checks: k_1*f_{ck}, k_2*f_{ck}, k_3*f_{yk}, k_4*f_{yk}, w_k, u_l
Characteristic with imposed deformation		Checks: w_k
Frequent		Checks: -
Quasi-permanent		Checks: k_1*f_{ck}, k_2*f_{ck}, k_3*f_{yk}, k_4*f_{yk}, w_k, u_l

1.2 MATERIALS

Material No.	Material Description: Concrete Strength Class	Material Description: Steel Description	Comment
2	Concrete C35/45*0,7	B 500 S (A)	
3	Concrete C35/45	B 500 S (A)	

1.2.1 MATERIAL PARAMETERS

Material No.	Description	Name	Size	Unit
2	**Concrete Strength Class: Concrete C35/45*0,7**			
	Characteristic Cylinder Compressive Strength	f_{ck}	35.00	N/mm^2
	5 % Fractile of Axial Tensile Strength	$f_{ctk,0.05}$	2.20	N/mm^2
	Characteristic for Nonlinear Calculations			
	Mean Secant Modulus of Elasticity	E_{cm}	34000.00	N/mm^2
	Mean Cylinder Compressive Strength	f_{cm}	43.00	N/mm^2
	Mean Axial Tensile Strength	f_{ctm}	3.20	N/mm^2
	Ultimate Strain for Pure Compression	ε_{c1}	-2.250	‰
	Ultimate Strain at Failure	ε_{c1u}	-3.500	‰
	Shear Modulus	G	9916.70	N/mm^2
	Poisson's Ratio	ν	0.200	-
	Characteristic Strains for Parabolic-Rectangular Diagram			
	Ultimate Strain for Pure Compression	ε_{c2}	-2.000	‰
	Ultimate Strain at Failure	ε_{cu2}	-3.500	‰
	Parabola Exponent	n	2.000	-
	Specific Weight	γ	25.00	kN/m^3
	Reinforcing Steel: B 500 S (A)			
	Modulus of Elasticity	E_s	200000.00	N/mm^2
	Yield Stress Mean Value	f_{ym}	550.00	N/mm^2
	Characteristic Yield Stress	f_{yk}	500.00	N/mm^2
	Tensile Strength Mean Value	f_{tm}	551.25	N/mm^2
	Characteristic Tensile Strength	f_{tk}	525.00	N/mm^2
	Limiting Strain	ε_{uk}	25.000	‰
3	**Concrete Strength Class: Concrete C35/45**			
	Characteristic Cylinder Compressive Strength	f_{ck}	35.00	N/mm^2
	5 % Fractile of Axial Tensile Strength	$f_{ctk,0.05}$	2.20	N/mm^2
	Characteristic for Nonlinear Calculations			
	Mean Secant Modulus of Elasticity	E_{cm}	34000.00	N/mm^2
	Mean Cylinder Compressive Strength	f_{cm}	43.00	N/mm^2
	Mean Axial Tensile Strength	f_{ctm}	3.20	N/mm^2
	Ultimate Strain for Pure Compression	ε_{c1}	-2.250	‰
	Ultimate Strain at Failure	ε_{c1u}	-3.500	‰
	Shear Modulus	G	14166.70	N/mm^2
	Poisson's Ratio	ν	0.200	-
	Characteristic Strains for Parabolic-Rectangular Diagram			
	Ultimate Strain for Pure Compression	ε_{c2}	-2.000	‰
	Ultimate Strain at Failure	ε_{cu2}	-3.500	‰

1.2.1 MATERIAL PARAMETERS

Material No.	Description	Name	Size	Unit
	Parabola Exponent	n	2.000	-
	Specific Weight	γ	25.00	kN/m^3
	Reinforcing Steel: B 500 S (A)			
	Modulus of Elasticity	E_s	200000.00	N/mm^2
	Yield Stress Mean Value	f_{ym}	550.00	N/mm^2
	Characteristic Yield Stress	f_{yk}	500.00	N/mm^2
	Tensile Strength Mean Value	f_{tm}	551.25	N/mm^2
	Characteristic Tensile Strength	f_{tk}	525.00	N/mm^2
	Limiting Strain	ε_{uk}	25.000	‰

1.3 SURFACES

Surface No.	Matl. No.	$\sigma_{c,max}$ [N/mm²] $\sigma_{s,max}$ [N/mm²]	$f_{ct,eff,wk}$ [N/mm²]	$f_{ct,eff,As,min}$ [N/mm²]	$w_{k,+z\ (top)}$ [mm] $w_{k,-z\ (bottom)}$ [mm]	Effects due to Restraint Apply	 k_c [-]	Notes
3	Thickness Type: Constant, Thickness: 300.0 mm							
	2	var. var.	3.20	3.20	0.100 0.100	☐	var.	
4	Thickness Type: Constant, Thickness: 300.0 mm							
	2	var. var.	3.20	3.20	0.100 0.100	☐	var.	
5	Thickness Type: Constant, Thickness: 300.0 mm							
	2	var. var.	3.20	3.20	0.100 0.100	☐	var.	
6	Thickness Type: Constant, Thickness: 300.0 mm							
	2	var. var.	3.20	3.20	0.100 0.100	☐	var.	
38	Thickness Type: Constant, Thickness: 300.0 mm							
	2	var. var.	3.20	3.20	0.100 0.100	☐	var.	
39	Thickness Type: Constant, Thickness: 300.0 mm							
	2	var. var.	3.20	3.20	0.100 0.100	☐	var.	
40	Thickness Type: Constant, Thickness: 300.0 mm							
	2	var. var.	3.20	3.20	0.100 0.100	☐	var.	
41	Thickness Type: Constant, Thickness: 250.0 mm							
	2	var. var.	3.20	3.20	0.100 0.100	☐	var.	
43	Thickness Type: Constant, Thickness: 300.0 mm							
	2	var. var.	3.20	3.20	0.100 0.100	☐	var.	
44	Thickness Type: Constant, Thickness: 300.0 mm							
	2	var. var.	3.20	3.20	0.100 0.100	☐	var.	

1.4 REINFORCEMENT GROUP NO. 1 - IÐORINIØ SIENØ ARMAVIMAS

Applied to surfaces:	3-6,38-41,43,44
REINFORCEMENT RATIO	
Minimum secondary reinforcement	20.0 %
Basic minimum reinforcement	0.0 %
Minimum compression reinforcement	0.0 %
Minimum tension reinforcement	0.0 %
Maximum reinforcement percentage	4.0 %
Minimum shear reinforcement percentage	0.0 %
Concrete cover acc. to Standard	☐
BASIC REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 56.0 mm
Bar diameter	ds-1: 16.0, ds-2: 12.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,-z (top): 10.05, As-2,-z (top): 7.54 cm²/m
BASIC REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 56.0 mm
Bar diameter	ds-1: 16.0, ds-2: 12.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,+z (bottom): 10.05, As-2,+z (bottom): 7.54 cm²/m
ADDITIONAL REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 56.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
ADDITIONAL REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 56.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
LONGITUDINAL REINFORCEMENT FOR SHEAR FORCE DESIGN	
Apply the greater value resulting from either the required or provided reinforcement (basic and add. reinforcement) per reinforcement direction	
OPTIONS FOR LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
Minimum longitudinal reinforcement for plates acc. to 9.3.1	☐
Minimum longitudinal reinforcement for walls acc. to 9.6	☒

1.4 REINFORCEMENT GROUP NO. 1 - IÐORINIØ SIENØ ARMAVIMAS

Minimum shear reinforcement	☒
Neutral axis depth limitation	☒
Variable strut inclination - min	21.801 °
Variable concrete strut inclination - max	45.000 °
Partial safety factor γ_s	PT 1.15, AC 1.00, SLS 1.00
Partial safety factor γ_c	PT 1.50, AC 1.20, SLS 1.00
Consideration of long-term effects Alpha-cc	PT 0.90, AC 0.90, SLS 1.00
Consideration of long-term effects Alpha-ct	SLS 1.00

1.4.2 RECTANGULAR REINFORCEMENT

No.	On Surface No.	Location Projection	Conc. Covers c [mm]	Definition of Reinforcement	Direction Φ [°]	Reinf. Area a_s [cm^2/m]	Reinforcement Position X [m]	Y [m]	Z [m]
1	3-6,39,40,43,44	Top (-z) YZ	40.0	d16;a=66.7mm	0	30.16		4.750 4.750	19.150 -0.250
2	3-6,39,40,43,44	Bottom (+z) YZ	40.0	d16;a=66.7mm	0	30.16		4.750 4.750	19.150 -0.250
3	3,5,6,39	Top (-z) YZ	40.0	d16;a=66.7mm	0	30.16		4.750 4.750	6.550 5.550
4	3,5,6,39	Bottom (+z) YZ	40.0	d16;a=66.7mm	0	30.16		4.750 4.750	6.550 5.550
5	5,39,40,43	Top (-z) YZ	40.0	d16;a=66.7mm	0	30.16		4.750 4.750	13.750 14.950
6	5,39,40,43	Bottom (+z) YZ	40.0	d16;a=66.7mm	0	30.16		4.750 4.750	13.750 14.950
7	38,41	Top (-z) XZ	40.0	d16;a=66.7mm	0	30.16	-0.000 5.150		-0.340 -1.340
8	38,41	Bottom (+z) XZ	40.0	d16;a=66.7mm	0	30.16	-0.000 5.150		-0.340 -1.340
9	3-6,39,40,43,44	Top (-z) YZ	56.0	d16;a=66.7mm	90	30.16		4.750 4.750	19.150 -0.250
10	3-6,39,40,43,44	Bottom (+z) YZ	56.0	d16;a=66.7mm	90	30.16		4.750 4.750	19.150 -0.250
11	3,5,6,39	Top (-z) YZ	56.0	d16;a=66.7mm	90	30.16		4.750 4.750	6.550 5.550
12	3,5,6,39	Bottom (+z) YZ	56.0	d16;a=66.7mm	90	30.16		4.750 4.750	6.550 5.550
13	5,39,40,43	Top (-z) YZ	56.0	d16;a=66.7mm	90	30.16		4.750 4.750	13.750 14.950
14	5,39,40,43	Bottom (+z) YZ	56.0	d16;a=66.7mm	90	30.16		4.750 4.750	13.750 14.950
15	38,41	Top (-z) XZ	56.0	d16;a=66.7mm	90	30.16	-0.000 5.150		-0.340 -1.340
16	38,41	Bottom (+z) XZ	56.0	d16;a=66.7mm	90	30.16	-0.000 5.150		-0.340 -1.340
17	38,41	Top (-z) XZ	40.0	d16;a=125mm	0	16.08	-0.250 0.350		-1.340 -4.940
18	38,41	Top (-z) XZ	40.0	d16;a=125mm	0	16.08	4.950 4.350		-1.340 -4.940

2.2 REQUIRED REINFORCEMENT BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Symbol	Required Reinforcement ULS	SLS	ULS/SLS	Basic Reinf.	Additional Reinforcement Required	Provided	Unit	Notes
3	M2118	4.750	2.700	-0.340	$a_{s,1,-z\ (top)}$	10.41	38.90	38.90	10.05	28.84	30.16	cm²/m	
	M2118	4.750	2.700	-0.340	$a_{s,2,-z\ (top)}$	5.00	18.32	18.32	7.54	10.78	30.16	cm²/m	
	M3572	4.750	1.700	-0.539	$a_{s,1,+z\ (bottom)}$	11.50	42.43	42.43	10.05	32.38	30.16	cm²/m	
	M3662	4.750	1.700	-0.739	$a_{s,2,+z\ (bottom)}$	7.54	11.38	11.38	7.54	3.84	30.16	cm²/m	
	M2108 - E4223	4.750	1.700	-0.340	a_{sw}	9.47	-	9.47	-	-	-	cm²/m²	
4	M4316	4.750	1.300	-0.340	$a_{s,1,-z\ (top)}$	10.41	38.90	38.90	10.05	28.84	30.16	cm²/m	
	M4316	4.750	1.300	-0.340	$a_{s,2,-z\ (top)}$	5.00	18.32	18.32	7.54	10.78	30.16	cm²/m	
	M4331	4.750	0.000	-0.540	$a_{s,1,+z\ (bottom)}$	6.18	21.60	21.60	10.05	11.55	30.16	cm²/m	
	M4316	4.750	1.300	-0.340	$a_{s,2,+z\ (bottom)}$	7.54	1.36	7.54	7.54	0.00	30.16	cm²/m	
	M4331	4.750	0.000	-0.540	a_{sw}	10.10	-	10.10	-	-	-	cm²/m²	
5	M136	-0.000	6.100	-0.340	$a_{s,1,-z\ (top)}$	10.30	38.40	38.40	10.05	28.35	30.16	cm²/m	
	M5045	-0.000	10.915	-0.537	$a_{s,2,-z\ (top)}$	7.21	23.96	23.96	7.54	16.42	30.16	cm²/m	
	M5244	-0.000	14.199	-0.741	$a_{s,1,+z\ (bottom)}$	11.29	40.49	40.49	10.05	30.44	30.16	cm²/m	
	M5043	-0.000	10.717	-0.537	$a_{s,2,+z\ (bottom)}$	3.97	15.43	15.43	7.54	7.89	30.16	cm²/m	
	M4998	-0.000	6.300	-0.541	a_{sw}	9.47	-	9.47	-	-	-	cm²/m²	
6	M136	-0.000	6.100	-0.340	$a_{s,1,-z\ (top)}$	10.30	38.40	38.40	10.05	28.35	30.16	cm²/m	
	M136	-0.000	6.100	-0.340	$a_{s,2,-z\ (top)}$	4.88	18.02	18.02	7.54	10.48	30.16	cm²/m	
	M6425	0.000	1.700	-0.539	$a_{s,1,+z\ (bottom)}$	11.50	42.43	42.43	10.05	32.38	30.16	cm²/m	
	M6515	0.000	1.700	-0.739	$a_{s,2,+z\ (bottom)}$	7.54	11.38	11.38	7.54	3.84	30.16	cm²/m	
	M6425	0.000	1.700	-0.539	a_{sw}	9.47	-	9.47	-	-	-	cm²/m²	
38	M7218	3.840	0.000	-0.340	$a_{s,1,-z\ (top)}$	11.20	41.90	41.90	10.05	31.85	30.16	cm²/m	
	M7218	3.840	0.000	-0.340	$a_{s,2,-z\ (top)}$	4.58	17.73	17.73	7.54	10.19	30.16	cm²/m	
	M7258	0.000	0.000	-0.540	$a_{s,1,+z\ (bottom)}$	6.38	22.18	22.18	10.05	12.12	30.16	cm²/m	
	M7211 - E7375	4.548	0.000	-0.340	$a_{s,2,+z\ (bottom)}$	7.54	2.45	7.54	7.54	0.00	30.16	cm²/m	
	M7258	0.000	0.000	-0.540	a_{sw}	11.09	-	11.09	-	-	-	cm²/m²	
39	M6 - E8524	4.750	6.600	-0.340	$a_{s,1,-z\ (top)}$	10.41	38.90	38.90	10.05	28.84	30.16	cm²/m	
	M8400	4.750	10.915	-0.537	$a_{s,2,-z\ (top)}$	7.21	23.86	23.86	7.54	16.32	30.16	cm²/m	
	M8533	4.750	14.199	-0.741	$a_{s,1,+z\ (bottom)}$	11.29	40.49	40.49	10.05	30.44	30.16	cm²/m	
	M8402	4.750	10.717	-0.537	$a_{s,2,+z\ (bottom)}$	3.97	15.43	15.43	7.54	7.89	30.16	cm²/m	
	M3 - E8527	4.750	6.300	-0.340	a_{sw}	9.47	-	9.47	-	-	-	cm²/m²	
40	M111	4.750	14.400	-0.340	$a_{s,1,-z\ (top)}$	10.41	38.90	38.90	10.05	28.84	30.16	cm²/m	
	M111	4.750	14.400	-0.340	$a_{s,2,-z\ (top)}$	5.00	18.32	18.32	7.54	10.78	30.16	cm²/m	
	M9878	4.750	17.864	-0.538	$a_{s,1,+z\ (bottom)}$	11.62	43.76	43.76	10.05	33.71	30.16	cm²/m	
	M9878	4.750	17.864	-0.538	$a_{s,2,+z\ (bottom)}$	6.19	26.53	26.53	7.54	18.99	30.16	cm²/m	
	M111	4.750	14.400	-0.340	a_{sw}	9.47	-	9.47	-	-	-	cm²/m²	

2.2 REQUIRED REINFORCEMENT BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Symbol	Required Reinforcement ULS	SLS	ULS/SLS	Basic Reinf.	Additional Reinforcement Required	Provided	Unit	Notes
41	M113	4.750	19.150	-0.340	$a_{s,1,-z\ (top)}$	10.20	37.61	37.61	10.05	27.56	30.16	cm²/m	
	M11051	3.446	19.150	-0.537	$a_{s,2,-z\ (top)}$	5.20	18.32	18.32	7.54	10.78	30.16	cm²/m	
	M113	4.750	19.150	-0.340	$a_{s,1,+z\ (bottom)}$	10.23	37.74	37.74	10.05	27.69	30.16	cm²/m	
	M10956	1.505	19.150	-0.537	$a_{s,2,+z\ (bottom)}$	5.28	18.37	18.37	7.54	10.83	30.16	cm²/m	
	M9725	4.750	19.150	-0.540	a_{sw}	10.15	-	10.15	-	-	-	cm²/m²	
43	M117	-0.000	14.400	-0.340	$a_{s,1,-z\ (top)}$	10.30	38.40	38.40	10.05	28.35	30.16	cm²/m	
	M117	-0.000	14.400	-0.340	$a_{s,2,-z\ (top)}$	4.88	18.02	18.02	7.54	10.48	30.16	cm²/m	
	M12986	-0.000	17.864	-0.538	$a_{s,1,+z\ (bottom)}$	11.62	43.76	43.76	10.05	33.71	30.16	cm²/m	
	M12986	-0.000	17.864	-0.538	$a_{s,2,+z\ (bottom)}$	6.19	26.53	26.53	7.54	18.99	30.16	cm²/m	
	M10707	-0.000	19.150	-0.540	a_{sw}	9.47	-	9.47	-	-	-	cm²/m²	
44	M144	0.000	1.500	-0.340	$a_{s,1,-z\ (top)}$	10.30	38.40	38.40	10.05	28.35	30.16	cm²/m	
	M144	0.000	1.500	-0.340	$a_{s,2,-z\ (top)}$	4.88	18.02	18.02	7.54	10.48	30.16	cm²/m	
	M7258	0.000	0.000	-0.540	$a_{s,1,+z\ (bottom)}$	6.18	21.60	21.60	10.05	11.55	30.16	cm²/m	
	M144	0.000	1.500	-0.340	$a_{s,2,+z\ (bottom)}$	7.54	1.38	7.54	7.54	0.00	30.16	cm²/m	
	M7258	0.000	0.000	-0.540	a_{sw}	10.10	-	10.10	-	-	-	cm²/m²	

3.2 SERVICEABILITY CHECK BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Load Case	Design Type	Exist. Value	Limit Value	Unit	Ratio	Notes
3	M2118	4.750	2.700	-0.340	Envelope Qp	σ_c	-4.95	-15.75	N/mm²	0.4	
	M3572	4.750	1.700	-0.539	Envelope Qp	σ_s	128.99	400.00	N/mm²	0.4	
	M3572	4.750	1.700	-0.539	Envelope Qp	w_k	0.109	0.100	mm	1.1	219)
4	M4331	4.750	0.000	-0.540	Envelope Qp	σ_c	-5.85	-15.75	N/mm²	0.4	
	M4316	4.750	1.300	-0.340	Envelope Qp	σ_s	116.96	400.00	N/mm²	0.3	
	M4316	4.750	1.300	-0.340	Envelope Qp	w_k	0.095	0.100	mm	1.0	
5	M5038	-0.000	10.250	-0.536	Envelope Qp	σ_c	-8.67	-15.75	N/mm²	0.6	
	M5307	-0.000	14.196	-0.838	Envelope Qp	σ_s	126.71	400.00	N/mm²	0.4	
	M5244	-0.000	14.199	-0.741	Envelope Qp	w_k	0.101	0.100	mm	1.1	219)
6	M136	-0.000	6.100	-0.340	Envelope Qp	σ_c	-4.90	-15.75	N/mm²	0.4	
	M6425	0.000	1.700	-0.539	Envelope Qp	σ_s	128.99	400.00	N/mm²	0.4	
	M6425	0.000	1.700	-0.539	Envelope Qp	w_k	0.109	0.100	mm	1.1	219)
38	M4332	4.750	0.000	-0.640	Envelope Qp	σ_c	-7.09	-15.75	N/mm²	0.5	
	M7218	3.840	0.000	-0.340	Envelope Qp	σ_s	125.99	400.00	N/mm²	0.4	
	M7218	3.840	0.000	-0.340	Envelope Qp	w_k	0.107	0.100	mm	1.1	219)
39	M8407	4.750	10.250	-0.536	Envelope Qp	σ_c	-8.67	-15.75	N/mm²	0.6	
	M8616	4.750	14.196	-0.838	Envelope Qp	σ_s	126.71	400.00	N/mm²	0.4	
	M8533	4.750	14.199	-0.741	Envelope Qp	w_k	0.101	0.100	mm	1.1	219)
40	M9881	4.750	18.160	-0.538	Envelope Qp	σ_c	-6.05	-15.75	N/mm²	0.4	
	M9878	4.750	17.864	-0.538	Envelope Qp	σ_s	131.97	400.00	N/mm²	0.4	
	M9878	4.750	17.864	-0.538	Envelope Qp	w_k	0.114	0.100	mm	1.2	219)
41	M9726	4.750	19.150	-0.640	Envelope Qp	σ_c	-11.05	-15.75	N/mm²	0.8	
	M113	4.750	19.150	-0.340	Envelope Qp	σ_s	114.82	400.00	N/mm²	0.3	
	M113	4.750	19.150	-0.340	Envelope Qp	w_k	0.090	0.100	mm	1.0	
43	M12989	-0.000	18.160	-0.538	Envelope Qp	σ_c	-6.05	-15.75	N/mm²	0.4	
	M12986	-0.000	17.864	-0.538	Envelope Qp	σ_s	131.97	400.00	N/mm²	0.4	
	M12986	-0.000	17.864	-0.538	Envelope Qp	w_k	0.114	0.100	mm	1.2	219)
44	M7258	0.000	0.000	-0.540	Envelope Qp	σ_c	-5.85	-15.75	N/mm²	0.4	
	M144	0.000	1.500	-0.340	Envelope Qp	σ_s	115.73	400.00	N/mm²	0.3	
	M144	0.000	1.500	-0.340	Envelope Qp	w_k	0.093	0.100	mm	1.0	

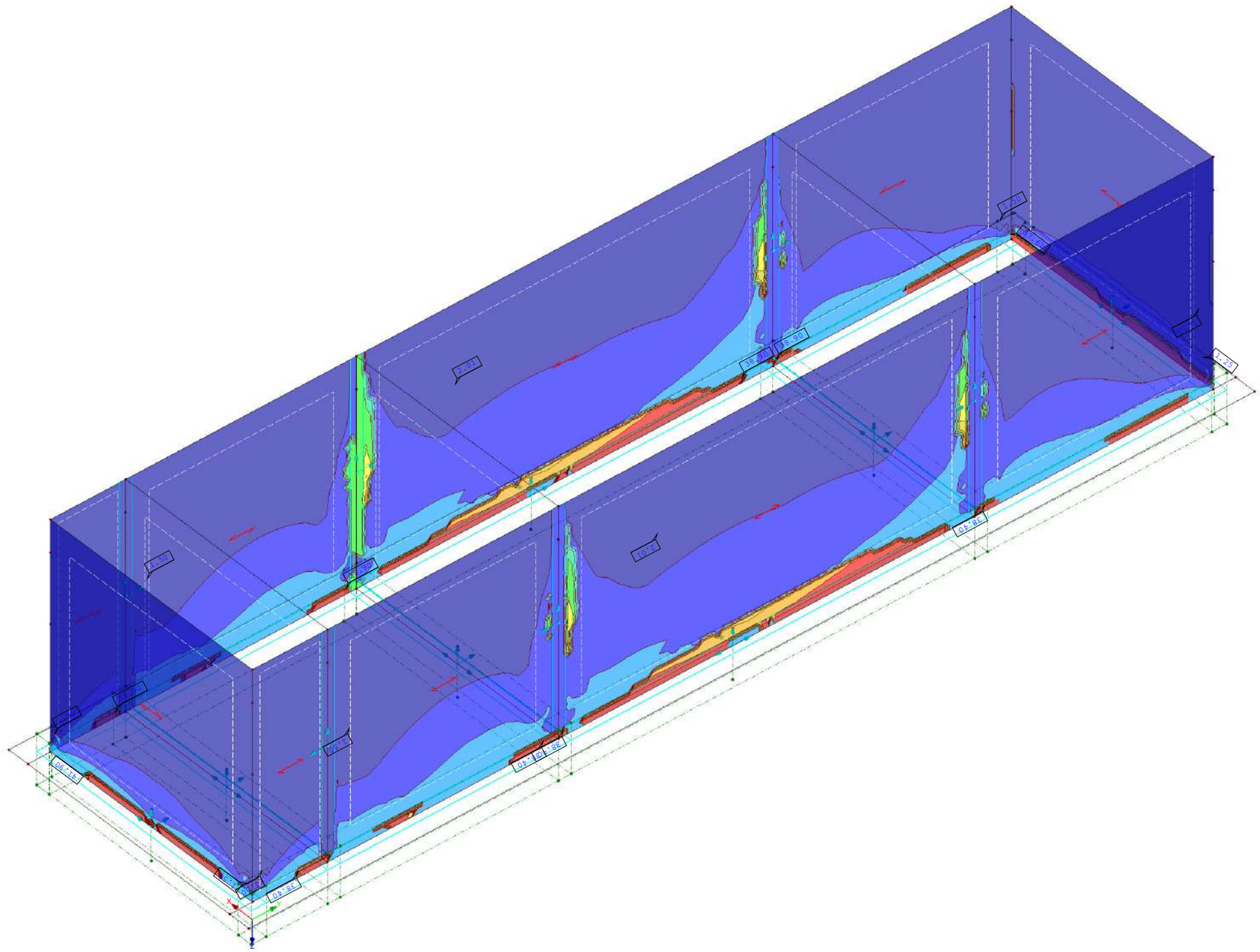
SERVICEABILITY CHECK NOTES

No.	Description
219)	Crack width exceeded.
226)	Concrete cracks on neither side.
233)	The design is not satisfactory! Because of the required reinforcement for ULS or user-defined reinforcement the defined reinforcement area is different from the required reinforcement for SLS and that negatively affects SLS design.

REQUIRED REINFORCEMENT $a_{s,1,-z\ (top)}$

RF-CONCRETE Surfaces CA2
Išorinės sienos
Required Reinforcement a-s,1,-z (top) [cm²/m]
Values: a-s,1,-z (top) [cm^2/m]

Isometric

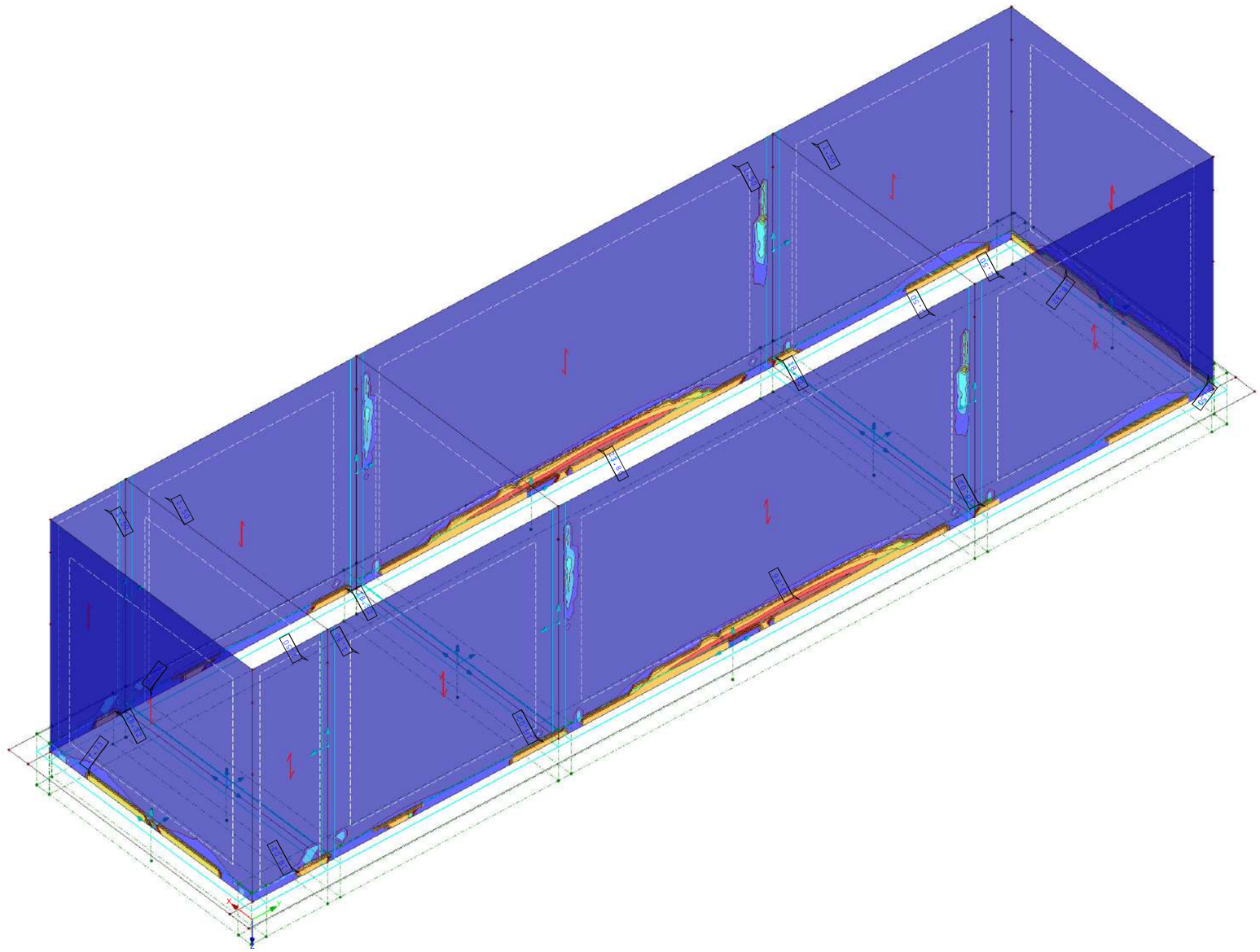


Max a-s,1,-z (top): 41.90, Min a-s,1,-z (top): 1.25 cm²/m

REQUIRED REINFORCEMENT $a_{s,2,-z\ (top)}$

RF-CONCRETE Surfaces CA2
Išorinės sienos
Required Reinforcement a-s,2,-z (top) [cm²/m]
Values: a-s,2,-z (top) [cm^2/m]

Isometric

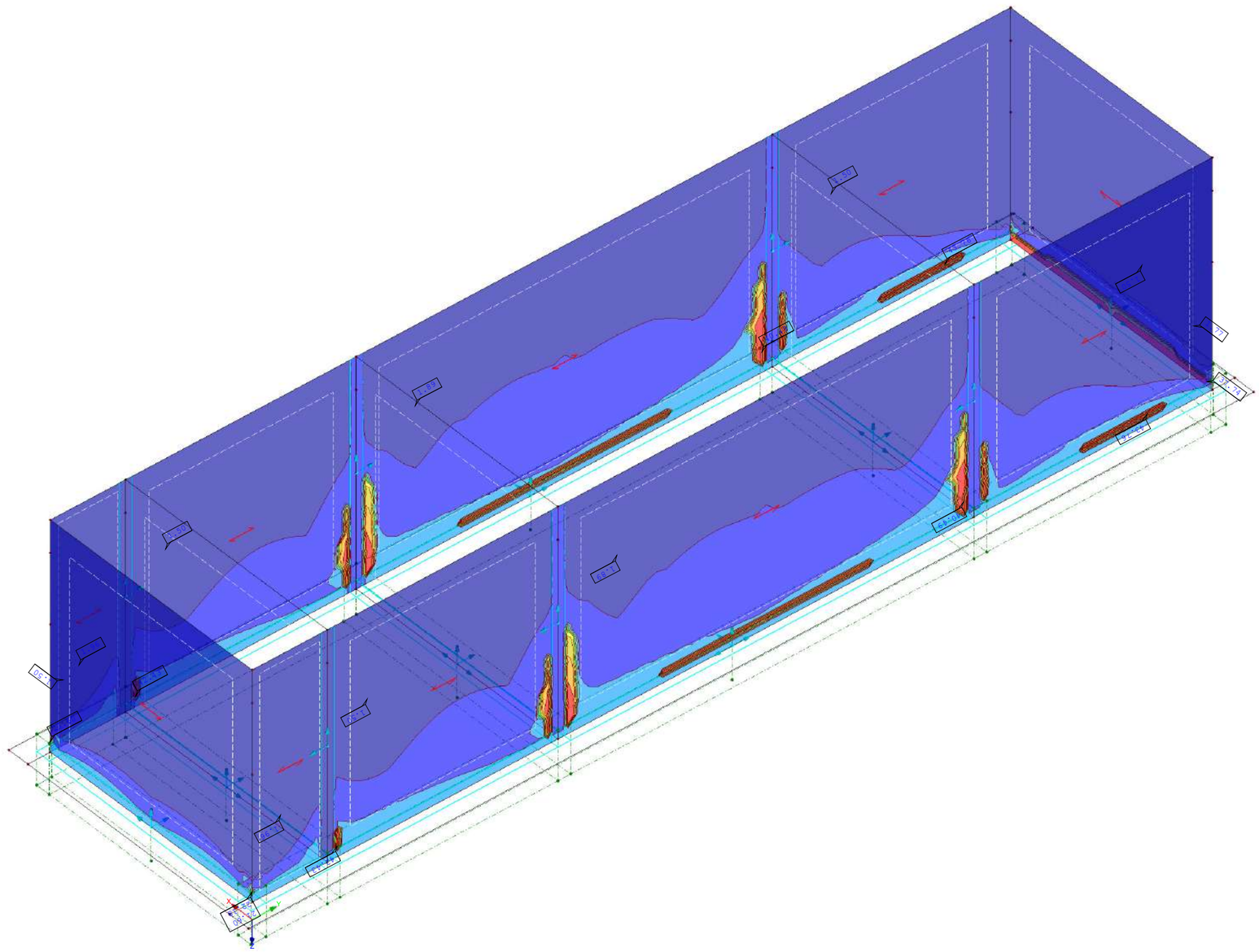


Max a-s,2,-z (top): 23.96, Min a-s,2,-z (top): 1.50 cm²/m

REQUIRED REINFORCEMENT $a_{s,1,+z}$ (bottom)

RF-CONCRETE Surfaces CA2
Išorinės sienos
Required Reinforcement a-s,1,+z (bottom) [cm²/m]
Values: a-s,1,+z (bottom) [cm^2/m]

Isometric

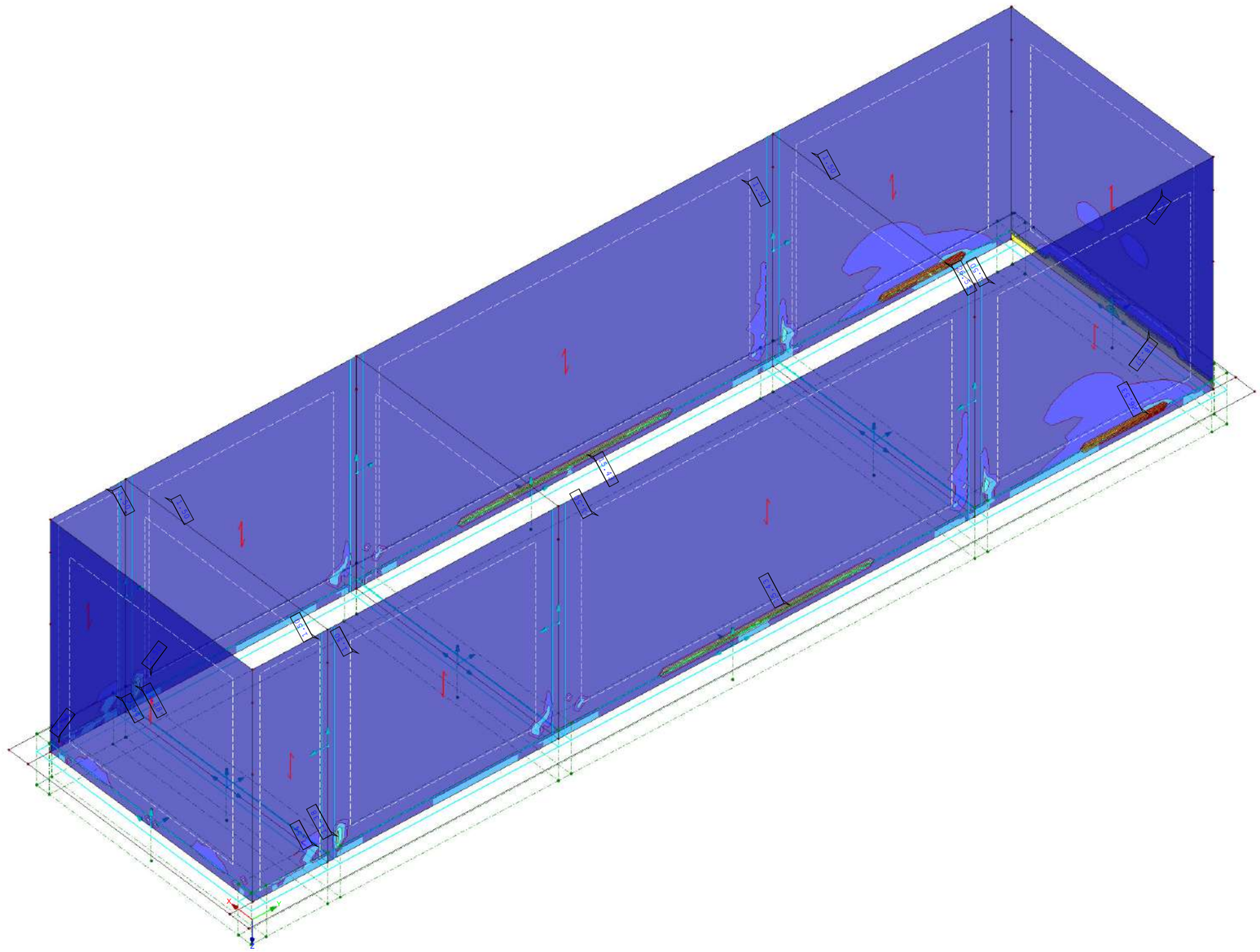


Max a-s,1,+z (bottom): 43.76, Min a-s,1,+z (bottom): 1.50 cm²/m

REQUIRED REINFORCEMENT $a_{s,2,+z}$ (bottom)

RF-CONCRETE Surfaces CA2
Išorinės sienos
Required Reinforcement a-s,2,+z (bottom) [cm²/m]
Values: a-s,2,+z (bottom) [cm^2/m]

Isometric

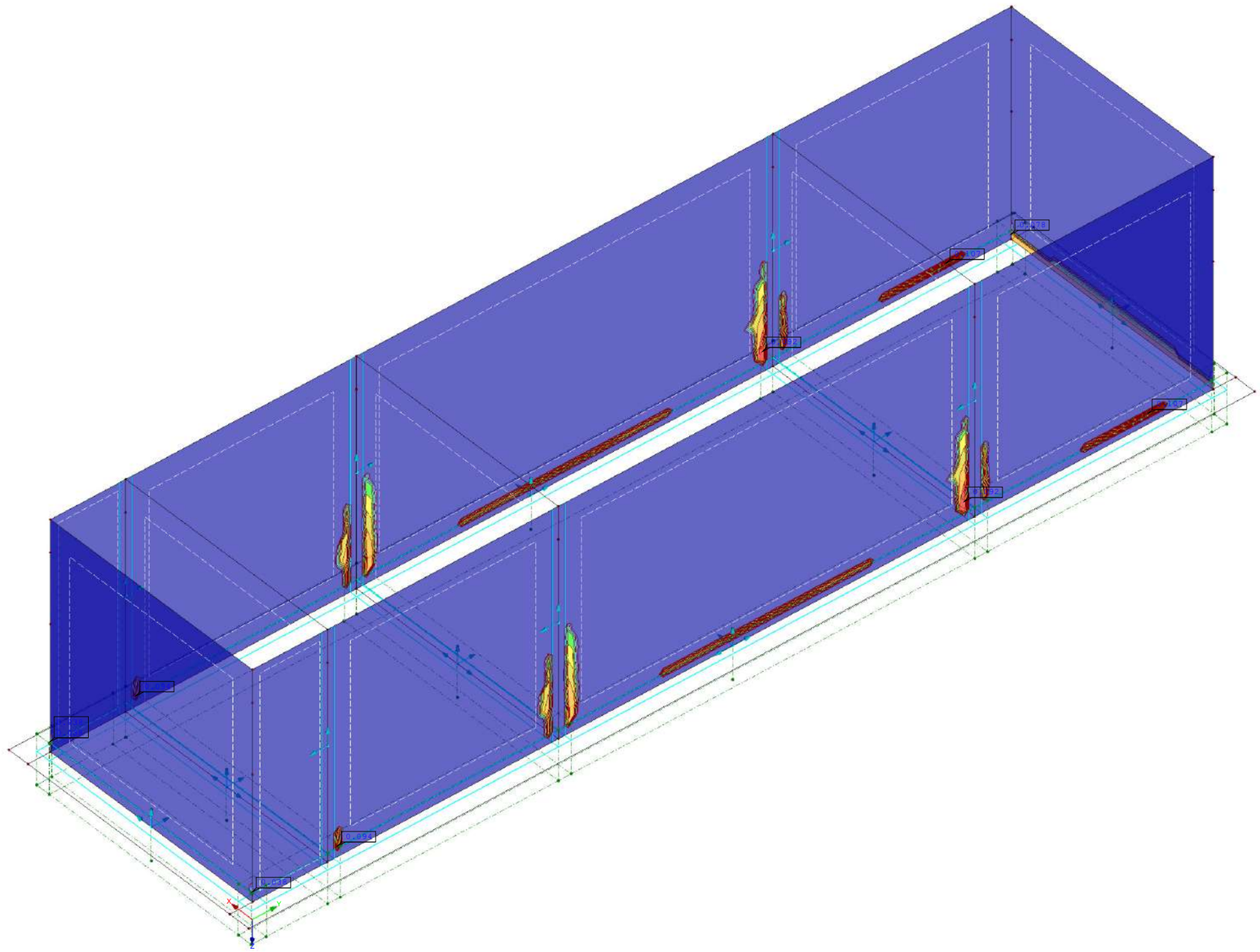


Max a-s,2,+z (bottom): 26.53, Min a-s,2,+z (bottom): 1.25 cm²/m

CRACK WIDTH $w_{k,res,+z\ (bottom)}$

RF-CONCRETE Surfaces CA2
Išorinės sienos
Crack width w-k,res,+z (bottom) [mm]
Values: w-k,res,+z (bottom) [mm]

Isometric

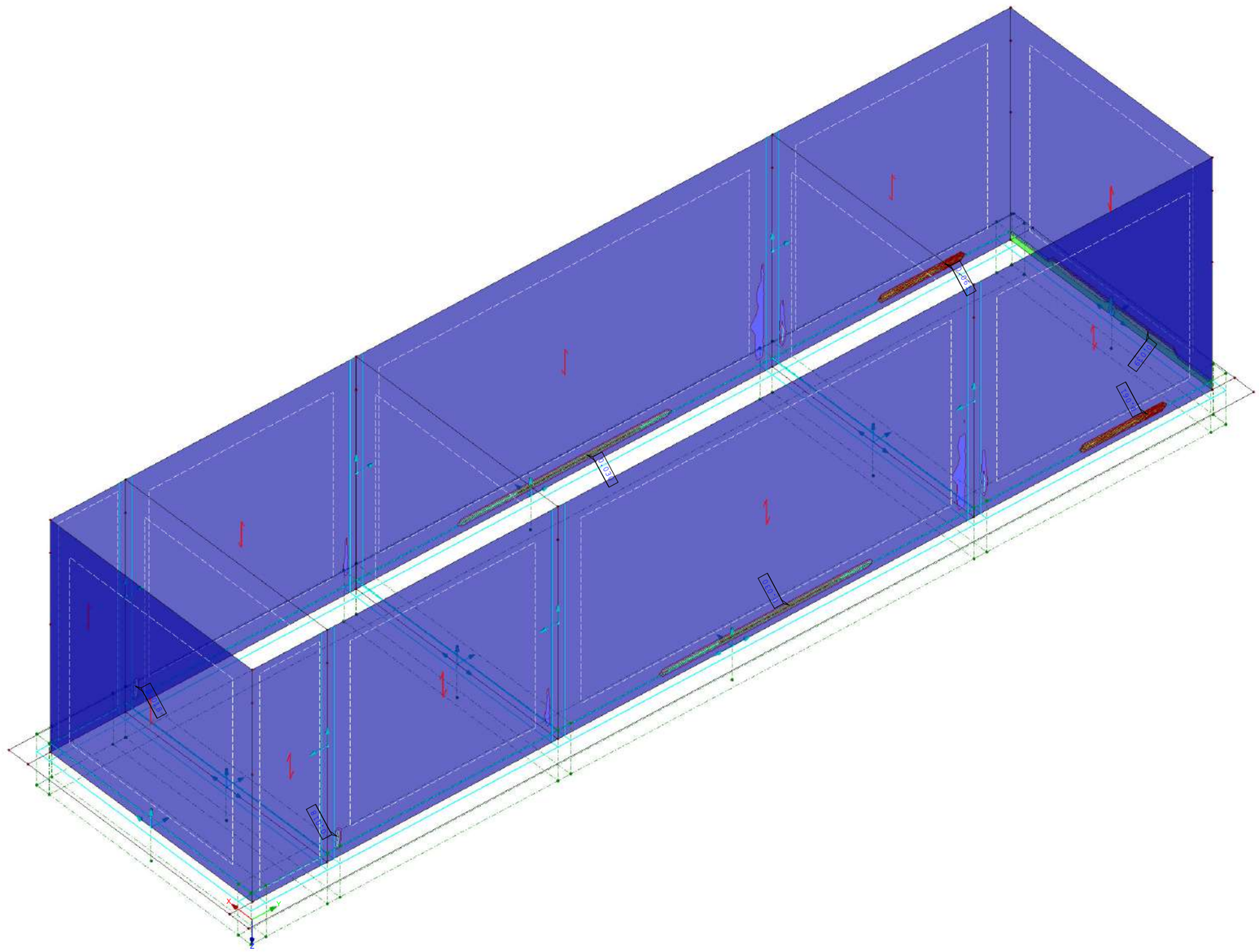


Max w-k,res,+z (bottom): 0.107, Min w-k,res,+z (bottom): 0.000 mm

CRACK WIDTH $w_{k,2,+z\ (bottom)}$

RF-CONCRETE Surfaces CA2
Išorinės sienos
Crack width w-k,2,+z (bottom) [mm]
Values: w-k,2,+z (bottom) [mm]

Isometric

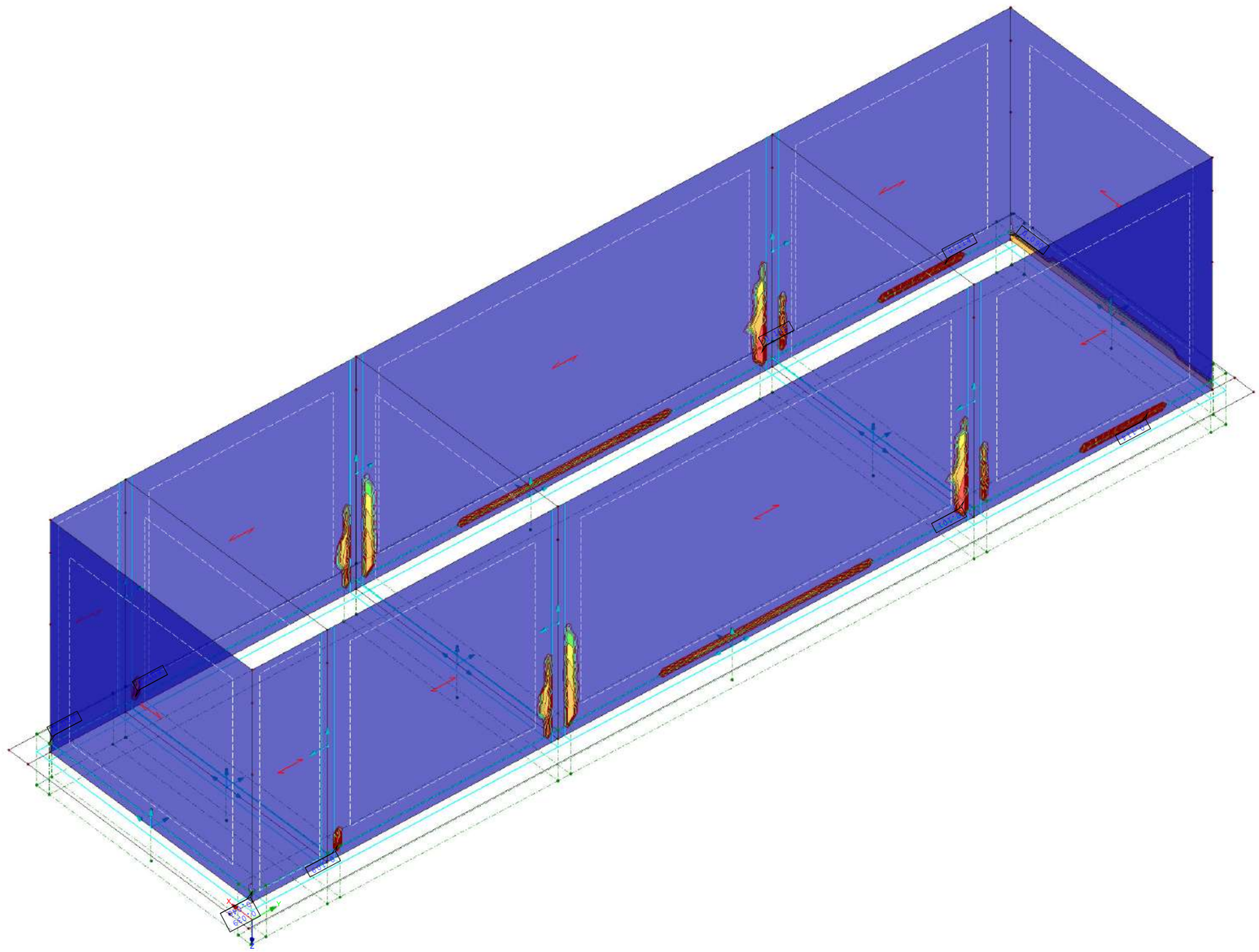


Max w-k,2,+z (bottom): 0.061, Min w-k,2,+z (bottom): 0.000 mm

CRACK WIDTH $w_{k,1,+z\ (bottom)}$

RF-CONCRETE Surfaces CA2
Išorinės sienos
Crack width w-k,1,+z (bottom) [mm]
Values: w-k,1,+z (bottom) [mm]

Isometric

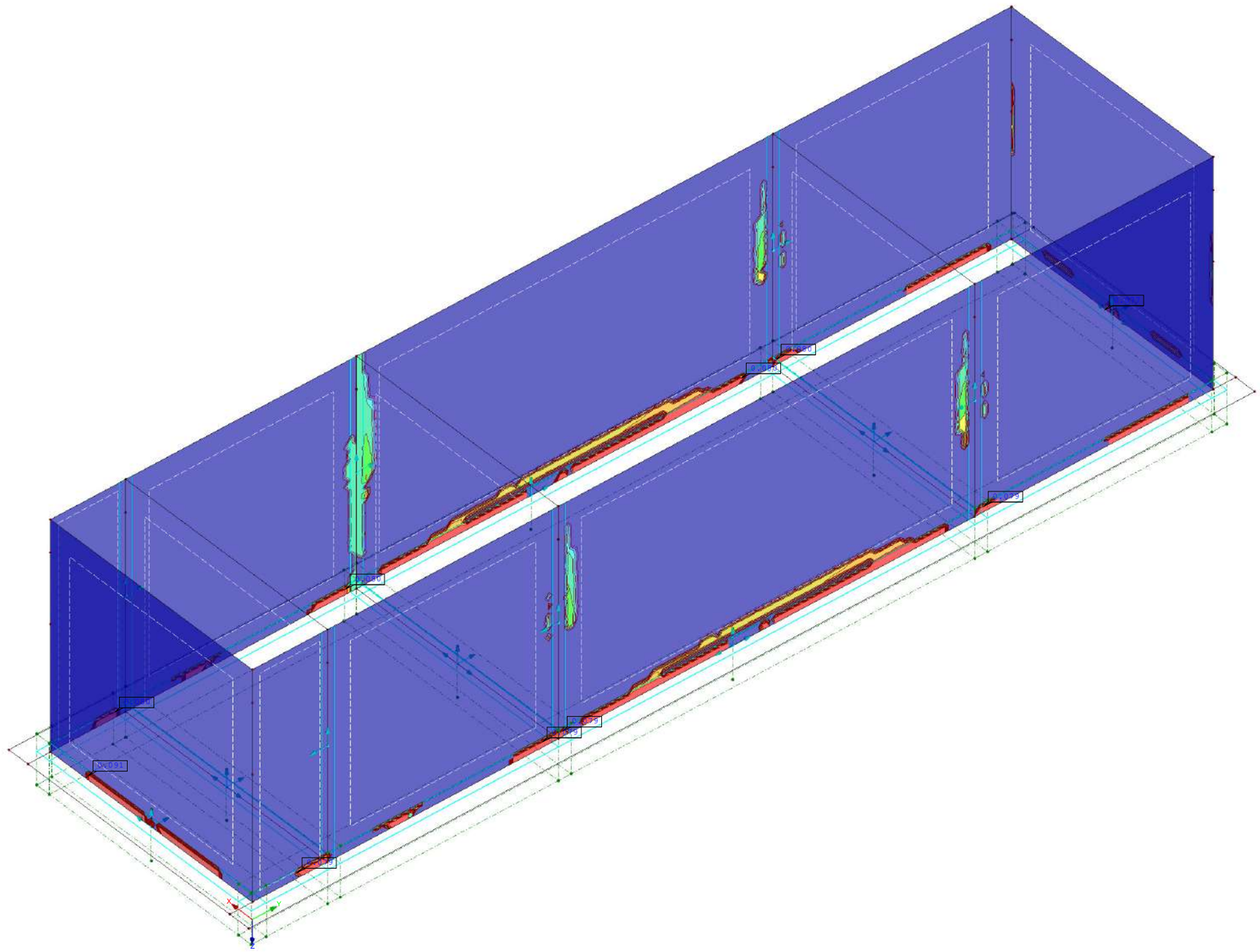


Max w-k,1,+z (bottom): 0.114, Min w-k,1,+z (bottom): 0.000 mm

CRACK WIDTH $w_{k,res,-z\ (top)}$

RF-CONCRETE Surfaces CA2
Išorinės sienos
Crack width w-k,res,-z (top) [mm]
Values: w-k,res,-z (top) [mm]

Isometric

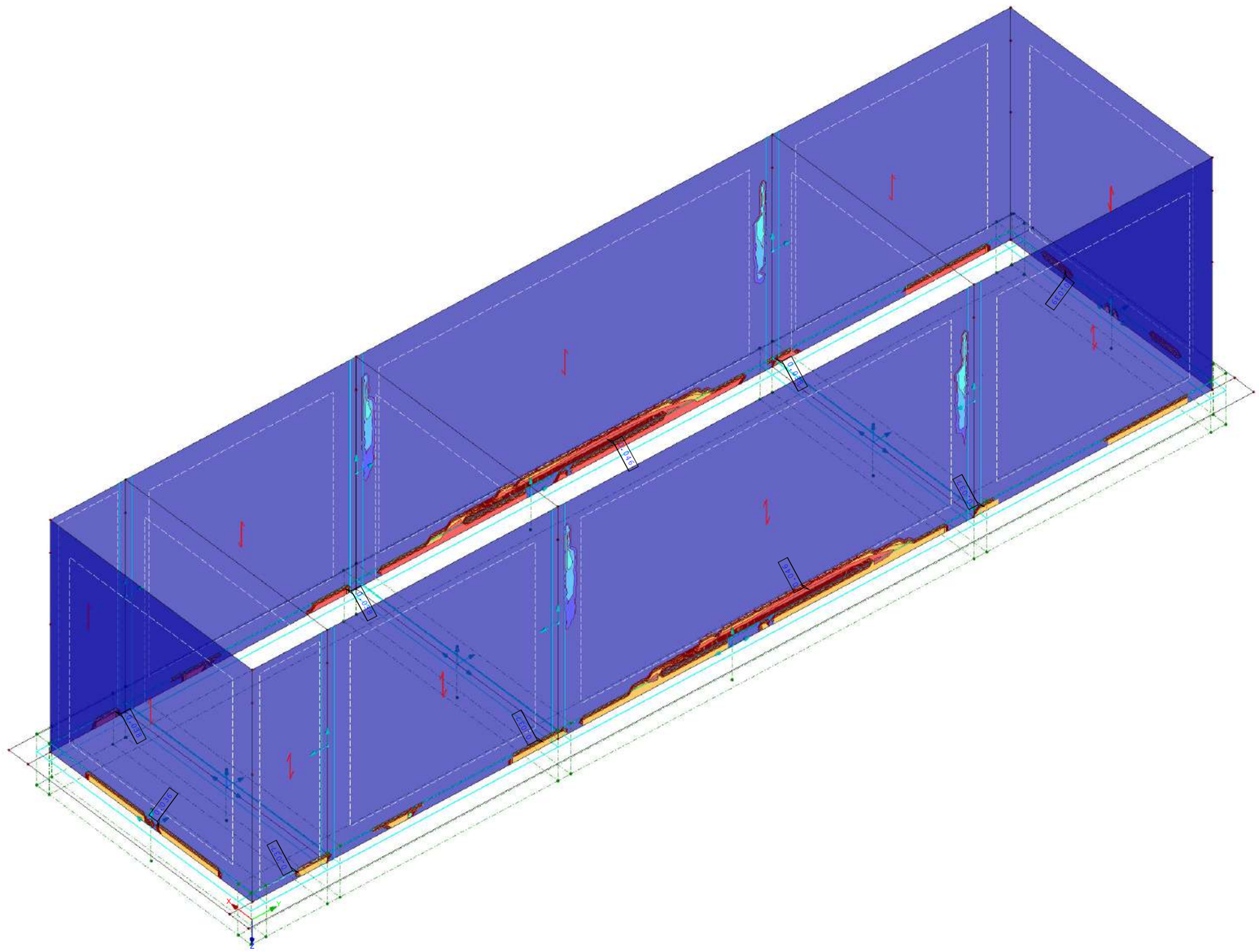


Max w-k,res,-z (top): 0.091, Min w-k,res,-z (top): 0.000 mm

CRACK WIDTH $w_{k,2,-z\ (top)}$

RF-CONCRETE Surfaces CA2
Išorinės sienos
Crack width w-k,2,-z (top) [mm]
Values: w-k,2,-z (top) [mm]

Isometric

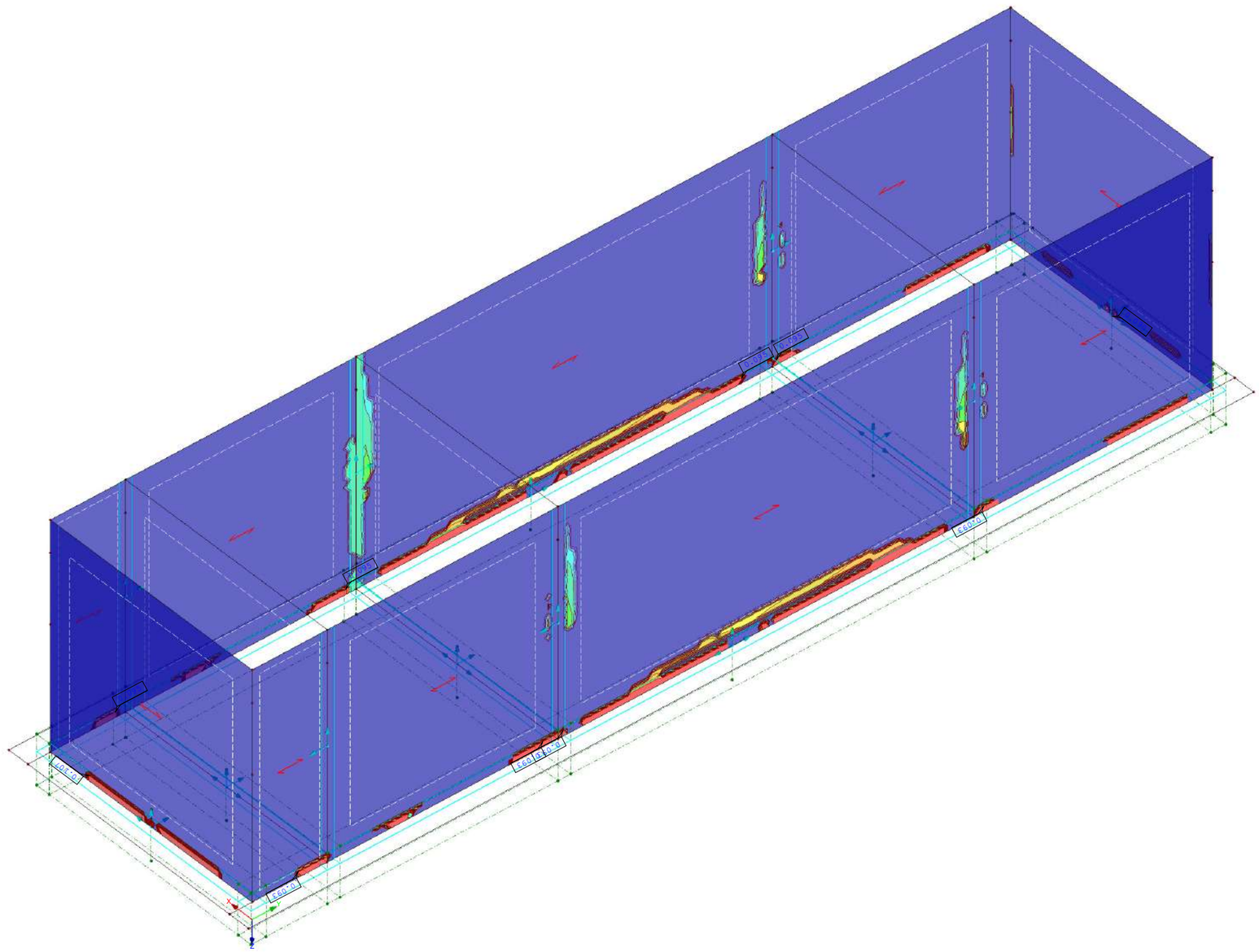


Max w-k,2,-z (top): 0.046, Min w-k,2,-z (top): 0.000 mm

CRACK WIDTH $w_{k,1,-z\ (top)}$

RF-CONCRETE Surfaces CA2
Išorinės sienos
Crack width w-k,1,-z (top) [mm]
Values: w-k,1,-z (top) [mm]

Isometric



Max w-k,1,-z (top): 0.107, Min w-k,1,-z (top): 0.000 mm

1.1 GENERAL DATA

Design according to Standard:	LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
ULTIMATE LIMIT STATE		
Load combinations for design:	CO1	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO2	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO3	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO4	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO5	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO6	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO7	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO8	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO9	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO10	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO11	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO12	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO13	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO14	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO15	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO16	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO17	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO18	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO19	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO20	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO21	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO22	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO23	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO24	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO25	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
	CO26	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Persistent and Transient
SERVICEABILITY LIMIT STATE		
Load combinations for design:	CO1	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.600
	CO2	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO3	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO4	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO5	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO6	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO7	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO8	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.559
	CO9	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.559
	CO10	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.574
	CO11	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.577
	CO12	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.600
	CO13	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO14	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO15	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO16	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO17	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO18	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 Quasi-permanent, k_t 0.532
	CO19	ULS (STR/GEO) - Permanent / transient - Eq. 6.10

1.1 GENERAL DATA

		Quasi-permanent, k$_t$ 0.559
	CO20	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
		Quasi-permanent, k$_t$ 0.559
	CO21	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
		Quasi-permanent, k$_t$ 0.574
	CO22	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
		Quasi-permanent, k$_t$ 0.577
	CO23	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
		Quasi-permanent, k$_t$ 0.532
	CO24	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
		Quasi-permanent, k$_t$ 0.549
	CO25	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
		Quasi-permanent, k$_t$ 0.498
	CO26	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
		Quasi-permanent, k$_t$ 0.532
Definition of Provided Additional Reinforcement		Manual definition of the reinforcement areas
Type of SLS method:		Analytical Method
		By assuming an identical deformation ratio of the longitudinal reinforcement
Design of		
Concrete Stress Analysis		☒
Steel Stress Analysis		☒
Crack widths		☒
Deformation Analysis		☐
Layout of longitudinal reinforcement		
Required longitudinal reinforcement automatically increased for serviceability limit state design:		☒
DETAILS		
Analysis Method for Reinforcement Envelope		Mixed
Apply the averaged internal forces in the defined average region for the ULS calculation and for the analytic method of SLS calculation.		☒
Apply the internal forces without the rib components		☐
Design Situation Settings for Serviceability Limit State Checks		
Load combination:		
Characteristic with direct load		Checks: k_1*f_{ck}, k_2*f_{ck}, k_3*f_{yk}, k_4*f_{yk}, w_k
Characteristic with imposed deformation		Checks: w_k
Frequent		Checks: -
Quasi-permanent		Checks: k_1*f_{ck}, k_2*f_{ck}, k_3*f_{yk}, k_4*f_{yk}, w_k, u_l

1.2 MATERIALS

Material No.	Material Description: Concrete Strength Class	Material Description: Steel Description	Comment
2	Concrete C35/45*0,7	B 500 S (A)	
3	Concrete C35/45	B 500 S (A)	

1.2.1 MATERIAL PARAMETERS

Material No.	Description	Name	Size	Unit
2	**Concrete Strength Class: Concrete C35/45*0,7**			
	Characteristic Cylinder Compressive Strength	f_{ck}	35.00	N/mm^2
	5 % Fractile of Axial Tensile Strength	$f_{ctk,0.05}$	2.20	N/mm^2
	Characteristic for Nonlinear Calculations			
	Mean Secant Modulus of Elasticity	E_{cm}	34000.00	N/mm^2
	Mean Cylinder Compressive Strength	f_{cm}	43.00	N/mm^2
	Mean Axial Tensile Strength	f_{ctm}	3.20	N/mm^2
	Ultimate Strain for Pure Compression	ε_{c1}	-2.250	‰
	Ultimate Strain at Failure	ε_{c1u}	-3.500	‰
	Shear Modulus	G	9916.70	N/mm^2
	Poisson's Ratio	ν	0.200	-
	Characteristic Strains for Parabolic-Rectangular Diagram			
	Ultimate Strain for Pure Compression	ε_{c2}	-2.000	‰
	Ultimate Strain at Failure	ε_{cu2}	-3.500	‰
	Parabola Exponent	n	2.000	-
	Specific Weight	γ	25.00	kN/m^3
	Reinforcing Steel: B 500 S (A)			
	Modulus of Elasticity	E_s	200000.00	N/mm^2
	Yield Stress Mean Value	f_{ym}	550.00	N/mm^2
	Characteristic Yield Stress	f_{yk}	500.00	N/mm^2
	Tensile Strength Mean Value	f_{tm}	551.25	N/mm^2
	Characteristic Tensile Strength	f_{tk}	525.00	N/mm^2
	Limiting Strain	ε_{uk}	25.000	‰
3	**Concrete Strength Class: Concrete C35/45**			
	Characteristic Cylinder Compressive Strength	f_{ck}	35.00	N/mm^2
	5 % Fractile of Axial Tensile Strength	$f_{ctk,0.05}$	2.20	N/mm^2
	Characteristic for Nonlinear Calculations			
	Mean Secant Modulus of Elasticity	E_{cm}	34000.00	N/mm^2
	Mean Cylinder Compressive Strength	f_{cm}	43.00	N/mm^2
	Mean Axial Tensile Strength	f_{ctm}	3.20	N/mm^2
	Ultimate Strain for Pure Compression	ε_{c1}	-2.250	‰
	Ultimate Strain at Failure	ε_{c1u}	-3.500	‰
	Shear Modulus	G	14166.70	N/mm^2
	Poisson's Ratio	ν	0.200	-
	Characteristic Strains for Parabolic-Rectangular Diagram			
	Ultimate Strain for Pure Compression	ε_{c2}	-2.000	‰
	Ultimate Strain at Failure	ε_{cu2}	-3.500	‰

1.2.1 MATERIAL PARAMETERS

Material No.	Description	Name	Size	Unit
	Parabola Exponent	n	2.000	-
	Specific Weight	γ	25.00	kN/m^3
	Reinforcing Steel: B 500 S (A)			
	Modulus of Elasticity	E_s	200000.00	N/mm^2
	Yield Stress Mean Value	f_{ym}	550.00	N/mm^2
	Characteristic Yield Stress	f_{yk}	500.00	N/mm^2
	Tensile Strength Mean Value	f_{tm}	551.25	N/mm^2
	Characteristic Tensile Strength	f_{tk}	525.00	N/mm^2
	Limiting Strain	ε_{uk}	25.000	‰

1.3 SURFACES

Surface No.	Matl. No.	$\sigma_{c,max}$ [N/mm²] / $\sigma_{s,max}$ [N/mm²]	$f_{ct,eff,wk}$ [N/mm²]	$f_{ct,eff,As,min}$ [N/mm²]	$w_{k,+z\ (top)}$ [mm] / $w_{k,-z\ (bottom)}$ [mm]	Effects due to Restraint: Apply	Effects due to Restraint: k_c [-]	Notes
42	Thickness Type: Constant, Thickness: 250.0 mm							
	2	var. var.	3.20	3.20	0.100 0.100	☐	var.	
45	Thickness Type: Constant, Thickness: 250.0 mm							
	2	var. var.	3.20	3.20	0.100 0.100	☐	var.	
46	Thickness Type: Constant, Thickness: 250.0 mm							
	2	var. var.	3.20	3.20	0.100 0.100	☐	var.	

1.4 REINFORCEMENT GROUP NO. 2 - VIDINËS SIENOS

Applied to surfaces:	42,45,46
REINFORCEMENT RATIO	
Minimum secondary reinforcement	20.0 %
Basic minimum reinforcement	0.0 %
Minimum compression reinforcement	0.0 %
Minimum tension reinforcement	0.0 %
Maximum reinforcement percentage	4.0 %
Minimum shear reinforcement percentage	0.0 %
Concrete cover acc. to Standard	☐
BASIC REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 56.0 mm
Bar diameter	ds-1: 16.0, ds-2: 16.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,-z (top): 10.05, As-2,-z (top): 10.05 cm²/m
BASIC REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 56.0 mm
Bar diameter	ds-1: 16.0, ds-2: 16.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,+z (bottom): 10.05, As-2,+z (bottom): 10.05 cm²/m
ADDITIONAL REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 56.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
ADDITIONAL REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 56.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
LONGITUDINAL REINFORCEMENT FOR SHEAR FORCE DESIGN	
Apply the greater value resulting from either the required or provided reinforcement (basic and add. reinforcement) per reinforcement direction	
OPTIONS FOR LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
Minimum longitudinal reinforcement for plates acc. to 9.3.1	☐
Minimum longitudinal reinforcement for walls acc. to 9.6	☒
Minimum shear reinforcement	☒
Neutral axis depth limitation	☒
Variable strut inclination - min	21.801 °
Variable concrete strut inclination - max	45.000 °
Partial safety factor γ_s	PT 1.15, AC 1.00, SLS 1.00
Partial safety factor γ_c	PT 1.50, AC 1.20, SLS 1.00
Consideration of long-term effects Alpha-cc	PT 0.90, AC 0.90, SLS 1.00
Consideration of long-term effects Alpha-ct	SLS 1.00

1.4.2 RECTANGULAR REINFORCEMENT

No.	On Surface No.	Location / Projection	Conc. Covers c [mm]	Definition of Reinforcement	Direction Φ [°]	Reinf. Area a_s [cm^2/m]	Reinforcement Position X [m]	Y [m]	Z [m]
1	42,45,46	Top (-z) XZ	40.0	d16;a=66.7mm	0	30.16	4.950 -0.450		-0.340 -1.340
2	42,45,46	Bottom (+z) XZ	40.0	d16;a=66.7mm	0	30.16	4.950 -0.450		-0.340 -1.340
3	42,45,46	Top (-z) XZ	56.0	d16;a=100mm	90	20.11	4.950 -0.450		-0.340 -1.340

1.4.2 RECTANGULAR REINFORCEMENT

No.	On Surface No.	Location Projection	Conc. Covers c [mm]	Definition of Reinforcement	Direction Φ [°]	Reinf. Area a_s [cm^2/m]	Reinforcement Position X [m]	Y [m]	Z [m]
4	42,45,46	Bottom (+z) XZ	56.0	d16;a=100mm	90	20.11	4.950 -0.450		-0.340 -1.340
5	42,45,46	Top (-z) XZ	40.0	d16;a=100mm	0	20.11	4.950 4.150		-1.340 -4.940
6	42,45,46	Top (-z) XZ	40.0	d16;a=100mm	0	20.11	-0.250 0.550		-1.340 -4.940
7	42,45,46	Top (-z) XZ	56.0	d16;a=100mm	90	20.11	-0.250 0.550		-1.340 -4.940
8	42,45,46	Top (-z) XZ	56.0	d16;a=100mm	90	20.11	4.950 4.150		-1.340 -4.940
9	42,45,46	Bottom (+z) XZ	40.0	d16;a=100mm	0	20.11	4.950 4.150		-1.340 -4.940
10	42,45,46	Bottom (+z) XZ	40.0	d16;a=100mm	0	20.11	-0.250 0.550		-1.340 -4.940

2.2 REQUIRED REINFORCEMENT BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Symbol	Required Reinforcement ULS	SLS	ULS/SLS	Basic Reinf.	Additional Reinforcement Required	Provided	Unit	Notes
42	M4329 - E11874	2.324	14.400	-0.340	$a_{s,1,-z\ (top)}$	11.22	41.26	41.26	10.05	31.21	30.16	cm²/m	
	M11755	0.705	14.400	-0.539	$a_{s,2,-z\ (top)}$	5.99	24.41	24.41	10.05	14.36	20.11	cm²/m	
	M88 - E11855	4.346	14.400	-0.340	$a_{s,1,+z\ (bottom)}$	10.90	40.38	40.38	10.05	30.33	30.16	cm²/m	
	M11754	0.804	14.400	-0.539	$a_{s,2,+z\ (bottom)}$	5.15	22.88	22.88	10.05	12.83	20.11	cm²/m	
	M84	1.920	14.400	-0.340	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	
45	M215 - E14327	0.101	6.100	-0.340	$a_{s,1,-z\ (top)}$	11.02	40.68	40.68	10.05	30.63	30.16	cm²/m	
	M13960	4.145	6.100	-0.540	$a_{s,2,-z\ (top)}$	5.16	22.89	22.89	10.05	12.84	20.11	cm²/m	
	M219 - E14323	0.505	6.100	-0.340	$a_{s,1,+z\ (bottom)}$	11.16	41.10	41.10	10.05	31.05	30.16	cm²/m	
	M13996	0.605	6.100	-0.540	$a_{s,2,+z\ (bottom)}$	5.15	22.58	22.58	10.05	12.53	20.11	cm²/m	
	M122	4.750	6.100	-0.340	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	
46	M2199 - E15304	0.202	1.500	-0.340	$a_{s,1,-z\ (top)}$	10.50	39.03	39.03	10.05	28.98	30.16	cm²/m	
	M14849	4.145	1.500	-0.540	$a_{s,2,-z\ (top)}$	4.96	22.51	22.51	10.05	12.46	20.11	cm²/m	
	M142	4.750	1.500	-0.340	$a_{s,1,+z\ (bottom)}$	10.65	39.36	39.36	10.05	29.31	30.16	cm²/m	
	M14887	0.404	1.500	-0.543	$a_{s,2,+z\ (bottom)}$	5.83	24.81	24.81	10.05	14.76	20.11	cm²/m	
	M142	4.750	1.500	-0.340	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	

3.2 SERVICEABILITY CHECK BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Load Case	Design Type	Exist. Value	Limit Value	Unit	Ratio	Notes
42	M11720	4.145	14.400	-0.540	Envelope Qp	σ_c	-6.53	-15.75	N/mm²	0.5	
	M4329 - E11874	2.324	14.400	-0.340	Envelope Qp	σ_s	126.76	400.00	N/mm²	0.4	
	M8257	4.750	14.400	-2.940	Envelope Qp	w_k	0.105	0.100	mm	1.1	219)
45	M13998	0.404	6.100	-0.543	Envelope Qp	σ_c	-7.15	-15.75	N/mm²	0.5	
	M219 - E14323	0.505	6.100	-0.340	Envelope Qp	σ_s	125.99	400.00	N/mm²	0.4	
	M240 - E14300	2.628	6.100	-0.340	Envelope Qp	w_k	0.103	0.100	mm	1.1	219)
46	M14849	4.145	1.500	-0.540	Envelope Qp	σ_c	-6.77	-15.75	N/mm²	0.5	
	M142	4.750	1.500	-0.340	Envelope Qp	σ_s	120.25	400.00	N/mm²	0.4	
	M142	4.750	1.500	-0.340	Envelope Qp	w_k	0.097	0.100	mm	1.0	

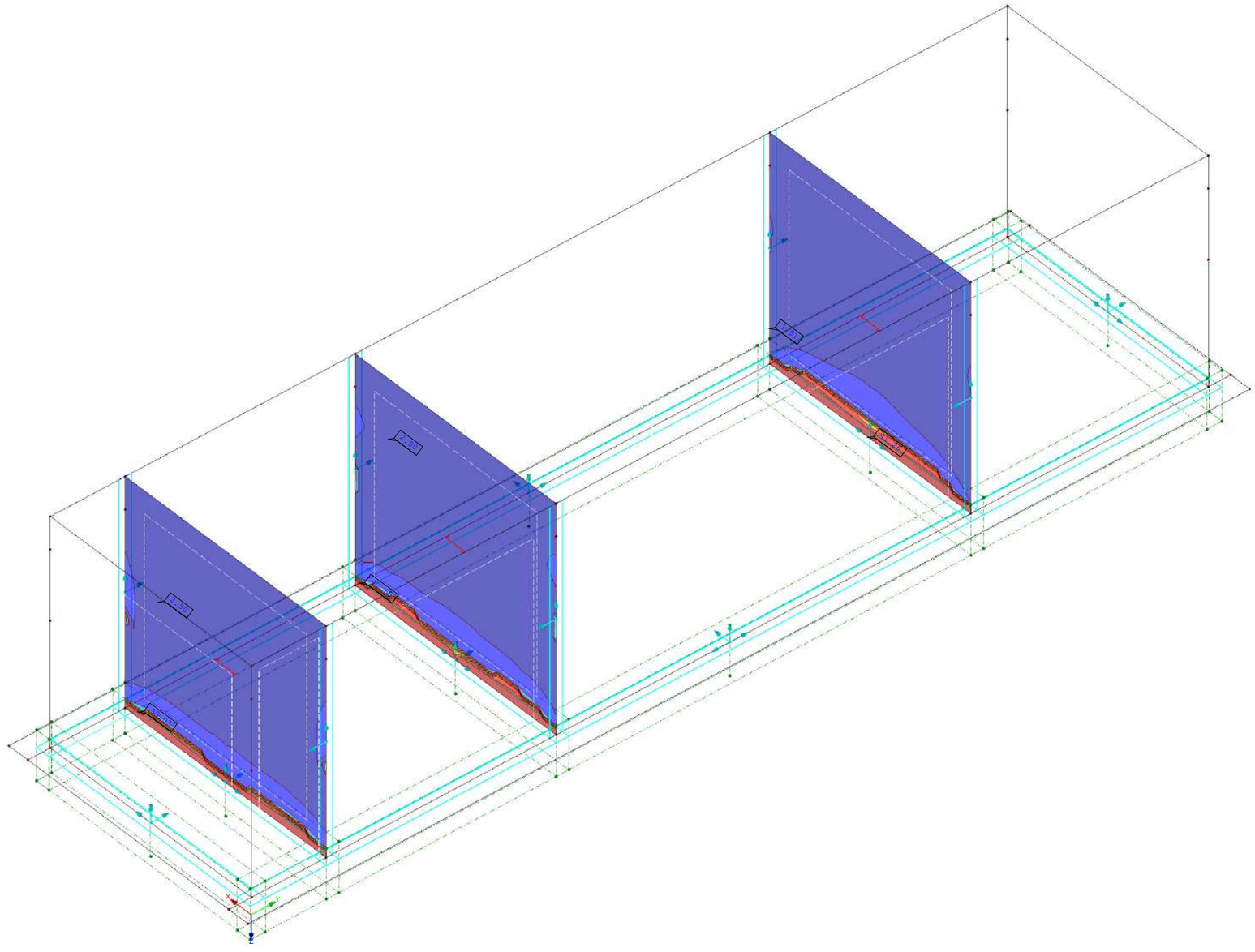
SERVICEABILITY CHECK NOTES

No.	Description
219)	Crack width exceeded.
226)	Concrete cracks on neither side.
233)	The design is not satisfactory! Because of the required reinforcement for ULS or user-defined reinforcement the defined reinforcement area is different from the required reinforcement for SLS and that negatively affects SLS design.

REQUIRED REINFORCEMENT $a_{s,1,-z\ (top)}$

RF-CONCRETE Surfaces CA4
Vidinės sienos
Required Reinforcement a-s,1,-z (top) [cm²/m]
Values: a-s,1,-z (top) [cm^2/m]

Isometric

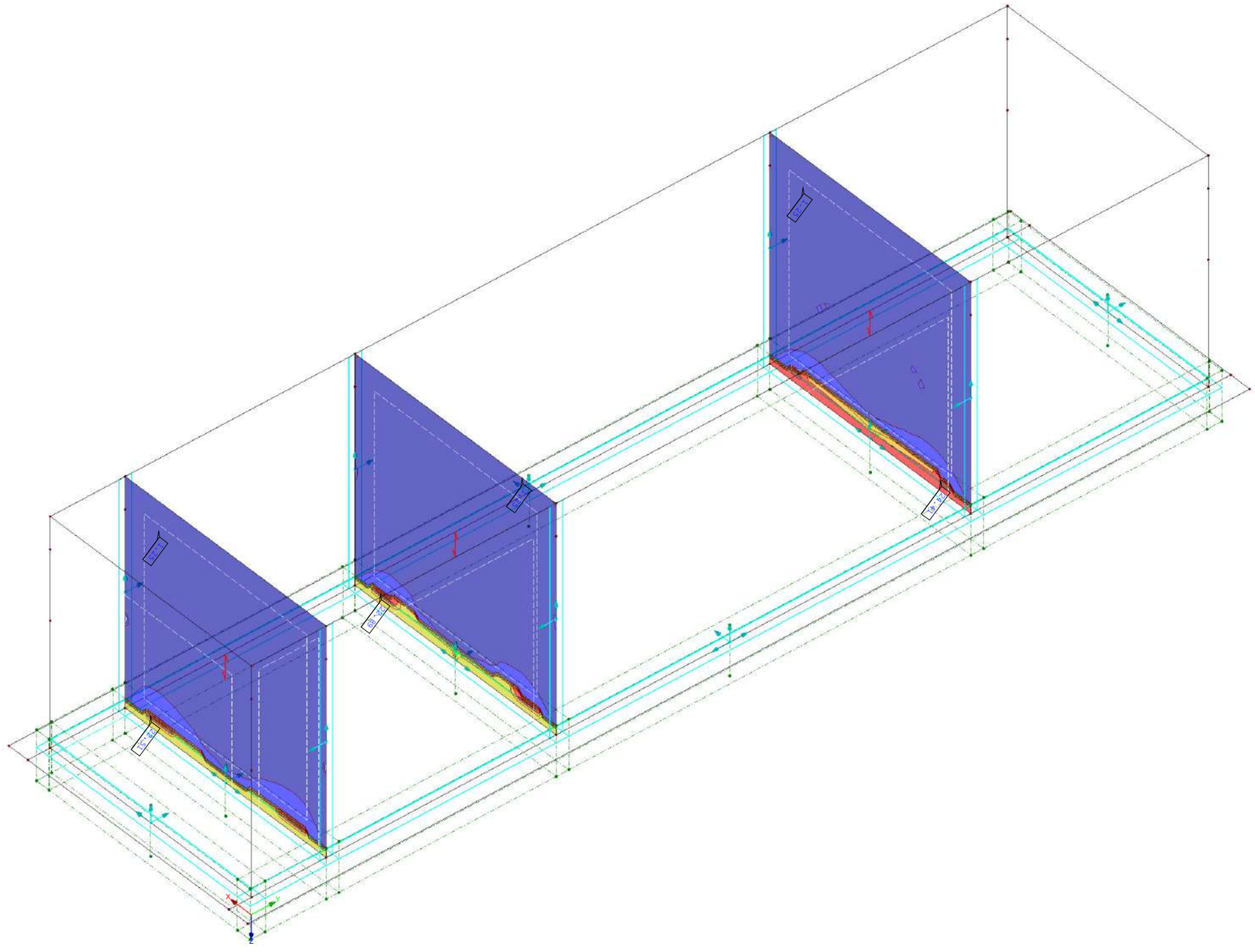


Max a-s,1,-z (top): 41.26, Min a-s,1,-z (top): 1.81 cm²/m

REQUIRED REINFORCEMENT $a_{s,2,-z\ (top)}$

RF-CONCRETE Surfaces CA4
Vidinės sienos
Required Reinforcement a-s,2,-z (top) [cm²/m]
Values: a-s,2,-z (top) [cm^2/m]

Isometric

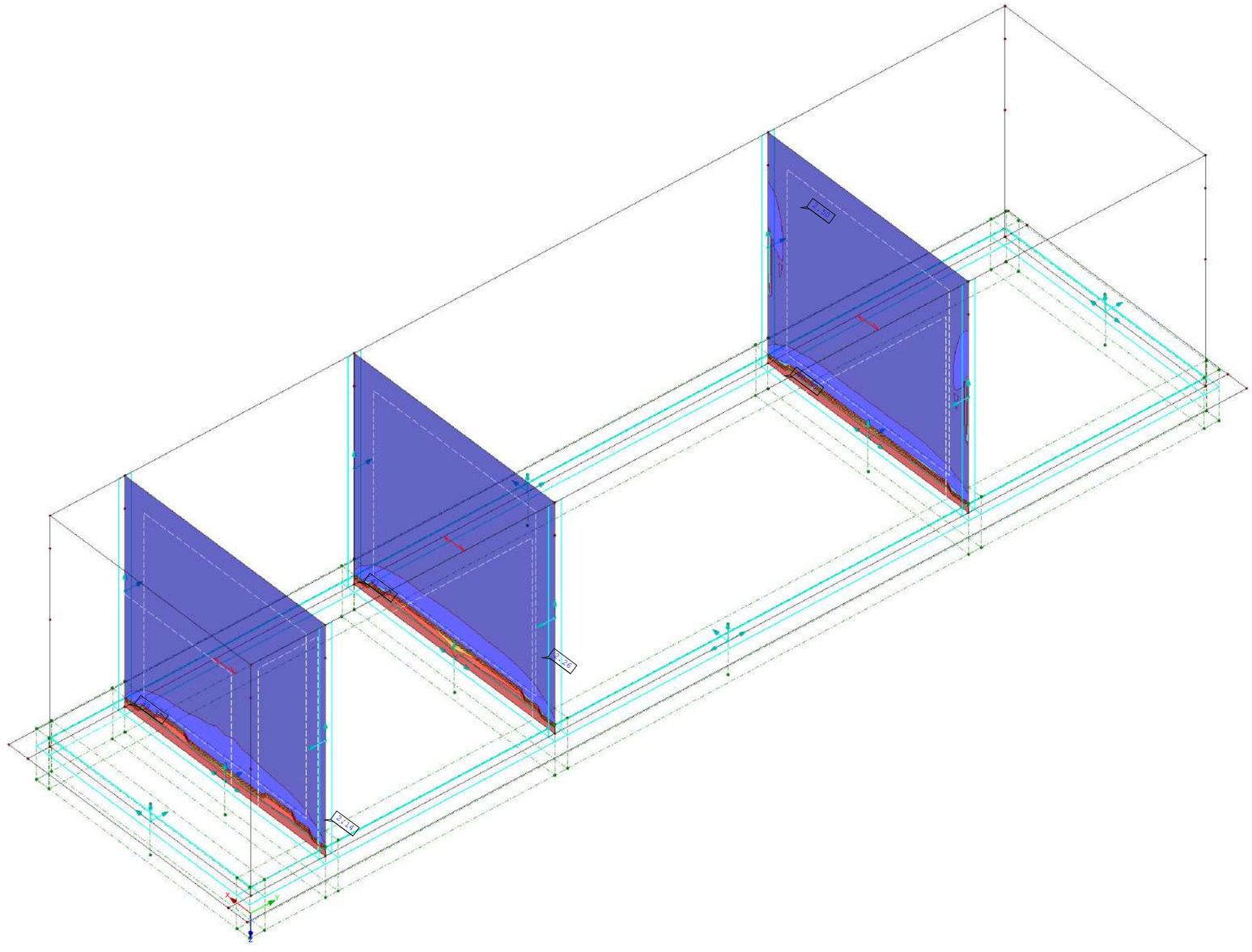


Max a-s,2,-z (top): 24.41, Min a-s,2,-z (top): 1.25 cm²/m

REQUIRED REINFORCEMENT $a_{s,1,+z}$ (bottom)

RF-CONCRETE Surfaces CA4
Vidinės sienos
Required Reinforcement a-s,1,+z (bottom) [cm²/m]
Values: a-s,1,+z (bottom) [cm^2/m]

Isometric

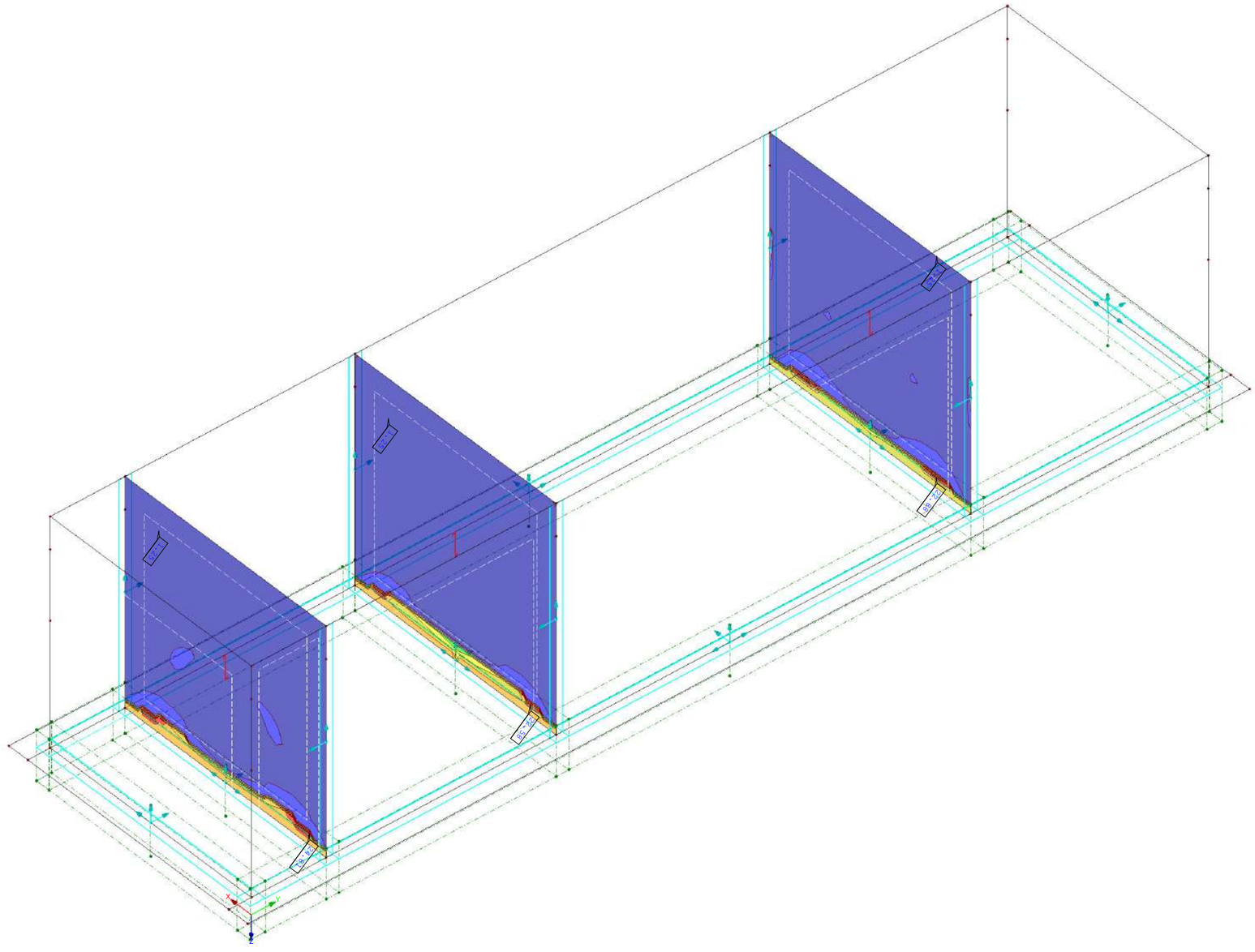


Max a-s,1,+z (bottom): 41.10, Min a-s,1,+z (bottom): 2.14 cm²/m

REQUIRED REINFORCEMENT $a_{s,2,+z}$ (bottom)

RF-CONCRETE Surfaces CA4
Vidinės sienos
Required Reinforcement a-s,2,+z (bottom) [cm²/m]
Values: a-s,2,+z (bottom) [cm^2/m]

Isometric

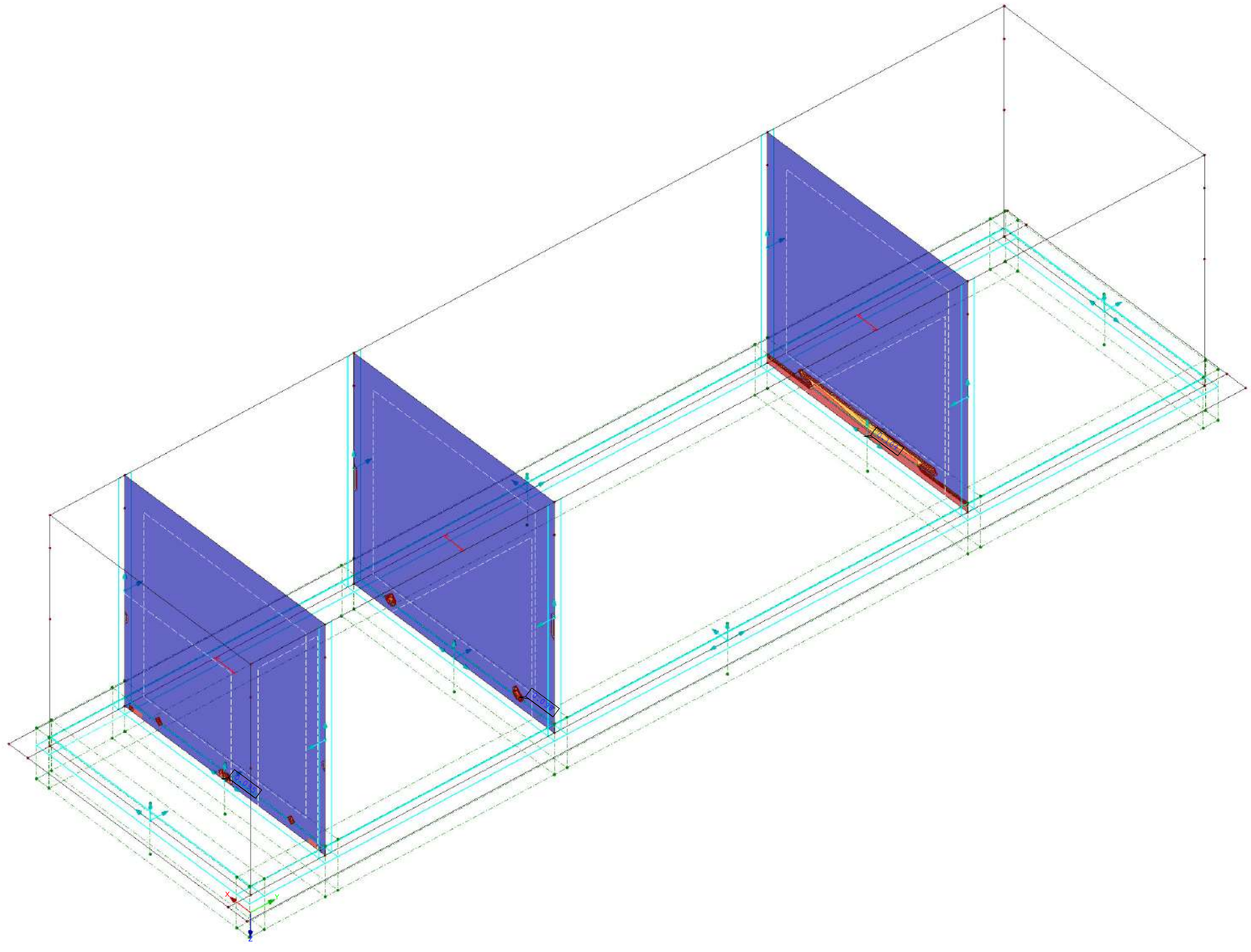


Max a-s,2,+z (bottom): 24.81, Min a-s,2,+z (bottom): 1.25 cm²/m

CRACK WIDTH $w_{k,1,-z\ (top)}$

RF-CONCRETE Surfaces CA4
Vidinės sienos
Crack width w-k,1,-z (top) [mm]
Values: w-k,1,-z (top) [mm]

Isometric

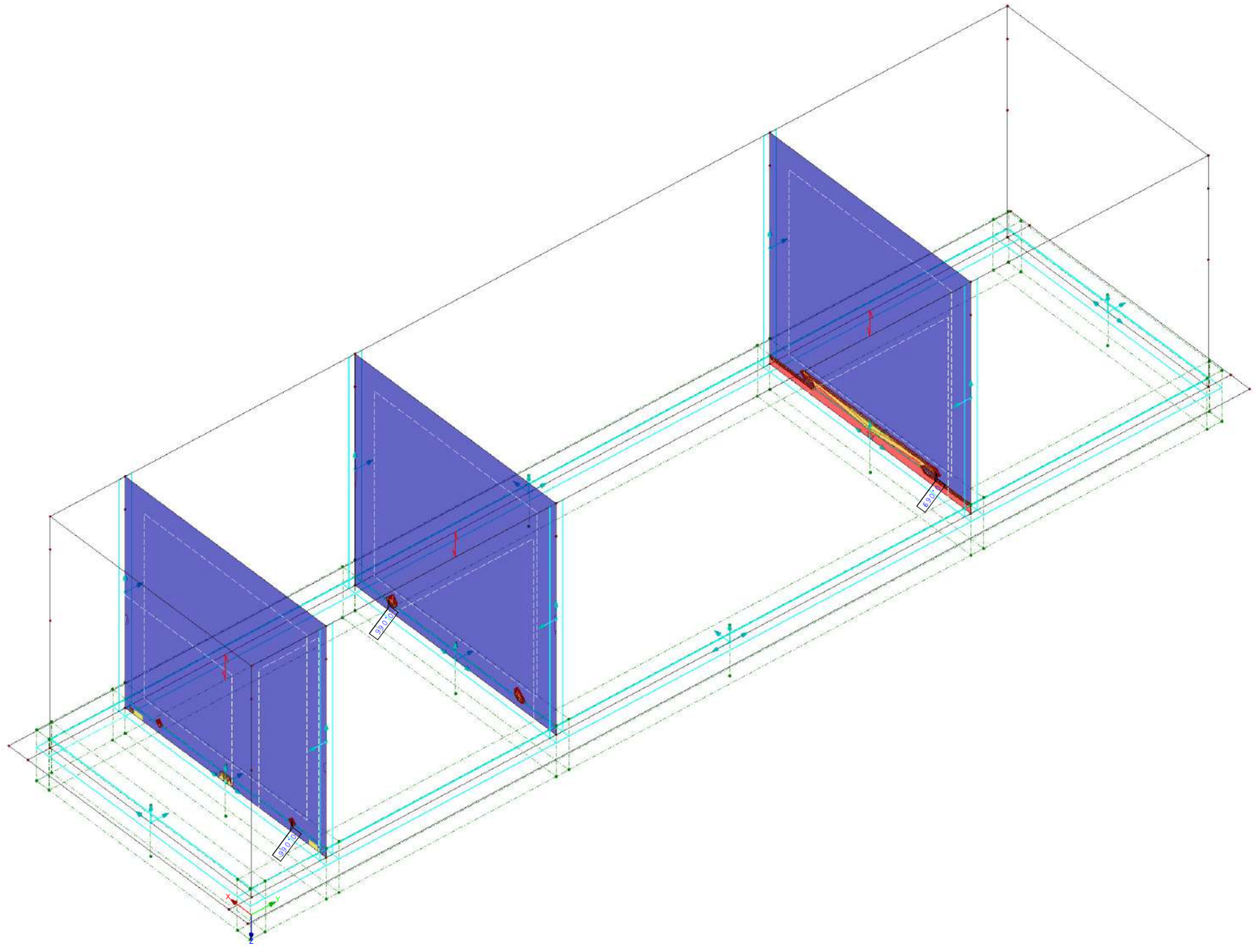


Max w-k,1,-z (top): 0.104, Min w-k,1,-z (top): 0.000 mm

CRACK WIDTH $w_{k,2,-z\ (top)}$

RF-CONCRETE Surfaces CA4
Vidinės sienos
Crack width w-k,2,-z (top) [mm]
Values: w-k,2,-z (top) [mm]

Isometric

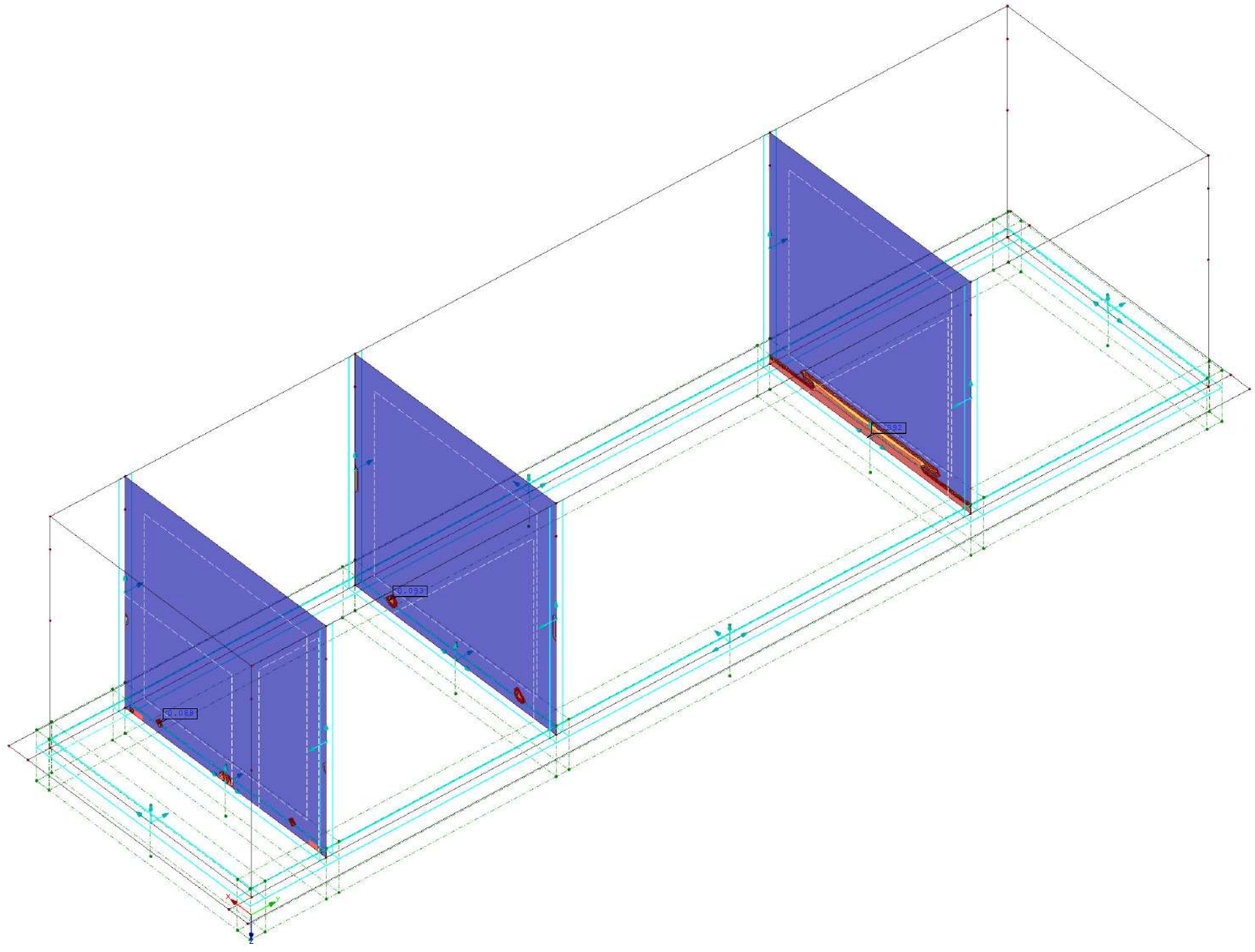


Max w-k,2,-z (top): 0.069, Min w-k,2,-z (top): 0.000 mm

CRACK WIDTH $w_{k,res,-z\ (top)}$

RF-CONCRETE Surfaces CA4
Vidinės sienos
Crack width w-k,res,-z (top) [mm]
Values: w-k,res,-z (top) [mm]

Isometric

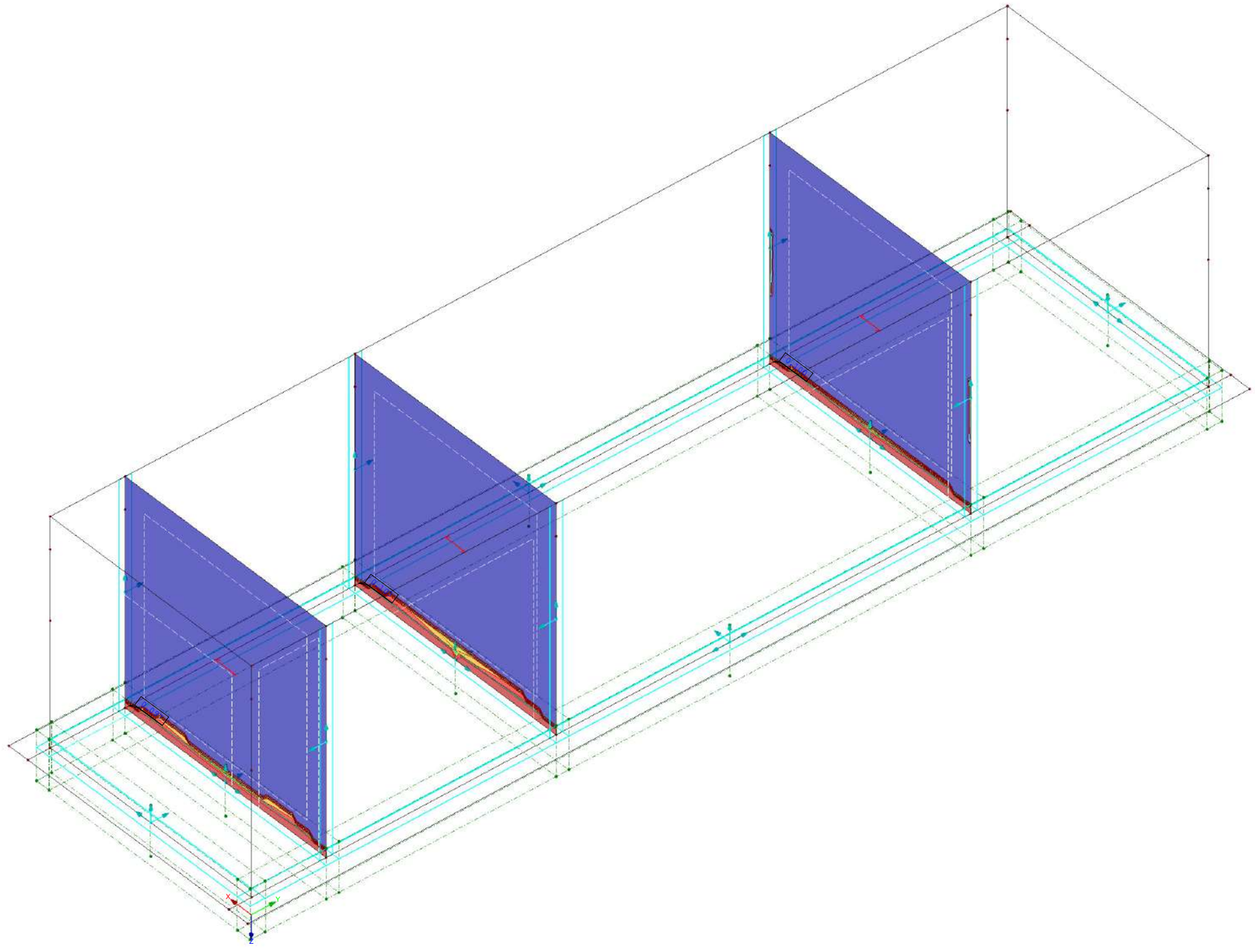


Max w-k,res,-z (top): 0.093, Min w-k,res,-z (top): 0.000 mm

CRACK WIDTH $w_{k,1,+z\ (bottom)}$

RF-CONCRETE Surfaces CA4
Vidinės sienos
Crack width w-k,1,+z (bottom) [mm]
Values: w-k,1,+z (bottom) [mm]

Isometric

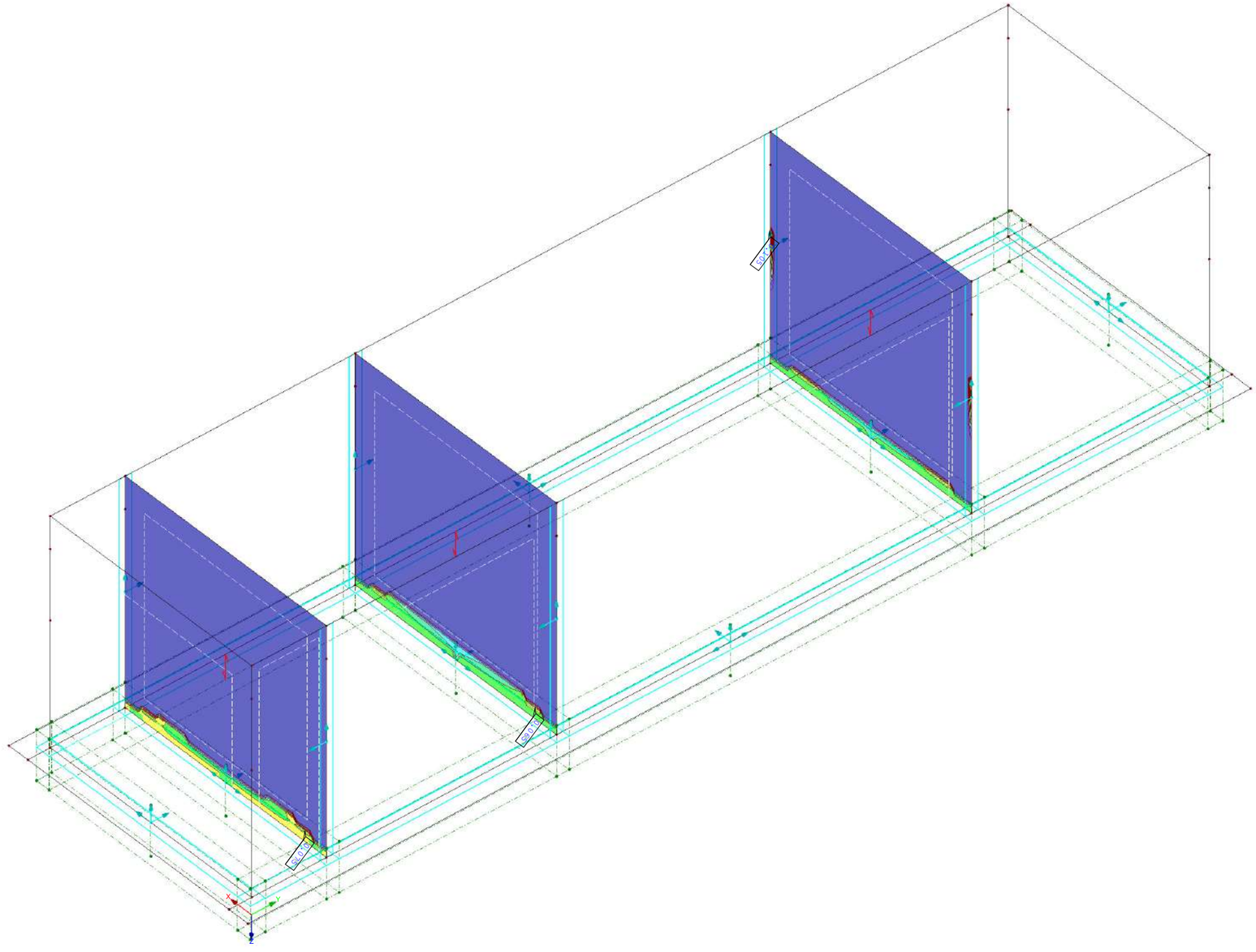


Max w-k,1,+z (bottom): 0.103, Min w-k,1,+z (bottom): 0.000 mm

CRACK WIDTH $w_{k,2,+z\ (bottom)}$

RF-CONCRETE Surfaces CA4
Vidinės sienos
Crack width w-k,2,+z (bottom) [mm]
Values: w-k,2,+z (bottom) [mm]

Isometric

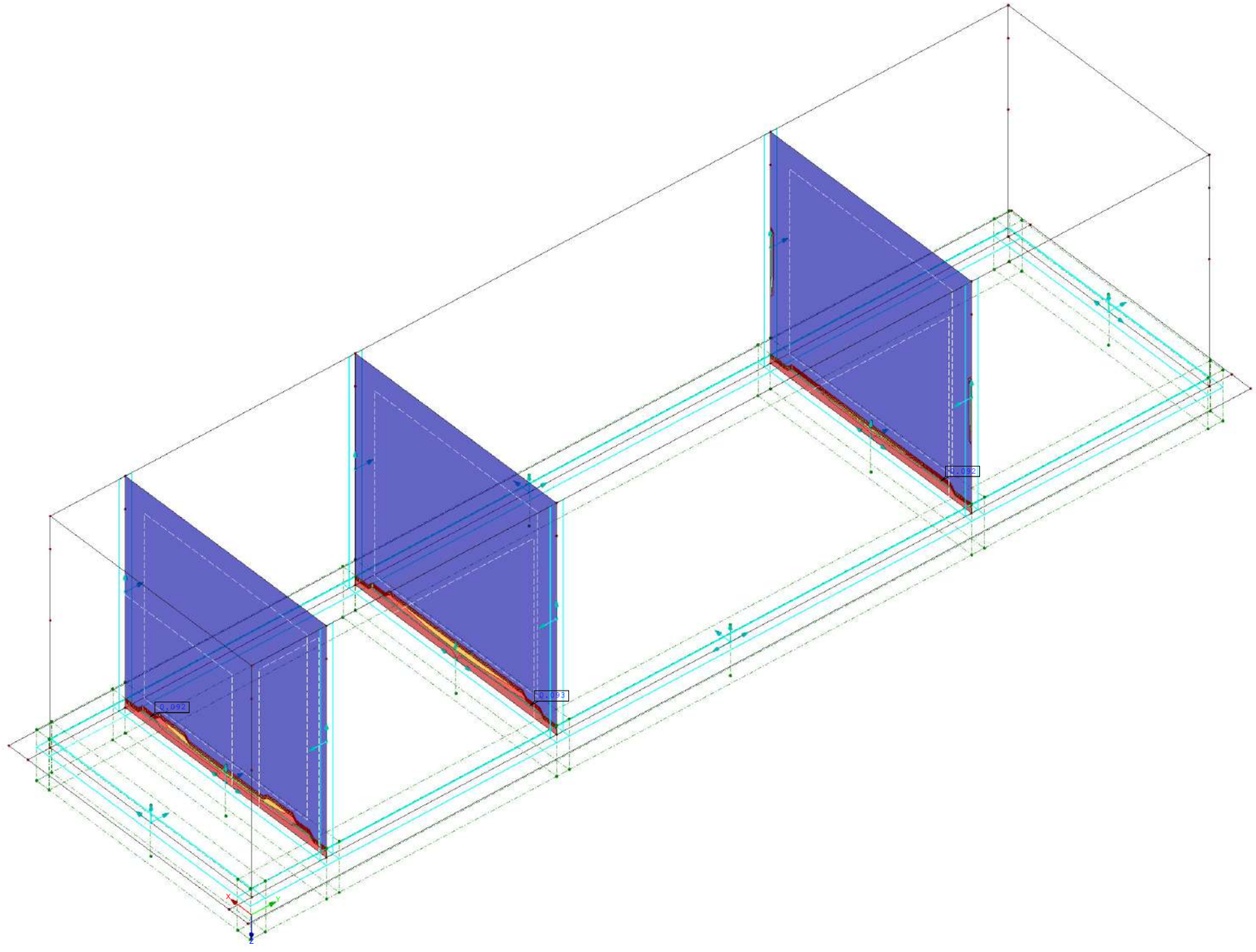


Max w-k,2,+z (bottom): 0.105, Min w-k,2,+z (bottom): 0.000 mm

CRACK WIDTH $w_{k,res,+z\ (bottom)}$

RF-CONCRETE Surfaces CA4
Vidinės sienos
Crack width w-k,res,+z (bottom) [mm]
Values: w-k,res,+z (bottom) [mm]

Isometric



Max w-k,res,+z (bottom): 0.093, Min w-k,res,+z (bottom): 0.000 mm

RF-SOILIN
CA1
Soil-structure
interaction analysis

1.1 GENERAL DATA

Surfaces to design	1,2,53-58	
Load combinations to design:	CO20	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
Standard:		EC7
Groundwater available		☒
Groundwater ordinate Z		0.000 m
Rock beneath the last layer		☐

1.2.1 DESCRIPTION OF MATERIALS

Soil No.	Soil Description	Specific Weight γ [kN/m³]	Specific Weight γ [kN/m³]	Modulus of Elasticity E_{def} [MN/m²]	Poisson's Ratio E_{def} [-]	Comment
1	Sand, Well-Graded (SW)	20.00	20.00	11.40	0.28	IGS-3
2	Silty Sand, Sand-Silt Mixture (SM)	20.00	20.50	31.00	0.31	IGS-4
3	Silty Sand, Sand-Silt Mixture (SM)	20.00	20.50	45.50	0.35	IGS-5
4	Silty Sand, Sand-Silt Mixture (SM)	20.00	20.50	78.80	0.30	IGS-6

1.2.2 - 1.2.3 SOIL SAMPLES AND SOIL LAYERS

Sample No.	Soil Sample Coordinates [m] X	Y	Z	Region No.	Soil	Thickness Δt [m]	Ordinate BL z [m]
2	-2.400	8.800	-0.340	-	1 - Sand, Well-Graded (SW)	0.800	0.800
					2 - Silty Sand, Sand-Silt Mixture (SM)	1.600	2.400
					3 - Silty Sand, Sand-Silt Mixture (SM)	2.100	4.500
					4 - Silty Sand, Sand-Silt Mixture (SM)	0.500	5.000
					3 - Silty Sand, Sand-Silt Mixture (SM)	1.000	6.000
					4 - Silty Sand, Sand-Silt Mixture (SM)	0.800	6.800

1.3 ADDITIONAL GEOLOGICAL REGIONS

Region No.	Region Shape	Additional Geological Region Coordinates [m] X_1 / X_c	Y_1 / Y_c	X_2 / R	Y_2	X_3	Y_3	X_4	Y_4	Number of Layers	Comment
-										6	

RF-SOILIN
CA1
Soil-structure
interaction analysis
RESULTS

2.1.1 STRESSES AND SETTLEMENTS

Grid Point	Surface No.	Grid Point Coordination [m] X	Y	Z	Excavation [m]	Contact Stress $\sigma_{z,0}$ [kN/m²]	Settlement $s_{z,0}$ [mm]	
1	55	-0.375	-0.375	-0.165	0.175	477.22	9.47	
2	58	2.125	-0.375	-0.165	0.175	227.59	8.80	
3	58	4.625	-0.375	-0.165	0.175	213.70	8.02	
4	55	-0.375	2.125	-0.165	0.175	402.76	11.47	
5	2	2.125	2.125	-0.165	0.175	67.78	7.30	
6	2	4.625	2.125	-0.165	0.175	72.89	7.85	
7	55	-0.375	4.625	-0.165	0.175	401.97	12.73	
8	2	2.125	4.625	-0.165	0.175	73.79	8.12	
9	2	4.625	4.625	-0.165	0.175	78.61	8.82	
10	55	-0.375	7.125	-0.165	0.175	501.01	14.23	
11	1	2.125	7.125	-0.165	0.175	78.38	8.67	
12	1	4.625	7.125	-0.165	0.175	84.41	9.48	
13	55	-0.375	9.625	-0.165	0.175	451.28	14.37	
14	1	2.125	9.625	-0.165	0.175	81.02	9.02	
15	1	4.625	9.625	-0.165	0.175	88.24	9.95	
16	55	-0.375	12.125	-0.165	0.175	539.49	15.36	
17	1	2.125	12.125	-0.165	0.175	82.45	9.22	
18	1	4.625	12.125	-0.165	0.175	90.04	10.19	
19	55	-0.375	14.625	-0.165	0.175	465.94	14.88	
20	54	2.125	14.625	-0.165	0.175	84.96	9.49	
21	54	4.625	14.625	-0.165	0.175	89.87	10.28	
22	55	-0.375	17.125	-0.165	0.175	513.94	14.74	
23	54	2.125	17.125	-0.165	0.175	88.55	9.55	
24	54	4.625	17.125	-0.165	0.175	90.01	9.99	

STRUCTURAL ANALYSIS

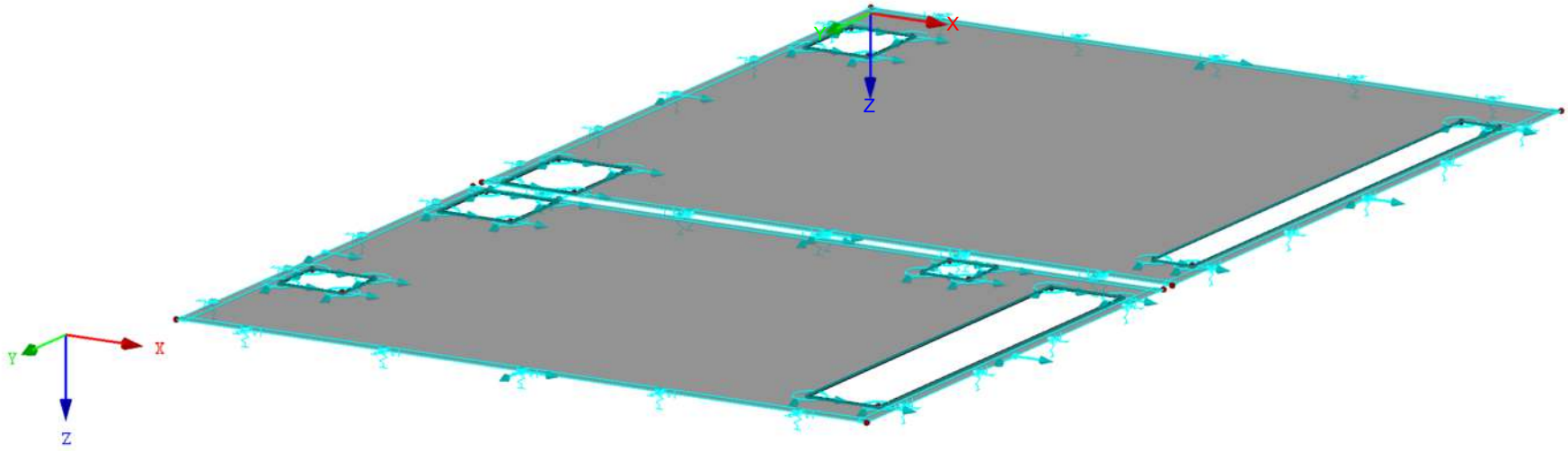
PROJECT

Perteklinių nuotekų talpa (04) ir perteklinio dumblo talpa (05);

CLIENT

CREATED BY

Isometric



MODEL - GENERAL DATA

General	Model name	:	SK23010_Dreverna_ (04, 05) statinys_ (talpos denginys) 23.08.08
	Project name	:	1
	Project description	:	1
	Type of model	:	3D
	Positive direction of global axis Z	:	Downward
	Classification of load cases and combinations	:	According to Standard: EN 1990 National Annex: LST - Lithuania
	☒ Automatically create combinations	:	☒ Load Combinations

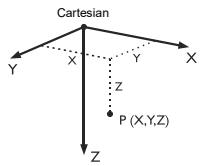
Options	☐	RF-FORM-FINDING - Find initial equilibrium shapes of membrane and cable structures
	☐	RF-CUTTING-PATTERN
	☐	Piping analysis
	☐	Use CQC Rule
	☐	Enable CAD/BIM model

Standard Gravity			
g	:	10.00 m/s²	

FE MESH SETTINGS

General	Target length of finite elements	l_{FE}	:	200 mm
	Maximum distance between a node and a line to integrate it into the line	ε	:	1 mm
	Maximum number of mesh nodes (in thousands)		:	500
Members	Number of divisions of members with cable, elastic foundation, taper, or plastic characteristic		:	10
	☒ Activate member divisions for large deformation or post-critical analysis			
	☒ Use division also for straight members, which are not integrated in surfaces, with		:	Target length LFE of finite elements
	Minimum number of member divisions		:	2
	☒ Use division for members with node lying on them			
Surfaces	Maximum ratio of FE rectangle diagonals	Δ_D	:	2
	Maximum out-of-plane inclination of two finite elements	α	:	0.50 °
	☒ Integrate also unutilized objects into surfaces			
	Shape direction of finite elements		:	Triangles and quadrangles ☒ Same squares where possible

1.1 NODES



Node No.	Node Type	Reference Node	Coordinate System	Node Coordinates X [mm]	Y [mm]	Z [mm]	Comment
3	Standard	-	Cartesian	8970	8850	0	
4	Standard	-	Cartesian	8970	8650	0	
79	Standard	-	Cartesian	-120	8850	0	
80	Standard	-	Cartesian	-120	8650	0	
147	Standard	-	Cartesian	-120	-220	0	
148	Standard	-	Cartesian	-120	15620	0	
149	Standard	-	Cartesian	8970	15620	0	

1.1 NODES

Node No.	Node Type	Reference Node	Coordinate System	Node Coordinates X [mm]	Y [mm]	Z [mm]	Comment
150	Standard	-	Cartesian	8970	-220	0	
151	Standard	-	Cartesian	125	653	0	
152	Standard	-	Cartesian	925	653	0	
153	Standard	-	Cartesian	925	1653	0	
154	Standard	-	Cartesian	125	1653	0	
155	Standard	-	Cartesian	8725	775	0	
156	Standard	-	Cartesian	8725	7775	0	
157	Standard	-	Cartesian	8225	7775	0	
158	Standard	-	Cartesian	8225	775	0	
159	Standard	-	Cartesian	8725	9425	0	
160	Standard	-	Cartesian	8725	14925	0	
161	Standard	-	Cartesian	7825	14925	0	
162	Standard	-	Cartesian	7825	9425	0	
163	Standard	-	Cartesian	6825	8975	0	
164	Standard	-	Cartesian	6825	9575	0	
165	Standard	-	Cartesian	6225	9575	0	
166	Standard	-	Cartesian	6225	8975	0	
167	Standard	-	Cartesian	1025	8975	0	
168	Standard	-	Cartesian	1025	9975	0	
169	Standard	-	Cartesian	125	9975	0	
170	Standard	-	Cartesian	125	8975	0	
171	Standard	-	Cartesian	925	12943	0	
172	Standard	-	Cartesian	925	13643	0	
173	Standard	-	Cartesian	125	13643	0	
174	Standard	-	Cartesian	125	12943	0	
175	Standard	-	Cartesian	1025	7325	0	
176	Standard	-	Cartesian	1025	8525	0	
177	Standard	-	Cartesian	125	8525	0	
178	Standard	-	Cartesian	125	7325	0	

1.2 LINES

Line No.	Line Type	Nodes No.	Line Length L [mm]		Comment
1	Polyline	3,79	9090	X	
2	Polyline	4,80	9090	X	
87	Polyline	4,150	8870	Y	
90	Polyline	79,148	6770	Y	
144	Polyline	147,80	8870	Y	
145	Polyline	148,149	9090	X	
146	Polyline	149,3	6770	Y	
147	Polyline	150,147	9090	X	
148	Polyline	151,152	800	X	
149	Polyline	152,153	1000	Y	
150	Polyline	153,154	800	X	
151	Polyline	154,151	1000	Y	
152	Polyline	155,156	7000	Y	
153	Polyline	156,157	500	X	
154	Polyline	157,158	7000	Y	
155	Polyline	158,155	500	X	
156	Polyline	159,160	5500	Y	
157	Polyline	160,161	900	X	
158	Polyline	161,162	5500	Y	
159	Polyline	162,159	900	X	
160	Polyline	163,164	600	Y	
161	Polyline	164,165	600	X	

1.2 LINES

Line No.	Line Type	Nodes No.	Line Length L [mm]		Comment
162	Polyline	165,166	600	Y	
163	Polyline	166,163	600	X	
164	Polyline	167,168	1000	Y	
165	Polyline	168,169	900	X	
166	Polyline	169,170	1000	Y	
167	Polyline	170,167	900	X	
168	Polyline	171,172	700	Y	
169	Polyline	172,173	800	X	
170	Polyline	173,174	700	Y	
171	Polyline	174,171	800	X	
172	Polyline	175,176	1200	Y	
173	Polyline	176,177	900	X	
174	Polyline	177,178	1200	Y	
175	Polyline	178,175	900	X	

1.3 MATERIALS

Matl. No.	Modulus E [kN/cm²]	Modulus G [kN/cm²]	Poisson's Ratio ν [-]	Spec. Weight γ [kN/m³]	Coeff. of Th. Exp. α [1/°C]	Partial Factor γ_M [-]	Material Model
4	Concrete C35/45 | EN 1992-1-1:2004/A1:2014						
	3400.00	1416.67	0.200	25.00	1.00E-05	1.00	Isotropic Linear Elastic

1.4 SURFACES

Surface No.	Surface Type Geometry	Surface Type Stiffness	Boundary Lines No.	Matl. No.	Thickness Type	Thickness d [mm]	Area A [mm²]	Weight W [kg]
5	Plane	Standard	144,2,87,147	4	Constant	200.0	75248300	37624.10
6	Plane	Standard	90,145,146,1	4	Constant	200.0	54769300	27384.70

1.4.2 SURFACES - INTEGRATED OBJECTS

Surface No.	Integrated Objects No. Nodes	Lines	Openings	Comment
5			23,24,29	
6			25-28	

1.6 OPENINGS

Opening No.	Boundary Lines No.	In Surface No.	Area A [mm²]	Comment
23	148-151	5	800000	
24	152-155	5	3500000	
25	156-159	6	4949997	
26	160-163	6	360000	
27	164-167	6	900000	
28	168-171	6	560000	
29	172-175	5	1080000	

1.8 LINE SUPPORTS

Support No.	Lines No.	Reference System	Rotation β [°]	Wall in Z	Support Conditions C_{ux}	C_{uy}	C_{uz}	φ_x	φ_y	φ_z
1	1,2,87,90,144-147	Local		☐	Spring	Spring	Ineffective	☐	☐	☐

1.8.2 LINE SUPPORTS - SPRINGS

Support No.	Lines No.	Translation Spring [kN/m²] $C_{u,X'}$	$C_{u,Y'}$	$C_{u,Z'}$	Rotation Spring [kNm/rad/m] $C_{\varphi,X'}$	$C_{\varphi,Y'}$	$C_{\varphi,Z'}$
1	1,2,87,90,144-147	1.000	1.000	1734690.000	-	-	-

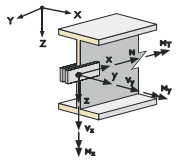
1.8.3 LINE SUPPORTS - INEFFECTIVE

Support No.	Lines No.	Ineffective Support Under [kN/m²] $u_{X'}$	$u_{Y'}$	$u_{Z'}$	Comment
1	1,2,87,90,144-147	-	-	Failure if -P	

1.13 CROSS-SECTIONS

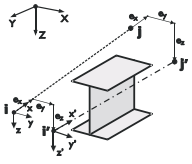
Section No.	Matl. No.	J [cm⁴] / A [cm²]	I_y [cm⁴] / A_y [cm²]	I_z [cm⁴] / A_z [cm²]	Principal Axes α [°]	Rotation α' [°]	Overall Dimensions [mm] Width b	Height h
19	Rectangle 400/400							
	4	360106.66	213333.34	213333.34	0.00	0.00	400.0	400.0
		1600.00	1333.33	1333.33				

1.14 MEMBER HINGES



Release No.	Reference System	Axial/Shear Release or Spring[kN/m] u_x	u_y	u_z	Moment Release or Spring[kNm/rad] φ_x	φ_y	φ_z	Comment
1	Local x,y,z	☐	☐	☐	☐	☐	☒	
2	Local x,y,z	☒	☒	☐	☒	☒	☒	
3	Local x,y,z	☐	☐	☐	☒	☒	☒	
4	Local x,y,z	☐	☐	☐	☐	☒	☒	
5	Local x,y,z	☐	☐	☐	☒	☒	☒	
6	Local x,y,z	☒	☐	☐	☒	☒	☒	
7	Local x,y,z	☐	☐	☐	☐	☐	☒	
8	Local x,y,z	☒	☐	☐	☒	☒	☒	

1.15/1 MEMBER ECCENTRICITIES - ABSOLUTE



Ecc. No.	Reference System	Member Start - Eccentricity [mm] $e_{i,x}$, $e_{i,X}$	$e_{i,y}$, $e_{i,Y}$	$e_{i,z}$, $e_{i,Z}$	Member End - Eccentricity $e_{j,x}$, $e_{j,X}$	$e_{j,y}$, $e_{j,Y}$	$e_{j,z}$, $e_{j,Z}$	Member hinge location Member Start	Member End
2	Global	0.0	0.0	0.0	0.0	0.0	100.0	at member	at member
3	Local	0.0	0.0	0.0	0.0	0.0	0.0	at member	at member
5	Local	250.0	0.0	0.0	0.0	0.0	0.0	at member	at member
6	Local	250.0	0.0	0.0	0.0	0.0	0.0	at member	at member
7	Local	0.0	0.0	0.0	0.0	0.0	0.0	at member	at member
10	Local	250.0	0.0	0.0	0.0	0.0	0.0	at member	at member
11	Local	0.0	0.0	0.0	-100.0	0.0	0.0	at member	at member

1.15/1 MEMBER ECCENTRICITIES - ABSOLUTE

Ecc. No.	Reference System	Member Start - Eccentricity [mm] $e_{i,x}$, $e_{i,X}$	$e_{i,y}$, $e_{i,Y}$	$e_{i,z}$, $e_{i,Z}$	Member End - Eccentricity $e_{j,x}$, $e_{j,X}$	$e_{j,y}$, $e_{j,Y}$	$e_{j,z}$, $e_{j,Z}$	Member hinge location Member Start	Member End
22	Local	0.0	0.0	0.0	-100.0	0.0	0.0	at member	at member
25	Global	0.0	0.0	0.0	0.0	0.0	120.0	at member	at member
29	Global	0.0	0.0	0.0	0.0	0.0	0.0	at member	at member

1.15/2 MEMBER ECCENTRICITIES - RELATIVE

Ecc. No.	Cross-Section Alignment y-Axis	z-Axis	Transverse offset from cross-section of another obj. Object Type	Object No.	y-Axis	z-Axis	Axial offset from adjacent Member Sta	Member End
2	Middle	Middle	None	0	Middle	Middle	☐	☐
3	Middle	Top (-z)	None	0	Middle	Top (-z)	☐	☐
5	Left (-y)	Middle	None	0	Left (-y)	Middle	☐	☐
6	Middle	Bottom (+z)	None	0	Middle	Bottom (+z)	☐	☐
7	Middle	Bottom (+z)	None	0	Middle	Bottom (+z)	☐	☐
10	Right (+y)	Middle	None	0	Right (+y)	Middle	☐	☐
11	Right (+y)	Middle	None	0	Right (+y)	Middle	☐	☐
22	Middle	Middle	None	0	Middle	Middle	☐	☐
25	Middle	Middle	None	0	Middle	Middle	☐	☐
29	Middle	Middle	None	0	Middle	Middle	☐	☐

1.25 LINE RELEASE TYPES

Release No.	Axial/Shear Release or Spring [kN/m²] u_x	u_y	u_z	Moment Release or Spring φ_x [kNm/rad/m]	Comment
1	☒	☒	Fixed if positive v_z	☒	
2	☒	☒	☐	☒	
3	☒	☒	Fixed if negative v_z	☒	

2.1 LOAD CASES

Load Case	Load Case Description	EN 1990 | LST Action Category	Self-Weight - Factor in Direction Active	X	Y	Z
LC1	[G]	Permanent	☐			
LC2	[Tv]	Temperature (non fire)	☐			
LC3	[Tp]	Temperature (non fire)	☐			
LC4	[S]	Snow / ice	☐			
LC5	[N]	Imposed - Category A: domestic, residential areas	☐			

2.1.1 LOAD CASES - CALCULATION PARAMETERS

Load Case	Load Case Description	Calculation Parameters		
LC1	[G]	Method of analysis	: ⊙	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	: ⊙	Newton-Raphson
LC2	[Tv]	Method of analysis	: ⊙	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	: ⊙	Newton-Raphson
		Activate stiffness factors of:	: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)

2.1.1 LOAD CASES - CALCULATION PARAMETERS

Load Case	Load Case Description	Calculation Parameters		
LC3	[Tþ]	Method of analysis	: ⊙	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	: ⊙	Newton-Raphson
		Activate stiffness factors of:	: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC4	[S]	Method of analysis	: ⊙	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	: ⊙	Newton-Raphson
LC5	[N]	Method of analysis	: ⊙	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	: ⊙	Newton-Raphson
		Activate stiffness factors of:	: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)

2.5 LOAD COMBINATIONS

Load Combin.	DS	Load Combination Description	No.	Factor	Load Case	
CO1	STR	1.35*LC1	1	1.35	LC1	[G]
CO2	STR	1.35*LC1 + 1.3*LC2	1	1.35	LC1	[G]
			2	1.30	LC2	[Tv]
CO3	STR	1.35*LC1 + 1.3*LC3	1	1.35	LC1	[G]
			2	1.30	LC3	[Tþ]
CO4	STR	1.35*LC1 + 1.3*LC3 + 0.91*LC4	1	1.35	LC1	[G]
			2	1.30	LC3	[Tþ]
			3	0.91	LC4	[S]
CO5	STR	1.35*LC1 + 1.3*LC3 + 0.91*LC4 + 0.91*LC5	1	1.35	LC1	[G]
			2	1.30	LC3	[Tþ]
			3	0.91	LC4	[S]
			4	0.91	LC5	[N]
CO6	STR	1.35*LC1 + 1.3*LC2 + 0.91*LC5	1	1.35	LC1	[G]
			2	1.30	LC2	[Tv]
			3	0.91	LC5	[N]
CO7	STR	1.35*LC1 + 1.3*LC3 + 0.91*LC5	1	1.35	LC1	[G]
			2	1.30	LC3	[Tþ]
			3	0.91	LC5	[N]
CO8	STR	1.35*LC1 + 1.3*LC4	1	1.35	LC1	[G]
			2	1.30	LC4	[S]
CO9	STR	1.35*LC1 + 0.78*LC3 + 1.3*LC4	1	1.35	LC1	[G]
			2	0.78	LC3	[Tþ]
			3	1.30	LC4	[S]
CO10	STR	1.35*LC1 + 0.78*LC3 + 1.3*LC4 + 0.91*LC5	1	1.35	LC1	[G]
			2	0.78	LC3	[Tþ]
			3	1.30	LC4	[S]
			4	0.91	LC5	[N]
CO11	STR	1.35*LC1 + 1.3*LC4 + 0.91*LC5	1	1.35	LC1	[G]
			2	1.30	LC4	[S]
			3	0.91	LC5	[N]
CO12	S Ch	LC1	1	1.00	LC1	[G]
CO13	S Ch	LC1 + LC2	1	1.00	LC1	[G]
			2	1.00	LC2	[Tv]
CO14	S Ch	LC1 + LC3	1	1.00	LC1	[G]
			2	1.00	LC3	[Tþ]
CO15	S Ch	LC1 + LC3 + 0.7*LC4	1	1.00	LC1	[G]
			2	1.00	LC3	[Tþ]

2.5 LOAD COMBINATIONS

Load Combin.	DS	Load Combination Description	No.	Factor	Load Case	
			3	0.70	LC4	[S]
CO16	S Ch	LC1 + LC3 + 0.7*LC4 + 0.7*LC5	1	1.00	LC1	[G]
			2	1.00	LC3	[Tþ]
			3	0.70	LC4	[S]
			4	0.70	LC5	[N]
CO17	S Ch	LC1 + LC2 + 0.7*LC5	1	1.00	LC1	[G]
			2	1.00	LC2	[Tv]
			3	0.70	LC5	[N]
CO18	S Ch	LC1 + LC3 + 0.7*LC5	1	1.00	LC1	[G]
			2	1.00	LC3	[Tþ]
			3	0.70	LC5	[N]
CO19	S Ch	LC1 + LC4	1	1.00	LC1	[G]
			2	1.00	LC4	[S]
CO20	S Ch	LC1 + 0.6*LC3 + LC4	1	1.00	LC1	[G]
			2	0.60	LC3	[Tþ]
			3	1.00	LC4	[S]
CO21	S Ch	LC1 + 0.6*LC3 + LC4 + 0.7*LC5	1	1.00	LC1	[G]
			2	0.60	LC3	[Tþ]
			3	1.00	LC4	[S]
			4	0.70	LC5	[N]
CO22	S Ch	LC1 + LC4 + 0.7*LC5	1	1.00	LC1	[G]
			2	1.00	LC4	[S]
			3	0.70	LC5	[N]
CO23	S Fr	LC1	1	1.00	LC1	[G]
CO24	S Fr	LC1 + 0.5*LC2	1	1.00	LC1	[G]
			2	0.50	LC2	[Tv]
CO25	S Fr	LC1 + 0.5*LC3	1	1.00	LC1	[G]
			2	0.50	LC3	[Tþ]
CO26	S Fr	LC1 + 0.5*LC3 + 0.2*LC4	1	1.00	LC1	[G]
			2	0.50	LC3	[Tþ]
			3	0.20	LC4	[S]
CO27	S Fr	LC1 + 0.5*LC3 + 0.2*LC4 + 0.3*LC5	1	1.00	LC1	[G]
			2	0.50	LC3	[Tþ]
			3	0.20	LC4	[S]
			4	0.30	LC5	[N]
CO28	S Fr	LC1 + 0.5*LC2 + 0.3*LC5	1	1.00	LC1	[G]
			2	0.50	LC2	[Tv]
			3	0.30	LC5	[N]
CO29	S Fr	LC1 + 0.5*LC3 + 0.3*LC5	1	1.00	LC1	[G]
			2	0.50	LC3	[Tþ]
			3	0.30	LC5	[N]
CO30	S Fr	LC1 + 0.5*LC4	1	1.00	LC1	[G]
			2	0.50	LC4	[S]
CO31	S Fr	LC1 + 0.5*LC4 + 0.3*LC5	1	1.00	LC1	[G]
			2	0.50	LC4	[S]
			3	0.30	LC5	[N]
CO32	S Qp	LC1	1	1.00	LC1	[G]
CO33	S Qp	LC1 + 0.2*LC4	1	1.00	LC1	[G]
			2	0.20	LC4	[S]
CO34	S Qp	LC1 + 0.2*LC4 + 0.3*LC5	1	1.00	LC1	[G]
			2	0.20	LC4	[S]
			3	0.30	LC5	[N]
CO35	S Qp	LC1 + 0.3*LC5	1	1.00	LC1	[G]
			2	0.30	LC5	[N]

2.5.2 LOAD COMBINATIONS - CALCULATION PARAMETERS

Load Combin.	Description	Calculation Parameters
CO1	1.35*LC1	Method of analysis : ◉ Geometrically linear analysis 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 Activate stiffness factors of: : ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO2	1.35*LC1 + 1.3*LC2	Method of analysis : ◉ Geometrically linear analysis 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 Activate stiffness factors of: : ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO3	1.35*LC1 + 1.3*LC3	Method of analysis : ◉ Geometrically linear analysis 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 Activate stiffness factors of: : ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO4	1.35*LC1 + 1.3*LC3 + 0.91*LC4	Method of analysis : ◉ Geometrically linear analysis 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 Activate stiffness factors of: : ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO5	1.35*LC1 + 1.3*LC3 + 0.91*LC4 + 0.91*LC5	Method of analysis : ◉ Geometrically linear analysis 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 Activate stiffness factors of: : ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO6	1.35*LC1 + 1.3*LC2 + 0.91*LC5	Method of analysis : ◉ Geometrically linear analysis 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 Activate stiffness factors of: : ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO7	1.35*LC1 + 1.3*LC3 + 0.91*LC5	Method of analysis : ◉ Geometrically linear analysis 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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO8	1.35*LC1 + 1.3*LC4	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO9	1.35*LC1 + 0.78*LC3 + 1.3*LC4	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO10	1.35*LC1 + 0.78*LC3 + 1.3*LC4 + 0.91*LC5	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO11	1.35*LC1 + 1.3*LC4 + 0.91*LC5	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO12	LC1	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO13	LC1 + LC2	Method of analysis	: ◉ Geometrically linear analysis
		Options	: ☒ Consider favorable effects due to tension : ☒ Refer internal forces to deformed system for:

2.5.2 LOAD COMBINATIONS - CALCULATION PARAMETERS

Load Combin.	Description	Calculation Parameters	
			☒ Normal forces N ☒ Shear forces V_y and V_z ☒ Moments M_y, M_z and M_T
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO14	LC1 + LC3	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ 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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO15	LC1 + LC3 + 0.7*LC4	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ 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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO16	LC1 + LC3 + 0.7*LC4 + 0.7*LC5	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ 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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO17	LC1 + LC2 + 0.7*LC5	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ 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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO18	LC1 + LC3 + 0.7*LC5	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ 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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO19	LC1 + LC4	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ Consider favorable effects due to tension : ☒ Refer internal forces to deformed system for: ☒ Normal forces N

2.5.2 LOAD COMBINATIONS - CALCULATION PARAMETERS

Load Combin.	Description	Calculation Parameters	
			☒ Shear forces V_y and V_z
			☒ Moments M_y, M_z and M_T
		Activate stiffness factors of:	: ☒ Materials (partial factor γM)
			: ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO20	LC1 + 0.6*LC3 + LC4	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM)
			: ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO21	LC1 + 0.6*LC3 + LC4 + 0.7*LC5	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM)
			: ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO22	LC1 + LC4 + 0.7*LC5	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM)
			: ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO23	LC1	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM)
			: ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO24	LC1 + 0.5*LC2	Method of analysis	: ◉ Geometrically linear analysis
		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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM)
			: ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO25	LC1 + 0.5*LC3	Method of analysis	: ◉ Geometrically linear analysis
		Options	: ☒ Consider favorable effects due to tension
			: ☒ Refer internal forces to deformed system for:
			☒ Normal forces N
			☒ Shear forces V_y and V_z

2.5.2 LOAD COMBINATIONS - CALCULATION PARAMETERS

Load Combin.	Description	Calculation Parameters	
			☒ Moments M_y, M_z and M_T
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO26	LC1 + 0.5*LC3 + 0.2*LC4	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ 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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO27	LC1 + 0.5*LC3 + 0.2*LC4 + 0.3*LC5	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ 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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO28	LC1 + 0.5*LC2 + 0.3*LC5	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ 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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO29	LC1 + 0.5*LC3 + 0.3*LC5	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ 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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO30	LC1 + 0.5*LC4	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ 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
		Activate stiffness factors of:	: ☒ Materials (partial factor γM) : ☒ Cross-sections (factor for J, I_y, I_z, A, A_y, A_z) : ☒ Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO31	LC1 + 0.5*LC4 + 0.3*LC5	Method of analysis Options	: ◉ Geometrically linear analysis : ☒ 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

2.5.2 LOAD COMBINATIONS - CALCULATION PARAMETERS

Load Combin.	Description	Calculation Parameters		
		Activate stiffness factors of:	: ☒	Materials (partial factor γM)
			: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO32	LC1	Method of analysis	: ⊙	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	: ⊙	Picard
		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
		Activate stiffness factors of:	: ☒	Materials (partial factor γM)
			: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO33	LC1 + 0.2*LC4	Method of analysis	: ⊙	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	: ⊙	Picard
		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
		Activate stiffness factors of:	: ☒	Materials (partial factor γM)
			: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO34	LC1 + 0.2*LC4 + 0.3*LC5	Method of analysis	: ⊙	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	: ⊙	Picard
		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
		Activate stiffness factors of:	: ☒	Materials (partial factor γM)
			: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO35	LC1 + 0.3*LC5	Method of analysis	: ⊙	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	: ⊙	Picard
		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
		Activate stiffness factors of:	: ☒	Materials (partial factor γM)
			: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)

2.7 RESULT COMBINATIONS

Result Combin	Description	Loading
RC1	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	CO1/p or to CO11
RC2	SLS - Characteristic	CO12/p or to CO22
RC3	SLS - Frequent	CO23/p or to CO31
RC4	SLS - Quasi-permanent	CO32/p or to CO35

LC1
[G]

3.4 SURFACE LOADS

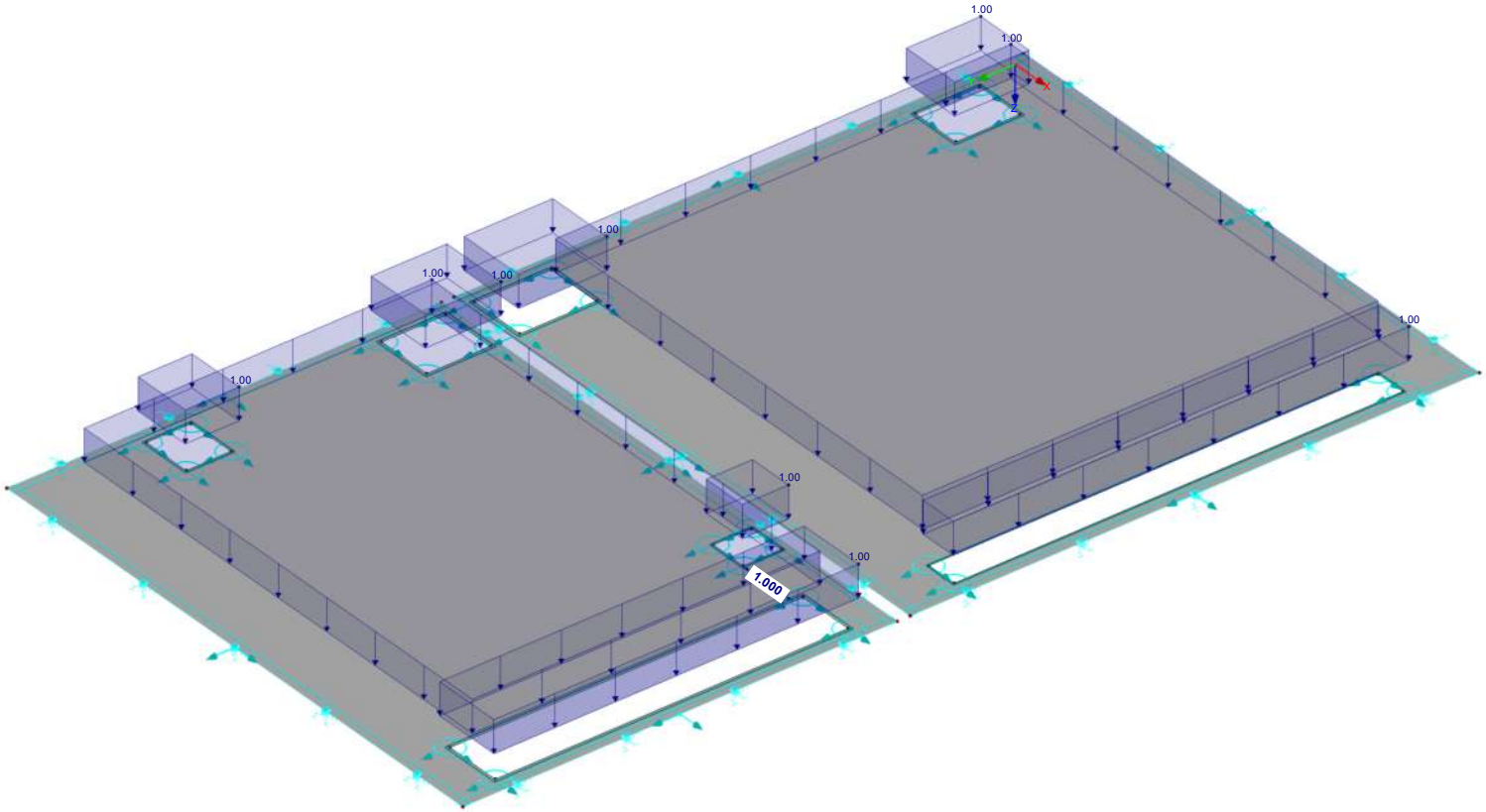
LC1: [G]

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	5,6	Force	Uniform	ZL	p	1.00	kN/m²

LC1: [G]

LC1 : [G]
Loads [kN/m^2]

Isometric



LC2
[Tv]

3.4 SURFACE LOADS

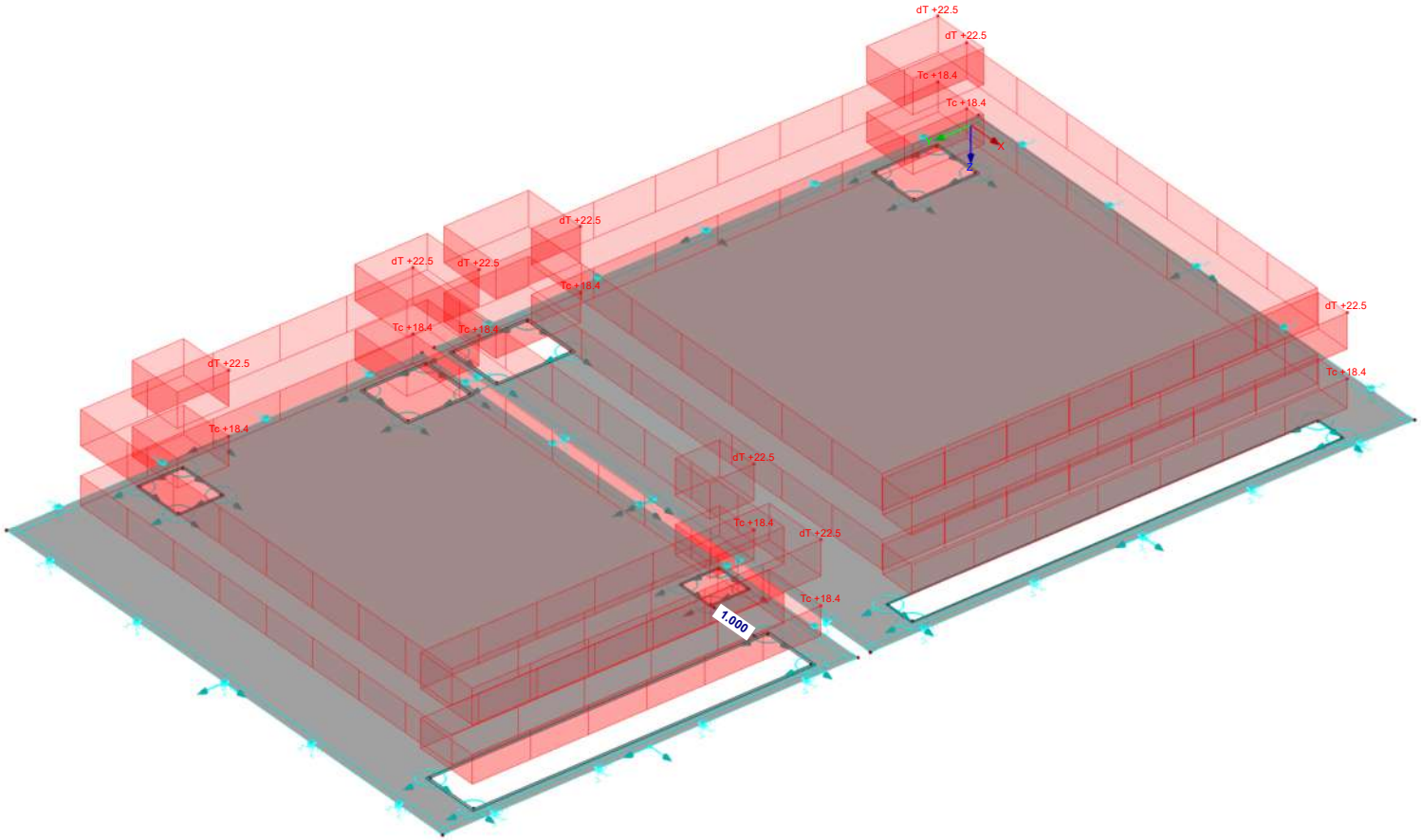
LC2: [Tv]

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	5,6	Temperature	Uniform		T_c	18.4	°C
					ΔT	22.5	°C

LC2: [TV]

LC2 : [Tv]
Loads [°C]

Isometric



LC3
[Tþ]

3.4 SURFACE LOADS

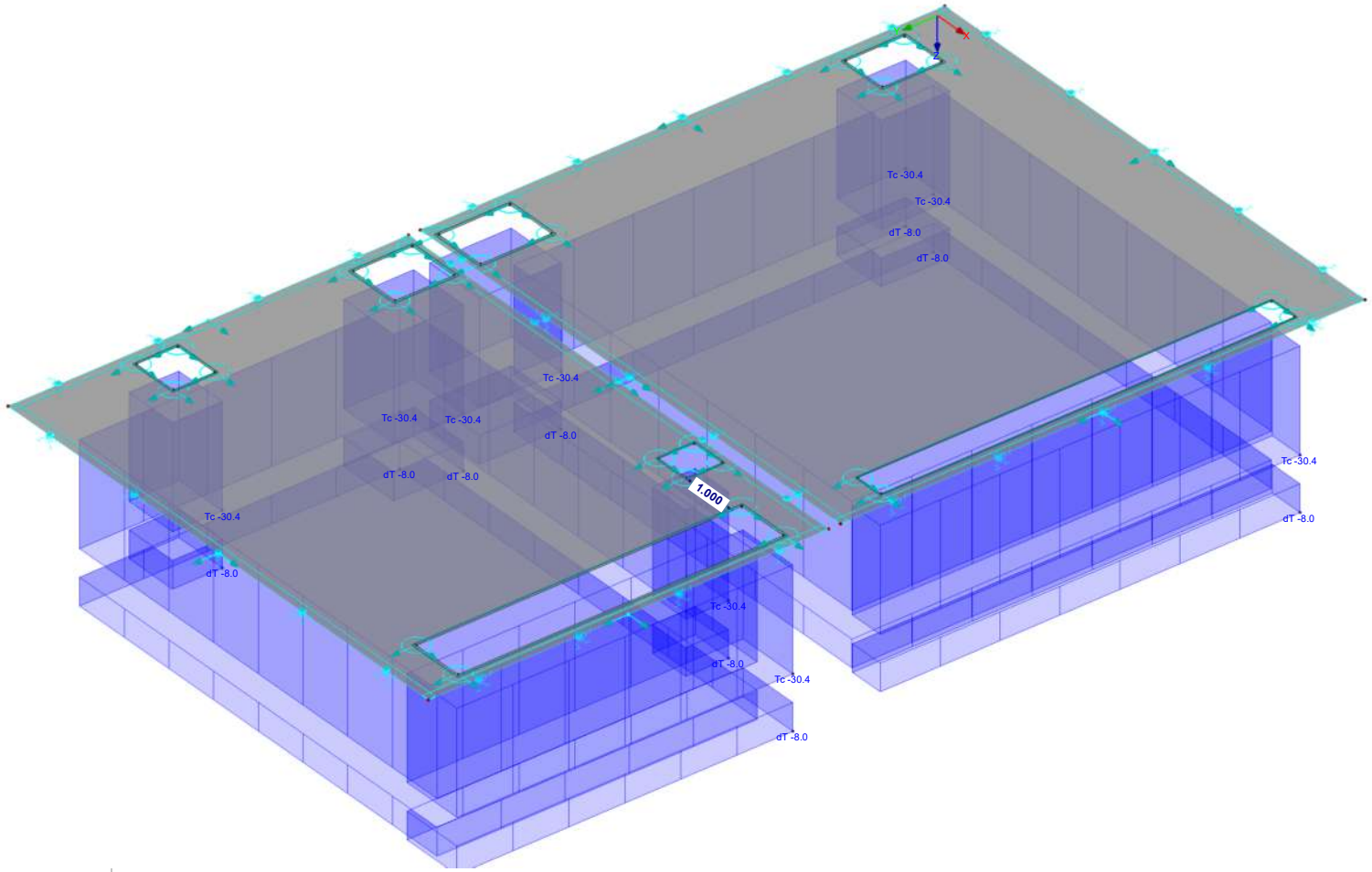
LC3: [Tþ]

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	5,6	Temperature	Uniform		T_c	-30.4	°C
					ΔT	-8.0	°C

LC3: [TÞ]

LC3 : [Tž]
Loads [°C]

Isometric



LC4
[S]

3.4 SURFACE LOADS

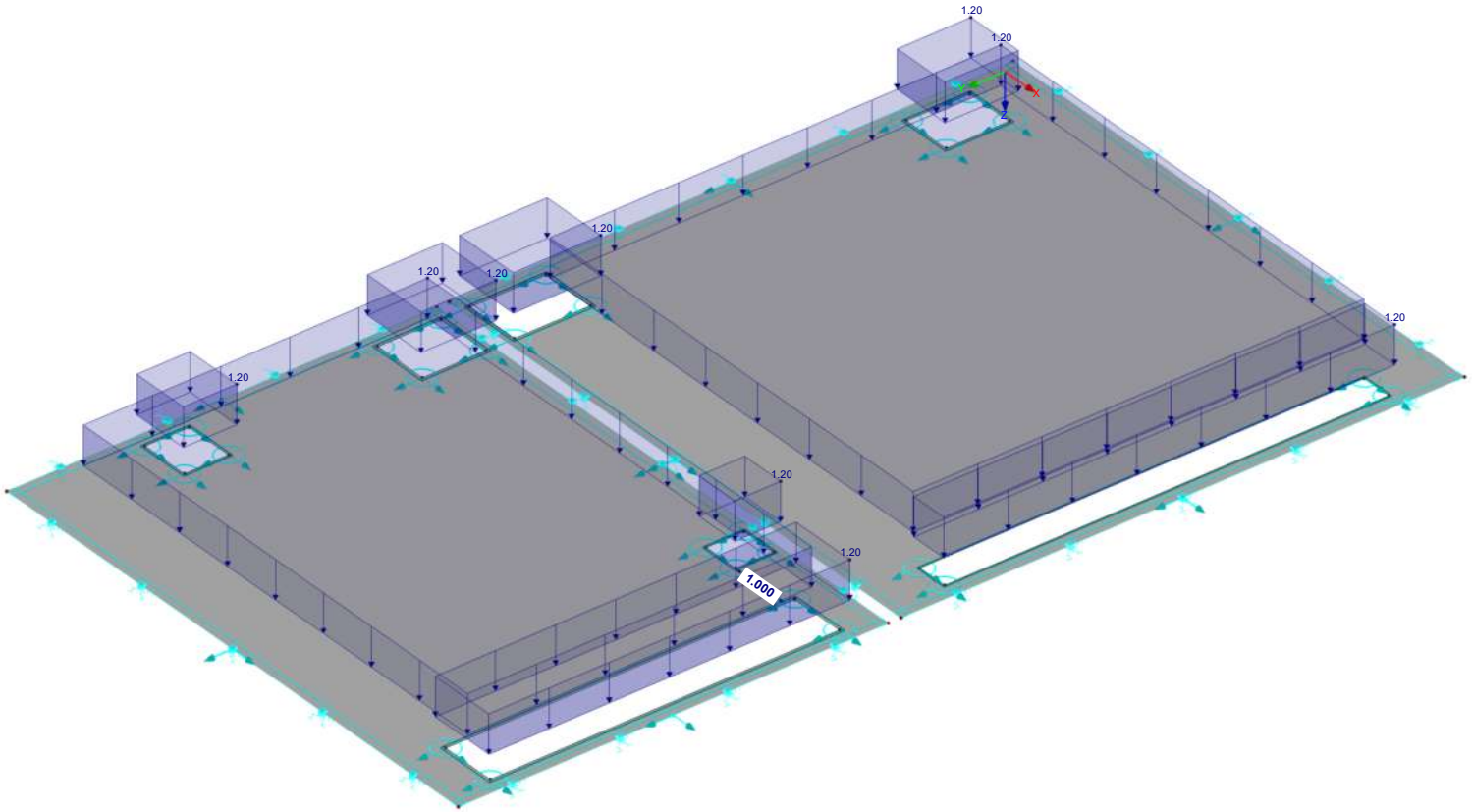
LC4: [S]

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	5,6	Force	Uniform	ZL	p	1.20	kN/m²

LC4: [S]

LC4 : [S]
Loads [kN/m], [kN/m^2]

Isometric



LC5
[N]

3.4 SURFACE LOADS

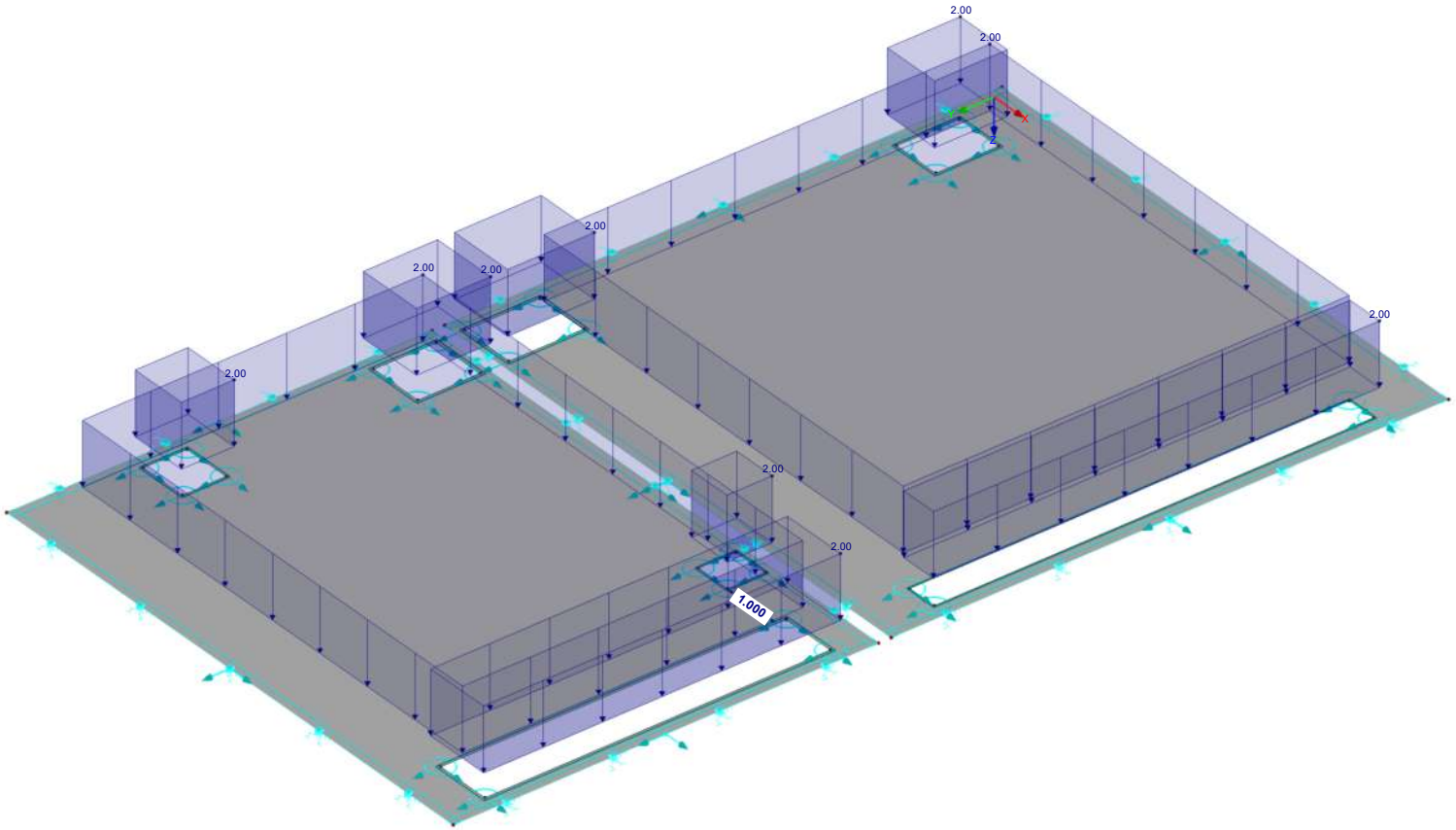
LC5: [N]

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	5,6	Force	Uniform	ZL	p	2.00	kN/m²

LC5: [N]

LC5 : [N]
Loads [kN/m^2]

Isometric



4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
Load Combination CO1 - 1.35*LC1				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	175.52	kN	
	Sum of support reactions in Z	175.52	kN	Deviation 0.00%
	Resultant of reactions about X	0.00	kNm	At center of gravity of model (X:4263.01, Y:7604.83, Z:0.00 mm)
	Resultant of reactions about Y	0.00	kNm	At center of gravity of model
	Resultant of reactions about Z	0.00	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	2.6	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. vector displacement	2.6	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. rotation about X	-0.9	mrad	FE Mesh Node No. 73 (X: 5536, Y: 8650, Z: 0 mm)
	Max. rotation about Y	0.8	mrad	FE Mesh Node No. 211 (X: 8725, Y: 3575, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 775, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	10		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	1.219E+180459		
	Infinity Norm	4.397E+10		
Load Combination CO2 - 1.35*LC1 + 1.3*LC2				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	175.52	kN	
	Sum of support reactions in Z	175.52	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	1.1	mm	FE Mesh Node No. 4 (X: 8970, Y: 8650, Z: 0 mm)
	Max. displacement in Y	-1.1	mm	FE Mesh Node No. 139 (X: 7960, Y: -220, Z: 0 mm)
	Max. displacement in Z	-18.8	mm	FE Mesh Node No. 1190 (X: 4526, Y: 4215, Z: 0 mm)
	Max. vector displacement	18.8	mm	FE Mesh Node No. 1190 (X: 4526, Y: 4215, Z: 0 mm)
	Max. rotation about X	5.7	mrad	FE Mesh Node No. 66 (X: 4122, Y: 8650, Z: 0 mm)
	Max. rotation about Y	5.7	mrad	FE Mesh Node No. 23 (X: -120, Y: 4215, Z: 0 mm)
	Max. rotation about Z	-0.0	mrad	FE Mesh Node No. 225 (X: 8725, Y: 6375, Z: 0 mm)
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 125, Y: 8525, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	11		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	1.574E+180382		
	Infinity Norm	4.397E+10		
Load Combination CO3 - 1.35*LC1 + 1.3*LC3				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	175.52	kN	
	Sum of support reactions in Z	175.52	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-1.8	mm	FE Mesh Node No. 4 (X: 8970, Y: 8650, Z: 0 mm)
	Max. displacement in Y	1.8	mm	FE Mesh Node No. 140 (X: 7758, Y: -220, Z: 0 mm)
	Max. displacement in Z	8.1	mm	FE Mesh Node No. 1319 (X: 5132, Y: 4215, Z: 0 mm)
	Max. vector displacement	8.1	mm	FE Mesh Node No. 1319 (X: 5132, Y: 4215, Z: 0 mm)
	Max. rotation about X	-3.5	mrad	FE Mesh Node No. 70 (X: 4930, Y: 8650, Z: 0 mm)
	Max. rotation about Y	-3.2	mrad	FE Mesh Node No. 23 (X: -120, Y: 4215, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	FE Mesh Node No. 225 (X: 8725, Y: 6375, Z: 0 mm)
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 975, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	16		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	1.687E+180408		
	Infinity Norm	4.397E+10		
Load Combination CO4 - 1.35*LC1 + 1.3*LC3 + 0.91*LC4				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	317.50	kN	
	Sum of support reactions in Z	317.50	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-1.8	mm	FE Mesh Node No. 4 (X: 8970, Y: 8650, Z: 0 mm)
	Max. displacement in Y	1.8	mm	FE Mesh Node No. 140 (X: 7758, Y: -220, Z: 0 mm)
	Max. displacement in Z	10.1	mm	FE Mesh Node No. 1362 (X: 5334, Y: 4215, Z: 0 mm)
	Max. vector displacement	10.1	mm	FE Mesh Node No. 1362 (X: 5334, Y: 4215, Z: 0 mm)
	Max. rotation about X	-4.3	mrad	FE Mesh Node No. 70 (X: 4930, Y: 8650, Z: 0 mm)
	Max. rotation about Y	-3.9	mrad	FE Mesh Node No. 23 (X: -120, Y: 4215, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	FE Mesh Node No. 225 (X: 8725, Y: 6375, Z: 0 mm)
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 7575, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	13		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	6.124E+180421		
	Infinity Norm	4.397E+10		
Load Combination CO5 - 1.35*LC1 + 1.3*LC3 + 0.91*LC4 + 0.91*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	554.14	kN	
	Sum of support reactions in Z	554.14	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-1.8	mm	FE Mesh Node No. 4 (X: 8970, Y: 8650, Z: 0 mm)
	Max. displacement in Y	1.8	mm	FE Mesh Node No. 140 (X: 7758, Y: -220, Z: 0 mm)
	Max. displacement in Z	13.5	mm	FE Mesh Node No. 1405 (X: 5536, Y: 4215, Z: 0 mm)
	Max. vector displacement	13.5	mm	FE Mesh Node No. 1405 (X: 5536, Y: 4215, Z: 0 mm)
	Max. rotation about X	-5.5	mrad	FE Mesh Node No. 71 (X: 5132, Y: 8650, Z: 0 mm)
	Max. rotation about Y	-5.0	mrad	FE Mesh Node No. 23 (X: -120, Y: 4215, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	FE Mesh Node No. 225 (X: 8725, Y: 6375, Z: 0 mm)
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 775, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	13		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	2.772E+180434		
	Infinity Norm	4.397E+10		
Load Combination CO6 - 1.35*LC1 + 1.3*LC2 + 0.91*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	412.16	kN	
	Sum of support reactions in Z	412.16	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	1.1	mm	FE Mesh Node No. 4 (X: 8970, Y: 8650, Z: 0 mm)
	Max. displacement in Y	-1.1	mm	FE Mesh Node No. 139 (X: 7960, Y: -220, Z: 0 mm)
	Max. displacement in Z	-7.5	mm	FE Mesh Node No. 1104 (X: 4122, Y: 4215, Z: 0 mm)
	Max. vector displacement	7.5	mm	FE Mesh Node No. 1104 (X: 4122, Y: 4215, Z: 0 mm)
	Max. rotation about X	-4.4	mrad	FE Mesh Node No. 2108 (X: 4122, Y: 8850, Z: 0 mm)
	Max. rotation about Y	4.4	mrad	FE Mesh Node No. 23 (X: -120, Y: 4215, Z: 0 mm)
	Max. rotation about Z	-0.0	mrad	FE Mesh Node No. 225 (X: 8725, Y: 6375, Z: 0 mm)
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 125, Y: 8975, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	13		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	7.790E+180406		
	Infinity Norm	4.397E+10		
Load Combination CO7 - 1.35*LC1 + 1.3*LC3 + 0.91*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	412.16	kN	
	Sum of support reactions in Z	412.40	kN	Deviation -0.06%
	Resultant of reactions about X	-1.1	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	1.1	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-1.8	mm	FE Mesh Node No. 4 (X: 8970, Y: 8650, Z: 0 mm)
	Max. displacement in Y	1.8	mm	FE Mesh Node No. 140 (X: 7758, Y: -220, Z: 0 mm)

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Max. displacement in Z	11.5	mm	FE Mesh Node No. 1362 (X: 5334, Y: 4215, Z: 0 mm)
	Max. vector displacement	11.5	mm	FE Mesh Node No. 1362 (X: 5334, Y: 4215, Z: 0 mm)
	Max. rotation about X	-4.7	mrad	FE Mesh Node No. 71 (X: 5132, Y: 8650, Z: 0 mm)
	Max. rotation about Y	-4.3	mrad	FE Mesh Node No. 23 (X: -120, Y: 4215, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	FE Mesh Node No. 225 (X: 8725, Y: 6375, Z: 0 mm)
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 7575, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	12		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	4.841E+180428		
	Infinity Norm	4.397E+10		
Load Combination CO8 - 1.35*LC1 + 1.3*LC4				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	378.35	kN	
	Sum of support reactions in Z	378.35	kN	Deviation -0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	5.5	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. vector displacement	5.5	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. rotation about X	-2.0	mrad	FE Mesh Node No. 73 (X: 5536, Y: 8650, Z: 0 mm)
	Max. rotation about Y	1.7	mrad	FE Mesh Node No. 211 (X: 8725, Y: 3575, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 775, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	10		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	1.219E+180459		
	Infinity Norm	4.397E+10		
Load Combination CO9 - 1.35*LC1 + 0.78*LC3 + 1.3*LC4				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	378.35	kN	
	Sum of support reactions in Z	378.35	kN	Deviation -0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-1.1	mm	FE Mesh Node No. 4 (X: 8970, Y: 8650, Z: 0 mm)
	Max. displacement in Y	-1.1	mm	FE Mesh Node No. 51 (X: 1092, Y: 8650, Z: 0 mm)
	Max. displacement in Z	8.8	mm	FE Mesh Node No. 1405 (X: 5536, Y: 4215, Z: 0 mm)
	Max. vector displacement	8.8	mm	FE Mesh Node No. 1405 (X: 5536, Y: 4215, Z: 0 mm)
	Max. rotation about X	-3.5	mrad	FE Mesh Node No. 71 (X: 5132, Y: 8650, Z: 0 mm)
	Max. rotation about Y	-3.2	mrad	FE Mesh Node No. 23 (X: -120, Y: 4215, Z: 0 mm)

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Max. rotation about Z	0.0	mrad	FE Mesh Node No. 102 (X: 8970, Y: 6231, Z: 0 mm)
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 775, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	12		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	9.996E+180436		
	Infinity Norm	4.397E+10		
Load Combination CO10 - 1.35*LC1 + 0.78*LC3 + 1.3*LC4 + 0.91*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	614.98	kN	
	Sum of support reactions in Z	614.98	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-1.1	mm	FE Mesh Node No. 4 (X: 8970, Y: 8650, Z: 0 mm)
	Max. displacement in Y	-1.1	mm	FE Mesh Node No. 51 (X: 1092, Y: 8650, Z: 0 mm)
	Max. displacement in Z	12.1	mm	FE Mesh Node No. 1448 (X: 5738, Y: 4215, Z: 0 mm)
	Max. vector displacement	12.2	mm	FE Mesh Node No. 1448 (X: 5738, Y: 4215, Z: 0 mm)
	Max. rotation about X	-4.7	mrad	FE Mesh Node No. 72 (X: 5334, Y: 8650, Z: 0 mm)
	Max. rotation about Y	-4.2	mrad	FE Mesh Node No. 23 (X: -120, Y: 4215, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	FE Mesh Node No. 102 (X: 8970, Y: 6231, Z: 0 mm)
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 775, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	11		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	7.217E+180445		
	Infinity Norm	4.397E+10		
Load Combination CO11 - 1.35*LC1 + 1.3*LC4 + 0.91*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	614.98	kN	
	Sum of support reactions in Z	614.98	kN	Deviation -0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	8.9	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. vector displacement	8.9	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. rotation about X	-3.2	mrad	FE Mesh Node No. 73 (X: 5536, Y: 8650, Z: 0 mm)
	Max. rotation about Y	2.8	mrad	FE Mesh Node No. 211 (X: 8725, Y: 3575, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 775, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Number of load increments	1		
	Number of iterations	10		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	1.219E+180459		
	Infinity Norm	4.397E+10		
Load Combination CO12 - LC1				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	130.02	kN	
	Sum of support reactions in Z	130.02	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	1.9	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. vector displacement	1.9	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. rotation about X	-0.7	mrad	FE Mesh Node No. 73 (X: 5536, Y: 8650, Z: 0 mm)
	Max. rotation about Y	0.6	mrad	FE Mesh Node No. 211 (X: 8725, Y: 3575, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 775, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	10		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	1.219E+180459		
	Infinity Norm	4.397E+10		
Load Combination CO13 - LC1 + LC2				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	130.02	kN	
	Sum of support reactions in Z	130.02	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.8	mm	FE Mesh Node No. 4 (X: 8970, Y: 8650, Z: 0 mm)
	Max. displacement in Y	-0.8	mm	FE Mesh Node No. 139 (X: 7960, Y: -220, Z: 0 mm)
	Max. displacement in Z	-14.8	mm	FE Mesh Node No. 1190 (X: 4526, Y: 4215, Z: 0 mm)
	Max. vector displacement	14.8	mm	FE Mesh Node No. 1190 (X: 4526, Y: 4215, Z: 0 mm)
	Max. rotation about X	4.4	mrad	FE Mesh Node No. 66 (X: 4122, Y: 8650, Z: 0 mm)
	Max. rotation about Y	4.4	mrad	FE Mesh Node No. 23 (X: -120, Y: 4215, Z: 0 mm)
	Max. rotation about Z	-0.0	mrad	FE Mesh Node No. 225 (X: 8725, Y: 6375, Z: 0 mm)
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 125, Y: 8525, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	11		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Stiffness matrix determinant	1.574E+180382		
	Infinity Norm	4.397E+10		
Load Combination CO14 - LC1 + LC3				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	130.02	kN	
	Sum of support reactions in Z	130.02	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-1.4	mm	FE Mesh Node No. 4 (X: 8970, Y: 8650, Z: 0 mm)
	Max. displacement in Y	1.3	mm	FE Mesh Node No. 139 (X: 7960, Y: -220, Z: 0 mm)
	Max. displacement in Z	6.2	mm	FE Mesh Node No. 1319 (X: 5132, Y: 4215, Z: 0 mm)
	Max. vector displacement	6.2	mm	FE Mesh Node No. 1319 (X: 5132, Y: 4215, Z: 0 mm)
	Max. rotation about X	-2.7	mrad	FE Mesh Node No. 70 (X: 4930, Y: 8650, Z: 0 mm)
	Max. rotation about Y	-2.4	mrad	FE Mesh Node No. 23 (X: -120, Y: 4215, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	FE Mesh Node No. 225 (X: 8725, Y: 6375, Z: 0 mm)
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 975, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	16		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	2.575E+180407		
	Infinity Norm	4.397E+10		
Load Combination CO15 - LC1 + LC3 + 0.7*LC4				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	239.23	kN	
	Sum of support reactions in Z	239.23	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-1.4	mm	FE Mesh Node No. 4 (X: 8970, Y: 8650, Z: 0 mm)
	Max. displacement in Y	1.3	mm	FE Mesh Node No. 139 (X: 7960, Y: -220, Z: 0 mm)
	Max. displacement in Z	7.7	mm	FE Mesh Node No. 1362 (X: 5334, Y: 4215, Z: 0 mm)
	Max. vector displacement	7.7	mm	FE Mesh Node No. 1362 (X: 5334, Y: 4215, Z: 0 mm)
	Max. rotation about X	-3.3	mrad	FE Mesh Node No. 70 (X: 4930, Y: 8650, Z: 0 mm)
	Max. rotation about Y	-3.0	mrad	FE Mesh Node No. 23 (X: -120, Y: 4215, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	FE Mesh Node No. 225 (X: 8725, Y: 6375, Z: 0 mm)
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 7575, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	13		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	2.010E+180421		
	Infinity Norm	4.397E+10		
Load Combination CO16 - LC1 + LC3 + 0.7*LC4 + 0.7*LC5				

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	421.26	kN	
	Sum of support reactions in Z	421.26	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-1.4	mm	FE Mesh Node No. 4 (X: 8970, Y: 8650, Z: 0 mm)
	Max. displacement in Y	1.3	mm	FE Mesh Node No. 139 (X: 7960, Y: -220, Z: 0 mm)
	Max. displacement in Z	10.3	mm	FE Mesh Node No. 1405 (X: 5536, Y: 4215, Z: 0 mm)
	Max. vector displacement	10.3	mm	FE Mesh Node No. 1405 (X: 5536, Y: 4215, Z: 0 mm)
	Max. rotation about X	-4.2	mrad	FE Mesh Node No. 71 (X: 5132, Y: 8650, Z: 0 mm)
	Max. rotation about Y	-3.8	mrad	FE Mesh Node No. 23 (X: -120, Y: 4215, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	FE Mesh Node No. 225 (X: 8725, Y: 6375, Z: 0 mm)
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 775, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	13		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	1.110E+180434		
	Infinity Norm	4.397E+10		
Load Combination CO17 - LC1 + LC2 + 0.7*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	312.04	kN	
	Sum of support reactions in Z	312.04	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.8	mm	FE Mesh Node No. 4 (X: 8970, Y: 8650, Z: 0 mm)
	Max. displacement in Y	-0.8	mm	FE Mesh Node No. 139 (X: 7960, Y: -220, Z: 0 mm)
	Max. displacement in Z	-5.9	mm	FE Mesh Node No. 1104 (X: 4122, Y: 4215, Z: 0 mm)
	Max. vector displacement	5.9	mm	FE Mesh Node No. 1104 (X: 4122, Y: 4215, Z: 0 mm)
	Max. rotation about X	-3.4	mrad	FE Mesh Node No. 2108 (X: 4122, Y: 8850, Z: 0 mm)
	Max. rotation about Y	3.4	mrad	FE Mesh Node No. 23 (X: -120, Y: 4215, Z: 0 mm)
	Max. rotation about Z	-0.0	mrad	FE Mesh Node No. 225 (X: 8725, Y: 6375, Z: 0 mm)
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 125, Y: 8975, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	13		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	1.516E+180404		
	Infinity Norm	4.397E+10		
Load Combination CO18 - LC1 + LC3 + 0.7*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Sum of loads in Z	312.04	kN	
	Sum of support reactions in Z	312.04	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-1.4	mm	FE Mesh Node No. 4 (X: 8970, Y: 8650, Z: 0 mm)
	Max. displacement in Y	1.3	mm	FE Mesh Node No. 139 (X: 7960, Y: -220, Z: 0 mm)
	Max. displacement in Z	8.8	mm	FE Mesh Node No. 1362 (X: 5334, Y: 4215, Z: 0 mm)
	Max. vector displacement	8.8	mm	FE Mesh Node No. 1362 (X: 5334, Y: 4215, Z: 0 mm)
	Max. rotation about X	-3.6	mrad	FE Mesh Node No. 71 (X: 5132, Y: 8650, Z: 0 mm)
	Max. rotation about Y	-3.3	mrad	FE Mesh Node No. 23 (X: -120, Y: 4215, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	FE Mesh Node No. 225 (X: 8725, Y: 6375, Z: 0 mm)
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 7575, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	13		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	7.394E+180427		
	Infinity Norm	4.397E+10		
Load Combination CO19 - LC1 + LC4				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	286.04	kN	
	Sum of support reactions in Z	286.04	kN	Deviation -0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	4.2	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. vector displacement	4.2	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. rotation about X	-1.5	mrad	FE Mesh Node No. 73 (X: 5536, Y: 8650, Z: 0 mm)
	Max. rotation about Y	1.3	mrad	FE Mesh Node No. 211 (X: 8725, Y: 3575, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 775, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	10		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	1.219E+180459		
	Infinity Norm	4.397E+10		
Load Combination CO20 - LC1 + 0.6*LC3 + LC4				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	286.04	kN	
	Sum of support reactions in Z	286.04	kN	Deviation -0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-0.8	mm	FE Mesh Node No. 4 (X: 8970, Y: 8650, Z: 0 mm)
	Max. displacement in Y	0.8	mm	FE Mesh Node No. 139 (X: 7960, Y: -220, Z: 0 mm)
	Max. displacement in Z	6.7	mm	FE Mesh Node No. 1405 (X: 5536, Y: 4215, Z: 0 mm)
	Max. vector displacement	6.7	mm	FE Mesh Node No. 1405 (X: 5536, Y: 4215, Z: 0 mm)
	Max. rotation about X	-2.7	mrad	FE Mesh Node No. 71 (X: 5132, Y: 8650, Z: 0 mm)
	Max. rotation about Y	-2.4	mrad	FE Mesh Node No. 23 (X: -120, Y: 4215, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	FE Mesh Node No. 102 (X: 8970, Y: 6231, Z: 0 mm)
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 775, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	11		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	3.261E+180436		
	Infinity Norm	4.397E+10		
Load Combination CO21 - LC1 + 0.6*LC3 + LC4 + 0.7*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	468.06	kN	
	Sum of support reactions in Z	468.06	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-0.8	mm	FE Mesh Node No. 4 (X: 8970, Y: 8650, Z: 0 mm)
	Max. displacement in Y	0.8	mm	FE Mesh Node No. 139 (X: 7960, Y: -220, Z: 0 mm)
	Max. displacement in Z	9.3	mm	FE Mesh Node No. 1448 (X: 5738, Y: 4215, Z: 0 mm)
	Max. vector displacement	9.3	mm	FE Mesh Node No. 1448 (X: 5738, Y: 4215, Z: 0 mm)
	Max. rotation about X	-3.6	mrad	FE Mesh Node No. 72 (X: 5334, Y: 8650, Z: 0 mm)
	Max. rotation about Y	-3.2	mrad	FE Mesh Node No. 23 (X: -120, Y: 4215, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	FE Mesh Node No. 102 (X: 8970, Y: 6231, Z: 0 mm)
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 775, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	11		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	2.862E+180445		
	Infinity Norm	4.397E+10		
Load Combination CO22 - LC1 + LC4 + 0.7*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	468.06	kN	
	Sum of support reactions in Z	468.06	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	6.8	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Max. vector displacement	6.8	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. rotation about X	-2.4	mrad	FE Mesh Node No. 73 (X: 5536, Y: 8650, Z: 0 mm)
	Max. rotation about Y	2.1	mrad	FE Mesh Node No. 211 (X: 8725, Y: 3575, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 775, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	10		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	1.219E+180459		
	Infinity Norm	4.397E+10		
Load Combination CO23 - LC1				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	130.02	kN	
	Sum of support reactions in Z	130.02	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	1.9	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. vector displacement	1.9	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. rotation about X	-0.7	mrad	FE Mesh Node No. 73 (X: 5536, Y: 8650, Z: 0 mm)
	Max. rotation about Y	0.6	mrad	FE Mesh Node No. 211 (X: 8725, Y: 3575, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 775, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	10		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	1.219E+180459		
	Infinity Norm	4.397E+10		
Load Combination CO24 - LC1 + 0.5*LC2				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	130.02	kN	
	Sum of support reactions in Z	130.02	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.4	mm	FE Mesh Node No. 4 (X: 8970, Y: 8650, Z: 0 mm)
	Max. displacement in Y	-0.4	mm	FE Mesh Node No. 1 (X: 6344, Y: -220, Z: 0 mm)
	Max. displacement in Z	-3.8	mm	FE Mesh Node No. 1147 (X: 4324, Y: 4215, Z: 0 mm)
	Max. vector displacement	3.8	mm	FE Mesh Node No. 1147 (X: 4324, Y: 4215, Z: 0 mm)
	Max. rotation about X	-1.8	mrad	FE Mesh Node No. 2107 (X: 4324, Y: 8850, Z: 0 mm)
	Max. rotation about Y	1.8	mrad	FE Mesh Node No. 23 (X: -120, Y: 4215, Z: 0 mm)
	Max. rotation about Z	-0.0	mrad	FE Mesh Node No. 102 (X: 8970, Y: 6231, Z: 0 mm)

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 125, Y: 8525, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	14		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	8.118E+180388		
	Infinity Norm	4.397E+10		
Load Combination CO25 - LC1 + 0.5*LC3				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	130.02	kN	
	Sum of support reactions in Z	130.02	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-0.7	mm	FE Mesh Node No. 4 (X: 8970, Y: 8650, Z: 0 mm)
	Max. displacement in Y	0.7	mm	FE Mesh Node No. 140 (X: 7758, Y: -220, Z: 0 mm)
	Max. displacement in Z	4.0	mm	FE Mesh Node No. 1362 (X: 5334, Y: 4215, Z: 0 mm)
	Max. vector displacement	4.0	mm	FE Mesh Node No. 1362 (X: 5334, Y: 4215, Z: 0 mm)
	Max. rotation about X	-1.7	mrad	FE Mesh Node No. 71 (X: 5132, Y: 8650, Z: 0 mm)
	Max. rotation about Y	-1.5	mrad	FE Mesh Node No. 23 (X: -120, Y: 4215, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	FE Mesh Node No. 225 (X: 8725, Y: 6375, Z: 0 mm)
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 7575, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	13		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	1.547E+180424		
	Infinity Norm	4.397E+10		
Load Combination CO26 - LC1 + 0.5*LC3 + 0.2*LC4				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	161.22	kN	
	Sum of support reactions in Z	161.22	kN	Deviation -0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-0.7	mm	FE Mesh Node No. 4 (X: 8970, Y: 8650, Z: 0 mm)
	Max. displacement in Y	0.7	mm	FE Mesh Node No. 140 (X: 7758, Y: -220, Z: 0 mm)
	Max. displacement in Z	4.5	mm	FE Mesh Node No. 1362 (X: 5334, Y: 4215, Z: 0 mm)
	Max. vector displacement	4.5	mm	FE Mesh Node No. 1362 (X: 5334, Y: 4215, Z: 0 mm)
	Max. rotation about X	-1.8	mrad	FE Mesh Node No. 71 (X: 5132, Y: 8650, Z: 0 mm)
	Max. rotation about Y	-1.7	mrad	FE Mesh Node No. 23 (X: -120, Y: 4215, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	FE Mesh Node No. 225 (X: 8725, Y: 6375, Z: 0 mm)
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 7575, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Number of iterations	12		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	1.230E+180429		
	Infinity Norm	4.397E+10		
Load Combination CO27 - LC1 + 0.5*LC3 + 0.2*LC4 + 0.3*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	239.23	kN	
	Sum of support reactions in Z	239.23	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-0.7	mm	FE Mesh Node No. 4 (X: 8970, Y: 8650, Z: 0 mm)
	Max. displacement in Y	0.7	mm	FE Mesh Node No. 140 (X: 7758, Y: -220, Z: 0 mm)
	Max. displacement in Z	5.6	mm	FE Mesh Node No. 1405 (X: 5536, Y: 4215, Z: 0 mm)
	Max. vector displacement	5.6	mm	FE Mesh Node No. 1405 (X: 5536, Y: 4215, Z: 0 mm)
	Max. rotation about X	-2.2	mrad	FE Mesh Node No. 71 (X: 5132, Y: 8650, Z: 0 mm)
	Max. rotation about Y	-2.0	mrad	FE Mesh Node No. 23 (X: -120, Y: 4215, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	FE Mesh Node No. 225 (X: 8725, Y: 6375, Z: 0 mm)
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 775, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	11		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	3.261E+180436		
	Infinity Norm	4.397E+10		
Load Combination CO28 - LC1 + 0.5*LC2 + 0.3*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	208.03	kN	
	Sum of support reactions in Z	208.03	kN	Deviation -0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.4	mm	FE Mesh Node No. 4 (X: 8970, Y: 8650, Z: 0 mm)
	Max. displacement in Y	-0.4	mm	FE Mesh Node No. 1 (X: 6344, Y: -220, Z: 0 mm)
	Max. displacement in Z	-2.2	mm	FE Mesh Node No. 2823 (X: 3920, Y: 12235, Z: 0 mm)
	Max. vector displacement	2.2	mm	FE Mesh Node No. 2823 (X: 3920, Y: 12235, Z: 0 mm)
	Max. rotation about X	-1.5	mrad	FE Mesh Node No. 2109 (X: 3920, Y: 8850, Z: 0 mm)
	Max. rotation about Y	-1.6	mrad	FE Mesh Node No. 253 (X: 8225, Y: 4175, Z: 0 mm)
	Max. rotation about Z	-0.0	mrad	FE Mesh Node No. 102 (X: 8970, Y: 6231, Z: 0 mm)
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 125, Y: 8975, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	9		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	5.233E+180448		

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Infinity Norm	4.397E+10		
Load Combination CO29 - LC1 + 0.5*LC3 + 0.3*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	208.03	kN	
	Sum of support reactions in Z	208.03	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	-0.7	mm	FE Mesh Node No. 4 (X: 8970, Y: 8650, Z: 0 mm)
	Max. displacement in Y	0.7	mm	FE Mesh Node No. 140 (X: 7758, Y: -220, Z: 0 mm)
	Max. displacement in Z	5.1	mm	FE Mesh Node No. 1405 (X: 5536, Y: 4215, Z: 0 mm)
	Max. vector displacement	5.1	mm	FE Mesh Node No. 1405 (X: 5536, Y: 4215, Z: 0 mm)
	Max. rotation about X	-2.1	mrad	FE Mesh Node No. 71 (X: 5132, Y: 8650, Z: 0 mm)
	Max. rotation about Y	-1.9	mrad	FE Mesh Node No. 23 (X: -120, Y: 4215, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	FE Mesh Node No. 225 (X: 8725, Y: 6375, Z: 0 mm)
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 775, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	12		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	1.110E+180434		
	Infinity Norm	4.397E+10		
Load Combination CO30 - LC1 + 0.5*LC4				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	208.03	kN	
	Sum of support reactions in Z	208.03	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	3.0	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. vector displacement	3.0	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. rotation about X	-1.1	mrad	FE Mesh Node No. 73 (X: 5536, Y: 8650, Z: 0 mm)
	Max. rotation about Y	1.0	mrad	FE Mesh Node No. 211 (X: 8725, Y: 3575, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 775, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	10		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	1.219E+180459		
	Infinity Norm	4.397E+10		
Load Combination CO31 - LC1 + 0.5*LC4 + 0.3*LC5				
	Sum of loads in X	0.00	kN	

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	286.04	kN	
	Sum of support reactions in Z	286.04	kN	Deviation -0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	4.2	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. vector displacement	4.2	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. rotation about X	-1.5	mrad	FE Mesh Node No. 73 (X: 5536, Y: 8650, Z: 0 mm)
	Max. rotation about Y	1.3	mrad	FE Mesh Node No. 211 (X: 8725, Y: 3575, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 775, Z: 0 mm)
	Method of analysis	Linear		Geometrically linear analysis
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Number of load increments	1		
	Number of iterations	10		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	1.219E+180459		
	Infinity Norm	4.397E+10		
Load Combination CO32 - LC1				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	130.02	kN	
	Sum of support reactions in Z	130.02	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	1.9	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. vector displacement	1.9	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. rotation about X	-0.7	mrad	FE Mesh Node No. 73 (X: 5536, Y: 8650, Z: 0 mm)
	Max. rotation about Y	0.6	mrad	FE Mesh Node No. 115 (X: 8970, Y: 3610, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 775, Z: 0 mm)
	Method of analysis	2nd Order		Second order analysis (Nonlinear, Timoshenko)
	Internal forces referred to deformed system for...	☒		N, V_y, V_z, M_y, M_z, M_T
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Consider favorable effects of tensile forces	☒		
	Divide results by CO factor	☐		
	Number of load increments	1		
	Number of iterations	10		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	8.152E+180846		
	Infinity Norm	4.397E+10		
Load Combination CO33 - LC1 + 0.2*LC4				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	161.22	kN	
	Sum of support reactions in Z	161.22	kN	Deviation -0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	2.4	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. vector displacement	2.4	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. rotation about X	-0.8	mrad	FE Mesh Node No. 73 (X: 5536, Y: 8650, Z: 0 mm)
	Max. rotation about Y	0.7	mrad	FE Mesh Node No. 115 (X: 8970, Y: 3610, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 775, Z: 0 mm)
	Method of analysis	2nd Order		Second order analysis (Nonlinear, Timoshenko)
	Internal forces referred to deformed system for...	☒		N, V_y, V_z, M_y, M_z, M_T
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Consider favorable effects of tensile forces	☒		
	Divide results by CO factor	☐		
	Number of load increments	1		
	Number of iterations	10		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	8.152E+180846		
	Infinity Norm	4.397E+10		
Load Combination CO34 - LC1 + 0.2*LC4 + 0.3*LC5				
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	239.23	kN	
	Sum of support reactions in Z	239.23	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	3.5	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. vector displacement	3.5	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. rotation about X	-1.2	mrad	FE Mesh Node No. 73 (X: 5536, Y: 8650, Z: 0 mm)
	Max. rotation about Y	1.1	mrad	FE Mesh Node No. 115 (X: 8970, Y: 3610, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 775, Z: 0 mm)
	Method of analysis	2nd Order		Second order analysis (Nonlinear, Timoshenko)
	Internal forces referred to deformed system for...	☒		N, V_y, V_z, M_y, M_z, M_T
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Consider favorable effects of tensile forces	☒		
	Divide results by CO factor	☐		
	Number of load increments	1		
	Number of iterations	10		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	8.152E+180846		
	Infinity Norm	4.397E+10		
Load Combination CO35 - LC1 + 0.3*LC5				

4.0 RESULTS - SUMMARY

	Description	Value	Unit	Comment
	Sum of loads in X	0.00	kN	
	Sum of support reactions in X	0.00	kN	
	Sum of loads in Y	0.00	kN	
	Sum of support reactions in Y	0.00	kN	
	Sum of loads in Z	208.03	kN	
	Sum of support reactions in Z	208.03	kN	Deviation 0.00%
	Resultant of reactions about X	0.0	kNm	At center of gravity of model (X:4263.0, Y:7604.8, Z:0.0 mm)
	Resultant of reactions about Y	0.0	kNm	At center of gravity of model
	Resultant of reactions about Z	0.0	kNm	At center of gravity of model
	Max. displacement in X	0.0	mm	
	Max. displacement in Y	0.0	mm	
	Max. displacement in Z	3.0	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. vector displacement	3.0	mm	FE Mesh Node No. 1577 (X: 6344, Y: 4215, Z: 0 mm)
	Max. rotation about X	-1.1	mrad	FE Mesh Node No. 73 (X: 5536, Y: 8650, Z: 0 mm)
	Max. rotation about Y	0.9	mrad	FE Mesh Node No. 115 (X: 8970, Y: 3610, Z: 0 mm)
	Max. rotation about Z	0.0	mrad	
	Maximum surface strain	0.00000	-	FE Mesh Node No. 0 (X: 8725, Y: 775, Z: 0 mm)
	Method of analysis	2nd Order		Second order analysis (Nonlinear, Timoshenko)
	Internal forces referred to deformed system for...	☒		N, V_y, V_z, M_y, M_z, M_T
	Reduction of stiffness			Materials, Cross-sections, Members, Surfaces
	Consider favorable effects of tensile forces	☒		
	Divide results by CO factor	☐		
	Number of load increments	1		
	Number of iterations	10		
	Maximum value of element of stiffness matrix on diagonal	1.552E+10		
	Minimum value of element of stiffness matrix on diagonal	7.916E+06		
	Stiffness matrix determinant	8.152E+180846		
	Infinity Norm	4.397E+10		

Summary

Other Settings:			
Number of 1D finite elements	0		
Number of 2D finite elements	3172		
Number of 3D finite elements	0		
Number of FE mesh nodes	3448		
Number of equations	20688		
Internal forces referred to deformed system for...:			
Max. number of iterations	100		
Number of divisions for member results	10		
Division of cable/foundation/tapered members	10		
Number of member divisions for searching maximum values	10		
Subdivisions of FE mesh for graphical results	0		
Percentage of iterations according to Picard method in combination with Newton-Raphson method	5	%	
Activate ineffective supports	☒		
Options:			
Activate shear stiffness of members (Ay, Az)	☒		
Activate member divisions for large deformation or post-critical analysis	☒		
Activate entered stiffness modifications	☒		
Ignore rotational degrees of freedom	☐		
Check of critical forces of members	☒		
Nonsymmetric direct solver if demanded by nonlinear model	☐		
Method for the system of equations	Direct		
Plate bending theory	Mindlin		
Solver version	64-bit		

4.0 RESULTS - SUMMARY

	Precision and Tolerance: Change default setting	☐		
	Nonlinear effects - Activate: Support and elastic foundations	☒		

RF-CONCRETE Surfaces
CA1
Dangtis_1

Project: 1
1

Model: SK23010_Dreverna_ (04, 05) statinys_ ..

Date: 2023-09-06

1.1 GENERAL DATA

Design according to Standard:		LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*
ULTIMATE LIMIT STATE		
Load combinations for design:	CO1	1.35*LC1
		Persistent and Transient
	CO2	1.35*LC1 + 1.3*LC2
		Persistent and Transient
	CO3	1.35*LC1 + 1.3*LC3
		Persistent and Transient
	CO4	1.35*LC1 + 1.3*LC3 + 0.91*LC4
		Persistent and Transient
	CO5	1.35*LC1 + 1.3*LC3 + 0.91*LC4 + 0.91*LC5
		Persistent and Transient
	CO6	1.35*LC1 + 1.3*LC2 + 0.91*LC5
		Persistent and Transient
	CO7	1.35*LC1 + 1.3*LC3 + 0.91*LC5
		Persistent and Transient
	CO8	1.35*LC1 + 1.3*LC4
		Persistent and Transient
	CO9	1.35*LC1 + 0.78*LC3 + 1.3*LC4
		Persistent and Transient
	CO10	1.35*LC1 + 0.78*LC3 + 1.3*LC4 + 0.91*LC5
		Persistent and Transient
	CO11	1.35*LC1 + 1.3*LC4 + 0.91*LC5
		Persistent and Transient
SERVICEABILITY LIMIT STATE		
Load combinations for design:	CO12	LC1
		Characteristic with direct load, k_t 0.400, β 0.500
	CO13	LC1 + LC2
		Characteristic with direct load, k_t 0.500, β 0.500
	CO14	LC1 + LC3
		Characteristic with direct load, k_t 0.500, β 0.500
	CO15	LC1 + LC3 + 0.7*LC4
		Characteristic with direct load, k_t 0.526, β 0.500
	CO16	LC1 + LC3 + 0.7*LC4 + 0.7*LC5
		Characteristic with direct load, k_t 0.541, β 0.500
	CO17	LC1 + LC2 + 0.7*LC5
		Characteristic with direct load, k_t 0.526, β 0.500
	CO18	LC1 + LC3 + 0.7*LC5
		Characteristic with direct load, k_t 0.526, β 0.500
	CO19	LC1 + LC4
		Characteristic with direct load, k_t 0.500, β 0.500
	CO20	LC1 + 0.6*LC3 + LC4
		Characteristic with direct load, k_t 0.523, β 0.500
	CO21	LC1 + 0.6*LC3 + LC4 + 0.7*LC5
		Characteristic with direct load, k_t 0.539, β 0.500
	CO22	LC1 + LC4 + 0.7*LC5
		Characteristic with direct load, k_t 0.526, β 0.500
	CO23	LC1
		Frequent, k_t 0.400, β 0.500
	CO24	LC1 + 0.5*LC2
		Frequent, k_t 0.467, β 0.500
	CO25	LC1 + 0.5*LC3
		Frequent, k_t 0.467, β 0.500
	CO26	LC1 + 0.5*LC3 + 0.2*LC4
		Frequent, k_t 0.482, β 0.500
	CO27	LC1 + 0.5*LC3 + 0.2*LC4 + 0.3*LC5

1.1 GENERAL DATA

		Frequent, k_t 0.500, β 0.500
	CO28	LC1 + 0.5*LC2 + 0.3*LC5
		Frequent, k_t 0.489, β 0.500
	CO29	LC1 + 0.5*LC3 + 0.3*LC5
		Frequent, k_t 0.489, β 0.500
	CO30	LC1 + 0.5*LC4
		Frequent, k_t 0.467, β 0.500
	CO31	LC1 + 0.5*LC4 + 0.3*LC5
		Frequent, k_t 0.489, β 0.500
	CO32	LC1
		Quasi-permanent, k_t 0.400, β 0.500
	CO33	LC1 + 0.2*LC4
		Quasi-permanent, k_t 0.433, β 0.500
	CO34	LC1 + 0.2*LC4 + 0.3*LC5
		Quasi-permanent, k_t 0.467, β 0.500
	CO35	LC1 + 0.3*LC5
		Quasi-permanent, k_t 0.446, β 0.500
Definition of Provided Additional Reinforcement		Automatic arrangement according to the specifications in Table 1.4
Type of SLS method:		Analytical Method
		By assuming an identical deformation ratio of the longitudinal reinforcement
Design of		
Concrete Stress Analysis		☒
Steel Stress Analysis		☒
Crack widths		☒
Deformation Analysis		☒
Consider creeping		☒
Consider shrinkage		☒
Tension stiffening:		☒
Layout of longitudinal reinforcement		
Required longitudinal reinforcement automatically increased for serviceability limit state design:		☒
DETAILS		
Analysis Method for Reinforcement Envelope		Mixed
Apply the averaged internal forces in the defined average region for the ULS calculation and for the analytic method of SLS calculation.		☒
Apply the internal forces without the rib components		☐
Design Situation Settings for Serviceability Limit State Checks		
Load combination:		
Characteristic with direct load		Checks: k_1*f_{ck}, k_3*f_{yk}
Characteristic with imposed deformation		Checks: k_1*f_{ck}, k_4*f_{yk}
Frequent		Checks: w_k
Quasi-permanent		Checks: k_2*f_{ck}, w_k, u_l

1.2 MATERIALS

Material No.	Material Description: Concrete Strength Class	Material Description: Steel Description	Comment
4	Concrete C35/45	B 500 S (A)	

1.2.1 MATERIAL PARAMETERS

Material No.	Description	Name	Size	Unit
4	**Concrete Strength Class: Concrete C35/45**			
	Characteristic Cylinder Compressive Strength	f_{ck}	35.00	N/mm^2
	5 % Fractile of Axial Tensile Strength	$f_{ctk,0.05}$	2.20	N/mm^2
	Characteristic for Nonlinear Calculations			
	Mean Secant Modulus of Elasticity	E_{cm}	34000.00	N/mm^2
	Mean Cylinder Compressive Strength	f_{cm}	43.00	N/mm^2
	Mean Axial Tensile Strength	f_{ctm}	3.20	N/mm^2
	Ultimate Strain for Pure Compression	ε_{c1}	-2.250	‰
	Ultimate Strain at Failure	ε_{c1u}	-3.500	‰
	Shear Modulus	G	14166.70	N/mm^2
	Poisson's Ratio	ν	0.200	-
	Characteristic Strains for Parabolic-Rectangular Diagram			
	Ultimate Strain for Pure Compression	ε_{c2}	-2.000	‰
	Ultimate Strain at Failure	ε_{cu2}	-3.500	‰
	Parabola Exponent	n	2.000	-
	Specific Weight	γ	25.00	kN/m^3
	Reinforcing Steel: B 500 S (A)			
	Modulus of Elasticity	E_s	200000.00	N/mm^2
	Yield Stress Mean Value	f_{ym}	550.00	N/mm^2
	Characteristic Yield Stress	f_{yk}	500.00	N/mm^2
	Tensile Strength Mean Value	f_{tm}	551.25	N/mm^2
	Characteristic Tensile Strength	f_{tk}	525.00	N/mm^2
	Limiting Strain	ε_{uk}	25.000	‰

1.3 SURFACES

Surface No.	Matl. No.	Creep coeff. φ [-]	Shrinkage ε_{cs} [-]	$u_{z,max}$ [mm]	$\sigma_{c,max}$ [N/mm²] / $\sigma_{s,max}$ [N/mm²]	$f_{ct,eff,wk}$ [N/mm²]	$f_{ct,eff,As,min}$ [N/mm²]	$w_{k,+z\ (top)}$ [mm] / $w_{k,-z\ (bottom)}$ [mm]	Effects due to Restraint: Apply	Effects due to Restraint: k_c [-]	Notes
5	Thickness Type: Constant, Thickness: 200.0 mm										
	4	2.07714	-0.00045	36.360	var. var.	3.20	3.20	0.100 0.100	☐	var.	
	Deformation referred to the displaced parallel surface at the point of minimum nodal deformation										
6	Thickness Type: Constant, Thickness: 200.0 mm										
	4	2.07714	-0.00045	27.080	var. var.	3.20	3.20	0.100 0.100	☐	var.	
	Deformation referred to undeformed system										

1.4 REINFORCEMENT GROUP NO. 3 - DANGTIS 1+2

Applied to surfaces:	5,6
REINFORCEMENT RATIO	
Minimum secondary reinforcement	20.0 %
Basic minimum reinforcement	0.0 %
Minimum compression reinforcement	0.0 %
Minimum tension reinforcement	0.0 %
Maximum reinforcement percentage	4.0 %
Minimum shear reinforcement percentage	0.0 %
REINFORCEMENT AREA FOR DESIGN OF SLS	
Use provided basic reinforcement and required additional reinforcement acc. to Tables 2.1, 2.2, 2.3	

1.4 REINFORCEMENT GROUP NO. 3 - DANGTIS 1+2

Concrete cover acc. to Standard	☐
BASIC REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 52.0 mm
Bar diameter	ds-1: 12.0, ds-2: 12.0 mm
Directions of reinforcement	Phi-1: 90.000°, Phi-2: 180.000°
Reinforcement area	As-1,-z (top): 7.54, As-2,-z (top): 7.54 cm²/m
BASIC REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 52.0 mm
Bar diameter	ds-1: 12.0, ds-2: 12.0 mm
Directions of reinforcement	Phi-1: 90.000°, Phi-2: 180.000°
Reinforcement area	As-1,+z (bottom): 7.54, As-2,+z (bottom): 7.54 cm²/m
ADDITIONAL REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 52.0 mm
Bar diameter	ds-1: 12.0, ds-2: 12.0 mm
Directions of reinforcement	Phi-1: 90.000°, Phi-2: 180.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
ADDITIONAL REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 52.0 mm
Bar diameter	ds-1: 12.0, ds-2: 12.0 mm
Directions of reinforcement	Phi-1: 90.000°, Phi-2: 180.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
LONGITUDINAL REINFORCEMENT FOR SHEAR FORCE DESIGN	
Apply the greater value resulting from either the required or provided reinforcement (basic and add. reinforcement) per reinforcement direction	
OPTIONS FOR LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
Minimum longitudinal reinforcement for plates acc. to 9.3.1	☒
Direction of minimum reinforcement	
Reinforcement direction with the main tensile force from top (-z) and bottom (+z) surfaces together:	☒
Minimum longitudinal reinforcement for walls acc. to 9.6	☐
Minimum shear reinforcement	☒
Neutral axis depth limitation	☒
Variable strut inclination - min	21.801 °
Variable concrete strut inclination - max	45.000 °
Partial safety factor γ_s	PT 1.15, AC 1.00, SLS 1.00
Partial safety factor γ_c	PT 1.50, AC 1.20, SLS 1.00
Consideration of long-term effects Alpha-cc	PT 0.90, AC 0.90, SLS 1.00
Consideration of long-term effects Alpha-ct	SLS 1.00

2.2 REQUIRED REINFORCEMENT BY SURFACE

Surface	Point	Point Coordinates [m]				Required Reinforcement			Basic	Additional Reinforcement			
No.	No.	X	Y	Z	Symbol	ULS	SLS	ULS/SLS	Reinf.	Required	Provided	Unit	Notes
5	M1	6.344	-0.220	0.000	$a_{s,1,-z\ (top)}$	7.54	0.42	7.54	7.54	0.00	0.00	cm²/m	
	M1	6.344	-0.220	0.000	$a_{s,2,-z\ (top)}$	7.54	0.12	7.54	7.54	0.00	0.00	cm²/m	
	M231	8.725	7.575	0.000	$a_{s,1,+z\ (bottom)}$	19.63	25.28	25.28	7.54	17.74	17.74	cm²/m	
	M50	0.890	8.650	0.000	$a_{s,2,+z\ (bottom)}$	13.30	21.71	21.71	7.54	14.17	14.17	cm²/m	
	M272	8.558	0.775	0.000	a_{sw}	32.10	-	32.10	-	-	-	cm²/m²	
6	M161 - E2039	7.825	14.925	0.000	$a_{s,1,-z\ (top)}$	7.54	1.12	7.54	7.54	0.00	0.00	cm²/m	

2.2 REQUIRED REINFORCEMENT BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Symbol	Required Reinforcement ULS	SLS	ULS/SLS	Basic Reinf.	Additional Reinforcement Required	Provided	Unit	Notes
	M173 - E1957	0.125	13.643	0.000	$a_{s,2,-z\ (top)}$	7.54	0.48	7.54	7.54	0.00	0.00	cm^2/m	
	M2216	0.125	9.775	0.000	$a_{s,1,+z\ (bottom)}$	14.78	17.29	17.29	7.54	9.75	9.75	cm^2/m	
	M2124	0.890	8.850	0.000	$a_{s,2,+z\ (bottom)}$	14.09	21.47	21.47	7.54	13.93	13.93	cm^2/m	
	M2223	0.665	8.975	0.000	a_{sw}	36.56	-	36.56	-	-	-	cm^2/m^2	

3.2 SERVICEABILITY CHECK BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Load Case	Design Type	Exist. Value	Limit Value	Unit	Ratio	Notes
5	M253	8.225	4.175	0.000	CO34	$u_{z,local}$	11.936	36.360	mm	0.4	
	M231	8.725	7.575	0.000	Envelope ChD	σ_c	-19.22	-21.00	N/mm^2	1.0	
	M11	-0.120	1.796	0.000	Envelope ChD	σ_s	377.92	400.00	N/mm^2	1.0	
	M96	8.970	7.440	0.000	Envelope Fr	w_k	0.109	0.100	mm	1.1	219) 233)
6	M2174	7.825	12.277	0.000	CO34	$u_{z,local}$	4.697	27.080	mm	0.2	
	M2224	0.845	8.975	0.000	Envelope ChD	σ_c	-14.93	-21.00	N/mm^2	0.8	
	M1975	-0.120	9.646	0.000	Envelope ChD	σ_s	370.15	400.00	N/mm^2	1.0	
	M2236	0.125	13.118	0.000	Envelope Fr	w_k	0.104	0.100	mm	1.1	219) 233)

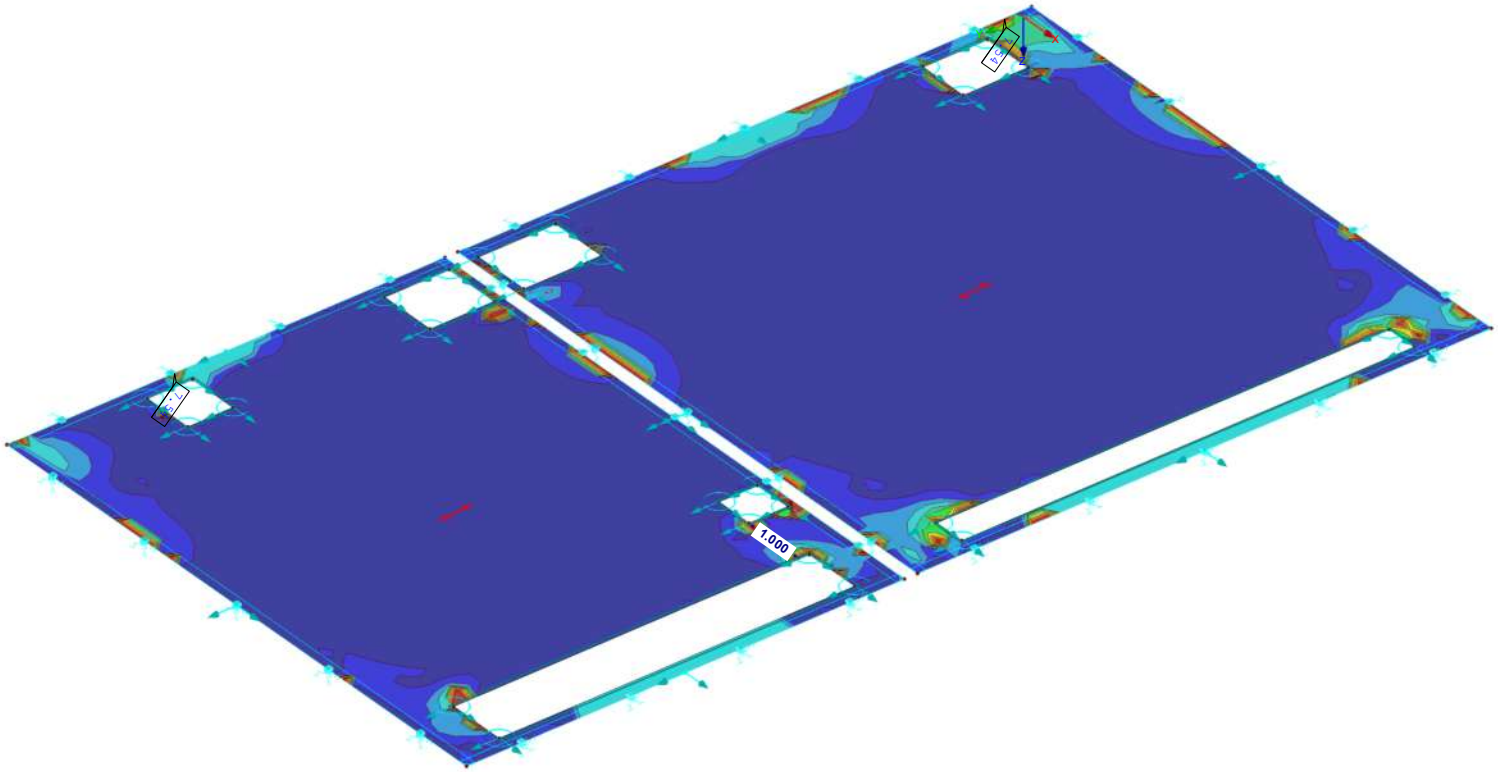
SERVICEABILITY CHECK NOTES

No.	Description
219)	Crack width exceeded.
233)	The design is not satisfactory! Because of the required reinforcement for ULS or user-defined reinforcement the defined reinforcement area is different from the required reinforcement for SLS and that negatively affects SLS design.

REQUIRED REINFORCEMENT $a_{s,1,-z\ (top)}$

RF-CONCRETE Surfaces CA1
Dangtis_1
Required Reinforcement a-s,1,-z (top) [cm²/m]
Values: a-s,1,-z (top) [cm^2/m]

Isometric

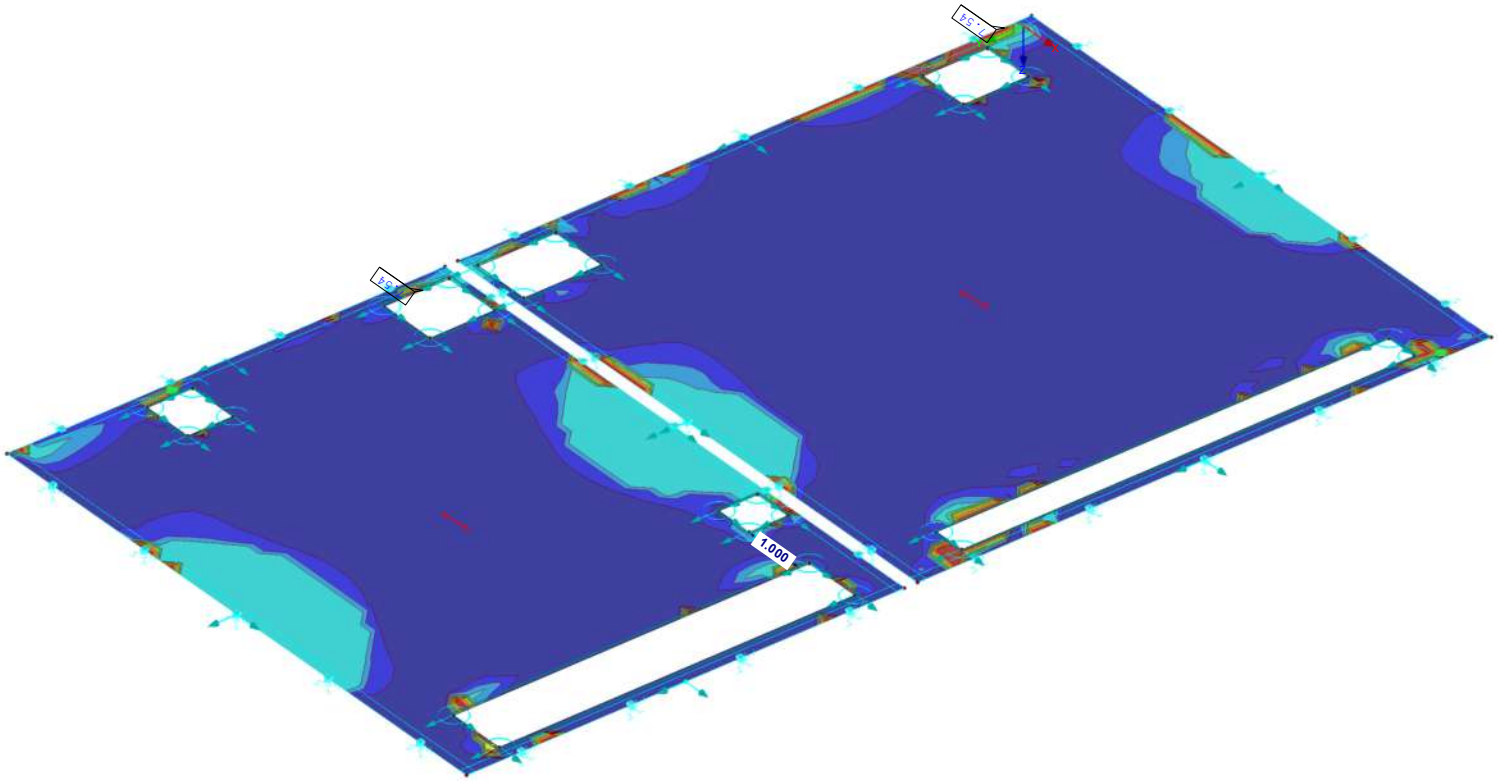


Max a-s,1,-z (top): 7.54, Min a-s,1,-z (top): 0.00 cm²/m

REQUIRED REINFORCEMENT $a_{s,2,-z\ (top)}$

RF-CONCRETE Surfaces CA1
Dangtis_1
Required Reinforcement a-s,2,-z (top) [cm²/m]
Values: a-s,2,-z (top) [cm^2/m]

Isometric

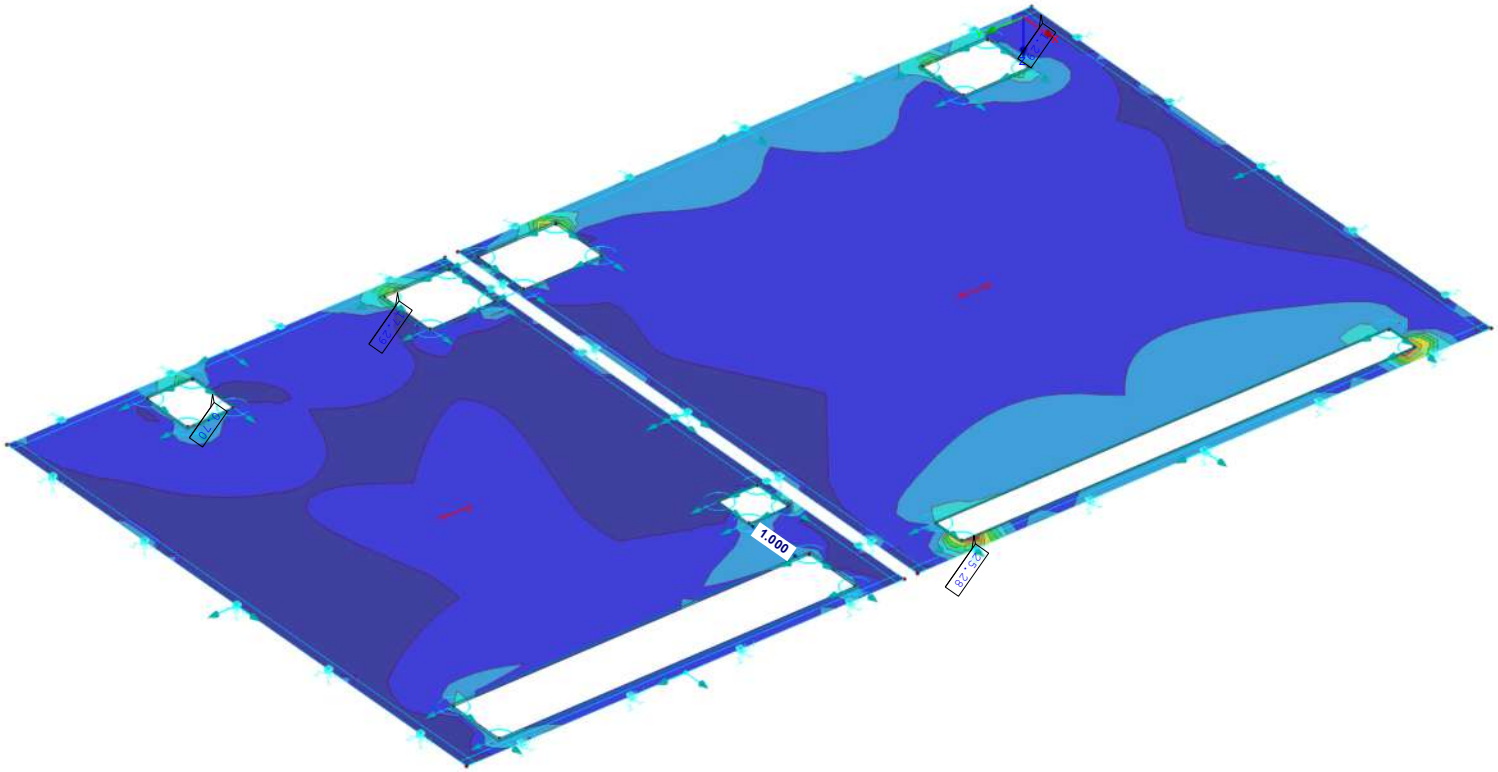


Max a-s,2,-z (top): 7.54, Min a-s,2,-z (top): 0.00 cm²/m

REQUIRED REINFORCEMENT $a_{s,1,+z\ (bottom)}$

RF-CONCRETE Surfaces CA1
Dangtis_1
Required Reinforcement a-s,1,+z (bottom) [cm²/m]
Values: a-s,1,+z (bottom) [cm^2/m]

Isometric

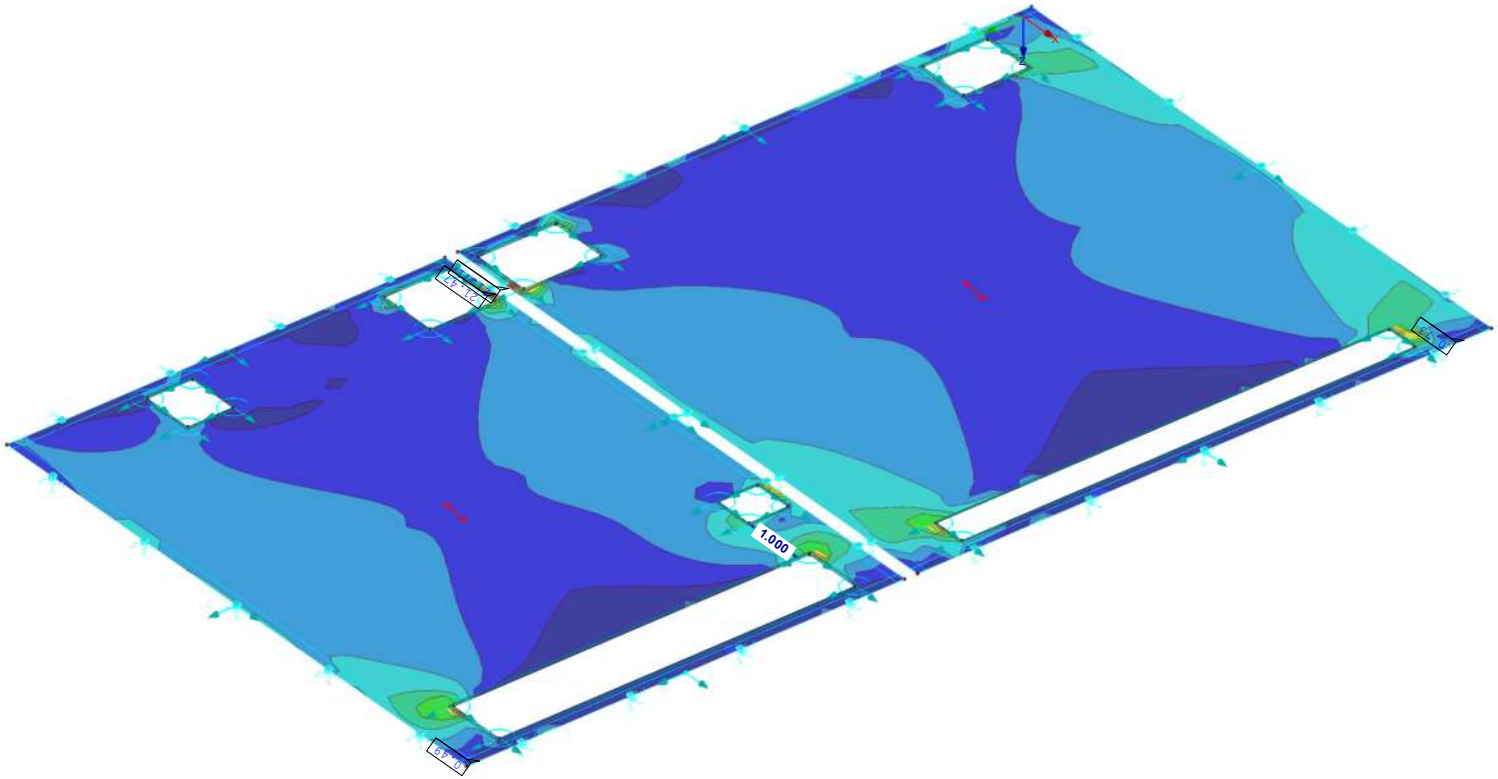


Max a-s,1,+z (bottom): 25.28, Min a-s,1,+z (bottom): 0.70 cm²/m

REQUIRED REINFORCEMENT $a_{s,2,+z\ (bottom)}$

RF-CONCRETE Surfaces CA1
Dangtis_1
Required Reinforcement a-s,2,+z (bottom) [cm²/m]
Values: a-s,2,+z (bottom) [cm^2/m]

Isometric

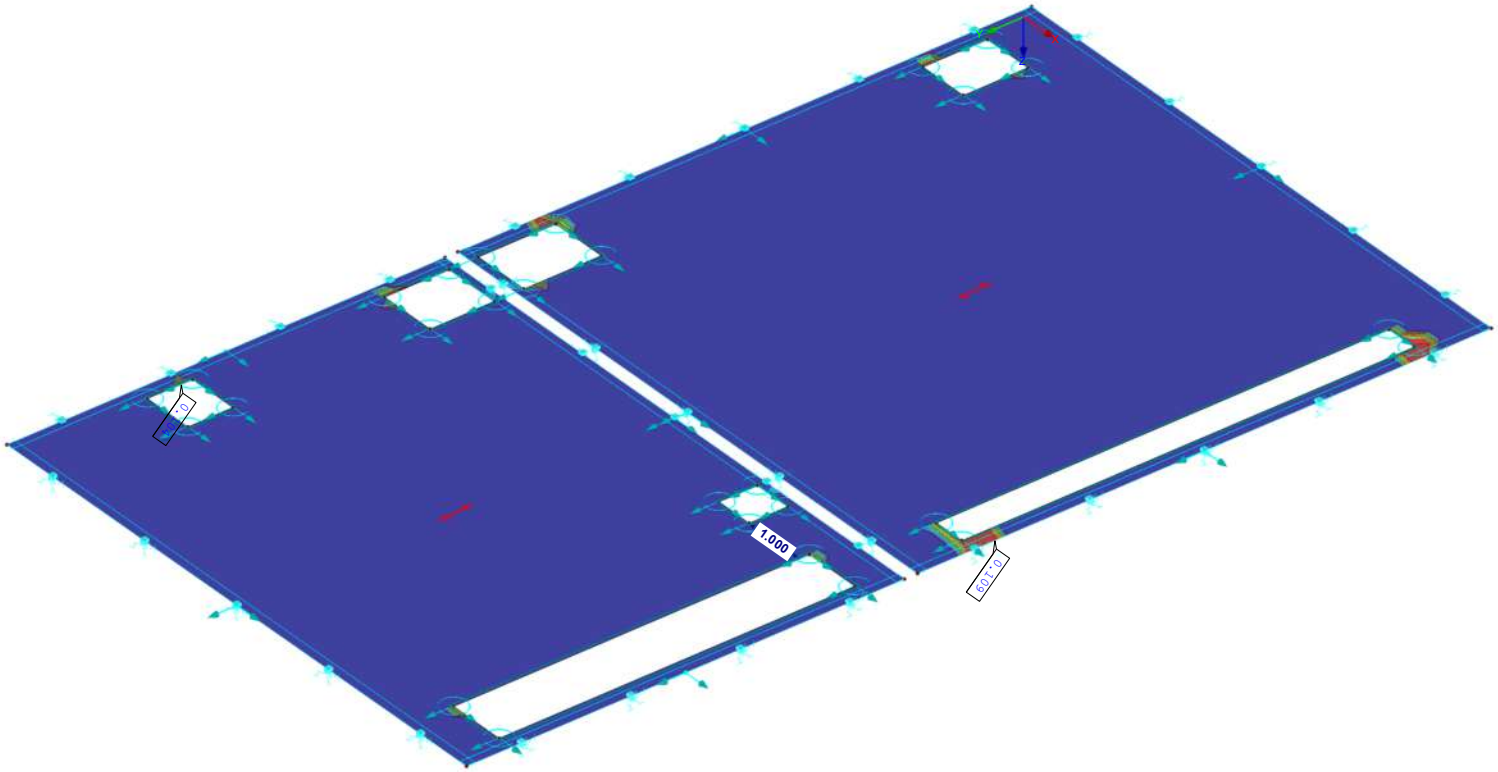


Max a-s,2,+z (bottom): 21.71, Min a-s,2,+z (bottom): 0.49 cm²/m

CRACK WIDTH $w_{k,1,+z}$ (bottom)

RF-CONCRETE Surfaces CA1
Dangtis_1
Crack width w-k,1,+z (bottom) [mm]
Values: w-k,1,+z (bottom) [mm]

Isometric

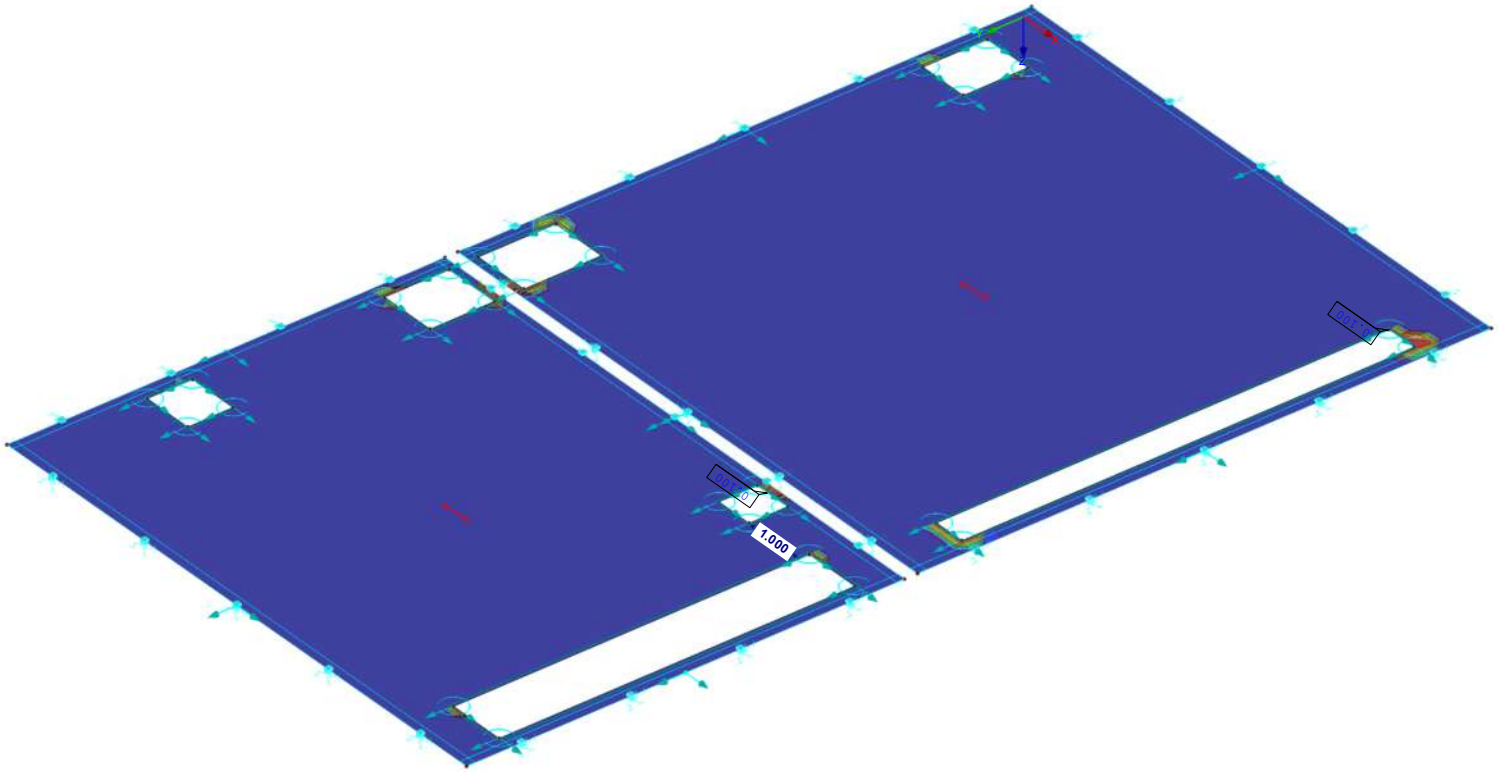


Max w-k,1,+z (bottom): 0.109, Min w-k,1,+z (bottom): 0.000 mm

CRACK WIDTH $w_{k,2,+z\ (bottom)}$

RF-CONCRETE Surfaces CA1
Dangtis_1
Crack width w-k,2,+z (bottom) [mm]
Values: w-k,2,+z (bottom) [mm]

Isometric

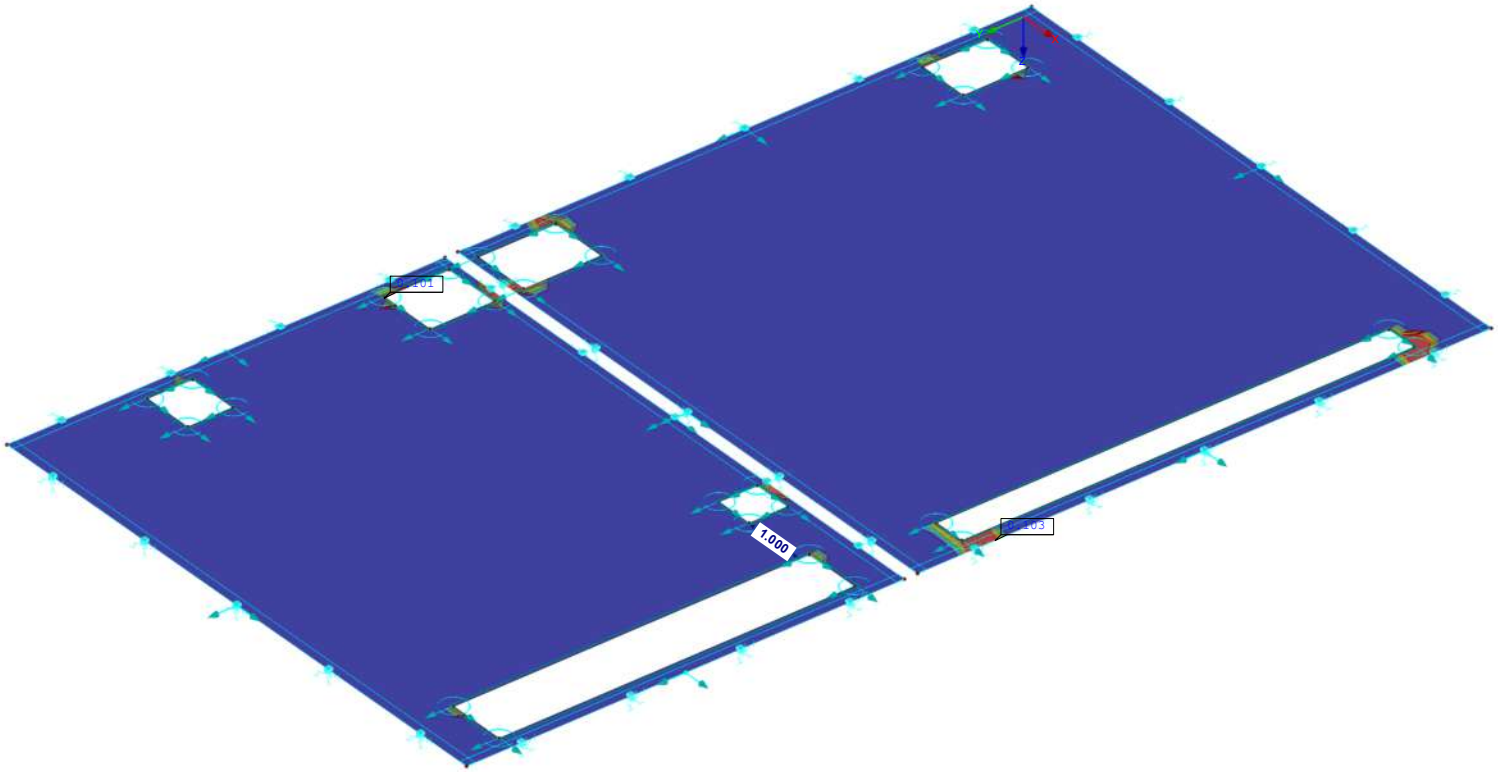


Max w-k,2,+z (bottom): 0.100, Min w-k,2,+z (bottom): 0.000 mm

CRACK WIDTH $w_{k,res,+z}$ (bottom)

RF-CONCRETE Surfaces CA1
Dangtis_1
Crack width w-k,res,+z (bottom) [mm]
Values: w-k,res,+z (bottom) [mm]

Isometric

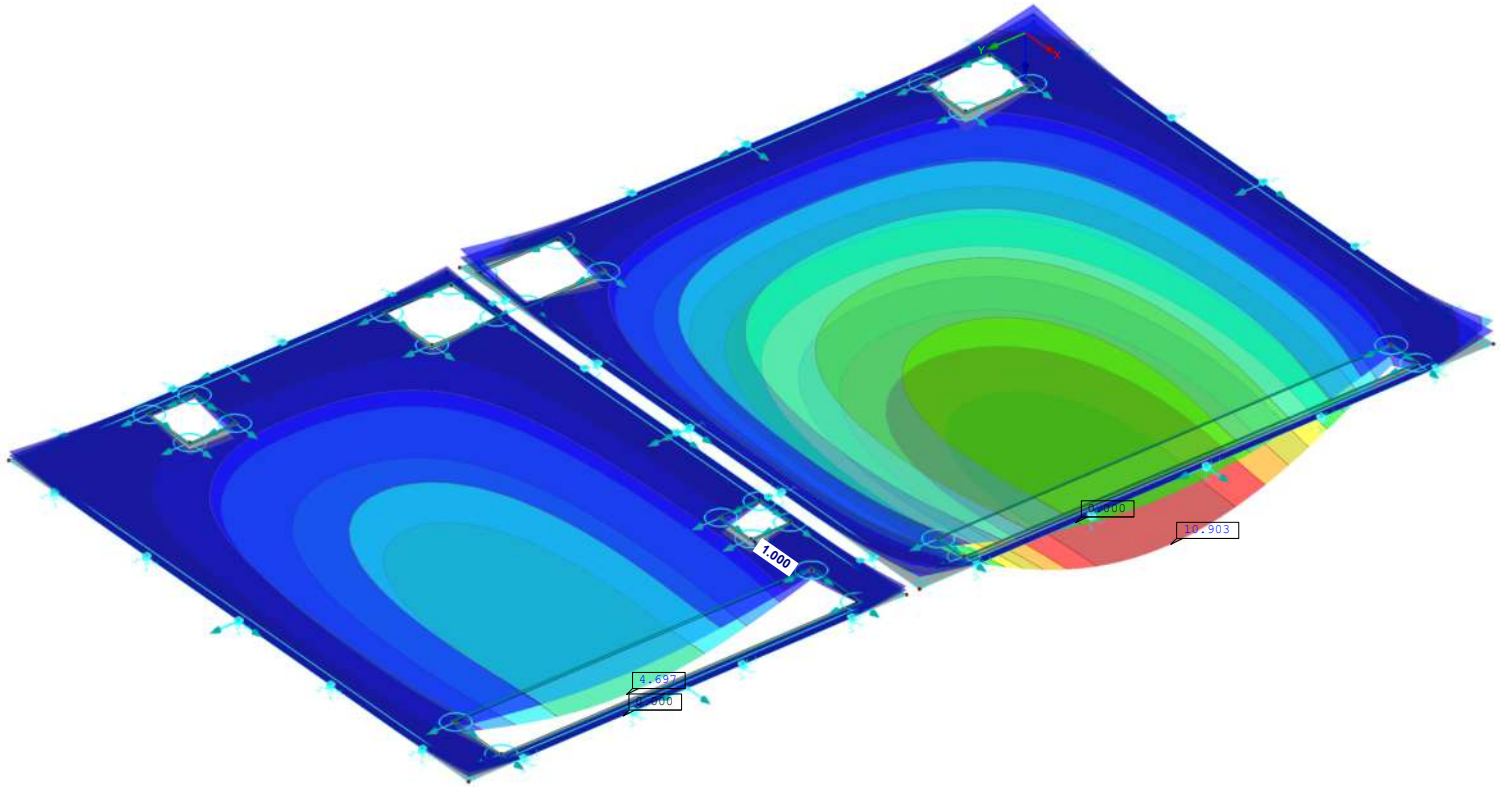


Max w-k,res,+z (bottom): 0.103, Min w-k,res,+z (bottom): 0.000 mm

DEFORMATIONS u

RF-CONCRETE Surfaces CA1
Dangtis_1
Deformations u [mm]
Values: u [mm]

Isometric



Factor of deformations: 140.00
Max u: - Min u: -

1.1 GENERAL DATA

Design according to Standard:	LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
ULTIMATE LIMIT STATES		
Result combinations to design:	RC1	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
		Persistent and Transient
SERVICEABILITY LIMIT STATES		
Result combinations to design:	RC2	SLS - Characteristic
		Characteristic with direct load, k-t: 0.600, β: 0.500
	RC3	SLS - Frequent
		Frequent, k-t: 0.578, β: 0.500
	RC4	SLS - Quasi-permanent
		Quasi-permanent, k-t: 0.550, β: 0.500
Design Situation Settings for Serviceability Limit State Checks		
Load combination:		
Characteristic with direct load	Checks: k_1*f_{ck}, k_3*f_{yk}	
Characteristic with imposed deformation	Checks: k_1*f_{ck}, k_4*f_{yk}	
Frequent	Checks: w_k	
Quasi-permanent	Checks: k_2*f_{ck}, w_k, u_l	
Deformation Relative to:	Undeformed system	

1.1 SETTINGS - NONLINEAR CALCULATION (STATE II)

Activate nonlinear calculation for ULTIMATE LIMIT state:	☐
Activate nonlinear calculation for SERVICEABILITY LIMIT state:	☐
Activate nonlinear calculation for fire resistance	☐

1.6 REINFORCEMENT GROUP NO. 1

LONGITUDINAL REINFORCEMENT	
Possible diameters:	16.0, 20.0, 25.0 mm
Max. number of layers:	1
Min. spacing for first layer:	20.0 mm
Type of anchorage:	Straight
Steel surface:	Ribbed
Reduction of reinforcement:	None
SHEAR REINFORCEMENT	
Possible diameters:	8.0, 10.0 mm
No. of stirrup legs:	2
Inclination:	90°
Type of anchorage:	Hook
Stirrup layout:	Uniform spacing throughout
REINFORCEMENT LAYOUT	
Concrete cover acc. to Standard	☒
Concrete cover c-top:	45.0 mm
Parameters for definition of the concrete cover	
Settings identical to cover	$C_{+z\ (bottom)}$
Concrete cover c-bottom:	45.0 mm

1.6 REINFORCEMENT GROUP NO. 1

Parameters for definition of the concrete cover			
Exposure Class acc. to 4.4.1.2(5)	XC4		
Abrasion Class acc. to 4.4.1.2(13)	No		
Design working life acc. to 4.4.1.2(5) Table 4.3N	50 Years		
Concrete Cast acc. to 4.4.1.3(4)	cast-in-place concrete		
Reinforcement type		Link	Longitudinal
Maximum diameter of reinforcement		10.0 mm	25.0 mm
Minimum cover due to bond requirement acc. to 4.4.1.2(3)		10.0 mm	25.0 mm
Minimum cover due to environmental conditions acc. to 4.4.1.2(5)		25.0 mm	25.0 mm
Additive safety element acc. to 4.4.1.2(6)		0.0 mm	0.0 mm
Minimum concrete cover acc. to 4.4.1.2(2)		25.0 mm	25.0 mm
Allowance for deviation acc. to 4.4.1.3		10.0 mm	10.0 mm
Nominal cover reinforcement, acc. to 4.4.1.1		35.0 mm	35.0 mm
Minimum cover of reinforcement		35.0 mm	45.0 mm
Air entrainment of more than 4% acc. to 4.4.1.2(5) Note 2.	☐		
Special quality control of the concrete production acc. to 4.4.1.2(5) Table 4.3N	☐		
Nominal maximum aggregate size greater than 32 mm, acc. to 4.4.1.2(3) Table 4.2	☐		
Concrete cover c-side:	45.0 mm		
Parameters for definition of the concrete cover			
Settings identical to cover	$C_{+z\ (bottom)}$		
Reinforcement layout:	-z (top) - +z (bottom) (optimized distribution)		
Torsional reinforcement distributed circumferentially:	☐		
Relevant internal forces:	N, V-y, V-z, M-y, M-z		
MINIMUM REINFORCEMENT			
Min. reinforcement area (min. A-s,top):	0.00 cm^2		
Min. reinforcement area (min. A-s,bottom):	0.00 cm^2		
Min. longitudinal reinforcement acc. to Standard:	☒		
Min. shear reinforcement acc. to Standard:	☒		
Longitudinal reinforcement for shear force design:	Use provided longitudinal reinforcement		
SHEAR JOINT			
Shear joint available:	☐		
Design of flange connections on segmented cross-sections	☐		
OPTIONS FOR EN 1992-1-1:2004/A1:2014			
Max. percentage of reinforcement:	8.00 %		
Neutral axis depth limitation	☒		
Partial safety factor Gamma-c	PT 1.50, AC 1.20, SLS 1.00		
Partial safety factor Gamma-s	PT 1.15, AC 1.00, SLS 1.00		
Reduction factor Alpha-cc	PT 0.90, AC 0.90, SLS 1.00		
Reduction factor Alpha-ct	PT 1.00, AC 1.00, SLS 1.00		
Min. inclination of concrete strut	21.80 °		
Max. inclination of concrete strut	45.00 °		
SERVICEABILITY			
Crack Analysis			
Limit values of allowable crack width $w_{k,max,-z\ (top)}$:	0.3 mm		
Limit values of allowable crack width $w_{k,max,+z\ (bottom)}$:	0.3 mm		
Design without direct crack width calculation:	☐		
Design with direct crack width calculation:	☒		
Use Eq. (7.14) for $s_{r,max}$:	☐		
Effective concrete tensile strength at time of cracking:	1.000 * f_{ctm}		
$A_{s,min}$ for effects due to restraint:	☐		
Stress Analysis			
Limitation of concrete Compressive stress σ_c:	☒		
According to the design situation with k_1*f_{ck} and k_2*f_{ck} acc. to EN 1992-1-1, NDP(7.2)			
Factor k_1 for limitation of compressive stress in concrete k_1:	0.600		
Factor k_2 for limitation of compressive stress in concrete k_2:	0.450		

1.6 REINFORCEMENT GROUP NO. 1

Limitation of steel stress σ_s: ☒

1.7 DEFLECTION DATA

No.	Reference to	Element No.	Reference Length Element	L [m]	Precamber w_0 [mm]	Limit value L / [-]	$u_{z,max}$ [mm]	Comment
1	Member	1	Distance between supports	8.340	0.0	250	33.4	
2	Member	2	Distance between supports	8.340	0.0	250	33.4	
3	Member	3	Distance between supports	8.340	0.0	250	33.4	
4	Member	4	Distance between supports	8.340	0.0	250	33.4	

STRUCTURAL ANALYSIS

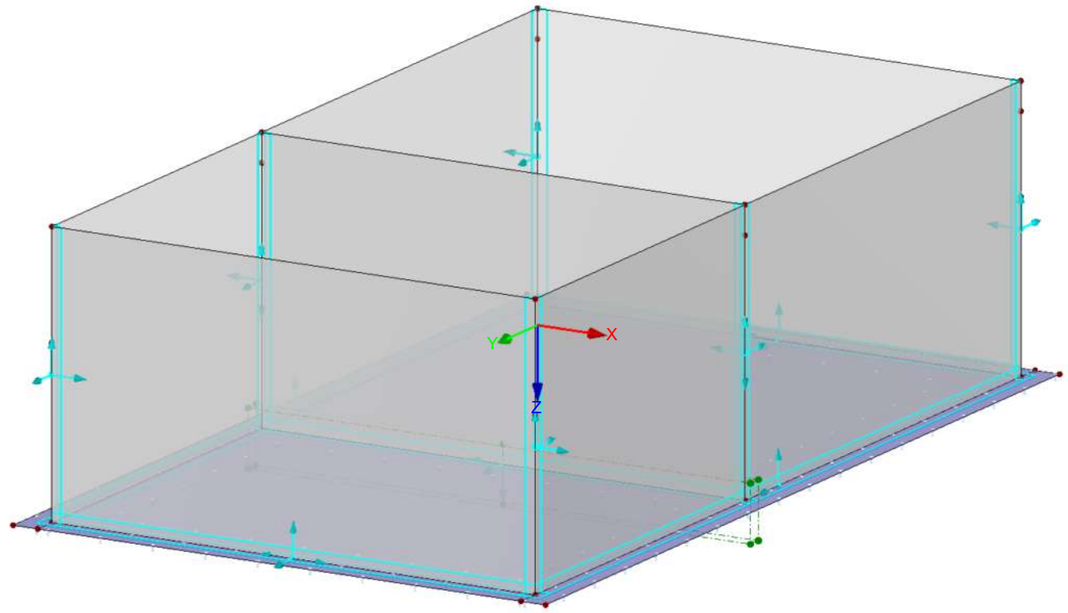
PROJECT

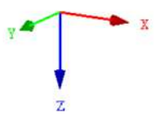
Perteklinių nuotekų talpa (04) ir perteklinio dumblo talpa (05);

CLIENT

CREATED BY

Isometric





MODEL - GENERAL DATA

General	Model name	:	SK23010_Dreverna_ (04, 05) statinys_ (pozemines talpos) 23.07.31	
	Project name	:	1	
	Project description	:	1	
	Type of model	:	3D	
	Positive direction of global axis Z	:	Downward	
	Classification of load cases and combinations	:	According to Standard: EN 1990 National Annex: LST - Lithuania	
Options	☐ RF-FORM-FINDING - Find initial equilibrium shapes of membrane and cable structures			
	☐ RF-CUTTING-PATTERN			
	☐ Piping analysis			
	☐ Use CQC Rule			
	☐ Enable CAD/BIM model			
	Standard Gravity			
	g	:	10.00 m/s^2	

FE MESH SETTINGS

General	Target length of finite elements	l_{FE}	:	200 mm	
	Maximum distance between a node and a line to integrate it into the line	ε	:	1 mm	
	Maximum number of mesh nodes (in thousands)		:	500	
Members	Number of divisions of members with cable, elastic foundation, taper, or plastic characteristic		:	10	
	☒ Activate member divisions for large deformation or post-critical analysis				
	☒ Use division also for straight members, which are not integrated in surfaces, with		:	Target length LFE of finite elements	
	Minimum number of member divisions		:	2	
	☒ Use division for members with node lying on them				
Surfaces	Maximum ratio of FE rectangle diagonals	Δ_D	:	2	
	Maximum out-of-plane inclination of two finite elements	α	:	0.50 °	
	☒ Integrate also unutilized objects into surfaces				
	Shape direction of finite elements		:	Triangles and quadrangles ☒Same squares where possible	

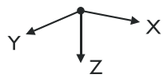
1.3 MATERIALS

Matl. No.	Modulus E [MPa]	Modulus G [MPa]	Poisson's Ratio ν [-]	Spec. Weight γ [kN/m³]	Coeff. of Th. Exp. α [1/°C]	Partial Factor γ_M [-]	Material Model
2	Concrete C35/45*0,7 23800.0 User-Defined Material	9916.7	0.200	25.00	1.00E-05	1.00	Isotropic Linear Elastic
3	Concrete C35/45 | EN 1992-1-1:2004/A1:2014 34000.0	14166.7	0.200	25.00	1.00E-05	1.00	Isotropic Linear Elastic

1.4 SURFACES

Surface No.	Surface Type Geometry	Surface Type Stiffness	Boundary Lines No.	Matl. No.	Thickness Type	Thickness d [mm]	Area A [mm²]	Weight W [kg]
38	Plane	Standard	146,147,191,184,148,149,183,192	2	Constant	350	42922500	37557.20
39	Plane	Standard	150,192,183,149,152,186,190,153	2	Constant	350	42437500	37132.80
40	Plane	Standard	154,155,188,156,186,190,153	2	Constant	350	32252500	28221.00
41	Plane	Standard	188,155,158,159,187,160	2	Constant	350	42922500	37557.20
42	Plane	Standard	161,162,189,185,163,186,190,153	2	Constant	250	42922500	26826.60
43	Plane	Standard	164,187,159,166,162,189,185	2	Constant	350	32252500	28220.90
44	Plane	Standard	184,191,147,168,162,189,185,170	2	Constant	350	42437500	37132.80
53	Plane	Standard	146,150,161,168	3	Constant	350	77437500	67757.90
54	Plane	Standard	161,154,158,166	3	Constant	350	58852600	51496.00
55	Plane	Standard	171,172,168,166,56,173,53	3	Constant	350	7334940	6418.07
56	Plane	Standard	174,154,150,57,175,54,177	3	Constant	350	7335000	6418.12
57	Plane	Standard	174,158,56,181	3	Constant	350	3982460	3484.65
58	Plane	Standard	182,172,146,57	3	Constant	350	3982520	3484.70

1.9 SURFACE SUPPORTS



Found. No.	On Surfaces No.	Spring Constants RF-SOILIN	Translation Support or Spring [kN/m³] u_x	u_y	u_z	Shear Spring [kN/m] v_{xz}	v_{yz}
1	53-58	+	50.000	50.000			

1.9.1 SURFACE SUPPORTS - INEFFECTIVE

Found. No.	On Surfaces No.	Ineffective support under σ_z	Yielding from contact stress $\sigma_{z'}$ [kN/m²]	Coefficient of friction μ_z [-]
1	53-58	Negative		

1.25 LINE RELEASE TYPES

Release No.	Axial/Shear Release or Spring [kN/m²] u_x	u_y	u_z	Moment Release or Spring φ_x [kNm/rad/m]	Comment
1	☒	☒	Fixed if positive v_z	☒	
3	☒	☒	Fixed if negative v_z	☒	

2.1 LOAD CASES

Load Case	Load Case Description	EN 1990 | LST Action Category	Self-Weight - Factor in Direction Active	X	Y	Z
LC1	Savas svoris	Permanent	☒	0.000	0.000	1.000
LC2	Savas svoris su grunto apkrova	Permanent	☒	0.000	0.000	1.000
LC3	Susitraukimas	Permanent/Imposed	☐			
LC4	Vanduo keliantis	Imposed - Category E: storage areas	☐			
LC5	Snow	Snow / ice	☐			
LC6	Vanduo1	Imposed - Category E: storage areas	☐			
LC7	Vanduo2	Imposed - Category E: storage areas	☐			

2.1.1 LOAD CASES - CALCULATION PARAMETERS

Load Case	Load Case Description	Calculation Parameters		
LC1	Savas svoris	Method of analysis	⊙	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	⊙	Newton-Raphson
LC2	Savas svoris su grunto apkrova	Method of analysis	⊙	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	⊙	Newton-Raphson
LC3	Susitraukimas	Method of analysis	⊙	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	⊙	Newton-Raphson
		Activate stiffness factors of:	☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC4	Vanduo keliantis	Method of analysis	⊙	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	⊙	Newton-Raphson
		Activate stiffness factors of:	☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC5	Snow	Method of analysis	⊙	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	⊙	Newton-Raphson
LC6	Vanduo1	Method of analysis	⊙	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	⊙	Newton-Raphson
LC7	Vanduo2	Method of analysis	⊙	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	⊙	Newton-Raphson

2.5 LOAD COMBINATIONS

Load Combin.	DS	Load Combination Description	No.	Factor	Load Case	
CO1	STR	Bandymas 1-a sisterna (susitraukimas)	1	1.35	LC1	Savas svoris
			2	1.30	LC3	Susitraukimas
			3	1.30	LC6	Vanduo1
CO2	STR	Bandymas 2-a sisterna (susitraukimas)	1	1.35	LC1	Savas svoris
			2	1.30	LC3	Susitraukimas
			3	1.30	LC7	Vanduo2
CO3	STR	Bandymas 1+2 (susitraukimas)	1	1.35	LC1	Savas svoris
			2	1.30	LC3	Susitraukimas
			3	1.30	LC6	Vanduo1
			4	1.30	LC7	Vanduo2
CO4	STR	Eksplotacija 1 (susitraukimas)	1	1.35	LC2	Savas svoris su grunto apkrova
			2	1.30	LC3	Susitraukimas
			3	1.30	LC6	Vanduo1
CO5	STR	Eksplotacija 2 (susitraukimas)	1	1.35	LC2	Savas svoris su grunto apkrova
			2	1.30	LC3	Susitraukimas
			3	1.30	LC7	Vanduo2
CO6	STR	Eksplotacija 1+2 (susitraukimas)	1	1.35	LC2	Savas svoris su grunto apkrova
			2	1.30	LC3	Susitraukimas
			3	1.30	LC6	Vanduo1
			4	1.30	LC7	Vanduo2
CO7	STR	Eksplotacija S (susitraukimas)	1	1.35	LC2	Savas svoris su grunto apkrova
			2	1.30	LC3	Susitraukimas
			3	1.30	LC5	Snow
			4	1.30	LC6	Vanduo1
CO8	STR	Eksplotacija 1+S (susitraukimas)	1	1.35	LC2	Savas svoris su grunto apkrova
			2	1.30	LC3	Susitraukimas
			3	1.30	LC6	Vanduo1
			4	1.30	LC5	Snow
CO9	STR	Eksplotacija 2+S (susitraukimas)	1	1.35	LC2	Savas svoris su grunto apkrova
			2	1.30	LC3	Susitraukimas
			3	1.30	LC7	Vanduo2
			4	1.30	LC5	Snow
CO10	STR	Eksplotacija 1+2+S (susitraukimas)	1	1.35	LC2	Savas svoris su grunto apkrova
			2	1.30	LC3	Susitraukimas
			3	1.30	LC6	Vanduo1
			4	1.30	LC7	Vanduo2
			5	1.30	LC5	Snow
CO11	STR	Eksplotacija (kėlimas) (susitraukimas)	1	1.35	LC2	Savas svoris su grunto apkrova
			2	1.30	LC3	Susitraukimas
			3	1.30	LC4	Vanduo keliantis

2.5.2 LOAD COMBINATIONS - CALCULATION PARAMETERS

Load Combin.	Description	Calculation Parameters		
CO1	Bandymas 1-a sisterna (susitraukimas)	Method of analysis	⊙	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	⊙	Picard
		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

2.5.2 LOAD COMBINATIONS - CALCULATION PARAMETERS

Load Combin.	Description	Calculation Parameters		
		Activate stiffness factors of:	☒	Materials (partial factor γM)
			☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO2	Bandymas 2-a sisterna (susitraukimas)	Method of analysis	◉	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	◉	Picard
		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
		Activate stiffness factors of:	☒	Materials (partial factor γM)
			☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO3	Bandymas 1+2 (susitraukimas)	Method of analysis	◉	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	◉	Picard
		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
		Activate stiffness factors of:	☒	Materials (partial factor γM)
			☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO4	Eksplotacija 1 (susitraukimas)	Method of analysis	◉	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	◉	Picard
		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
		Activate stiffness factors of:	☒	Materials (partial factor γM)
			☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO5	Eksplotacija 2 (susitraukimas)	Method of analysis	◉	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	◉	Picard
		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
		Activate stiffness factors of:	☒	Materials (partial factor γM)
			☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO6	Eksplotacija 1+2 (susitraukimas)	Method of analysis	◉	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	◉	Picard
		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
		Activate stiffness factors of:	☒	Materials (partial factor γM)
			☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO7	Eksplotacija S (susitraukimas)	Method of analysis	◉	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	◉	Picard
		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
		Activate stiffness factors of:	☒	Materials (partial factor γM)
			☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO8	Eksplotacija 1+S (susitraukimas)	Method of analysis	◉	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	◉	Picard
		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
		Activate stiffness factors of:	☒	Materials (partial factor γM)
			☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO9	Eksplotacija 2+S (susitraukimas)	Method of analysis	◉	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	◉	Picard
		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
		Activate stiffness factors of:	☒	Materials (partial factor γM)
			☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO10	Eksplotacija 1+2+S (susitraukimas)	Method of analysis	◉	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	◉	Picard
		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

2.5.2 LOAD COMBINATIONS - CALCULATION PARAMETERS

Load Combin.	Description	Calculation Parameters		
		Activate stiffness factors of:	: ☒	Materials (partial factor γM)
			: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO11	Eksplotacija (kėlimas) (susitraukimas)	Method of analysis	: ◉	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	: ◉	Picard
		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
		Activate stiffness factors of:	: ☒	Materials (partial factor γM)
			: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)

2.7 RESULT COMBINATIONS

Result Combin	Description	Loading
RC1	ULS (STR/GEO) - VISI	CO1 or to CO11

LC1
Savas svoris

3.3 LINE LOADS

LC1: Savas svoris

No.	Reference to	On Lines No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	Lines	152	Force	Parabolic	ZL	p_1	6.000	kN/m
						p_2	6.000	kN/m
						p_3	3300000.000	%
2	Lines	163	Force	Parabolic	ZL	p_1	12.000	kN/m
						p_2	12.000	kN/m
						p_3	7030000.000	%
3	Lines	160	Force	Parabolic	ZL	p_1	6.000	kN/m
						p_2	6.000	kN/m
						p_3	25.000	kN/m
4	Lines	148	Force	Parabolic	ZL	p_1	6.000	kN/m
						p_2	6.000	kN/m
						p_3	3300000.000	%
5	Lines	170	Force	Parabolic	ZL	p_1	6.000	kN/m
						p_2	6.000	kN/m
						p_3	3300000.000	%
6	Lines	164	Force	Parabolic	ZL	p_1	6.000	kN/m
						p_2	6.000	kN/m
						p_3	2500000.000	%
7	Lines	156	Force	Parabolic	ZL	p_1	6.000	kN/m
						p_2	6.000	kN/m
						p_3	2500000.000	%

3.4 SURFACE LOADS

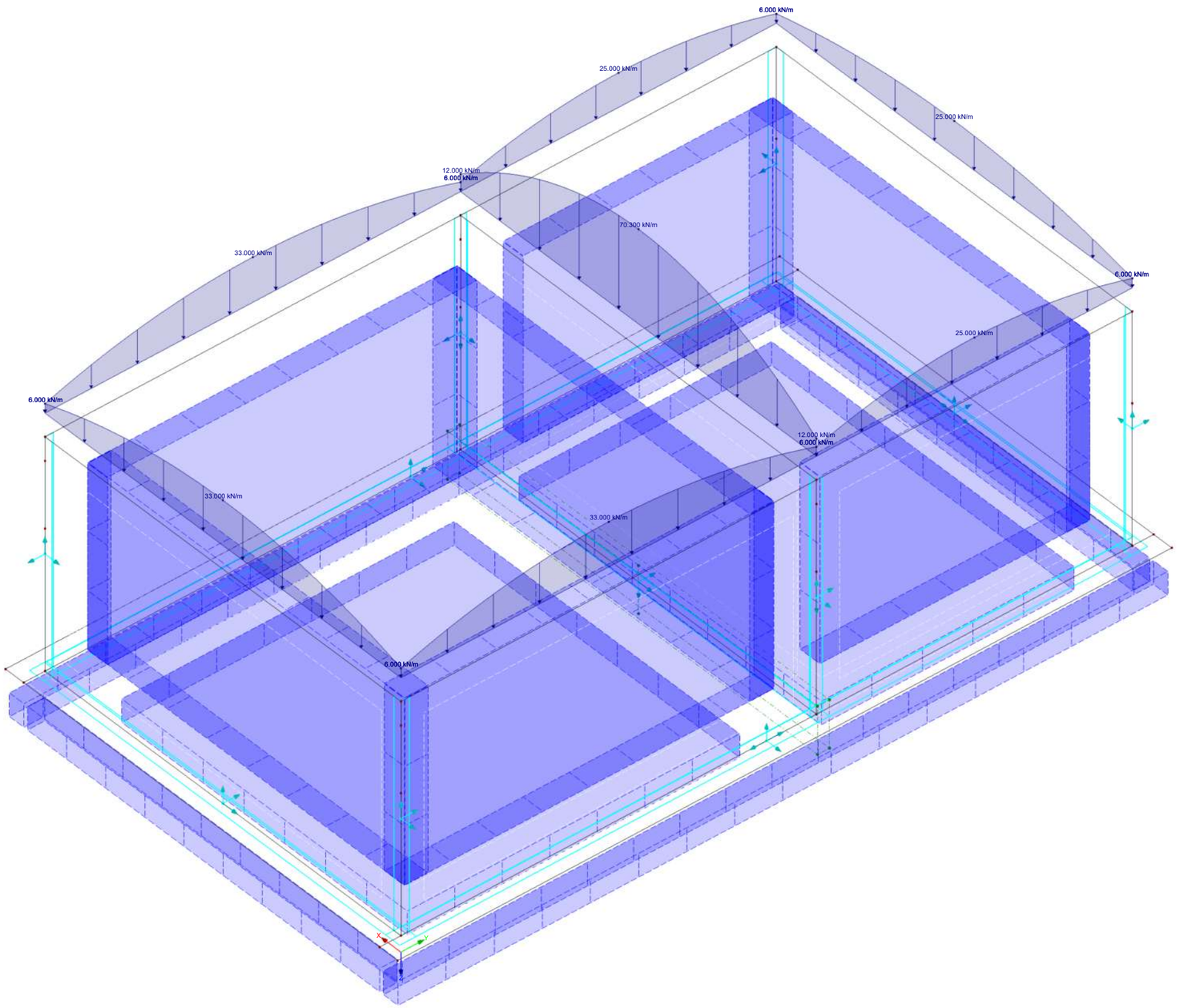
LC1: Savas svoris

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
2	38-41,43,44	Axial Strain	Uniform		ε_1	-0.00035	-
3	53-58	Axial Strain	Uniform		ε_1	-0.00035	-
4	42	Axial Strain	Uniform		ε_1	-0.00036	-

LC1: SAVAS SVORIS

LC1 : Savas svoris

Isometric



LC2
Savas svoris su grunto apkrova

3.3 LINE LOADS

LC2: Savas svoris su grunto apkrova

No.	Reference to	On Lines No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
2	Lines	163	Force	Uniform	ZL	p	6.000	kN/m
3	Lines	152	Force	Parabolic	ZL	p_1	6.000	kN/m
						p_2	6.000	kN/m
						p_3	3300000.000	%
4	Lines	163	Force	Parabolic	ZL	p_1	12.000	kN/m
						p_2	12.000	kN/m
						p_3	7030000.000	%
5	Lines	160	Force	Varying	ZL	x_1	0	mm
						P_1	0.000	kN/m
						x_2	1	mm
						P_2	1.000	kN/m
6	Lines	148	Force	Parabolic	ZL	p_1	6.000	kN/m
						p_2	6.000	kN/m
						p_3	3300000.000	%
7	Lines	170	Force	Parabolic	ZL	p_1	6.000	kN/m
						p_2	6.000	kN/m
						p_3	3300000.000	%
8	Lines	164	Force	Parabolic	ZL	p_1	6.000	kN/m
						p_2	6.000	kN/m
						p_3	2500000.000	%
9	Lines	156	Force	Parabolic	ZL	p_1	6.000	kN/m
						p_2	6.000	kN/m
						p_3	2600000.000	%
10	Lines	160	Force	Parabolic	ZL	p_1	6.000	kN/m
						p_2	6.000	kN/m
						p_3	25.000	kN/m

3.4 SURFACE LOADS

LC2: Savas svoris su grunto apkrova

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	38-41,43,44	Axial Strain	Uniform		ε_1	-0.00042	-
2	53-58	Axial Strain	Uniform		ε_1	-0.00042	-
3	55-58	Force	Uniform	ZL	p	32.00	kN/m²
4	42	Axial Strain	Uniform		ε_1	-0.00036	-

3.8 FREE RECTANGULAR LOADS

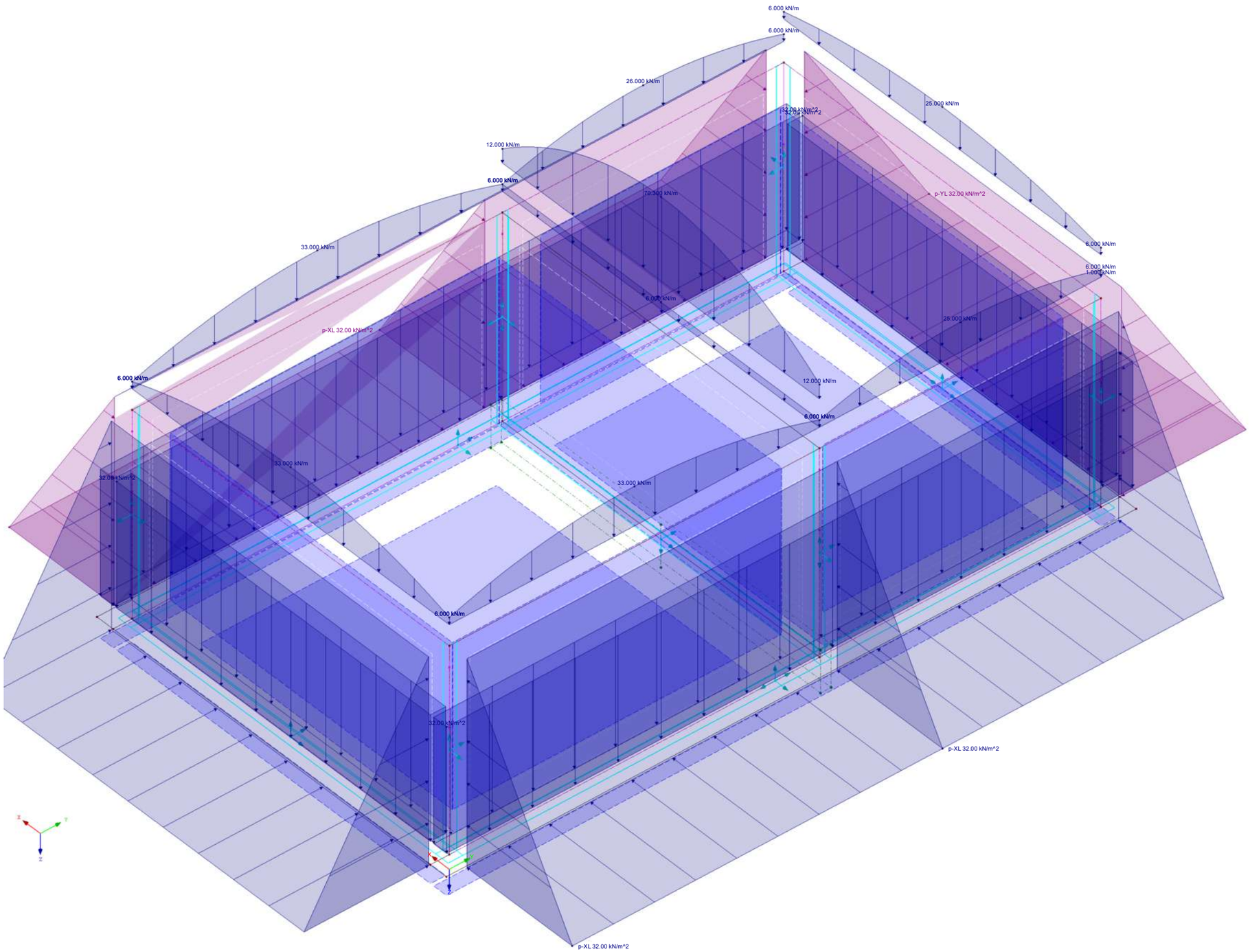
LC2: Savas svoris su grunto apkrova

No.	On Surfaces No.	Project.	Load Distribution	Load Direction	Magnitude Symbol	Value	Unit	Load Position X [mm]	Y [mm]	Z [mm]
1	44	YZ	Linear Z	XL	p_1	32.00	kN/m²		0	-340
					p_2	0.00	kN/m²		8750	-5190
2	43	YZ	Linear Z	XL	p_1	32.00	kN/m²		8750	-340
					p_2	0.00	kN/m²		15400	-5190
3	39	YZ	Linear Z	XL	p_1	-32.00	kN/m²		0	-340
					p_2	0.00	kN/m²		8750	-5190
4	40	YZ	Linear Z	XL	p_1	-32.00	kN/m²		8750	-340
					p_2	0.00	kN/m²		15400	-5190
5	41	XZ	Linear Z	YL	p_1	-32.00	kN/m²	8850		-340
					p_2	0.00	kN/m²	0		-5190
6	38	XZ	Linear Z	YL	p_1	32.00	kN/m²	8850		-340
					p_2	0.00	kN/m²	0		-5190

LC2: SAVAS SVORIS SU GRUNTO APKROVA

LC2 : Savas svoris su grunto apkrova

Isometric



LC3
Susitraukimas

3.4 SURFACE LOADS

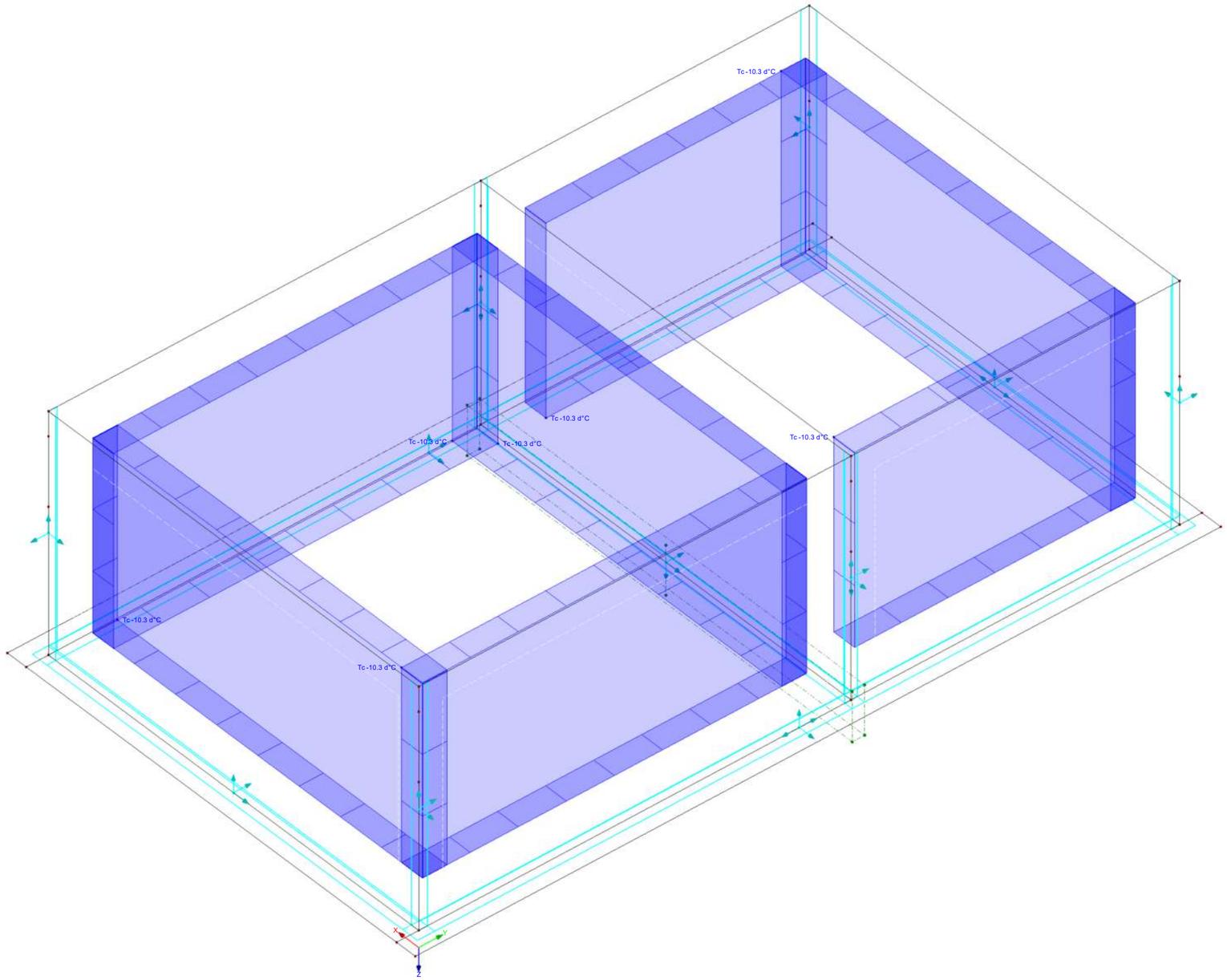
LC3: Susitraukimas

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	38-44	Temperature	Uniform		T_c	-10.3	°C
					ΔT	0.0	°C

LC3: VANDUO1

LC3 : Susitraukimas

Isometric



LC4
Vanduo keliantis

3.4 SURFACE LOADS

LC4: Vanduo keliantis

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	53-58	Force	Uniform	ZL	p	-30.00	kN/m²

3.8 FREE RECTANGULAR LOADS

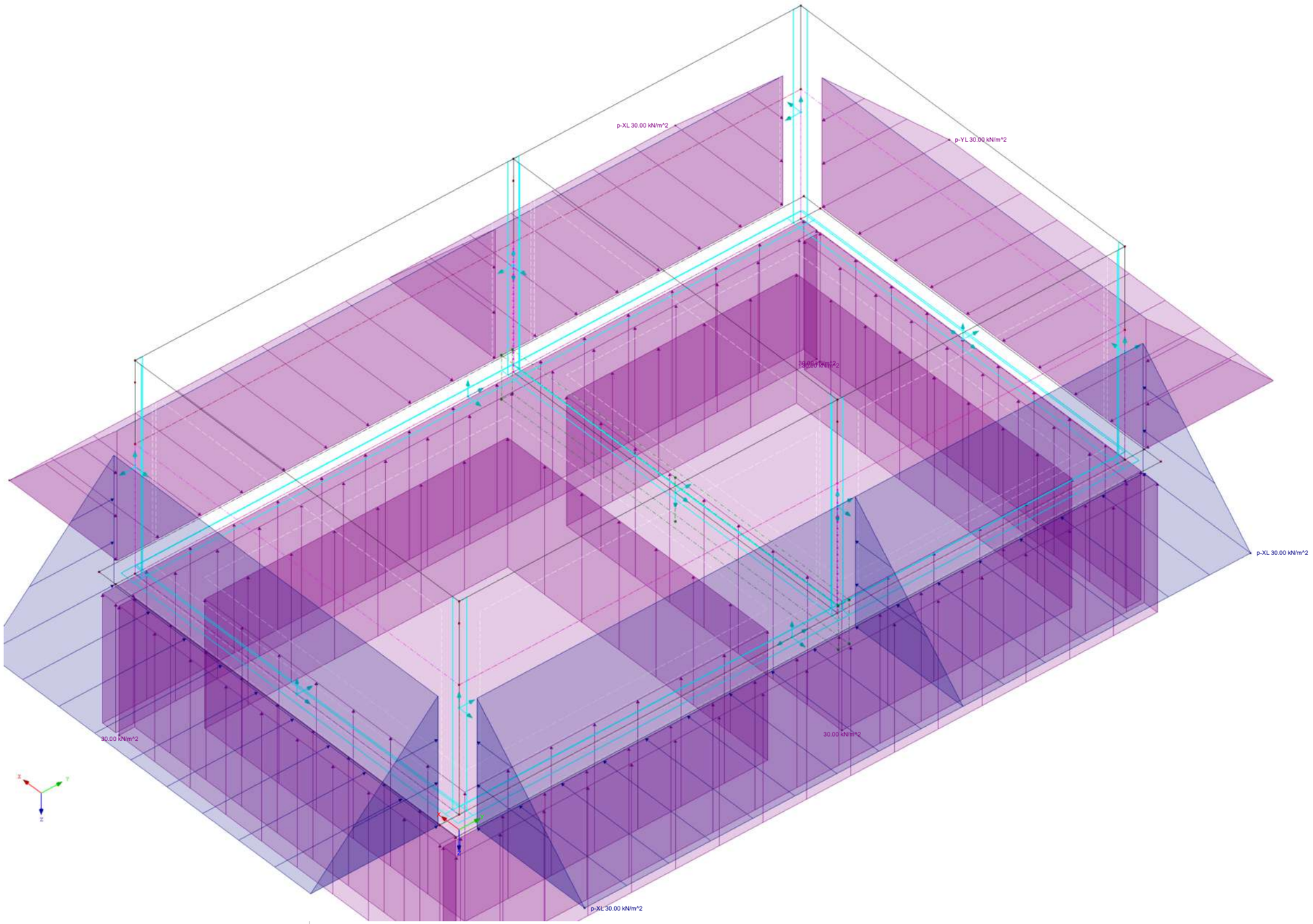
LC4: Vanduo keliantis

No.	On Surfaces No.	Project.	Load Distribution	Load Direction	Magnitude Symbol	Value	Unit	Load Position X [mm]	Y [mm]	Z [mm]
1	43,44	YZ	Linear Z	XL	p_1	30.00	kN/m²		15400	-340
					p_2	0.00	kN/m²		0	-3290
2	39,40	YZ	Linear Z	XL	p_1	-30.00	kN/m²		0	-340
					p_2	0.00	kN/m²		15400	-3290
3	41	XZ	Linear Z	YL	p_1	-30.00	kN/m²	8850		-340
					p_2	0.00	kN/m²	0		-3290
4	38	XZ	Linear Z	YL	p_1	30.00	kN/m²	8850		-340
					p_2	0.00	kN/m²	0		-3290

LC4: VANDUO2

LC4 : Vanduo keliantis

Isometric



LC5
Snow

3.3 LINE LOADS

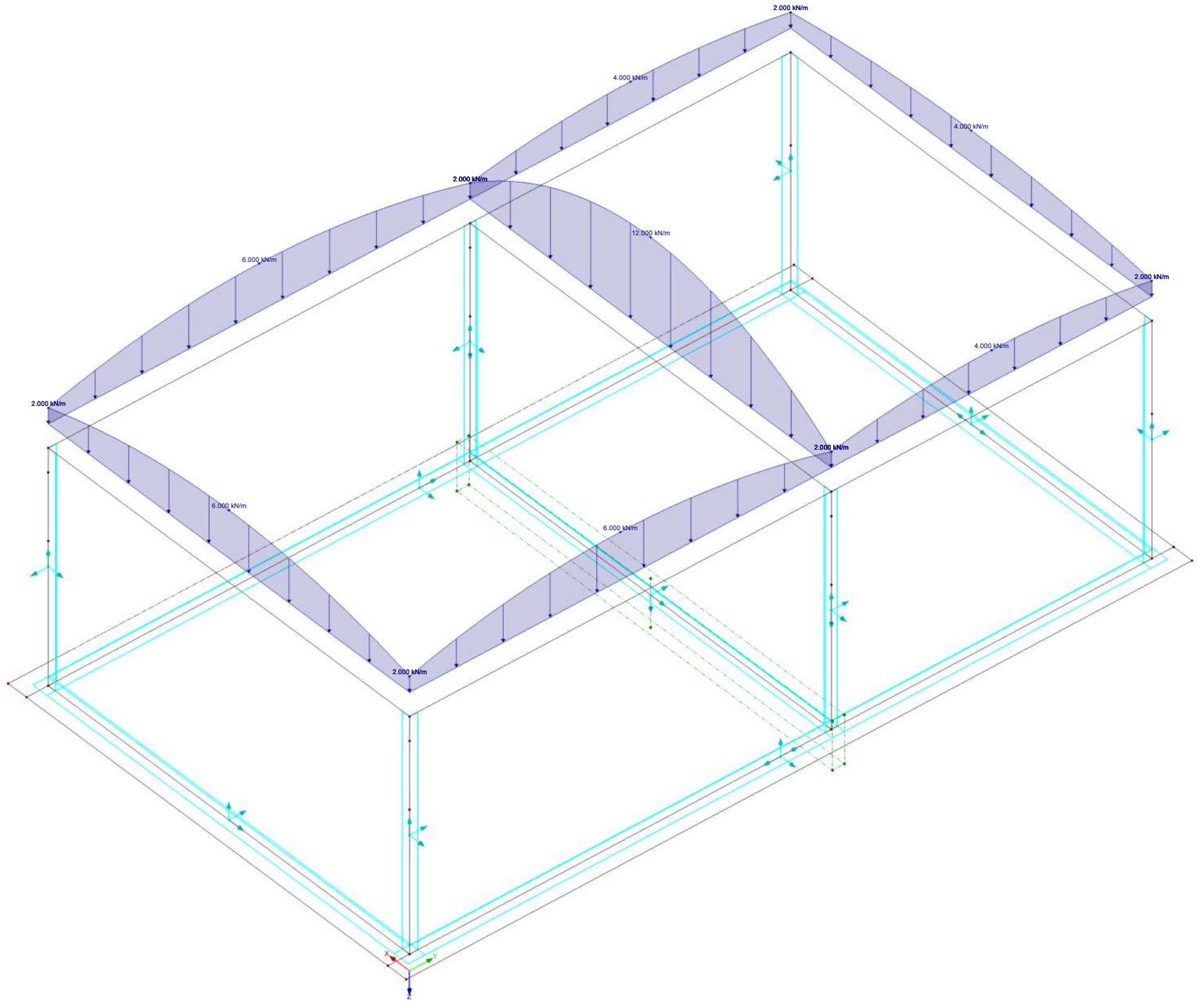
LC5: Snow

No.	Reference to	On Lines No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	Lines	156	Force	Parabolic	ZL	p_1	2.000	kN/m
						p_2	2.000	kN/m
						p_3	4.000	kN/m
2	Lines	163	Force	Parabolic	ZL	p_1	2.000	kN/m
						p_2	2.000	kN/m
						p_3	12.000	kN/m
3	Lines	152	Force	Parabolic	ZL	p_1	2.000	kN/m
						p_2	2.000	kN/m
						p_3	6.000	kN/m
4	Lines	148	Force	Parabolic	ZL	p_1	2.000	kN/m
						p_2	2.000	kN/m
						p_3	6.000	kN/m
5	Lines	170	Force	Parabolic	ZL	p_1	2.000	kN/m
						p_2	2.000	kN/m
						p_3	6.000	kN/m
6	Lines	164	Force	Parabolic	ZL	p_1	2.000	kN/m
						p_2	2.000	kN/m
						p_3	4.000	kN/m
7	Lines	160	Force	Parabolic	ZL	p_1	2.000	kN/m
						p_2	2.000	kN/m
						p_3	4.000	kN/m

LC5: VANDUO3

LC5 : Snow

Isometric



LC6
Vanduo1

3.4 SURFACE LOADS

LC6: Vanduo1

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	53	Force	Uniform	ZL	p	44.00	kN/m²

3.8 FREE RECTANGULAR LOADS

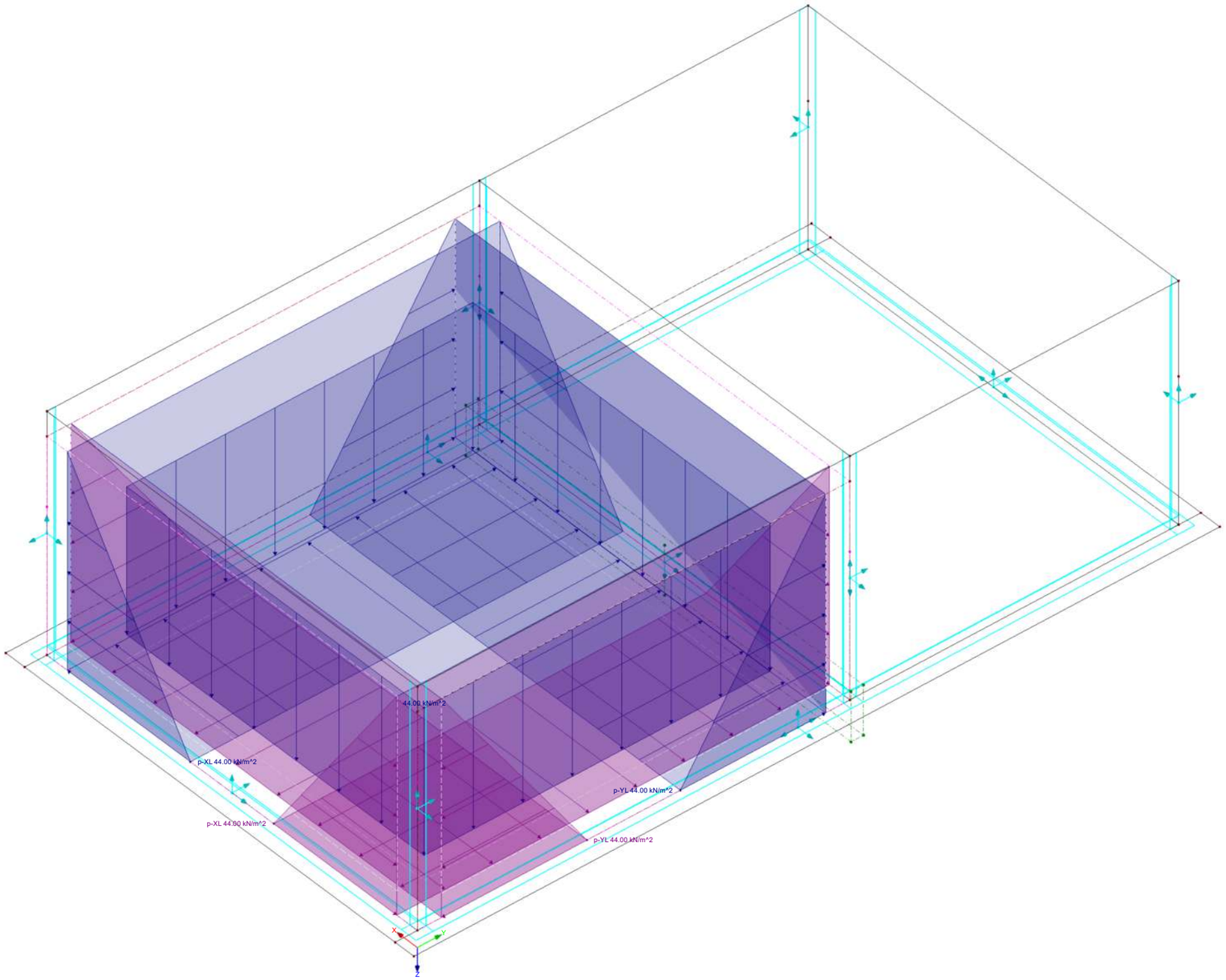
LC6: Vanduo1

No.	On Surfaces No.	Project.	Load Distribution	Load Direction	Magnitude Symbol	Value	Unit	Load Position X [mm]	Y [mm]	Z [mm]
1	39	YZ	Linear Z	XL	p_1	44.00	kN/m²		0	-340
					p_2	0.00	kN/m²		8750	-4690
2	38	XZ	Linear Z	YL	p_1	-44.00	kN/m²	0		-340
					p_2	0.00	kN/m²	8850		-4690
3	44	YZ	Linear Z	XL	p_1	-44.00	kN/m²		0	-340
					p_2	0.00	kN/m²		8750	-4690
4	42	XZ	Linear Z	YL	p_1	44.00	kN/m²	0		-340
					p_2	0.00	kN/m²	8850		-4690

LC6: VANDUO4

LC6 : Vanduo1

Isometric



LC7
Vanduo2

3.4 SURFACE LOADS

LC7: Vanduo2

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	54	Force	Uniform	ZL	p	30.00	kN/m²

3.8 FREE RECTANGULAR LOADS

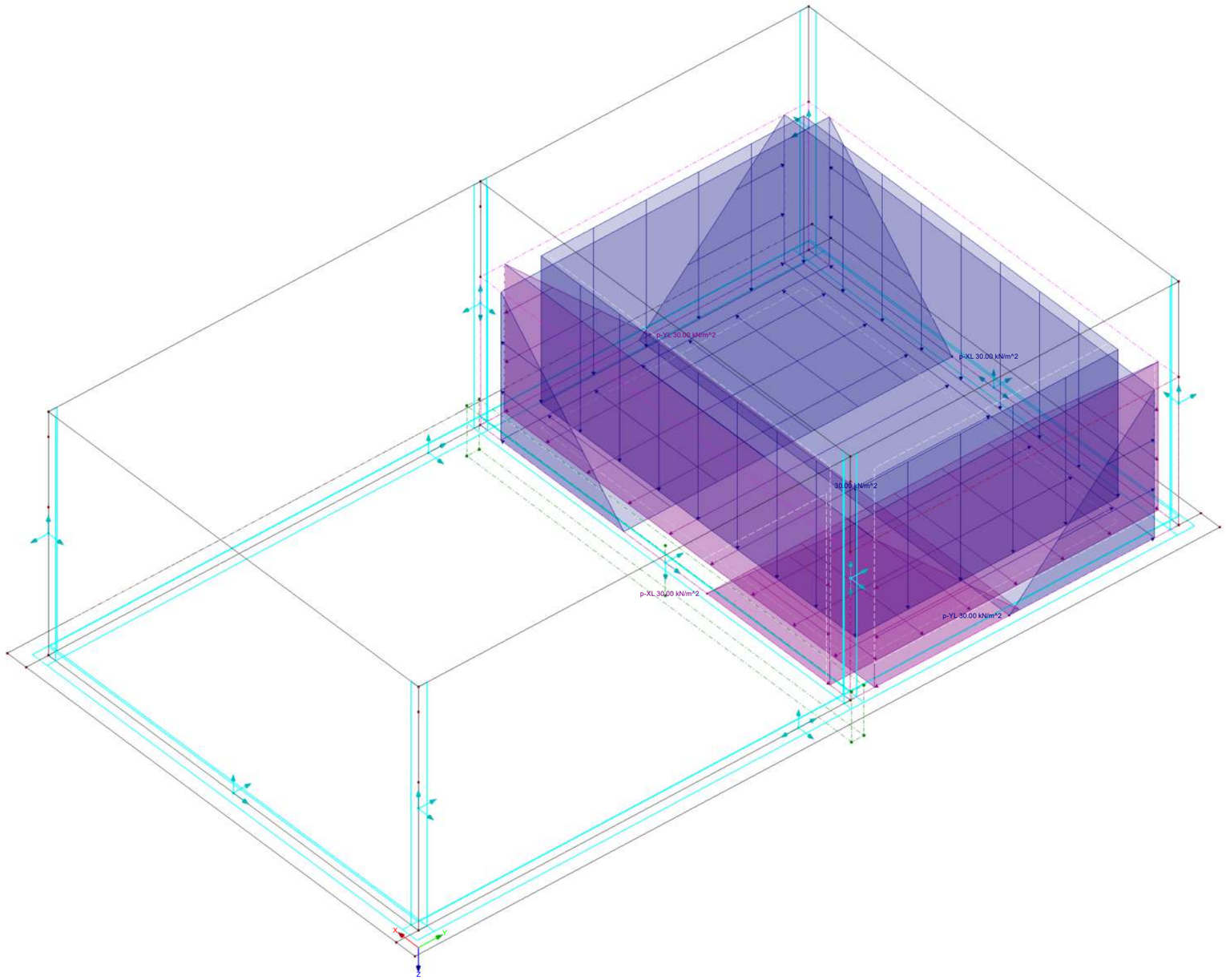
LC7: Vanduo2

No.	On Surfaces No.	Project.	Load Distribution	Load Direction	Magnitude Symbol	Value	Unit	Load Position X [mm]	Y [mm]	Z [mm]
1	40	YZ	Linear Z	XL	p_1	30.00	kN/m²		15400	-340
					p_2	0.00	kN/m²		8750	-3290
2	43	YZ	Linear Z	XL	p_1	-30.00	kN/m²		8750	-340
					p_2	0.00	kN/m²		15400	-3290
3	42	XZ	Linear Z	YL	p_1	-30.00	kN/m²	8850		-340
					p_2	0.00	kN/m²	0		-3290
4	41	XZ	Linear Z	YL	p_1	30.00	kN/m²	0		-340
					p_2	0.00	kN/m²	8850		-3290

LC7: VANDUO KELIANTIS

LC7 : Vanduo2

Isometric



RF-CONCRETE Surfaces
CA1
Pagrindo plokštė

Project: 1
1
Model: SK23010_Dreverna_ (04, 05) statinys_ ..
Date: 2023-09-06

1.1 GENERAL DATA

Design according to Standard:	LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
ULTIMATE LIMIT STATE		
Load combinations for design:	CO1	Bandymas 1-a sisterna (susitraukimas)
		Persistent and Transient
	CO2	Bandymas 2-a sisterna (susitraukimas)
		Persistent and Transient
	CO3	Bandymas 1+2 (susitraukimas)
		Persistent and Transient
	CO4	Eksplotacija 1 (susitraukimas)
		Persistent and Transient
	CO5	Eksplotacija 2 (susitraukimas)
		Persistent and Transient
	CO6	Eksplotacija 1+2 (susitraukimas)
		Persistent and Transient
	CO7	Eksplotacija S (susitraukimas)
		Persistent and Transient
	CO8	Eksplotacija 1+S (susitraukimas)
		Persistent and Transient
	CO9	Eksplotacija 2+S (susitraukimas)
		Persistent and Transient
	CO10	Eksplotacija 1+2+S (susitraukimas)
		Persistent and Transient
	CO11	Eksplotacija (kėlimas) (susitraukimas)
		Persistent and Transient
SERVICEABILITY LIMIT STATE		
Load combinations for design:	CO1	Bandymas 1-a sisterna (susitraukimas)
		Quasi-permanent, k_t 0.600
	CO2	Bandymas 2-a sisterna (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO3	Bandymas 1+2 (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO4	Eksplotacija 1 (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO5	Eksplotacija 2 (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO6	Eksplotacija 1+2 (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO7	Eksplotacija S (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO8	Eksplotacija 1+S (susitraukimas)
		Quasi-permanent, k_t 0.559
	CO9	Eksplotacija 2+S (susitraukimas)
		Quasi-permanent, k_t 0.559
	CO10	Eksplotacija 1+2+S (susitraukimas)
		Quasi-permanent, k_t 0.574
	CO11	Eksplotacija (kėlimas) (susitraukimas)
		Quasi-permanent, k_t 0.577
Definition of Provided Additional Reinforcement	Automatic arrangement according to the specifications in Table 1.4	
Type of SLS method:	Analytical Method	
	By assuming an identical deformation ratio of the longitudinal reinforcement	
Design of		
Concrete Stress Analysis	☒	
Steel Stress Analysis	☒	
Crack widths	☒	
Deformation Analysis	☐	
Layout of longitudinal reinforcement		
Required longitudinal reinforcement automatically increased for serviceability limit state design:	☒	
DETAILS		
Analysis Method for Reinforcement Envelope	Mixed	
Apply the averaged internal forces in the defined average region for the ULS calculation and for the analytic method of SLS calculation.	☒	
Apply the internal forces without the rib components	☐	
Design Situation Settings for Serviceability Limit State Checks		
Load combination:		
Characteristic with direct load	Checks: -	
Characteristic with imposed deformation	Checks: -	
Frequent	Checks: -	
Quasi-permanent	Checks: k_1*f_{ck}, k_2*f_{ck}, k_3*f_{yk}, k_4*f_{yk}, w_k, u_l	

1.2 MATERIALS

Material No.	Material Description: Concrete Strength Class	Material Description: Steel Description	Comment
2	Concrete C35/45*0,7	B 500 S (A)	
3	Concrete C35/45	B 500 S (A)	

1.2.1 MATERIAL PARAMETERS

Material No.	Description	Name	Size	Unit
2	**Concrete Strength Class: Concrete C35/45*0,7**			
	Characteristic Cylinder Compressive Strength	f_{ck}	35.00	N/mm^2
	5 % Fractile of Axial Tensile Strength	$f_{ctk,0.05}$	2.20	N/mm^2
	Characteristic for Nonlinear Calculations			

1.2.1 MATERIAL PARAMETERS

Material No.	Description	Name	Size	Unit
	Mean Secant Modulus of Elasticity	E_{cm}	34000.00	N/mm^2
	Mean Cylinder Compressive Strength	f_{cm}	43.00	N/mm^2
	Mean Axial Tensile Strength	f_{ctm}	3.20	N/mm^2
	Ultimate Strain for Pure Compression	ε_{c1}	-2.250	‰
	Ultimate Strain at Failure	ε_{c1u}	-3.500	‰
	Shear Modulus	G	9916.70	N/mm^2
	Poisson's Ratio	ν	0.200	-
	Characteristic Strains for Parabolic-Rectangular Diagram			
	Ultimate Strain for Pure Compression	ε_{c2}	-2.000	‰
	Ultimate Strain at Failure	ε_{cu2}	-3.500	‰
	Parabola Exponent	n	2.000	-
	Specific Weight	γ	25.00	kN/m^3
	Reinforcing Steel: B 500 S (A)			
	Modulus of Elasticity	E_s	200000.00	N/mm^2
	Yield Stress Mean Value	f_{ym}	550.00	N/mm^2
	Characteristic Yield Stress	f_{yk}	500.00	N/mm^2
	Tensile Strength Mean Value	f_{tm}	551.25	N/mm^2
	Characteristic Tensile Strength	f_{tk}	525.00	N/mm^2
	Limiting Strain	ε_{uk}	25.000	‰
3	**Concrete Strength Class: Concrete C35/45**			
	Characteristic Cylinder Compressive Strength	f_{ck}	35.00	N/mm^2
	5 % Fractile of Axial Tensile Strength	$f_{ctk,0.05}$	2.20	N/mm^2
	Characteristic for Nonlinear Calculations			
	Mean Secant Modulus of Elasticity	E_{cm}	34000.00	N/mm^2
	Mean Cylinder Compressive Strength	f_{cm}	43.00	N/mm^2
	Mean Axial Tensile Strength	f_{ctm}	3.20	N/mm^2
	Ultimate Strain for Pure Compression	ε_{c1}	-2.250	‰
	Ultimate Strain at Failure	ε_{c1u}	-3.500	‰
	Shear Modulus	G	14166.70	N/mm^2
	Poisson's Ratio	ν	0.200	-
	Characteristic Strains for Parabolic-Rectangular Diagram			
	Ultimate Strain for Pure Compression	ε_{c2}	-2.000	‰
	Ultimate Strain at Failure	ε_{cu2}	-3.500	‰
	Parabola Exponent	n	2.000	-
	Specific Weight	γ	25.00	kN/m^3
	Reinforcing Steel: B 500 S (A)			
	Modulus of Elasticity	E_s	200000.00	N/mm^2
	Yield Stress Mean Value	f_{ym}	550.00	N/mm^2
	Characteristic Yield Stress	f_{yk}	500.00	N/mm^2
	Tensile Strength Mean Value	f_{tm}	551.25	N/mm^2
	Characteristic Tensile Strength	f_{tk}	525.00	N/mm^2
	Limiting Strain	ε_{uk}	25.000	‰

1.3 SURFACES

Surface No.	Matl. No.	$\sigma_{c,max}$ [N/mm²] / $\sigma_{s,max}$ [N/mm²]	$f_{ct,eff,wk}$ [N/mm²]	$f_{ct,eff,As,min}$ [N/mm²]	$w_{k,+z\ (top)}$ [mm] / $w_{k,-z\ (bottom)}$ [mm]	Effects due to Restraint: Apply	Effects due to Restraint: k_c [-]	Notes
53	Thickness Type: Constant, Thickness: 350.0 mm							
	3	var. / var.	3.20	3.20	0.100 / 0.100	☐	var.	
54	Thickness Type: Constant, Thickness: 350.0 mm							
	3	var. / var.	3.20	3.20	0.100 / 0.100	☐	var.	
55	Thickness Type: Constant, Thickness: 350.0 mm							
	3	var. / var.	3.20	3.20	0.100 / 0.100	☐	var.	
56	Thickness Type: Constant, Thickness: 350.0 mm							
	3	var. / var.	3.20	3.20	0.100 / 0.100	☐	var.	
57	Thickness Type: Constant, Thickness: 350.0 mm							
	3	var. / var.	3.20	3.20	0.100 / 0.100	☐	var.	
58	Thickness Type: Constant, Thickness: 350.0 mm							
	3	var. / var.	3.20	3.20	0.100 / 0.100	☐	var.	

1.4 REINFORCEMENT GROUP NO. 1 - DUGNO PLOKĐTĖS ARMAVIMAS

Applied to surfaces:	53-58
REINFORCEMENT RATIO	
Minimum secondary reinforcement	20.0 %
Basic minimum reinforcement	0.0 %
Minimum compression reinforcement	0.0 %
Minimum tension reinforcement	0.0 %
Maximum reinforcement percentage	4.0 %
Minimum shear reinforcement percentage	0.0 %
REINFORCEMENT AREA FOR DESIGN OF SLS	
Use provided basic reinforcement and layout (provided) additional reinforcement acc. to Tables 2.1, 2.2, 2.3	
Concrete cover acc. to Standard	☐
BASIC REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 56.0 mm
Bar diameter	ds-1: 16.0, ds-2: 16.0 mm

1.4 REINFORCEMENT GROUP NO. 1 - DUGNO PLOKĐTĖS ARMAVIMAS

Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,-z (top): 10.05, As-2,-z (top): 10.05 cm²/m
BASIC REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 56.0 mm
Bar diameter	ds-1: 16.0, ds-2: 16.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,+z (bottom): 10.05, As-2,+z (bottom): 10.05 cm²/m
ADDITIONAL REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 56.0 mm
Bar diameter	ds-1: 16.0, ds-2: 16.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,-z (top): 0.00, As-2,-z (top): 0.00 cm²/m
ADDITIONAL REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 56.0 mm
Bar diameter	ds-1: 16.0, ds-2: 16.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,+z (bottom): 19.03, As-2,+z (bottom): 22.22 cm²/m
LONGITUDINAL REINFORCEMENT FOR SHEAR FORCE DESIGN	
Apply the greater value resulting from either the required or provided reinforcement (basic and add. reinforcement) per reinforcement direction	
OPTIONS FOR LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
Minimum longitudinal reinforcement for plates acc. to 9.3.1	☒
Direction of minimum reinforcement	
Reinforcement direction with the main tensile force from top (-z) and bottom (+z) surfaces together:	☒
Minimum longitudinal reinforcement for walls acc. to 9.6	☐
Minimum shear reinforcement	☒
Neutral axis depth limitation	☒
Variable strut inclination - min	21.801 °
Variable concrete strut inclination - max	45.000 °
Partial safety factor γ_s	PT 1.15, AC 1.00, SLS 1.00
Partial safety factor γ_c	PT 1.50, AC 1.20, SLS 1.00
Consideration of long-term effects Alpha-cc	PT 0.90, AC 0.90, SLS 1.00
Consideration of long-term effects Alpha-ct	SLS 1.00

2.2 REQUIRED REINFORCEMENT BY SURFACE

Surface	Point	Point Coordinates [m]				Required Reinforcement			Basic	Additional Reinforcement			
No.	No.	X	Y	Z	Symbol	ULS	SLS	ULS/SLS	Reinf.	Required	Provided	Unit	Notes
53	M11503	8.649	7.656	-0.340	$a_{s,1,-z\ (top)}$	4.89	0.56	4.89	10.05	0.00	0.00	cm²/m	
	M12198	7.245	0.498	-0.340	$a_{s,2,-z\ (top)}$	4.89	2.16	4.89	10.05	0.00	0.00	cm²/m	
	M11855	8.649	3.977	-0.340	$a_{s,1,+z\ (bottom)}$	6.24	29.09	29.09	10.05	19.03	19.03	cm²/m	
	M12465	4.955	0.197	-0.340	$a_{s,2,+z\ (bottom)}$	6.17	32.28	32.28	10.05	22.22	22.22	cm²/m	
	M2	8.751	0.000	-0.340	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	
54	M15590	7.643	14.191	-0.340	$a_{s,1,-z\ (top)}$	4.89	0.96	4.89	10.05	0.00	0.00	cm²/m	
	M14237	5.953	15.200	-0.340	$a_{s,2,-z\ (top)}$	4.89	0.86	4.89	10.05	0.00	0.00	cm²/m	
	M14210	8.650	15.200	-0.340	$a_{s,1,+z\ (bottom)}$	5.23	4.54	5.23	10.05	0.00	0.00	cm²/m	
	M14243	5.354	15.200	-0.340	$a_{s,2,+z\ (bottom)}$	5.65	30.45	30.45	10.05	20.39	22.22	cm²/m	
	M111	8.850	8.750	-0.340	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	
55	M94	-0.450	15.850	-0.340	$a_{s,1,-z\ (top)}$	4.89	0.30	4.89	10.05	0.00	0.00	cm²/m	
	M94	-0.450	15.850	-0.340	$a_{s,2,-z\ (top)}$	4.89	0.30	4.89	10.05	0.00	0.00	cm²/m	
	M94	-0.450	15.850	-0.340	$a_{s,1,+z\ (bottom)}$	4.89	0.29	4.89	10.05	0.00	0.00	cm²/m	
	M108	0.000	0.000	-0.340	$a_{s,2,+z\ (bottom)}$	4.89	2.88	4.89	10.05	0.00	0.00	cm²/m	
	M94	-0.450	15.850	-0.340	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	
56	M120	9.300	15.850	-0.340	$a_{s,1,-z\ (top)}$	4.89	0.30	4.89	10.05	0.00	0.00	cm²/m	
	M120	9.300	15.850	-0.340	$a_{s,2,-z\ (top)}$	4.89	0.30	4.89	10.05	0.00	0.00	cm²/m	
	M111	8.850	8.750	-0.340	$a_{s,1,+z\ (bottom)}$	4.89	1.22	4.89	10.05	0.00	0.00	cm²/m	
	M107	8.850	0.000	-0.340	$a_{s,2,+z\ (bottom)}$	4.89	2.88	4.89	10.05	0.00	0.00	cm²/m	
	M107	8.850	0.000	-0.340	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	
57	M124	0.000	15.850	-0.340	$a_{s,1,-z\ (top)}$	0.98	0.00	0.98	10.05	0.00	0.00	cm²/m	
	M124	0.000	15.850	-0.340	$a_{s,2,-z\ (top)}$	4.89	0.07	4.89	10.05	0.00	0.00	cm²/m	
	M17900	0.302	15.850	-0.340	$a_{s,1,+z\ (bottom)}$	4.89	0.33	4.89	10.05	0.00	0.00	cm²/m	
	M113	8.850	15.400	-0.340	$a_{s,2,+z\ (bottom)}$	4.89	2.79	4.89	10.05	0.00	0.00	cm²/m	
	M113	8.850	15.400	-0.340	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	
58	M125	0.000	-0.450	-0.340	$a_{s,1,-z\ (top)}$	0.98	0.00	0.98	10.05	0.00	0.00	cm²/m	
	M125	0.000	-0.450	-0.340	$a_{s,2,-z\ (top)}$	4.89	0.09	4.89	10.05	0.00	0.00	cm²/m	
	M18249	8.448	-0.450	-0.340	$a_{s,1,+z\ (bottom)}$	4.89	0.16	4.89	10.05	0.00	0.00	cm²/m	
	M2	8.751	0.000	-0.340	$a_{s,2,+z\ (bottom)}$	4.89	2.88	4.89	10.05	0.00	0.00	cm²/m	
	M2	8.751	0.000	-0.340	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	

NOTES

No.	Description
18)	To cover the reinforcement in the transition region, the provided additional reinforcement for $a_{s,2,-z\ (top)}$ is applied.

■ 3.2 SERVICEABILITY CHECK BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Load Case	Type	Design Exist. Value	Design Limit Value	Unit	Ratio	Notes
53	M11779	8.649	4.773	-0.340	CO11	σ_c	-9.96	-15.75	N/mm²	0.7	
	M11872	0.201	3.878	-0.340	CO11	σ_s	150.03	400.00	N/mm²	0.4	
	M12476	3.794	0.198	-0.340	CO11	w_k	0.098	0.100	mm	1.0	
54	M14252	4.425	15.207	-0.340	CO11	σ_c	-8.62	-15.75	N/mm²	0.6	
	M14242	5.454	15.200	-0.340	CO11	σ_s	115.19	400.00	N/mm²	0.3	
	M14242	5.454	15.200	-0.340	CO11	w_k	0.091	0.100	mm	1.0	
55	M117	-0.000	8.750	-0.340	CO11	σ_c	-4.40	-15.75	N/mm²	0.3	
	M94	-0.450	15.850	-0.340	CO1	σ_s	0.00	400.00	N/mm²	0.0	226)
	M94	-0.450	15.850	-0.340	CO3	w_k	0.000	0.100	mm	0.0	226)
56	M111	8.850	8.750	-0.340	CO11	σ_c	-4.40	-15.75	N/mm²	0.3	
	M107	8.850	0.000	-0.340	CO1	σ_s	0.00	400.00	N/mm²	0.0	226)
	M107	8.850	0.000	-0.340	CO11	w_k	0.000	0.100	mm	0.0	226)
57	M113	8.850	15.400	-0.340	CO7	σ_c	-2.31	-15.75	N/mm²	0.2	
	M113	8.850	15.400	-0.340	CO1	σ_s	0.00	400.00	N/mm²	0.0	226)
	M113	8.850	15.400	-0.340	CO7	w_k	0.000	0.100	mm	0.0	226)
58	M2	8.751	0.000	-0.340	CO11	σ_c	-2.41	-15.75	N/mm²	0.2	
	M2	8.751	0.000	-0.340	CO1	σ_s	0.00	400.00	N/mm²	0.0	226)
	M2	8.751	0.000	-0.340	CO11	w_k	0.000	0.100	mm	0.0	226)

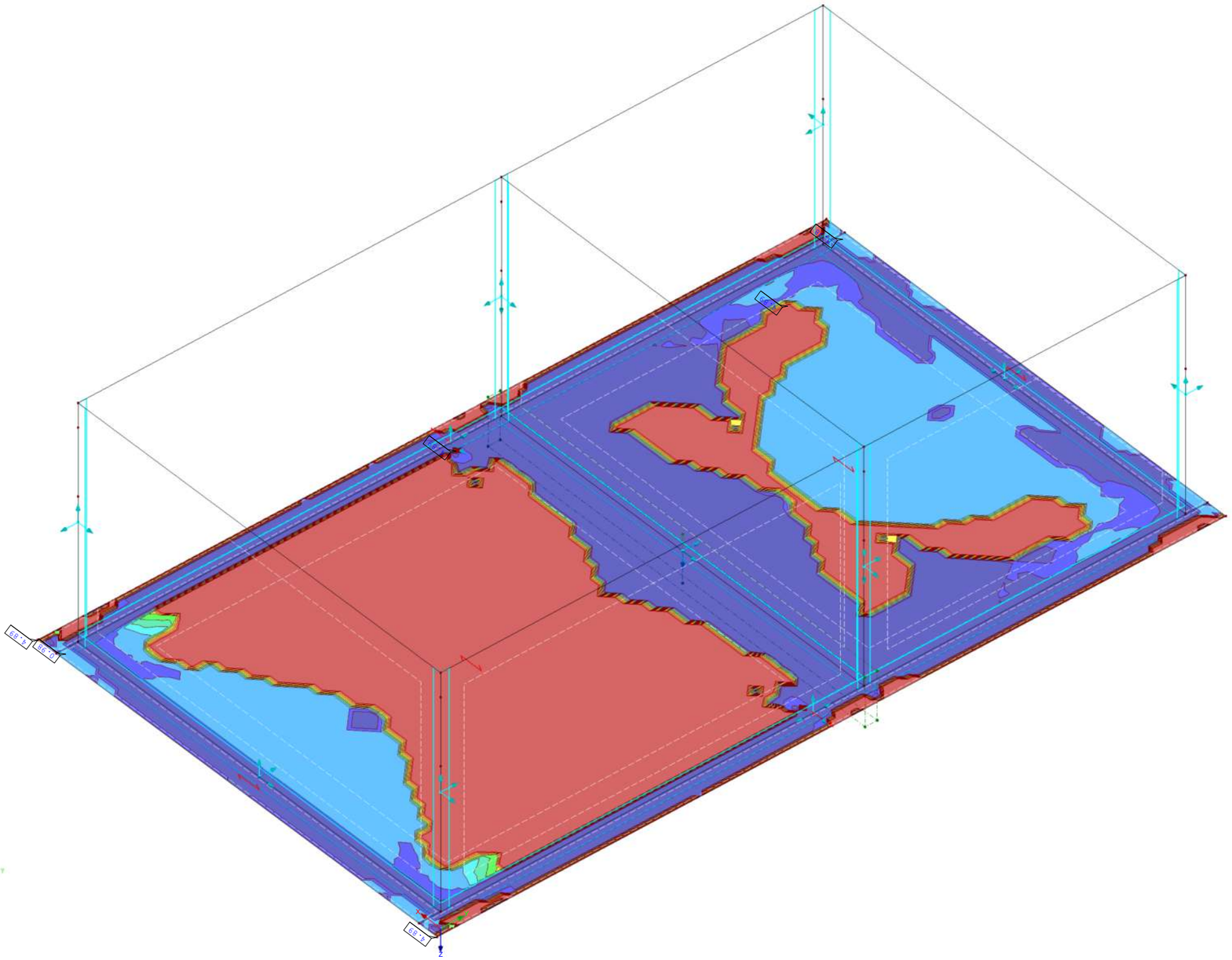
■ SERVICEABILITY CHECK NOTES

No.	Description
219)	Crack width exceeded.
226)	Concrete cracks on neither side.
233)	The design is not satisfactory! Because of the required reinforcement for ULS or user-defined reinforcement the defined reinforcement area is different from the required reinforcement for SLS and that negatively affects SLS design.

REQUIRED REINFORCEMENT $a_{s,1,-z\ (top)}$

RF-CONCRETE Surfaces CA1
Pagrindo plokštė
Required Reinforcement a-s,1,-z (top) [cm²/m]
Values: a-s,1,-z (top) [cm^2/m]

Isometric

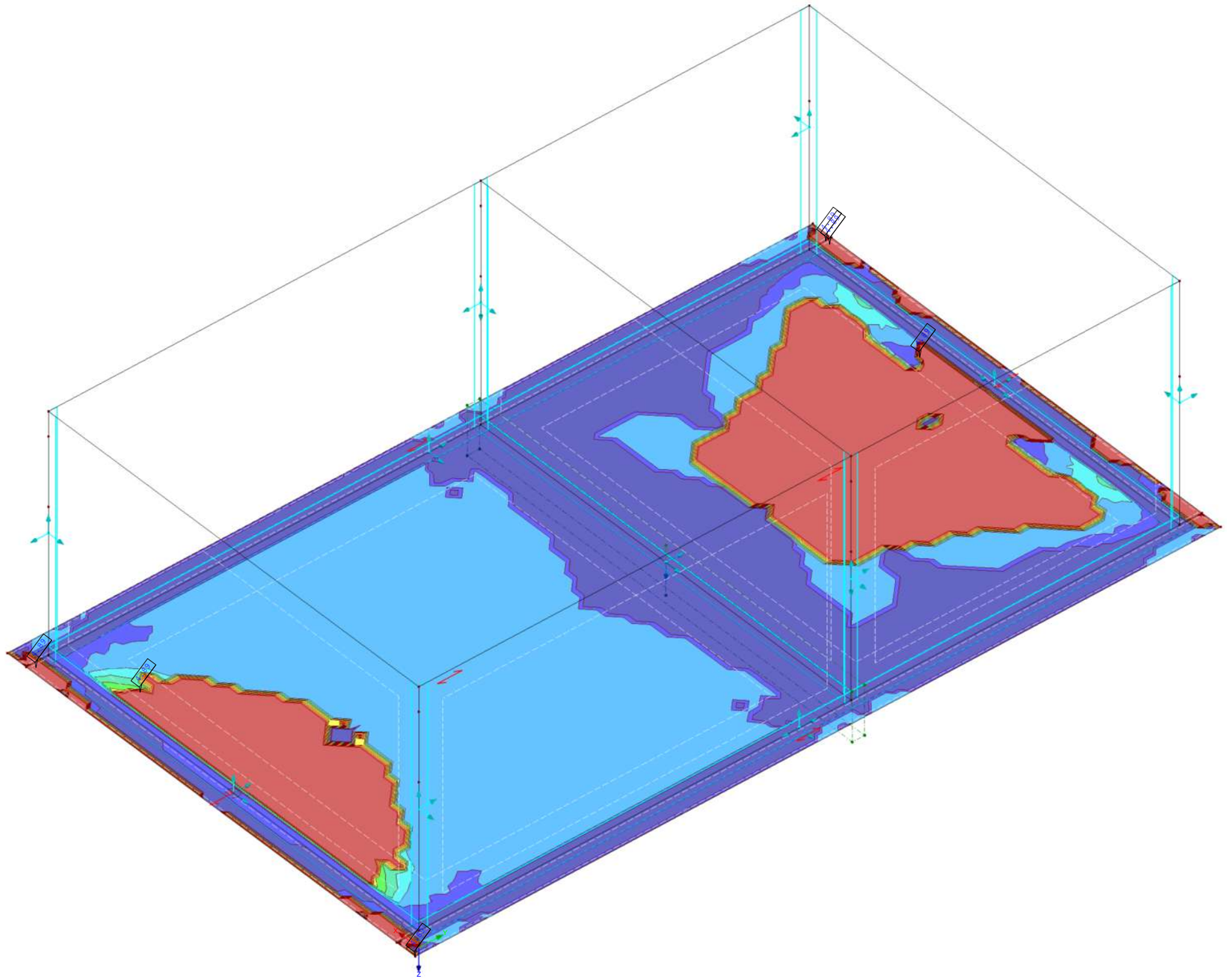


Max a-s,1,-z (top): 4.89, Min a-s,1,-z (top): 0.00 cm²/m

REQUIRED REINFORCEMENT $a_{s,2,-z\ (top)}$

RF-CONCRETE Surfaces CA1
Pagrindo plokštė
Required Reinforcement a-s,2,-z (top) [cm²/m]
Values: a-s,2,-z (top) [cm^2/m]

Isometric

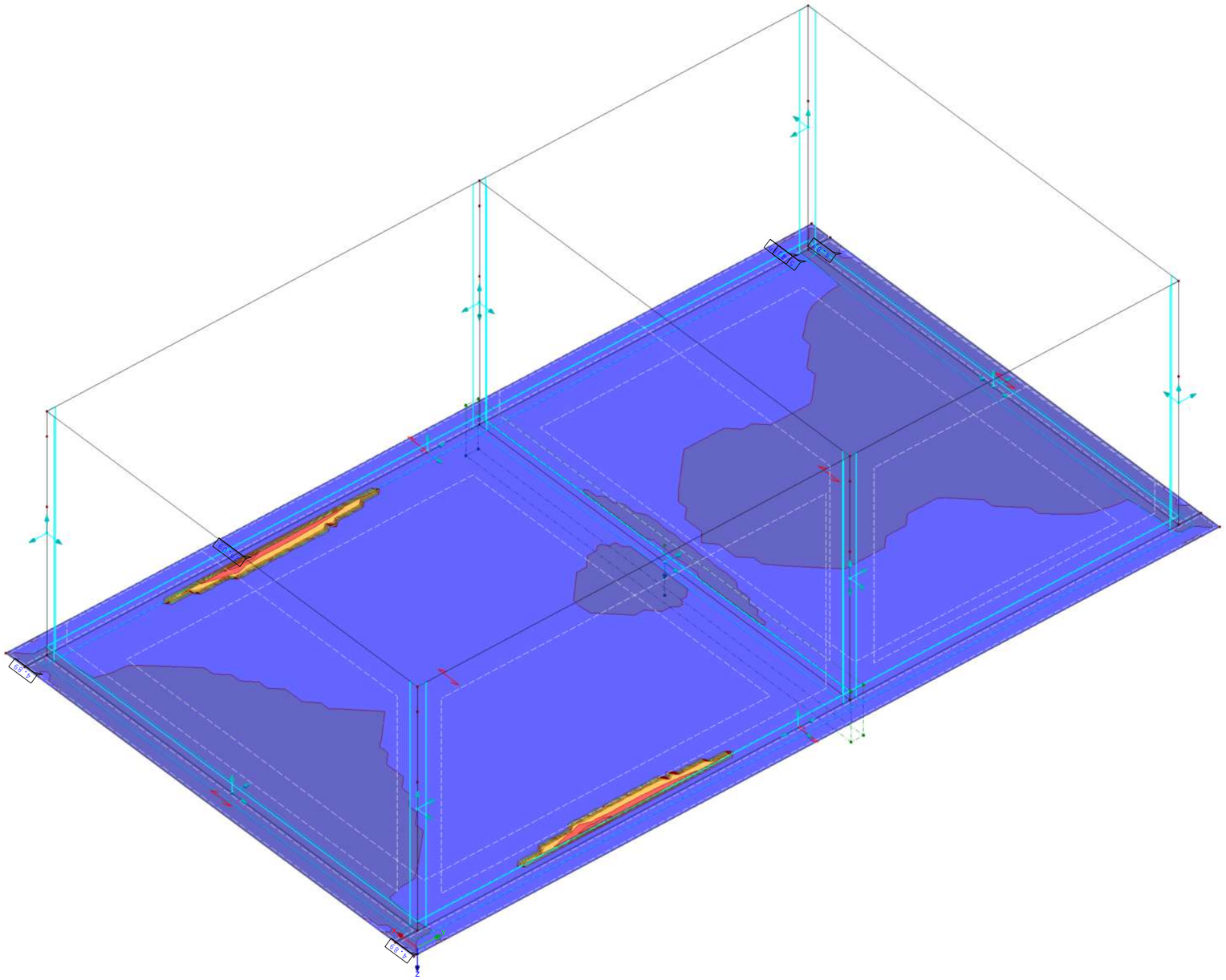


Max a-s,2,-z (top): 4.89, Min a-s,2,-z (top): 0.00 cm²/m

REQUIRED REINFORCEMENT $a_{s,1,+z}$ (bottom)

RF-CONCRETE Surfaces CA1
Pagrindo plokštė
Required Reinforcement a-s,1,+z (bottom) [cm²/m]
Values: a-s,1,+z (bottom) [cm^2/m]

Isometric

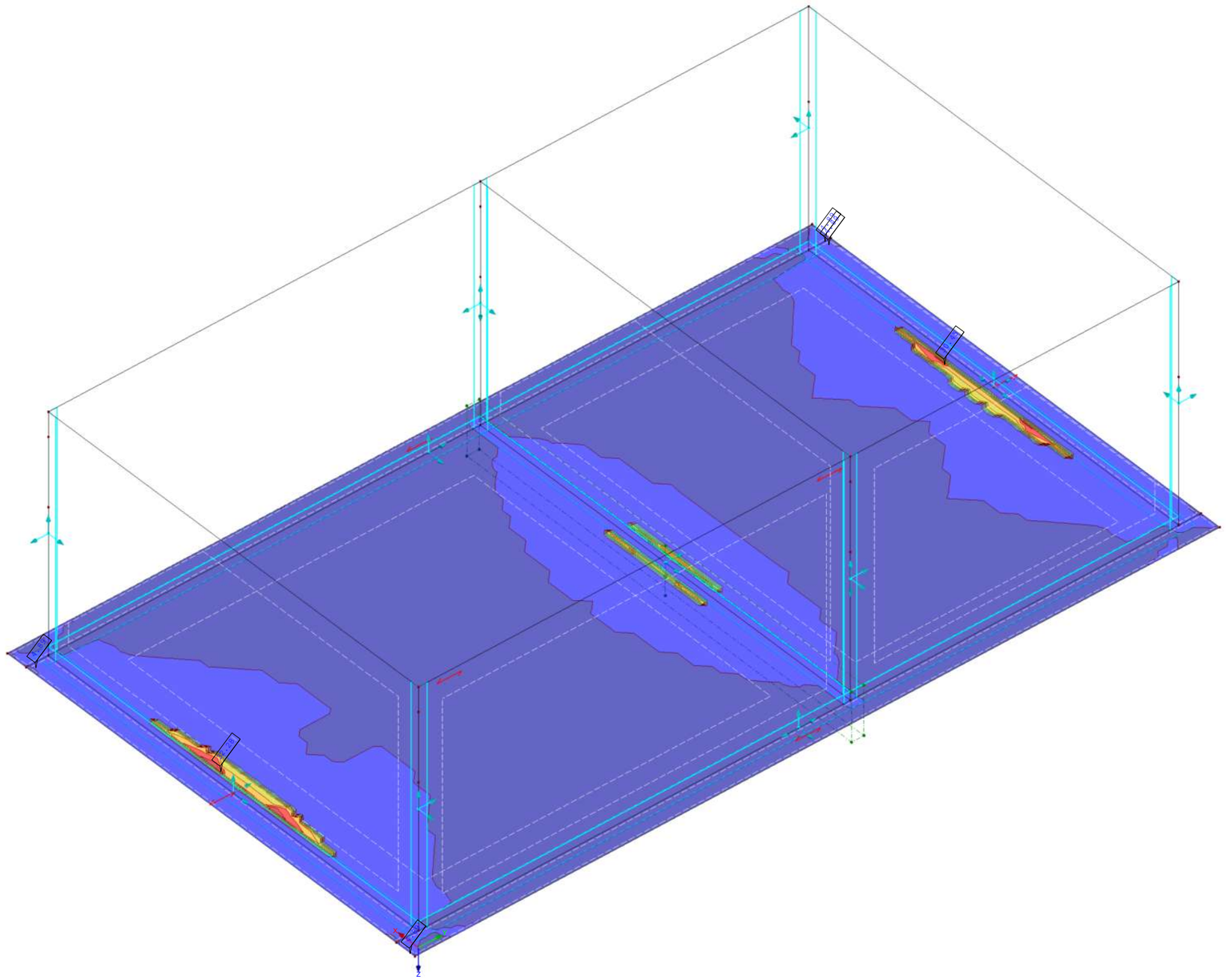


Max a-s,1,+z (bottom): 29.09, Min a-s,1,+z (bottom): 0.00 cm²/m

REQUIRED REINFORCEMENT $a_{s,2,+z}$ (bottom)

RF-CONCRETE Surfaces CA1
Pagrindo plokštė
Required Reinforcement a-s,2,+z (bottom) [cm²/m]
Values: a-s,2,+z (bottom) [cm^2/m]

Isometric

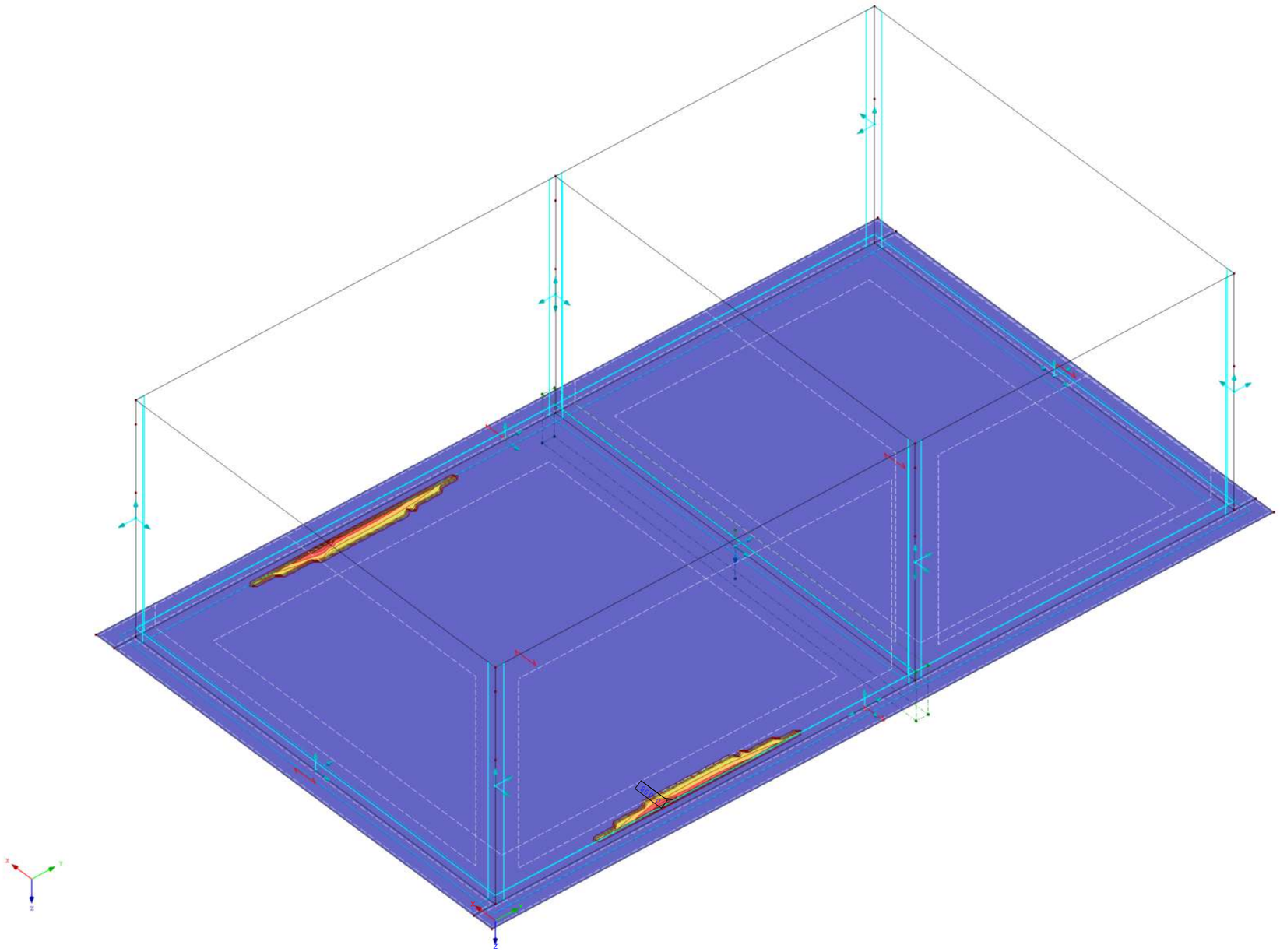


Max a-s,2,+z (bottom): 32.28, Min a-s,2,+z (bottom): 0.00 cm²/m

CRACK WIDTH $w_{k,1,+z\ (bottom)}$

RF-CONCRETE Surfaces CA1
Pagrindo plokštė
Crack width w-k,1,+z (bottom) [mm]
Values: w-k,1,+z (bottom) [mm]

Isometric

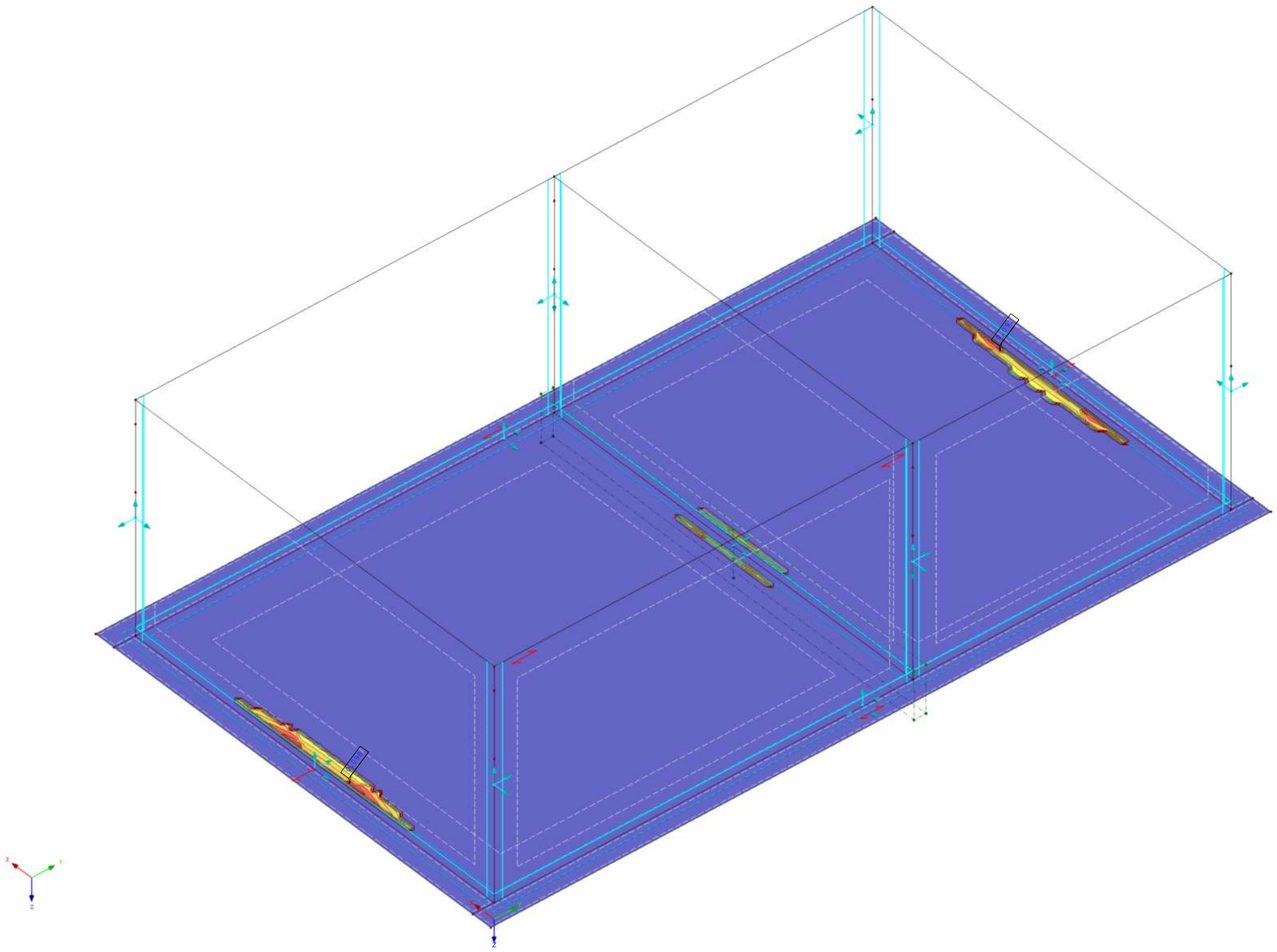


Max w-k,1,+z (bottom): 0.098, Min w-k,1,+z (bottom): 0.000 mm

CRACK WIDTH $w_{k,2,+z\ (bottom)}$

RF-CONCRETE Surfaces CA1
Pagrindo plokštė
Crack width w-k,2,+z (bottom) [mm]
Values: w-k,2,+z (bottom) [mm]

Isometric

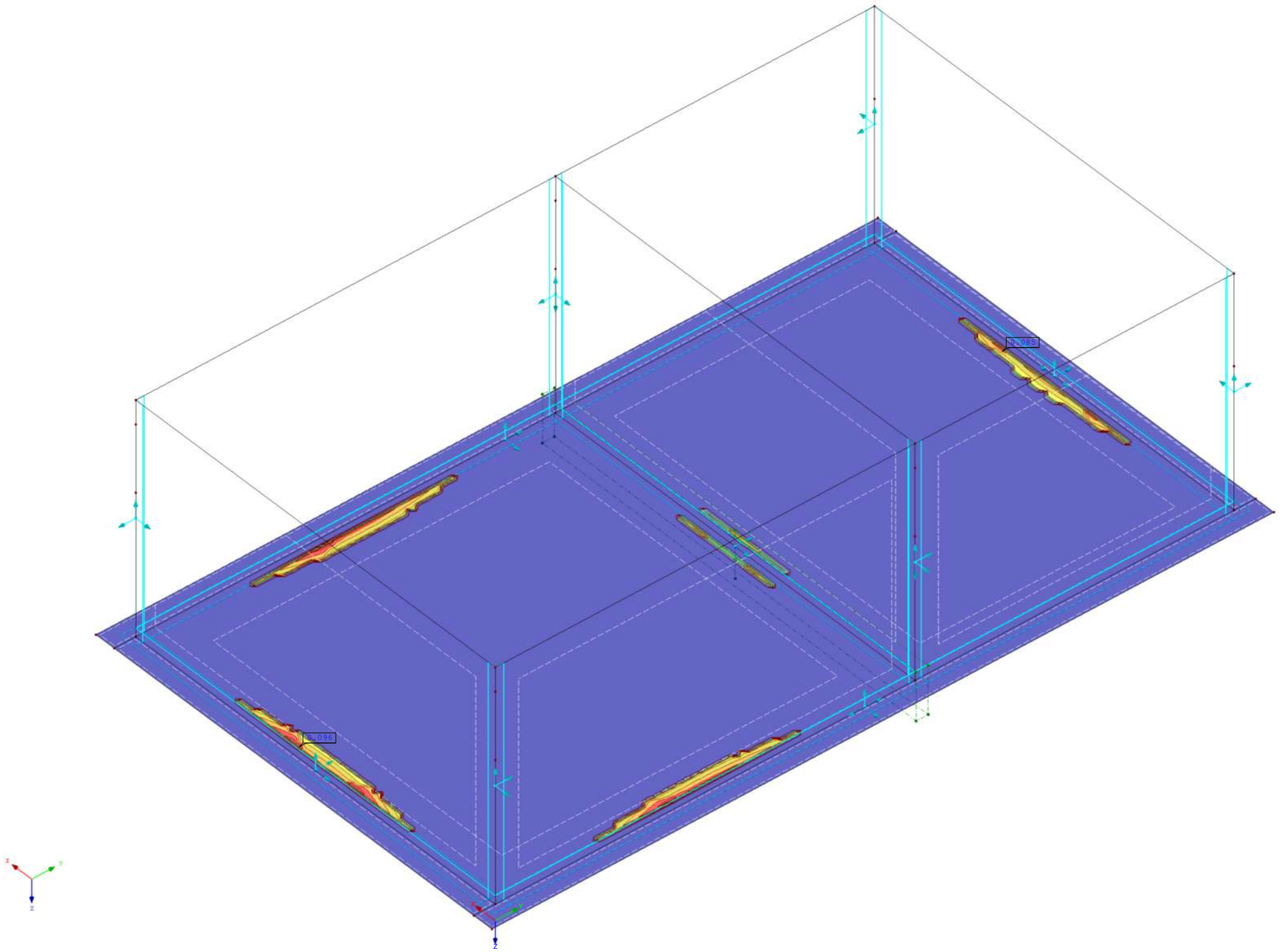


Max w-k,2,+z (bottom): 0.098, Min w-k,2,+z (bottom): 0.000 mm

CRACK WIDTH $w_{k,res,+z\ (bottom)}$

RF-CONCRETE Surfaces CA1
Pagrindo plokštė
Crack width w-k,res,+z (bottom) [mm]
Values: w-k,res,+z (bottom) [mm]

Isometric



Max w-k,res,+z (bottom): 0.096, Min w-k,res,+z (bottom): 0.000 mm

RF-CONCRETE Surfaces
CA2
Išorinės sienos

Project: 1
1
Model: SK23010_Dreverna_ (04, 05) statinys_ ..
Date: 2023-09-06

1.1 GENERAL DATA

Design according to Standard:	LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
ULTIMATE LIMIT STATE		
Load combinations for design:	CO1	Bandymas 1-a sisterna (susitraukimas)
		Persistent and Transient
	CO2	Bandymas 2-a sisterna (susitraukimas)
		Persistent and Transient
	CO3	Bandymas 1+2 (susitraukimas)
		Persistent and Transient
	CO4	Eksplotacija 1 (susitraukimas)
		Persistent and Transient
	CO5	Eksplotacija 2 (susitraukimas)
		Persistent and Transient
	CO6	Eksplotacija 1+2 (susitraukimas)
		Persistent and Transient
	CO7	Eksplotacija S (susitraukimas)
		Persistent and Transient
	CO8	Eksplotacija 1+S (susitraukimas)
		Persistent and Transient
	CO9	Eksplotacija 2+S (susitraukimas)
		Persistent and Transient
	CO10	Eksplotacija 1+2+S (susitraukimas)
		Persistent and Transient
	CO11	Eksplotacija (kėlimas) (susitraukimas)
		Persistent and Transient
SERVICEABILITY LIMIT STATE		
Load combinations for design:	CO1	Bandymas 1-a sisterna (susitraukimas)
		Quasi-permanent, k_t 0.600
	CO2	Bandymas 2-a sisterna (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO3	Bandymas 1+2 (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO4	Eksplotacija 1 (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO5	Eksplotacija 2 (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO6	Eksplotacija 1+2 (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO7	Eksplotacija S (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO8	Eksplotacija 1+S (susitraukimas)
		Quasi-permanent, k_t 0.559
	CO9	Eksplotacija 2+S (susitraukimas)
		Quasi-permanent, k_t 0.559
	CO10	Eksplotacija 1+2+S (susitraukimas)
		Quasi-permanent, k_t 0.574
	CO11	Eksplotacija (kėlimas) (susitraukimas)
		Quasi-permanent, k_t 0.577
Definition of Provided Additional Reinforcement	Automatic arrangement according to the specifications in Table 1.4	
Type of SLS method:	Analytical Method	
	By assuming an identical deformation ratio of the longitudinal reinforcement	
Design of		
Concrete Stress Analysis	☒	
Steel Stress Analysis	☒	
Crack widths	☒	
Deformation Analysis	☐	
Layout of longitudinal reinforcement		
Required longitudinal reinforcement automatically increased for serviceability limit state design:	☒	
DETAILS		
Analysis Method for Reinforcement Envelope	Mixed	
Apply the averaged internal forces in the defined average region for the ULS calculation and for the analytic method of SLS calculation.	☒	
Apply the internal forces without the rib components	☐	
Design Situation Settings for Serviceability Limit State Checks		
Load combination:		
Characteristic with direct load	Checks: -	
Characteristic with imposed deformation	Checks: -	
Frequent	Checks: -	
Quasi-permanent	Checks: k_1*f_{ck}, k_2*f_{ck}, k_3*f_{yk}, k_4*f_{yk}, w_k, u_l	

1.2 MATERIALS

Material No.	Material Description: Concrete Strength Class	Material Description: Steel Description	Comment
2	Concrete C35/45*0,7	B 500 S (A)	
3	Concrete C35/45	B 500 S (A)	

1.2.1 MATERIAL PARAMETERS

Material No.	Description	Name	Size	Unit
2	**Concrete Strength Class: Concrete C35/45*0,7**			
	Characteristic Cylinder Compressive Strength	f_{ck}	35.00	N/mm^2
	5 % Fractile of Axial Tensile Strength	$f_{ctk,0.05}$	2.20	N/mm^2
	Characteristic for Nonlinear Calculations			

1.2.1 MATERIAL PARAMETERS

Material No.	Description	Name	Size	Unit
	Mean Secant Modulus of Elasticity	E_{cm}	34000.00	N/mm^2
	Mean Cylinder Compressive Strength	f_{cm}	43.00	N/mm^2
	Mean Axial Tensile Strength	f_{ctm}	3.20	N/mm^2
	Ultimate Strain for Pure Compression	ε_{c1}	-2.250	‰
	Ultimate Strain at Failure	ε_{c1u}	-3.500	‰
	Shear Modulus	G	9916.70	N/mm^2
	Poisson's Ratio	ν	0.200	-
	Characteristic Strains for Parabolic-Rectangular Diagram			
	Ultimate Strain for Pure Compression	ε_{c2}	-2.000	‰
	Ultimate Strain at Failure	ε_{cu2}	-3.500	‰
	Parabola Exponent	n	2.000	-
	Specific Weight	γ	25.00	kN/m^3
	Reinforcing Steel: B 500 S (A)			
	Modulus of Elasticity	E_s	200000.00	N/mm^2
	Yield Stress Mean Value	f_{ym}	550.00	N/mm^2
	Characteristic Yield Stress	f_{yk}	500.00	N/mm^2
	Tensile Strength Mean Value	f_{tm}	551.25	N/mm^2
	Characteristic Tensile Strength	f_{tk}	525.00	N/mm^2
	Limiting Strain	ε_{uk}	25.000	‰
3	**Concrete Strength Class: Concrete C35/45**			
	Characteristic Cylinder Compressive Strength	f_{ck}	35.00	N/mm^2
	5 % Fractile of Axial Tensile Strength	$f_{ctk,0.05}$	2.20	N/mm^2
	Characteristic for Nonlinear Calculations			
	Mean Secant Modulus of Elasticity	E_{cm}	34000.00	N/mm^2
	Mean Cylinder Compressive Strength	f_{cm}	43.00	N/mm^2
	Mean Axial Tensile Strength	f_{ctm}	3.20	N/mm^2
	Ultimate Strain for Pure Compression	ε_{c1}	-2.250	‰
	Ultimate Strain at Failure	ε_{c1u}	-3.500	‰
	Shear Modulus	G	14166.70	N/mm^2
	Poisson's Ratio	ν	0.200	-
	Characteristic Strains for Parabolic-Rectangular Diagram			
	Ultimate Strain for Pure Compression	ε_{c2}	-2.000	‰
	Ultimate Strain at Failure	ε_{cu2}	-3.500	‰
	Parabola Exponent	n	2.000	-
	Specific Weight	γ	25.00	kN/m^3
	Reinforcing Steel: B 500 S (A)			
	Modulus of Elasticity	E_s	200000.00	N/mm^2
	Yield Stress Mean Value	f_{ym}	550.00	N/mm^2
	Characteristic Yield Stress	f_{yk}	500.00	N/mm^2
	Tensile Strength Mean Value	f_{tm}	551.25	N/mm^2
	Characteristic Tensile Strength	f_{tk}	525.00	N/mm^2
	Limiting Strain	ε_{uk}	25.000	‰

1.3 SURFACES

Surface No.	Matl. No.	$\sigma_{c,max}$ [N/mm²] $\sigma_{s,max}$ [N/mm²]	$f_{ct,eff,wk}$ [N/mm²]	$f_{ct,eff,As,min}$ [N/mm²]	$w_{k,+z\ (top)}$ [mm] $w_{k,-z\ (bottom)}$ [mm]	Effects due to Restraint Apply	 k_c [-]	Notes
38	Thickness Type: Constant, Thickness: 350.0 mm							
	2	var. var.	3.20	3.20	0.100 0.100	☐	var.	
39	Thickness Type: Constant, Thickness: 350.0 mm							
	2	var. var.	3.20	3.20	0.100 0.100	☐	var.	
40	Thickness Type: Constant, Thickness: 350.0 mm							
	2	var. var.	3.20	3.20	0.100 0.100	☐	var.	
41	Thickness Type: Constant, Thickness: 350.0 mm							
	2	var. var.	3.20	3.20	0.100 0.100	☐	var.	
43	Thickness Type: Constant, Thickness: 350.0 mm							
	2	var. var.	3.20	3.20	0.100 0.100	☐	var.	
44	Thickness Type: Constant, Thickness: 350.0 mm							
	2	var. var.	3.20	3.20	0.100 0.100	☐	var.	

1.4 REINFORCEMENT GROUP NO. 1 - IÐORINIØ SIENØ ARMAVIMAS

Applied to surfaces:	38-41,43,44
REINFORCEMENT RATIO	
Minimum secondary reinforcement	20.0 %
Basic minimum reinforcement	0.0 %
Minimum compression reinforcement	0.0 %
Minimum tension reinforcement	0.0 %
Maximum reinforcement percentage	4.0 %
Minimum shear reinforcement percentage	0.0 %
REINFORCEMENT AREA FOR DESIGN OF SLS	
Use provided basic reinforcement and layout (provided) additional reinforcement acc. to Tables 2.1, 2.2, 2.3	
Concrete cover acc. to Standard	☐
BASIC REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 56.0 mm
Bar diameter	ds-1: 16.0, ds-2: 16.0 mm

1.4 REINFORCEMENT GROUP NO. 1 - IÐORINIØ SIENØ ARMAVIMAS

Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,-z (top): 10.05, As-2,-z (top): 10.05 cm²/m
BASIC REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 56.0 mm
Bar diameter	ds-1: 16.0, ds-2: 16.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,+z (bottom): 10.05, As-2,+z (bottom): 10.05 cm²/m
ADDITIONAL REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 56.0 mm
Bar diameter	ds-1: 16.0, ds-2: 16.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,-z (top): 35.59, As-2,-z (top): 18.44 cm²/m
ADDITIONAL REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 56.0 mm
Bar diameter	ds-1: 16.0, ds-2: 16.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,+z (bottom): 32.14, As-2,+z (bottom): 0.00 cm²/m
LONGITUDINAL REINFORCEMENT FOR SHEAR FORCE DESIGN	
Apply the greater value resulting from either the required or provided reinforcement (basic and add. reinforcement) per reinforcement direction	
OPTIONS FOR LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
Minimum longitudinal reinforcement for plates acc. to 9.3.1	☐
Minimum longitudinal reinforcement for walls acc. to 9.6	☒
Minimum shear reinforcement	☒
Neutral axis depth limitation	☒
Variable strut inclination - min	21.801 °
Variable concrete strut inclination - max	45.000 °
Partial safety factor γ_s	PT 1.15, AC 1.00, SLS 1.00
Partial safety factor γ_c	PT 1.50, AC 1.20, SLS 1.00
Consideration of long-term effects Alpha-cc	PT 0.90, AC 0.90, SLS 1.00
Consideration of long-term effects Alpha-ct	SLS 1.00

2.2 REQUIRED REINFORCEMENT BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Symbol	Required Reinforcement ULS	SLS	ULS/SLS	Basic Reinf.	Additional Reinforcement Required	Provided	Unit	Notes
38	M247	7.654	0.000	-0.441	$a_{s,1,-z\ (top)}$	12.42	45.40	45.40	10.05	35.34	35.59	cm²/m	
	M247	7.654	0.000	-0.441	$a_{s,2,-z\ (top)}$	7.35	28.19	28.19	10.05	18.14	18.44	cm²/m	
	M331	7.950	0.000	-0.542	$a_{s,1,+z\ (bottom)}$	12.61	10.97	12.61	10.05	2.56	32.14	cm²/m	
	M339	7.152	0.000	-0.541	$a_{s,2,+z\ (bottom)}$	4.75	4.14	4.75	10.05	0.00	0.00	cm²/m	
	M3	8.651	0.000	-0.340	a_{sw}	9.47	-	9.47	-	-	-	cm²/m²	
39	M2084	8.850	1.491	-0.542	$a_{s,1,-z\ (top)}$	12.31	45.41	45.41	10.05	35.36	35.59	cm²/m	
	M2065	8.850	3.381	-0.542	$a_{s,2,-z\ (top)}$	7.24	27.60	27.60	10.05	17.54	18.44	cm²/m	
	M2187	8.850	8.551	-0.738	$a_{s,1,+z\ (bottom)}$	11.49	42.19	42.19	10.05	32.14	32.14	cm²/m	
	M2022	8.850	7.656	-0.542	$a_{s,2,+z\ (bottom)}$	10.05	1.22	10.05	10.05	0.00	0.00	cm²/m	
	M111	8.850	8.750	-0.340	a_{sw}	9.47	-	9.47	-	-	-	cm²/m²	
40	M3434	8.850	9.246	-0.340	$a_{s,1,-z\ (top)}$	11.52	43.22	43.22	10.05	33.17	35.59	cm²/m	
	M3434	8.850	9.246	-0.340	$a_{s,2,-z\ (top)}$	5.73	23.49	23.49	10.05	13.43	18.44	cm²/m	
	M3713	8.850	8.951	-0.641	$a_{s,1,+z\ (bottom)}$	10.98	41.25	41.25	10.05	31.19	32.14	cm²/m	
	M3768	8.850	14.497	-0.641	$a_{s,2,+z\ (bottom)}$	3.56	3.10	3.56	10.05	0.00	0.00	cm²/m	
	M111	8.850	8.750	-0.340	a_{sw}	9.47	-	9.47	-	-	-	cm²/m²	
41	M5404	7.551	15.400	-0.541	$a_{s,1,-z\ (top)}$	12.47	45.65	45.65	10.05	35.59	35.59	cm²/m	
	M4780	5.867	15.400	-0.340	$a_{s,2,-z\ (top)}$	7.46	28.49	28.49	10.05	18.44	18.44	cm²/m	
	M5409	7.651	15.400	-0.542	$a_{s,1,+z\ (bottom)}$	12.11	10.53	12.11	10.05	2.06	32.14	cm²/m	
	M4752	8.651	15.400	-0.340	$a_{s,2,+z\ (bottom)}$	10.05	2.19	10.05	10.05	0.00	0.00	cm²/m	
	M4752	8.651	15.400	-0.340	a_{sw}	9.47	-	9.47	-	-	-	cm²/m²	
43	M8225 - E8326	-0.000	9.544	-0.340	$a_{s,1,-z\ (top)}$	11.52	43.22	43.22	10.05	33.17	35.59	cm²/m	
	M8225 - E8326	-0.000	9.544	-0.340	$a_{s,2,-z\ (top)}$	5.74	23.49	23.49	10.05	13.44	18.44	cm²/m	18)
	M8578	-0.000	8.951	-0.641	$a_{s,1,+z\ (bottom)}$	10.98	41.25	41.25	10.05	31.19	32.14	cm²/m	
	M8454	-0.000	8.948	-1.044	$a_{s,2,+z\ (bottom)}$	3.50	3.56	3.56	10.05	0.00	0.00	cm²/m	
	M117	-0.000	8.750	-0.340	a_{sw}	9.47	-	9.47	-	-	-	cm²/m²	
44	M9994	0.000	1.491	-0.542	$a_{s,1,-z\ (top)}$	12.32	45.41	45.41	10.05	35.36	35.59	cm²/m	
	M9904	0.000	3.381	-0.542	$a_{s,2,-z\ (top)}$	7.24	27.60	27.60	10.05	17.55	18.44	cm²/m	
	M9586	0.000	8.551	-0.738	$a_{s,1,+z\ (bottom)}$	11.49	42.19	42.19	10.05	32.14	32.14	cm²/m	
	M9590	0.000	8.552	-1.140	$a_{s,2,+z\ (bottom)}$	10.05	1.79	10.05	10.05	0.00	0.00	cm²/m	
	M117	-0.000	8.750	-0.340	a_{sw}	9.47	-	9.47	-	-	-	cm²/m²	

NOTES

No.	Description
18)	To cover the reinforcement in the transition region, the provided additional reinforcement for $a_{s,2,-z\ (top)}$ is applied.

■ 3.2 SERVICEABILITY CHECK BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Load Case	Design Type	Exist. Value	Limit Value	Unit	Ratio	Notes
38	M366	4.425	0.000	-0.534	CO11	σ_c	-6.75	-15.75	N/mm²	0.5	
	M279	4.425	0.000	-0.425	CO11	σ_s	123.52	400.00	N/mm²	0.4	
	M279	4.425	0.000	-0.425	CO11	w_k	0.099	0.100	mm	1.0	
39	M2055	8.850	4.375	-0.542	CO11	σ_c	-6.80	-15.75	N/mm²	0.5	
	M2187	8.850	8.551	-0.738	CO3	σ_s	123.70	400.00	N/mm²	0.4	
	M2187	8.850	8.551	-0.738	CO3	w_k	0.100	0.100	mm	1.0	
40	M3434	8.850	9.246	-0.340	CO11	σ_c	-4.49	-15.75	N/mm²	0.3	
	M3896	8.850	8.948	-1.044	CO2	σ_s	117.64	400.00	N/mm²	0.3	
	M3713	8.850	8.951	-0.641	CO3	w_k	0.096	0.100	mm	1.0	
41	M5257	4.425	15.400	-0.534	CO11	σ_c	-6.54	-15.75	N/mm²	0.5	
	M5404	7.551	15.400	-0.541	CO11	σ_s	124.09	400.00	N/mm²	0.4	
	M4800	3.878	15.400	-0.340	CO11	w_k	0.100	0.100	mm	1.0	
43	M8225 - E8326	-0.000	9.544	-0.340	CO11	σ_c	-4.48	-15.75	N/mm²	0.3	
	M8454	-0.000	8.948	-1.044	CO2	σ_s	117.64	400.00	N/mm²	0.3	
	M8578	-0.000	8.951	-0.641	CO3	w_k	0.096	0.100	mm	1.0	
44	M9857	0.000	4.375	-0.542	CO11	σ_c	-6.80	-15.75	N/mm²	0.5	
	M9586	0.000	8.551	-0.738	CO3	σ_s	123.70	400.00	N/mm²	0.4	
	M9586	0.000	8.551	-0.738	CO3	w_k	0.100	0.100	mm	1.0	

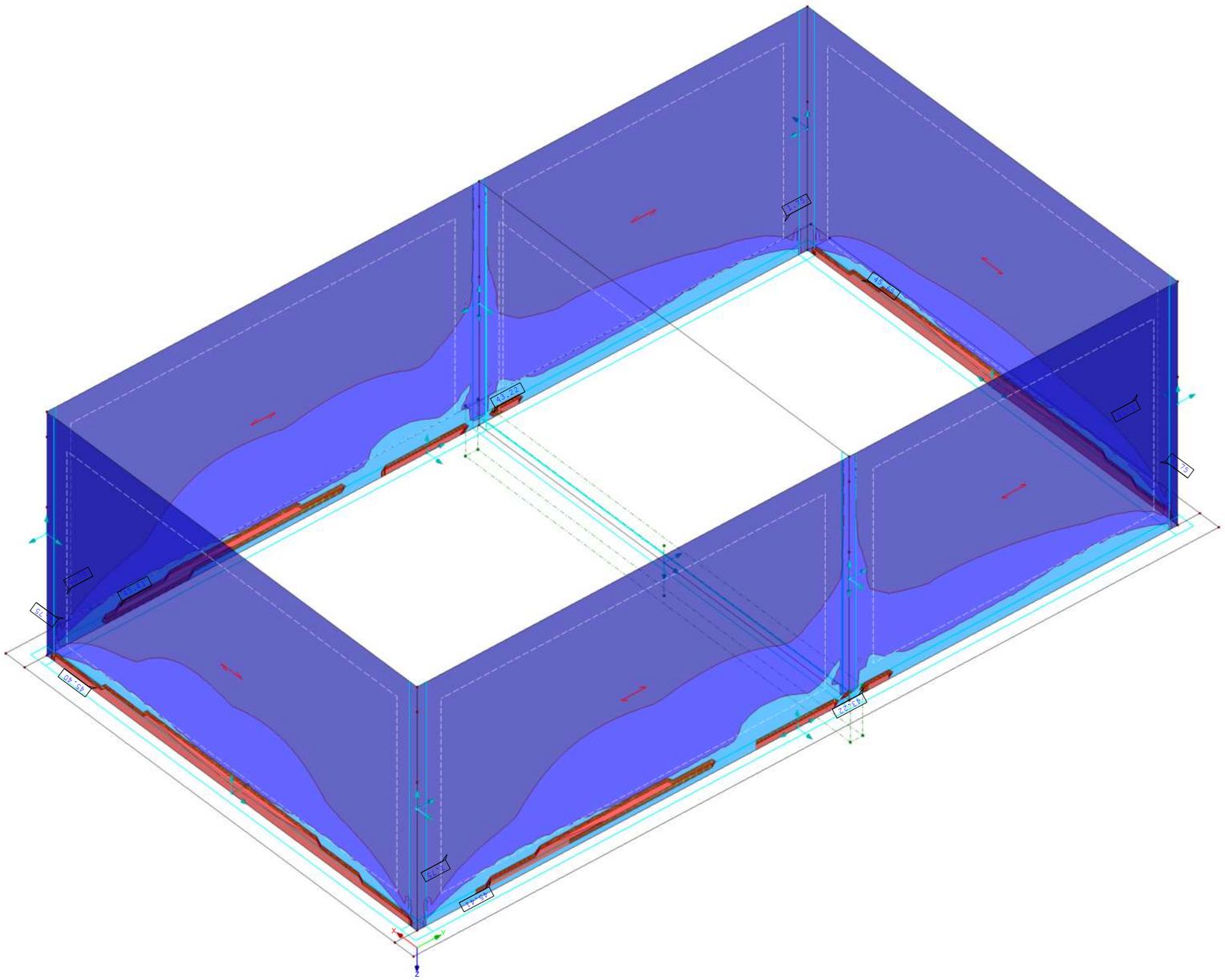
■ SERVICEABILITY CHECK NOTES

No.	Description
219)	Crack width exceeded.
226)	Concrete cracks on neither side.
233)	The design is not satisfactory! Because of the required reinforcement for ULS or user-defined reinforcement the defined reinforcement area is different from the required reinforcement for SLS and that negatively affects SLS design.

REQUIRED REINFORCEMENT $a_{s,1,-z\ (top)}$

RF-CONCRETE Surfaces CA2
Išorinės sienos
Required Reinforcement a-s,1,-z (top) [cm²/m]
Values: a-s,1,-z (top) [cm^2/m]

Isometric

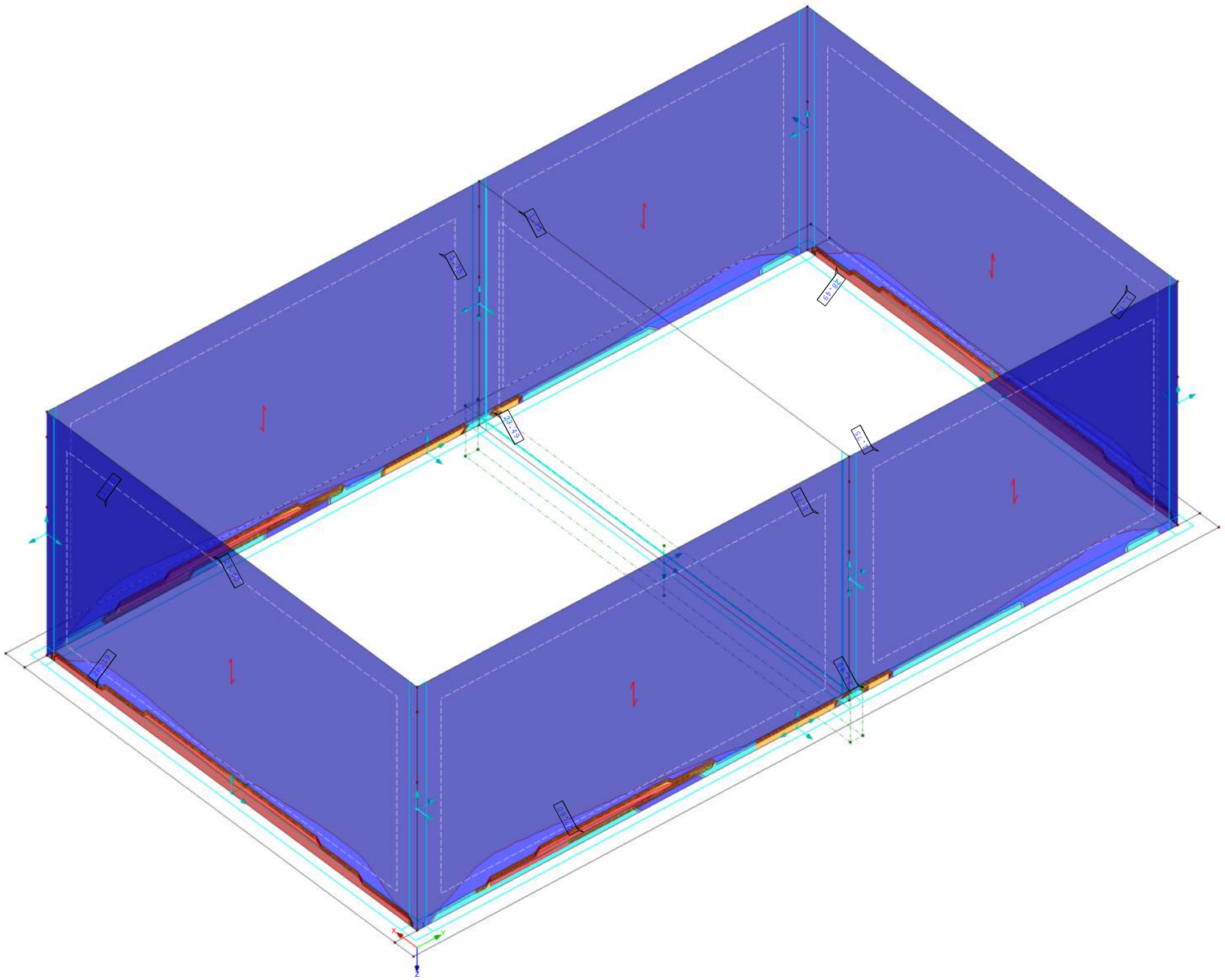


Max a-s,1,-z (top): 45.65, Min a-s,1,-z (top): 1.75 cm²/m

REQUIRED REINFORCEMENT $a_{s,2,-z\ (top)}$

RF-CONCRETE Surfaces CA2
Išorinės sienos
Required Reinforcement a-s,2,-z (top) [cm²/m]
Values: a-s,2,-z (top) [cm^2/m]

Isometric

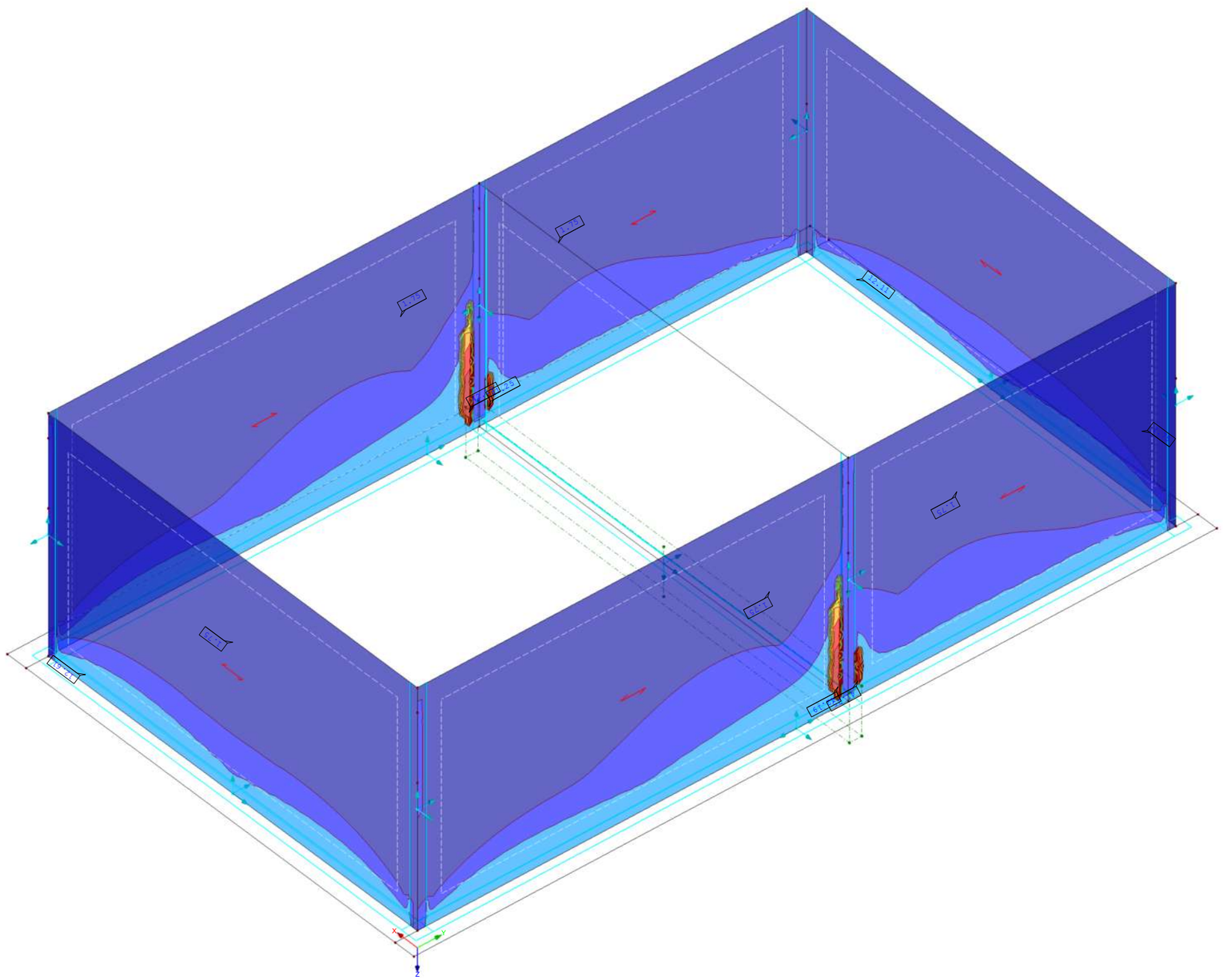


Max a-s,2,-z (top): 28.49, Min a-s,2,-z (top): 1.75 cm²/m

REQUIRED REINFORCEMENT $a_{s,1,+z\ (bottom)}$

RF-CONCRETE Surfaces CA2
Išorinės sienos
Required Reinforcement a-s,1,+z (bottom) [cm²/m]
Values: a-s,1,+z (bottom) [cm^2/m]

Isometric

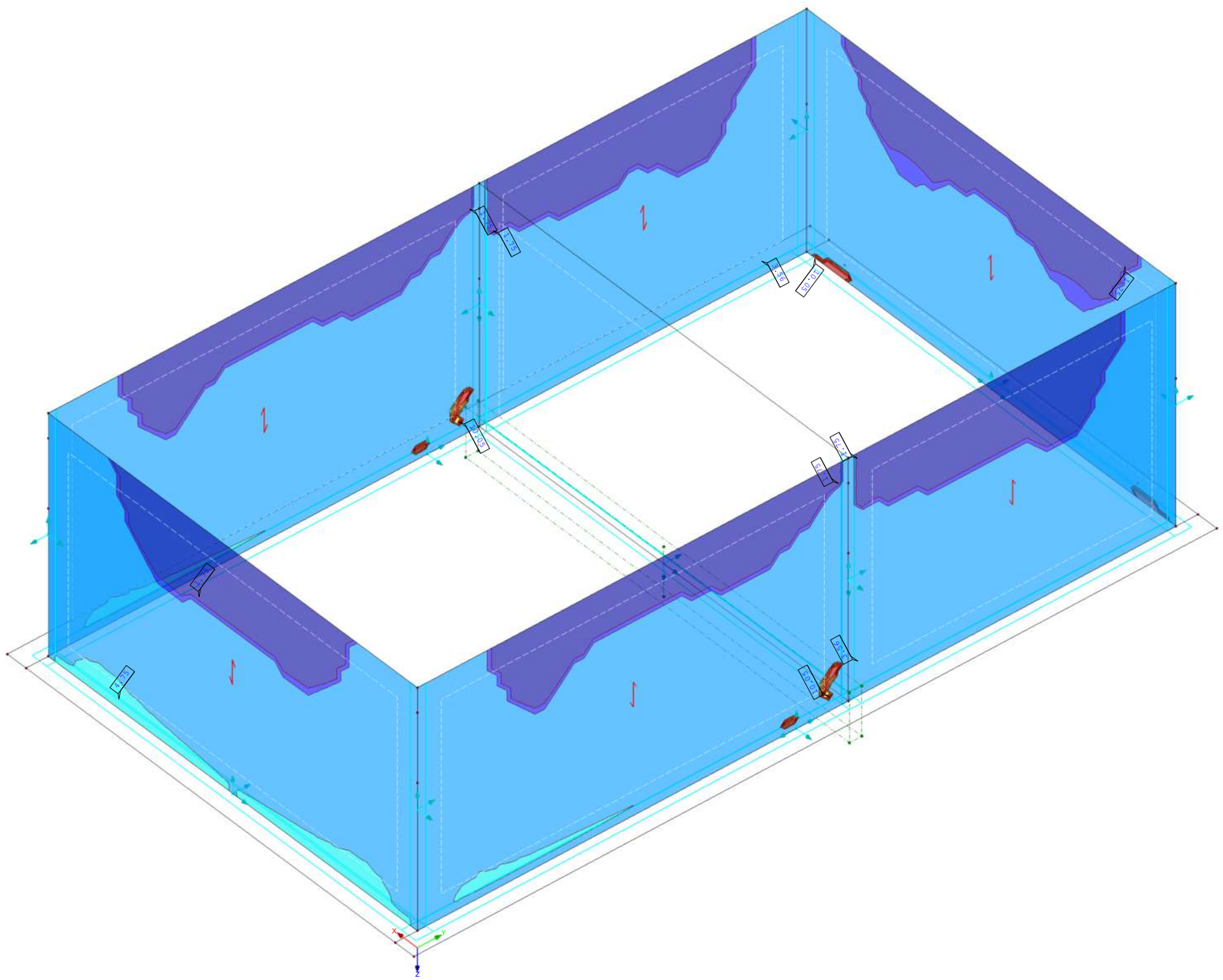


Max a-s,1,+z (bottom): 42.19, Min a-s,1,+z (bottom): 1.75 cm²/m

REQUIRED REINFORCEMENT $a_{s,2,+z}$ (bottom)

RF-CONCRETE Surfaces CA2
Išorinės sienos
Required Reinforcement a-s,2,+z (bottom) [cm²/m]
Values: a-s,2,+z (bottom) [cm^2/m]

Isometric

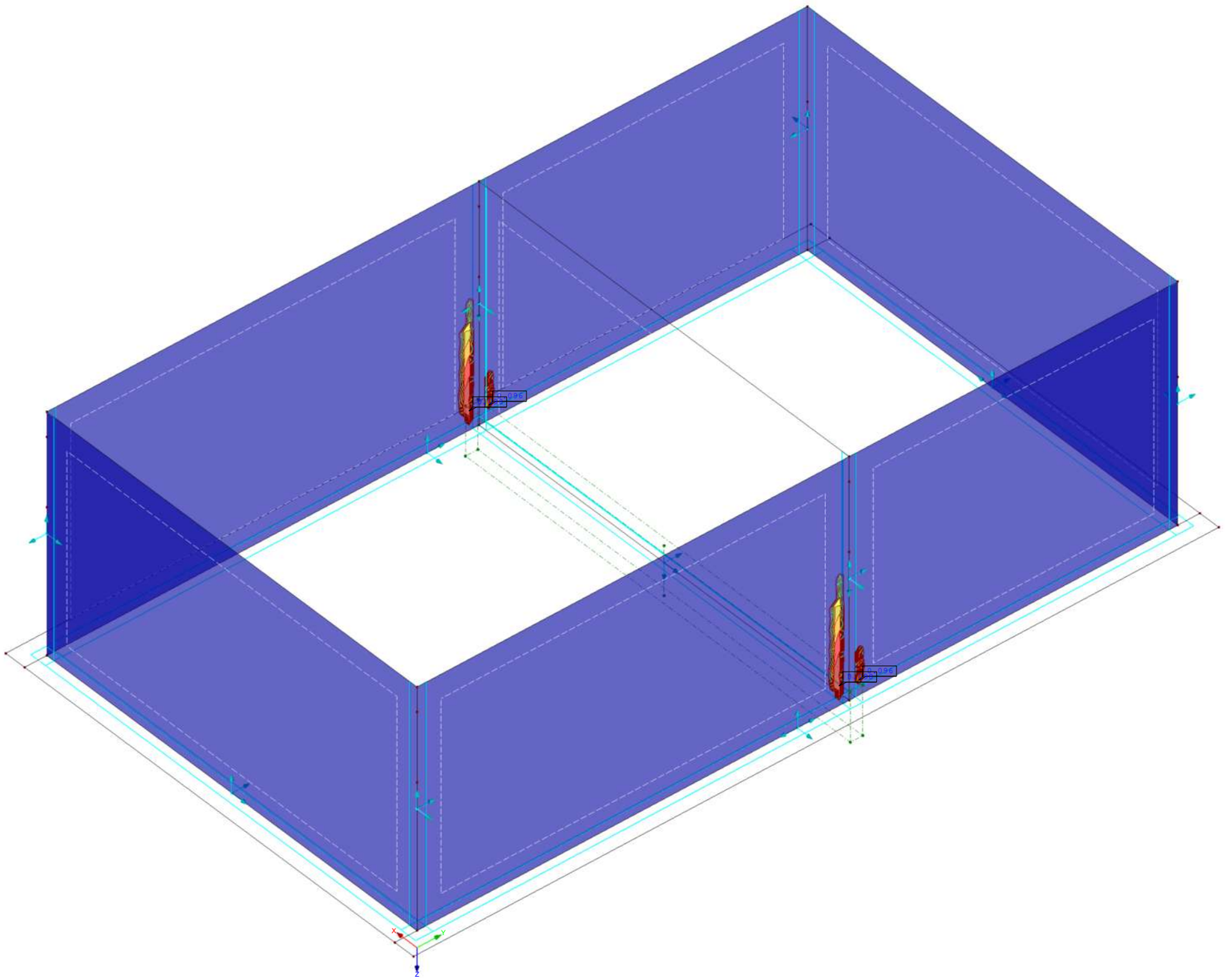


Max a-s,2,+z (bottom): 10.05, Min a-s,2,+z (bottom): 1.75 cm²/m

CRACK WIDTH $w_{k,res,+z\ (bottom)}$

RF-CONCRETE Surfaces CA2
Išorinės sienos
Crack width w-k,res,+z (bottom) [mm]
Values: w-k,res,+z (bottom) [mm]

Isometric

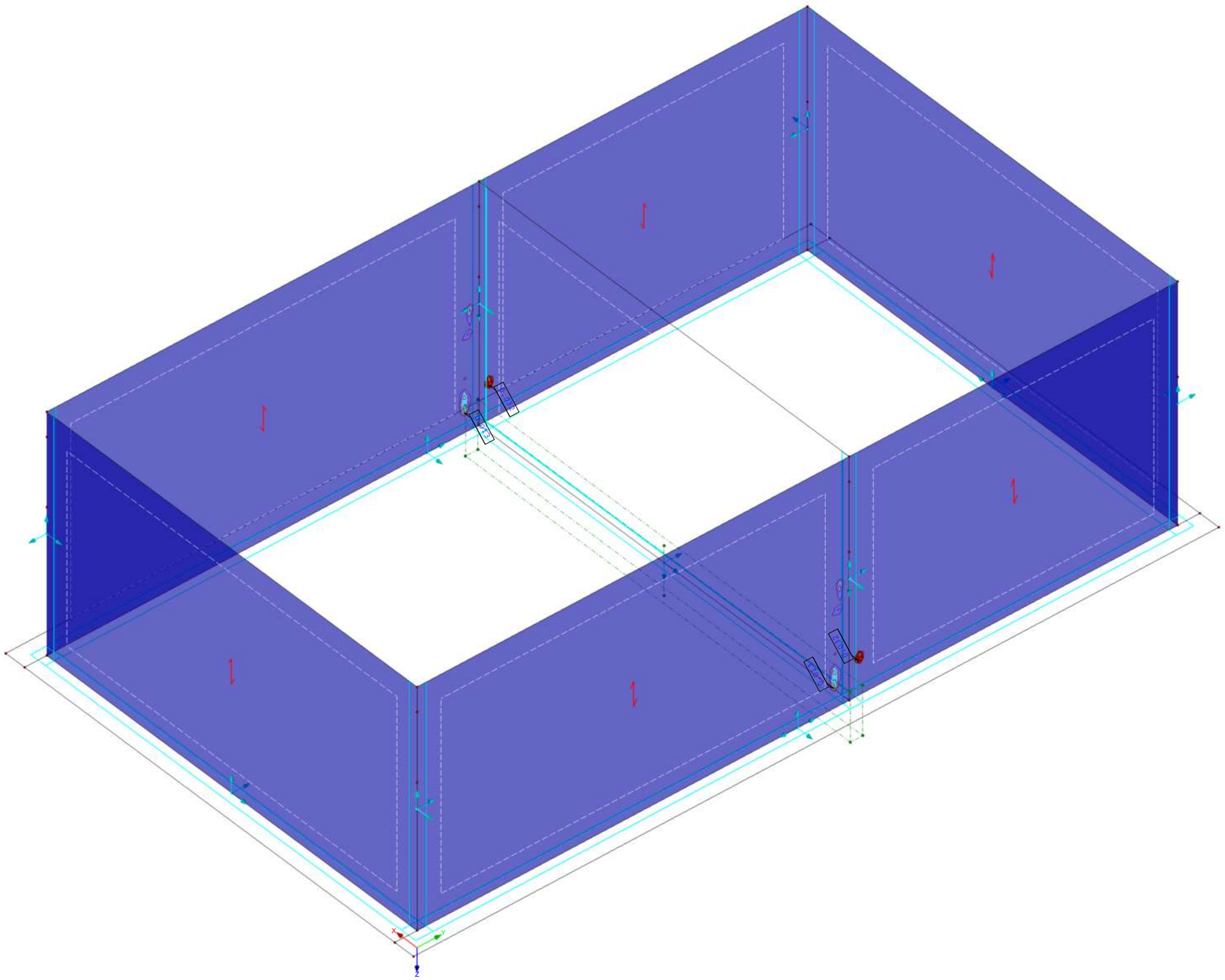


Max w-k,res,+z (bottom): 0.098, Min w-k,res,+z (bottom): 0.000 mm

CRACK WIDTH $w_{k,2,+z\ (bottom)}$

RF-CONCRETE Surfaces CA2
Išorinės sienos
Crack width w-k,2,+z (bottom) [mm]
Values: w-k,2,+z (bottom) [mm]

Isometric

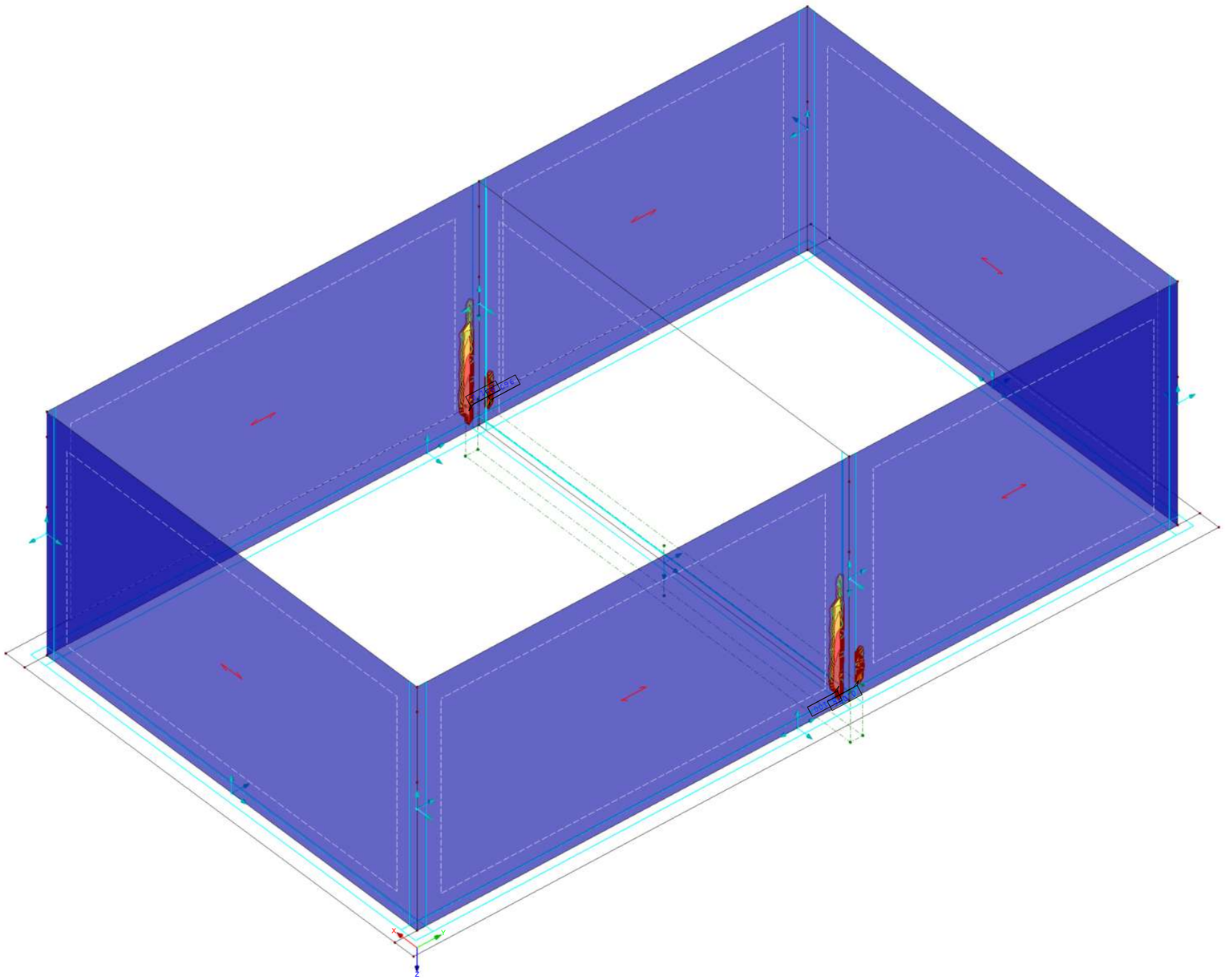


Max w-k,2,+z (bottom): 0.032, Min w-k,2,+z (bottom): 0.000 mm

CRACK WIDTH $w_{k,1,+z\ (bottom)}$

RF-CONCRETE Surfaces CA2
Išorinės sienos
Crack width w-k,1,+z (bottom) [mm]
Values: w-k,1,+z (bottom) [mm]

Isometric

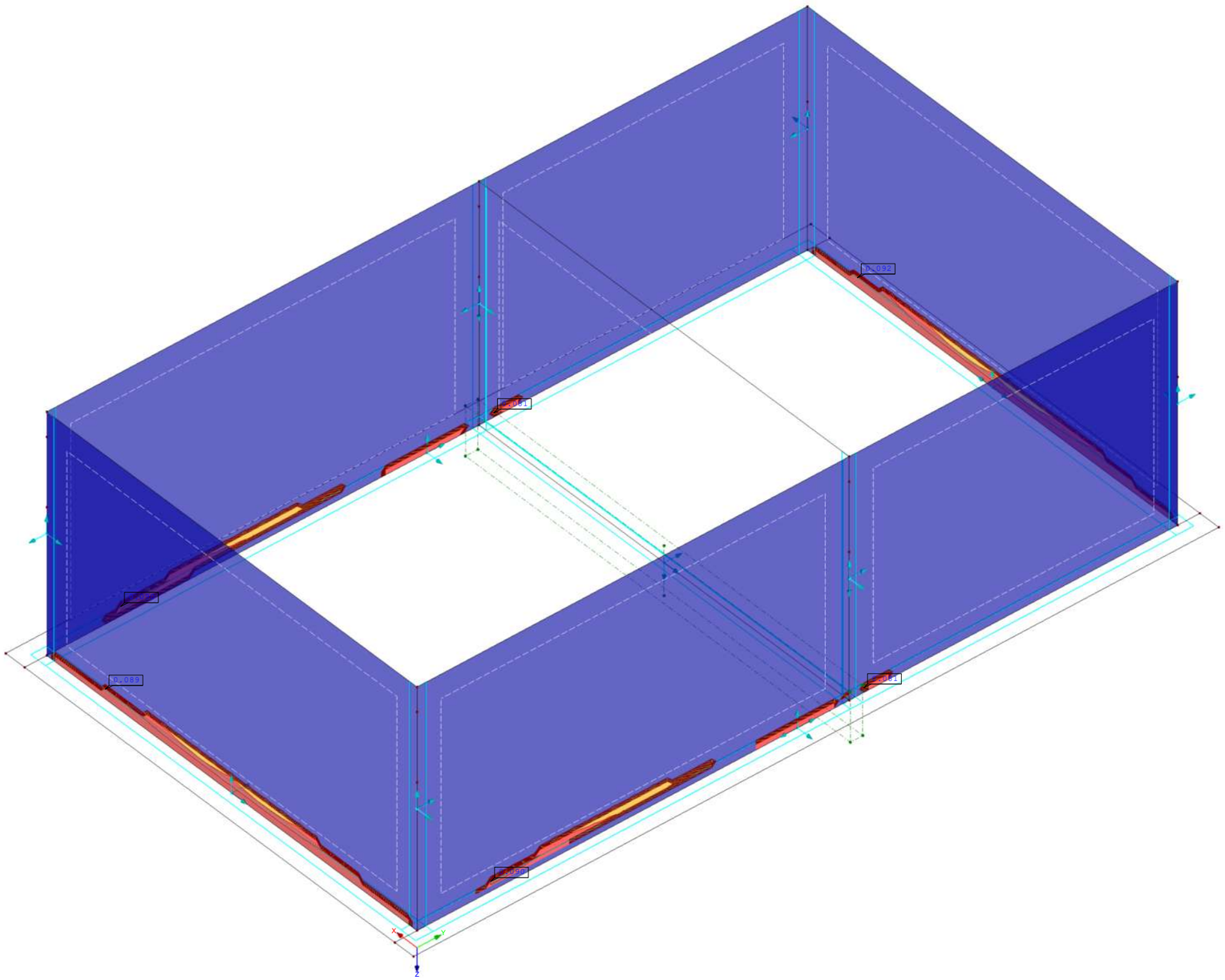


Max w-k,1,+z (bottom): 0.100, Min w-k,1,+z (bottom): 0.000 mm

CRACK WIDTH $w_{k,res,-z\ (top)}$

RF-CONCRETE Surfaces CA2
Išorinės sienos
Crack width w-k,res,-z (top) [mm]
Values: w-k,res,-z (top) [mm]

Isometric

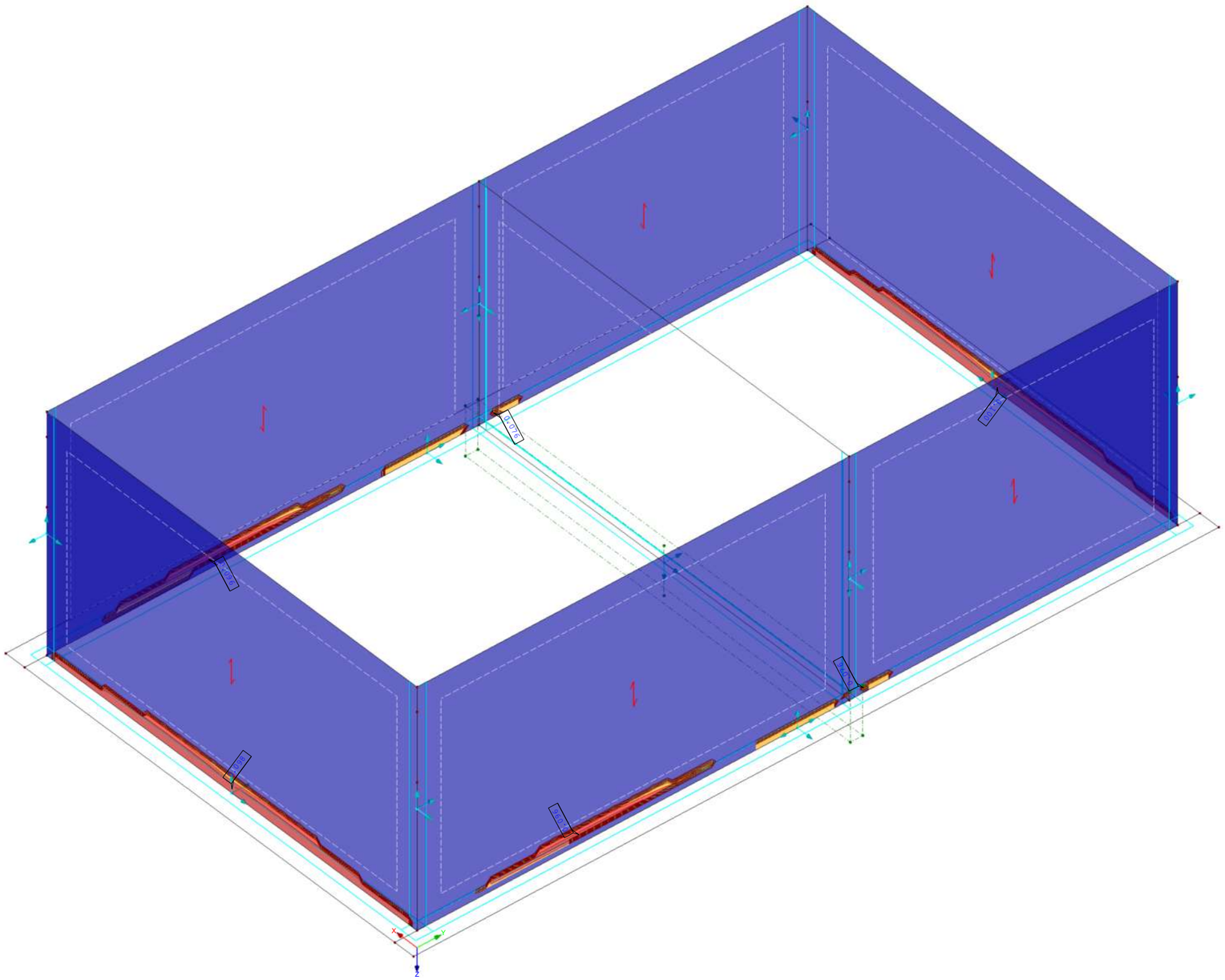


Max w-k,res,-z (top): 0.092, Min w-k,res,-z (top): 0.000 mm

CRACK WIDTH $w_{k,2,-z\ (top)}$

RF-CONCRETE Surfaces CA2
Išorinės sienos
Crack width w-k,2,-z (top) [mm]
Values: w-k,2,-z (top) [mm]

Isometric

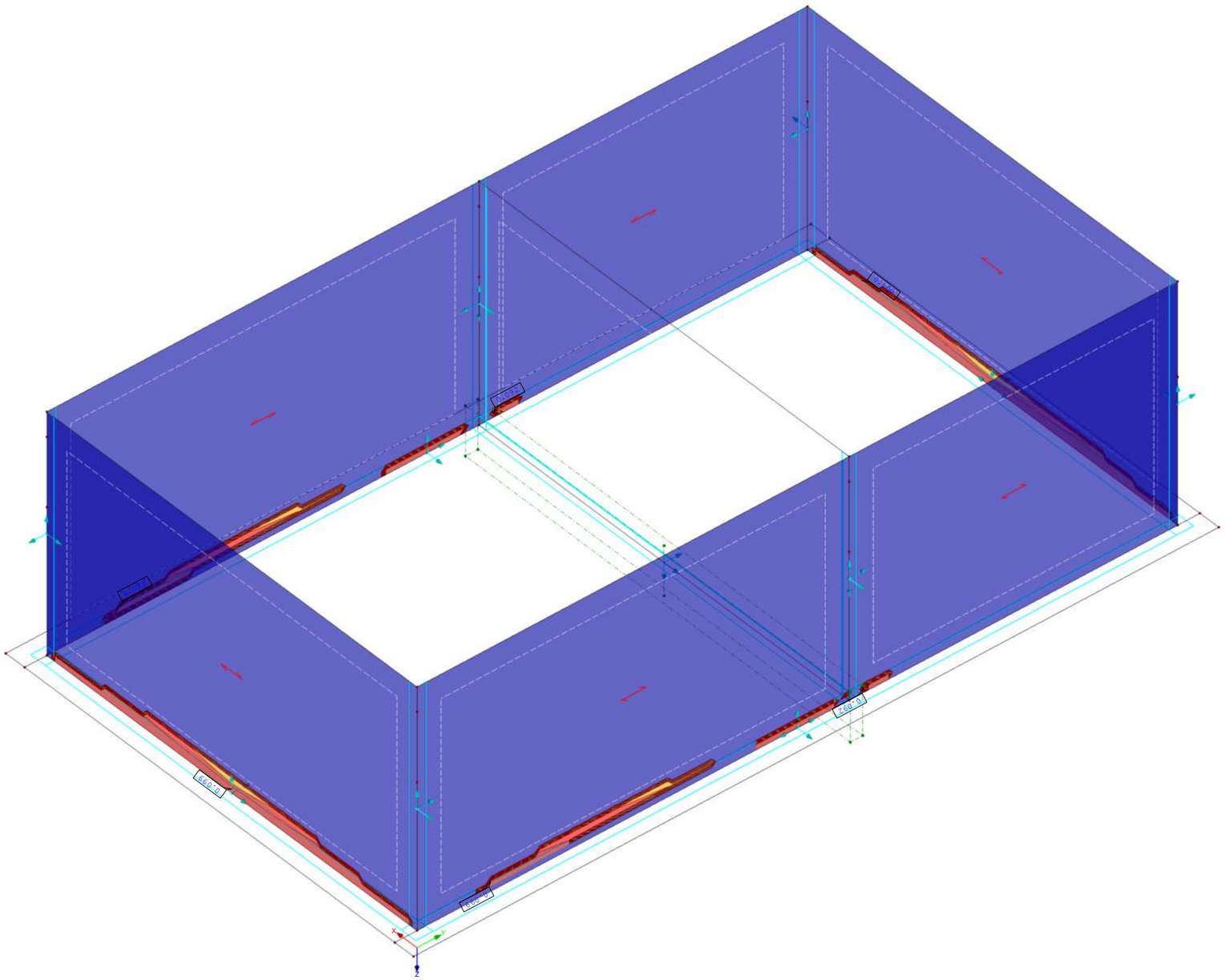


Max w-k,2,-z (top): 0.100, Min w-k,2,-z (top): 0.000 mm

CRACK WIDTH $w_{k,1,-z\ (top)}$

RF-CONCRETE Surfaces CA2
Išorinės sienos
Crack width w-k,1,-z (top) [mm]
Values: w-k,1,-z (top) [mm]

Isometric


0.000
0.000
2.69E-0
5.67E-04
5.67E-04
5.67E-04

RF-CONCRETE Surfaces
CA4
Vidinės sienos

Project: 1
1

Model: SK23010_Dreverna_ (04, 05) statinys_ ..

Date: 2023-09-06

1.1 GENERAL DATA

Design according to Standard:	LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
ULTIMATE LIMIT STATE		
Load combinations for design:	CO1	Bandymas 1-a sisterna (susitraukimas)
		Persistent and Transient
	CO2	Bandymas 2-a sisterna (susitraukimas)
		Persistent and Transient
	CO3	Bandymas 1+2 (susitraukimas)
		Persistent and Transient
	CO4	Eksplotacija 1 (susitraukimas)
		Persistent and Transient
	CO5	Eksplotacija 2 (susitraukimas)
		Persistent and Transient
	CO6	Eksplotacija 1+2 (susitraukimas)
		Persistent and Transient
	CO7	Eksplotacija S (susitraukimas)
		Persistent and Transient
	CO8	Eksplotacija 1+S (susitraukimas)
		Persistent and Transient
	CO9	Eksplotacija 2+S (susitraukimas)
		Persistent and Transient
	CO10	Eksplotacija 1+2+S (susitraukimas)
		Persistent and Transient
	CO11	Eksplotacija (kėlimas) (susitraukimas)
		Persistent and Transient
SERVICEABILITY LIMIT STATE		
Load combinations for design:	CO1	Bandymas 1-a sisterna (susitraukimas)
		Quasi-permanent, k_t 0.600
	CO2	Bandymas 2-a sisterna (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO3	Bandymas 1+2 (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO4	Eksplotacija 1 (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO5	Eksplotacija 2 (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO6	Eksplotacija 1+2 (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO7	Eksplotacija S (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO8	Eksplotacija 1+S (susitraukimas)
		Quasi-permanent, k_t 0.559
	CO9	Eksplotacija 2+S (susitraukimas)
		Quasi-permanent, k_t 0.559
	CO10	Eksplotacija 1+2+S (susitraukimas)
		Quasi-permanent, k_t 0.574
	CO11	Eksplotacija (kėlimas) (susitraukimas)
		Quasi-permanent, k_t 0.577
Definition of Provided Additional Reinforcement	Automatic arrangement according to the specifications in Table 1.4	
Type of SLS method:	Analytical Method	
	By assuming an identical deformation ratio of the longitudinal reinforcement	
Design of		
Concrete Stress Analysis	☒	
Steel Stress Analysis	☒	
Crack widths	☒	
Deformation Analysis	☐	
Layout of longitudinal reinforcement		
Required longitudinal reinforcement automatically increased for serviceability limit state design:	☒	
DETAILS		
Analysis Method for Reinforcement Envelope	Mixed	
Apply the averaged internal forces in the defined average region for the ULS calculation and for the analytic method of SLS calculation.	☒	
Apply the internal forces without the rib components	☐	
Design Situation Settings for Serviceability Limit State Checks		
Load combination:		
Characteristic with direct load	Checks: -	
Characteristic with imposed deformation	Checks: -	
Frequent	Checks: -	
Quasi-permanent	Checks: k_1*f_{ck}, k_2*f_{ck}, k_3*f_{yk}, k_4*f_{yk}, w_k, u_l	

1.2 MATERIALS

Material No.	Material Description: Concrete Strength Class	Material Description: Steel Description	Comment
2	Concrete C35/45*0,7	B 500 S (A)	
3	Concrete C35/45	B 500 S (A)	

1.2.1 MATERIAL PARAMETERS

Material No.	Description	Name	Size	Unit
2	**Concrete Strength Class: Concrete C35/45*0,7**			
	Characteristic Cylinder Compressive Strength	f_{ck}	35.00	N/mm^2
	5 % Fractile of Axial Tensile Strength	$f_{ctk,0.05}$	2.20	N/mm^2
	Characteristic for Nonlinear Calculations			

1.2.1 MATERIAL PARAMETERS

Material No.	Description	Name	Size	Unit
	Mean Secant Modulus of Elasticity	E_{cm}	34000.00	N/mm^2
	Mean Cylinder Compressive Strength	f_{cm}	43.00	N/mm^2
	Mean Axial Tensile Strength	f_{ctm}	3.20	N/mm^2
	Ultimate Strain for Pure Compression	ε_{c1}	-2.250	‰
	Ultimate Strain at Failure	ε_{c1u}	-3.500	‰
	Shear Modulus	G	9916.70	N/mm^2
	Poisson's Ratio	ν	0.200	-
	Characteristic Strains for Parabolic-Rectangular Diagram			
	Ultimate Strain for Pure Compression	ε_{c2}	-2.000	‰
	Ultimate Strain at Failure	ε_{cu2}	-3.500	‰
	Parabola Exponent	n	2.000	-
	Specific Weight	γ	25.00	kN/m^3
	Reinforcing Steel: B 500 S (A)			
	Modulus of Elasticity	E_s	200000.00	N/mm^2
	Yield Stress Mean Value	f_{ym}	550.00	N/mm^2
	Characteristic Yield Stress	f_{yk}	500.00	N/mm^2
	Tensile Strength Mean Value	f_{tm}	551.25	N/mm^2
	Characteristic Tensile Strength	f_{tk}	525.00	N/mm^2
	Limiting Strain	ε_{uk}	25.000	‰
3	**Concrete Strength Class: Concrete C35/45**			
	Characteristic Cylinder Compressive Strength	f_{ck}	35.00	N/mm^2
	5 % Fractile of Axial Tensile Strength	$f_{ctk,0.05}$	2.20	N/mm^2
	Characteristic for Nonlinear Calculations			
	Mean Secant Modulus of Elasticity	E_{cm}	34000.00	N/mm^2
	Mean Cylinder Compressive Strength	f_{cm}	43.00	N/mm^2
	Mean Axial Tensile Strength	f_{ctm}	3.20	N/mm^2
	Ultimate Strain for Pure Compression	ε_{c1}	-2.250	‰
	Ultimate Strain at Failure	ε_{c1u}	-3.500	‰
	Shear Modulus	G	14166.70	N/mm^2
	Poisson's Ratio	ν	0.200	-
	Characteristic Strains for Parabolic-Rectangular Diagram			
	Ultimate Strain for Pure Compression	ε_{c2}	-2.000	‰
	Ultimate Strain at Failure	ε_{cu2}	-3.500	‰
	Parabola Exponent	n	2.000	-
	Specific Weight	γ	25.00	kN/m^3
	Reinforcing Steel: B 500 S (A)			
	Modulus of Elasticity	E_s	200000.00	N/mm^2
	Yield Stress Mean Value	f_{ym}	550.00	N/mm^2
	Characteristic Yield Stress	f_{yk}	500.00	N/mm^2
	Tensile Strength Mean Value	f_{tm}	551.25	N/mm^2
	Characteristic Tensile Strength	f_{tk}	525.00	N/mm^2
	Limiting Strain	ε_{uk}	25.000	‰

1.3 SURFACES

Surface No.	Matl. No.	$\sigma_{c,max}$ [N/mm²] / $\sigma_{s,max}$ [N/mm²]	$f_{ct,eff,wk}$ [N/mm²]	$f_{ct,eff,As,min}$ [N/mm²]	$w_{k,+z\ (top)}$ [mm] / $w_{k,-z\ (bottom)}$ [mm]	Effects due to Restraint: Apply	Effects due to Restraint: k_c [-]	Notes
42	Thickness Type: Constant, Thickness: 250.0 mm							
	2	var. var.	3.20	3.20	0.100 0.100	☐	var.	

1.4 REINFORCEMENT GROUP NO. 2 - VIDINËS SIENOS

Applied to surfaces:	42
REINFORCEMENT RATIO	
Minimum secondary reinforcement	20.0 %
Basic minimum reinforcement	0.0 %
Minimum compression reinforcement	0.0 %
Minimum tension reinforcement	0.0 %
Maximum reinforcement percentage	4.0 %
Minimum shear reinforcement percentage	0.0 %
REINFORCEMENT AREA FOR DESIGN OF SLS	
Use provided basic reinforcement and required additional reinforcement acc. to Tables 2.1, 2.2, 2.3	
Concrete cover acc. to Standard	☐
BASIC REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 56.0 mm
Bar diameter	ds-1: 16.0, ds-2: 16.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,-z (top): 10.05, As-2,-z (top): 10.05 cm²/m
BASIC REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 56.0 mm
Bar diameter	ds-1: 16.0, ds-2: 16.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,+z (bottom): 10.05, As-2,+z (bottom): 10.05 cm²/m
ADDITIONAL REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 56.0 mm
Bar diameter	ds-1: 16.0, ds-2: 16.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°

1.4 REINFORCEMENT GROUP NO. 2 - VIDINËS SIENOS

Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
ADDITIONAL REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.0, c-2: 56.0 mm
Bar diameter	ds-1: 16.0, ds-2: 16.0 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
LONGITUDINAL REINFORCEMENT FOR SHEAR FORCE DESIGN	
Apply the greater value resulting from either the required or provided reinforcement (basic and add. reinforcement) per reinforcement direction	
OPTIONS FOR LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
Minimum longitudinal reinforcement for plates acc. to 9.3.1	☐
Minimum longitudinal reinforcement for walls acc. to 9.6	☒
Minimum shear reinforcement	☒
Neutral axis depth limitation	☒
Variable strut inclination - min	21.801 °
Variable concrete strut inclination - max	45.000 °
Partial safety factor γ_s	PT 1.15, AC 1.00, SLS 1.00
Partial safety factor γ_c	PT 1.50, AC 1.20, SLS 1.00
Consideration of long-term effects Alpha-cc	PT 0.90, AC 0.90, SLS 1.00
Consideration of long-term effects Alpha-ct	SLS 1.00

2.2 REQUIRED REINFORCEMENT BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Symbol	Required Reinforcement ULS	SLS	ULS/SLS	Basic Reinf.	Additional Reinforcement Required	Provided	Unit	Notes
42	M6669	4.425	8.750	-0.425	$a_{s,1,-z\ (top)}$	10.08	35.96	35.96	10.05	25.91	25.91	cm²/m	
	M6669	4.425	8.750	-0.425	$a_{s,2,-z\ (top)}$	4.38	17.61	17.61	10.05	7.55	7.55	cm²/m	
	M6445	8.353	8.750	-0.340	$a_{s,1,+z\ (bottom)}$	10.90	36.98	36.98	10.05	26.93	26.93	cm²/m	
	M6758	4.203	8.750	-0.538	$a_{s,2,+z\ (bottom)}$	9.36	34.04	34.04	10.05	23.99	23.99	cm²/m	
	M111	8.850	8.750	-0.340	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	

NOTES

No.	Description
18)	To cover the reinforcement in the transition region, the provided additional reinforcement for $a_{s,2,-z\ (top)}$ is applied.

3.2 SERVICEABILITY CHECK BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Load Case	Design Type	Exist. Value	Limit Value	Unit	Ratio	Notes
42	M7265	8.659	8.750	-5.091	CO1	σ_c	-12.73	-15.75	N/mm²	0.9	
	M6624	8.649	8.750	-5.190	CO1	σ_s	157.29	400.00	N/mm²	0.4	
	M7265	8.659	8.750	-5.091	CO7	w_k	0.103	0.100	mm	1.1	219) 233)

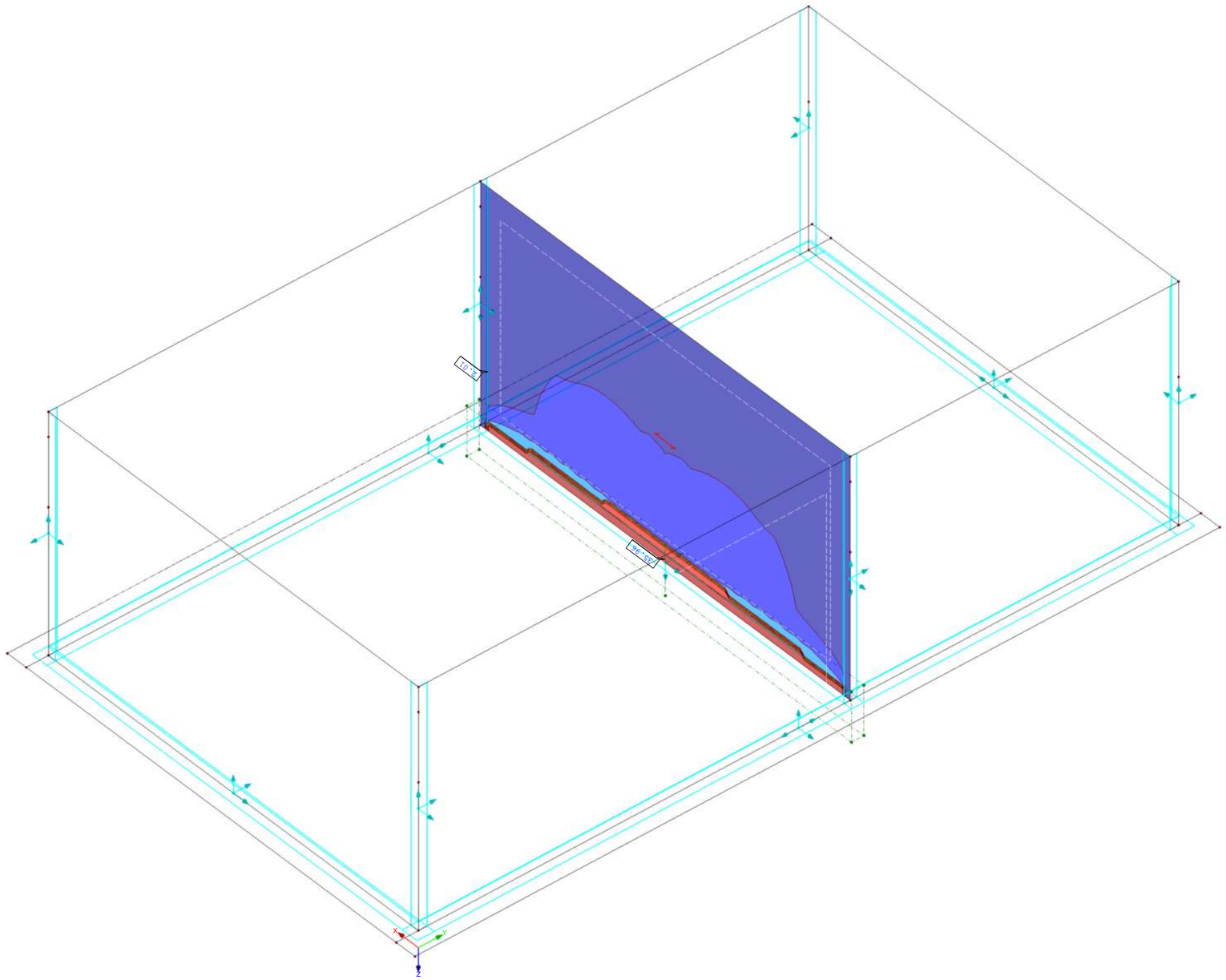
SERVICEABILITY CHECK NOTES

No.	Description
219)	Crack width exceeded.
226)	Concrete cracks on neither side.
233)	The design is not satisfactory! Because of the required reinforcement for ULS or user-defined reinforcement the defined reinforcement area is different from the required reinforcement for SLS and that negatively affects SLS design.

REQUIRED REINFORCEMENT $a_{s,1,-z\ (top)}$

RF-CONCRETE Surfaces CA4
Vidinės sienos
Required Reinforcement a-s,1,-z (top) [cm²/m]
Values: a-s,1,-z (top) [cm^2/m]

Isometric

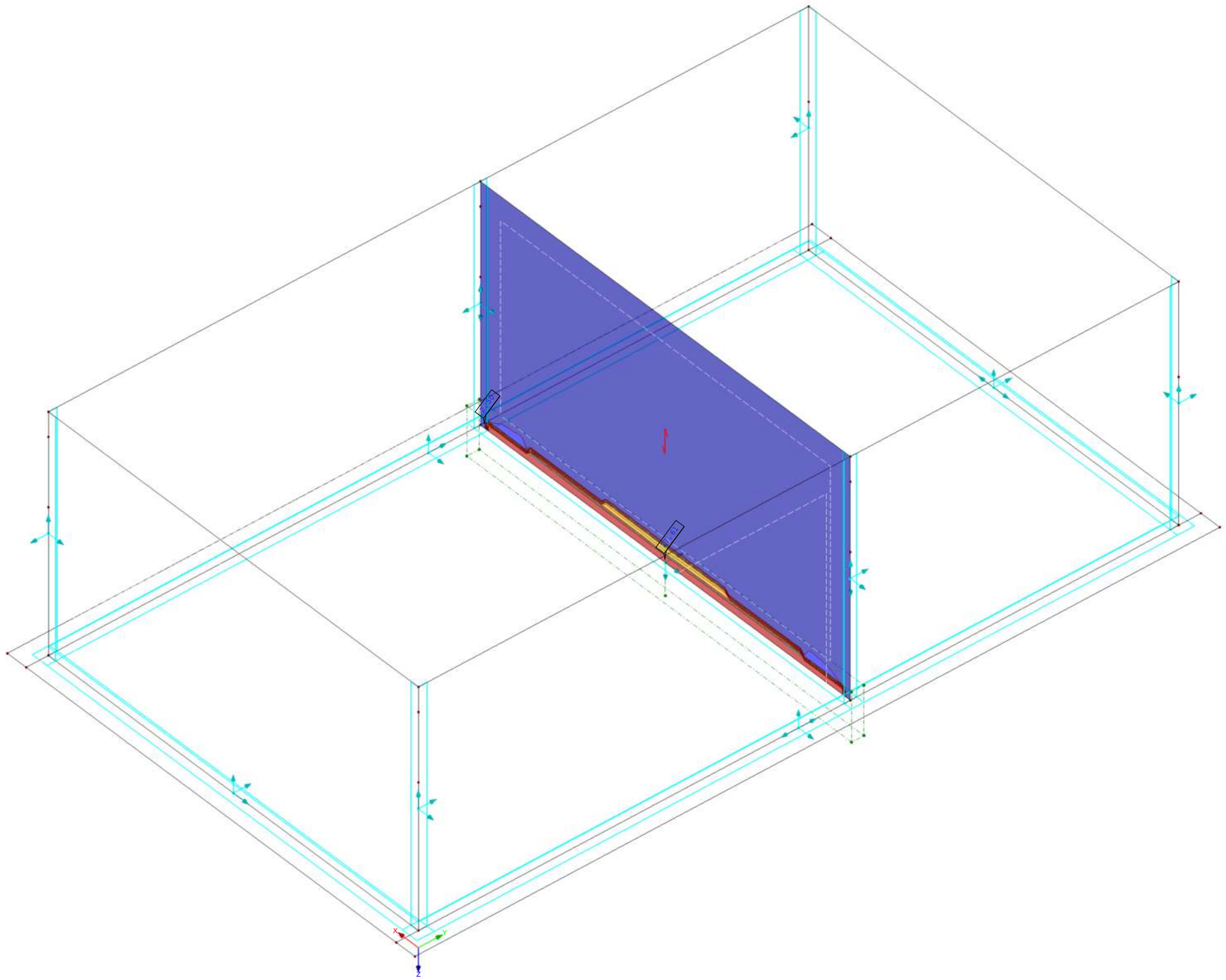


Max a-s,1,-z (top): 35.96, Min a-s,1,-z (top): 2.01 cm²/m

REQUIRED REINFORCEMENT $a_{s,2,-z\ (top)}$

RF-CONCRETE Surfaces CA4
Vidinės sienos
Required Reinforcement a-s,2,-z (top) [cm²/m]
Values: a-s,2,-z (top) [cm^2/m]

Isometric

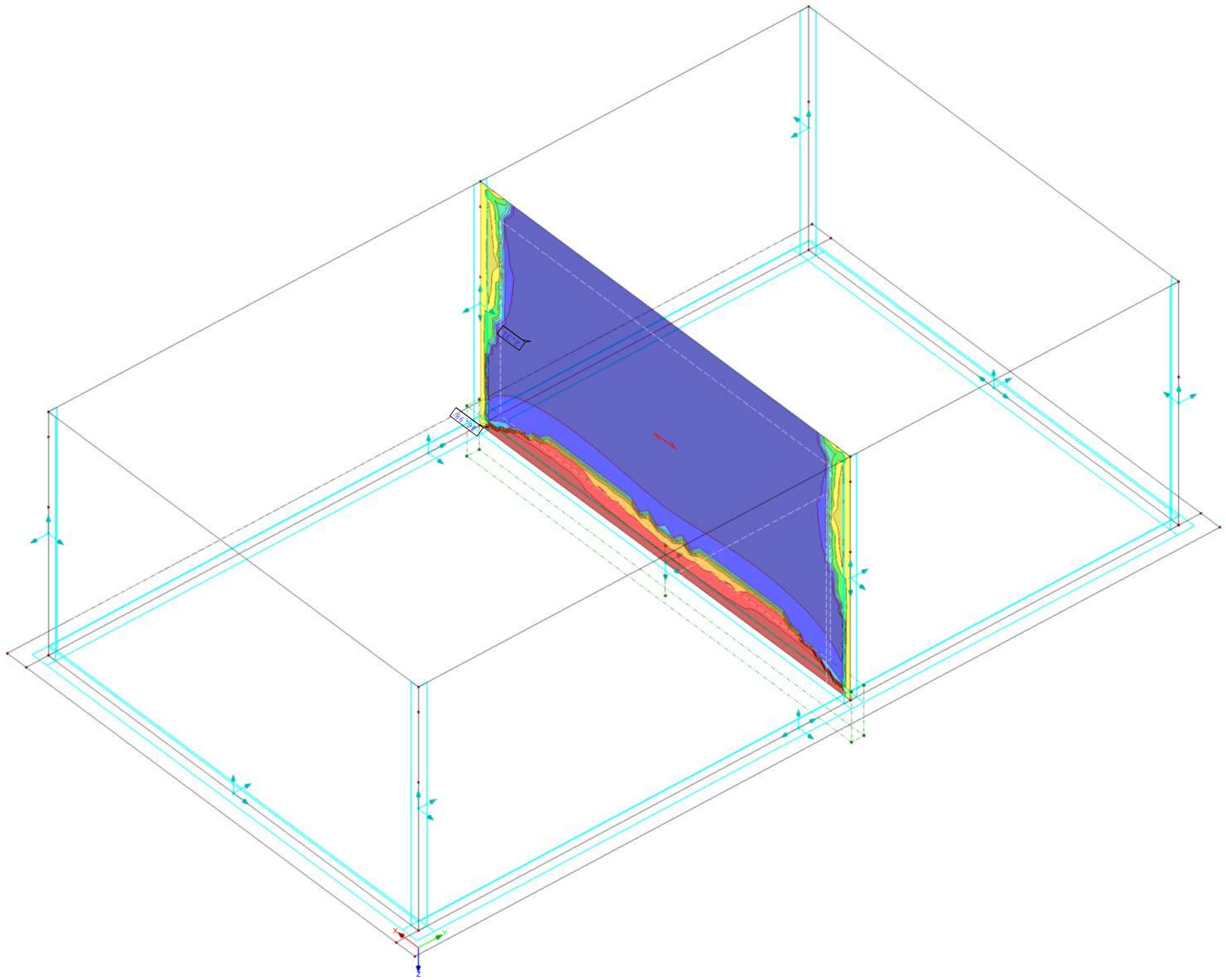


Max a-s,2,-z (top): 17.61, Min a-s,2,-z (top): 2.50 cm²/m

REQUIRED REINFORCEMENT $a_{s,1,+z\ (bottom)}$

RF-CONCRETE Surfaces CA4
Vidinės sienos
Required Reinforcement a-s,1,+z (bottom) [cm²/m]
Values: a-s,1,+z (bottom) [cm^2/m]

Isometric

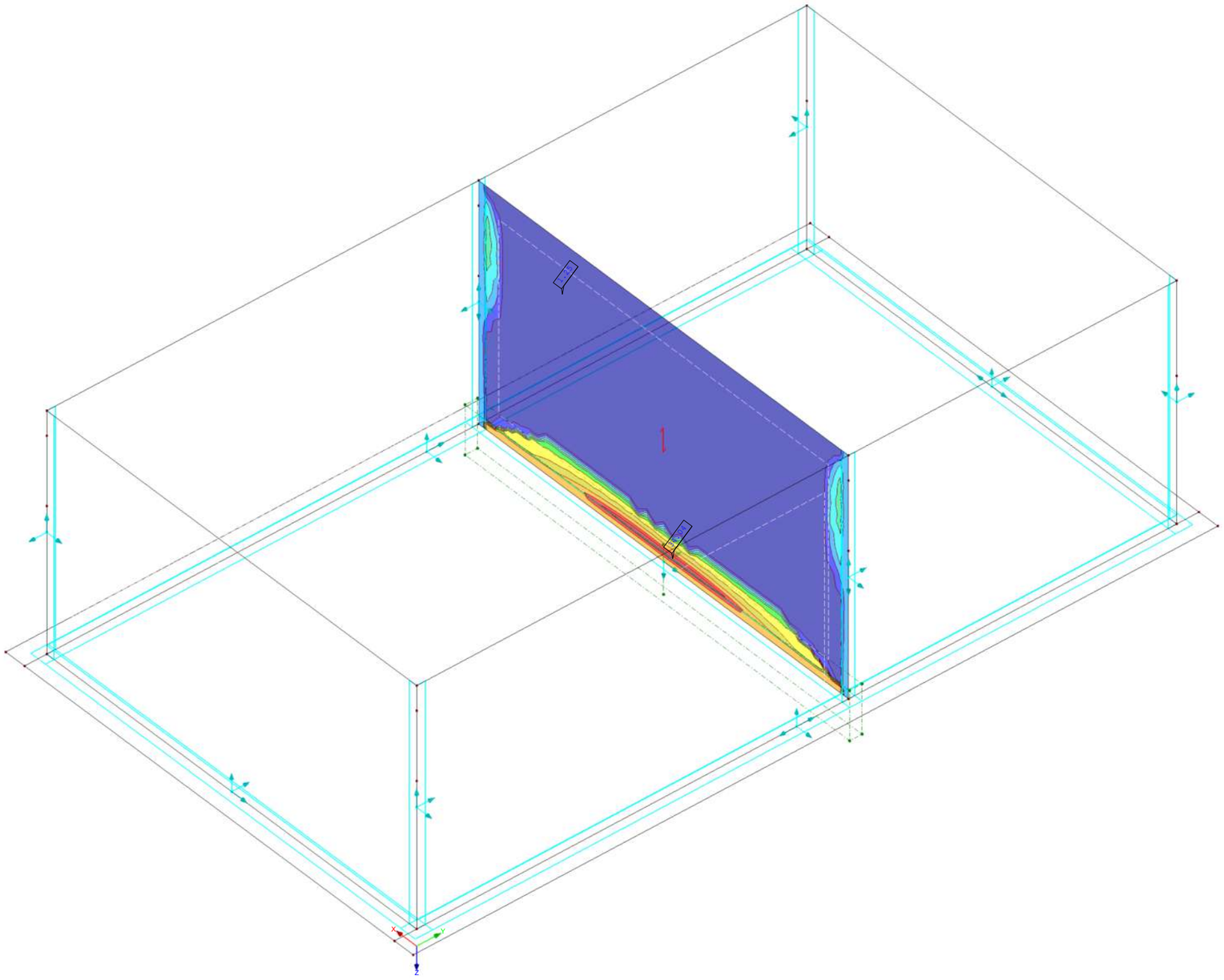


Max a-s,1,+z (bottom): 36.98, Min a-s,1,+z (bottom): 2.31 cm²/m

REQUIRED REINFORCEMENT $a_{s,2,+z\ (bottom)}$

RF-CONCRETE Surfaces CA4
Vidinės sienos
Required Reinforcement a-s,2,+z (bottom) [cm²/m]
Values: a-s,2,+z (bottom) [cm^2/m]

Isometric

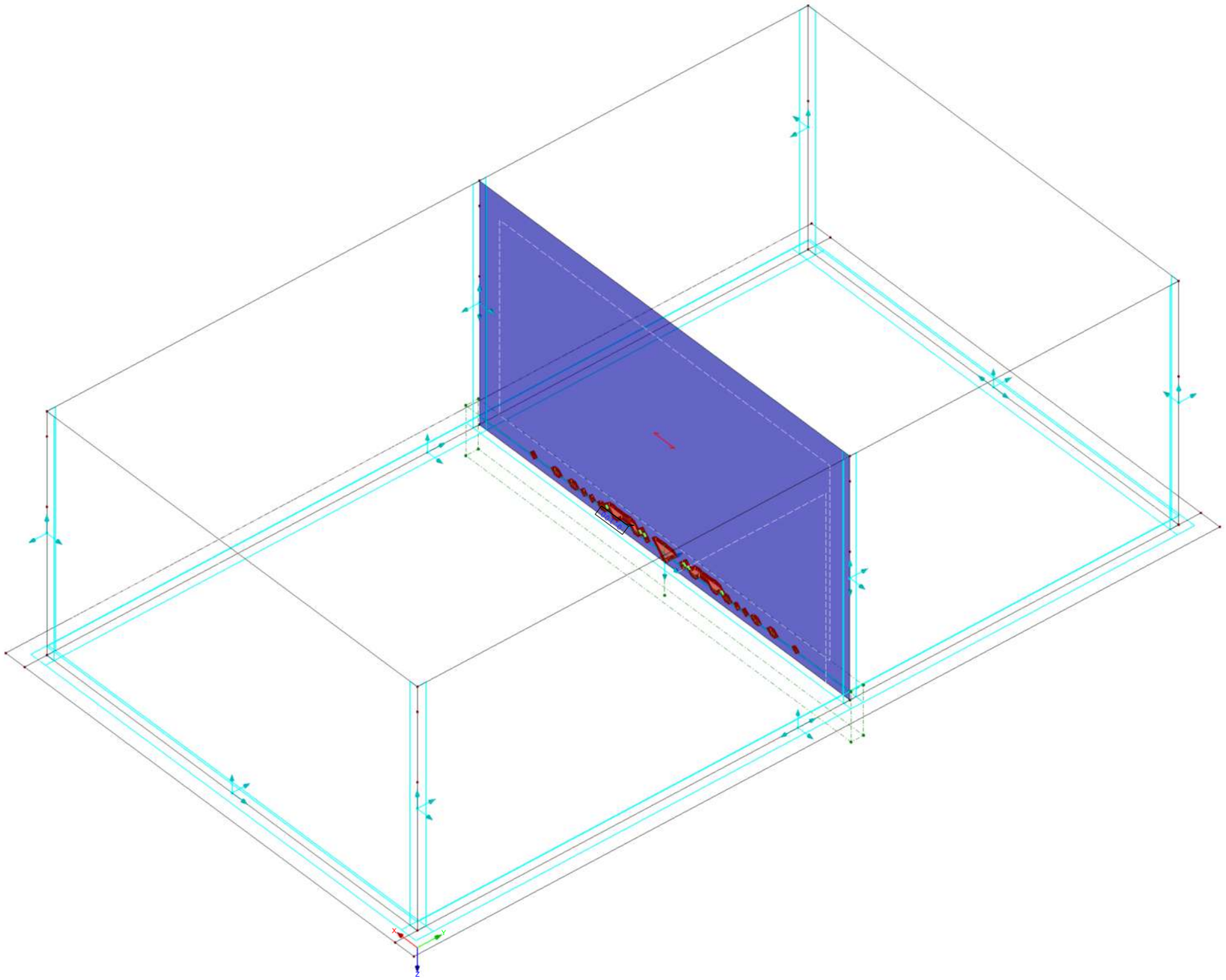


Max a-s,2,+z (bottom): 34.04, Min a-s,2,+z (bottom): 1.25 cm²/m

CRACK WIDTH $w_{k,1,-z\ (top)}$

RF-CONCRETE Surfaces CA4
Vidinės sienos
Crack width w-k,1,-z (top) [mm]
Values: w-k,1,-z (top) [mm]

Isometric

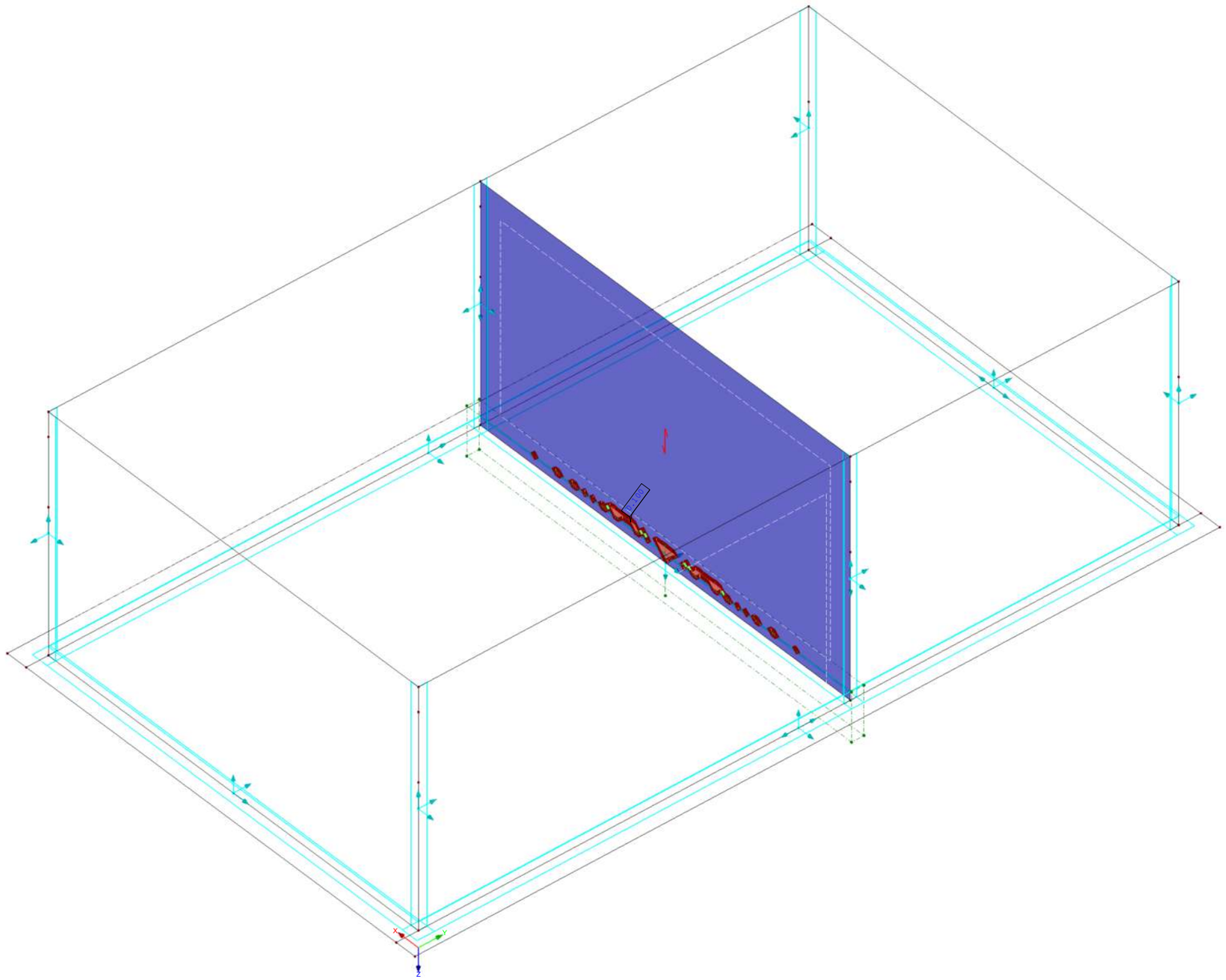


Max w-k,1,-z (top): 0.100, Min w-k,1,-z (top): 0.000 mm

CRACK WIDTH $w_{k,2,-z\ (top)}$

RF-CONCRETE Surfaces CA4
Vidinės sienos
Crack width w-k,2,-z (top) [mm]
Values: w-k,2,-z (top) [mm]

Isometric

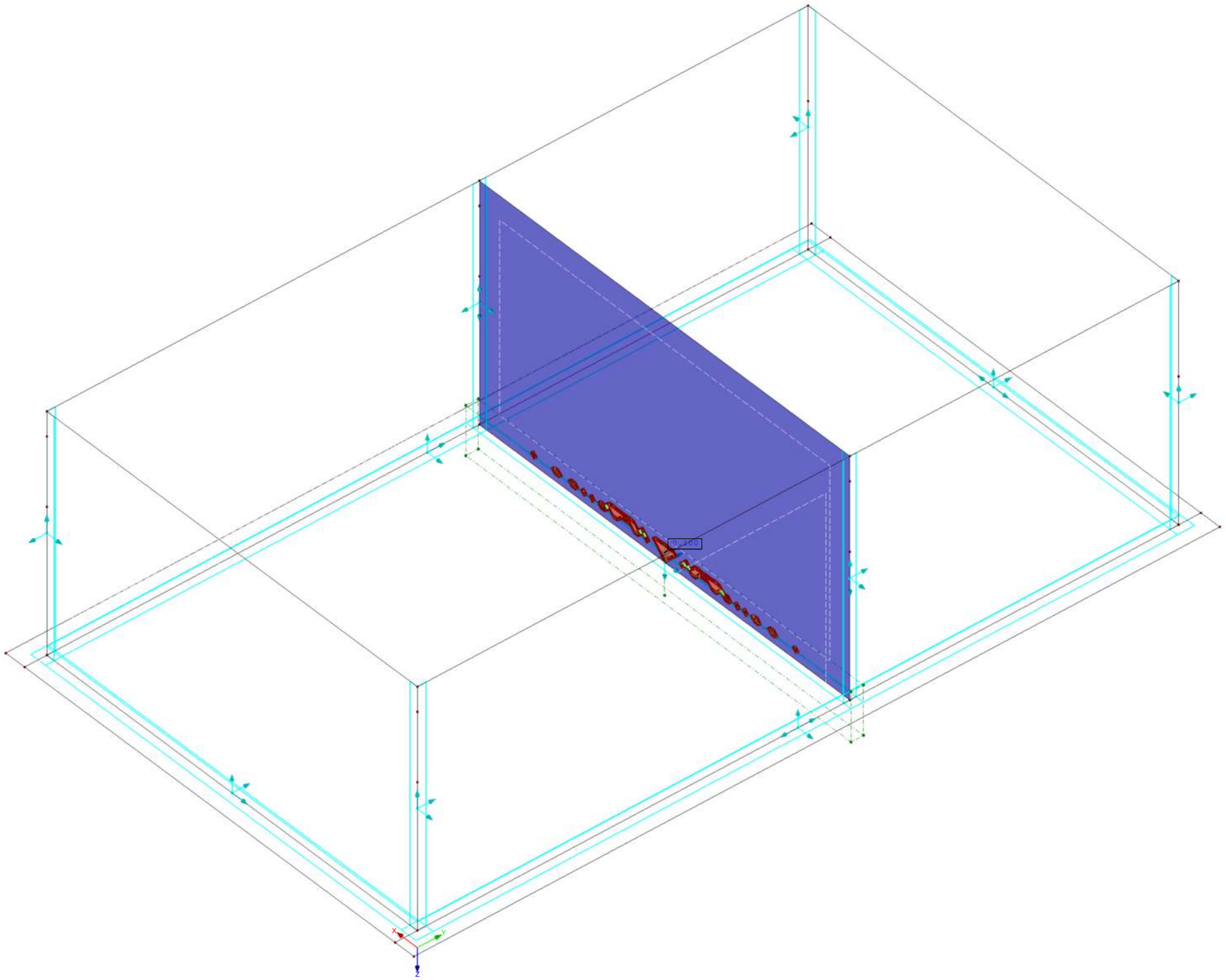


Max w-k,2,-z (top): 0.100, Min w-k,2,-z (top): 0.000 mm

CRACK WIDTH $w_{k,res,-z\ (top)}$

RF-CONCRETE Surfaces CA4
Vidinės sienos
Crack width w-k,res,-z (top) [mm]
Values: w-k,res,-z (top) [mm]

Isometric

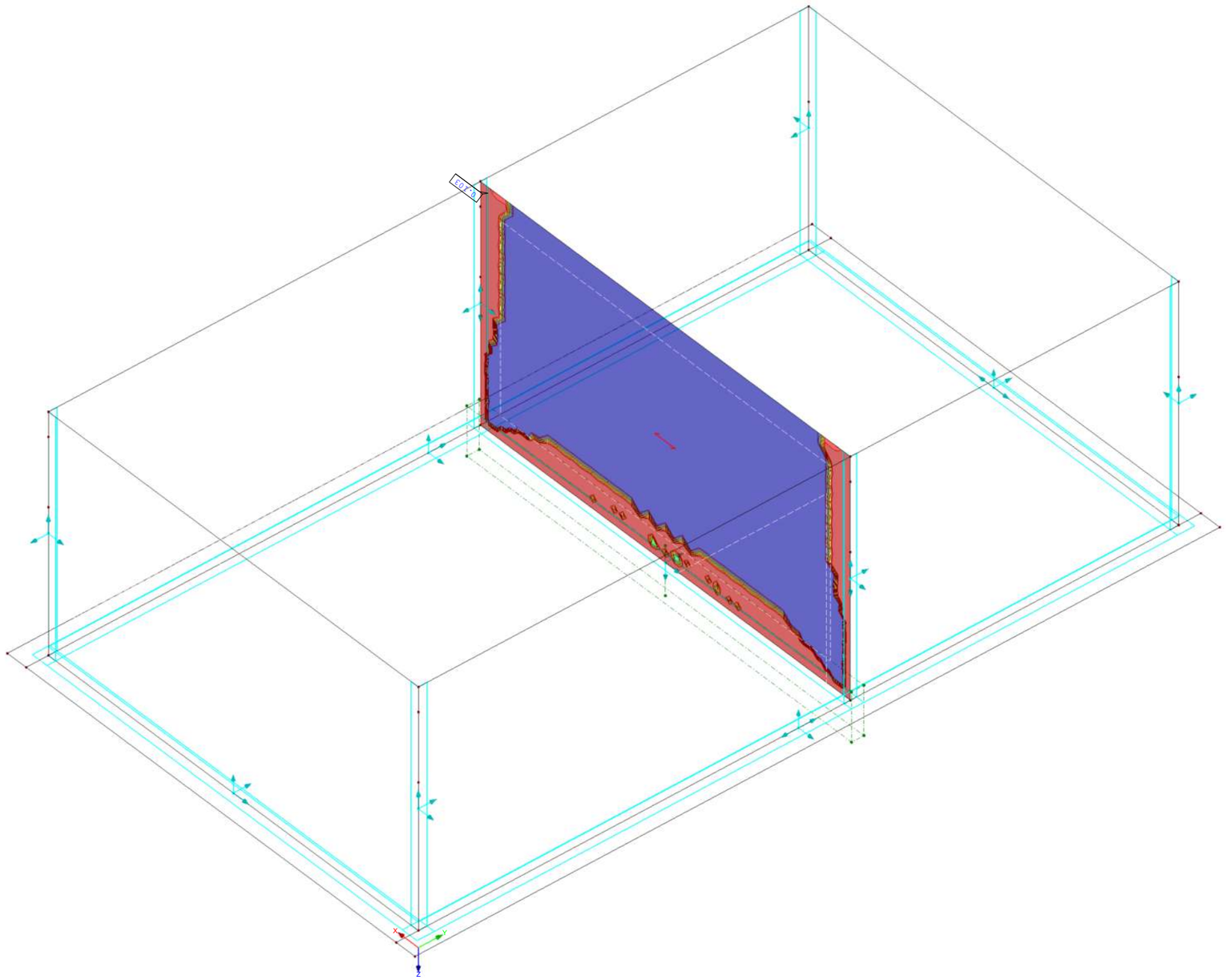


Max w-k,res,-z (top): 0.100, Min w-k,res,-z (top): 0.000 mm

CRACK WIDTH $w_{k,1,+z\ (bottom)}$

RF-CONCRETE Surfaces CA4
Vidinės sienos
Crack width w-k,1,+z (bottom) [mm]
Values: w-k,1,+z (bottom) [mm]

Isometric

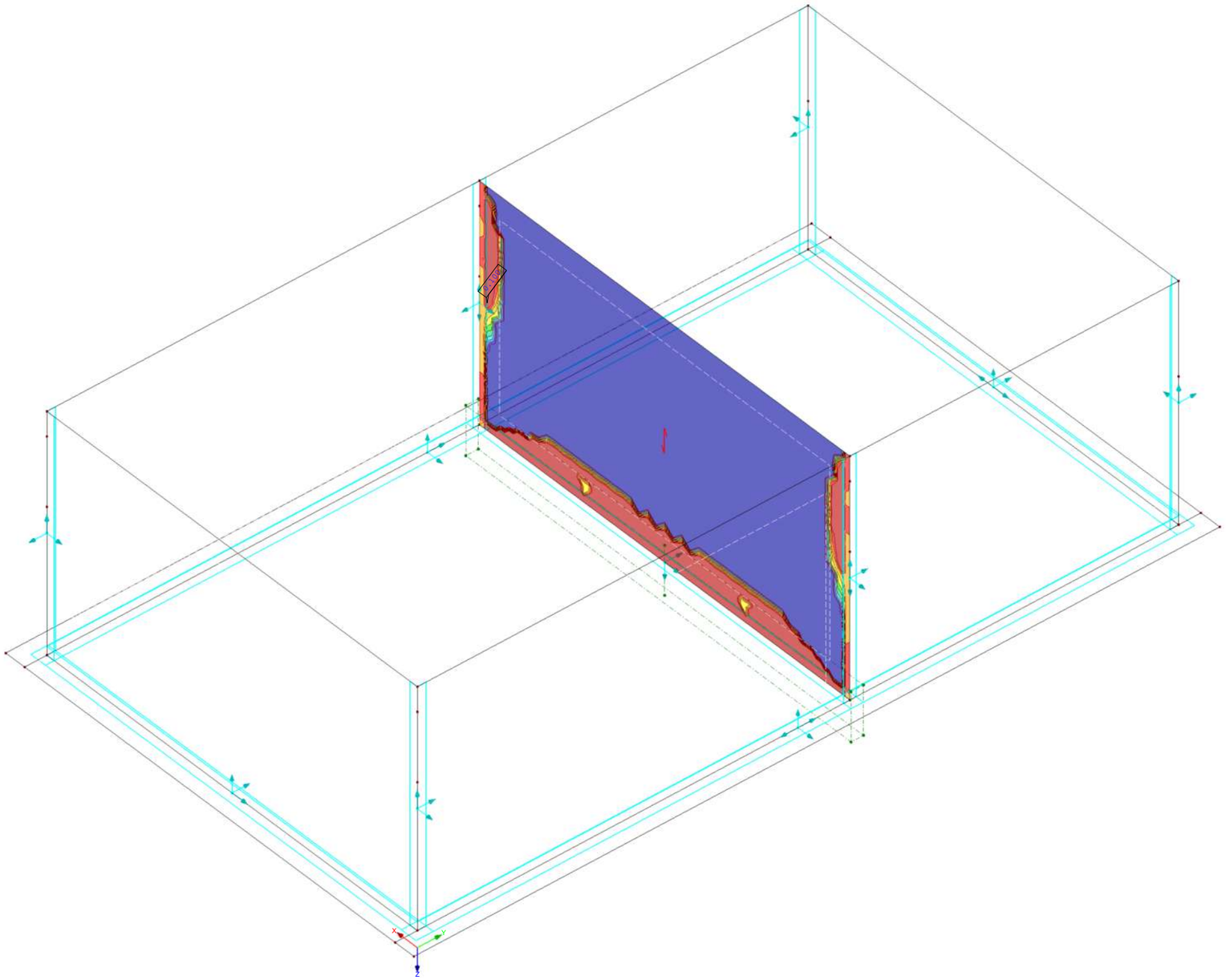


Max w-k,1,+z (bottom): 0.103, Min w-k,1,+z (bottom): 0.000 mm

CRACK WIDTH $w_{k,2,+z\ (bottom)}$

RF-CONCRETE Surfaces CA4
Vidinės sienos
Crack width w-k,2,+z (bottom) [mm]
Values: w-k,2,+z (bottom) [mm]

Isometric

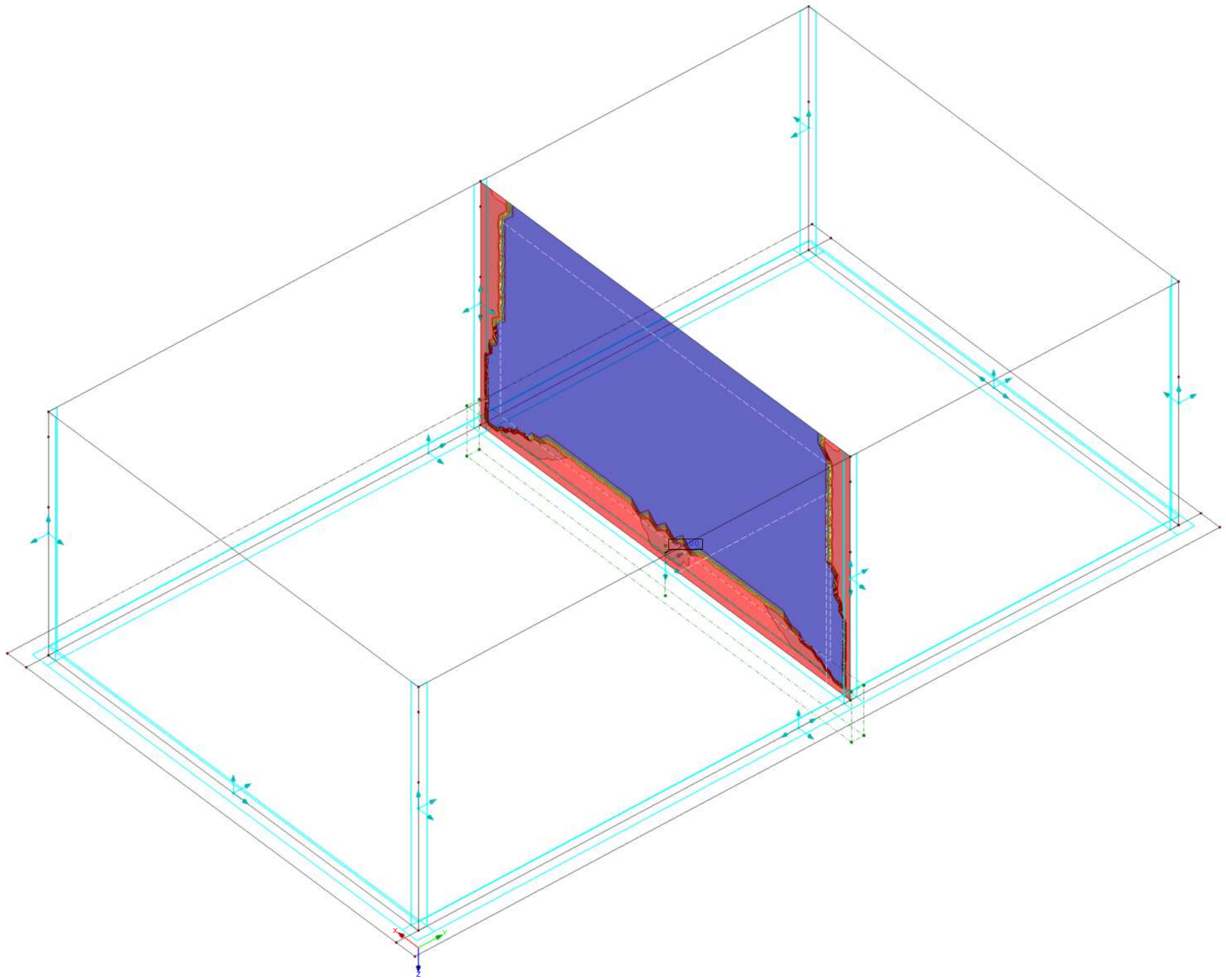


Max w-k,2,+z (bottom): 0.100, Min w-k,2,+z (bottom): 0.000 mm

CRACK WIDTH $w_{k,res,+z\ (bottom)}$

RF-CONCRETE Surfaces CA4
Vidinės sienos
Crack width w-k,res,+z (bottom) [mm]
Values: w-k,res,+z (bottom) [mm]

Isometric



Max w-k,res,+z (bottom): 0.100, Min w-k,res,+z (bottom): 0.000 mm

RF-SOILIN
CA1
Soil-structure
interaction analysis

Project: 1
1
Model: SK23010_Dreverna_ (04, 05) statinys_ ..
Date: 2023-09-06

1.1 GENERAL DATA

Surfaces to design	53-58	
Load combinations to design:	CO10	Eksplotacija 1+2+S (susitraukimas)
Standard:		EC7
Groundwater available		☒
Groundwater ordinate Z		-3.000 m
Rock beneath the last layer		☐

1.2.1 DESCRIPTION OF MATERIALS

Soil No.	Soil Description	Specific Weight γ [kN/m³]	Specific Weight γ [kN/m³]	Modulus of Elasticity E_{def} [MN/m²]	Poisson's Ratio E_{def} [-]	Comment
1	Sand, Well-Graded (SW)	20.00	20.00	11.40	0.28	IGS-3
2	Silty Sand, Sand-Silt Mixture (SM)	20.00	20.50	31.00	0.31	IGS-4
3	Silty Sand, Sand-Silt Mixture (SM)	20.00	20.50	45.50	0.35	IGS-5
4	Silty Sand, Sand-Silt Mixture (SM)	20.00	20.50	78.80	0.30	IGS-6

1.2.2 - 1.2.3 SOIL SAMPLES AND SOIL LAYERS

Sample No.	Soil Sample Coordinates [m] X	Y	Z	Region No.	Soil	Thickness Δt [m]	Ordinate BL z [m]
2	4.425	6.750	-0.340	-	1 - Sand, Well-Graded (SW)	0.800	0.800
					2 - Silty Sand, Sand-Silt Mixture (SM)	1.600	2.400
					3 - Silty Sand, Sand-Silt Mixture (SM)	2.100	4.500
					4 - Silty Sand, Sand-Silt Mixture (SM)	0.500	5.000
					3 - Silty Sand, Sand-Silt Mixture (SM)	1.000	6.000
					4 - Silty Sand, Sand-Silt Mixture (SM)	2.800	8.800

1.3 ADDITIONAL GEOLOGICAL REGIONS

Region No.	Region Shape	Additional Geological Region Coordinates [m] X_1 / X_c	Y_1 / Y_c	X_2 / R	Y_2	X_3	Y_3	X_4	Y_4	Number of Layers	Comment
-										6	

RF-SOILIN
CA1
Soil-structure
interaction analysis
RESULTS

2.1.1 STRESSES AND SETTLEMENTS

Grid Point	Surface No.	Grid Point Coordination [m] X	Y	Z	Excavation [m]	Contact Stress $\sigma_{z,0}$ [kN/m²]	Settlement $s_{z,0}$ [mm]	
1	55	-0.375	-0.375	-0.165	0.175	466.94	11.16	
2	58	2.125	-0.375	-0.165	0.175	335.15	12.02	
3	58	4.625	-0.375	-0.165	0.175	300.55	11.76	
4	58	7.125	-0.375	-0.165	0.175	332.26	11.99	
5	55	-0.375	2.125	-0.165	0.175	341.06	11.77	
6	53	2.125	2.125	-0.165	0.175	74.91	8.38	
7	53	4.625	2.125	-0.165	0.175	72.50	8.38	
8	53	7.125	2.125	-0.165	0.175	75.79	8.40	
9	55	-0.375	4.625	-0.165	0.175	355.85	12.62	
10	53	2.125	4.625	-0.165	0.175	73.02	8.34	
11	53	4.625	4.625	-0.165	0.175	70.90	8.26	
12	53	7.125	4.625	-0.165	0.175	73.91	8.37	
13	55	-0.375	7.125	-0.165	0.175	355.14	12.69	
14	53	2.125	7.125	-0.165	0.175	73.53	8.30	
15	53	4.625	7.125	-0.165	0.175	71.47	8.22	
16	53	7.125	7.125	-0.165	0.175	74.34	8.33	
17	55	-0.375	9.625	-0.165	0.175	341.55	12.27	
18	54	2.125	9.625	-0.165	0.175	72.35	8.09	
19	54	4.625	9.625	-0.165	0.175	71.20	8.07	
20	54	7.125	9.625	-0.165	0.175	72.99	8.11	
21	55	-0.375	12.125	-0.165	0.175	315.73	11.33	
22	54	2.125	12.125	-0.165	0.175	65.92	7.50	
23	54	4.625	12.125	-0.165	0.175	63.08	7.41	
24	54	7.125	12.125	-0.165	0.175	67.13	7.54	
25	55	-0.375	14.625	-0.165	0.175	267.90	9.60	
26	54	2.125	14.625	-0.165	0.175	67.24	7.13	
27	54	4.625	14.625	-0.165	0.175	65.75	7.20	
28	54	7.125	14.625	-0.165	0.175	68.03	7.14	

STRUCTURAL ANALYSIS

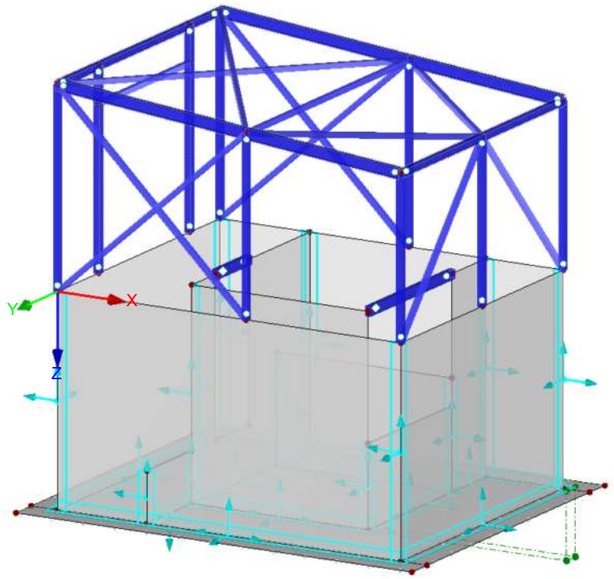
PROJECT

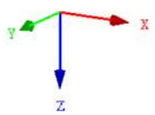
Tretinio valymo pastatas (06);

CLIENT

CREATED BY

Isometric





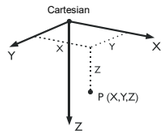
MODEL - GENERAL DATA

General	Model name	:	SK23010_Dreverna_ (06) statinys_ (antzemnine, pozemine) 23.07.31	
	Project name	:	1	
	Project description	:	1	
	Type of model	:	3D	
	Positive direction of global axis Z	:	Downward	
	Classification of load cases and combinations	:	According to Standard: EN 1990 National Annex: LST - Lithuania	
Options	☐ RF-FORM-FINDING - Find initial equilibrium shapes of membrane and cable structures			
	☐ RF-CUTTING-PATTERN			
	☐ Piping analysis			
	☐ Use CQC Rule			
	☐ Enable CAD/BIM model			
	Standard Gravity			
	g	:	10.00 m/s^2	

FE MESH SETTINGS

General	Target length of finite elements	l_{FE}	:	200 mm	
	Maximum distance between a node and a line to integrate it into the line	ε	:	1 mm	
	Maximum number of mesh nodes (in thousands)		:	500	
Members	Number of divisions of members with cable, elastic foundation, taper, or plastic characteristic		:	10	
	☒ Activate member divisions for large deformation or post-critical analysis				
	☒ Use division for members with node lying on them				
Surfaces	Maximum ratio of FE rectangle diagonals	Δ_D	:	2	
	Maximum out-of-plane inclination of two finite elements	α	:	0.50 °	
	Shape direction of finite elements		:	Triangles and quadrangles ☒Same squares where possible	

1.1 NODES



Node No.	Node Type	Reference Node	Coordinate System	Node Coordinates X [mm]	Y [mm]	Z [mm]	Comment
17	Standard	-	Cartesian	0	0	-3000	
18	Standard	-	Cartesian	0	0	0	
19	Standard	-	Cartesian	0	-4550	-3000	
20	Standard	-	Cartesian	0	-4550	0	
21	Standard	-	Cartesian	5550	0	-2450	
22	Standard	-	Cartesian	5550	0	0	
23	Standard	-	Cartesian	5550	-4550	-2450	
24	Standard	-	Cartesian	5550	-4550	0	
25	Standard	-	Cartesian	0	-3700	-3000	
26	Standard	-	Cartesian	0	-3700	0	
27	Standard	-	Cartesian	0	-1150	-3000	
28	Standard	-	Cartesian	0	-1150	0	
29	Standard	-	Cartesian	0	-3700	-2450	
30	Standard	-	Cartesian	0	-1150	-2450	
31	Standard	-	Cartesian	5550	-2275	-2450	
32	Standard	-	Cartesian	5550	-2275	0	
33	Standard	-	Cartesian	3055	0	-2697	
34	Standard	-	Cartesian	3055	0	0	
37	Standard	-	Cartesian	3055	-4550	-2697	
38	Standard	-	Cartesian	3055	-4550	0	
39	Standard	-	Cartesian	0	0	3160	
40	Standard	-	Cartesian	0	-4550	3160	
41	Standard	-	Cartesian	5550	0	3160	
42	Standard	-	Cartesian	5550	-4550	3160	
43	Standard	-	Cartesian	4300	-1250	3160	
44	Standard	-	Cartesian	1450	-1250	3160	
45	Standard	-	Cartesian	1450	-1250	0	
46	Standard	-	Cartesian	4300	-1250	0	
47	Standard	-	Cartesian	1450	-4550	3160	
48	Standard	-	Cartesian	1450	-4550	0	
49	Standard	-	Cartesian	1450	-3600	3160	
50	Standard	-	Cartesian	4300	-3600	3160	
51	Standard	-	Cartesian	4300	-3600	1510	
52	Standard	-	Cartesian	1450	-3600	1510	
53	Standard	-	Cartesian	4300	-3600	1910	
54	Standard	-	Cartesian	4300	-1250	1910	
55	Standard	-	Cartesian	4300	-4550	3160	
56	Standard	-	Cartesian	5975	0	3160	
57	Standard	-	Cartesian	4300	-3600	0	
58	Standard	-	Cartesian	4300	-4550	0	
59	Standard	-	Cartesian	-425	425	3160	
60	Standard	-	Cartesian	-425	-4975	3160	
61	Standard	-	Cartesian	5975	-4975	3160	
62	Standard	-	Cartesian	5975	425	3160	
63	Standard	-	Cartesian	1450	-1900	0	
64	Standard	-	Cartesian	1450	-2850	0	
65	Standard	-	Cartesian	1450	-1900	2400	
66	Standard	-	Cartesian	1450	-2850	2400	

1.1 NODES

Node No.	Node Type	Reference Node	Coordinate System	Node Coordinates X [mm]	Y [mm]	Z [mm]	Comment
67	Standard	-	Cartesian	1450	-1250	2400	
68	Standard	-	Cartesian	1450	0	3160	
69	Standard	-	Cartesian	1450	0	2400	
70	Standard	-	Cartesian	-425	0	3160	
71	Standard	-	Cartesian	5975	-4550	3160	
72	Standard	-	Cartesian	-425	-4550	3160	

1.2 LINES

Line No.	Line Type	Nodes No.	Line Length L [mm]		Comment
1	Polyline	46,57	2350	Y	
2	Polyline	63,65	2400	Z	
3	Polyline	21,31	2275	Y	
4	Polyline	17,27	1150	Y	
5	Polyline	25,19	850	Y	
6	Polyline	27,25	2550	Y	
7	Polyline	26,28	2550	Y	
8	Polyline	29,30	2550	Y	
9	Polyline	17,18	3000	Z	
10	Polyline	19,20	3000	Z	
11	Polyline	25,29	550	Z	
12	Polyline	27,30	550	Z	
13	Polyline	21,22	2450	Z	
14	Polyline	23,24	2450	Z	
15	Polyline	41,56	425	X	
16	Polyline	56,62	425	Y	
17	Polyline	18,33	4075	XZ	
18	Polyline	17,34	4282	XZ	
19	Polyline	20,37	4075	XZ	
20	Polyline	19,38	4282	XZ	
21	Polyline	24,31	3343	YZ	
22	Polyline	22,31	3343	YZ	
23	Polyline	29,26	2450	Z	
24	Polyline	30,28	2450	Z	
25	Polyline	31,32	2450	Z	
26	Polyline	31,23	2275	Y	
27	Polyline	33,34	2697	Z	
28	Polyline	65,66	950	Y	
29	Polyline	37,38	2697	Z	
30	Polyline	66,64	2400	Z	
31	Polyline	39,40	4550	Y	
32	Polyline	40,20	3160	Z	
33	Polyline	20,26	850	Y	
34	Polyline	18,39	3160	Z	
35	Polyline	34,18	3055	X	
36	Polyline	28,18	1150	Y	
37	Polyline	39,68	1450	X	
38	Polyline	41,22	3160	Z	
39	Polyline	22,34	2495	X	
40	Polyline	41,42	4550	Y	
41	Polyline	42,24	3160	Z	
42	Polyline	24,32	2275	Y	
43	Polyline	38,58	1245	X	
44	Polyline	32,22	2275	Y	
45	Polyline	42,55	1250	X	
46	Polyline	47,40	1450	X	
47	Polyline	20,48	1450	X	
48	Polyline	43,44	2850	X	
49	Polyline	44,67	760	Z	
50	Polyline	45,46	2850	X	
51	Polyline	46,54	1910	Z	
52	Polyline	44,49	2350	Y	
53	Polyline	47,48	3160	Z	
54	Polyline	48,64	1700	Y	
55	Polyline	49,47	950	Y	
56	Polyline	48,38	1605	X	
57	Polyline	49,50	2850	X	
58	Polyline	55,47	2850	X	
59	Polyline	51,52	2850	X	
60	Polyline	52,49	1650	Z	
61	Polyline	43,50	2350	Y	
62	Polyline	50,53	1250	Z	
63	Polyline	53,54	2350	Y	
64	Polyline	54,43	1250	Z	
65	Polyline	58,24	1250	X	
66	Polyline	53,51	400	Z	
67	Polyline	50,55	950	Y	
68	Polyline	63,64	950	Y	
69	Polyline	51,57	1510	Z	
70	Polyline	58,57	950	Y	
71	Polyline	69,68	760	Z	
72	Polyline	58,55	3160	Z	
73	Polyline	59,70	425	Y	
74	Polyline	60,61	6400	X	
75	Polyline	61,71	425	Y	
76	Polyline	62,59	6400	X	
77	Polyline	67,45	2400	Z	
78	Polyline	67,69	1250	Y	
79	Polyline	68,41	4100	X	
80	Polyline	68,44	1250	Y	
81	Polyline	33,19	5489		

1.2 LINES

Line No.	Line Type	Nodes No.	Line Length L [mm]		Comment
82	Polyline	17,33	3070	XZ	
83	Polyline	19,37	3070	XZ	
84	Polyline	37,17	5489		
85	Polyline	33,31	3385		
86	Polyline	31,37	3385		
87	Polyline	33,37	4550	Y	
88	Polyline	39,70	425	X	
89	Polyline	70,72	4550	Y	
90	Polyline	42,71	425	X	
91	Polyline	33,21	2507	XZ	
92	Polyline	37,23	2507	XZ	
93	Polyline	63,45	650	Y	
94	Polyline	71,56	4550	Y	
95	Polyline	40,72	425	X	
96	Polyline	72,60	425	Y	

1.3 MATERIALS

Matl. No.	Modulus E [kN/cm²]	Modulus G [kN/cm²]	Poisson's Ratio ν [-]	Spec. Weight γ [kN/m³]	Coeff. of Th. Exp. α [1/°C]	Partial Factor γ_M [-]	Material Model
1	Steel S 355 J2 | LST EN 10025-2:2004-11 21000.00 Sijos, kolonos	8076.92	0.300	78.50	1.20E-05	1.00	Isotropic Linear Elastic
2	Steel S 275 J2 | LST EN 10025-2:2004-11 21000.00 Ryðiai, rėmai	8076.92	0.300	78.50	1.20E-05	1.00	Isotropic Linear Elastic
3	Concrete C35/45 | EN 1992-1-1:2004/A1:2014 3400.00 Pamatai, plokštė	1416.67	0.200	25.00	1.00E-05	1.00	Isotropic Linear Elastic
4	Concrete C35/45 (70%) | EN 1992-1-1:2004/A1:2014 2380.00 User-Defined Material	991.67	0.200	25.00	1.00E-05	1.00	Isotropic Linear Elastic

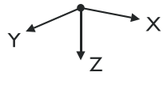
1.4 SURFACES

Surface No.	Surface Type Geometry	Stiffness	Boundary Lines No.	Matl. No.	Thickness Type	d [mm]	Area A [mm²]	Weight W [kg]
1	Plane	Standard	31-33,7,36,34	4	Constant	300	14378000	10783.50
2	Plane	Standard	37,79,38,39,35,34	4	Constant	300	17538000	13153.50
3	Plane	Standard	40-42,44,38	4	Constant	300	14378000	10783.50
4	Plane	Standard	45,58,46,32,47,56,43,65,41	4	Constant	300	17538000	13153.50
5	Plane	Standard	89,95,31,88	3	Constant	300	1933750	1450.31
6	Plane	Standard	48,49,77,50,51,64	4	Constant	250	9006000	5628.75
7	Plane	Standard	52,55,53,54,30,28,2,93,77,49	4	Constant	250	8148000	5092.50
8	Plane	Standard	57,62,66,59,60	4	Constant	250	4702500	2939.06
9	Plane	Standard	61-64	4	Constant	250	2937500	1835.94
10	Plane	Standard	70,72,67,62,66,69	4	Constant	250	3002000	1876.25
11	Plane	Standard	73,88,37,79,15,16,76	3	Constant	300	2720000	2040.00
12	Plane	Standard	80,49,78,71	4	Constant	250	950000	593.75
13	Plane	Standard	79,80,48,61,67,45,40	3	Constant	300	9250000	6937.50
14	Plane	Standard	58,67,57,55	3	Constant	300	2707500	2030.63
15	Plane	Standard	61,48,52,57	3	Constant	300	6697500	5023.13
16	Plane	Standard	37,31,46,55,52,80	3	Constant	300	6597500	4948.13
17	Plane	Standard	94,15,40,90	3	Constant	300	1933750	1450.31
18	Plane	Standard	96,74,75,90,45,58,46,95	3	Constant	300	2720000	2040.00

1.4.2 SURFACES - INTEGRATED OBJECTS

Surface No.	Integrated Objects No. Nodes	Lines	Openings	Comment
2		71		
4		53,72		
7		60		

1.9 SURFACE SUPPORTS

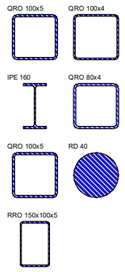


Found. No.	On Surfaces No.	Spring Constants RF-SOILIN	Translation Support or Spring [kN/m³] u_x	u_y	u_z	Shear Spring [kN/m] v_{xz}	v_{yz}
1	11	+	100.000	100.000			
2	5	+	1000.000	1000.000			
3	13	+	1000.000	1000.000			
4	14	+	1000.000	1000.000			
5	15	+	1000.000	1000.000			
6	16	+	1000.000	1000.000			
7	17	+	1000.000	1000.000			
8	18	+	1000.000	1000.000			

1.9.1 SURFACE SUPPORTS - INEFFECTIVE

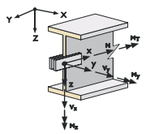
Found. No.	On Surfaces No.	Ineffective support under σ_z	Yielding from contact stress $\sigma_{z'}$ [kN/m²]	Coefficient of friction μ_z [-]
1	11	Negative		
2	5	Negative		

1.13 CROSS-SECTIONS



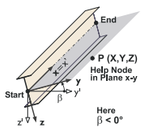
Section No.	Matl. No.	J [cm⁴] / A [cm²]	I_y [cm⁴] / A_y [cm²]	I_z [cm⁴] / A_z [cm²]	Principal Axes α [°]	Rotation α' [°]	Overall Dimensions [mm] Width b	Height h
1	QRO 100x5 | EN 10219-2:2006							
	1	441.00	271.00	271.00	0.00	0.00	100	100
		18.40	8.02	8.02				
2	QRO 100x4 | EN 10219-2:2006							
	1	362.00	226.00	226.00	0.00	0.00	100	100
		14.90	6.47	6.47				
3	IPE 160 | Euronorm 19-57							
	1	3.62	869.00	68.30	0.00	0.00	82	160
		20.10	10.17	7.33				
4	QRO 80x4 | EN 10219-2:2006							
	2	180.00	111.00	111.00	0.00	0.00	80	80
		11.70	5.13	5.13				
5	QRO 100x5 | EN 10219-2:2006							
	1	441.00	271.00	271.00	0.00	0.00	100	100
		18.40	8.02	8.02				
6	RD 40 | ArcelorMittal (EN 10060:2003)							
	1	25.13	12.57	12.57	0.00	0.00	40	40
		12.60	10.58	10.58				
7	RRO 150x100x5 | EN 10219-2:2006							
	1	809.00	719.00	384.00	0.00	0.00	100	150
		23.40	7.14	13.05				

1.14 MEMBER HINGES



Release No.	Reference System	Axial/Shear Release or Spring[kN/m] u_x	u_y	u_z	Moment Release or Spring[kNm/rad] φ_x	φ_y	φ_z	Comment
1	Local x,y,z	☐	☐	☐	☐	☒	☐	Paprastas lankstas My
2	Local x,y,z	☐	☐	☐	☐	☒	☒	Paprastas lanstas My+Mz
3	Local x,y,z	☐	☐	☐	☐	☐	☒	
4	Local x,y,z	☒	☐	☐	☐	☒	☒	

1.17 MEMBERS



Mbr. No.	Line No.	Member	Rotation Type	Rotation β [°]	Cross-Section Start	Cross-Section End	Hinge No. Start	Hinge No. End	Ecc. No.	Div. No.	Length L [mm]	
1	5	Beam	Angle	0.00	1	1	-	1	-	-	850	Y
2	6	Beam	Angle	0.00	1	1	-	-	-	-	2550	Y
3	23	Beam	Angle	0.00	1	1	-	2	-	-	2450	Z
4	24	Beam	Angle	0.00	1	1	-	2	-	-	2450	Z
5	26	Beam	Angle	0.00	1	1	-	1	-	-	2275	Y
9	9	Beam	Angle	0.00	1	1	-	2	-	-	3000	Z
10	10	Beam	Angle	0.00	1	1	-	2	-	-	3000	Z
11	13	Beam	Angle	0.00	1	1	-	2	-	-	2450	Z
12	14	Beam	Angle	0.00	1	1	-	2	-	-	2450	Z
13	11	Beam	Angle	0.00	1	1	2	-	-	-	550	Z
14	12	Beam	Angle	0.00	1	1	2	-	-	-	550	Z
15	25	Beam	Angle	0.00	1	1	1	2	-	-	2450	Z
16	27	Beam	Angle	0.00	1	1	1	2	-	-	2697	Z
17	29	Beam	Angle	0.00	1	1	1	2	-	-	2697	Z
21	82	Beam	Angle	0.00	3	3	1	-	-	-	3070	XZ
22	83	Beam	Angle	0.00	3	3	1	-	-	-	3070	XZ
27	91	Beam	Angle	0.00	3	3	-	1	-	-	2507	XZ
28	92	Beam	Angle	0.00	3	3	-	1	-	-	2507	XZ
99	3	Beam	Angle	0.00	1	1	1	-	-	-	2275	Y
100	4	Beam	Angle	0.00	1	1	1	-	-	-	1150	Y
103	17	Truss (N only)	Angle	0.00	4	4	-	-	-	-	4075	XZ
104	18	Truss (N only)	Angle	0.00	4	4	-	-	-	-	4282	XZ
105	19	Truss (N only)	Angle	0.00	4	4	-	-	-	-	4075	XZ
106	20	Truss (N only)	Angle	0.00	4	4	-	-	-	-	4282	XZ
107	21	Truss (N only)	Angle	0.00	4	4	-	-	-	-	3343	YZ
108	22	Truss (N only)	Angle	0.00	4	4	-	-	-	-	3343	YZ
109	8	Truss (N only)	Angle	0.00	4	4	-	-	-	-	2550	Y
110	1	Beam	Angle	0.00	7	7	4	1	-	-	2350	Y
111	68	Beam	Angle	0.00	7	7	4	1	-	-	950	Y
112	81	Truss (N only)	Angle	0.00	4	4	-	-	-	-	5489	
113	84	Truss (N only)	Angle	0.00	4	4	-	-	-	-	5489	
114	85	Truss (N only)	Angle	0.00	4	4	-	-	-	-	3385	
115	86	Truss (N only)	Angle	0.00	4	4	-	-	-	-	3385	
116	87	Truss (N only)	Angle	0.00	4	4	-	-	-	-	4550	Y

1.21 SETS OF MEMBERS

Set No.	Set of Members Description	Type	Member No.	Length [mm]	Comment
1	Continuous Members 1	Contin. member	3,13	3000	
2	Continuous Members 2	Contin. member	4,14	3000	
3	Continuous Members 3	Contin. member	1,2,100	4550	
4	Continuous Members 4	Contin. member	28,22	5577	
5	Continuous Members 5	Contin. member	27,21	5577	
6	Continuous Members 6	Contin. member	5,99	4550	

1.23 FE MESH REFINEMENTS

Refinem. No.	FE Mesh Refinement applied to	Nodes No.	Number Divisions	Sphere Radius [mm]	Target FE Length [mm] Inner	Target FE Length [mm] Outer	Comment
1	Lines via FE length	2,28,30,32,34,38,41,49, 53,60,62,64,66,71,72		100			Sienos
2	Lines via FE length	31,37,40,45,46,48,52, 55,57,58,61,67,79,80		100			Dugnas

2.1 LOAD CASES

Load Case	Load Case Description	EN 1990 | LST* | Pilni Action Category	Self-Weight - Factor in Direction Active	X	Y	Z
LC1	[G]	Permanent	☒	0.000	0.000	1.000
LC2	[G+Gr]	Permanent	☒	0.000	0.000	1.000
LC3	[T]	Temperature (non fire)	☐			
LC4	[Wu]	Imposed - Category E: storage areas	☐			
LC5	[S]	Snow / ice	☐			
LC6	[L]	Imposed - Category E: storage areas	☐			
LC7	[Wd]	Imposed - Category E: storage areas	☐			
LC8	[W-y]	Wind	☐			
LC9	[W-x]	Wind	☐			
LC10	[W+y]	Wind	☐			
LC11	[W+x]	Wind	☐			
LC12	[Wup]	Wind	☐			

2.1.1 LOAD CASES - CALCULATION PARAMETERS

Load Case	Load Case Description	Calculation Parameters		
LC1	[G]	Method of analysis	: ◉	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	: ◉	Newton-Raphson
		Activate stiffness factors of:	: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC2	[G+Gr]	Method of analysis	: ◉	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	: ◉	Newton-Raphson
		Activate stiffness factors of:	: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC3	[T]	Method of analysis	: ◉	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	: ◉	Newton-Raphson
		Activate stiffness factors of:	: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC4	[Wu]	Method of analysis	: ◉	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	: ◉	Newton-Raphson
		Activate stiffness factors of:	: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC5	[S]	Method of analysis	: ◉	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	: ◉	Newton-Raphson
		Activate stiffness factors of:	: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC6	[L]	Method of analysis	: ◉	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	: ◉	Newton-Raphson
		Activate stiffness factors of:	: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC7	[Wd]	Method of analysis	: ◉	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	: ◉	Newton-Raphson
		Activate stiffness factors of:	: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC8	[W-y]	Method of analysis	: ◉	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	: ◉	Newton-Raphson
		Activate stiffness factors of:	: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC9	[W-x]	Method of analysis	: ◉	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	: ◉	Newton-Raphson
		Activate stiffness factors of:	: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC10	[W+y]	Method of analysis	: ◉	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	: ◉	Newton-Raphson
		Activate stiffness factors of:	: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC11	[W+x]	Method of analysis	: ◉	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	: ◉	Newton-Raphson
		Activate stiffness factors of:	: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
LC12	[Wup]	Method of analysis	: ◉	Geometrically linear analysis
		Method for solving system of nonlinear algebraic equations	: ◉	Newton-Raphson
		Activate stiffness factors of:	: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)

2.5 LOAD COMBINATIONS

Load Combin.	DS	Load Combination Description	No.	Factor	Load Case	
CO1	STR	Bandymas 1-a sisterna (susitraukimas)	1	1.35	LC1	[G]
			2	1.30	LC3	[T]
CO2	ULS	Bandymas 2-a sisterna (susitraukimas)	1	1.35	LC1	[G]
			2	1.30	LC3	[T]
			3	1.30	LC7	[Wd]
CO3	ULS	Bandymas 1+live (susitraukimas)	1	1.35	LC1	[G]
			2	1.30	LC3	[T]
			3	1.30	LC7	[Wd]
			4	1.30	LC6	[L]
CO4	ULS	Eksplotacija 1 (susitraukimas)	1	1.35	LC2	[G+Gr]
			2	1.30	LC3	[T]
CO5	ULS	Eksplotacija 2 (susitraukimas)	1	1.35	LC2	[G+Gr]
			2	1.30	LC3	[T]
			3	1.30	LC7	[Wd]
CO6	ULS	Eksplotacija 1+2 (susitraukimas)	1	1.35	LC2	[G+Gr]
			2	1.30	LC3	[T]
			3	1.30	LC7	[Wd]
			4	1.30	LC6	[L]
CO7	ULS	Eksplotacija S (susitraukimas)	1	1.35	LC2	[G+Gr]
			2	1.30	LC3	[T]
			3	1.30	LC7	[Wd]
			4	1.30	LC6	[L]
			5	1.30	LC5	[S]
CO8	ULS	Eksplotacija 1+S (susitraukimas)	1	1.35	LC2	[G+Gr]
			2	1.30	LC3	[T]
			3	1.30	LC7	[Wd]
			4	1.30	LC6	[L]
			5	1.30	LC5	[S]
			6	1.30	LC8	[W-y]
CO9	ULS	Eksplotacija 2+S (susitraukimas)	1	1.35	LC2	[G+Gr]
			2	1.30	LC3	[T]
			3	1.30	LC7	[Wd]
			4	1.30	LC6	[L]
			5	1.30	LC5	[S]
			6	1.30	LC9	[W-x]
CO10	ULS	Eksplotacija 1+S (susitraukimas)	1	1.35	LC2	[G+Gr]
			2	1.30	LC3	[T]
			3	1.30	LC7	[Wd]
			4	1.30	LC6	[L]
			5	1.30	LC5	[S]
			6	1.30	LC10	[W+y]
CO11	ULS	Eksplotacija 2+S (susitraukimas)	1	1.35	LC2	[G+Gr]
			2	1.30	LC3	[T]
			3	1.30	LC7	[Wd]
			4	1.30	LC6	[L]
			5	1.30	LC5	[S]
			6	1.30	LC11	[W+x]
CO12	ULS	Eksplotacija (kėlimas) (susitraukimas)	1	1.35	LC2	[G+Gr]
			2	1.30	LC3	[T]
			3	1.30	LC4	[Wu]
			4	1.30	LC12	[Wup]

2.5.2 LOAD COMBINATIONS - CALCULATION PARAMETERS

Load Combin.	Description	Calculation Parameters		
CO1	Bandymas 1-a sisterna (susitraukimas)	Method of analysis	: ⦿	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	: ⦿	Picard
		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
		Activate stiffness factors of:	: ☒	Materials (partial factor γM)
			: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO2	Bandymas 2-a sisterna (susitraukimas)	Method of analysis	: ⦿	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	: ⦿	Picard
		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
		Activate stiffness factors of:	: ☒	Materials (partial factor γM)
			: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO3	Bandymas 1+live (susitraukimas)	Method of analysis	: ⦿	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	: ⦿	Picard
		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
		Activate stiffness factors of:	: ☒	Materials (partial factor γM)
			: ☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			: ☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO4	Eksplotacija 1 (susitraukimas)	Method of analysis	: ⦿	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	: ⦿	Picard
		Options	: ☒	Consider favorable effects due to tension
			: ☒	Refer internal forces to deformed system for:
				☒ Normal forces N

2.5.2 LOAD COMBINATIONS - CALCULATION PARAMETERS

Load Combin.	Description	Calculation Parameters		
				☒ Shear forces V_y and V_z
				☒ Moments M_y, M_z and M_T
		Activate stiffness factors of:	☒	Materials (partial factor γM)
			☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO5	Eksplotacija 2 (susitraukimas)	Method of analysis	◉	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	◉	Picard
		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
		Activate stiffness factors of:	☒	Materials (partial factor γM)
			☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO6	Eksplotacija 1+2 (susitraukimas)	Method of analysis	◉	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	◉	Picard
		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
		Activate stiffness factors of:	☒	Materials (partial factor γM)
			☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO7	Eksplotacija S (susitraukimas)	Method of analysis	◉	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	◉	Picard
		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
		Activate stiffness factors of:	☒	Materials (partial factor γM)
			☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO8	Eksplotacija 1+S (susitraukimas)	Method of analysis	◉	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	◉	Picard
		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
		Activate stiffness factors of:	☒	Materials (partial factor γM)
			☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO9	Eksplotacija 2+S (susitraukimas)	Method of analysis	◉	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	◉	Picard
		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
		Activate stiffness factors of:	☒	Materials (partial factor γM)
			☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO10	Eksplotacija 1+S (susitraukimas)	Method of analysis	◉	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	◉	Picard
		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
		Activate stiffness factors of:	☒	Materials (partial factor γM)
			☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO11	Eksplotacija 2+S (susitraukimas)	Method of analysis	◉	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	◉	Picard
		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
		Activate stiffness factors of:	☒	Materials (partial factor γM)
			☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)
CO12	Eksplotacija (kėlimas) (susitraukimas)	Method of analysis	◉	Second order analysis (P-Delta)
		Method for solving system of nonlinear algebraic equations	◉	Picard
		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
		Activate stiffness factors of:	☒	Materials (partial factor γM)
			☒	Cross-sections (factor for J, I_y, I_z, A, A_y, A_z)
			☒	Members (factor for GJ, EI_y, EI_z, EA, GA_y, GA_z)

LC1
[G]

3.2 MEMBER LOADS

LC1: [G]

No.	Reference to	On Members No.	Load Type	Load Distribution	Load Direction	Reference Length	Load Parameters Symbol	Value	Unit
1	Members	110,111	Force	Uniform	ZL	True Length	p	0.750	kN/m

3.2/1 MEMBER LOADS - LOAD ECCENTRICITY

LC1: [G]

No.	Reference to	On Members No.	Absolute Offset Mbr. Start e_Y [mm]	Absolute Offset Mbr. Start e_Z [mm]	Absolute Offset Mbr. End e_Y [mm]	Absolute Offset Mbr. End e_Z [mm]	Relative Offset Mbr. Start y-Axis	Relative Offset Mbr. Start z-Axis	Relative Offset Mbr. End y-Axis	Relative Offset Mbr. End z-Axis
1	Members	110,111	0	0	0	0	Middle	Middle	Middle	Middle

3.3 LINE LOADS

LC1: [G]

No.	Reference to	On Lines No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	Lines	7,33,35,36,39,42,44,47,50,54,65,70,93	Force	Uniform	ZL	p	0.750	kN/m

3.4 SURFACE LOADS

LC1: [G]

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	1-18	Axial Strain	Uniform		ε_1	-0.00043	-

3.8 FREE RECTANGULAR LOADS

LC1: [G]

No.	On Surfaces No.	Project.	Load Distribution	Load Direction	Magnitude Symbol	Value	Unit	Load Position X [mm]	Y [mm]	Z [mm]
1	5,11,13-18	XY	Uniform	ZP	p	25.00	kN/m²	1450	0	
								0	-4550	
2	5,11,13-18	XY	Uniform	ZL	p	10.00	kN/m²	4300	-1250	
								1450	-3600	

3.15 GENERATED LOADS

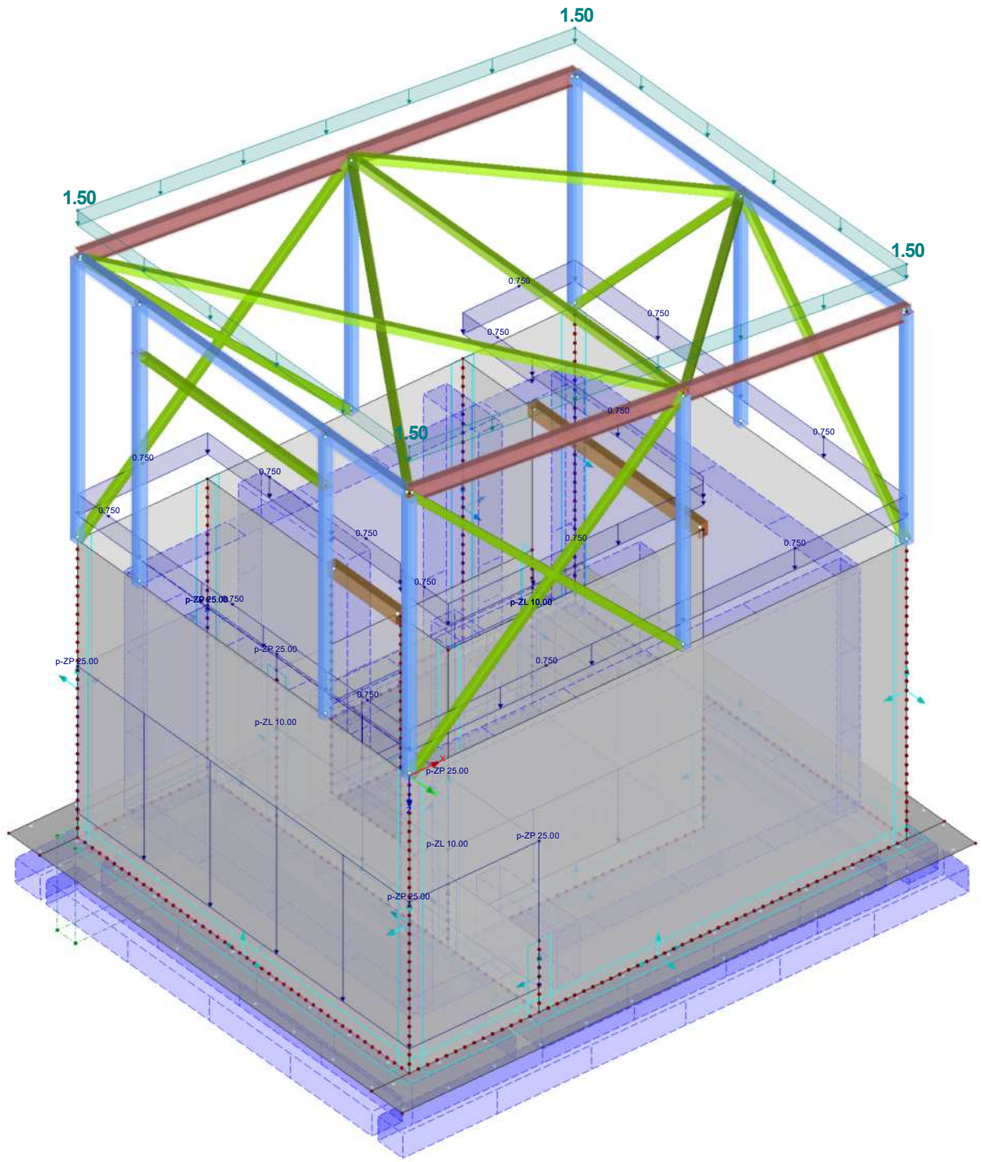
LC1: [G]

No.	Load Description				
1	From Area Loads via Plane				
	Area load direction	Global relative to the true area:	:	☒ZL	
	Area of load application	☒Fully closed plane			
	Load distribution type:	☒Constant			
	Area load magnitude	☒Constant	:	1.50	kN/m²
	Boundary of the area load plane	Corner nodes	:	17,21,23,19	
		Note	:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member	:	99,112,113,114,115	
	Generating total loads in direction	ΣP_{Areas} X	:	0.000	kN
		Y	:	0.000	kN
		Z	:	38.064	kN
		$\Sigma P_{Members}$ X	:	0.000	kN
		Y	:	0.000	kN
		Z	:	38.064	kN
	Total moment to the origin	ΣM_{Areas} X	:	-86.596	kNm
		Y	:	-105.628	kNm
		Z	:	0.000	kNm
		$\Sigma M_{Members}$ X	:	-86.596	kNm
		Y	:	-105.628	kNm
		Z	:	0.000	kNm
	Cells selected for generating	Σ number of cells	:	1	
		Σ cell area	:	25376196	mm²
	Convert loads to members No.		:	21,22,27,28	

LC1: [G]

LC1 : [G]
Loads [-], [kN/m], [kN/m^2]

Isometric



LC2
[G+Gr]

3.2 MEMBER LOADS

LC2: [G+Gr]

No.	Reference to	On Members No.	Load Type	Load Distribution	Load Direction	Reference Length	Load Parameters Symbol	Value	Unit
1	Members	110,111	Force	Uniform	ZL	True Length	p	0.750	kN/m

3.2/1 MEMBER LOADS - LOAD ECCENTRICITY

LC2: [G+Gr]

No.	Reference to	On Members No.	Absolute Offset Mbr. Start e_Y [mm]	Absolute Offset Mbr. Start e_Z [mm]	Absolute Offset Mbr. End e_Y [mm]	Absolute Offset Mbr. End e_Z [mm]	Relative Offset Mbr. Start y-Axis	Relative Offset Mbr. Start z-Axis	Relative Offset Mbr. End y-Axis	Relative Offset Mbr. End z-Axis
1	Members	110,111	0	0	0	0	Middle	Middle	Middle	Middle

3.3 LINE LOADS

LC2: [G+Gr]

No.	Reference to	On Lines No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	Lines	7,33,35,36,39,42,44,47,50,54,65,70,93	Force	Uniform	ZL	p	0.750	kN/m

3.4 SURFACE LOADS

LC2: [G+Gr]

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	5,11,13-18	Axial Strain	Uniform		ε_1	-0.00043	-
2	1-4,6-10,12	Axial Strain	Uniform		ε_1	-0.00043	-

3.8 FREE RECTANGULAR LOADS

LC2: [G+Gr]

No.	On Surfaces No.	Project.	Load Distribution	Load Direction	Magnitude Symbol	Value	Unit	Load Position X [mm]	Y [mm]	Z [mm]
1	1	YZ	Linear Z	z	p_1	26.00	kN/m²		0	3000
					p_2	3.50	kN/m²		-4550	0
2	3	YZ	Linear Z	z	p_1	26.00	kN/m²		0	3000
					p_2	3.50	kN/m²		-4550	0
3	2	XZ	Linear Z	z	p_1	26.00	kN/m²	5550		3160
					p_2	3.50	kN/m²	0		0
4	4	XZ	Linear Z	z	p_1	26.00	kN/m²	0		3160
					p_2	3.50	kN/m²	5550		0
5	5,11,13-18	XY	Uniform	ZP	p	26.00	kN/m²	5975	425	
								0	0	
6	5,11,13-18	XY	Uniform	ZP	p	26.00	kN/m²	-425	425	
								0	-4550	
7	5,11,13-18	XY	Uniform	ZP	p	26.00	kN/m²	-425	-4975	
								5550	-4550	
8	5,11,13-18	XY	Uniform	ZP	p	26.00	kN/m²	5975	-4975	
								5550	0	
9	5,11,13-18	XY	Uniform	ZL	p	10.00	kN/m²	4300	-1250	
								1450	-3600	
10	5,11,13-18	XY	Uniform	ZP	p	25.00	kN/m²	0	0	
								1450	-4550	

3.15 GENERATED LOADS

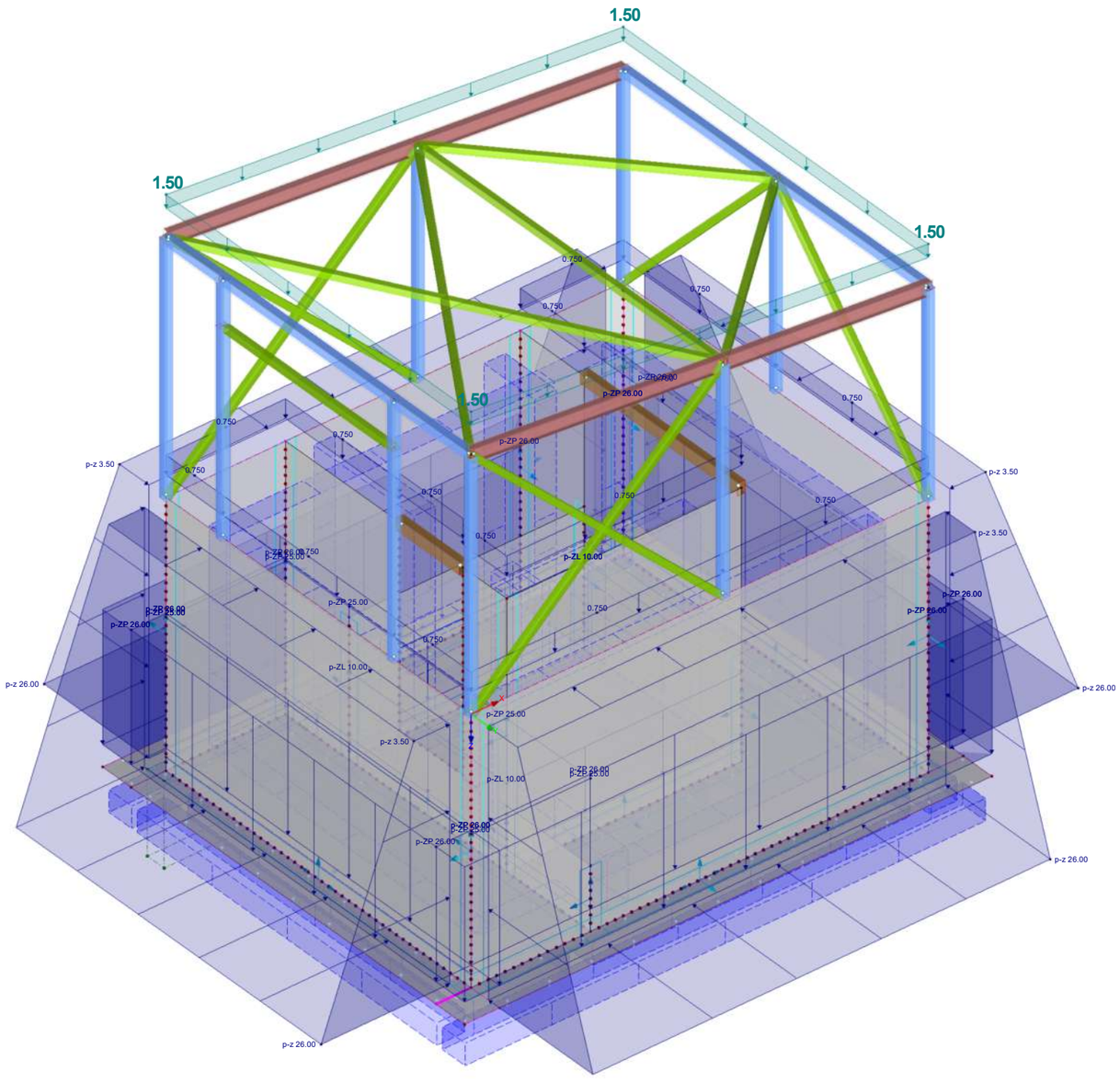
LC2: [G+Gr]

No.	Load Description				
1	From Area Loads via Plane				
	Area load direction	Global relative to the true area:		: ☒ZL	
	Area of load application	☒Fully closed plane			
	Load distribution type:	☒Constant			
	Area load magnitude	☒Constant		: 1.50	kN/m²
	Boundary of the area load plane	Corner nodes		: 17,21,23,19	
		Note		: Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member		: 2,112,113,114,115	
	Generating total loads in direction	ΣP_{Areas}	X	: 0.000	kN
			Y	: 0.000	kN
			Z	: 38.064	kN
		$\Sigma P_{Members}$	X	: 0.000	kN
			Y	: 0.000	kN
			Z	: 38.064	kN
	Total moment to the origin	ΣM_{Areas}	X	: -86.596	kNm
			Y	: -105.628	kNm
			Z	: 0.000	kNm
		$\Sigma M_{Members}$	X	: -86.596	kNm
			Y	: -105.628	kNm
			Z	: 0.000	kNm
	Cells selected for generating	Σ number of cells		: 1	
		Σ cell area		: 25376196	mm²
	Convert loads to members No.			: 21,22,27,28	

LC2: [G+GR]

LC2 : [G+Gr]
Loads [-], [kN/m], [kN/m^2]

Isometric



LC3
[T]

3.4 SURFACE LOADS

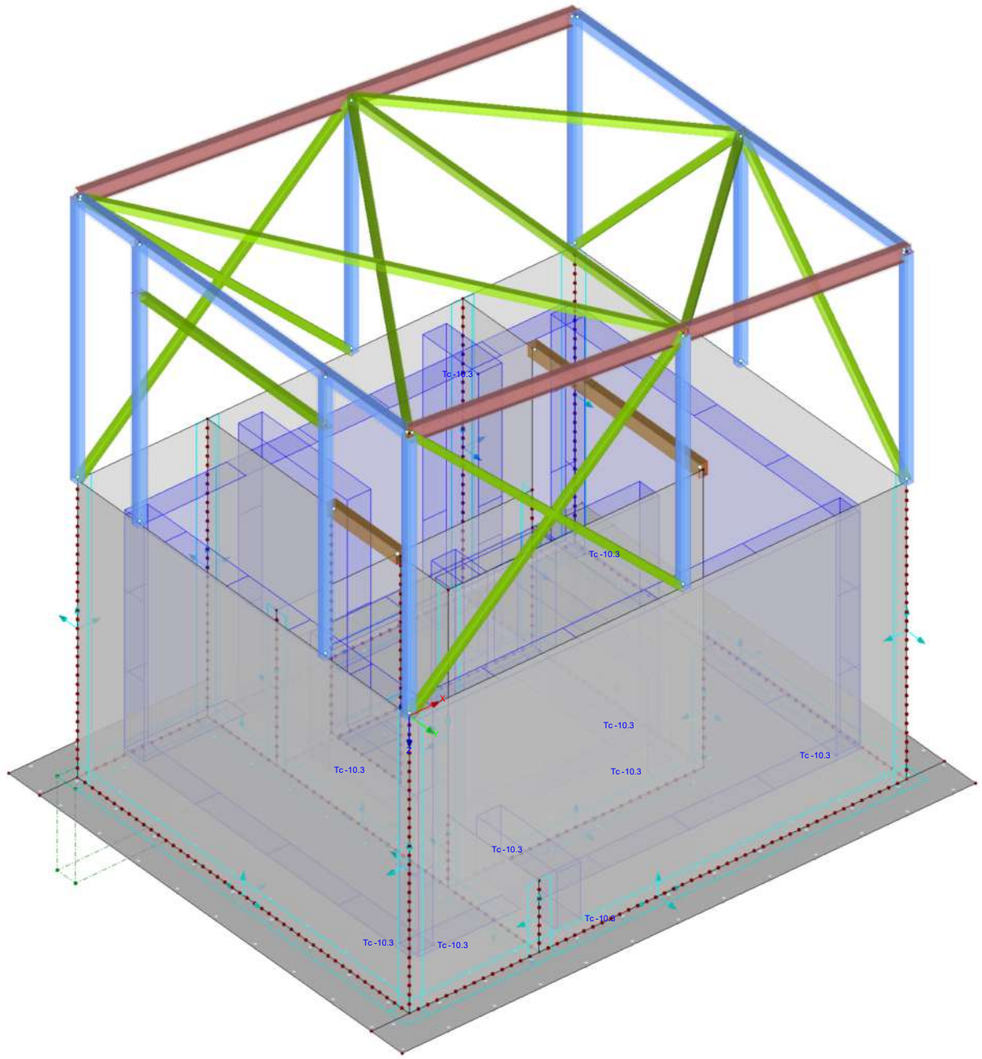
LC3: [T]

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	1-4,6-10,12	Temperature	Uniform		T_c	-10.3	°C
					ΔT	0.0	°C

LC3: [T]

LC3 : [T]
Loads [°C]

Isometric



LC4
[Wu]

3.4 SURFACE LOADS

LC4: [Wu]

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	5,11,13-18	Force	Uniform	ZL	p	-35.00	kN/m²

3.8 FREE RECTANGULAR LOADS

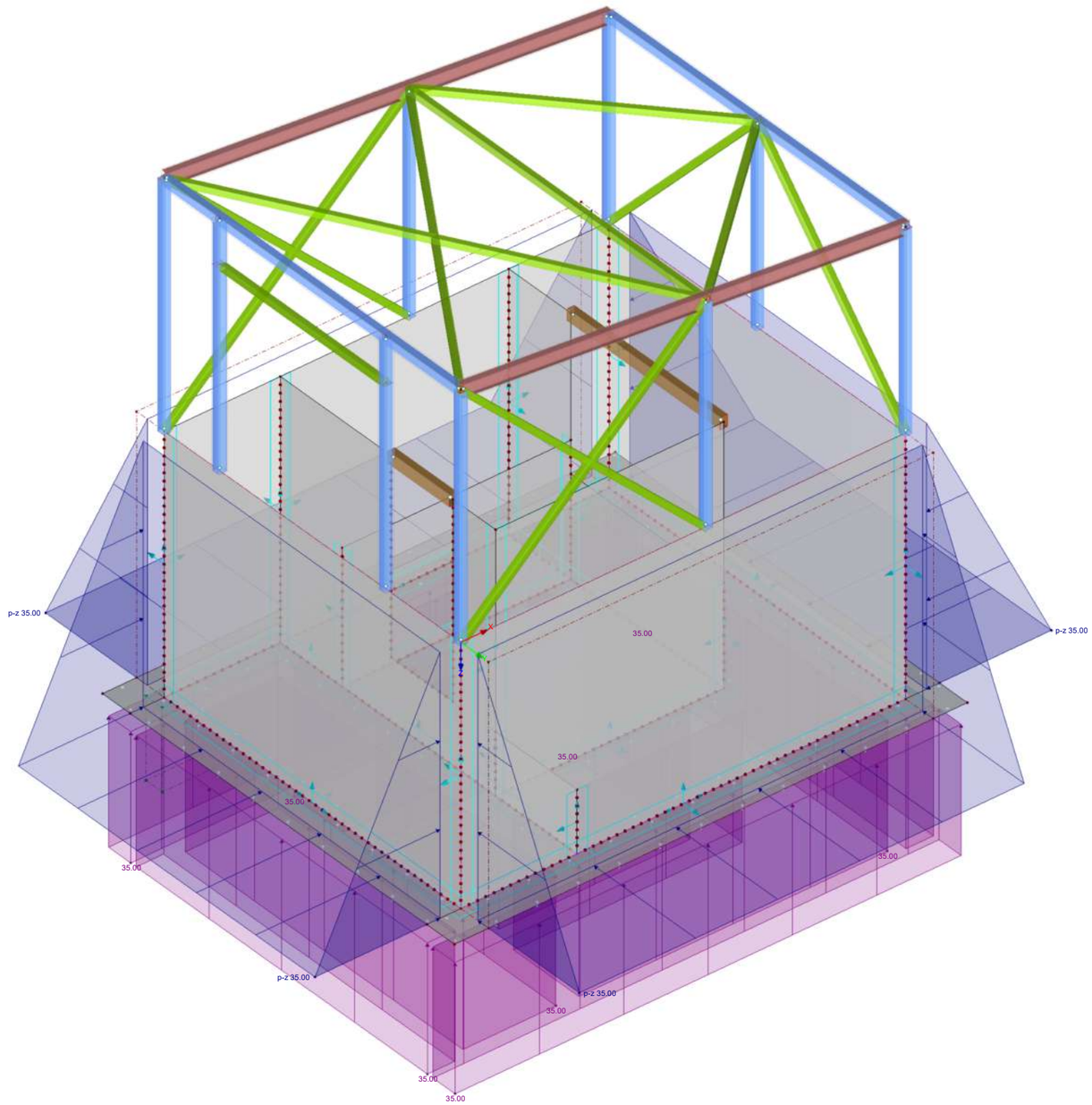
LC4: [Wu]

No.	On Surfaces No.	Project.	Load Distribution	Load Direction	Magnitude Symbol	Value	Unit	Load Position X [mm]	Y [mm]	Z [mm]
1	1	YZ	Linear Z	z	p_1	35.00	kN/m²		0	3160
					p_2	0.00	kN/m²		-4550	0
2	3	YZ	Linear Z	z	p_1	35.00	kN/m²		0	3160
					p_2	0.00	kN/m²		-4550	0
3	2	XZ	Linear Z	z	p_1	35.00	kN/m²	0		3160
					p_2	0.00	kN/m²	5550		0
4		XZ	Linear Z	z	p_1	35.00	kN/m²	0		3160
					p_2	0.00	kN/m²	5550		0

LC4: [WU]

LC4 : [Wu]
Loads [kN/m^2]

Isometric



LC5
[S]

3.15 GENERATED LOADS

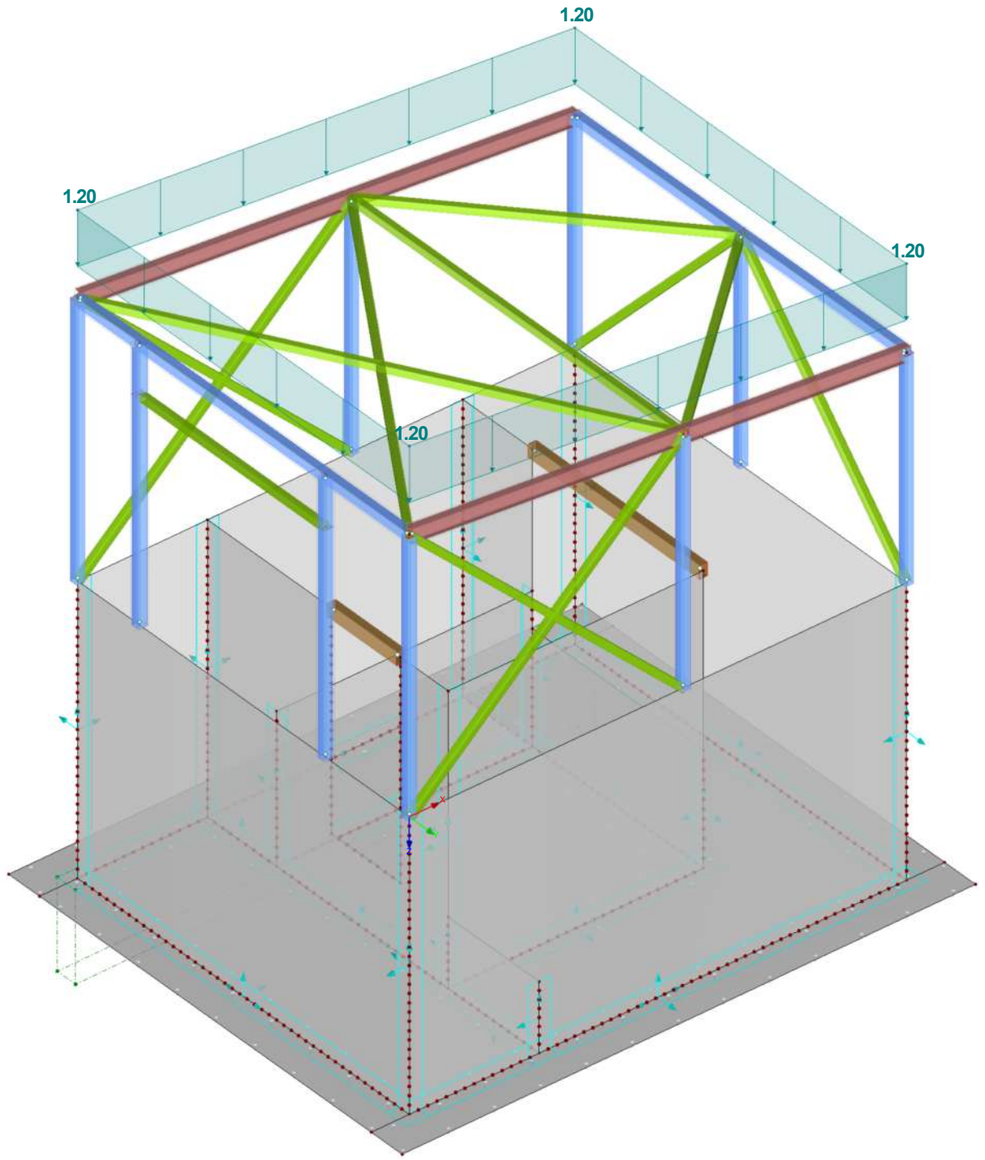
LC5: [S]

No.	Load Description					
1	From Area Loads via Plane					
	Area load direction	Global relative to the true area:		:	☒ZL	
	Area of load application	☒Fully closed plane				
	Load distribution type:	☒Constant				
	Area load magnitude	☒Constant		:	1.20	kN/m²
	Boundary of the area load plane	Corner nodes		:	17,21,23,19	
		Note		:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member		:	5,112,113,114,115	
	Generating total loads in direction	Σ P Areas	X	:	0.000	kN
			Y	:	0.000	kN
			Z	:	30.451	kN
		ΣP Members	X	:	0.000	kN
			Y	:	0.000	kN
			Z	:	30.451	kN
	Total moment to the origin	Σ M Areas	X	:	-69.277	kNm
			Y	:	-84.503	kNm
			Z	:	0.000	kNm
		ΣM Members	X	:	-69.277	kNm
			Y	:	-84.503	kNm
			Z	:	0.000	kNm
	Cells selected for generating	Σ number of cells		:	1	
		Σ cell area		:	25376196	mm²
	Convert loads to members No.			:	21,22,27,28	

LC5: [S]

LC5 : [S]
Loads [kN/m^2]

Isometric



LC6
[L]

3.2 MEMBER LOADS

LC6: [L]

No.	Reference to	On Members No.	Load Type	Load Distribution	Load Direction	Reference Length	Load Parameters Symbol	Value	Unit
1	Members	110,111	Force	Uniform	ZL	True Length	p	1.500	kN/m

3.2/1 MEMBER LOADS - LOAD ECCENTRICITY

LC6: [L]

No.	Reference to	On Members No.	Absolute Offset Mbr. Start e_Y [mm]	Absolute Offset Mbr. Start e_Z [mm]	Absolute Offset Mbr. End e_Y [mm]	Absolute Offset Mbr. End e_Z [mm]	Relative Offset Mbr. Start y-Axis	Relative Offset Mbr. Start z-Axis	Relative Offset Mbr. End y-Axis	Relative Offset Mbr. End z-Axis
1	Members	110,111	0	0	0	0	Middle	Middle	Middle	Middle

3.3 LINE LOADS

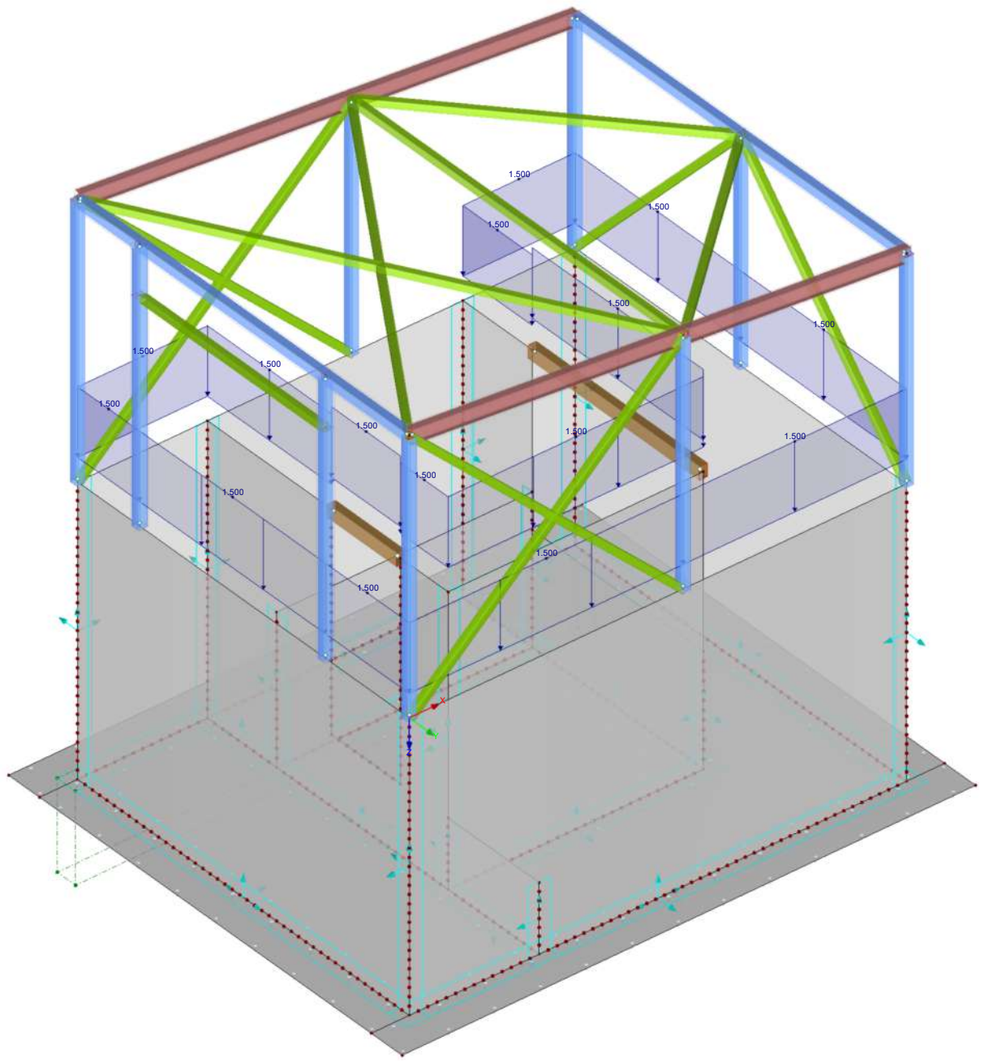
LC6: [L]

No.	Reference to	On Lines No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	Lines	7,33,35,36,39,42,44,47,50,54,65,70,93	Force	Uniform	ZL	p	1.500	kN/m

LC6: [L]

LC6 : [L]
Loads [kN/m]

Isometric



LC7
[Wd]

3.4 SURFACE LOADS

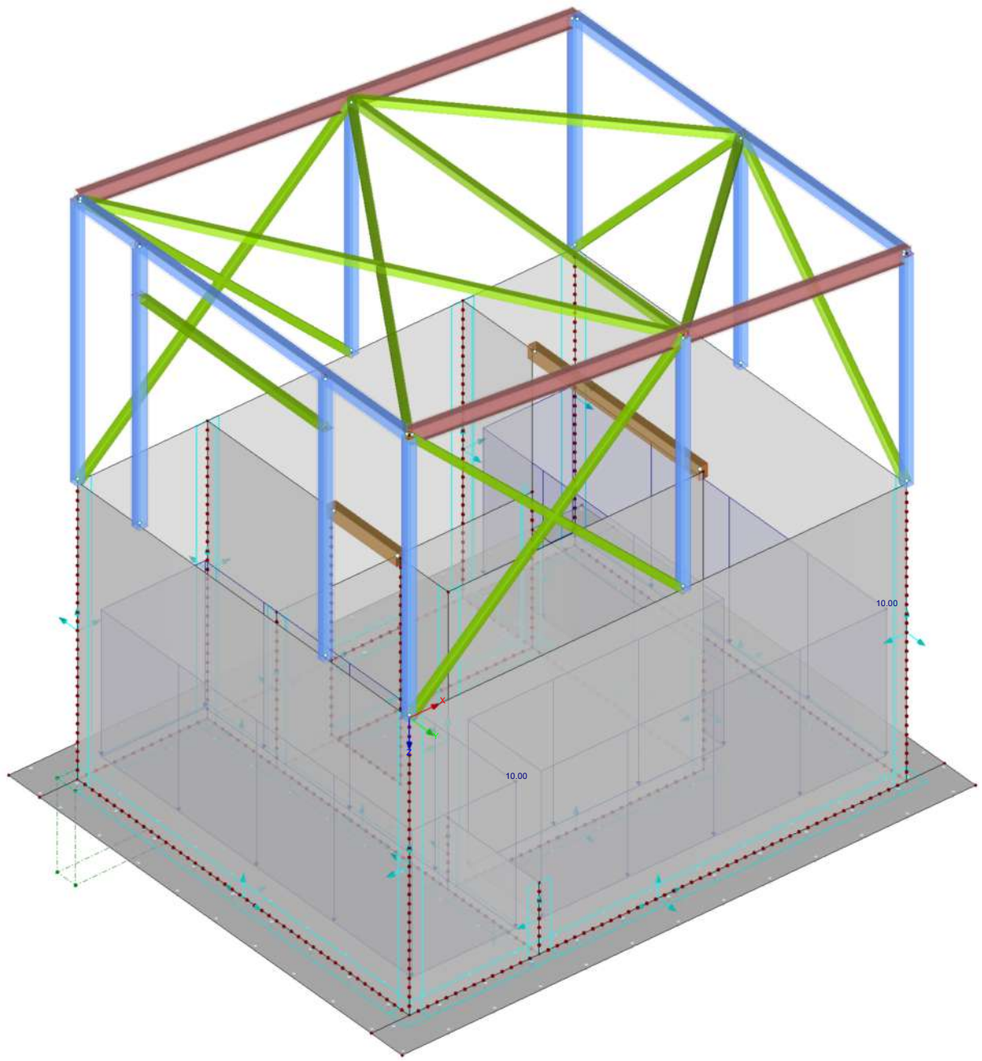
LC7: [Wd]

No.	On Surfaces No.	Load Type	Load Distribution	Load Direction	Load Parameters Symbol	Value	Unit
1	13,16	Force	Uniform	ZL	p	10.00	kN/m²

LC7: [WD]

LC7 : [Wd]
Loads [kN/m^2]

Isometric



LC8
[W-y]

3.15 GENERATED LOADS

LC8: [W-y]

No.	Load Description					
1	From Area Loads via Plane					
	Area load direction	Global relative to the projected area:		:	☒YP	
	Area of load application	☒Fully closed plane				
	Load distribution type:	☒Constant				
	Area load magnitude	☒Constant		:	-1.57	kN/m²
	Boundary of the area load plane	Corner nodes		:	22,21,17,18	
		Note		:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member		:	27,103,104	
	Generating total loads in direction	Σ P Areas	X	:	0.000	kN
			Y	:	-23.714	kN
			Z	:	0.000	kN
		ΣP Members	X	:	0.000	kN
			Y	:	-23.714	kN
			Z	:	0.000	kN
	Total moment to the origin	Σ M Areas	X	:	-32.420	kNm
			Y	:	0.000	kNm
			Z	:	-63.593	kNm
		ΣM Members	X	:	-32.420	kNm
			Y	:	0.000	kNm
			Z	:	-63.593	kNm
	Cells selected for generating	Σ number of cells		:	2	
		Σ cell area		:	15123751	mm²
	Convert loads to members No.			:	9,11,16	
2	From Area Loads via Plane					
	Area load direction	Global relative to the projected area:		:	☒YP	
	Area of load application	☒Fully closed plane				
	Load distribution type:	☒Constant				
	Area load magnitude	☒Constant		:	-0.69	kN/m²
	Boundary of the area load plane	Corner nodes		:	24,23,19,20	
		Note		:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member		:	22,105,106	
	Generating total loads in direction	Σ P Areas	X	:	0.000	kN
			Y	:	-10.405	kN
			Z	:	0.000	kN
		ΣP Members	X	:	0.000	kN
			Y	:	-10.405	kN
			Z	:	0.000	kN
	Total moment to the origin	Σ M Areas	X	:	-14.225	kNm
			Y	:	0.000	kNm
			Z	:	-27.903	kNm
		ΣM Members	X	:	-14.225	kNm
			Y	:	0.000	kNm
			Z	:	-27.903	kNm
	Cells selected for generating	Σ number of cells		:	2	
		Σ cell area		:	15123751	mm²
	Convert loads to members No.			:	10,12,17	
3	From Area Loads via Plane					
	Area load direction	Global relative to the projected area:		:	☒XP	
	Area of load application	☒Fully closed plane				
	Load distribution type:	☒Constant				
	Area load magnitude	☒Constant		:	1.28	kN/m²
	Boundary of the area load plane	Corner nodes		:	24,23,21,22	
		Note		:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member		:	5,107,108	
	Generating total loads in direction	Σ P Areas	X	:	14.269	kN
			Y	:	0.000	kN
			Z	:	0.000	kN
		ΣP Members	X	:	14.269	kN
			Y	:	0.000	kN
			Z	:	0.000	kN
	Total moment to the origin	Σ M Areas	X	:	0.000	kNm
			Y	:	-17.479	kNm
			Z	:	32.462	kNm
		ΣM Members	X	:	0.000	kNm
			Y	:	-17.479	kNm
			Z	:	32.462	kNm
	Cells selected for generating	Σ number of cells		:	2	
		Σ cell area		:	11147501	mm²
	Convert loads to members No.			:	11,12,15	
4	From Area Loads via Plane					
	Area load direction	Global relative to the projected area:		:	☒XP	
	Area of load application	☒Fully closed plane				
	Load distribution type:	☒Constant				

3.15 GENERATED LOADS

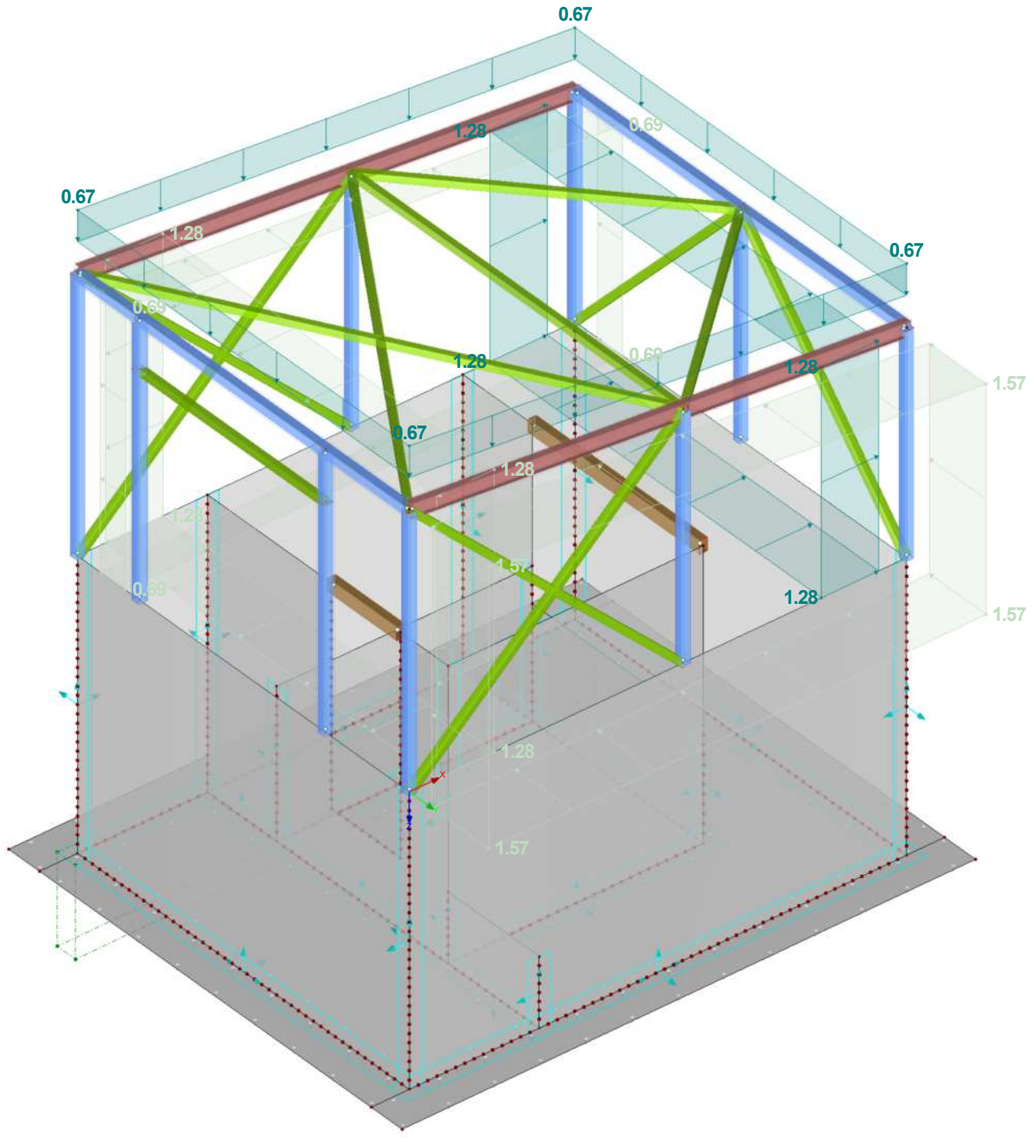
LC8: [W-y]

No.	Load Description				
	Area load magnitude	☒Constant	:	-1.28	kN/m²
	Boundary of the area load plane	Corner nodes	:	18,17,19,20	
		Note	:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member	:	2	
	Generating total loads in direction	Σ P Areas X	:	-17.472	kN
		Y	:	0.000	kN
		Z	:	0.000	kN
		ΣP Members X	:	-17.472	kN
		Y	:	0.000	kN
		Z	:	0.000	kN
	Total moment to the origin	Σ M Areas X	:	0.000	kNm
		Y	:	26.208	kNm
		Z	:	-39.749	kNm
		ΣM Members X	:	0.000	kNm
		Y	:	26.208	kNm
		Z	:	-39.749	kNm
	Cells selected for generating	Σ number of cells	:	3	
		Σ cell area	:	13650001	mm²
	Convert loads to members No.		:	3,4,9,10,13,14	
5	From Area Loads via Plane				
	Area load direction	Global relative to the true area:	:	☒ZL	
	Area of load application	☒Fully closed plane			
	Load distribution type:	☒Constant			
	Area load magnitude	☒Constant	:	0.67	kN/m²
	Boundary of the area load plane	Corner nodes	:	17,21,23,19	
		Note	:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member	:	5,112,113,114,115	
	Generating total loads in direction	Σ P Areas X	:	0.000	kN
		Y	:	0.000	kN
		Z	:	17.053	kN
		ΣP Members X	:	0.000	kN
		Y	:	0.000	kN
		Z	:	17.053	kN
	Total moment to the origin	Σ M Areas X	:	-38.795	kNm
		Y	:	-47.322	kNm
		Z	:	0.000	kNm
		ΣM Members X	:	-38.795	kNm
		Y	:	-47.322	kNm
		Z	:	0.000	kNm
	Cells selected for generating	Σ number of cells	:	1	
		Σ cell area	:	25376196	mm²
	Convert loads to members No.		:	21,22,27,28	

LC8: [W-Y]

LC8 : [W-y]
Loads [kN/m^2]

Isometric



LC9
[W-x]

3.15 GENERATED LOADS

LC9: [W-x]

No.	Load Description					
1	From Area Loads via Plane					
	Area load direction	Global relative to the projected area:		:	☒XP	
	Area of load application	☒Fully closed plane				
	Load distribution type:	☒Constant				
	Area load magnitude	☒Constant		:	-1.57	kN/m²
	Boundary of the area load plane	Corner nodes		:	22,21,23,24	
		Note		:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member		:	5,107,108	
	Generating total loads in direction	Σ P Areas	X	:	-17.479	kN
			Y	:	0.000	kN
			Z	:	0.000	kN
		ΣP Members	X	:	-17.479	kN
			Y	:	0.000	kN
			Z	:	0.000	kN
	Total moment to the origin	Σ M Areas	X	:	0.000	kNm
			Y	:	21.412	kNm
			Z	:	-39.765	kNm
		ΣM Members	X	:	0.000	kNm
			Y	:	21.412	kNm
			Z	:	-39.765	kNm
	Cells selected for generating	Σ number of cells		:	2	
		Σ cell area		:	11147501	mm²
	Convert loads to members No.			:	11,12,15	
2	From Area Loads via Plane					
	Area load direction	Global relative to the projected area:		:	☒XP	
	Area of load application	☒Fully closed plane				
	Load distribution type:	☒Constant				
	Area load magnitude	☒Constant		:	-0.69	kN/m²
	Boundary of the area load plane	Corner nodes		:	18,17,19,20	
		Note		:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member		:	2	
	Generating total loads in direction	Σ P Areas	X	:	-9.391	kN
			Y	:	0.000	kN
			Z	:	0.000	kN
		ΣP Members	X	:	-9.391	kN
			Y	:	0.000	kN
			Z	:	0.000	kN
	Total moment to the origin	Σ M Areas	X	:	0.000	kNm
			Y	:	14.087	kNm
			Z	:	-21.365	kNm
		ΣM Members	X	:	0.000	kNm
			Y	:	14.087	kNm
			Z	:	-21.365	kNm
	Cells selected for generating	Σ number of cells		:	3	
		Σ cell area		:	13650001	mm²
	Convert loads to members No.			:	3,4,9,10,13,14	
3	From Area Loads via Plane					
	Area load direction	Global relative to the projected area:		:	☒YP	
	Area of load application	☒Fully closed plane				
	Load distribution type:	☒Constant				
	Area load magnitude	☒Constant		:	-1.28	kN/m²
	Boundary of the area load plane	Corner nodes		:	20,19,23,24	
		Note		:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member		:	22,105,106	
	Generating total loads in direction	Σ P Areas	X	:	0.000	kN
			Y	:	-19.358	kN
			Z	:	0.000	kN
		ΣP Members	X	:	0.000	kN
			Y	:	-19.358	kN
			Z	:	0.000	kN
	Total moment to the origin	Σ M Areas	X	:	-26.465	kNm
			Y	:	0.000	kNm
			Z	:	-51.912	kNm
		ΣM Members	X	:	-26.465	kNm
			Y	:	0.000	kNm
			Z	:	-51.912	kNm
	Cells selected for generating	Σ number of cells		:	2	
		Σ cell area		:	15123751	mm²
	Convert loads to members No.			:	10,12,17	
4	From Area Loads via Plane					
	Area load direction	Global relative to the projected area:		:	☒YP	
	Area of load application	☒Fully closed plane				
	Load distribution type:	☒Constant				

3.15 GENERATED LOADS

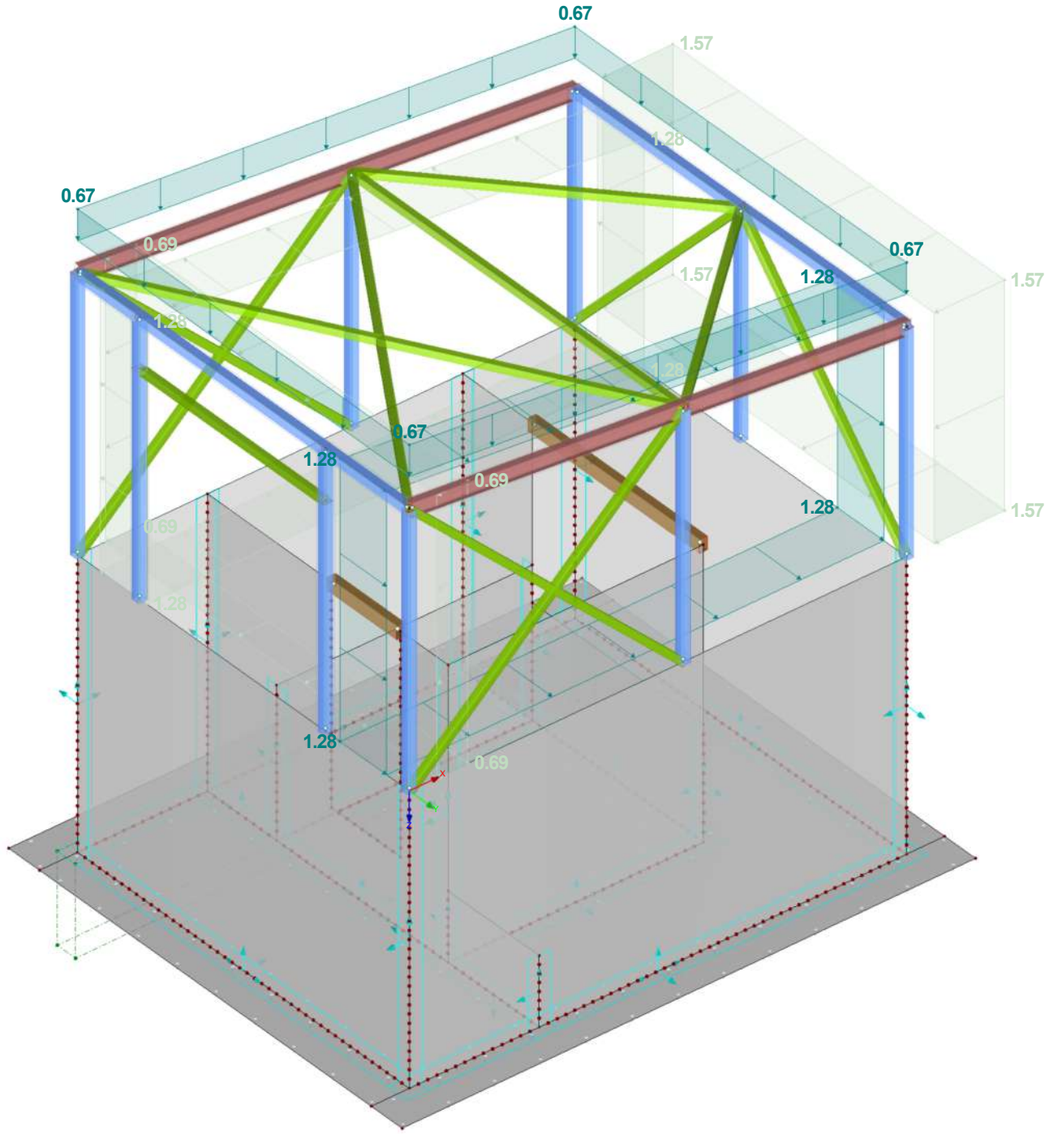
LC9: [W-x]

No.	Load Description					
	Area load magnitude	☒Constant		:	1.28	kN/m²
	Boundary of the area load plane	Corner nodes		:	18,17,21,22	
		Note		:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member		:	21,103,104	
	Generating total loads in direction	Σ P Areas	X	:	0.000	kN
			Y	:	19.358	kN
			Z	:	0.000	kN
		ΣP Members	X	:	0.000	kN
			Y	:	19.358	kN
			Z	:	0.000	kN
	Total moment to the origin	Σ M Areas	X	:	26.465	kNm
			Y	:	0.000	kNm
			Z	:	51.912	kNm
		ΣM Members	X	:	26.465	kNm
			Y	:	0.000	kNm
			Z	:	51.912	kNm
	Cells selected for generating	Σ number of cells		:	2	
		Σ cell area		:	15123751	mm²
	Convert loads to members No.			:	9,11,16	
5	From Area Loads via Plane					
	Area load direction	Global relative to the true area:		:	☒ZL	
	Area of load application	☒Fully closed plane				
	Load distribution type:	☒Constant				
	Area load magnitude	☒Constant		:	0.67	kN/m²
	Boundary of the area load plane	Corner nodes		:	17,21,23,19	
		Note		:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member		:	5,112,113,114,115	
	Generating total loads in direction	Σ P Areas	X	:	0.000	kN
			Y	:	0.000	kN
			Z	:	17.053	kN
		ΣP Members	X	:	0.000	kN
			Y	:	0.000	kN
			Z	:	17.053	kN
	Total moment to the origin	Σ M Areas	X	:	-38.795	kNm
			Y	:	-47.322	kNm
			Z	:	0.000	kNm
		ΣM Members	X	:	-38.795	kNm
			Y	:	-47.322	kNm
			Z	:	0.000	kNm
	Cells selected for generating	Σ number of cells		:	1	
		Σ cell area		:	25376196	mm²
	Convert loads to members No.			:	21,22,27,28	

LC9: [W-X]

LC9 : [W-x]
Loads [kN/m^2]

Isometric



LC10
[W+y]

3.15 GENERATED LOADS

LC10: [W+y]

No.	Load Description					
1	From Area Loads via Plane					
	Area load direction	Global relative to the projected area:		:	☒YP	
	Area of load application	☒Fully closed plane				
	Load distribution type:	☒Constant				
	Area load magnitude	☒Constant		:	1.57	kN/m²
	Boundary of the area load plane	Corner nodes		:	24,23,19,20	
		Note		:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member		:	28,105,106	
	Generating total loads in direction	Σ P Areas	X	:	0.000	kN
			Y	:	23.714	kN
			Z	:	0.000	kN
		ΣP Members	X	:	0.000	kN
			Y	:	23.714	kN
			Z	:	0.000	kN
	Total moment to the origin	Σ M Areas	X	:	32.420	kNm
			Y	:	0.000	kNm
			Z	:	63.593	kNm
		ΣM Members	X	:	32.420	kNm
			Y	:	0.000	kNm
			Z	:	63.593	kNm
	Cells selected for generating	Σ number of cells		:	2	
		Σ cell area		:	15123751	mm²
	Convert loads to members No.			:	10,12,17	
2	From Area Loads via Plane					
	Area load direction	Global relative to the projected area:		:	☒YP	
	Area of load application	☒Fully closed plane				
	Load distribution type:	☒Constant				
	Area load magnitude	☒Constant		:	0.69	kN/m²
	Boundary of the area load plane	Corner nodes		:	22,21,17,18	
		Note		:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member		:	27,103,104	
	Generating total loads in direction	Σ P Areas	X	:	0.000	kN
			Y	:	10.405	kN
			Z	:	0.000	kN
		ΣP Members	X	:	0.000	kN
			Y	:	10.405	kN
			Z	:	0.000	kN
	Total moment to the origin	Σ M Areas	X	:	14.225	kNm
			Y	:	0.000	kNm
			Z	:	27.903	kNm
		ΣM Members	X	:	14.225	kNm
			Y	:	0.000	kNm
			Z	:	27.903	kNm
	Cells selected for generating	Σ number of cells		:	2	
		Σ cell area		:	15123751	mm²
	Convert loads to members No.			:	9,11,16	
3	From Area Loads via Plane					
	Area load direction	Global relative to the projected area:		:	☒XP	
	Area of load application	☒Fully closed plane				
	Load distribution type:	☒Constant				
	Area load magnitude	☒Constant		:	-1.28	kN/m²
	Boundary of the area load plane	Corner nodes		:	18,17,19,20	
		Note		:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member		:	2	
	Generating total loads in direction	Σ P Areas	X	:	-17.472	kN
			Y	:	0.000	kN
			Z	:	0.000	kN
		ΣP Members	X	:	-17.472	kN
			Y	:	0.000	kN
			Z	:	0.000	kN
	Total moment to the origin	Σ M Areas	X	:	0.000	kNm
			Y	:	26.208	kNm
			Z	:	-39.749	kNm
		ΣM Members	X	:	0.000	kNm
			Y	:	26.208	kNm
			Z	:	-39.749	kNm
	Cells selected for generating	Σ number of cells		:	3	
		Σ cell area		:	13650001	mm²
	Convert loads to members No.			:	3,4,9,10,13,14	
4	From Area Loads via Plane					
	Area load direction	Global relative to the projected area:		:	☒XP	
	Area of load application	☒Fully closed plane				
	Load distribution type:	☒Constant				

3.15 GENERATED LOADS

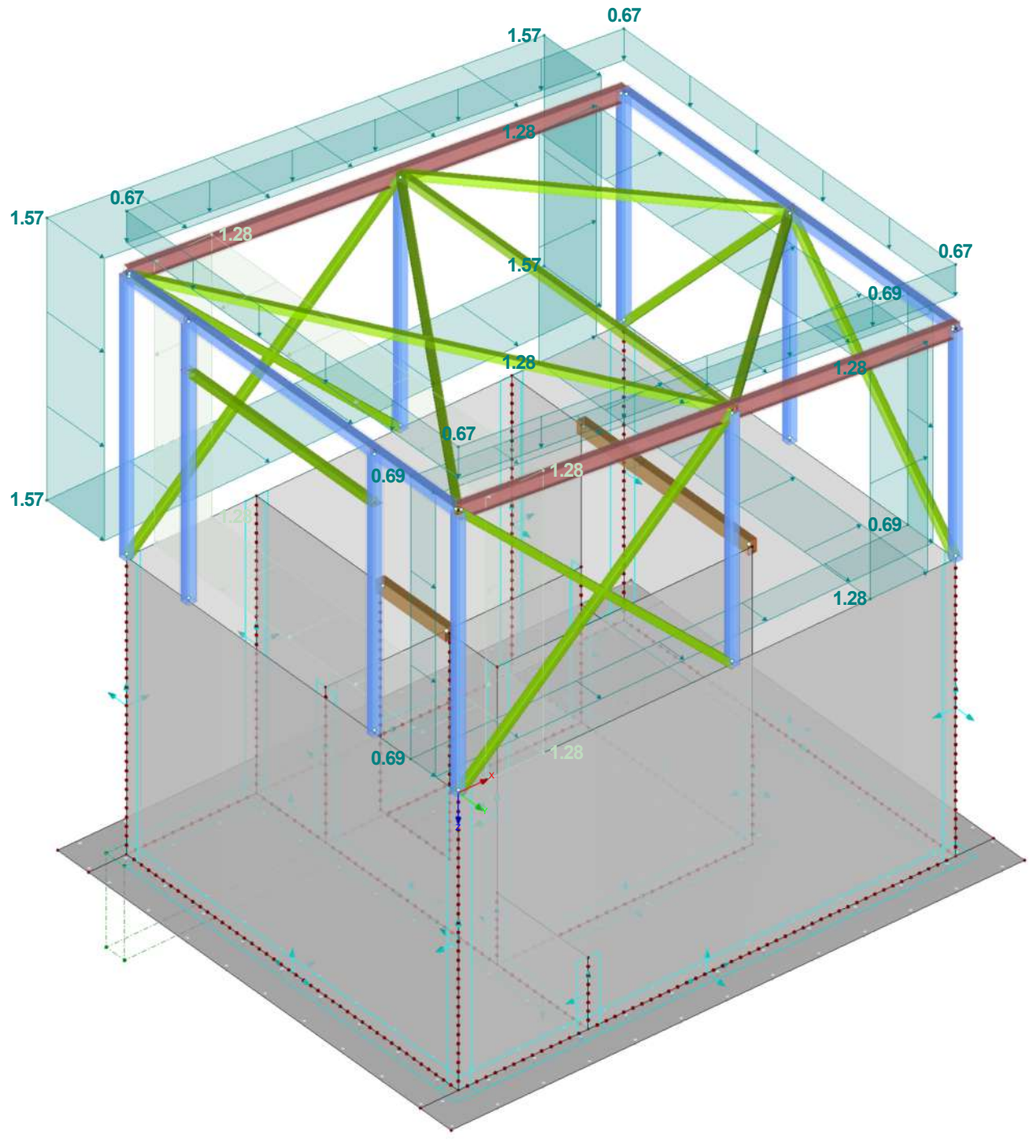
LC10: [W+y]

No.	Load Description					
	Area load magnitude	☒Constant		:	1.28	kN/m²
	Boundary of the area load plane	Corner nodes		:	24,23,21,22	
		Note		:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member		:	5,107,108	
	Generating total loads in direction	Σ P Areas	X	:	14.269	kN
			Y	:	0.000	kN
			Z	:	0.000	kN
		ΣP Members	X	:	14.269	kN
			Y	:	0.000	kN
			Z	:	0.000	kN
	Total moment to the origin	Σ M Areas	X	:	0.000	kNm
			Y	:	-17.479	kNm
			Z	:	32.462	kNm
		ΣM Members	X	:	0.000	kNm
			Y	:	-17.479	kNm
			Z	:	32.462	kNm
	Cells selected for generating	Σ number of cells		:	2	
		Σ cell area		:	11147501	mm²
	Convert loads to members No.			:	11,12,15	
5	From Area Loads via Plane					
	Area load direction	Global relative to the true area:		:	☒ZL	
	Area of load application	☒Fully closed plane				
	Load distribution type:	☒Constant				
	Area load magnitude	☒Constant		:	0.67	kN/m²
	Boundary of the area load plane	Corner nodes		:	17,21,23,19	
		Note		:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member		:	5,112,113,114,115	
	Generating total loads in direction	Σ P Areas	X	:	0.000	kN
			Y	:	0.000	kN
			Z	:	17.053	kN
		ΣP Members	X	:	0.000	kN
			Y	:	0.000	kN
			Z	:	17.053	kN
	Total moment to the origin	Σ M Areas	X	:	-38.795	kNm
			Y	:	-47.322	kNm
			Z	:	0.000	kNm
		ΣM Members	X	:	-38.795	kNm
			Y	:	-47.322	kNm
			Z	:	0.000	kNm
	Cells selected for generating	Σ number of cells		:	1	
		Σ cell area		:	25376196	mm²
	Convert loads to members No.			:	21,22,27,28	

LC10: [W+Y]

LC10 : [W+y]
Loads [kN/m^2]

Isometric



LC11
[W+x]

3.15 GENERATED LOADS

LC11: [W+x]

No.	Load Description				
1	From Area Loads via Plane				
	Area load direction	Global relative to the true area:	:	☒ZL	
	Area of load application	☒Fully closed plane			
	Load distribution type:	☒Constant			
	Area load magnitude	☒Constant	:	0.67	kN/m²
	Boundary of the area load plane	Corner nodes	:	17,21,23,19	
		Note	:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member	:	5,112,113,114,115	
	Generating total loads in direction	Σ P Areas X	:	0.000	kN
		Y	:	0.000	kN
		Z	:	17.053	kN
		ΣP Members X	:	0.000	kN
		Y	:	0.000	kN
		Z	:	17.053	kN
	Total moment to the origin	Σ M Areas X	:	-38.795	kNm
		Y	:	-47.322	kNm
		Z	:	0.000	kNm
		ΣM Members X	:	-38.795	kNm
		Y	:	-47.322	kNm
		Z	:	0.000	kNm
	Cells selected for generating	Σ number of cells	:	1	
		Σ cell area	:	25376196	mm²
	Convert loads to members No.		:	21,22,27,28	
2	From Area Loads via Plane				
	Area load direction	Global relative to the projected area:	:	☒XP	
	Area of load application	☒Fully closed plane			
	Load distribution type:	☒Constant			
	Area load magnitude	☒Constant	:	1.57	kN/m²
	Boundary of the area load plane	Corner nodes	:	18,17,19,20	
		Note	:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member	:	2	
	Generating total loads in direction	Σ P Areas X	:	21.403	kN
		Y	:	0.000	kN
		Z	:	0.000	kN
		ΣP Members X	:	21.403	kN
		Y	:	0.000	kN
		Z	:	0.000	kN
	Total moment to the origin	Σ M Areas X	:	0.000	kNm
		Y	:	-32.105	kNm
		Z	:	48.692	kNm
		ΣM Members X	:	0.000	kNm
		Y	:	-32.105	kNm
		Z	:	48.692	kNm
	Cells selected for generating	Σ number of cells	:	3	
		Σ cell area	:	13650001	mm²
	Convert loads to members No.		:	3,4,9,10,13,14	
3	From Area Loads via Plane				
	Area load direction	Global relative to the projected area:	:	☒XP	
	Area of load application	☒Fully closed plane			
	Load distribution type:	☒Constant			
	Area load magnitude	☒Constant	:	0.69	kN/m²
	Boundary of the area load plane	Corner nodes	:	24,22,21,23	
		Note	:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member	:	5,107,108	
	Generating total loads in direction	Σ P Areas X	:	7.669	kN
		Y	:	0.000	kN
		Z	:	0.000	kN
		ΣP Members X	:	7.669	kN
		Y	:	0.000	kN
		Z	:	0.000	kN
	Total moment to the origin	Σ M Areas X	:	0.000	kNm
		Y	:	-9.395	kNm
		Z	:	17.448	kNm
		ΣM Members X	:	0.000	kNm
		Y	:	-9.395	kNm
		Z	:	17.448	kNm
	Cells selected for generating	Σ number of cells	:	2	
		Σ cell area	:	11147501	mm²
	Convert loads to members No.		:	11,12,15	
4	From Area Loads via Plane				
	Area load direction	Global relative to the projected area:	:	☒YP	
	Area of load application	☒Fully closed plane			
	Load distribution type:	☒Constant			

3.15 GENERATED LOADS

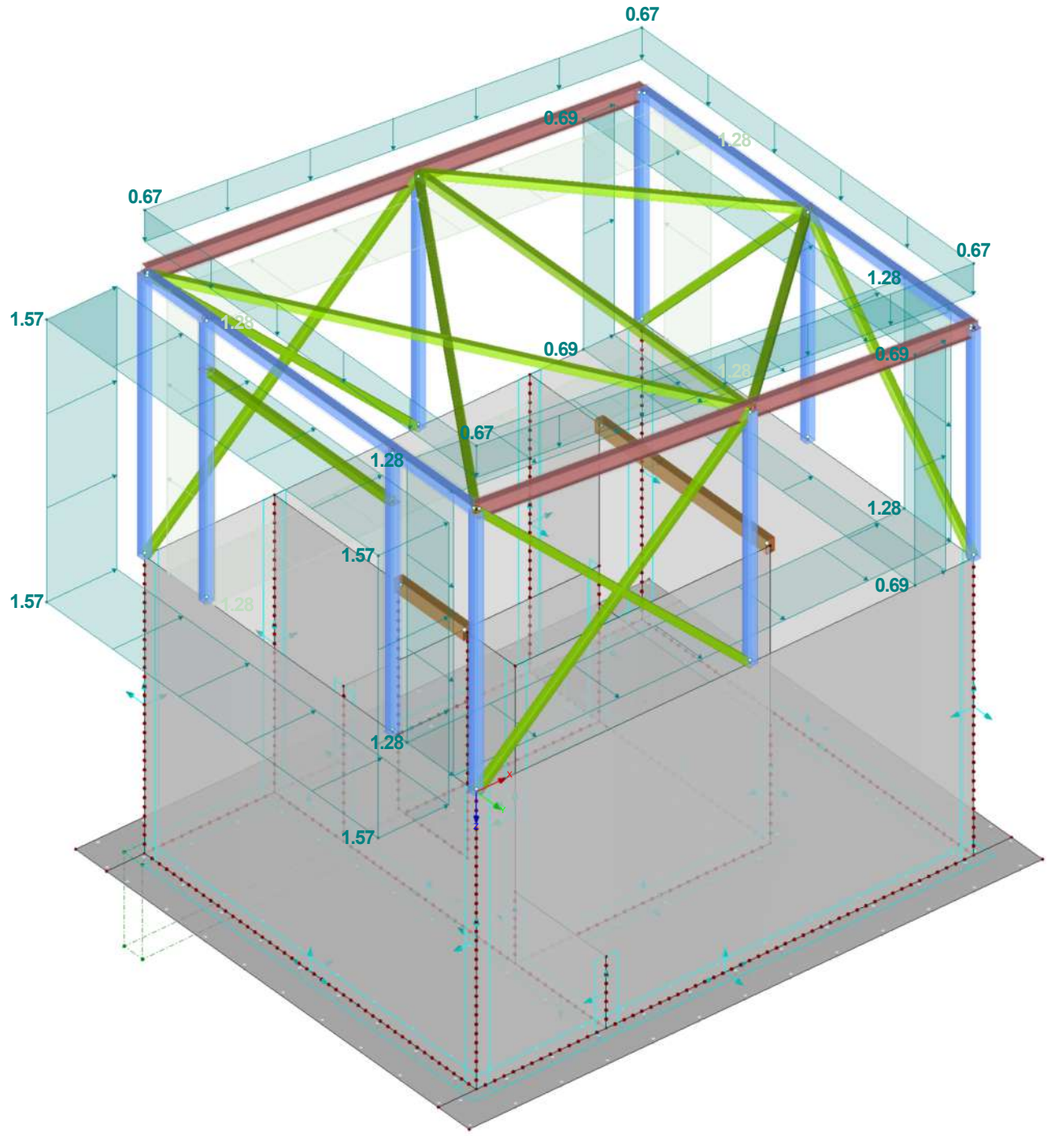
LC11: [W+x]

No.	Load Description					
	Area load magnitude	☒Constant		:	-1.28	kN/m²
	Boundary of the area load plane	Corner nodes		:	20,24,23,19	
		Note		:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member		:	22,105,106	
	Generating total loads in direction	Σ P Areas	X	:	0.000	kN
			Y	:	-19.358	kN
			Z	:	0.000	kN
		ΣP Members	X	:	0.000	kN
			Y	:	-19.358	kN
			Z	:	0.000	kN
	Total moment to the origin	Σ M Areas	X	:	-26.465	kNm
			Y	:	0.000	kNm
			Z	:	-51.912	kNm
		ΣM Members	X	:	-26.465	kNm
			Y	:	0.000	kNm
			Z	:	-51.912	kNm
	Cells selected for generating	Σ number of cells		:	2	
		Σ cell area		:	15123751	mm²
	Convert loads to members No.			:	10,12,17	
5	From Area Loads via Plane					
	Area load direction	Global relative to the projected area:		:	☒YP	
	Area of load application	☒Fully closed plane				
	Load distribution type:	☒Constant				
	Area load magnitude	☒Constant		:	1.28	kN/m²
	Boundary of the area load plane	Corner nodes		:	18,22,21,17	
		Note		:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member		:	21,103,104	
	Generating total loads in direction	Σ P Areas	X	:	0.000	kN
			Y	:	19.358	kN
			Z	:	0.000	kN
		ΣP Members	X	:	0.000	kN
			Y	:	19.358	kN
			Z	:	0.000	kN
	Total moment to the origin	Σ M Areas	X	:	26.465	kNm
			Y	:	0.000	kNm
			Z	:	51.912	kNm
		ΣM Members	X	:	26.465	kNm
			Y	:	0.000	kNm
			Z	:	51.912	kNm
	Cells selected for generating	Σ number of cells		:	2	
		Σ cell area		:	15123751	mm²
	Convert loads to members No.			:	9,11,16	

LC11: [W+X]

LC11 : [W+x]
Loads [kN/m^2]

Isometric



LC12
[Wup]

3.15 GENERATED LOADS

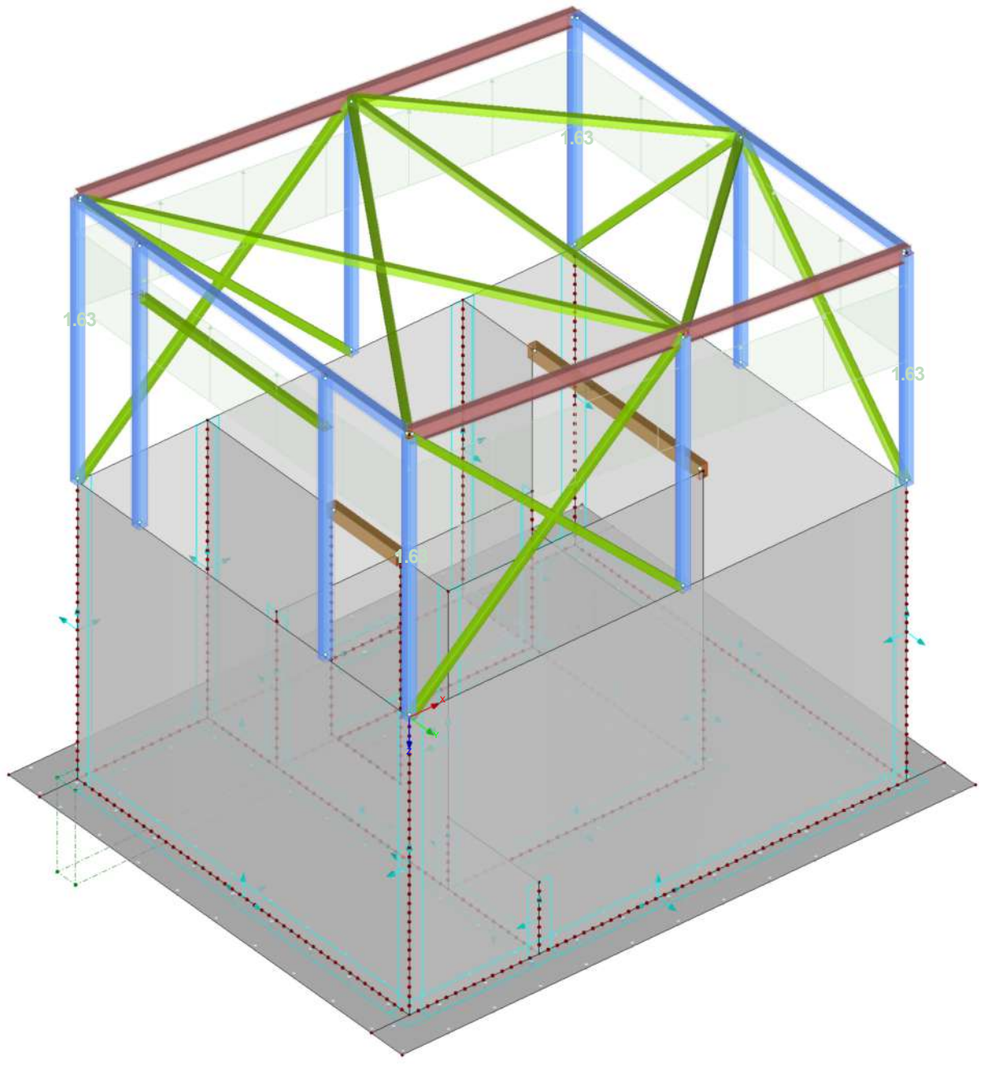
LC12: [Wup]

No.	Load Description					
1	From Area Loads via Plane					
	Area load direction	Global relative to the true area:		:	☒ZL	
	Area of load application	☒Fully closed plane				
	Load distribution type:	☒Constant				
	Area load magnitude	☒Constant		:	-1.63	kN/m²
	Boundary of the area load plane	Corner nodes		:	17,21,23,19	
		Note		:	Each row in the drop down list box denotes one plane	
	Remove influence from	Members parallel to member		:	5,112,113,114,115	
	Generating total loads in direction	Σ P Areas	X	:	0.000	kN
			Y	:	0.000	kN
			Z	:	-41.414	kN
		ΣP Members	X	:	0.000	kN
			Y	:	0.000	kN
			Z	:	-41.414	kN
	Total moment to the origin	Σ M Areas	X	:	94.217	kNm
			Y	:	114.924	kNm
			Z	:	0.000	kNm
		ΣM Members	X	:	94.217	kNm
			Y	:	114.924	kNm
			Z	:	0.000	kNm
	Cells selected for generating	Σ number of cells		:	1	
		Σ cell area		:	25376196	mm²
	Convert loads to members No.			:	21,22,27,28	

LC12: [WUP]

LC12 : [Wup]
Loads [kN/m^2]

Isometric



RF-STEEL EC3
CA1
1.1_STOGO SIJOS

Project: 1
1
Model: SK23010_Dreverna_ (06) statinys_ ..
Date: 2023-09-06

1.1 GENERAL DATA

Members to design:	21,22,27,28		
Sets of members to design:	4,5		
National Annex:	LST		
Ultimate Limit State Design			
Load combinations to design:	CO1	Bandymas 1-a sisterna (susitraukimas)	
	CO2	Bandymas 2-a sisterna (susitraukimas)	
	CO3	Bandymas 1+live (susitraukimas)	
	CO4	Eksplotacija 1 (susitraukimas)	
	CO5	Eksplotacija 2 (susitraukimas)	
	CO6	Eksplotacija 1+2 (susitraukimas)	
	CO7	Eksplotacija S (susitraukimas)	
	CO8	Eksplotacija 1+S (susitraukimas)	
	CO9	Eksplotacija 2+S (susitraukimas)	
	CO10	Eksplotacija 1+S (susitraukimas)	
	CO11	Eksplotacija 2+S (susitraukimas)	
	CO12	Eksplotacija (kėlimas) (susitraukimas)	
Serviceability Limit State Design			
Load combinations to design:	CO1	Bandymas 1-a sisterna (susitraukimas)	
	CO2	Bandymas 2-a sisterna (susitraukimas)	
	CO3	Bandymas 1+live (susitraukimas)	
	CO4	Eksplotacija 1 (susitraukimas)	
	CO5	Eksplotacija 2 (susitraukimas)	
	CO6	Eksplotacija 1+2 (susitraukimas)	
	CO7	Eksplotacija S (susitraukimas)	
	CO8	Eksplotacija 1+S (susitraukimas)	
	CO9	Eksplotacija 2+S (susitraukimas)	
	CO10	Eksplotacija 1+S (susitraukimas)	
	CO11	Eksplotacija 2+S (susitraukimas)	
	CO12	Eksplotacija (kėlimas) (susitraukimas)	

1.2 MATERIALS

Matl. No.	Material Description	E- Modulus E [kN/cm²]	Shear Modulus G [kN/cm²]	Poisson's Ratio ν [-]	Yield Stress f_{yk} [kN/cm²]	Max. Thickness t [mm]
1	Steel S 355 J2 | LST EN 10025-2:2004-11	21000.00	8076.92	0.300	35.50	3
					35.50	16
					34.50	40
					33.50	63
					32.50	80
					31.50	100
					29.50	150
					28.50	200
	Sijos, kolonos					

IPE 160

1.3 CROSS-SECTIONS

Sect. No.	Matl. No.	Cross-Section Description	Cross-Section Type	Max Design Ratio	Comment
3	1	IPE 160 | Euronorm 19-57	I-section rolled	0.94	

1.5 EFFECTIVE LENGTHS - MEMBERS

Member No.	Buckling Possible	Buckling About Axis y			Buckling About Axis z			Lateral-Torsional Buckling				
		Possible	$k_{cr,y}$	$L_{cr,y}$ [mm]	Possible	$k_{cr,z}$	$L_{cr,z}$ [mm]	Possible	k_z	k_w	L_w [mm]	L_T [mm]
21	☒	☒	1.00	3070	☒	1.00	3070	☒	1.0	1.0	3070	3070
22	☒	☒	1.00	3070	☒	1.00	3070	☒	1.0	1.0	3070	3070
27	☒	☒	1.00	2507	☒	1.00	2507	☒	1.0	1.0	2507	2507
28	☒	☒	1.00	2507	☒	1.00	2507	☒	1.0	1.0	2507	2507

1.6 EFFECTIVE LENGTHS - SETS OF MEMBERS

Set No.	Buckling Possible	Buckling About Axis y			Buckling About Axis z			Lateral-Torsional Buckling				
		Possible	$k_{cr,y}$	$L_{cr,y}$ [mm]	Possible	$k_{cr,z}$	$L_{cr,z}$ [mm]	Possible	k_z	k_w	L_w [mm]	L_T [mm]
4	☒	☒	1.00	5577	☒	0.55	3070	☒	1.0	1.0	3070	3070
5	☒	☒	1.00	5577	☒	0.55	3070	☒	1.0	1.0	3070	3070

1.9 SERVICEABILITY DATA

No.	Reference to	Members/Sets No.	Reference Length Manually	Reference Length l [mm]	Direct.	Precamber e_0 [mm]	Beam Type
1	List of Members	4	☐	5577	y, z	0	Beam
2	List of Members	5	☐	5577	y, z	0	Beam

1.12 PARAMETERS - MEMBERS

Member No.	Description	Parameter
21	Cross-Section	3 - IPE 160 | Euronorm 19-57
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
22	Cross-Section	3 - IPE 160 | Euronorm 19-57
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
27	Cross-Section	3 - IPE 160 | Euronorm 19-57
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
28	Cross-Section	3 - IPE 160 | Euronorm 19-57
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐

1.13 PARAMETERS - SETS OF MEMBERS

Set No.	Description	Parameter
4	Set of Members	Continuous Members 4
	Cross-Section	3 - IPE 160 | Euronorm 19-57
	Shear panel	☐
	Rotational restraint	☐
5	Set of Members	Continuous Members 5
	Cross-Section	3 - IPE 160 | Euronorm 19-57
	Shear panel	☐
	Rotational restraint	☐

2.3 DESIGN BY SET OF MEMBERS

Set No.	Member No.	Location x [mm]	LC/CO/ RC	Design		Equation No.	Description
4	Continuous Members 4 (Member No. 28,22)						
	28	2507	CO12	0.00	≤ 1	CS100)	Negligible internal forces
	22	0	CO8	0.06	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	28	2507	CO9	0.01	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	28	0	CO7	0.18	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	28	2507	CO11	0.01	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	22	3070	CO10	0.10	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	22	0	CO11	0.00	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	28	0	CO1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	28	0	CO7	0.18	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	28	2507	CO11	0.01	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	28	0	CO9	0.07	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	22	3070	CO7	0.18	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	22	0	CO11	0.14	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	22	512	CO11	0.12	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	28	1003	CO7	0.73	≤ 1	ST331)	Stability analysis - Lateral torsional buckling acc. to 6.3.2.1 and 6.3.2.3 - I-Section
	28	0	CO11	0.94	≤ 1	ST363)	Stability analysis - Biaxial bending acc. to 6.3.3, Method 2
	28	1504	CO12	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	22	1535	CO11	0.19	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	22	1023	CO11	0.18	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
5	Continuous Members 5 (Member No. 27,21)						
	27	0	CO12	0.00	≤ 1	CS100)	Negligible internal forces
	21	0	CO10	0.06	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	27	2507	CO9	0.01	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	27	0	CO7	0.18	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	27	2507	CO11	0.01	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	21	3070	CO8	0.10	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	21	0	CO11	0.00	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	27	0	CO1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	27	0	CO7	0.18	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	27	2507	CO11	0.01	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	27	0	CO9	0.08	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	21	3070	CO7	0.18	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	21	0	CO11	0.15	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	21	512	CO11	0.12	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	27	0	CO7	0.73	≤ 1	ST331)	Stability analysis - Lateral torsional buckling acc. to 6.3.2.1 and 6.3.2.3 - I-Section
	27	0	CO11	0.94	≤ 1	ST363)	Stability analysis - Biaxial bending acc. to 6.3.3, Method 2
	27	1003	CO12	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	21	1535	CO11	0.19	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	21	1023	CO11	0.19	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction

2.4 DESIGN BY MEMBER

Member No.	Location x [mm]	LC/CO/ RC	Design		Equation No.	Description
21	Cross-section No. 3 - IPE 160 | Euronorm 19-57					
	0	CO10	0.06	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	3070	CO8	0.10	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0	CO11	0.00	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6

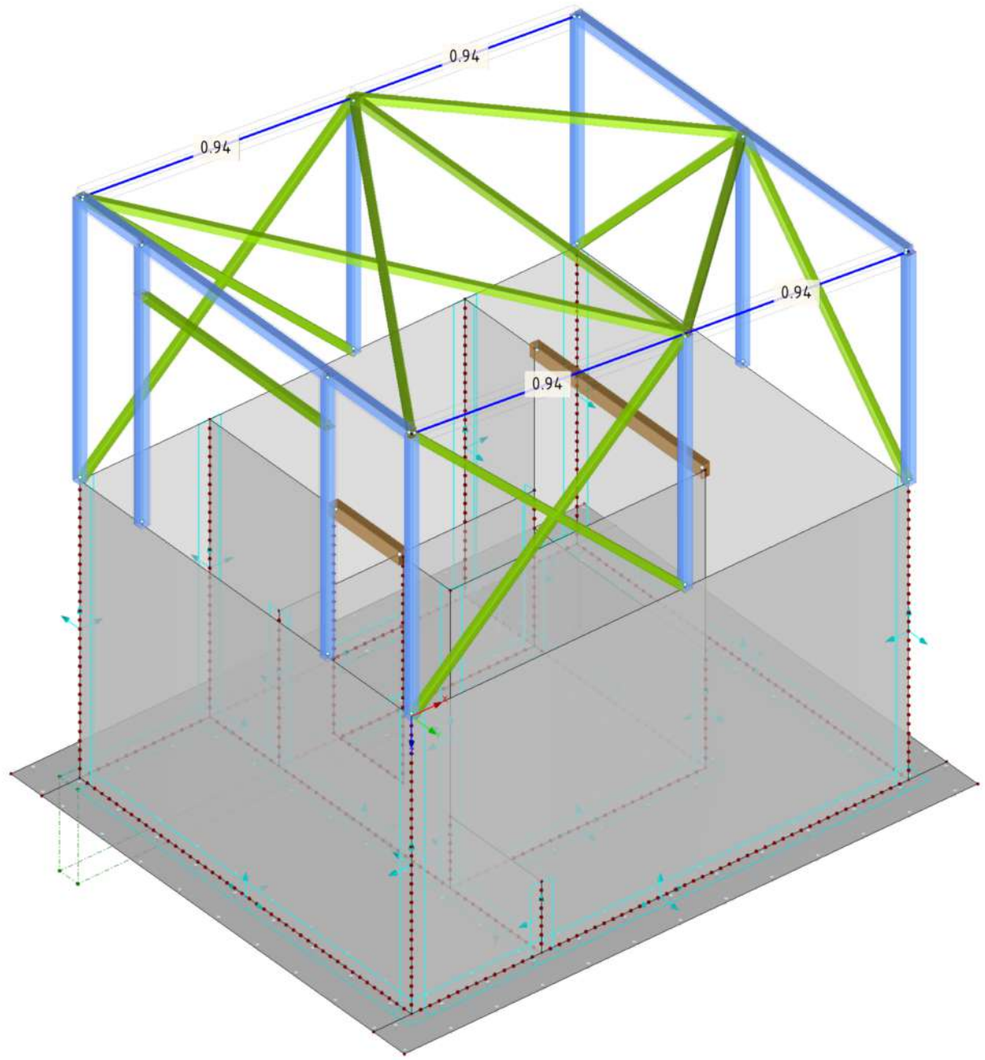
2.4 DESIGN BY MEMBER

Member No.	Location x [mm]	LC/CO/ RC	Design		Equation No.	Description
	0	CO1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	3070	CO7	0.18	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	0	CO11	0.15	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	512	CO11	0.12	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	3070	CO7	0.73	≤ 1	ST331)	Stability analysis - Lateral torsional buckling acc. to 6.3.2.1 and 6.3.2.3 - I-Section
	0	CO11	0.94	≤ 1	ST363)	Stability analysis - Biaxial bending acc. to 6.3.3, Method 2
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	1535	CO11	0.19	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	1023	CO11	0.19	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
22	Cross-section No. 3 - IPE 160 | Euronorm 19-57					
	0	CO8	0.06	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	3070	CO10	0.10	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0	CO11	0.00	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0	CO1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	3070	CO7	0.18	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	0	CO11	0.14	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	512	CO11	0.12	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	3070	CO7	0.73	≤ 1	ST331)	Stability analysis - Lateral torsional buckling acc. to 6.3.2.1 and 6.3.2.3 - I-Section
	0	CO11	0.94	≤ 1	ST363)	Stability analysis - Biaxial bending acc. to 6.3.3, Method 2
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	1535	CO11	0.19	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	1023	CO11	0.18	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
27	Cross-section No. 3 - IPE 160 | Euronorm 19-57					
	0	CO12	0.00	≤ 1	CS100)	Negligible internal forces
	0	CO10	0.01	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	2507	CO9	0.01	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0	CO7	0.18	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	2507	CO11	0.01	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0	CO8	0.09	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0	CO1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0	CO7	0.18	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	2507	CO11	0.01	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	0	CO9	0.08	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	1504	CO8	0.08	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	2507	CO10	0.02	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	0	CO10	0.08	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	0	CO7	0.73	≤ 1	ST331)	Stability analysis - Lateral torsional buckling acc. to 6.3.2.1 and 6.3.2.3 - I-Section
	0	CO11	0.94	≤ 1	ST363)	Stability analysis - Biaxial bending acc. to 6.3.3, Method 2
	1003	CO12	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	1504	CO10	0.06	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	1003	CO11	0.02	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
28	Cross-section No. 3 - IPE 160 | Euronorm 19-57					
	2507	CO12	0.00	≤ 1	CS100)	Negligible internal forces
	0	CO10	0.01	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	2507	CO9	0.01	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0	CO7	0.18	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	2507	CO11	0.01	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0	CO10	0.09	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0	CO1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0	CO7	0.18	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	2507	CO11	0.01	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	0	CO9	0.07	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	1504	CO10	0.09	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	2507	CO8	0.02	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	0	CO8	0.08	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	1003	CO7	0.73	≤ 1	ST331)	Stability analysis - Lateral torsional buckling acc. to 6.3.2.1 and 6.3.2.3 - I-Section
	0	CO11	0.94	≤ 1	ST363)	Stability analysis - Biaxial bending acc. to 6.3.3, Method 2
	1504	CO12	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	1504	CO8	0.06	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	1003	CO11	0.02	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction

DESIGN RATIO

RF-STEEL EC3 CA1
Ultimate Limit State: Cross-Section Design, Stability Design, Weld Design, Pressure Design, Plastic Design
Serviceability Limit State: Deformations, Web Breathing

Isometric



Members Max Design Ratio: 0.94

RF-STEEL EC3
CA2
1.2_KOLONOS

1.1 GENERAL DATA

Members to design:	3,4,9-17	
Sets of members to design:	1,2	
National Annex:	LST	
Ultimate Limit State Design		
Load combinations to design:	CO1	Bandymas 1-a sisterna (susitraukimas)
	CO2	Bandymas 2-a sisterna (susitraukimas)
	CO3	Bandymas 1+live (susitraukimas)
	CO4	Eksplotacija 1 (susitraukimas)
	CO5	Eksplotacija 2 (susitraukimas)
	CO6	Eksplotacija 1+2 (susitraukimas)
	CO7	Eksplotacija S (susitraukimas)
	CO8	Eksplotacija 1+S (susitraukimas)
	CO9	Eksplotacija 2+S (susitraukimas)
	CO10	Eksplotacija 1+S (susitraukimas)
	CO11	Eksplotacija 2+S (susitraukimas)
	CO12	Eksplotacija (kėlimas) (susitraukimas)
Serviceability Limit State Design		
Load combinations to design:	CO1	Bandymas 1-a sisterna (susitraukimas)
	CO2	Bandymas 2-a sisterna (susitraukimas)
	CO3	Bandymas 1+live (susitraukimas)
	CO4	Eksplotacija 1 (susitraukimas)
	CO5	Eksplotacija 2 (susitraukimas)
	CO6	Eksplotacija 1+2 (susitraukimas)
	CO7	Eksplotacija S (susitraukimas)
	CO8	Eksplotacija 1+S (susitraukimas)
	CO9	Eksplotacija 2+S (susitraukimas)
	CO10	Eksplotacija 1+S (susitraukimas)
	CO11	Eksplotacija 2+S (susitraukimas)
	CO12	Eksplotacija (kėlimas) (susitraukimas)

1.2 MATERIALS

Matl. No.	Material Description	E- Modulus E [kN/cm²]	Shear Modulus G [kN/cm²]	Poisson's Ratio ν [-]	Yield Stress f_{yk} [kN/cm²]	Max. Thickness t [mm]
1	Steel S 355 J2 | LST EN 10025-2:2004-11	21000.00	8076.92	0.300	35.50	3
					35.50	16
					34.50	40
					33.50	63
					32.50	80
					31.50	100
					29.50	150
					28.50	200
	Sijos, kolonos					

QRO 100x5

1.3 CROSS-SECTIONS

Sect. No.	Matl. No.	Cross-Section Description	Cross-Section Type	Max Design Ratio	Comment
1	1	QRO 100x5 | EN 10219-2:2006	Box rolled	0.74	

1.5 EFFECTIVE LENGTHS - MEMBERS

Member No.	Buckling Possible	Buckling About Axis y Possible	$k_{cr,y}$	$L_{cr,y}$ [mm]	Buckling About Axis z Possible	$k_{cr,z}$	$L_{cr,z}$ [mm]	Lateral-Torsional Buckling Possible	k_z	k_w	L_w [mm]	L_T [mm]
3	☒	☒	1.00	2450	☒	1.00	2450	☐	1.0	1.0	2450	2450
4	☒	☒	1.00	2450	☒	1.00	2450	☐	1.0	1.0	2450	2450
9	☒	☒	1.00	3000	☒	1.00	3000	☐	1.0	1.0	3000	3000
10	☒	☒	1.00	3000	☒	1.00	3000	☐	1.0	1.0	3000	3000
11	☒	☒	1.00	2450	☒	1.00	2450	☐	1.0	1.0	2450	2450
12	☒	☒	1.00	2450	☒	1.00	2450	☐	1.0	1.0	2450	2450
13	☒	☒	1.00	550	☒	1.00	550	☐	1.0	1.0	550	550
14	☒	☒	1.00	550	☒	1.00	550	☐	1.0	1.0	550	550
15	☒	☒	1.00	2450	☒	1.00	2450	☐	1.0	1.0	2450	2450
16	☒	☒	1.00	2697	☒	1.00	2697	☐	1.0	1.0	2697	2697
17	☒	☒	1.00	2697	☒	1.00	2697	☐	1.0	1.0	2697	2697

1.6 EFFECTIVE LENGTHS - SETS OF MEMBERS

Set No.	Buckling Possible	Buckling About Axis y Possible	$k_{cr,y}$	$L_{cr,y}$ [mm]	Buckling About Axis z Possible	$k_{cr,z}$	$L_{cr,z}$ [mm]	Lateral-Torsional Buckling Possible	k_z	k_w	L_w [mm]	L_T [mm]
1	☒	☒	1.00	3000	☒	1.00	3000	☐	1.0	1.0	3000	3000
2	☒	☒	1.00	3000	☒	1.00	3000	☐	1.0	1.0	3000	3000

1.9 SERVICEABILITY DATA

No.	Reference to	Members/Sets No.	Reference Length Manually	Reference Length l [mm]	Direct.	Precamber e_0 [mm]	Beam Type
1	Member	9	☐	3000	y, z	0	Beam
2	Member	10	☐	3000	y, z	0	Beam
3	Member	11	☐	2450	y, z	0	Beam
4	Member	12	☐	2450	y, z	0	Beam
5	Member	15	☐	2450	y, z	0	Beam

1.9 SERVICEABILITY DATA

No.	Reference to	Members/Sets No.	Reference Length Manually	Reference Length l [mm]	Direct.	Precamber e_0 [mm]	Beam Type
6	Member	16	☐	2697	y, z	0	Beam
7	Member	17	☐	2697	y, z	0	Beam
8	List of Members	1	☐	3000	y, z	0	Beam
9	List of Members	2	☐	3000	y, z	0	Beam

1.12 PARAMETERS - MEMBERS

Member No.	Description	Parameter
3	Cross-Section	1 - QRO 100x5 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
4	Cross-Section	1 - QRO 100x5 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
9	Cross-Section	1 - QRO 100x5 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
10	Cross-Section	1 - QRO 100x5 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
11	Cross-Section	1 - QRO 100x5 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
12	Cross-Section	1 - QRO 100x5 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
13	Cross-Section	1 - QRO 100x5 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
14	Cross-Section	1 - QRO 100x5 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
15	Cross-Section	1 - QRO 100x5 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
16	Cross-Section	1 - QRO 100x5 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
17	Cross-Section	1 - QRO 100x5 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐

1.13 PARAMETERS - SETS OF MEMBERS

Set No.	Description	Parameter
1	Set of Members	Continuous Members 1
	Cross-Section	1 - QRO 100x5 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
2	Set of Members	Continuous Members 2
	Cross-Section	1 - QRO 100x5 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐

2.3 DESIGN BY SET OF MEMBERS

Set No.	Member No.	Location x [mm]	LC/CO/RC	Design		Equation No.	Description
1	Continuous Members 1 (Member No. 3,13)						
	3	2450	CO7	0.00	≤ 1	CS100)	Negligible internal forces
	3	0	CO12	0.01	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	3	2450	CO11	0.03	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	13	0	CO12	0.00	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6

2.3 DESIGN BY SET OF MEMBERS

Set No.	Member No.	Location x [mm]	LC/CO/ RC	Design		Equation No.	Description
	3	0	CO8	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	3	0	CO12	0.01	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	3	1225	CO11	0.05	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	3	2450	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	3	1225	CO11	0.62	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	3	613	CO8	0.03	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
2	Continuous Members 2 (Member No. 4,14)						
	4	2450	CO7	0.00	≤ 1	CS100)	Negligible internal forces
	4	0	CO12	0.01	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	4	2450	CO11	0.03	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	14	0	CO12	0.00	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	4	0	CO8	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	4	0	CO12	0.01	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	4	1225	CO11	0.06	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	4	2450	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	4	1225	CO11	0.68	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	4	613	CO10	0.03	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction

2.4 DESIGN BY MEMBER

Member No.	Location x [mm]	LC/CO/ RC	Design		Equation No.	Description
3	Cross-section No. 1 - QRO 100x5 | EN 10219-2:2006					
	2450	CO7	0.00	≤ 1	CS100)	Negligible internal forces
	0	CO12	0.01	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	2450	CO11	0.03	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0	CO8	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0	CO12	0.01	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	1225	CO11	0.05	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	2450	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	1225	CO11	0.62	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	613	CO8	0.03	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
4	Cross-section No. 1 - QRO 100x5 | EN 10219-2:2006					
	2450	CO7	0.00	≤ 1	CS100)	Negligible internal forces
	0	CO12	0.01	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	2450	CO11	0.03	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0	CO8	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0	CO12	0.01	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	1225	CO11	0.06	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	2450	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	1225	CO11	0.68	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	613	CO10	0.03	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
9	Cross-section No. 1 - QRO 100x5 | EN 10219-2:2006					
	0	CO12	0.04	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	0	CO11	0.01	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0	CO8	0.02	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0	CO8	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0	CO11	0.01	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	1800	CO8	0.04	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	1800	CO11	0.20	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	1800	CO8	0.52	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
10	Cross-section No. 1 - QRO 100x5 | EN 10219-2:2006					
	0	CO12	0.04	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	3000	CO11	0.01	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0	CO10	0.02	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0	CO8	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0	CO11	0.01	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	1800	CO10	0.04	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	1200	CO11	0.15	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	1800	CO10	0.52	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
11	Cross-section No. 1 - QRO 100x5 | EN 10219-2:2006					
	0	CO12	0.00	≤ 1	CS100)	Negligible internal forces
	2450	CO9	0.01	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	2450	CO9	0.02	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	2450	CO8	0.02	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0	CO8	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	1225	CO8	0.03	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	2450	CO9	0.02	≤ 1	ST301)	Stability analysis - Flexural buckling about y-axis acc. to 6.3.1.1 and 6.3.1.2(4)
	2450	CO9	0.02	≤ 1	ST311)	Stability analysis - Flexural buckling about z-axis acc. to 6.3.1.1 and 6.3.1.2(4)
	1838	CO8	0.14	≤ 1	ST364)	Stability analysis - Bending and compression acc. to 6.3.3, Method 2
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	1225	CO9	0.24	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	1225	CO8	0.27	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
12	Cross-section No. 1 - QRO 100x5 | EN 10219-2:2006					
	2450	CO12	0.00	≤ 1	CS100)	Negligible internal forces
	2450	CO9	0.01	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	2450	CO9	0.02	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	2450	CO10	0.02	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0	CO8	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	1225	CO10	0.03	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	2450	CO9	0.02	≤ 1	ST301)	Stability analysis - Flexural buckling about y-axis acc. to 6.3.1.1 and 6.3.1.2(4)
	2450	CO9	0.02	≤ 1	ST311)	Stability analysis - Flexural buckling about z-axis acc. to 6.3.1.1 and 6.3.1.2(4)
	1838	CO10	0.14	≤ 1	ST364)	Stability analysis - Bending and compression acc. to 6.3.3, Method 2
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations

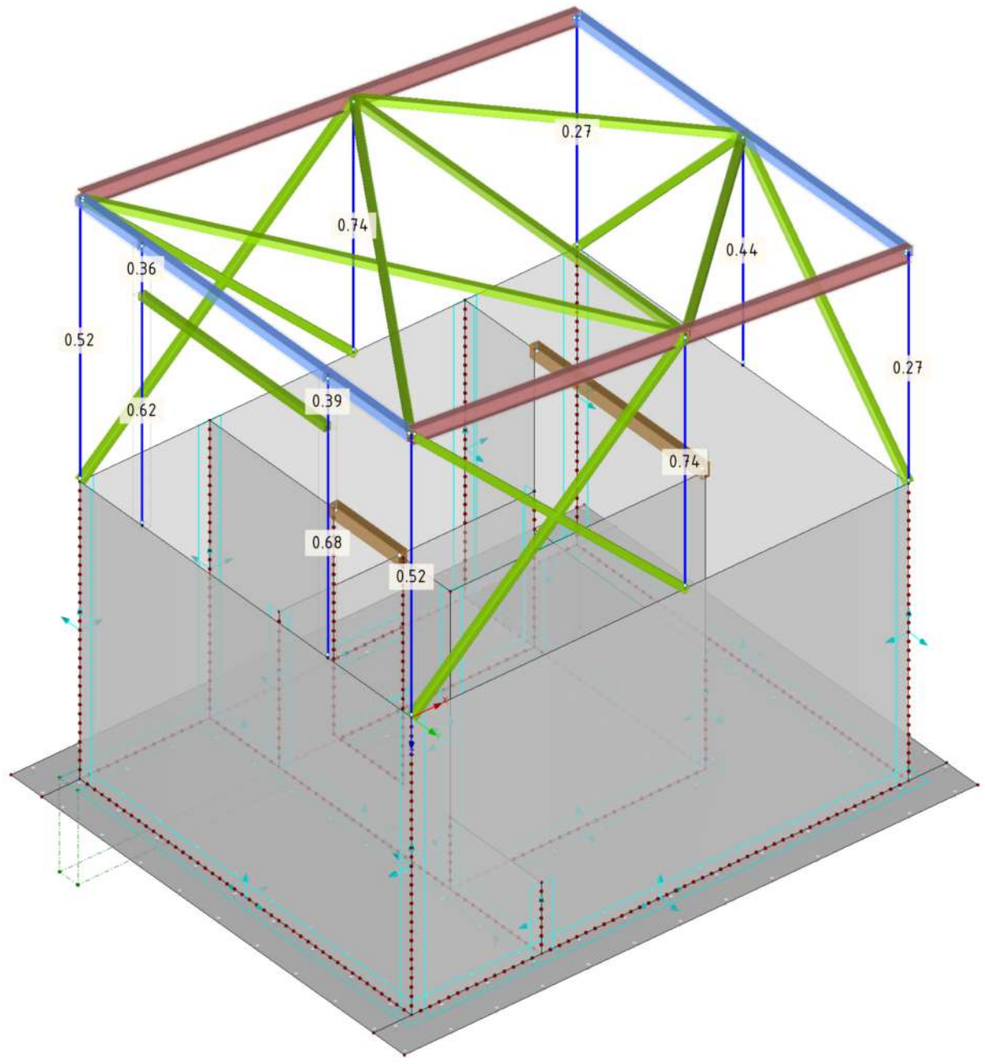
2.4 DESIGN BY MEMBER

Member No.	Location x [mm]	LC/CO/ RC	Design		Equation No.	Description
	1225	CO9	0.24	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	1225	CO10	0.27	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
13	Cross-section No. 1 - QRO 100x5 | EN 10219-2:2006					
	550	CO12	0.01	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0	CO11	0.03	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0	CO12	0.00	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0	CO8	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	550	CO12	0.01	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	550	CO11	0.02	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	550	CO11	0.36	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	550	CO8	0.02	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
14	Cross-section No. 1 - QRO 100x5 | EN 10219-2:2006					
	550	CO12	0.01	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0	CO11	0.03	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0	CO12	0.00	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0	CO8	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	550	CO12	0.01	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	550	CO11	0.03	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	550	CO11	0.39	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	550	CO10	0.02	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
15	Cross-section No. 1 - QRO 100x5 | EN 10219-2:2006					
	0	CO12	0.12	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	2450	CO9	0.03	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0	CO8	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	1225	CO9	0.14	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	0	CO10	0.00	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	613	CO10	0.02	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	1225	CO9	0.44	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	1225	CO10	0.01	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
16	Cross-section No. 1 - QRO 100x5 | EN 10219-2:2006					
	2697	CO7	0.00	≤ 1	CS100)	Negligible internal forces
	0	CO12	0.04	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	2697	CO10	0.02	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	1618	CO8	0.22	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0	CO8	0.04	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	1618	CO8	0.22	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	1618	CO11	0.18	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	2697	CO10	0.04	≤ 1	ST301)	Stability analysis - Flexural buckling about y-axis acc. to 6.3.1.1 and 6.3.1.2(4)
	2697	CO10	0.04	≤ 1	ST311)	Stability analysis - Flexural buckling about z-axis acc. to 6.3.1.1 and 6.3.1.2(4)
	2697	CO11	0.21	≤ 1	ST364)	Stability analysis - Bending and compression acc. to 6.3.3, Method 2
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	1618	CO8	0.74	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
17	Cross-section No. 1 - QRO 100x5 | EN 10219-2:2006					
	2697	CO7	0.00	≤ 1	CS100)	Negligible internal forces
	0	CO12	0.04	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	2697	CO8	0.02	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	1618	CO10	0.22	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0	CO10	0.04	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	1618	CO10	0.22	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	1618	CO11	0.18	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	2697	CO8	0.04	≤ 1	ST301)	Stability analysis - Flexural buckling about y-axis acc. to 6.3.1.1 and 6.3.1.2(4)
	2697	CO8	0.04	≤ 1	ST311)	Stability analysis - Flexural buckling about z-axis acc. to 6.3.1.1 and 6.3.1.2(4)
	2697	CO11	0.20	≤ 1	ST364)	Stability analysis - Bending and compression acc. to 6.3.3, Method 2
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	1618	CO10	0.74	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction

DESIGN RATIO

RF-STEEL EC3 CA2
Ultimate Limit State: Cross-Section Design, Stability Design, Weld Design, Pressure Design, Plastic Design
Serviceability Limit State: Deformations, Web Breathing

Isometric



Members Max Design Ratio: 0.74

RF-STEEL EC3
CA3
1.3_RYÐIAI

1.1 GENERAL DATA

Members to design:	1,2,5,99,100,103-108,112-116	
Sets of members to design:	3,6	
National Annex:	LST	
Ultimate Limit State Design		
Load combinations to design:	CO1	Bandymas 1-a sisterna (susitraukimas)
	CO2	Bandymas 2-a sisterna (susitraukimas)
	CO3	Bandymas 1+live (susitraukimas)
	CO4	Eksplotacija 1 (susitraukimas)
	CO5	Eksplotacija 2 (susitraukimas)
	CO6	Eksplotacija 1+2 (susitraukimas)
	CO7	Eksplotacija S (susitraukimas)
	CO8	Eksplotacija 1+S (susitraukimas)
	CO9	Eksplotacija 2+S (susitraukimas)
	CO10	Eksplotacija 1+S (susitraukimas)
	CO11	Eksplotacija 2+S (susitraukimas)
	CO12	Eksplotacija (kėlimas) (susitraukimas)
Serviceability Limit State Design		
Load combinations to design:	CO1	Bandymas 1-a sisterna (susitraukimas)
	CO2	Bandymas 2-a sisterna (susitraukimas)
	CO3	Bandymas 1+live (susitraukimas)
	CO4	Eksplotacija 1 (susitraukimas)
	CO5	Eksplotacija 2 (susitraukimas)
	CO6	Eksplotacija 1+2 (susitraukimas)
	CO7	Eksplotacija S (susitraukimas)
	CO8	Eksplotacija 1+S (susitraukimas)
	CO9	Eksplotacija 2+S (susitraukimas)
	CO10	Eksplotacija 1+S (susitraukimas)
	CO11	Eksplotacija 2+S (susitraukimas)
	CO12	Eksplotacija (kėlimas) (susitraukimas)

1.2 MATERIALS

Matl. No.	Material Description	E- Modulus E [kN/cm²]	Shear Modulus G [kN/cm²]	Poisson's Ratio ν [-]	Yield Stress f_{yk} [kN/cm²]	Max. Thickness t [mm]
1	Steel S 355 J2 | LST EN 10025-2:2004-11	21000.00	8076.92	0.300	35.50	3
					35.50	16
					34.50	40
					33.50	63
					32.50	80
					31.50	100
					29.50	150
					28.50	200
	Sijos, kolonos					
2	Steel S 275 J2 | LST EN 10025-2:2004-11	21000.00	8076.92	0.300	27.50	3
					27.50	16
					26.50	40
					25.50	63
					24.50	80
					23.50	100
					22.50	150
					21.50	200
	Ryðiai, rėmai					

QRO 100x5 QRO 80x4

1.3 CROSS-SECTIONS

Sect. No.	Matl. No.	Cross-Section Description	Cross-Section Type	Max Design Ratio	Comment
1	1	QRO 100x5 | EN 10219-2:2006	Box rolled	0.73	
4	2	QRO 80x4 | EN 10219-2:2006	Box rolled	0.53	

1.5 EFFECTIVE LENGTHS - MEMBERS

Member	Buckling	Buckling About Axis y			Buckling About Axis z			Lateral-Torsional Buckling				
No.	Possible	Possible	$k_{cr,y}$	$L_{cr,y}$ [mm]	Possible	$k_{cr,z}$	$L_{cr,z}$ [mm]	Possible	k_z	k_w	L_w [mm]	L_T [mm]
1	☒	☒	1.00	850	☒	1.00	850	☐	1.0	1.0	850	850
2	☒	☒	1.00	2550	☒	1.00	2550	☐	1.0	1.0	2550	2550
5	☒	☒	1.00	2275	☒	1.00	2275	☐	1.0	1.0	2275	2275
99	☒	☒	1.00	2275	☒	1.00	2275	☐	1.0	1.0	2275	2275
100	☒	☒	1.00	1150	☒	1.00	1150	☐	1.0	1.0	1150	1150
103	☐	☐	1.00	4075	☐	1.00	4075	☐	1.0	1.0	4075	4075
	This type of member is not allowed for stability calculation.											
104	☐	☐	1.00	4282	☐	1.00	4282	☐	1.0	1.0	4282	4282
	This type of member is not allowed for stability calculation.											
105	☐	☐	1.00	4075	☐	1.00	4075	☐	1.0	1.0	4075	4075
	This type of member is not allowed for stability calculation.											
106	☐	☐	1.00	4282	☐	1.00	4282	☐	1.0	1.0	4282	4282
	This type of member is not allowed for stability calculation.											
107	☒	☒	1.00	3343	☒	1.00	3343	☐	1.0	1.0	3343	3343
108	☒	☒	1.00	3343	☒	1.00	3343	☐	1.0	1.0	3343	3343
112	☒	☒	1.00	5489	☒	1.00	5489	☐	1.0	1.0	5489	5489
113	☒	☒	1.00	5489	☒	1.00	5489	☐	1.0	1.0	5489	5489
114	☒	☒	1.00	3385	☒	1.00	3385	☐	1.0	1.0	3385	3385
115	☒	☒	1.00	3385	☒	1.00	3385	☐	1.0	1.0	3385	3385
116	☒	☒	1.00	4550	☒	1.00	4550	☐	1.0	1.0	4550	4550

1.6 EFFECTIVE LENGTHS - SETS OF MEMBERS

Set No.	Buckling Possible	Buckling About Axis y			Buckling About Axis z			Lateral-Torsional Buckling				
		Possible	$k_{cr,y}$	$L_{cr,y}$ [mm]	Possible	$k_{cr,z}$	$L_{cr,z}$ [mm]	Possible	k_z	k_w	L_w [mm]	L_T [mm]
3	☒	☒	1.00	4550	☒	0.56	2550	☐	1.0	1.0	4550	4550
6	☒	☒	1.00	4550	☒	0.50	2275	☐	1.0	1.0	4550	4550

1.9 SERVICEABILITY DATA

No.	Reference to	Members/Sets No.	Reference Length		Direct.	Precamber	Beam Type
			Manually	l [mm]		e_0 [mm]	
1	List of Members	3	☐	4550	y, z	0	Beam
2	List of Members	6	☐	4550	y, z	0	Beam
5	Member	100	☐	1150	y, z	0	Beam
6	Member	103	☐	4075	y, z	0	Beam
7	Member	104	☐	4282	y, z	0	Beam
8	Member	105	☐	4075	y, z	0	Beam
9	Member	106	☐	4282	y, z	0	Beam
10	Member	107	☐	3343	y, z	0	Beam
11	Member	108	☐	3343	y, z	0	Beam
12	Member	112	☐	5489	y, z	0	Beam
13	Member	113	☐	5489	y, z	0	Beam
14	Member	114	☐	3385	y, z	0	Beam
15	Member	115	☐	3385	y, z	0	Beam

1.12 PARAMETERS - MEMBERS

Member No.	Description	Parameter
1	Cross-Section	1 - QRO 100x5 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
2	Cross-Section	1 - QRO 100x5 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
5	Cross-Section	1 - QRO 100x5 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
99	Cross-Section	1 - QRO 100x5 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
100	Cross-Section	1 - QRO 100x5 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
103	Cross-Section	4 - QRO 80x4 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
104	Cross-Section	4 - QRO 80x4 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
105	Cross-Section	4 - QRO 80x4 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
106	Cross-Section	4 - QRO 80x4 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
107	Cross-Section	4 - QRO 80x4 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
108	Cross-Section	4 - QRO 80x4 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
112	Cross-Section	4 - QRO 80x4 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
113	Cross-Section	4 - QRO 80x4 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐

1.12 PARAMETERS - MEMBERS

Member No.	Description	Parameter
114	Cross-Section	4 - QRO 80x4 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
115	Cross-Section	4 - QRO 80x4 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
116	Cross-Section	4 - QRO 80x4 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐

1.13 PARAMETERS - SETS OF MEMBERS

Set No.	Description	Parameter
3	Set of Members	Continuous Members 3
	Cross-Section	1 - QRO 100x5 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
6	Set of Members	Continuous Members 6
	Cross-Section	1 - QRO 100x5 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐

2.3 DESIGN BY SET OF MEMBERS

Set No.	Member No.	Location x [mm]	LC/CO/ RC	Design		Equation No.	Description
3	Continuous Members 3 (Member No. 1,2,100)						
	100	1150	CO10	0.01	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	100	1150	CO11	0.17	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	1	425	CO11	0.03	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	100	1150	CO11	0.17	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	2	510	CO11	0.03	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	2	1530	CO12	0.01	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	100	1150	CO10	0.14	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	100	1150	CO8	0.04	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	1	850	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	2	1530	CO12	0.02	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	2	1020	CO11	0.73	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
6	Continuous Members 6 (Member No. 5,99)						
	5	1138	CO7	0.00	≤ 1	CS100)	Negligible internal forces
	99	1706	CO9	0.00	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	5	0	CO10	0.00	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	5	0	CO7	0.01	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	5	0	CO7	0.01	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	5	0	CO11	0.01	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	99	0	CO10	0.00	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	5	0	CO10	0.00	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	5	2275	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	5	0	CO11	0.04	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	5	0	CO8	0.01	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction

2.4 DESIGN BY MEMBER

Member No.	Location x [mm]	LC/CO/ RC	Design		Equation No.	Description
1	Cross-section No. 1 - QRO 100x5 | EN 10219-2:2006					
	0	CO10	0.01	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0	CO11	0.12	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	425	CO11	0.03	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0	CO11	0.12	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	0	CO9	0.01	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0	CO8	0.10	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	0	CO10	0.02	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	850	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	0	CO12	0.01	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	0	CO11	0.40	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
2	Cross-section No. 1 - QRO 100x5 | EN 10219-2:2006					
	0	CO10	0.00	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0	CO11	0.14	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	2550	CO11	0.00	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0	CO11	0.14	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	510	CO11	0.03	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	1530	CO12	0.01	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	0	CO10	0.11	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	0	CO8	0.03	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	1530	CO12	0.02	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	1020	CO11	0.73	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction

2.4 DESIGN BY MEMBER

Member No.	Location x [mm]	LC/CO/ RC	Design		Equation No.	Description
5	Cross-section No. 1 - QRO 100x5 | EN 10219-2:2006					
	1138	CO7	0.00	≤ 1	CS100)	Negligible internal forces
	569	CO9	0.00	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	0	CO10	0.00	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0	CO7	0.01	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0	CO7	0.01	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0	CO11	0.01	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	2275	CO8	0.00	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	0	CO10	0.00	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	2275	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	0	CO11	0.04	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	0	CO8	0.01	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
99	Cross-section No. 1 - QRO 100x5 | EN 10219-2:2006					
	1138	CO7	0.00	≤ 1	CS100)	Negligible internal forces
	1706	CO9	0.00	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	2275	CO8	0.00	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	2275	CO7	0.01	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	2275	CO7	0.01	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	2275	CO11	0.01	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	0	CO10	0.00	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	2275	CO8	0.00	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	2275	CO11	0.04	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	2275	CO8	0.01	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
100	Cross-section No. 1 - QRO 100x5 | EN 10219-2:2006					
	1150	CO10	0.01	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	1150	CO11	0.17	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	575	CO11	0.03	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	1150	CO11	0.17	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	1150	CO9	0.01	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	1150	CO7	0.00	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	1150	CO10	0.14	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	1150	CO8	0.04	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	1150	CO12	0.01	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	1150	CO11	0.55	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
103	Cross-section No. 4 - QRO 80x4 | EN 10219-2:2006					
	0	CO8	0.16	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
104	Cross-section No. 4 - QRO 80x4 | EN 10219-2:2006					
	4282	CO10	0.16	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
105	Cross-section No. 4 - QRO 80x4 | EN 10219-2:2006					
	0	CO10	0.16	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
106	Cross-section No. 4 - QRO 80x4 | EN 10219-2:2006					
	4282	CO8	0.16	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
107	Cross-section No. 4 - QRO 80x4 | EN 10219-2:2006					
	0	CO8	0.22	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0	CO8	0.53	≤ 1	ST302)	Stability analysis - Flexural buckling about y-axis acc. to 6.3.1.1 and 6.3.1.2
	0	CO8	0.53	≤ 1	ST312)	Stability analysis - Flexural buckling about z-axis acc. to 6.3.1.1 and 6.3.1.2
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
108	Cross-section No. 4 - QRO 80x4 | EN 10219-2:2006					
	0	CO10	0.22	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0	CO10	0.53	≤ 1	ST302)	Stability analysis - Flexural buckling about y-axis acc. to 6.3.1.1 and 6.3.1.2
	0	CO10	0.53	≤ 1	ST312)	Stability analysis - Flexural buckling about z-axis acc. to 6.3.1.1 and 6.3.1.2
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
112	Cross-section No. 4 - QRO 80x4 | EN 10219-2:2006					
	5489	CO8	0.02	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	0	CO10	0.00	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
113	Cross-section No. 4 - QRO 80x4 | EN 10219-2:2006					
	5489	CO10	0.02	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	0	CO8	0.00	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
114	Cross-section No. 4 - QRO 80x4 | EN 10219-2:2006					
	3385	CO12	0.00	≤ 1	CS100)	Negligible internal forces
	0	CO10	0.05	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	3385	CO8	0.03	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	3385	CO9	0.03	≤ 1	ST301)	Stability analysis - Flexural buckling about y-axis acc. to 6.3.1.1 and 6.3.1.2(4)
	3385	CO8	0.08	≤ 1	ST302)	Stability analysis - Flexural buckling about y-axis acc. to 6.3.1.1 and 6.3.1.2
	3385	CO9	0.03	≤ 1	ST311)	Stability analysis - Flexural buckling about z-axis acc. to 6.3.1.1 and 6.3.1.2(4)
	3385	CO8	0.08	≤ 1	ST312)	Stability analysis - Flexural buckling about z-axis acc. to 6.3.1.1 and 6.3.1.2
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
115	Cross-section No. 4 - QRO 80x4 | EN 10219-2:2006					
	0	CO12	0.00	≤ 1	CS100)	Negligible internal forces
	3385	CO8	0.05	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	0	CO10	0.03	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0	CO9	0.03	≤ 1	ST301)	Stability analysis - Flexural buckling about y-axis acc. to 6.3.1.1 and 6.3.1.2(4)
	0	CO10	0.08	≤ 1	ST302)	Stability analysis - Flexural buckling about y-axis acc. to 6.3.1.1 and 6.3.1.2
	0	CO9	0.03	≤ 1	ST311)	Stability analysis - Flexural buckling about z-axis acc. to 6.3.1.1 and 6.3.1.2(4)

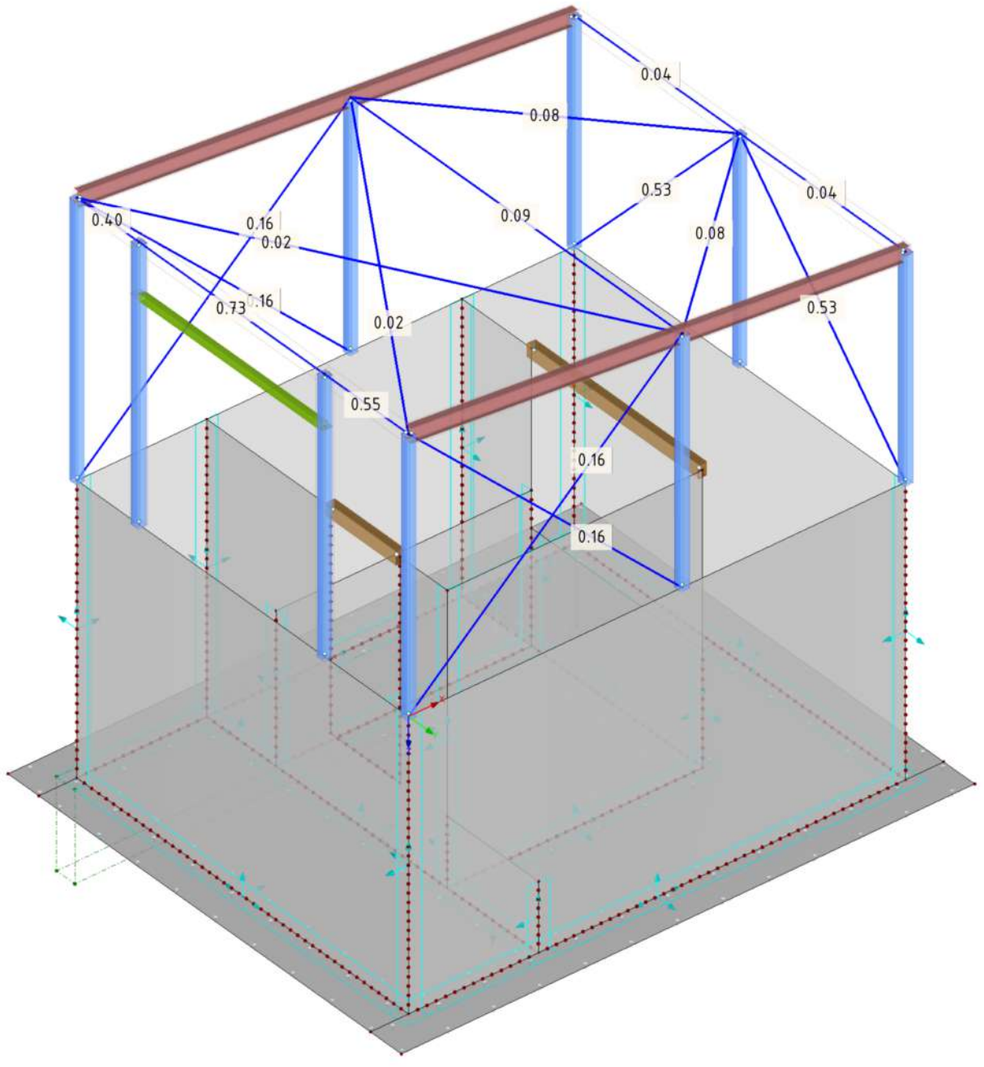
2.4 DESIGN BY MEMBER

Member No.	Location x [mm]	LC/CO/ RC	Design		Equation No.	Description
116	0	CO10	0.08	≤ 1	ST312)	Stability analysis - Flexural buckling about z-axis acc. to 6.3.1.1 and 6.3.1.2
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	Cross-section No. 4 - QRO 80x4 | EN 10219-2:2006					
	0	CO9	0.01	≤ 1	CS101)	Cross-section check - Tension acc. to 6.2.3
	0	CO8	0.02	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0	CO8	0.09	≤ 1	ST302)	Stability analysis - Flexural buckling about y-axis acc. to 6.3.1.1 and 6.3.1.2
	0	CO8	0.09	≤ 1	ST312)	Stability analysis - Flexural buckling about z-axis acc. to 6.3.1.1 and 6.3.1.2

DESIGN RATIO

RF-STEEL EC3 CA3
Ultimate Limit State: Cross-Section Design, Stability Design, Weld Design, Pressure Design, Plastic Design
Serviceability Limit State: Deformations, Web Breathing

Isometric



Members Max Design Ratio: 0.73

RF-STEEL EC3
CA4
1.4_KITA

Project: 1
1

Model: SK23010_Dreverna_ (06) statinys_ ..

Date: 2023-09-06

1.1 GENERAL DATA

Members to design:	109-111		
Sets of members to design:			
National Annex:	LST		
Ultimate Limit State Design			
Load combinations to design:	CO1	Bandymas 1-a sisterna (susitraukimas)	
	CO2	Bandymas 2-a sisterna (susitraukimas)	
	CO3	Bandymas 1+live (susitraukimas)	
	CO4	Eksplotacija 1 (susitraukimas)	
	CO5	Eksplotacija 2 (susitraukimas)	
	CO6	Eksplotacija 1+2 (susitraukimas)	
	CO7	Eksplotacija S (susitraukimas)	
	CO8	Eksplotacija 1+S (susitraukimas)	
	CO9	Eksplotacija 2+S (susitraukimas)	
	CO10	Eksplotacija 1+S (susitraukimas)	
	CO11	Eksplotacija 2+S (susitraukimas)	
	CO12	Eksplotacija (kėlimas) (susitraukimas)	
Serviceability Limit State Design			
Load combinations to design:	CO1	Bandymas 1-a sisterna (susitraukimas)	
	CO2	Bandymas 2-a sisterna (susitraukimas)	
	CO3	Bandymas 1+live (susitraukimas)	
	CO4	Eksplotacija 1 (susitraukimas)	
	CO5	Eksplotacija 2 (susitraukimas)	
	CO6	Eksplotacija 1+2 (susitraukimas)	
	CO7	Eksplotacija S (susitraukimas)	
	CO8	Eksplotacija 1+S (susitraukimas)	
	CO9	Eksplotacija 2+S (susitraukimas)	
	CO10	Eksplotacija 1+S (susitraukimas)	
	CO11	Eksplotacija 2+S (susitraukimas)	
	CO12	Eksplotacija (kėlimas) (susitraukimas)	

1.2 MATERIALS

Matl. No.	Material Description	E- Modulus E [kN/cm²]	Shear Modulus G [kN/cm²]	Poisson's Ratio ν [-]	Yield Stress f_{yk} [kN/cm²]	Max. Thickness t [mm]
1	Steel S 355 J2 | LST EN 10025-2:2004-11	21000.00	8076.92	0.300	35.50	3
					35.50	16
					34.50	40
					33.50	63
					32.50	80
					31.50	100
					29.50	150
					28.50	200
	Sijos, kolonos					
2	Steel S 275 J2 | LST EN 10025-2:2004-11	21000.00	8076.92	0.300	27.50	3
					27.50	16
					26.50	40
					25.50	63
					24.50	80
					23.50	100
					22.50	150
					21.50	200
	Ryðiai, rėmai					

QRO 80x4 RRO 150x100x5

1.3 CROSS-SECTIONS

Sect. No.	Matl. No.	Cross-Section Description	Cross-Section Type	Max Design Ratio	Comment
4	2	QRO 80x4 | EN 10219-2:2006	Box rolled	0.00	
7	1	RRO 150x100x5 | EN 10219-2:2006	Box rolled	0.11	

1.5 EFFECTIVE LENGTHS - MEMBERS

Member	Buckling	Buckling About Axis y			Buckling About Axis z			Lateral-Torsional Buckling				
No.	Possible	Possible	$k_{cr,y}$	$L_{cr,y}$ [mm]	Possible	$k_{cr,z}$	$L_{cr,z}$ [mm]	Possible	k_z	k_w	L_w [mm]	L_T [mm]
109	☒	☒	1.00	2550	☒	1.00	2550	☐	1.0	1.0	2550	2550
110	☒	☒	1.00	2350	☒	1.00	2350	☐	1.0	1.0	2350	2350
111	☒	☒	1.00	950	☒	1.00	950	☐	1.0	1.0	950	950

1.9 SERVICEABILITY DATA

No.	Reference to	Members/Sets No.	Reference Length Manually	Reference Length l [mm]	Direct.	Precamber e_0 [mm]	Beam Type
1	Member	109	☐	2550	y, z	0	Beam
2	Member	110	☐	2350	y, z	0	Beam
3	Member	111	☐	950	y, z	0	Beam

1.12 PARAMETERS - MEMBERS

Member No.	Description	Parameter
109	Cross-Section	4 - QRO 80x4 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
110	Cross-Section	7 - RRO 150x100x5 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐
111	Cross-Section	7 - RRO 150x100x5 | EN 10219-2:2006
	Shear panel	☐
	Rotational restraint	☐
	Cross-sectional area for tension design	☐

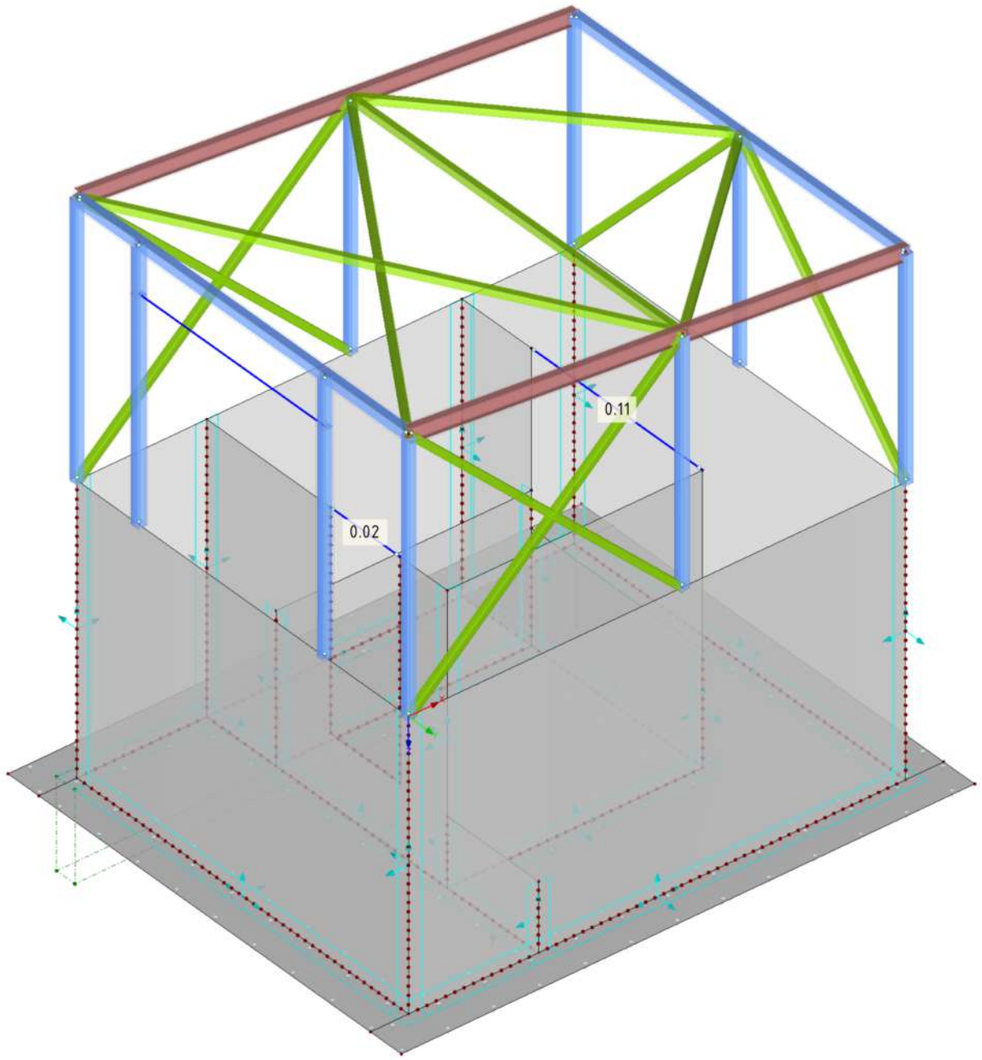
2.4 DESIGN BY MEMBER

Member No.	Location x [mm]	LC/CO/ RC	Design		Equation No.	Description
109	Cross-section No. 4 - QRO 80x4 | EN 10219-2:2006					
	0	CO10	0.00	≤ 1	CS100)	Negligible internal forces
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
110	Cross-section No. 7 - RRO 150x100x5 | EN 10219-2:2006					
	1175	CO10	0.05	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	2350	CO8	0.01	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0	CO8	0.01	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0	CO1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	1175	CO10	0.05	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	2350	CO8	0.01	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	1175	CO8	0.01	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	1175	CO10	0.11	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	1175	CO8	0.02	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
111	Cross-section No. 7 - RRO 150x100x5 | EN 10219-2:2006					
	475	CO11	0.01	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	950	CO10	0.02	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	950	CO10	0.01	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0	CO10	0.00	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0	CO1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	475	CO11	0.01	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	950	CO10	0.02	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	475	CO10	0.00	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0	CO1	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	475	CO10	0.01	≤ 1	SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	475	CO10	0.01	≤ 1	SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction

DESIGN RATIO

RF-STEEL EC3 CA4
Ultimate Limit State: Cross-Section Design, Stability Design, Weld Design, Pressure Design, Plastic Design
Serviceability Limit State: Deformations, Web Breathing

Isometric



Members Max Design Ratio: 0.11

RF-CONCRETE Surfaces
CA1
1.1_Dugnas

Project: 1
1

Model: SK23010_Dreverna_ (06) statinys_ ..

Date: 2023-09-06

1.1 GENERAL DATA

Design according to Standard:	LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
ULTIMATE LIMIT STATE		
Load combinations for design:	CO1	Bandymas 1-a sisterna (susitraukimas)
		Persistent and Transient
	CO2	Bandymas 2-a sisterna (susitraukimas)
		Persistent and Transient
	CO3	Bandymas 1+live (susitraukimas)
		Persistent and Transient
	CO4	Eksplotacija 1 (susitraukimas)
		Persistent and Transient
	CO5	Eksplotacija 2 (susitraukimas)
		Persistent and Transient
	CO6	Eksplotacija 1+2 (susitraukimas)
		Persistent and Transient
	CO7	Eksplotacija S (susitraukimas)
		Persistent and Transient
	CO8	Eksplotacija 1+S (susitraukimas)
		Persistent and Transient
	CO9	Eksplotacija 2+S (susitraukimas)
		Persistent and Transient
	CO10	Eksplotacija 1+S (susitraukimas)
		Persistent and Transient
	CO11	Eksplotacija 2+S (susitraukimas)
		Persistent and Transient
	CO12	Eksplotacija (kėlimas) (susitraukimas)
		Persistent and Transient
SERVICEABILITY LIMIT STATE		
Load combinations for design:	CO1	Bandymas 1-a sisterna (susitraukimas)
		Quasi-permanent, k_t 0.600
	CO2	Bandymas 2-a sisterna (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO3	Bandymas 1+live (susitraukimas)
		Quasi-permanent, k_t 0.549
	CO4	Eksplotacija 1 (susitraukimas)
		Quasi-permanent, k_t 0.600
	CO5	Eksplotacija 2 (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO6	Eksplotacija 1+2 (susitraukimas)
		Quasi-permanent, k_t 0.549
	CO7	Eksplotacija S (susitraukimas)
		Quasi-permanent, k_t 0.559
	CO8	Eksplotacija 1+S (susitraukimas)
		Quasi-permanent, k_t 0.566
	CO9	Eksplotacija 2+S (susitraukimas)
		Quasi-permanent, k_t 0.566
	CO10	Eksplotacija 1+S (susitraukimas)
		Quasi-permanent, k_t 0.566
	CO11	Eksplotacija 2+S (susitraukimas)
		Quasi-permanent, k_t 0.566
	CO12	Eksplotacija (kėlimas) (susitraukimas)
		Quasi-permanent, k_t 0.549
Definition of Provided Additional Reinforcement	Automatic arrangement according to the specifications in Table 1.4	
Type of SLS method:	Analytical Method	
	By assuming an identical deformation ratio of the longitudinal reinforcement	
Design of		
Concrete Stress Analysis	☒	
Steel Stress Analysis	☒	
Crack widths	☒	
Deformation Analysis	☐	
Layout of longitudinal reinforcement		
Required longitudinal reinforcement automatically increased for serviceability limit state design:	☒	
DETAILS		
Analysis Method for Reinforcement Envelope	Mixed	
Apply the averaged internal forces in the defined average region for the ULS calculation and for the analytic method of SLS calculation.	☒	
Apply the internal forces without the rib components	☐	
Design Situation Settings for Serviceability Limit State Checks		
Load combination:		
Characteristic with direct load	Checks: -	
Characteristic with imposed deformation	Checks: -	
Frequent	Checks: -	
Quasi-permanent	Checks: k_1*f_{ck}, k_2*f_{ck}, k_3*f_{yk}, k_4*f_{yk}, w_k, u_l	

1.2 MATERIALS

Material No.	Material Description		Comment
	Concrete Strength Class	Steel Description	
3	Concrete C35/45	B 500 S (A)	
4	Concrete C35/45 (70%)	B 500 S (A)	

1.2.1 MATERIAL PARAMETERS

Material No.	Description	Name	Size	Unit
3	**Concrete Strength Class: Concrete C35/45**			
	Characteristic Cylinder Compressive Strength	f_{ck}	35.00	N/mm^2
	5 % Fractile of Axial Tensile Strength	$f_{ctk,0.05}$	2.20	N/mm^2
	Characteristic for Nonlinear Calculations			
	Mean Secant Modulus of Elasticity	E_{cm}	34000.00	N/mm^2
	Mean Cylinder Compressive Strength	f_{cm}	43.00	N/mm^2
	Mean Axial Tensile Strength	f_{ctm}	3.20	N/mm^2
	Ultimate Strain for Pure Compression	ε_{c1}	-2.250	‰
	Ultimate Strain at Failure	ε_{c1u}	-3.500	‰
	Shear Modulus	G	14166.70	N/mm^2
	Poisson's Ratio	ν	0.200	-
	Characteristic Strains for Parabolic-Rectangular Diagram			
	Ultimate Strain for Pure Compression	ε_{c2}	-2.000	‰
	Ultimate Strain at Failure	ε_{cu2}	-3.500	‰
	Parabola Exponent	n	2.000	-
	Specific Weight	γ	25.00	kN/m^3
	Reinforcing Steel: B 500 S (A)			
	Modulus of Elasticity	E_s	200000.00	N/mm^2
	Yield Stress Mean Value	f_{ym}	550.00	N/mm^2
	Characteristic Yield Stress	f_{yk}	500.00	N/mm^2
	Tensile Strength Mean Value	f_{tm}	551.25	N/mm^2
	Characteristic Tensile Strength	f_{tk}	525.00	N/mm^2
	Limiting Strain	ε_{uk}	25.000	‰
4	**Concrete Strength Class: Concrete C35/45 (70%)**			
	Characteristic Cylinder Compressive Strength	f_{ck}	35.00	N/mm^2
	5 % Fractile of Axial Tensile Strength	$f_{ctk,0.05}$	2.20	N/mm^2
	Characteristic for Nonlinear Calculations			
	Mean Secant Modulus of Elasticity	E_{cm}	34000.00	N/mm^2
	Mean Cylinder Compressive Strength	f_{cm}	43.00	N/mm^2
	Mean Axial Tensile Strength	f_{ctm}	3.20	N/mm^2
	Ultimate Strain for Pure Compression	ε_{c1}	-2.250	‰
	Ultimate Strain at Failure	ε_{c1u}	-3.500	‰
	Shear Modulus	G	9916.70	N/mm^2
	Poisson's Ratio	ν	0.200	-
	Characteristic Strains for Parabolic-Rectangular Diagram			
	Ultimate Strain for Pure Compression	ε_{c2}	-2.000	‰
	Ultimate Strain at Failure	ε_{cu2}	-3.500	‰
	Parabola Exponent	n	2.000	-
	Specific Weight	γ	25.00	kN/m^3
	Reinforcing Steel: B 500 S (A)			
	Modulus of Elasticity	E_s	200000.00	N/mm^2
	Yield Stress Mean Value	f_{ym}	550.00	N/mm^2
	Characteristic Yield Stress	f_{yk}	500.00	N/mm^2
	Tensile Strength Mean Value	f_{tm}	551.25	N/mm^2
	Characteristic Tensile Strength	f_{tk}	525.00	N/mm^2
	Limiting Strain	ε_{uk}	25.000	‰

1.3 SURFACES

Surface No.	Matl. No.	$\sigma_{c,max}$ [N/mm²] / $\sigma_{s,max}$ [N/mm²]	$f_{ct,eff,wk}$ [N/mm²]	$f_{ct,eff,As,min}$ [N/mm²]	$w_{k,+z\ (top)}$ [mm] / $w_{k,-z\ (bottom)}$ [mm]	Effects due to Restraint: Apply	Effects due to Restraint: k_c [-]	Notes
5	Thickness Type: Constant, Thickness: 300.00 mm							
	3	var. var.	3.20	3.20	0.100 0.100	☐	var.	
11	Thickness Type: Constant, Thickness: 300.00 mm							
	3	var. var.	3.20	3.20	0.100 0.100	☐	var.	
13	Thickness Type: Constant, Thickness: 300.00 mm							
	3	var. var.	3.20	3.20	0.100 0.100	☐	var.	
14	Thickness Type: Constant, Thickness: 300.00 mm							
	3	var. var.	3.20	3.20	0.100 0.100	☐	var.	
15	Thickness Type: Constant, Thickness: 300.00 mm							
	3	var. var.	3.20	3.20	0.100 0.100	☐	var.	
16	Thickness Type: Constant, Thickness: 300.00 mm							
	3	var. var.	3.20	3.20	0.100 0.100	☐	var.	
17	Thickness Type: Constant, Thickness: 300.00 mm							
	3	var. var.	3.20	3.20	0.100 0.100	☐	var.	
18	Thickness Type: Constant, Thickness: 300.00 mm							
	3	var. var.	3.20	3.20	0.100 0.100	☐	var.	

1.4 REINFORCEMENT GROUP NO. 1 - DUGNAS

Applied to surfaces:	5,11,13-18
REINFORCEMENT RATIO	
Minimum secondary reinforcement	20.0 %
Basic minimum reinforcement	0.0 %
Minimum compression reinforcement	0.0 %
Minimum tension reinforcement	0.0 %
Maximum reinforcement percentage	4.0 %
Minimum shear reinforcement percentage	0.0 %

1.4 REINFORCEMENT GROUP NO. 1 - DUGNAS

REINFORCEMENT AREA FOR DESIGN OF SLS	
Use provided basic reinforcement and required additional reinforcement acc. to Tables 2.1, 2.2, 2.3	
Concrete cover acc. to Standard	☐
BASIC REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.00, c-2: 52.00 mm
Bar diameter	ds-1: 12.00, ds-2: 12.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,-z (top): 7.54, As-2,-z (top): 7.54 cm²/m
BASIC REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.00, c-2: 52.00 mm
Bar diameter	ds-1: 12.00, ds-2: 12.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,+z (bottom): 7.54, As-2,+z (bottom): 7.54 cm²/m
ADDITIONAL REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.00, c-2: 52.00 mm
Bar diameter	ds-1: 12.00, ds-2: 12.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
ADDITIONAL REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.00, c-2: 52.00 mm
Bar diameter	ds-1: 12.00, ds-2: 12.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
LONGITUDINAL REINFORCEMENT FOR SHEAR FORCE DESIGN	
Apply the greater value resulting from either the required or provided reinforcement (basic and add. reinforcement) per reinforcement direction	
OPTIONS FOR LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
Minimum longitudinal reinforcement for plates acc. to 9.3.1	☒
Direction of minimum reinforcement	
Reinforcement direction with the main tensile force from top (-z) and bottom (+z) surfaces together:	☒
Minimum longitudinal reinforcement for walls acc. to 9.6	☐
Minimum shear reinforcement	☒
Neutral axis depth limitation	☒
Variable strut inclination - min	21.801 °
Variable concrete strut inclination - max	45.000 °
Partial safety factor γ_s	PT 1.15, AC 1.00, SLS 1.00
Partial safety factor γ_c	PT 1.50, AC 1.20, SLS 1.00
Consideration of long-term effects Alpha-cc	PT 0.90, AC 0.90, SLS 1.00
Consideration of long-term effects Alpha-ct	SLS 1.00

2.2 REQUIRED REINFORCEMENT BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Symbol	Required Reinforcement ULS	SLS	ULS/SLS	Basic Reinf.	Additional Reinforcement Required	Provided	Unit	Notes
5	M3515	-0.425	-0.198	3.160	$a_{s,1,-z\ (top)}$	4.13	0.10	4.13	7.54	0.00	0.00	cm²/m	
	M3515	-0.425	-0.198	3.160	$a_{s,2,-z\ (top)}$	0.83	0.00	0.83	7.54	0.00	0.00	cm²/m	
	M1	0.000	-3.264	3.160	$a_{s,1,+z\ (bottom)}$	4.13	1.64	4.13	7.54	0.00	0.00	cm²/m	
	M2	0.000	-0.099	3.160	$a_{s,2,+z\ (bottom)}$	4.13	1.50	4.13	7.54	0.00	0.00	cm²/m	
	M1	0.000	-3.264	3.160	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	
11	M56	5.975	-0.000	3.160	$a_{s,1,-z\ (top)}$	4.13	0.04	4.13	7.54	0.00	0.00	cm²/m	
	M41 - E5509	5.550	0.000	3.160	$a_{s,2,-z\ (top)}$	4.13	1.20	4.13	7.54	0.00	0.00	cm²/m	
	M39 - E5452	0.000	0.000	3.160	$a_{s,1,+z\ (bottom)}$	4.13	1.77	4.13	7.54	0.00	0.00	cm²/m	
	M39 - E5453	0.000	0.000	3.160	$a_{s,2,+z\ (bottom)}$	4.13	1.69	4.13	7.54	0.00	0.00	cm²/m	
	M39 - E5452	0.000	0.000	3.160	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	
13	M6021	5.355	-2.770	3.160	$a_{s,1,-z\ (top)}$	4.13	0.28	4.13	7.54	0.00	0.00	cm²/m	
	M6232	4.296	-1.069	3.160	$a_{s,2,-z\ (top)}$	4.13	0.65	4.13	7.54	0.00	0.00	cm²/m	
	M6514	5.353	-0.198	3.160	$a_{s,1,+z\ (bottom)}$	4.46	3.86	4.46	7.54	0.00	0.00	cm²/m	
	M6514	5.353	-0.198	3.160	$a_{s,2,+z\ (bottom)}$	4.54	3.94	4.54	7.54	0.00	0.00	cm²/m	
	M41	5.550	0.000	3.160	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	
14	M47	1.450	-4.550	3.160	$a_{s,1,-z\ (top)}$	0.00	0.00	0.00	7.54	0.00	0.00	cm²/m	
	M47	1.450	-4.550	3.160	$a_{s,2,-z\ (top)}$	0.00	0.00	0.00	7.54	0.00	0.00	cm²/m	
	M49	1.450	-3.600	3.160	$a_{s,1,+z\ (bottom)}$	4.13	0.04	4.13	7.54	0.00	0.00	cm²/m	
	M47	1.450	-4.550	3.160	$a_{s,2,+z\ (bottom)}$	4.13	1.87	4.13	7.54	0.00	0.00	cm²/m	
	M47	1.450	-4.550	3.160	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	
15	M43	4.300	-1.250	3.160	$a_{s,1,-z\ (top)}$	0.00	0.00	0.00	7.54	0.00	0.00	cm²/m	
	M43	4.300	-1.250	3.160	$a_{s,2,-z\ (top)}$	0.00	0.00	0.00	7.54	0.00	0.00	cm²/m	
	M49	1.450	-3.600	3.160	$a_{s,1,+z\ (bottom)}$	4.13	0.39	4.13	7.54	0.00	0.00	cm²/m	
	M43	4.300	-1.250	3.160	$a_{s,2,+z\ (bottom)}$	4.13	0.99	4.13	7.54	0.00	0.00	cm²/m	
	M43	4.300	-1.250	3.160	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	
16	M7371	1.245	-3.583	3.160	$a_{s,1,-z\ (top)}$	0.07	0.06	0.07	7.54	0.00	0.00	cm²/m	
	M7371	1.245	-3.583	3.160	$a_{s,2,-z\ (top)}$	0.01	0.00	0.01	7.54	0.00	0.00	cm²/m	
	M7278	0.201	-4.352	3.160	$a_{s,1,+z\ (bottom)}$	5.06	4.39	5.06	7.54	0.00	0.00	cm²/m	
	M7693	0.201	-0.198	3.160	$a_{s,2,+z\ (bottom)}$	4.70	4.07	4.70	7.54	0.00	0.00	cm²/m	
	M1	0.000	-3.264	3.160	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	
17	M7757	5.975	-4.352	3.160	$a_{s,1,-z\ (top)}$	4.13	0.05	4.13	7.54	0.00	0.00	cm²/m	
	M7757	5.975	-4.352	3.160	$a_{s,2,-z\ (top)}$	0.83	0.00	0.83	7.54	0.00	0.00	cm²/m	
	M41	5.550	0.000	3.160	$a_{s,1,+z\ (bottom)}$	4.13	1.43	4.13	7.54	0.00	0.00	cm²/m	
	M41	5.550	0.000	3.160	$a_{s,2,+z\ (bottom)}$	4.13	1.67	4.13	7.54	0.00	0.00	cm²/m	
	M41	5.550	0.000	3.160	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	
18	M71	5.975	-4.550	3.160	$a_{s,1,-z\ (top)}$	4.13	0.02	4.13	7.54	0.00	0.00	cm²/m	

■ 2.2 REQUIRED REINFORCEMENT BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Symbol	Required Reinforcement ULS	SLS	ULS/SLS	Basic Reinf.	Additional Reinforcement Required	Provided	Unit	Notes
	M60	-0.425	-4.975	3.160	$a_{s,2,-z\ (top)}$	4.13	0.24	4.13	7.54	0.00	0.00	cm²/m	
	M40 - E8307	0.000	-4.550	3.160	$a_{s,1,+z\ (bottom)}$	4.13	1.74	4.13	7.54	0.00	0.00	cm²/m	
	M40 - E8307	0.000	-4.550	3.160	$a_{s,2,+z\ (bottom)}$	4.13	1.78	4.13	7.54	0.00	0.00	cm²/m	
	M40 - E8307	0.000	-4.550	3.160	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	

■ 3.2 SERVICEABILITY CHECK BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Load Case	Type	Design Exist. Value	Limit Value	Unit	Ratio	Notes
5	M39	0.000	0.000	3.160	CO12	σ_c	-2.99	-15.75	N/mm²	0.2	
	M1	0.000	-3.264	3.160	CO1	σ_s	0.00	400.00	N/mm²	0.0	226)
	M1	0.000	-3.264	3.160	CO12	w_k	0.000	0.100	mm	0.0	226)
11	M754	0.193	0.000	3.160	CO12	σ_c	-2.78	-15.75	N/mm²	0.2	
	M39 - E5452	0.000	0.000	3.160	CO1	σ_s	0.00	400.00	N/mm²	0.0	226)
	M39 - E5452	0.000	0.000	3.160	CO12	w_k	0.000	0.100	mm	0.0	226)
13	M6535	3.413	-0.126	3.160	CO12	σ_c	-3.52	-15.75	N/mm²	0.3	
	M41	5.550	0.000	3.160	CO1	σ_s	0.00	400.00	N/mm²	0.0	226)
	M41	5.550	0.000	3.160	CO12	w_k	0.000	0.100	mm	0.0	226)
14	M4149 - E6729	1.450	-3.790	3.160	CO12	σ_c	-2.77	-15.75	N/mm²	0.2	
	M47	1.450	-4.550	3.160	CO1	σ_s	0.00	400.00	N/mm²	0.0	226)
	M47	1.450	-4.550	3.160	CO12	w_k	0.000	0.100	mm	0.0	226)
15	M4132 - E7399	1.450	-2.131	3.160	CO12	σ_c	-3.06	-15.75	N/mm²	0.2	
	M43	4.300	-1.250	3.160	CO1	σ_s	0.00	400.00	N/mm²	0.0	226)
	M43	4.300	-1.250	3.160	CO12	w_k	0.000	0.100	mm	0.0	226)
16	M7278	0.201	-4.352	3.160	CO8	σ_c	-3.05	-15.75	N/mm²	0.2	
	M1	0.000	-3.264	3.160	CO1	σ_s	0.00	400.00	N/mm²	0.0	226)
	M1	0.000	-3.264	3.160	CO12	w_k	0.000	0.100	mm	0.0	226)
17	M41	5.550	0.000	3.160	CO12	σ_c	-2.95	-15.75	N/mm²	0.2	
	M41	5.550	0.000	3.160	CO1	σ_s	0.00	400.00	N/mm²	0.0	226)
	M41	5.550	0.000	3.160	CO12	w_k	0.000	0.100	mm	0.0	226)
18	M2406	0.193	-4.550	3.160	CO12	σ_c	-2.92	-15.75	N/mm²	0.2	
	M40 - E8307	0.000	-4.550	3.160	CO1	σ_s	0.00	400.00	N/mm²	0.0	226)
	M40 - E8307	0.000	-4.550	3.160	CO12	w_k	0.000	0.100	mm	0.0	226)

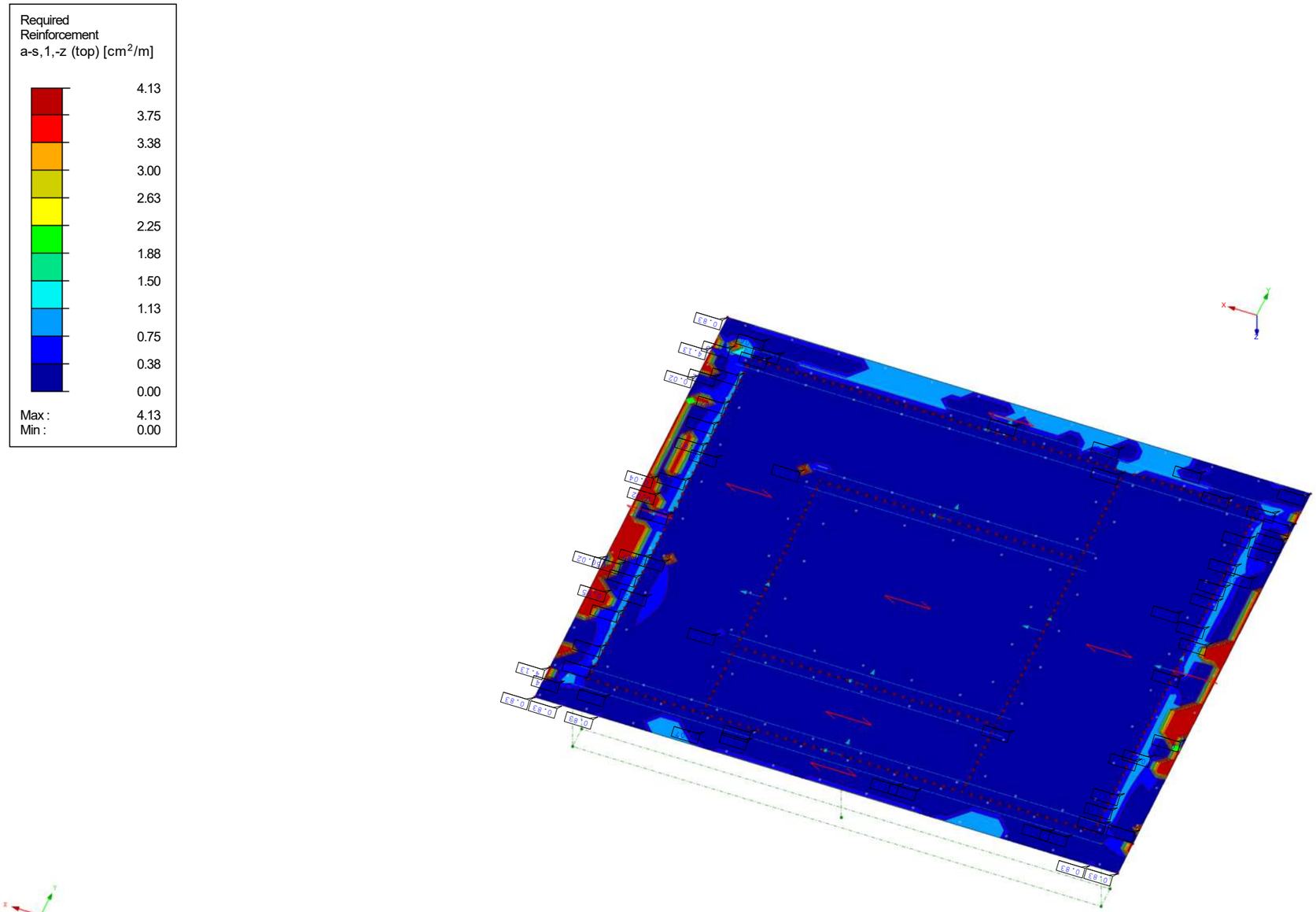
■ SERVICEABILITY CHECK NOTES

No.	Description
219)	Crack width exceeded.
226)	Concrete cracks on neither side.
233)	The design is not satisfactory! Because of the required reinforcement for ULS or user-defined reinforcement the defined reinforcement area is different from the required reinforcement for SLS and that negatively affects SLS design.

REQUIRED REINFORCEMENT $a_{s,1,-z\ (top)}$

RF-CONCRETE Surfaces CA1
1.1_Dugnas
Surfaces Required Reinforcement a-s,1,-z (top) [cm²/m]
Values: a-s,1,-z (top) [cm^2/m]

Isometric



Max a-s,1,-z (top): 4.13, Min a-s,1,-z (top): 0.00 cm²/m

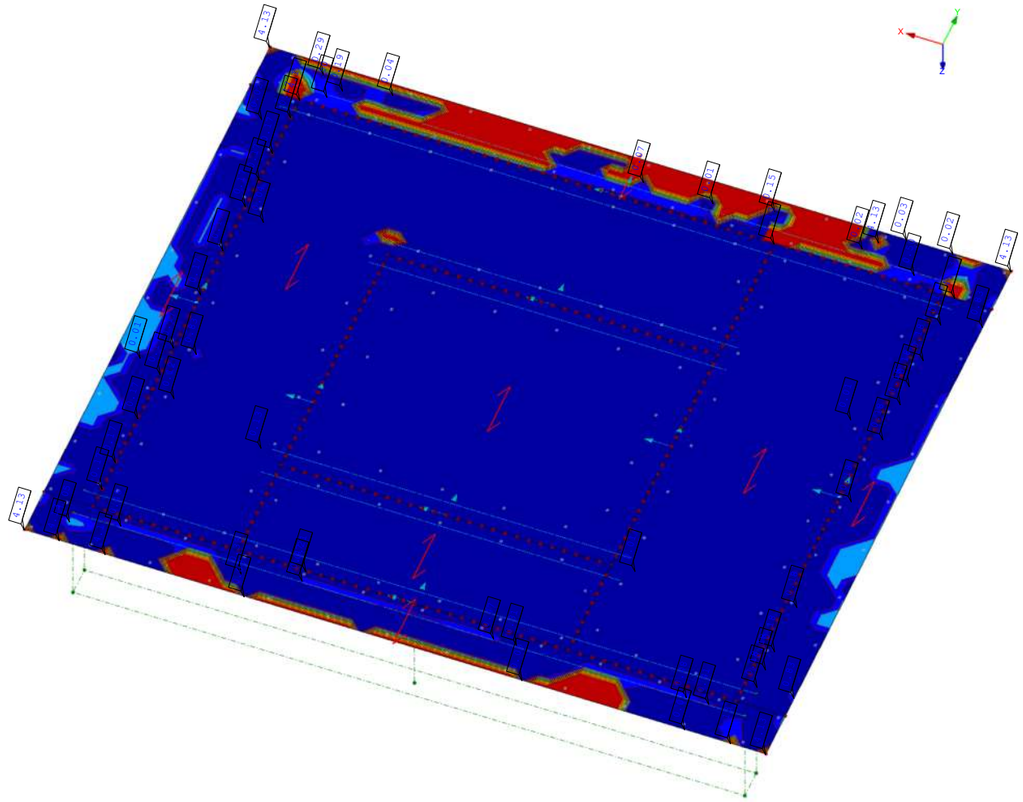
REQUIRED REINFORCEMENT $a_{s,2,-z\ (top)}$

RF-CONCRETE Surfaces CA1
1.1_Dugnas
Surfaces Required Reinforcement a-s,2,-z (top) [cm²/m]
Values: a-s,2,-z (top) [cm^2/m]

Isometric

Required Reinforcement
a-s,2,-z (top) [cm²/m]

	4.13
	3.75
	3.38
	3.00
	2.63
	2.25
	1.88
	1.50
	1.13
	0.75
	0.38
	0.00
Max :	4.13
Min :	0.00



Max a-s,2,-z (top): 4.13, Min a-s,2,-z (top): 0.00 cm²/m

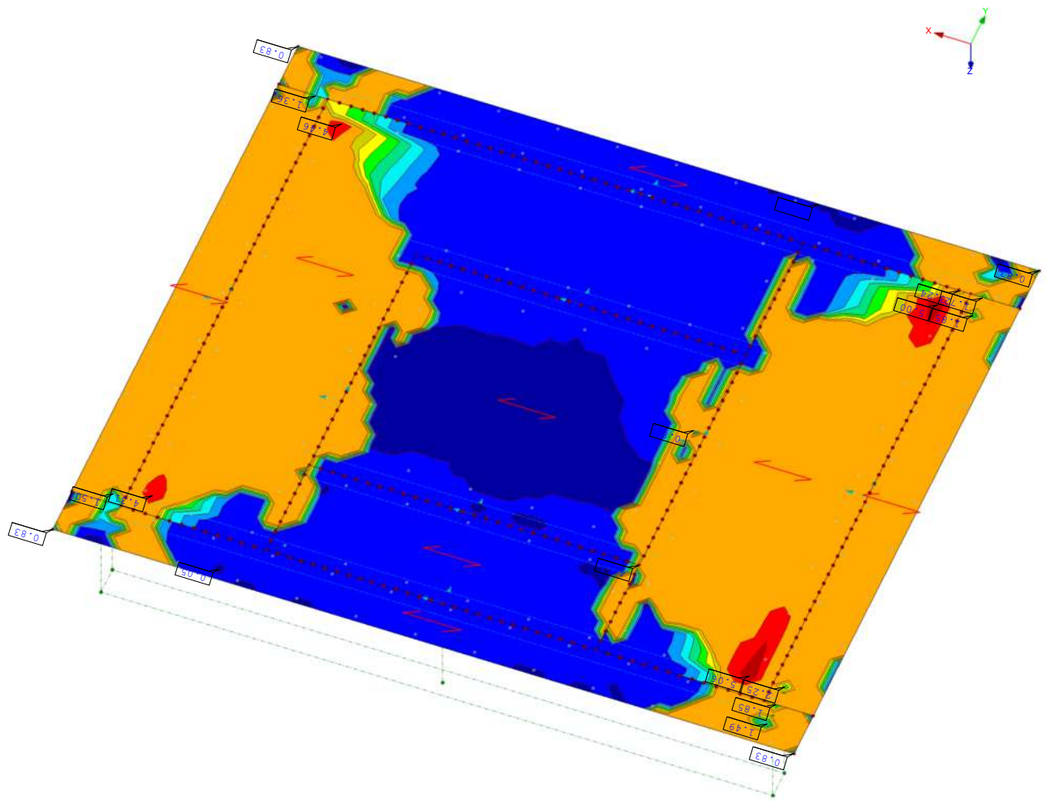
REQUIRED REINFORCEMENT $a_{s,1,+z\ (bottom)}$

RF-CONCRETE Surfaces CA1
1.1_Dugnas
Surfaces Required Reinforcement a-s,1,+z (bottom) [cm²/m]
Values: a-s,1,+z (bottom) [cm^2/m]

Isometric

Required Reinforcement a-s,1,+z (bottom) [cm²/m]

	5.06
	4.60
	4.14
	3.68
	3.22
	2.76
	2.30
	1.84
	1.38
	0.92
	0.46
	0.00
Max :	5.06
Min :	0.00

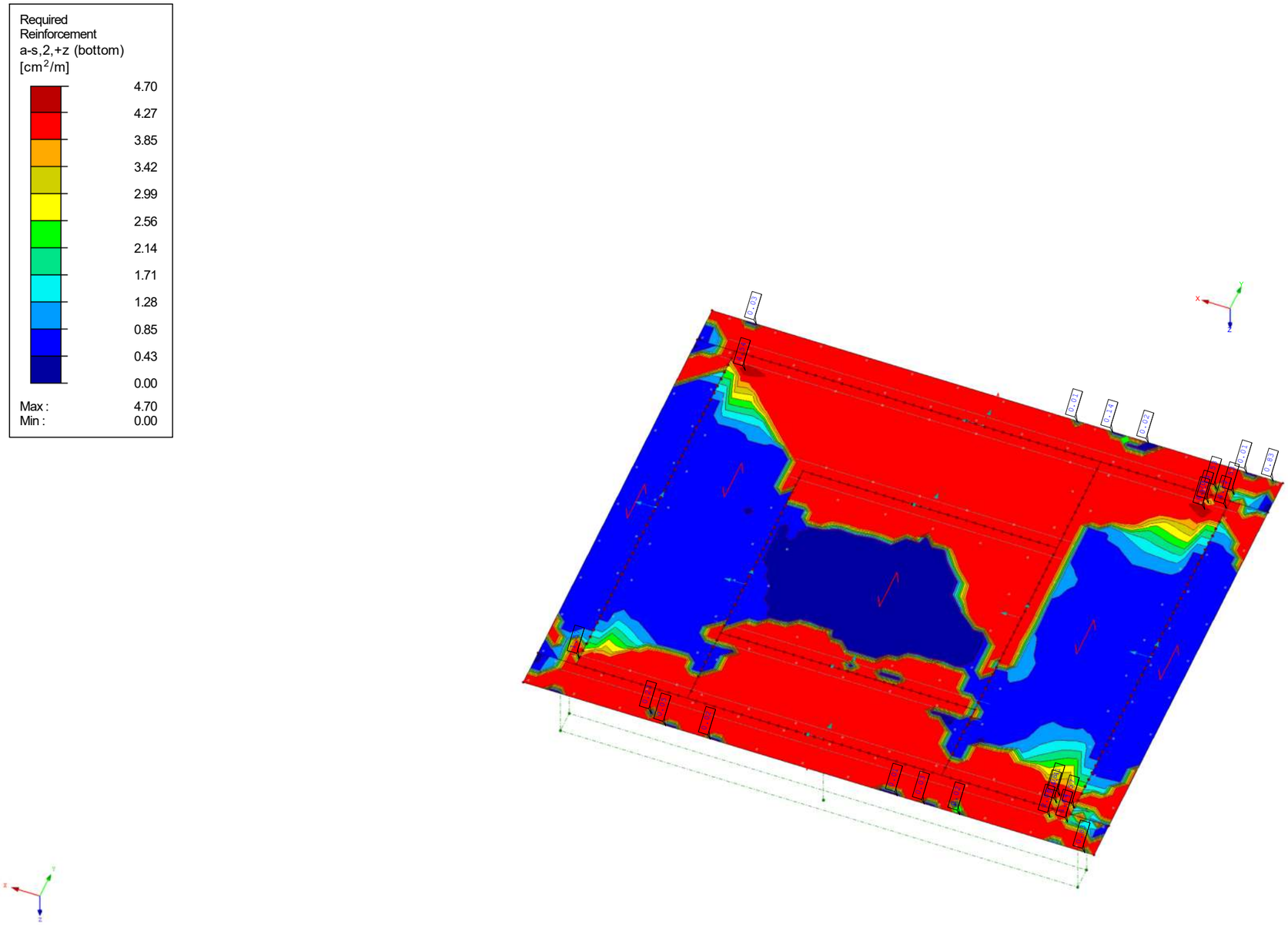


Max a-s,1,+z (bottom): 5.06, Min a-s,1,+z (bottom): 0.00 cm²/m

REQUIRED REINFORCEMENT $a_{s,2,+z\ (bottom)}$

RF-CONCRETE Surfaces CA1
1.1_Dugnas
Surfaces Required Reinforcement a-s,2,+z (bottom) [cm²/m]
Values: a-s,2,+z (bottom) [cm^2/m]

Isometric



Max a-s,2,+z (bottom): 4.70, Min a-s,2,+z (bottom): 0.00 cm²/m

RF-CONCRETE Surfaces
CA2
1.2_Soninees sienos

Project: 1
1

Model: SK23010_Dreverna_ (06) statinys_ ..

Date: 2023-09-06

1.1 GENERAL DATA

Design according to Standard:	LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
ULTIMATE LIMIT STATE		
Load combinations for design:	CO1	Bandymas 1-a sisterna (susitraukimas)
		Persistent and Transient
	CO2	Bandymas 2-a sisterna (susitraukimas)
		Persistent and Transient
	CO3	Bandymas 1+live (susitraukimas)
		Persistent and Transient
	CO4	Eksplotacija 1 (susitraukimas)
		Persistent and Transient
	CO5	Eksplotacija 2 (susitraukimas)
		Persistent and Transient
	CO6	Eksplotacija 1+2 (susitraukimas)
		Persistent and Transient
	CO7	Eksplotacija S (susitraukimas)
		Persistent and Transient
	CO8	Eksplotacija 1+S (susitraukimas)
		Persistent and Transient
	CO9	Eksplotacija 2+S (susitraukimas)
		Persistent and Transient
	CO10	Eksplotacija 1+S (susitraukimas)
		Persistent and Transient
	CO11	Eksplotacija 2+S (susitraukimas)
		Persistent and Transient
	CO12	Eksplotacija (kėlimas) (susitraukimas)
		Persistent and Transient
SERVICEABILITY LIMIT STATE		
Load combinations for design:	CO1	Bandymas 1-a sisterna (susitraukimas)
		Quasi-permanent, k_t 0.600
	CO2	Bandymas 2-a sisterna (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO3	Bandymas 1+live (susitraukimas)
		Quasi-permanent, k_t 0.549
	CO4	Eksplotacija 1 (susitraukimas)
		Quasi-permanent, k_t 0.600
	CO5	Eksplotacija 2 (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO6	Eksplotacija 1+2 (susitraukimas)
		Quasi-permanent, k_t 0.549
	CO7	Eksplotacija S (susitraukimas)
		Quasi-permanent, k_t 0.559
	CO8	Eksplotacija 1+S (susitraukimas)
		Quasi-permanent, k_t 0.566
	CO9	Eksplotacija 2+S (susitraukimas)
		Quasi-permanent, k_t 0.566
	CO10	Eksplotacija 1+S (susitraukimas)
		Quasi-permanent, k_t 0.566
	CO11	Eksplotacija 2+S (susitraukimas)
		Quasi-permanent, k_t 0.566
	CO12	Eksplotacija (kėlimas) (susitraukimas)
		Quasi-permanent, k_t 0.549
Definition of Provided Additional Reinforcement	Automatic arrangement according to the specifications in Table 1.4	
Type of SLS method:	Analytical Method	
	By assuming an identical deformation ratio of the longitudinal reinforcement	
Design of		
Concrete Stress Analysis	☒	
Steel Stress Analysis	☒	
Crack widths	☒	
Deformation Analysis	☐	
Layout of longitudinal reinforcement		
Required longitudinal reinforcement automatically increased for serviceability limit state design:	☒	
DETAILS		
Analysis Method for Reinforcement Envelope	Mixed	
Apply the averaged internal forces in the defined average region for the ULS calculation and for the analytic method of SLS calculation.	☒	
Apply the internal forces without the rib components	☐	
Design Situation Settings for Serviceability Limit State Checks		
Load combination:		
Characteristic with direct load	Checks: -	
Characteristic with imposed deformation	Checks: -	
Frequent	Checks: -	
Quasi-permanent	Checks: k_1*f_{ck}, k_2*f_{ck}, k_3*f_{yk}, k_4*f_{yk}, w_k, u_l	

1.2 MATERIALS

Material No.	Material Description		Comment
	Concrete Strength Class	Steel Description	
3	Concrete C35/45	B 500 S (A)	
4	Concrete C35/45 (70%)	B 500 S (A)	

1.2.1 MATERIAL PARAMETERS

Material No.	Description	Name	Size	Unit
3	**Concrete Strength Class: Concrete C35/45**			
	Characteristic Cylinder Compressive Strength	f_{ck}	35.00	N/mm^2
	5 % Fractile of Axial Tensile Strength	$f_{ctk,0.05}$	2.20	N/mm^2
	Characteristic for Nonlinear Calculations			
	Mean Secant Modulus of Elasticity	E_{cm}	34000.00	N/mm^2
	Mean Cylinder Compressive Strength	f_{cm}	43.00	N/mm^2
	Mean Axial Tensile Strength	f_{ctm}	3.20	N/mm^2
	Ultimate Strain for Pure Compression	ε_{c1}	-2.250	‰
	Ultimate Strain at Failure	ε_{c1u}	-3.500	‰
	Shear Modulus	G	14166.70	N/mm^2
	Poisson's Ratio	ν	0.200	-
	Characteristic Strains for Parabolic-Rectangular Diagram			
	Ultimate Strain for Pure Compression	ε_{c2}	-2.000	‰
	Ultimate Strain at Failure	ε_{cu2}	-3.500	‰
	Parabola Exponent	n	2.000	-
	Specific Weight	γ	25.00	kN/m^3
	Reinforcing Steel: B 500 S (A)			
	Modulus of Elasticity	E_s	200000.00	N/mm^2
	Yield Stress Mean Value	f_{ym}	550.00	N/mm^2
	Characteristic Yield Stress	f_{yk}	500.00	N/mm^2
	Tensile Strength Mean Value	f_{tm}	551.25	N/mm^2
	Characteristic Tensile Strength	f_{tk}	525.00	N/mm^2
	Limiting Strain	ε_{uk}	25.000	‰
4	**Concrete Strength Class: Concrete C35/45 (70%)**			
	Characteristic Cylinder Compressive Strength	f_{ck}	35.00	N/mm^2
	5 % Fractile of Axial Tensile Strength	$f_{ctk,0.05}$	2.20	N/mm^2
	Characteristic for Nonlinear Calculations			
	Mean Secant Modulus of Elasticity	E_{cm}	34000.00	N/mm^2
	Mean Cylinder Compressive Strength	f_{cm}	43.00	N/mm^2
	Mean Axial Tensile Strength	f_{ctm}	3.20	N/mm^2
	Ultimate Strain for Pure Compression	ε_{c1}	-2.250	‰
	Ultimate Strain at Failure	ε_{c1u}	-3.500	‰
	Shear Modulus	G	9916.70	N/mm^2
	Poisson's Ratio	ν	0.200	-
	Characteristic Strains for Parabolic-Rectangular Diagram			
	Ultimate Strain for Pure Compression	ε_{c2}	-2.000	‰
	Ultimate Strain at Failure	ε_{cu2}	-3.500	‰
	Parabola Exponent	n	2.000	-
	Specific Weight	γ	25.00	kN/m^3
	Reinforcing Steel: B 500 S (A)			
	Modulus of Elasticity	E_s	200000.00	N/mm^2
	Yield Stress Mean Value	f_{ym}	550.00	N/mm^2
	Characteristic Yield Stress	f_{yk}	500.00	N/mm^2
	Tensile Strength Mean Value	f_{tm}	551.25	N/mm^2
	Characteristic Tensile Strength	f_{tk}	525.00	N/mm^2
	Limiting Strain	ε_{uk}	25.000	‰

1.3 SURFACES

Surface No.	Matl. No.	$\sigma_{c,max}$ [N/mm²] / $\sigma_{s,max}$ [N/mm²]	$f_{ct,eff,wk}$ [N/mm²]	$f_{ct,eff,As,min}$ [N/mm²]	$w_{k,+z\ (top)}$ [mm] / $w_{k,-z\ (bottom)}$ [mm]	Effects due to Restraint: Apply	Effects due to Restraint: k_c [-]	Notes
1	Thickness Type: Constant, Thickness: 300.00 mm							
	4	var. var.	3.20	3.20	0.100 0.100	☐	var.	
2	Thickness Type: Constant, Thickness: 300.00 mm							
	4	var. var.	3.20	3.20	0.100 0.100	☐	var.	
3	Thickness Type: Constant, Thickness: 300.00 mm							
	4	var. var.	3.20	3.20	0.100 0.100	☐	var.	
4	Thickness Type: Constant, Thickness: 300.00 mm							
	4	var. var.	3.20	3.20	0.100 0.100	☐	var.	

1.4 REINFORCEMENT GROUP NO. 1 - SIENA ISORINE

Applied to surfaces:	1-4
REINFORCEMENT RATIO	
Minimum secondary reinforcement	20.0 %
Basic minimum reinforcement	0.0 %
Minimum compression reinforcement	0.0 %
Minimum tension reinforcement	0.0 %
Maximum reinforcement percentage	4.0 %
Minimum shear reinforcement percentage	0.0 %
REINFORCEMENT AREA FOR DESIGN OF SLS	
Use provided basic reinforcement and required additional reinforcement acc. to Tables 2.1, 2.2, 2.3	
Concrete cover acc. to Standard	☐
BASIC REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.00, c-2: 52.00 mm
Bar diameter	ds-1: 12.00, ds-2: 12.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,-z (top): 7.54, As-2,-z (top): 7.54 cm²/m

1.4 REINFORCEMENT GROUP NO. 1 - SIENA ISORINE

BASIC REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.00, c-2: 52.00 mm
Bar diameter	ds-1: 12.00, ds-2: 12.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,+z (bottom): 7.54, As-2,+z (bottom): 7.54 cm²/m
ADDITIONAL REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.00, c-2: 52.00 mm
Bar diameter	ds-1: 12.00, ds-2: 12.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
ADDITIONAL REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.00, c-2: 52.00 mm
Bar diameter	ds-1: 12.00, ds-2: 12.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
LONGITUDINAL REINFORCEMENT FOR SHEAR FORCE DESIGN	
Apply the greater value resulting from either the required or provided reinforcement (basic and add. reinforcement) per reinforcement direction	
OPTIONS FOR LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
Minimum longitudinal reinforcement for plates acc. to 9.3.1	☒
Direction of minimum reinforcement	
Reinforcement direction with the main tensile force from top (-z) and bottom (+z) surfaces together:	☒
Minimum longitudinal reinforcement for walls acc. to 9.6	☐
Minimum shear reinforcement	☒
Neutral axis depth limitation	☒
Variable strut inclination - min	21.801 °
Variable concrete strut inclination - max	45.000 °
Partial safety factor γ_s	PT 1.15, AC 1.00, SLS 1.00
Partial safety factor γ_c	PT 1.50, AC 1.20, SLS 1.00
Consideration of long-term effects Alpha-cc	PT 0.90, AC 0.90, SLS 1.00
Consideration of long-term effects Alpha-ct	SLS 1.00

2.2 REQUIRED REINFORCEMENT BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Symbol	Required Reinforcement ULS	SLS	ULS/SLS	Basic Reinf.	Additional Reinforcement Required	Provided	Unit	Notes
1	M104	0.000	-0.192	0.000	$a_{s,1,-z\ (top)}$	7.30	21.05	21.05	7.54	13.51	13.51	cm²/m	
	M39	0.000	0.000	3.160	$a_{s,2,-z\ (top)}$	1.74	9.20	9.20	7.54	1.66	1.66	cm²/m	
	M1711	0.000	-2.176	3.160	$a_{s,1,+z\ (bottom)}$	9.86	8.58	9.86	7.54	2.32	2.32	cm²/m	
	M566	0.000	-2.967	1.975	$a_{s,2,+z\ (bottom)}$	4.40	3.82	4.40	7.54	0.00	0.00	cm²/m	
	M2	0.000	-0.099	3.160	a_{sw}	9.47	-	9.47	-	-	-	cm²/m²	
2	M800	4.750	0.000	3.160	$a_{s,1,-z\ (top)}$	10.34	34.89	34.89	7.54	27.35	27.35	cm²/m	
	M785	3.250	0.000	3.160	$a_{s,2,-z\ (top)}$	5.24	19.16	19.16	7.54	11.62	11.62	cm²/m	
	M894	1.651	0.000	3.064	$a_{s,1,+z\ (bottom)}$	9.78	8.50	9.78	7.54	2.24	2.24	cm²/m	
	M765	1.257	0.000	3.160	$a_{s,2,+z\ (bottom)}$	7.54	0.50	7.54	7.54	0.00	0.00	cm²/m	
	M22	5.550	0.000	0.000	a_{sw}	9.47	-	9.47	-	-	-	cm²/m²	
3	M1735	5.550	-0.207	0.000	$a_{s,1,-z\ (top)}$	9.37	28.25	28.25	7.54	20.71	20.71	cm²/m	
	M41	5.550	0.000	3.160	$a_{s,2,-z\ (top)}$	2.17	10.68	10.68	7.54	3.14	3.14	cm²/m	
	M1656	5.550	-2.275	3.160	$a_{s,1,+z\ (bottom)}$	9.62	8.37	9.62	7.54	2.08	2.08	cm²/m	
	M32	5.550	-2.275	0.000	$a_{s,2,+z\ (bottom)}$	4.38	3.81	4.38	7.54	0.00	0.00	cm²/m	
	M41	5.550	0.000	3.160	a_{sw}	9.47	-	9.47	-	-	-	cm²/m²	
4	M2409	0.207	-4.550	0.000	$a_{s,1,-z\ (top)}$	7.54	21.60	21.60	7.54	14.06	14.06	cm²/m	
	M2409	0.207	-4.550	0.000	$a_{s,2,-z\ (top)}$	7.54	0.47	7.54	7.54	0.00	0.00	cm²/m	
	M2545	1.649	-4.550	3.061	$a_{s,1,+z\ (bottom)}$	9.47	8.24	9.47	7.54	1.93	1.93	cm²/m	
	M2409	0.207	-4.550	0.000	$a_{s,2,+z\ (bottom)}$	7.54	0.11	7.54	7.54	0.00	0.00	cm²/m	
	M24	5.550	-4.550	0.000	a_{sw}	9.47	-	9.47	-	-	-	cm²/m²	

3.2 SERVICEABILITY CHECK BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Load Case	Design Type	Exist. Value	Limit Value	Unit	Ratio	Notes
1	M444	0.000	-0.189	0.888	CO12	σ_c	-10.71	-15.75	N/mm²	0.7	
	M104	0.000	-0.192	0.000	CO12	σ_s	157.59	400.00	N/mm²	0.4	
	M109	0.000	0.000	0.296	CO12	w_k	0.110	0.100	mm	1.1	219) 233)
2	M1272	0.190	0.000	0.888	CO12	σ_c	-10.04	-15.75	N/mm²	0.7	
	M869	0.204	0.000	0.000	CO12	σ_s	162.04	400.00	N/mm²	0.5	
	M1262	0.190	0.000	1.087	CO12	w_k	0.117	0.100	mm	1.2	219) 233)
3	M2083	5.550	-0.208	0.197	CO12	σ_c	-10.45	-15.75	N/mm²	0.7	
	M2087	5.550	-0.195	0.098	CO12	σ_s	164.46	400.00	N/mm²	0.5	
	M2071	5.550	-0.195	0.395	CO12	w_k	0.108	0.100	mm	1.1	219) 233)
4	M3252	0.189	-4.550	0.297	CO12	σ_c	-9.03	-15.75	N/mm²	0.6	
	M2409	0.207	-4.550	0.000	CO12	σ_s	158.11	400.00	N/mm²	0.4	
	M2409	0.207	-4.550	0.000	CO12	w_k	0.103	0.100	mm	1.1	219) 233)

■ SERVICEABILITY CHECK NOTES

No.	Description
219)	Crack width exceeded.
226)	Concrete cracks on neither side.
233)	The design is not satisfactory! Because of the required reinforcement for ULS or user-defined reinforcement the defined reinforcement area is different from the required reinforcement for SLS and that negatively affects SLS design.

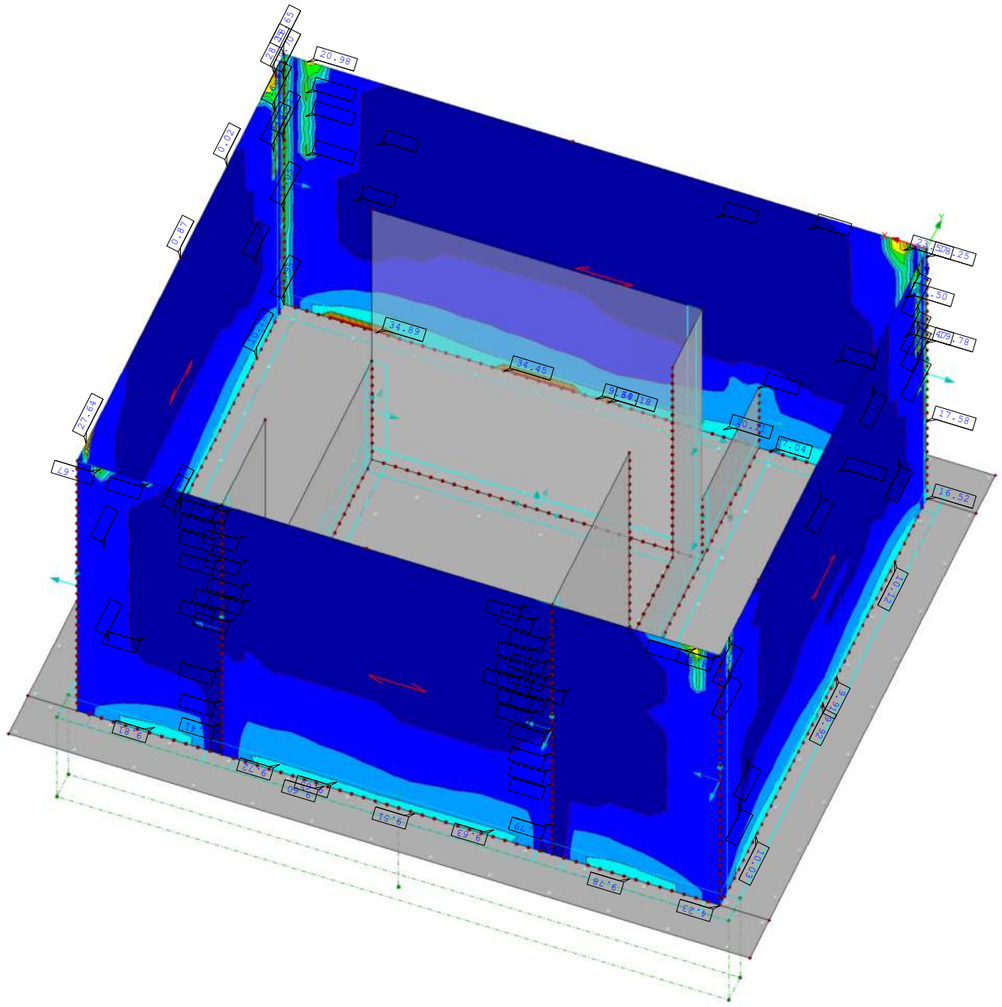
REQUIRED REINFORCEMENT $a_{s,1,-z\ (top)}$

RF-CONCRETE Surfaces CA2
1.2_Soninees sienos
Surfaces Required Reinforcement a-s,1,-z (top) [cm²/m]
Values: a-s,1,-z (top) [cm^2/m]

Isometric

Required Reinforcement
a-s,1,-z (top) [cm²/m]

	34.89
	31.72
	28.54
	25.37
	22.20
	19.03
	15.86
	12.69
	9.51
	6.34
	3.17
	0.00
Max :	34.89
Min :	0.00

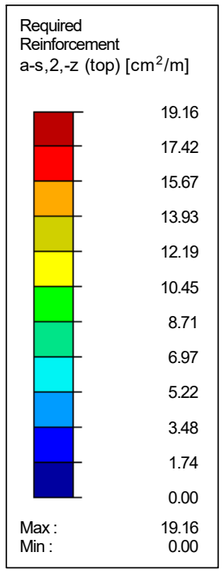


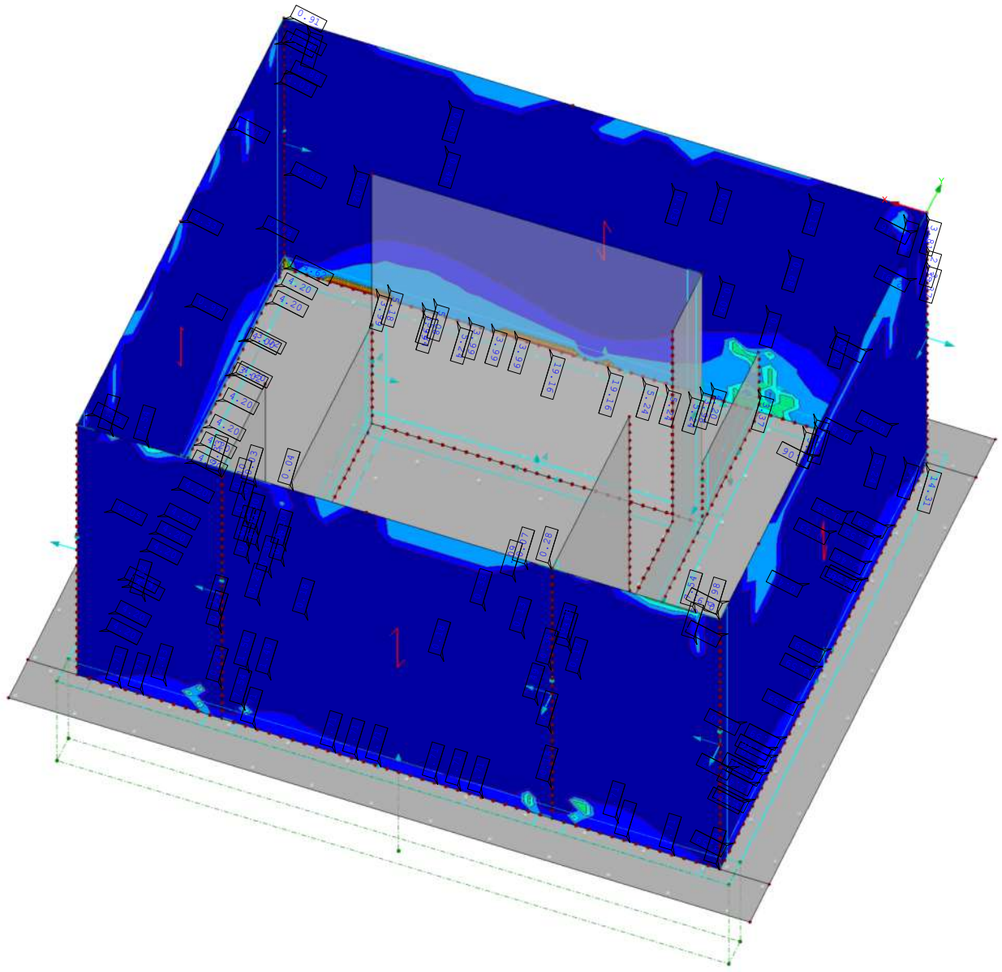
Max a-s,1,-z (top): 34.89, Min a-s,1,-z (top): 0.00 cm²/m

REQUIRED REINFORCEMENT $a_{s,2,-z\ (top)}$

RF-CONCRETE Surfaces CA2
1.2_Soninees sienos
Surfaces Required Reinforcement a-s,2,-z (top) [cm²/m]
Values: a-s,2,-z (top) [cm^2/m]

Isometric





Max a-s,2,-z (top): 19.16, Min a-s,2,-z (top): 0.00 cm²/m

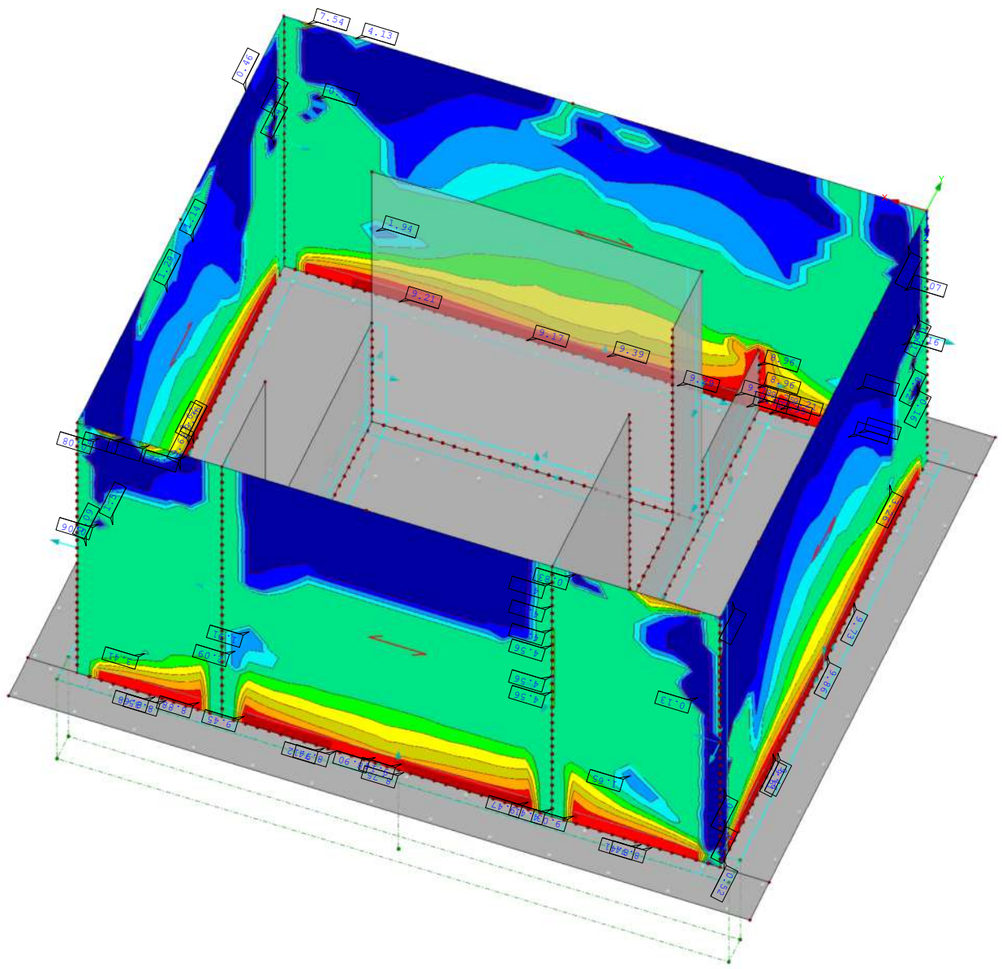
REQUIRED REINFORCEMENT $a_{s,1,+z}$ (bottom)

RF-CONCRETE Surfaces CA2
1.2_Soninees sienos
Surfaces Required Reinforcement a-s,1,+z (bottom) [cm²/m]
Values: a-s,1,+z (bottom) [cm^2/m]

Isometric

Required Reinforcement a-s,1,+z (bottom) [cm²/m]

	9.86
	8.96
	8.07
	7.17
	6.28
	5.38
	4.48
	3.59
	2.69
	1.79
	0.90
	0.00
Max :	9.86
Min :	0.00

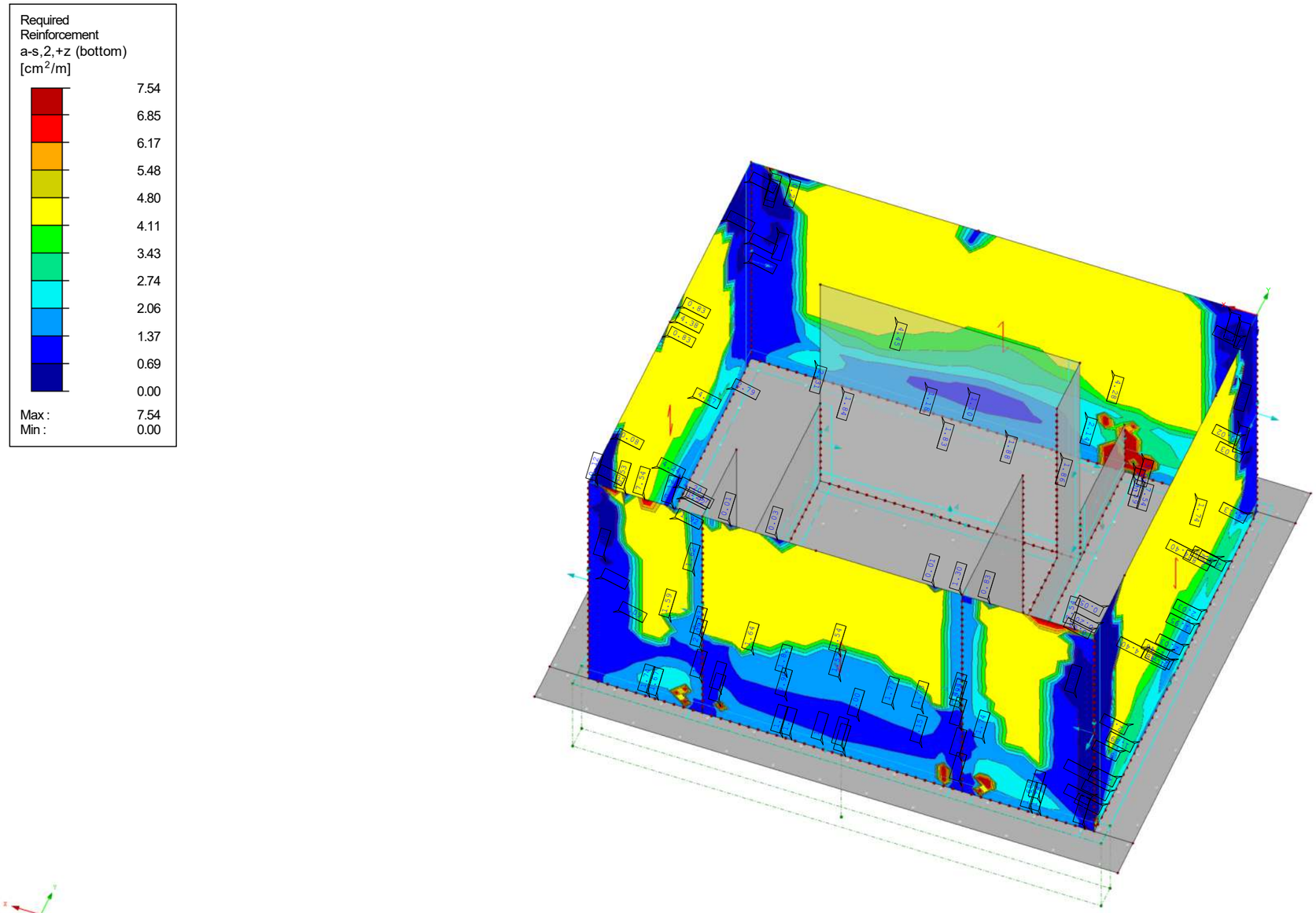


Max a-s,1,+z (bottom): 9.86, Min a-s,1,+z (bottom): 0.00 cm²/m

REQUIRED REINFORCEMENT $a_{s,2,+z\ (bottom)}$

RF-CONCRETE Surfaces CA2
1.2_Soninees sienos
Surfaces Required Reinforcement a-s,2,+z (bottom) [cm²/m]
Values: a-s,2,+z (bottom) [cm^2/m]

Isometric



Max a-s,2,+z (bottom): 7.54, Min a-s,2,+z (bottom): 0.00 cm²/m

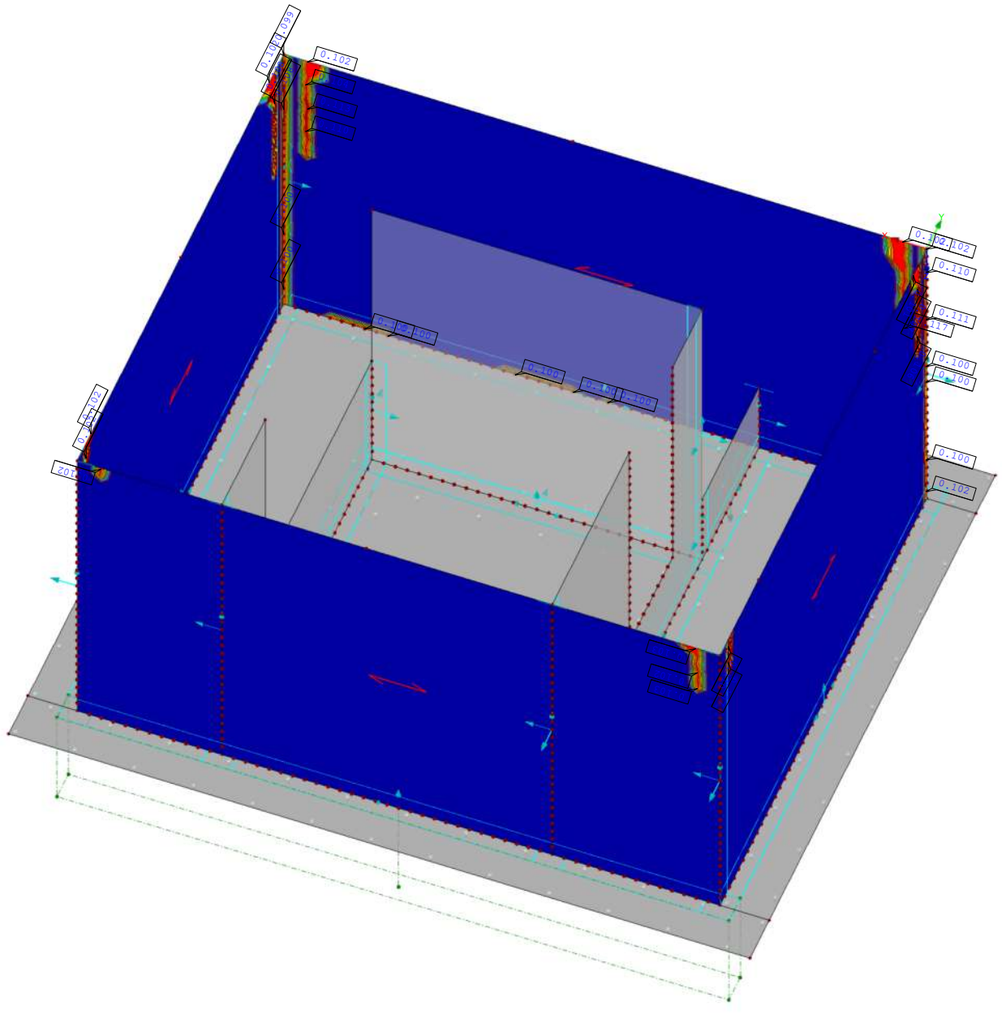
CRACK WIDTH $w_{k,1,-z\ (top)}$

RF-CONCRETE Surfaces CA2
1.2_Soninees sienos
Surfaces Crack width w-k,1,-z (top) [mm]
Values: w-k,1,-z (top) [mm]

Isometric

Crack width
w-k,1,-z (top) [mm]

	0.117
	0.106
	0.096
	0.085
	0.075
	0.064
	0.053
	0.043
	0.032
	0.021
	0.011
	0.000
Max :	0.117
Min :	0.000

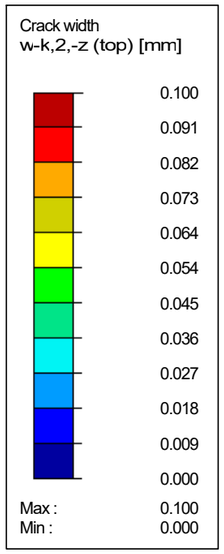


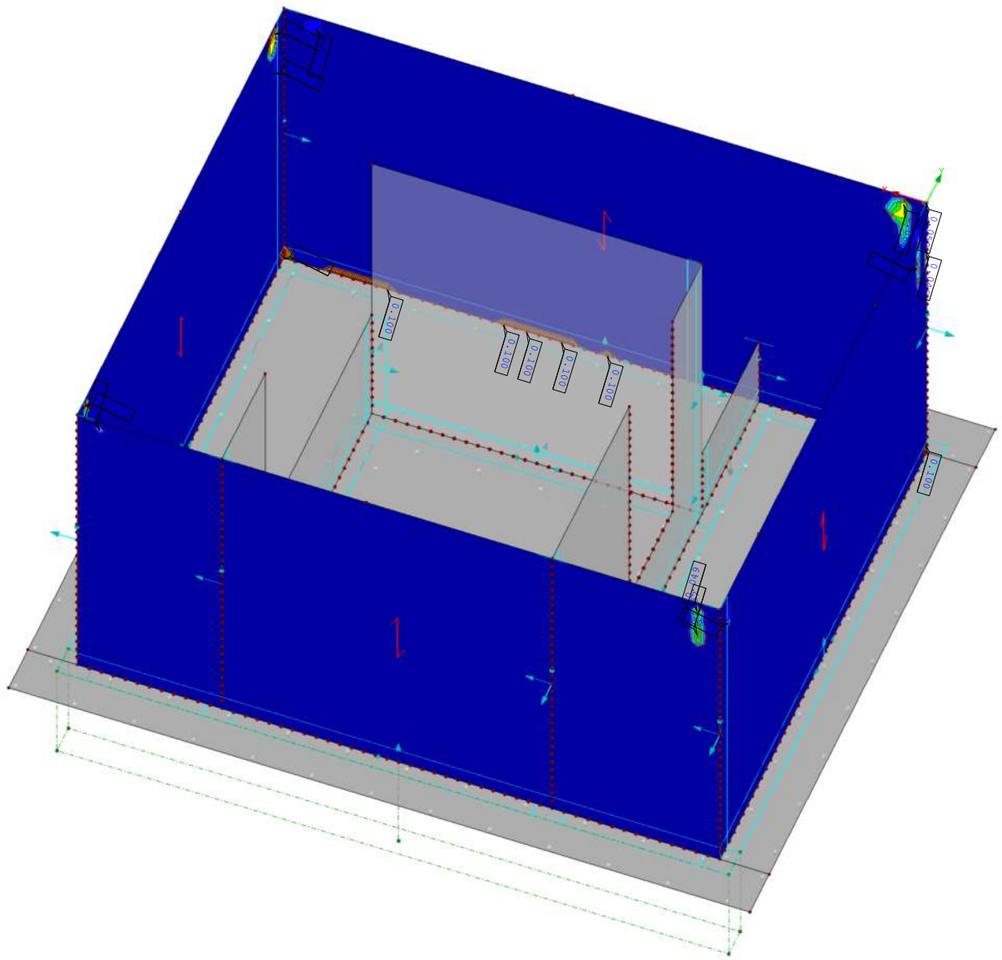
Max w-k,1,-z (top): 0.117, Min w-k,1,-z (top): 0.000 mm

CRACK WIDTH $w_{k,2,-z\ (top)}$

RF-CONCRETE Surfaces CA2
1.2_Soninees sienos
Surfaces Crack width w-k,2,-z (top) [mm]
Values: w-k,2,-z (top) [mm]

Isometric





Max w-k,2,-z (top): 0.100, Min w-k,2,-z (top): 0.000 mm

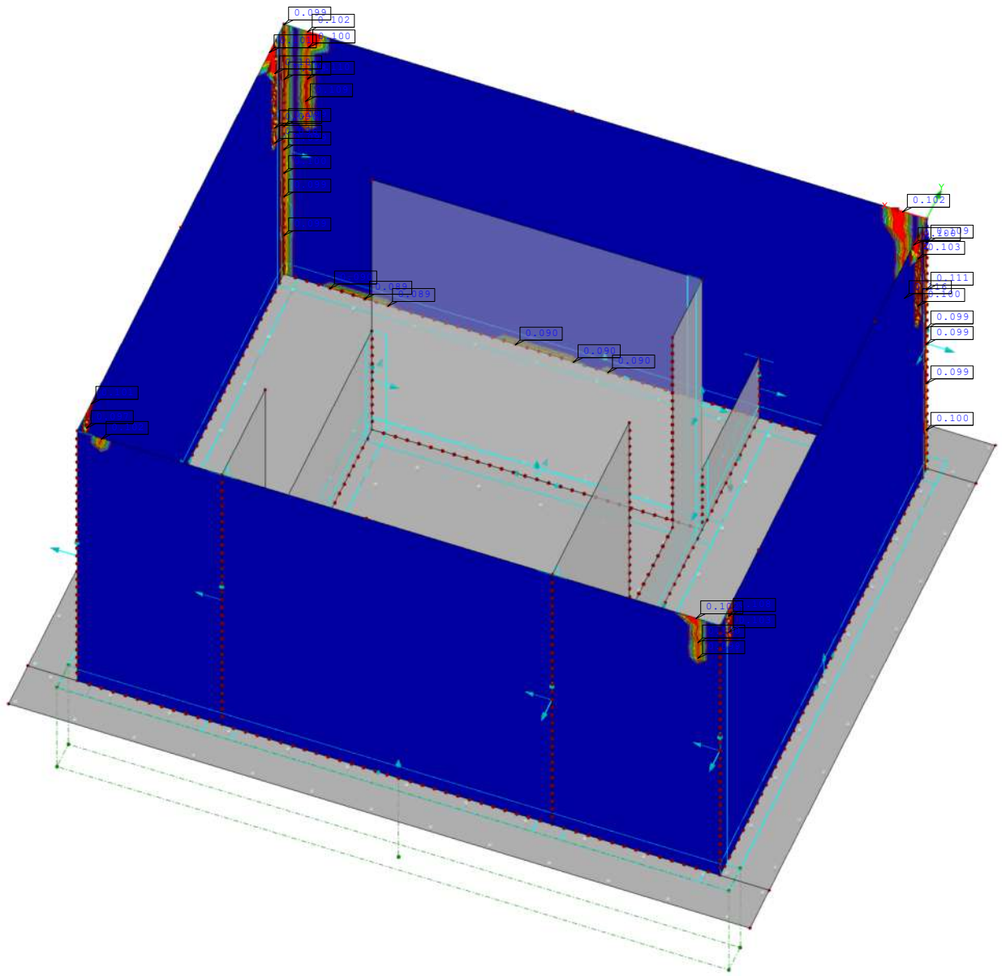
CRACK WIDTH $w_{k,res,-z\ (top)}$

RF-CONCRETE Surfaces CA2
1.2_Soninees sienos
Surfaces Crack width w-k,res,-z (top) [mm]
Values: w-k,res,-z (top) [mm]

Isometric

Crack width
w-k,res,-z (top) [mm]

	0.116
	0.106
	0.095
	0.085
	0.074
	0.063
	0.053
	0.042
	0.032
	0.021
	0.011
	0.000
Max :	0.116
Min :	0.000



Max w-k,res,-z (top): 0.116, Min w-k,res,-z (top): 0.000 mm

RF-CONCRETE Surfaces
CA3
1.3_Vidines sienos

Project: 1
1

Model: SK23010_Dreverna_ (06) statinys_ ..

Date: 2023-09-06

1.1 GENERAL DATA

Design according to Standard:	LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
ULTIMATE LIMIT STATE		
Load combinations for design:	CO1	Bandymas 1-a sisterna (susitraukimas)
		Persistent and Transient
	CO2	Bandymas 2-a sisterna (susitraukimas)
		Persistent and Transient
	CO3	Bandymas 1+live (susitraukimas)
		Persistent and Transient
	CO4	Eksplotacija 1 (susitraukimas)
		Persistent and Transient
	CO5	Eksplotacija 2 (susitraukimas)
		Persistent and Transient
	CO6	Eksplotacija 1+2 (susitraukimas)
		Persistent and Transient
	CO7	Eksplotacija S (susitraukimas)
		Persistent and Transient
	CO8	Eksplotacija 1+S (susitraukimas)
		Persistent and Transient
	CO9	Eksplotacija 2+S (susitraukimas)
		Persistent and Transient
	CO10	Eksplotacija 1+S (susitraukimas)
		Persistent and Transient
	CO11	Eksplotacija 2+S (susitraukimas)
		Persistent and Transient
	CO12	Eksplotacija (kėlimas) (susitraukimas)
		Persistent and Transient
SERVICEABILITY LIMIT STATE		
Load combinations for design:	CO1	Bandymas 1-a sisterna (susitraukimas)
		Quasi-permanent, k_t 0.600
	CO2	Bandymas 2-a sisterna (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO3	Bandymas 1+live (susitraukimas)
		Quasi-permanent, k_t 0.549
	CO4	Eksplotacija 1 (susitraukimas)
		Quasi-permanent, k_t 0.600
	CO5	Eksplotacija 2 (susitraukimas)
		Quasi-permanent, k_t 0.532
	CO6	Eksplotacija 1+2 (susitraukimas)
		Quasi-permanent, k_t 0.549
	CO7	Eksplotacija S (susitraukimas)
		Quasi-permanent, k_t 0.559
	CO8	Eksplotacija 1+S (susitraukimas)
		Quasi-permanent, k_t 0.566
	CO9	Eksplotacija 2+S (susitraukimas)
		Quasi-permanent, k_t 0.566
	CO10	Eksplotacija 1+S (susitraukimas)
		Quasi-permanent, k_t 0.566
	CO11	Eksplotacija 2+S (susitraukimas)
		Quasi-permanent, k_t 0.566
	CO12	Eksplotacija (kėlimas) (susitraukimas)
		Quasi-permanent, k_t 0.549
Definition of Provided Additional Reinforcement	Automatic arrangement according to the specifications in Table 1.4	
Type of SLS method:	Analytical Method	
	By assuming an identical deformation ratio of the longitudinal reinforcement	
Design of		
Concrete Stress Analysis	☒	
Steel Stress Analysis	☒	
Crack widths	☒	
Deformation Analysis	☐	
Layout of longitudinal reinforcement		
Required longitudinal reinforcement automatically increased for serviceability limit state design:	☒	
DETAILS		
Analysis Method for Reinforcement Envelope	Mixed	
Apply the averaged internal forces in the defined average region for the ULS calculation and for the analytic method of SLS calculation.	☒	
Apply the internal forces without the rib components	☐	
Design Situation Settings for Serviceability Limit State Checks		
Load combination:		
Characteristic with direct load	Checks: -	
Characteristic with imposed deformation	Checks: -	
Frequent	Checks: -	
Quasi-permanent	Checks: k_1*f_{ck}, k_2*f_{ck}, k_3*f_{yk}, k_4*f_{yk}, w_k, u_l	

1.2 MATERIALS

Material No.	Material Description		Comment
	Concrete Strength Class	Steel Description	
3	Concrete C35/45	B 500 S (A)	
4	Concrete C35/45 (70%)	B 500 S (A)	

1.2.1 MATERIAL PARAMETERS

Material No.	Description	Name	Size	Unit
3	**Concrete Strength Class: Concrete C35/45**			
	Characteristic Cylinder Compressive Strength	f_{ck}	35.00	N/mm^2
	5 % Fractile of Axial Tensile Strength	$f_{ctk,0.05}$	2.20	N/mm^2
	Characteristic for Nonlinear Calculations			
	Mean Secant Modulus of Elasticity	E_{cm}	34000.00	N/mm^2
	Mean Cylinder Compressive Strength	f_{cm}	43.00	N/mm^2
	Mean Axial Tensile Strength	f_{ctm}	3.20	N/mm^2
	Ultimate Strain for Pure Compression	ε_{c1}	-2.250	‰
	Ultimate Strain at Failure	ε_{c1u}	-3.500	‰
	Shear Modulus	G	14166.70	N/mm^2
	Poisson's Ratio	ν	0.200	-
	Characteristic Strains for Parabolic-Rectangular Diagram			
	Ultimate Strain for Pure Compression	ε_{c2}	-2.000	‰
	Ultimate Strain at Failure	ε_{cu2}	-3.500	‰
	Parabola Exponent	n	2.000	-
	Specific Weight	γ	25.00	kN/m^3
	Reinforcing Steel: B 500 S (A)			
	Modulus of Elasticity	E_s	200000.00	N/mm^2
	Yield Stress Mean Value	f_{ym}	550.00	N/mm^2
	Characteristic Yield Stress	f_{yk}	500.00	N/mm^2
	Tensile Strength Mean Value	f_{tm}	551.25	N/mm^2
	Characteristic Tensile Strength	f_{tk}	525.00	N/mm^2
	Limiting Strain	ε_{uk}	25.000	‰
4	**Concrete Strength Class: Concrete C35/45 (70%)**			
	Characteristic Cylinder Compressive Strength	f_{ck}	35.00	N/mm^2
	5 % Fractile of Axial Tensile Strength	$f_{ctk,0.05}$	2.20	N/mm^2
	Characteristic for Nonlinear Calculations			
	Mean Secant Modulus of Elasticity	E_{cm}	34000.00	N/mm^2
	Mean Cylinder Compressive Strength	f_{cm}	43.00	N/mm^2
	Mean Axial Tensile Strength	f_{ctm}	3.20	N/mm^2
	Ultimate Strain for Pure Compression	ε_{c1}	-2.250	‰
	Ultimate Strain at Failure	ε_{c1u}	-3.500	‰
	Shear Modulus	G	9916.70	N/mm^2
	Poisson's Ratio	ν	0.200	-
	Characteristic Strains for Parabolic-Rectangular Diagram			
	Ultimate Strain for Pure Compression	ε_{c2}	-2.000	‰
	Ultimate Strain at Failure	ε_{cu2}	-3.500	‰
	Parabola Exponent	n	2.000	-
	Specific Weight	γ	25.00	kN/m^3
	Reinforcing Steel: B 500 S (A)			
	Modulus of Elasticity	E_s	200000.00	N/mm^2
	Yield Stress Mean Value	f_{ym}	550.00	N/mm^2
	Characteristic Yield Stress	f_{yk}	500.00	N/mm^2
	Tensile Strength Mean Value	f_{tm}	551.25	N/mm^2
	Characteristic Tensile Strength	f_{tk}	525.00	N/mm^2
	Limiting Strain	ε_{uk}	25.000	‰

1.3 SURFACES

Surface No.	Matl. No.	$\sigma_{c,max}$ [N/mm²] / $\sigma_{s,max}$ [N/mm²]	$f_{ct,eff,wk}$ [N/mm²]	$f_{ct,eff,As,min}$ [N/mm²]	$w_{k,+z\ (top)}$ [mm] / $w_{k,-z\ (bottom)}$ [mm]	Effects due to Restraint: Apply	Effects due to Restraint: k_c [-]	Notes
6	Thickness Type: Constant, Thickness: 250.00 mm							
	4	var. var.	3.20	3.20	0.100 0.100	☐	var.	
7	Thickness Type: Constant, Thickness: 250.00 mm							
	4	var. var.	3.20	3.20	0.100 0.100	☐	var.	
8	Thickness Type: Constant, Thickness: 250.00 mm							
	4	var. var.	3.20	3.20	0.100 0.100	☐	var.	
9	Thickness Type: Constant, Thickness: 250.00 mm							
	4	var. var.	3.20	3.20	0.100 0.100	☐	var.	
10	Thickness Type: Constant, Thickness: 250.00 mm							
	4	var. var.	3.20	3.20	0.100 0.100	☐	var.	
12	Thickness Type: Constant, Thickness: 250.00 mm							
	4	var. var.	3.20	3.20	0.100 0.100	☐	var.	

1.4 REINFORCEMENT GROUP NO. 1 - SIENA VIDINE

Applied to surfaces:	6-10,12
REINFORCEMENT RATIO	
Minimum secondary reinforcement	20.0 %
Basic minimum reinforcement	0.0 %
Minimum compression reinforcement	0.0 %
Minimum tension reinforcement	0.0 %
Maximum reinforcement percentage	4.0 %
Minimum shear reinforcement percentage	0.0 %
REINFORCEMENT AREA FOR DESIGN OF SLS	
Use provided basic reinforcement and required additional reinforcement acc. to Tables 2.1, 2.2, 2.3	
Concrete cover acc. to Standard	☐

1.4 REINFORCEMENT GROUP NO. 1 - SIENA VIDINE

BASIC REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.00, c-2: 52.00 mm
Bar diameter	ds-1: 12.00, ds-2: 12.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,-z (top): 7.54, As-2,-z (top): 7.54 cm²/m
BASIC REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.00, c-2: 52.00 mm
Bar diameter	ds-1: 12.00, ds-2: 12.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	As-1,+z (bottom): 7.54, As-2,+z (bottom): 7.54 cm²/m
ADDITIONAL REINFORCEMENT LAYOUT - TOP (-z)	
Number of directions	2
Cover to rebar edge	c-1: 40.00, c-2: 52.00 mm
Bar diameter	ds-1: 12.00, ds-2: 12.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
ADDITIONAL REINFORCEMENT LAYOUT - BOTTOM (+z)	
Number of directions	2
Cover to rebar edge	c-1: 40.00, c-2: 52.00 mm
Bar diameter	ds-1: 12.00, ds-2: 12.00 mm
Directions of reinforcement	Phi-1: 0.000°, Phi-2: 90.000°
Reinforcement area	Use required additional reinforcement acc. to Tables 2.1, 2.2, 2.3
LONGITUDINAL REINFORCEMENT FOR SHEAR FORCE DESIGN	
Apply the greater value resulting from either the required or provided reinforcement (basic and add. reinforcement) per reinforcement direction	
OPTIONS FOR LST EN 1992-1-1:2005/NA:2011 Lithuania (copied)*	
Minimum longitudinal reinforcement for plates acc. to 9.3.1	☒
Direction of minimum reinforcement	
Reinforcement direction with the main tensile force from top (-z) and bottom (+z) surfaces together:	☒
Minimum longitudinal reinforcement for walls acc. to 9.6	☐
Minimum shear reinforcement	☒
Neutral axis depth limitation	☒
Variable strut inclination - min	21.801 °
Variable concrete strut inclination - max	45.000 °
Partial safety factor γ_s	PT 1.15, AC 1.00, SLS 1.00
Partial safety factor γ_c	PT 1.50, AC 1.20, SLS 1.00
Consideration of long-term effects Alpha-cc	PT 0.90, AC 0.90, SLS 1.00
Consideration of long-term effects Alpha-ct	SLS 1.00

2.2 REQUIRED REINFORCEMENT BY SURFACE

Surface	Point	Point Coordinates [m]				Required Reinforcement			Basic	Additional Reinforcement			
No.	No.	X	Y	Z	Symbol	ULS	SLS	ULS/SLS	Reinf.	Required	Provided	Unit	Notes
6	M3804	2.875	-1.250	3.077	$a_{s,1,-z\ (top)}$	7.43	6.46	7.43	7.54	0.00	0.00	cm²/m	
	M43	4.300	-1.250	3.160	$a_{s,2,-z\ (top)}$	3.29	2.27	3.29	7.54	0.00	0.00	cm²/m	
	M3812	2.045	-1.250	3.061	$a_{s,1,+z\ (bottom)}$	7.28	6.33	7.28	7.54	0.00	0.00	cm²/m	
	M3753	1.654	-1.250	0.000	$a_{s,2,+z\ (bottom)}$	3.29	0.14	3.29	7.54	0.00	0.00	cm²/m	
	M3952	4.200	-1.250	1.907	a_{sw}	11.41	-	11.41	-	-	-	cm²/m²	
7	M4276	1.450	-3.980	3.059	$a_{s,1,-z\ (top)}$	8.32	7.23	8.32	7.54	0.78	0.78	cm²/m	
	M4274	1.450	-3.790	3.061	$a_{s,2,-z\ (top)}$	7.54	1.91	7.54	7.54	0.00	0.00	cm²/m	
	M4274	1.450	-3.790	3.061	$a_{s,1,+z\ (bottom)}$	7.54	6.23	7.54	7.54	0.00	0.00	cm²/m	
	M4274	1.450	-3.790	3.061	$a_{s,2,+z\ (bottom)}$	7.54	0.24	7.54	7.54	0.00	0.00	cm²/m	
	M4149	1.450	-3.790	3.160	a_{sw}	9.47	-	9.47	-	-	-	cm²/m²	
8	M4848	2.998	-3.600	3.063	$a_{s,1,-z\ (top)}$	7.05	6.13	7.05	7.54	0.00	0.00	cm²/m	
	M4820	3.893	-3.600	1.510	$a_{s,2,-z\ (top)}$	3.29	0.17	3.29	7.54	0.00	0.00	cm²/m	
	M4847	2.875	-3.600	3.074	$a_{s,1,+z\ (bottom)}$	6.99	6.08	6.99	7.54	0.00	0.00	cm²/m	
	M4821	3.689	-3.600	1.510	$a_{s,2,+z\ (bottom)}$	3.29	0.06	3.29	7.54	0.00	0.00	cm²/m	
	M49	1.450	-3.600	3.160	a_{sw}	0.00	-	0.00	-	-	-	cm²/m²	
9	M5091	4.300	-3.208	3.160	$a_{s,1,-z\ (top)}$	7.83	6.81	7.83	7.54	0.29	0.29	cm²/m	
	M5096	4.300	-3.404	1.910	$a_{s,2,-z\ (top)}$	3.29	0.03	3.29	7.54	0.00	0.00	cm²/m	
	M5154	4.300	-3.405	2.957	$a_{s,1,+z\ (bottom)}$	7.54	5.21	7.54	7.54	0.00	0.00	cm²/m	
	M5154	4.300	-3.405	2.957	$a_{s,2,+z\ (bottom)}$	7.54	0.41	7.54	7.54	0.00	0.00	cm²/m	
	M5154	4.300	-3.405	2.957	a_{sw}	9.47	-	9.47	-	-	-	cm²/m²	
10	M5309	4.300	-3.980	3.061	$a_{s,1,-z\ (top)}$	8.34	7.25	8.34	7.54	0.80	0.80	cm²/m	
	M5295	4.300	-3.600	1.416	$a_{s,2,-z\ (top)}$	7.54	1.46	7.54	7.54	0.00	0.00	cm²/m	
	M5295	4.300	-3.600	1.416	$a_{s,1,+z\ (bottom)}$	7.54	0.40	7.54	7.54	0.00	0.00	cm²/m	
	M5295	4.300	-3.600	1.416	$a_{s,2,+z\ (bottom)}$	7.54	4.98	7.54	7.54	0.00	0.00	cm²/m	
	M5295	4.300	-3.600	1.416	a_{sw}	9.47	-	9.47	-	-	-	cm²/m²	
12	M69	1.450	0.000	2.400	$a_{s,1,-z\ (top)}$	8.32	7.24	8.32	7.54	0.78	0.78	cm²/m	
	M44	1.450	-1.250	3.160	$a_{s,2,-z\ (top)}$	7.54	1.44	7.54	7.54	0.00	0.00	cm²/m	
	M69	1.450	0.000	2.400	$a_{s,1,+z\ (bottom)}$	7.89	6.86	7.89	7.54	0.35	0.35	cm²/m	
	M3732 - E5715	1.450	-1.250	2.970	$a_{s,2,+z\ (bottom)}$	7.54	0.29	7.54	7.54	0.00	0.00	cm²/m	
	M44	1.450	-1.250	3.160	a_{sw}	9.47	-	9.47	-	-	-	cm²/m²	

3.2 SERVICEABILITY CHECK BY SURFACE

Surface	Point	Point Coordinates [m]			Load	Design					
No.	No.	X	Y	Z	Case	Type	Exist. Value	Limit Value	Unit	Ratio	Notes
6	M54	4.300	-1.250	1.910	CO12	σ_c	-4.65	-15.75	N/mm²	0.3	
	M43	4.300	-1.250	3.160	CO1	σ_s	0.00	400.00	N/mm²	0.0	226)
	M43	4.300	-1.250	3.160	CO12	w_k	0.000	0.100	mm	0.0	226)
7	M65	1.450	-1.900	2.400	CO12	σ_c	-5.67	-15.75	N/mm²	0.4	
	M44	1.450	-1.250	3.160	CO1	σ_s	0.00	400.00	N/mm²	0.0	226)

3.2 SERVICEABILITY CHECK BY SURFACE

Surface No.	Point No.	Point Coordinates [m] X	Y	Z	Load Case	Type	Exist. Value	Design Limit Value	Unit	Ratio	Notes
	M44	1.450	-1.250	3.160	CO12	w_k	0.000	0.100	mm	0.0	226)
8	M4825	2.875	-3.600	1.510	CO12	σ_c	-1.66	-15.75	N/mm²	0.2	
	M49	1.450	-3.600	3.160	CO1	σ_s	0.00	400.00	N/mm²	0.0	226)
	M49	1.450	-3.600	3.160	CO12	w_k	0.000	0.100	mm	0.0	226)
9	M5108	4.300	-1.446	1.910	CO12	σ_c	-3.69	-15.75	N/mm²	0.3	
	M43	4.300	-1.250	3.160	CO1	σ_s	0.00	400.00	N/mm²	0.0	226)
	M43	4.300	-1.250	3.160	CO12	w_k	0.000	0.100	mm	0.0	226)
10	M5396	4.300	-4.372	1.679	CO12	σ_c	-2.10	-15.75	N/mm²	0.2	
	M50	4.300	-3.600	3.160	CO1	σ_s	0.00	400.00	N/mm²	0.0	226)
	M50	4.300	-3.600	3.160	CO3	w_k	0.000	0.100	mm	0.0	226)
12	M69	1.450	0.000	2.400	CO12	σ_c	-7.60	-15.75	N/mm²	0.5	
	M44	1.450	-1.250	3.160	CO1	σ_s	0.00	400.00	N/mm²	0.0	226)
	M44	1.450	-1.250	3.160	CO1	w_k	0.000	0.100	mm	0.0	226)

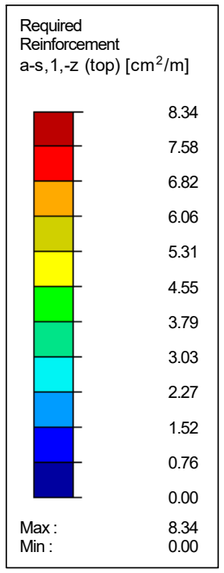
SERVICEABILITY CHECK NOTES

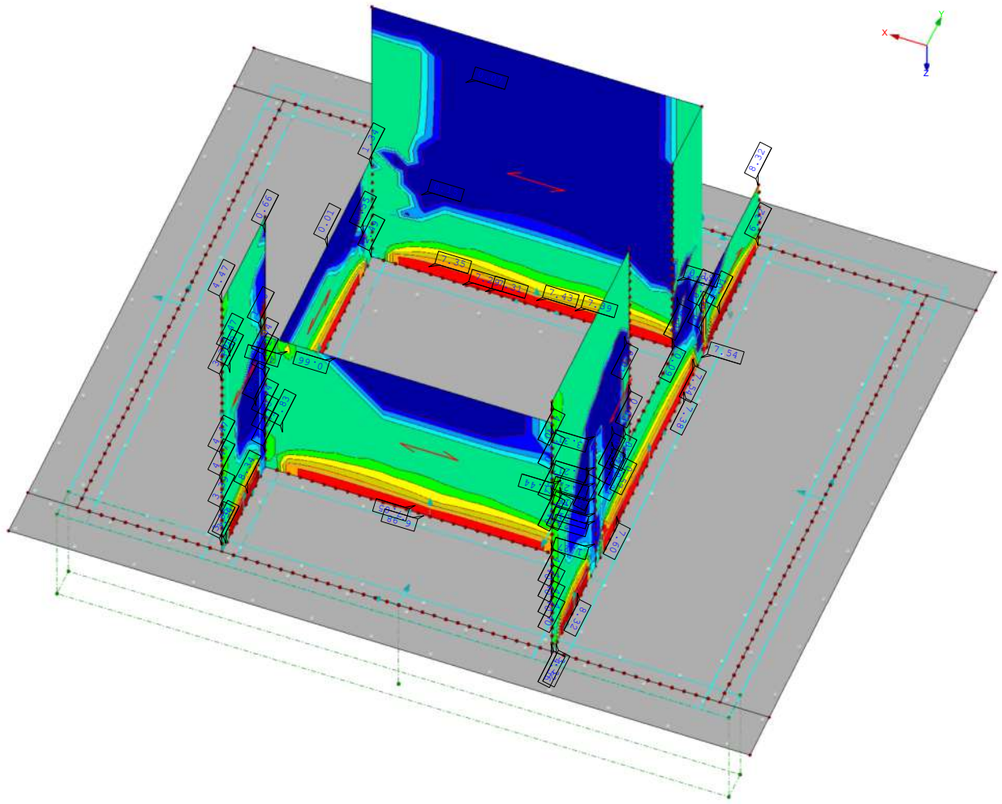
No.	Description
219)	Crack width exceeded.
226)	Concrete cracks on neither side.
233)	The design is not satisfactory! Because of the required reinforcement for ULS or user-defined reinforcement the defined reinforcement area is different from the required reinforcement for SLS and that negatively affects SLS design.

REQUIRED REINFORCEMENT $a_{s,1,-z\ (top)}$

RF-CONCRETE Surfaces CA3
1.3_Vidines sienos
Surfaces Required Reinforcement a-s,1,-z (top) [cm²/m]
Values: a-s,1,-z (top) [cm^2/m]

Isometric



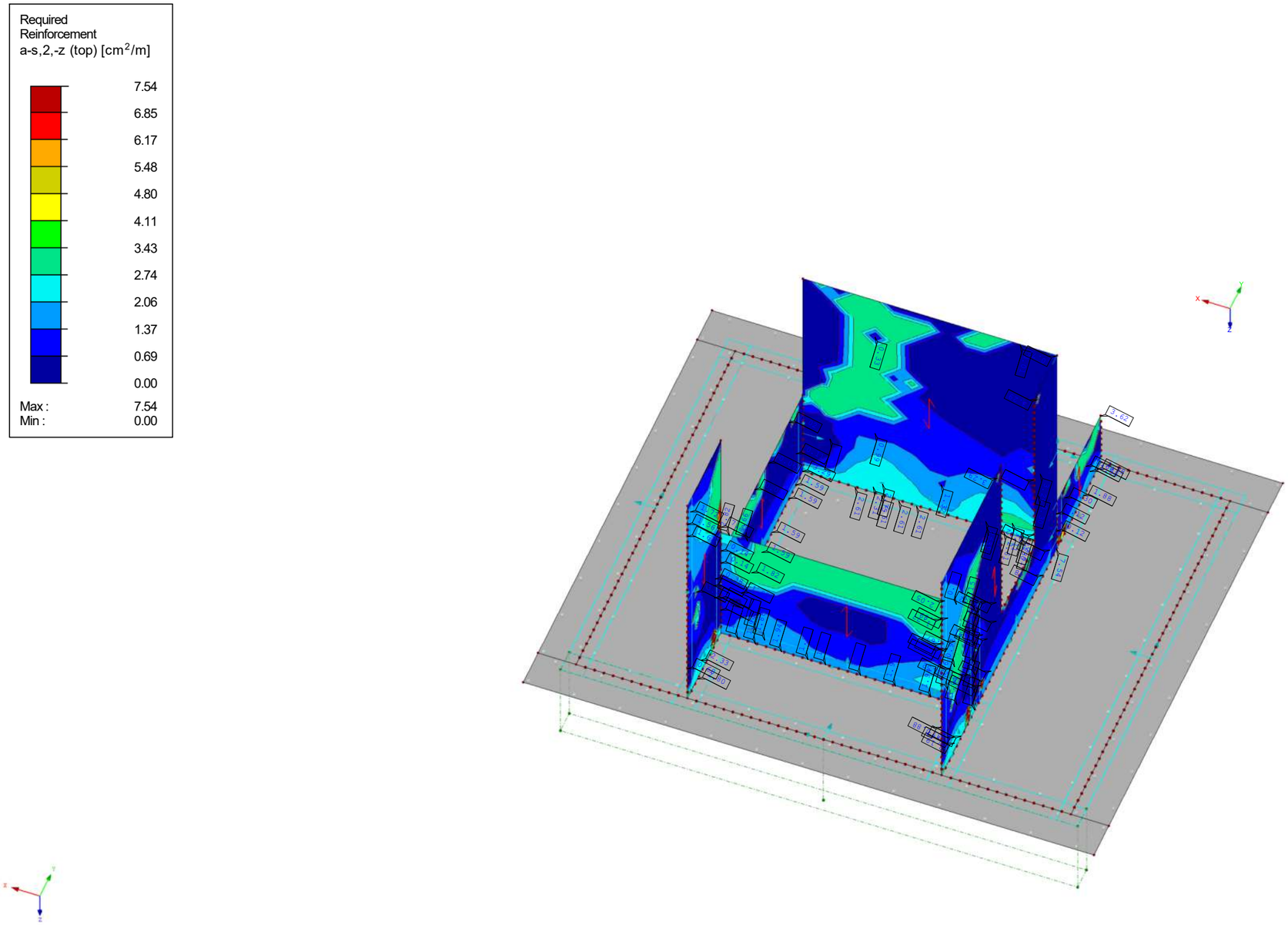


Max a-s,1,-z (top): 8.34, Min a-s,1,-z (top): 0.00 cm²/m

REQUIRED REINFORCEMENT $a_{s,2,-z\ (top)}$

RF-CONCRETE Surfaces CA3
1.3_Vidines sienos
Surfaces Required Reinforcement a-s,2,-z (top) [cm²/m]
Values: a-s,2,-z (top) [cm^2/m]

Isometric



Max a-s,2,-z (top): 7.54, Min a-s,2,-z (top): 0.00 cm²/m

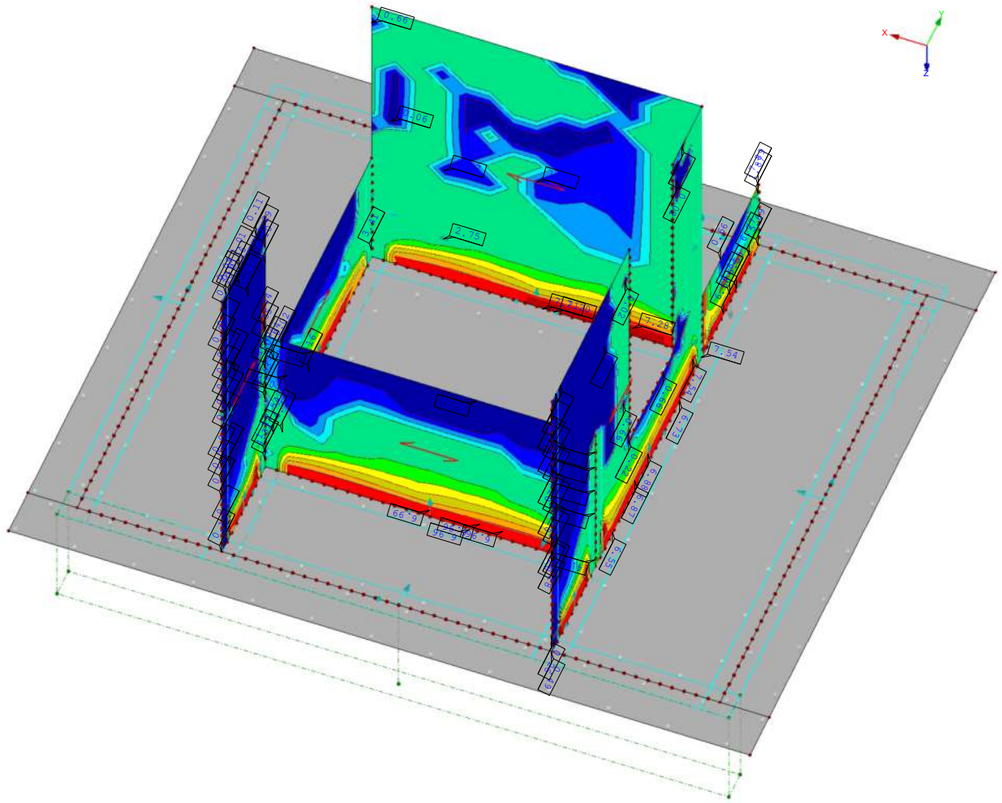
REQUIRED REINFORCEMENT $a_{s,1,+z\ (bottom)}$

RF-CONCRETE Surfaces CA3
1.3_Vidines sienos
Surfaces Required Reinforcement a-s,1,+z (bottom) [cm²/m]
Values: a-s,1,+z (bottom) [cm^2/m]

Isometric

Required Reinforcement a-s,1,+z (bottom) [cm²/m]

	7.89
	7.17
	6.46
	5.74
	5.02
	4.30
	3.59
	2.87
	2.15
	1.43
	0.72
	0.00
Max :	7.89
Min :	0.00



Max a-s,1,+z (bottom): 7.89, Min a-s,1,+z (bottom): 0.00 cm²/m

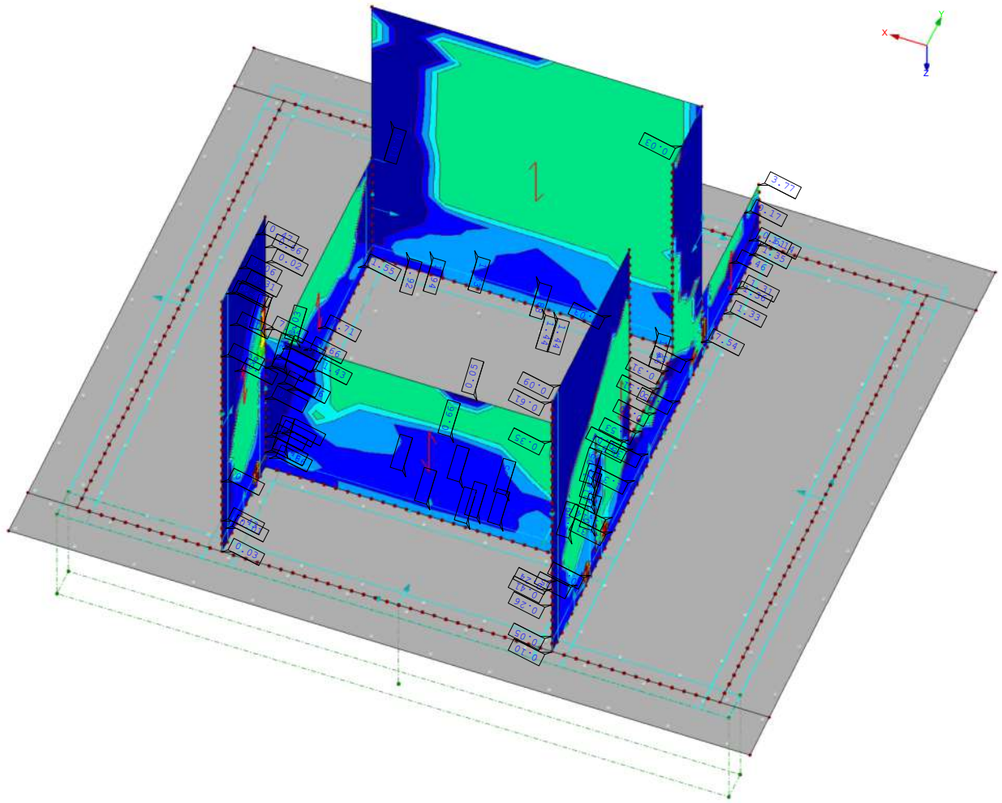
REQUIRED REINFORCEMENT $a_{s,2,+z\ (bottom)}$

RF-CONCRETE Surfaces CA3
1.3_Vidines sienos
Surfaces Required Reinforcement a-s,2,+z (bottom) [cm²/m]
Values: a-s,2,+z (bottom) [cm^2/m]

Isometric

Required Reinforcement a-s,2,+z (bottom) [cm²/m]

	7.54
	6.85
	6.17
	5.48
	4.80
	4.11
	3.43
	2.74
	2.06
	1.37
	0.69
	0.00
Max :	7.54
Min :	0.00



Max a-s,2,+z (bottom): 7.54, Min a-s,2,+z (bottom): 0.00 cm²/m

RF-SOILIN
CA1
Soil-structure
interaction analysis

Project: 1
1
Model: SK23010_Dreverna_ (06) statinys_ ..
Date: 2023-09-06

1.1 GENERAL DATA

Surfaces to design	5,11,13-18	
Load combinations to design:	CO10	Eksplotacija 1+S (susitraukimas)
Standard:		EC7
Groundwater available		☐
Rock beneath the last layer		☐

1.2.1 DESCRIPTION OF MATERIALS

Soil No.	Soil Description	Specific Weight γ [kN/m³]	γ [kN/m³]	Modulus of Elasticity E_{def} [MPa]	Poisson's Ratio E_{def} [-]	Comment
1	Sand, Well-Graded (SW)	19.00	20.00	11.400	0.28	IGS-3
2	Clayey Sand, Sand-Clay Mixture (SC)	19.00	20.00	30.000	0.35	IGS-4
3	Clayey Sand, Sand-Clay Mixture (SC)	19.00	20.00	45.000	0.35	IGS-5
4	Clayey Sand, Sand-Clay Mixture (SC)	19.00	20.00	78.000	0.35	IGS-6

1.2.2 - 1.2.3 SOIL SAMPLES AND SOIL LAYERS

Sample No.	Soil Sample Coordinates [m] X	Y	Z	Region No.	Soil	Thickness Δt [m]	Ordinate BL z [m]
1	-14.500	14.500	3.160	-	1 - Sand, Well-Graded (SW)	0.500	0.500
					1 - Sand, Well-Graded (SW)	1.000	1.500
					2 - Clayey Sand, Sand-Clay Mixture (SC)	2.500	4.000
					3 - Clayey Sand, Sand-Clay Mixture (SC)	1.700	5.700
					4 - Clayey Sand, Sand-Clay Mixture (SC)	1.500	7.200
					3 - Clayey Sand, Sand-Clay Mixture (SC)	0.500	7.700
					4 - Clayey Sand, Sand-Clay Mixture (SC)	0.300	8.000

1.3 ADDITIONAL GEOLOGICAL REGIONS

Region No.	Region Shape	Additional Geological Region Coordinates [m] X_1 / X_c	Y_1 / Y_c	X_2 / R	Y_2	X_3	Y_3	X_4	Y_4	Number of Layers	Comment
-										7	

RF-SOILIN
CA1
Soil-structure
interaction analysis
RESULTS

2.1.1 STRESSES AND SETTLEMENTS

Grid Point	Surface No.	Grid Point Coordination [m] X	Y	Z	Excavation [m]	Contact Stress $\sigma_{z,0}$ [kN/m²]	Settlement $s_{z,0}$ [mm]	
1	5	0.000	-4.550	3.310	0.150	56.21	6.14	
2	14	2.500	-4.550	3.310	0.150	43.75	5.32	
3	13	5.000	-4.550	3.310	0.150	39.70	4.34	
4	5	0.000	-2.050	3.310	0.150	51.80	6.33	
5	15	2.500	-2.050	3.310	0.150	45.70	5.64	
6	13	5.000	-2.050	3.310	0.150	40.94	4.78	

SNIEGO APKROVA

Pagal LST EN 1991-1-3 sniego regionus **Dreverna** priklauso I-ajam sniego regionui.

1 pav. Lietuvos sniego apkrovos rajonai

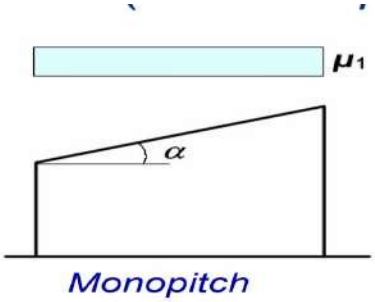
1 lentelė. Sniego antžeminės apkrovos s_k charakteristinės reikšmės

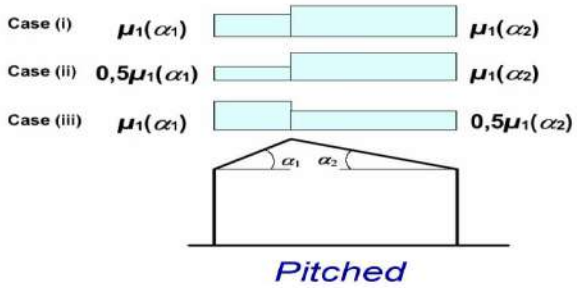
Sniego apkrovos rajonas	s_k, kN/m²
I	1,2
II	1,6

Sniego apkrovos rajonas s_k = 1,2 kN/m²

Stogo formos faktorius vienlaiciam/dvislaiciam stogui : (α_1; $\alpha_1=\alpha_2$)

Stogo nuolydis α **= 5,2 laipsniai**





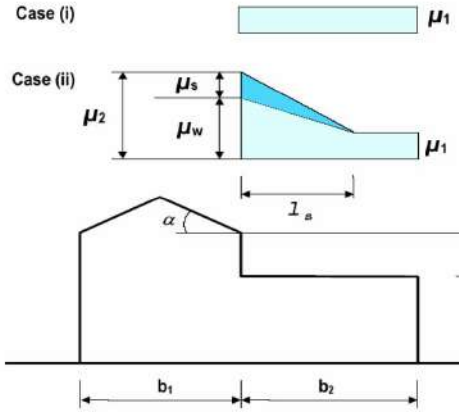
Formos faktorius μ_1 = IF($\alpha \le 30$; 0.8 ; IF($\alpha > 30$ AND $\alpha < 60$; 0.8*(60-α)/30; 0)) = 0,80

Ch. sniego apkrova S_{k1} **=** $s_k*\mu_1$ = **1,0 kN/m²**

Ch. Sniego apkrova S_{k2} **=** $s_k*\mu_1*0,5$ = **0,5 kN/m²**

Sniego maisai

b_1= **5,8 m**
b_2= **6,67 m**
h= **3,0 m**



Roofs abutting and close to taller construction works

$\mu_{s,ras}$= *0,0*
γ= *2,0 kN/m³*

Snølomme
$\mu_{w,areal}$= $(b_1+b_2)/(2*h)$ = *2,08*
$\mu_{w,h.forskj}$= $\gamma*h/s_k$ = *5,00*

Formfaktor $\mu_{w,2}$= MAX(0,8;MIN($\mu_{w,areal}$;$\mu_{w,h.forskj}$;4)) = 2,08
Lengde l_s= MAX(5;MIN(2*h;15)) = 6,00 m
Endefaktor $\mu_{w,b2}$= $\mu_{w,2}$-MIN(1;b_2/l_s)*($\mu_{w,2}$-μ_1) = 0,80

x= **6,67 m**
Formfaktor $\mu_{w,x}$= MAX(0,8;($\mu_{w,2}$-$\mu_{w,b2}$)*(l_s-x)/l_s+$\mu_{w,b2}$) = 0,80

Ch. sniego apkrova prie sienos S_{kb}=s_k*$\mu_{w,2}$ = 2,5 kN/m²

VEJO SKAICIAVIMAI

Pagal LST EN 1991-1-4 vejo regionus **Dreverna** priklauso III-ajam vejo regionui.

1 pav. Lietuvos vėjo apkrovos rajonai

1 lentelė. Svarbiausios pagrindinio vėjo greičio reikšmės

Vėjo greičio rajonas	$v_{b,0}$, m/s
I	24
II	28
III	32

Vejo greitis v_{b0}= 32 m/s

Vejo apkrovos skaiciavimas

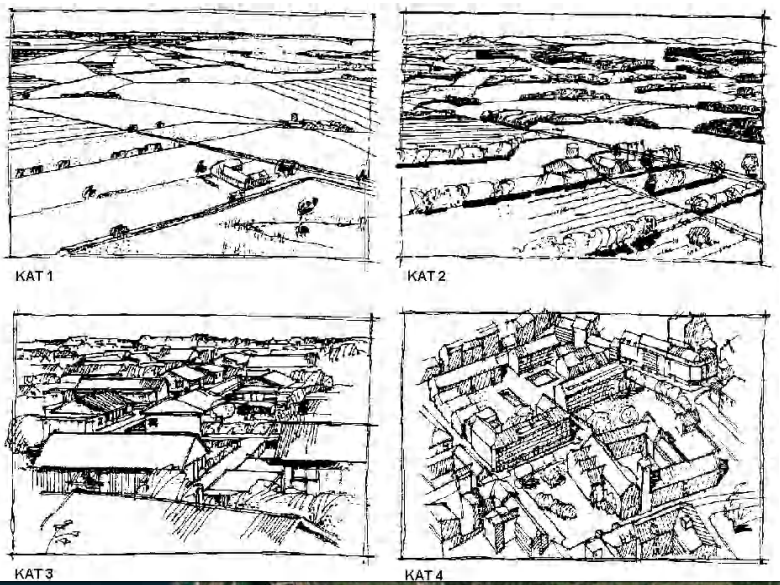
c_{dir} = 1,0

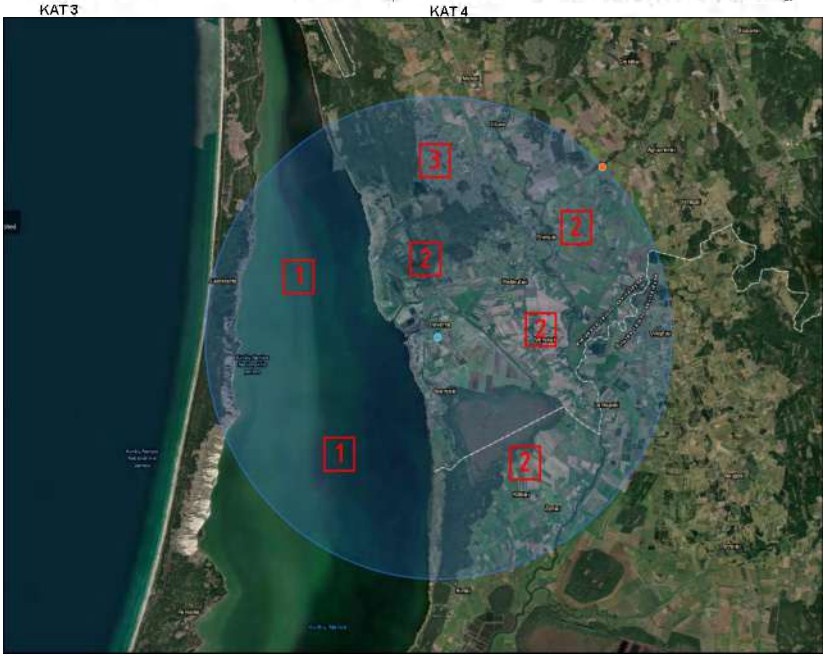
c_{season} = 1,0

$c_{altitude}$ = 1,0

c_{prob} = 1,0

v_b = c_{dir}*c_{season}*$c_{altitude}$*c_{prob}*v_{b0} = 32,0 m/s





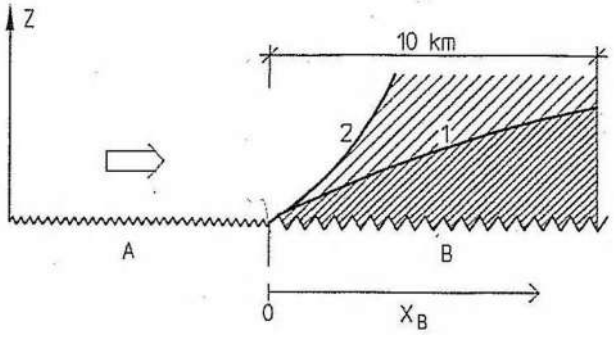
Vietinis vejo greitis

Aukstis virs zemes pavirsiaus z = 6,20 m

Vietoves kategorija Kat_B = 1

Vietoves kategorija Kat_A = 2

Atstumas nuo kategorijos pasikeitimo ir esamos konstrukcijos X_B = 10,0 km



Kategoriju skirtumas

Antall kategorier n= Kat_B-Kat_A = -1

Zona A

$z_{0,A}$ = IF(Kat_A=0;0.003;IF(Kat_A=1;0.01;IF(Kat_A=2;0.05;IF(Kat_A=3;0.3;1)))) = 0,050 m

$z_{min,A}$ = IF(Kat_A=0;2;IF(Kat_A=1;2;IF(Kat_A=2;4;IF(Kat_A=3;8;16)))) = 4,00 m

$k_{r,A}$ = $0,19*(z_{0,A}/0,05)^{0,07}$ = 0,19

$z_{1,A}$ = IF(z>$z_{min,A}$; z ; $z_{min,A}$) = 6,20 m

$c_{r,A}$ = $k_{r,A}$ *LN($z_{1,A}/z_{0,A}$) = 0,916

$c_{0,A}$ = 1,0

$v_{m,A}$ = $c_{r,A}*c_{0,A}*v_b$ = 29,31 m/s

Zona B

$z_{0,B}$ = IF(Kat_B=0;0.003;IF(Kat_B=1;0.01;IF(Kat_B=2;0.05;IF(Kat_B=3;0.3;1)))) = 0,010 m

$z_{min,B}$ = IF(Kat_B=0;2;IF(Kat_B=1;2;IF(Kat_B=2;4;IF(Kat_B=3;8;16)))) = 2,00 m

$k_{r,B}$ = $0,19*(z_{0,B}/0,05)^{0,07}$ = 0,17

$z_{1,B}$ = IF(z>$z_{min,B}$; z ; $z_{min,B}$) = 6,20 m

$c_{r,B}$ = $k_{r,B}$ *LN($z_{1,B}/z_{0,B}$) = 1,093

$c_{0,B}$ = 1,0

$v_{m,B}$ = $c_{r,B}*c_{0,B}*v_b$ = 34,98 m/s

Atsitiktinis vejo greitis

$v_{m,pos}$= MIN($v_{m,A}$;$10^{-0,04*ABS(n)*LOG(XB/10)}$*$v_{m,B}$) = 29,31 m/s

$v_{m,neg}$= MAX($v_{m,A}$;(2-$10^{-0,04*ABS(n)*LOG(XB/10)}$)*$v_{m,B}$) = 34,98 m/s

v_m= IF(n>0;$v_{m,pos}$;$v_{m,neg}$) = 34,98 m/s

Turbulecijos intensyvumas

$k_{i,A}$ = 1,0

$k_{i,B}$ = 1,0

$I_{v,A}$ = $k_{i,A}/(c_{0,A}*LN(z_{1,A}/z_{0,A}))$ = 0,207

$I_{v,B}$ = $k_{i,B}/(c_{0,B}*LN(z_{1,B}/z_{0,B}))$ = 0,156

c_s= IF(n>0;$10^{-0,04*ABS(n)*LOG(XB/10)}$;2-$10^{-0,04*ABS(n)*LOG(XB/10)}$) = 1,000

$v_{m,B}c_s$= IF(n>0;MIN($v_{m,A}$;$v_{m,B}*c_s$);MAX($v_{m,A}$;$v_{m,B}*c_s$)) = 34,98

I_v= ($I_{v,A}*v_{m,A}*(1-X_B/10)+I_{v,B}*v_{m,B}*(X_B/10)$)/$v_{m,B}c_s$ = 0,156

Charakteristinis vejo greitis:

Luft densitet ρ= 1,25 kg/m³

q_p = $(1+7*I_v)*(1000/(0,5*\rho))^{-1}*v_m^2$ = **1,60 kN/m²**

Stogo slegio koeficientas:

Pastato forma:

Ilgis L_G = **12,81 m**

Plotis B_G = **8,31 m**

Aukstis H_G = **6,12 m**

Parapeto aukstis h_p = **0,000 m**

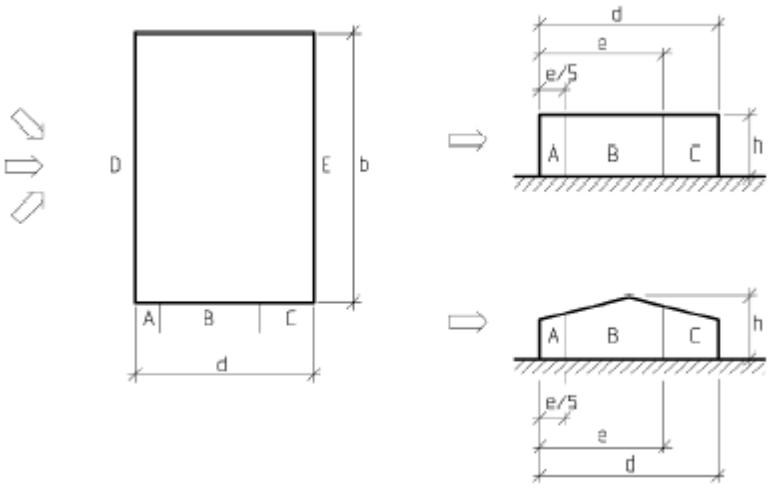
Bygningskropp

Ilgis L = L_G = **12,8 m**

Plotis B = B_G = **8,3 m**

Aukstis H = H_G = **6,12 m**

Sienu koeficientai



1. Vejas pucia i fasada:

b =	L_G	=	12,8 m
d =	B_G	=	8,3 m
h =	H_G	=	6,1 m
e =	MIN(b ; 2*h)	=	12,2 m
e' =	e/5	=	2,4 m
h_1 =	h/d	=	0,73

$c_{pe,A}$ = **-1,20**

e' = e/5 = **2,4 m**

$c_{pe,B}$ = **-0,80**

e -e' = MIN(b ; 2*h)-e' = **9,8 m**

e = MIN(b ; 2*h) = 12,2 m

$c_{pe,C}$ = IF(d>e; -0.5 ; 0.) = **0,0**

d-e = IF((B_G-e)≤ 0;0;B_G-e) = **0,0 m**

d = B_G = 8,3 m

$c_{pe,D}$ = IF(h_1 ≤ 0.25; 0.7;IF(h_1 ≥ 1. ; 0.8; (0.7+0.1*(h_1-0.25)/0.75))) = **0,76**

$c_{pe,E}$ = IF(h_1≤ 0.25; -0.3;IF((h_1>0.25 AND h_1≤1.);(-0.3-(0.2*(h_1-0.25)/0.75)); (-0.5-(0.2*(h_1-1.)/4.)))) = **-0,43**

2. Vejas pucia i pastato sona:

b_1 =	B_G	=	8,3 m
d_1 =	L_G	=	12,8 m
e_1 =	MIN(b_1 ; 2*h)	=	8,3 m
e' =	e_1/5	=	1,7 m
h_2 =	h/d_1	=	0,48

$c_{pe,A}$ = **-1,20**

e' = e_1/5 = **1,7 m**

$c_{pe,B}$ = **-0,80**

e_1-e' = MIN(b_1 ; 2*h)-e' = **6,6 m**

e_1 = MIN(b_1 ; 2*h) = 8,3 m

$c_{pe,C}$ = IF(d_1>e_1; -0.5 ; 0.) = **-0,50**

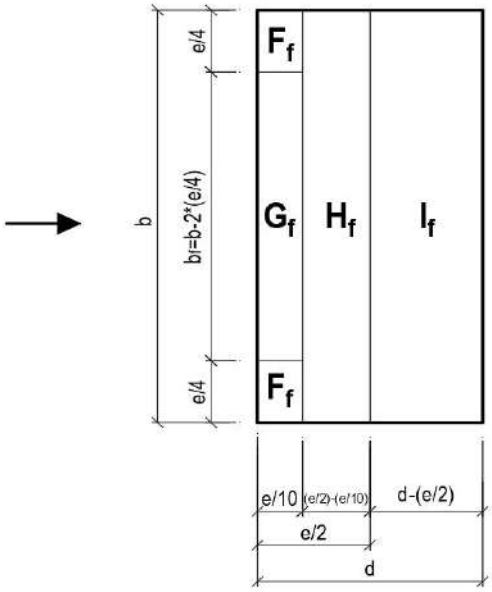
d_1-e_1 = IF(d_1-e_1≤ 0;0;d_1-e_1) = **4,5 m**

d_1 = L_G = 12,8 m

$c_{pe,D}$ = IF(h_2 ≤ 0.25; 0.7; IF(h_2 ≥ 1. ; 0.8; (0.7+0.1*(h_2-0.25)/0.75))) = **0,73**

$c_{pe,E}$ = IF(h_2≤ 0.25; -0.3;IF((h_2>0.25 AND h_2≤1.);(-0.3-(0.2*(h_2-0.25)/0.75)); (-0.5-(0.2*(h_2-1.)/4.)))) = **-0,36**

Vejo koeficientai stogui



1. Vejas pucia i fasada (Q = 0°)

b	=	L_G	=	12,8 m
d	=	d	=	8,3 m
h	=	H_G-h_p	=	6,1 m
e	=	MIN(b ; 2*h)	=	12,2 m
e_1	=	e/4	=	3,0 m
e_2	=	e/10	=	1,2 m

Apribojimai : $0{,}025 \le \alpha \le 0{,}10$

α_p = h_p/h = 0,000

Siurbimas:

$c_{pe,Ff}$ = WENN($\alpha_p \le 0{,}05$; -1.6+ ((α_p-0,025)/0,025)*0.2 ; -1,4+ ((α_p-0,05)/0,05)*0.2) = **-1,80**

e_1 = e/4 = **3,0 m**

e_2 = e/10 = **1,2 m**

$c_{pe,Gf}$ = WENN($\alpha_p \le 0{,}05$; -1.1+ ((α_p-0,025)/0,025)*0.2 ; -0,9+ ((α_p-0,05)/0,05)*0.1) = **-1,30**

e_2 = e/10 = **1,2 m**

b_f = (L_G-2*(e/4)) = **6,7 m**

$c_{pe,Hf}$ = **-0,70**

e_2-e_{10} = (e/2)-(e/10) = **4,9 m**

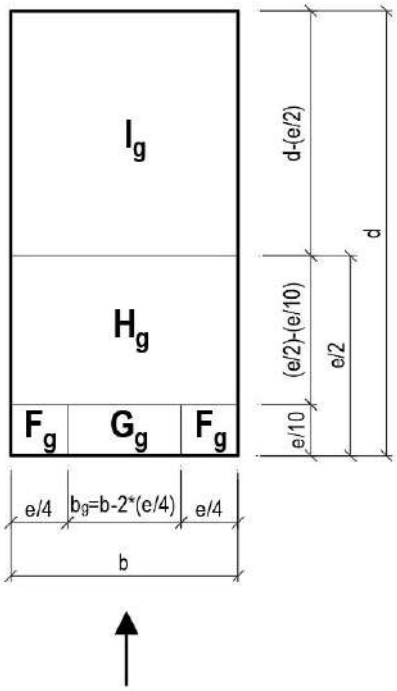
$c_{pe,If-}$ = **-0,20**

d-e_{10} = (d)-(e/2) = **2,2 m**

Gniuzdymas:

$c_{pe,If+}$ = **0,20**

d-e_{10} = (d)-(e/2) = **2,2 m**



2. Vejas pucia i sonini fasada (Q = 90°)

b =	B_G	=	8,3 m	
d =	L_G	=	12,8 m	
h =	H_G-h_p	=	6,1 m	
e =	MIN(b ; 2*h)	=	8,3 m	
e_1 =	e/4	=	2,1 m	
e_2 =	e/10	=	0,8 m	

Apribojimai : $0{,}025 \le \alpha \le 0{,}10$

α_p = h_p/h = 0,000

Siurbimas:

$c_{pe,Fg}$ = WENN($\alpha_p \le 0{,}05$; -1.6+ ((α_p-0,025)/0,025)*0.2 ; -1,4+ ((α_p-0,05)/0,05)*0.2) = **-1,80**

e_1 = e/4 = **2,1 m**

e_2 = e/10 = **0,8 m**

$c_{pe,Gg}$ = WENN($\alpha_p \le 0{,}05$; -1.1+ ((α_p-0,025)/0,025)*0.2 ; -0,9+ ((α_p-0,05)/0,05)*0.1) = **-1,30**

e_1 = e/4 = **2,1 m**

b_f = b-2*(e/4) = **4,2 m**

$c_{pe,Hg}$ = **-0,70**

e_2-e_{10} = (e/2)-(e/10) = **3,3 m**

e_1 = e/2 = 4,2 m

$c_{pe,lg-}$ = **-0,20**

d-e_2 = (d)-(e/2) = **8,7 m**

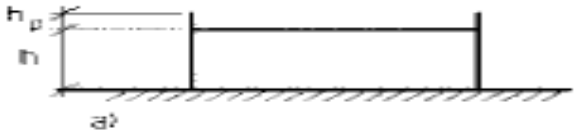
Gniuzdymas:

$c_{pe,lg+}$ = **0,20**

d-e_2 = (d)-(e/2) = **8,7 m**

Vidinio slegio koeficientai:

0. Geomtrija



$B_i = B_G = 8{,}3$ m
$L_i = L_G = 12{,}8$ m
$H_i = H_G = 6{,}12$ m

1. Pastato sandarumas

Prielaidos:
- Pastatas yra uzdaromas ekstremaliomis oro salygomis.
- Normalus pratekejimai
- Visos sienos yra visnodo sandarumo
- Atidaryti vartai, durys, langai yra kontoliuojami sumazinti poveiki jei to reikia.

Dvs : $\mu = \Sigma$ sienos plotas i kuri pucia vejas / Σ sienos plotas

1.1 Vejas pucia i sonini pavirsiu:

Soninis fasadas $A_1 = B_i * H_i = 51$ m²
Fasadas $A_2 = H_i * L_i = 78$ m²

Santykis $\mu_= $ (A1+2*A2)/(2*A1+2*A2) = 0,80

c1= 0,73-μ*1,14 = -0,18
c2= 0,80-μ*1,37 = -0,30
h/d h1= H_i/L_i = 0,48

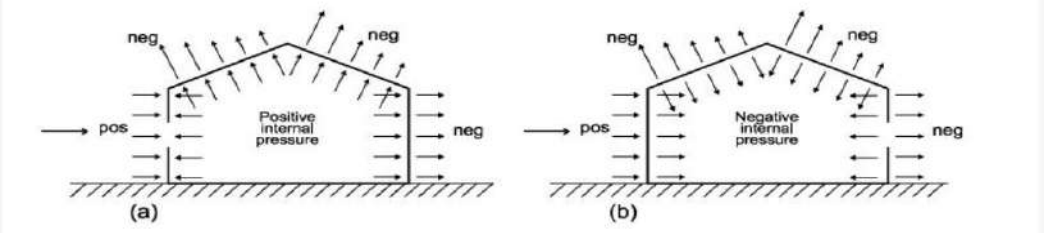
Vidinis slegis:
c_{pi1} = WENN($h_1 \leq 0.25$; c1; WENN(($h_1 > 0.25$ UND $h_1 \leq 1.$);(c1+(c2-c1)*(h1-0,25)/0,75); c2)) = **-0,22**

1.2 Vejas pucia i fasada:

Santykis $\mu_= $ (A2+2*A1)/(2*A1+2*A2) = 0,70

c1= 0,73-μ*1,14 = -0,07
c2= 0,80-μ*1,37 = -0,16
h/d h1= H_i/B_i = 0,74

Vidinis slegis:
c_{pi2} = WENN($h_1 \leq 0.25$; c1; WENN(($h_1 > 0.25$ UND $h_1 \leq 1.$);(c1+(c2-c1)*(h1-0,25)/0,75); c2)) = **-0,13**



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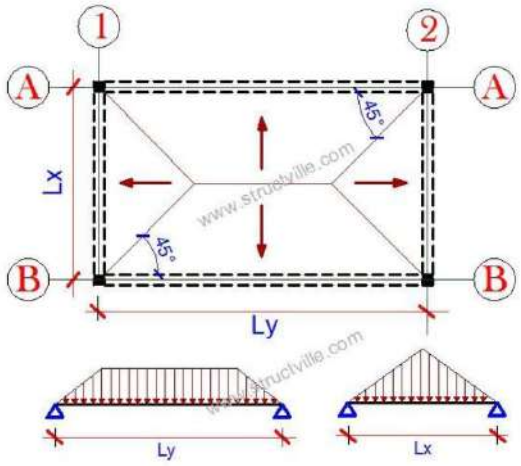


APKROVŲ NUO DANGČIO SKAIČIAVIMAS AŠIS 1-1'

Geometrija:

Ilgis, l_x= **1,50 m**

Plotis, l_y = **4,75 m**

Sniegas, q_s = **1,2 kN/m²**

Savasis svoris ir tech., q_g = **25,0*0,25+1** = 7,3 kN/m²

Sneigo svoris, L_s = $(MIN(l_x;l_y)/2)*q_s$ = 0,9 kN/m

Savasis svoris, L_g= $(MIN(l_x;l_y)/2)*q_g$ = 5,5 kN/m

Apkrovos ilgis, l_s = $MIN(l_x;l_y)/2$ = 0,8 m

Jie dangtis nekaprytas tarpinės atramos dauginamos iš 1,25 sudėjus kraštinių rezervuorų denginių pusinius atstumus Lx.

Sniego svoris tarpinėse atramose, $L_{s,mid}$= 1,25*(0,8+2,3)*qs = 4,7 kN/m

Savasis svoris tarpinėse atramose, $L_{g,mid}$= 1,25*(0,8+2,3)*q_g = 28,3 kN/m

APKROVŲ NUO DANGČIO SKAIČIAVIMAS AŠIS 1'-2

Geometrija:

Ilgis, l_x= **4,60 m**

Plotis, l_y = **4,75 m**

Sniegas, q_s = **1,2 kN/m²**

Savasis svoris ir tech., q_g = **25,0*0,25+1** = 7,3 kN/m²

Sneigo svoris, L_s = $(MIN(l_x;l_y)/2)*q_s$ = 2,8 kN/m

Savasis svoris, L_g= $(MIN(l_x;l_y)/2)*q_g$ = 16,8 kN/m

Apkrovos ilgis, l_s = $MIN(l_x;l_y)/2$ = 2,3 m

Jie dangtis nekaprytas tarpinės atramos dauginamos iš 1,25 sudėjus kraštinių rezervuorų denginių pusinius atstumus Lx.

Sniego svoris tarpinėse atramose, $L_{s,mid}$= 1,25*(2,3+2,4)*qs = 7,0 kN/m

Savasis svoris tarpinėse atramose, $L_{g,mid}$= 1,25*(2,3+2,4)*q_g = 42,9 kN/m

APKROVŲ NUO DANGČIO SKAIČIAVIMAS AŠIS 2-3

Geometrija:

Ilgis, $\mathbf{l_x}$= **8,30 m**

Plotis, $\mathbf{l_y}$ = **4,75 m**

Sniegas, $\mathbf{q_s}$ = **1,2 kN/m^2**

Savasis svoris ir tech., $\mathbf{q_g}$ = **25,0*0,25+1** = 7,3 kN/m^2

Sniego svoris, L_s = $(MIN(l_x;l_y)/2)*q_s$ = 2,9 kN/m

Savasis svoris, L_g= $(MIN(l_x;l_y)/2)*q_g$ = 17,3 kN/m

Apkrovos ilgis, l_s = $MIN(l_x;l_y)/2$ = 2,4 m

Jie dangtis nekaprytas tarpinės atramos dauginamos iš 1,25 sudėjus kraštinių rezervuorų denginių pusinius atstumus Lx.

Sniego svoris tarpinėse atramose, $L_{s,mid}$= 1,25*(2,4+2,4)*qs = 7,2 kN/m

Savasis svoris tarpinėse atramose, $L_{g,mid}$= 1,25*(2,4+2,4)*q_g = 43,8 kN/m

APKROVŲ NUO DANGČIO SKAIČIAVIMAS AŠIS 3-4

Geometrija:

Ilgis, $\mathbf{l_x}$= **4,75 m**

Plotis, $\mathbf{l_y}$ = **4,75 m**

Sniegas, $\mathbf{q_s}$ = **1,2 kN/m^2**

Savasis svoris ir tech., $\mathbf{q_g}$ = **25,0*0,25+1** = 7,3 kN/m^2

Sniego svoris, L_s = $(MIN(l_x;l_y)/2)*q_s$ = 2,9 kN/m

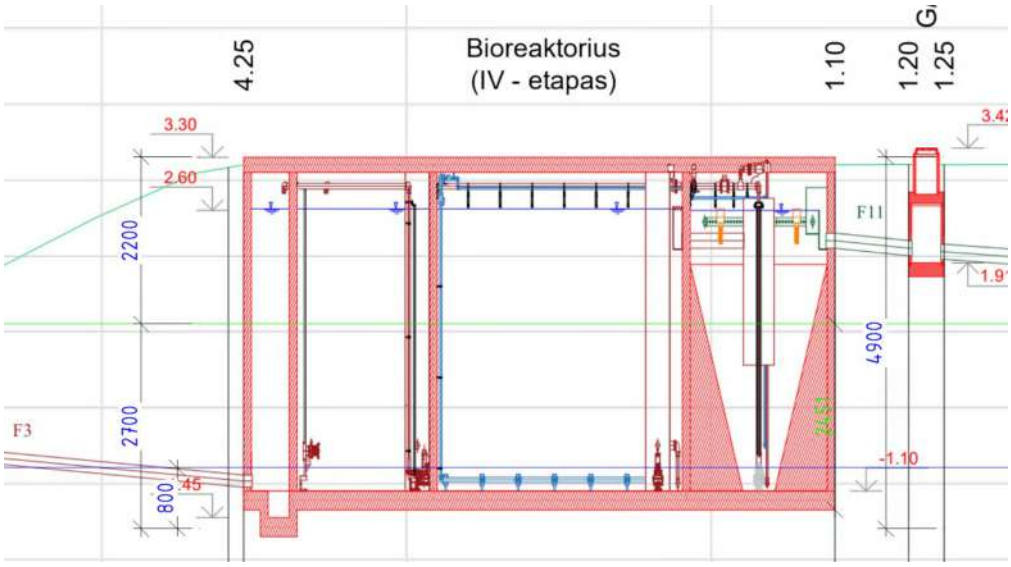
Savasis svoris, L_g= $(MIN(l_x;l_y)/2)*q_g$ = 17,3 kN/m

Apkrovos ilgis, l_s = $MIN(l_x;l_y)/2$ = 2,4 m

RFEM programoje uždedama parabolinė apkrova su kraštinėmis apkrovomis dėl saugumo nors teoriškai apkrovos pasiskirsto trikampiu.

SK23010_Dreverna_ slėgių skaičiavimai_(03)_23.08.01

IŠORINIO VANDENS SLĖGIO SKAIČIAVIMAS Į SIENĄ IR DUGNĄ:



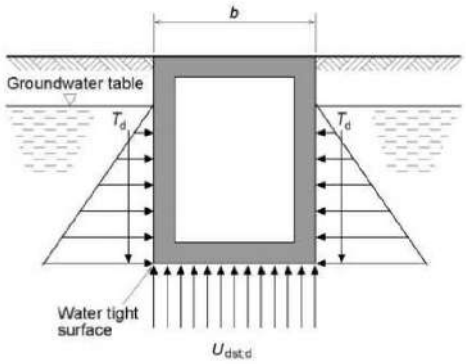
Geometrija:

Aukštis, h_v= **4,90 m**

Žingsnis, **cc** = **1,0 m**

Medžiagos koeficientas, $g_{m,G}$ = **1,0**

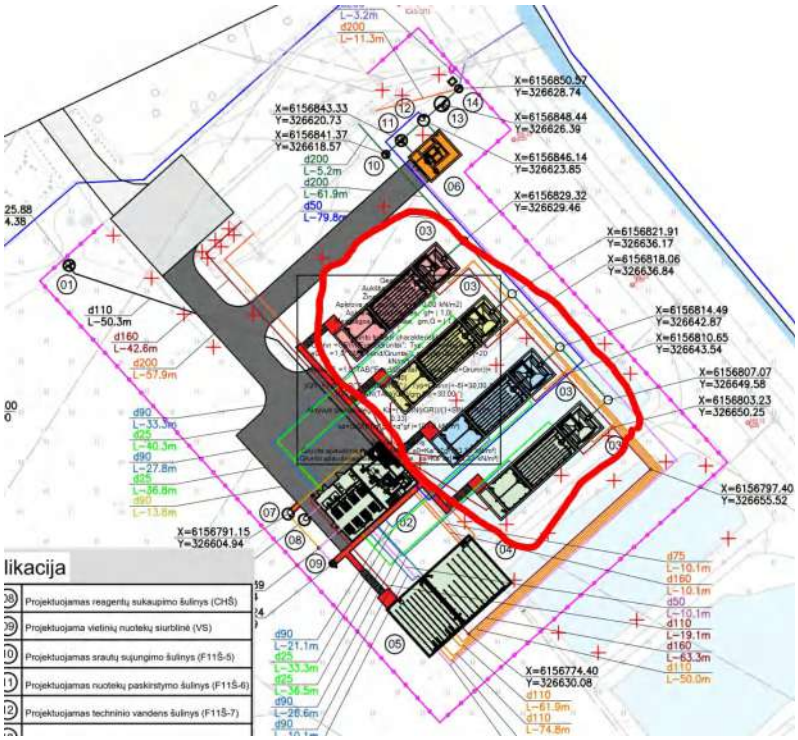
Apkrova vanduo, **q**= **10,00 kN/m^2**



Vandens spaudimas į dugną, U_h= $g_{m,G}$*cc*q*h_v = 49,0 kN/m^2

Priimama, kad vanduo vistiek spaus per visą rezervuaro aukštį nors jo aukštis tik 1 m žemiau rezervuaro, kadangi padaryta sankasa traktuojama kad joje vandens slėgis nesusidarys ir bus spaudžiama tik įkasta rezervaro dalis. Dugno kėlimo apkrova bus tokia pati kaip maksimali šoninio spaudimo apkrova.

GRUNTO SLĖGIO SKAIČIAVIMAS



Geometrija:

Aukštis, h_g=	**4,55 m**
Žingsnis, **cc** =	**1,0 m**
Apkrova ant grunto, **q**=	**0,00 kN/m²**
Apkrovos koeficientas, γ_f=	**1,0**
Medžiagos koeficientas, $\gamma_{m,G}$ =	**1,0**

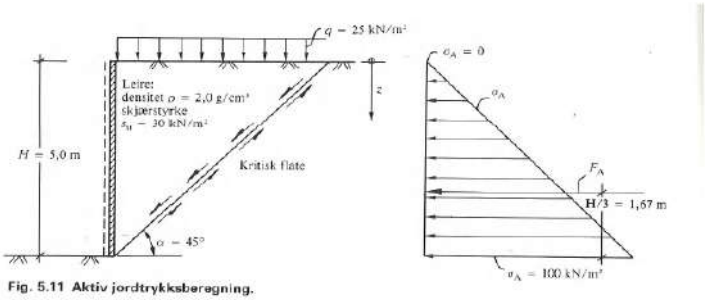


Fig. 5.11 Aktiv jordtrykksberegning.

Grunto tipas ir charakteristikos:

Grunn =	**GEW("Fund/Gruntai"; Typ;)**	=	**Smėlis (piltinis)**
a_{GR} =	1,0*TAB("Fund/Gruntai"; a; Typ=Grunn)+0	=	20 kN/m²
$r_{max,GR}$ =	1,0*TAB("Fund/Gruntai"; r_{max}; Typ=Grunn)	=	0,90
φ_{GR} =	1,0*TAB("Fund/Gruntai";φ; Typ=Grunn)+-6	=	30,00 °
ρ_{GR}=	ATAN(TAN(φ_{GR})/$\gamma_{m,G}$)	=	30,00 °

Aktyvus grunto slėgis, K_a= (1-SIN(ρ_{GR}))/(1+SIN(ρ_{GR})) = 0,33

σz= (a_{GR}*h_g*γ_f)+q*γ_f = 91,0 kN/m²

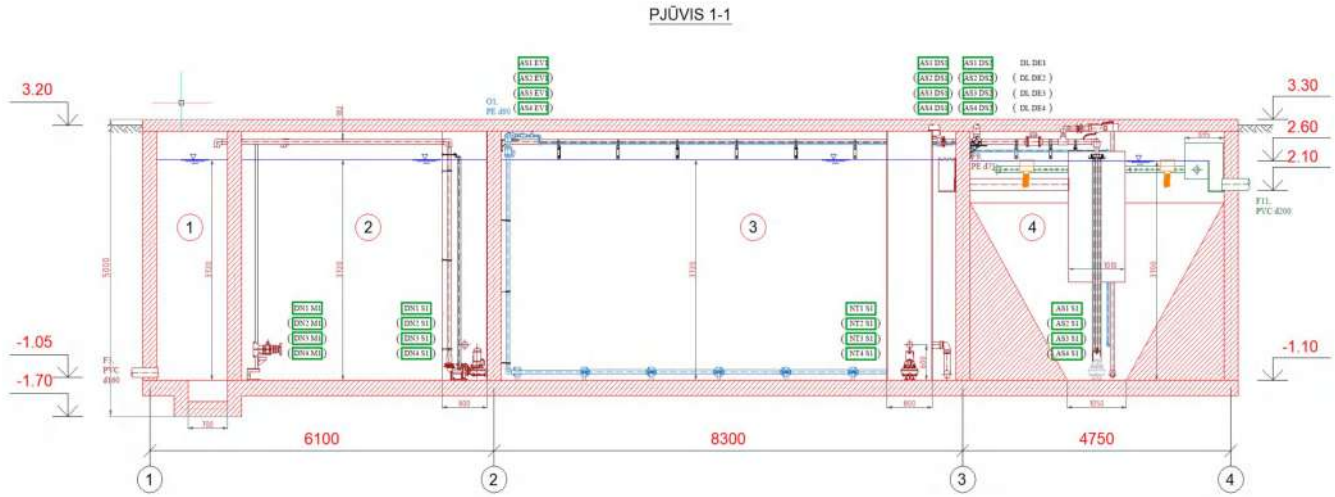
Apkrovos į sieną:

Grunto spaudimas sienos viršuje, σ_0= K_a*q*γ_f = 0,00 kN/m²

Grunto spaudimas sienos apačioje, σ_α= K_a*σ_z = 30,03 kN/m²

Priimama kad sankasos grunto apkorva bus pilna, kaip pilnai užkasto rezervuaro.

VIDINIO VANDENS SLĖGIO SKAIČIAVIMAS Į SIENĄ IR DUGNĄ:

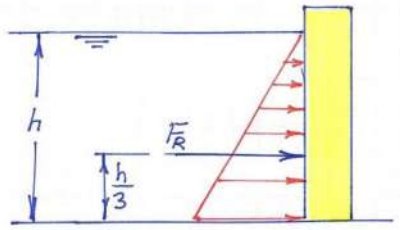


Geometrija:

Aukštis, h_v= **3,90 m**

Žingsnis, **cc** = **1,0 m**

Medžiagos koeficientas, $g_{m,G}$ = **1,0**



Vandens spaudimas sienos apačioje, $q_h = g_{m,G}*cc*10*1000*h_v/1000$ = 39,0 kN/m^2

Dugno spaudimo apkrova bus tokia pati kaip maksimali šoninio spaudimo apkrova.
Visų rezervuarų vidiniai slėgiai vienodi.

BETONO SAVOJI APKORVA KŪGIUI SUFORMUOTI REZERVUARUI:

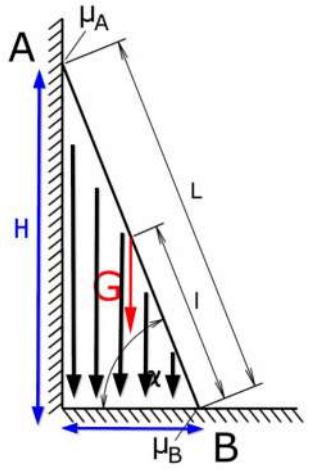
Geometrija:

Aukštis, h_v= **3,00 m**

Žingsnis, **cc** = **1,0 m**

Medžiagos koeficientas, $g_{m,G}$ = **1,0**

Apkrova betonas, **q**= **25,00 kN/m^2**

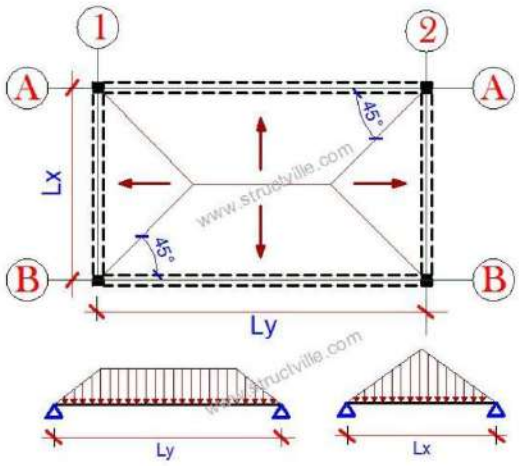


Vandens spaudimas sienos krašte, $q_h = g_{m,G}*cc*q*h_v$ = 75,0 kN/m^2

SK23010_Dreverna_ apkrovos nuo dangčio_(04, 05)_23.08.01

APKROVŲ NUO DANGČIO SKAIČIAVIMAS

Didesnis rezervuaras:



Geometrija:

Ilgis, l_x= **8,85 m**

Plotis, l_y = **8,75 m**

Sniegas, q_s = **1,2 kN/m²**

Savasis svoris ir tech., q_g = **25,0*0,25+1** = 7,3 kN/m²

Sneigo svoris, L_s = $(MIN(l_x;l_y)/2)*q_s$ = 5,3 kN/m

Savasis svoris, L_g= $(MIN(l_x;l_y)/2)*q_g$ = 31,9 kN/m

Apkrovos ilgis, l_s = $MIN(l_x;l_y)/2$ = 4,4 m

Jie dangtis nekaprytas tarpinės atramos dauginamos iš 1,25 sudėjus kraštinių rezervuorų denginių pusinius atstumus Lx.

Sniego svoris tarpinėse atramose, $L_{s,mid}$= 1,00*(4,4+3,3)*qs = 9,2 kN/m

Savasis svoris tarpinėse atramose, $L_{g,mid}$= 1,00*(4,4+3,3)*q_g = 56,2 kN/m

Mažesnis rezervuaras:

Geometrija:

Ilgis, l_x= **8,85 m**

Plotis, l_y = **6,65 m**

Sniegas, q_s = **1,2 kN/m²**

Savasis svoris ir tech., q_g = **25,0*0,25+1** = 7,3 kN/m²

Sneigo svoris, L_s = $(MIN(l_x;l_y)/2)*q_s$ = 4,0 kN/m

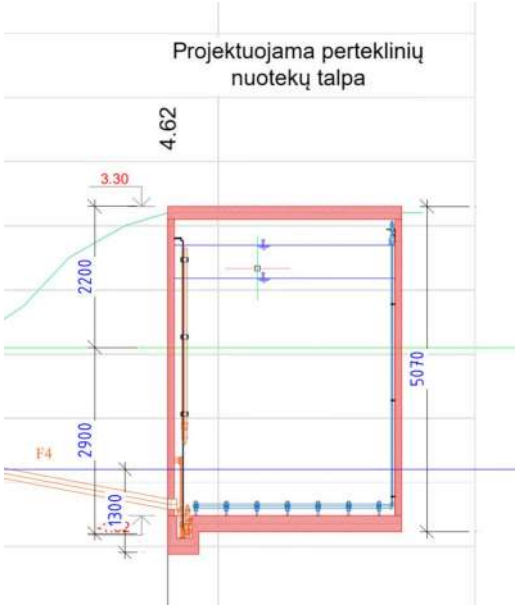
Savasis svoris, L_g= $(MIN(l_x;l_y)/2)*q_g$ = 24,3 kN/m

Apkrovos ilgis, l_s = $MIN(l_x;l_y)/2$ = 3,3 m

RFEM programoje uždedama parabolinė apkrova su kraštinėmis apkrovomis dėl saugumo nors teoriškai apkrovos pasiskirsto trikampiu.

SK23010_Dreverna_ slėgių skaičiavimai_(04, 05)_23.08.01

IŠORINIO VANDENS SLĖGIO SKAIČIAVIMAS Į SIENĄ IR DUGNĄ:

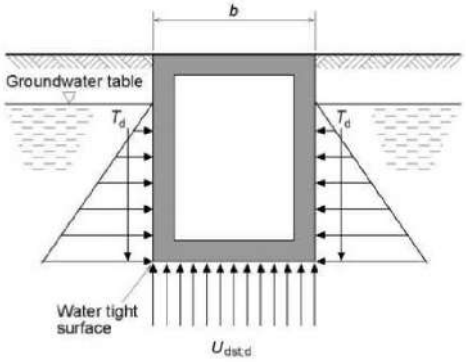


Geometrija:

Aukštis, h_v= **3,00 m**

Žingsnis, **cc** = **1,0 m**

Medžiagos koeficientas, $g_{m,G}$ = **1,0**



Vandens spaudimas sienos apačioje, q_h= $g_{m,G}$*cc*10*1000*h_v/1000 = 30,0 kN/m^2

Priimama, kad vanduo vistiek spaus per visą rezervuaro aukštį nors jo aukštis tik 1 m žemiau rezervuaro, kadangi padaryta sankasa traktuojama kad joje vandens slėgis nesusidarys ir bus psaudžiama tik įkasta rezervarro dalis. Dugno kėlimo apkrova bus tokia pati kaip maksimali šoninio spaudimo apkrova.

GRUNTO SLĖGIO SKAIČIAVIMAS

Geometrija:

Aukštis, h_g=	**5,10 m**
Žingsnis, **cc** =	**1,0 m**
Apkrova ant grunto, **q**=	**0,00 kN/m²**
Apkrovos koeficientas, γ_f=	**1,0**
Medžiagos koeficientas, $\gamma_{m,G}$ =	**1,0**

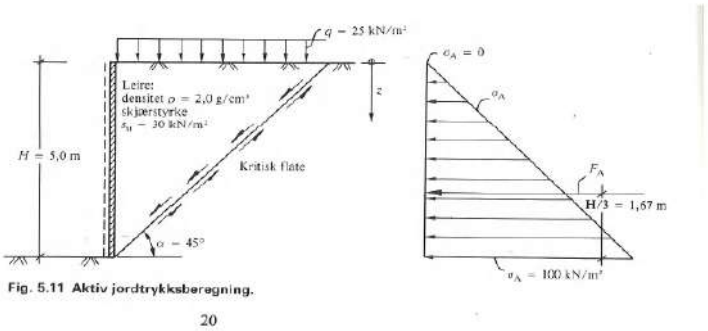


Fig. 5.11 Aktiv jordtrykksberegning.

20

Grunto tipas ir charakteristikos:

Grunn =	**GEW("Fund/Gruntai"; Typ;)**	=	**Smėlis (piltinis)**
a_{GR} =	1,0*TAB("Fund/Gruntai"; a; Typ=Grunn)+0	=	20 kN/m²
$r_{max,GR}$ =	1,0*TAB("Fund/Gruntai"; r_{max}; Typ=Grunn)	=	0,90
φ_{GR} =	1,0*TAB("Fund/Gruntai";φ; Typ=Grunn)+-6	=	30,00 °
ρ_{GR}=	ATAN(TAN(φ_{GR})/$\gamma_{m,G}$)	=	30,00 °

Aktyvus grunto slėgis, K_a= (1-SIN(ρ_{GR}))/(1+SIN(ρ_{GR})) = 0,33

σz= (a_{GR}*h_g*γ_f)+q*γ_f = 102,0 kN/m²

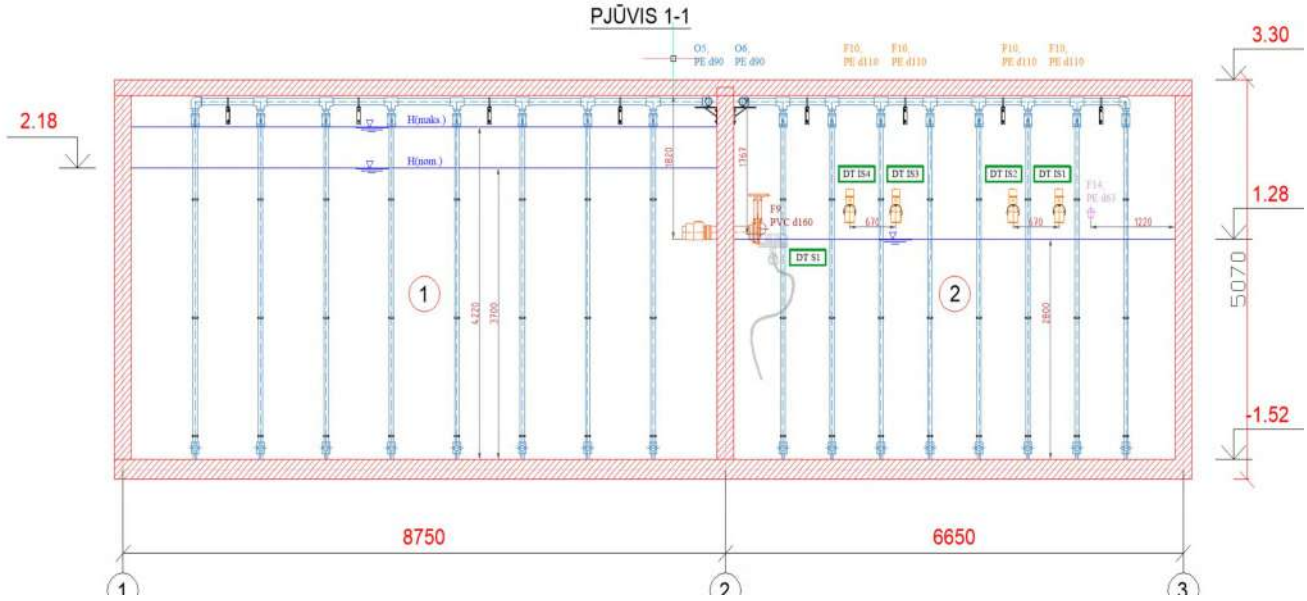
Apkrovos į sieną:

Grunto spaudimas sienos viršuje, σ_0= K_a*q*γ_f = 0,00 kN/m²

Grunto spaudimas sienos apačioje, σ_α= K_a*σ_z = 33,66 kN/m²

Priimama kad sankasos grunto apkorva bus pilna, kaip pilnai užkasto rezervuaro.

VIDINIO VANDENS SLĖGIO SKAIČIAVIMAS Į SIENĄ IR DUGNĄ:



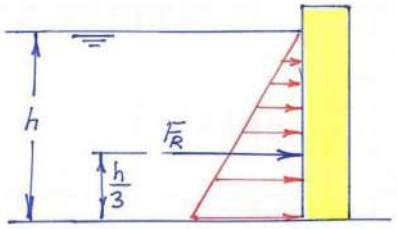
Mažesnis rezervuaras:

Geometrija:

Aukštis, h_v= **3,00 m**

Žingsnis, **cc** = **1,0 m**

Medžiagos koeficientas, $g_{m,G}$ = **1,0**



Vandens spaudimas sienos apačioje, $q_h = g_{m,G}*cc*10*1000*h_v/1000$ = 30,0 kN/m^2

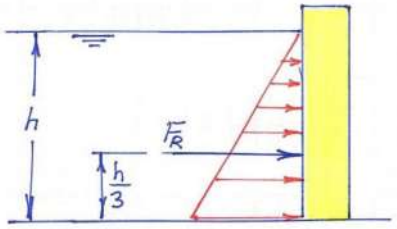
Didesnis rezervuaras:

Geometrija:

Aukštis, h_v= **4,40 m**

Žingsnis, **cc** = **1,0 m**

Medžiagos koeficientas, $g_{m,G}$ = **1,0**

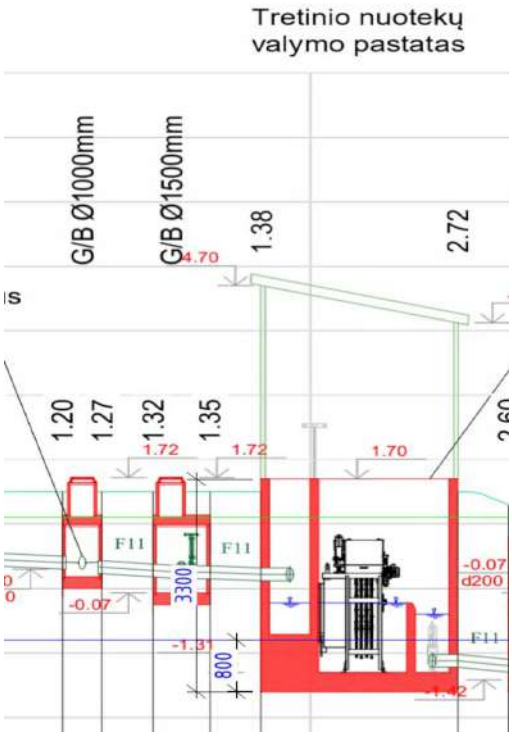


Vandens spaudimas sienos apačioje, $q_h = g_{m,G}*cc*10*1000*h_v/1000$ = 44,0 kN/m^2

Dugno spaudimo apkrova bus tokia pati kaip maksimali šoninio spaudimo apkrova.

SK23010_Dreverna_ slėgių skaičiavimai_(06)_23.08.01

IŠORINIO VANDENS SLĖGIO SKAIČIAVIMAS Į SIENĄ IR DUGNĄ:

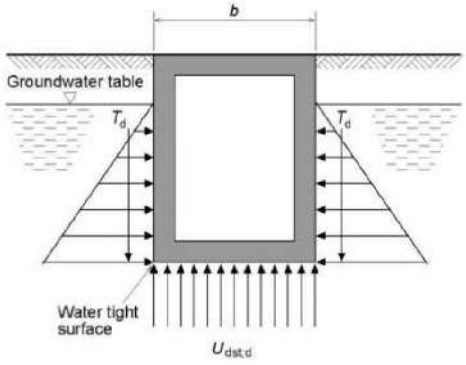


Geometrija:

Aukštis, h_v= **3,30 m**

Žingsnis, **cc** = **1,0 m**

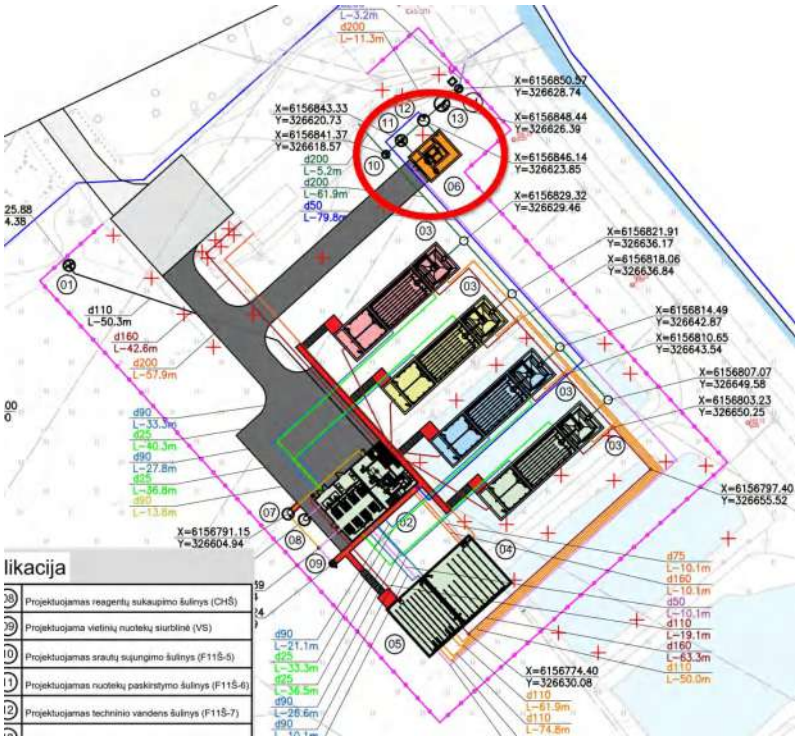
Medžiagos koeficientas, $g_{m,G}$ = **1,0**



Vandens spaudimas sienos apačioje, q_h= $g_{m,G}$*cc*10*1000*h_v/1000 = 33,0 kN/m^2

Priimama, kad vanduo vistiek spaus per visą rezervuaro aukštį nors jo aukštis tik 1 m žemiau rezervuaro. Dugno kėlimo apkrova bus tokia pati kaip maksimali šoninio spaudimo apkrova.

GRUNTO SLĖGIO SKAIČIAVIMAS



Geometrija:

Aukštis, h_g=	**3,30 m**
Žingsnis, **cc** =	**1,0 m**
Apkrova ant grunto, **q**=	**10,00 kN/m²**
Apkrovos koeficientas, γ_f=	**1,0**
Medžiagos koeficientas, $\gamma_{m,G}$ =	**1,0**

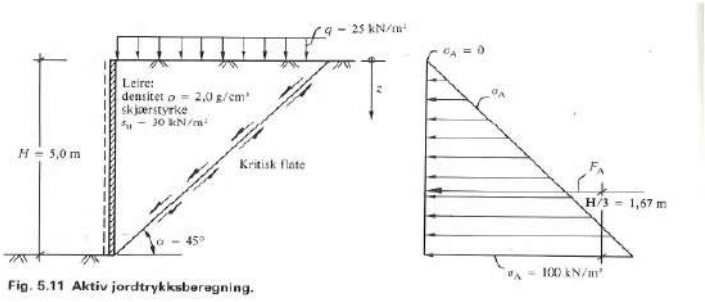


Fig. 5.11 Aktiv jordtrykksberegning.

Grunto tipas ir charakteristikos:

Grunn =	**GEW("Fund/Gruntai"; Typ;)**	=	**Smėlis (piltinis)**
a_{GR} =	1,0*TAB("Fund/Gruntai"; a; Typ=Grunn)+0	=	20 kN/m²
$r_{max,GR}$ =	1,0*TAB("Fund/Gruntai"; r_{max}; Typ=Grunn)	=	0,90
φ_{GR} =	1,0*TAB("Fund/Gruntai";φ; Typ=Grunn)+-6	=	30,00 °
ρ_{GR}=	ATAN(TAN(φ_{GR})/$\gamma_{m,G}$)	=	30,00 °

Aktyvus grunto slėgis, K_a= (1-SIN(ρ_{GR}))/(1+SIN(ρ_{GR})) = 0,33

σz= (a_{GR}*h_g*γ_f)+q*γ_f = 76,0 kN/m²

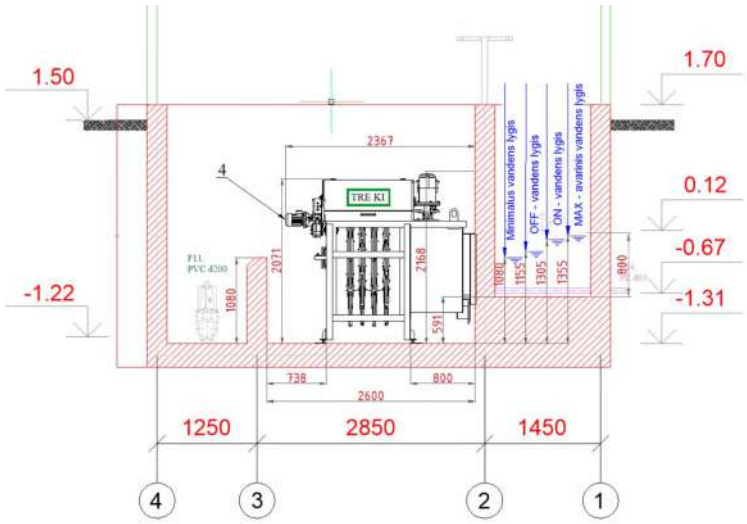
Apkrovos į sieną:

Grunto spaudimas sienos viršuje, σ_0= K_a*q*γ_f = 3,30 kN/m²

Grunto spaudimas sienos apačioje, σ_α= K_a*σ_z = 25,08 kN/m²

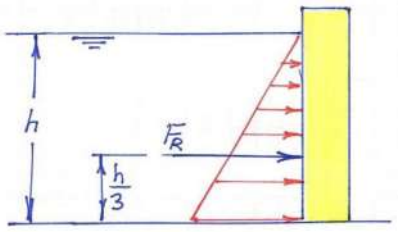
Priimama kad šalia pastato bus privažiuojama technika todėl prideama apkorva ant grunto.

VIDINIS VANDENS SLĖGIO SKAIČIAVIMAS:



Geometrija:

Aukštis, h_v=	**1,00 m**
Žingsnis, **cc** =	**1,0 m**
Medžiagos koeficientas, $g_{m,G}$ =	**1,0**



Vandens spaudimas sienos apačioje, $q_h = g_{m,G}*cc*10*1000*h_v/1000$ = 10,0 kN/m^2

Priimama, kad vanduo spaus tik vertikaliai ir horizontali kryptimi bus nykstamai maža apkova dėl mažo vandens kiekio.

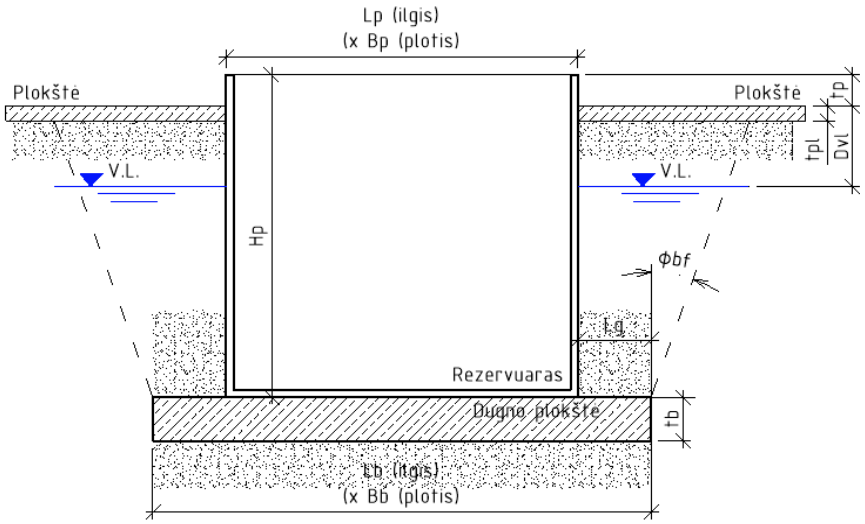
Rezervuaro plūdrumo skaičiavimas - Bioreaktoriai (I-IV)

Priedas Nr.2

pagal LST EN 1997-1:2006

PASTABA: Rezervuaras stačiakampis.

Pjūvis:



Rezervuaro charakteristikos:

$m_r := 150000\ kg$ - rezervuaro masė (vidinės, išorinės sienos dangtis)

$L_p := 19400\ mm$ - rezervuaro išorinis ilgis

$B_p := 5000\ mm$ - rezervuaro išorinis plotis

$H_p := 4650\ mm$ - rezervuaro aukštis

$t_p := 0\ mm$ - rezervuaro viršaus išsikišimas virš žemės paviršiaus

$R_{ck} := 0\ kN$ - Papildoma stabilizuojanti charakteristinė jėga

Dugno plokštės charakteristikos:

$Dugno_pl :=$ "kvadratinė" - "apvali" arba "kvadratinė"

$L_b := (19400 + 2 \cdot 300)\ mm$ - dugno plokštės ilgis (arba skersmuo esant apvaliai plokštei)

$B_b := (5000 + 2 \cdot 300)\ mm$ - dugno plokštės plotis

$t_b := 350\ mm$ - dugno plokštės storis

$\gamma_c := 2400\ \frac{kg}{m^3}$ - dugno plokštės vienetinis svoris

$A_b = 112\ m^2$ - dugno plokštės plotas

Grunto charakteristikos:

$\gamma_{gs} := 1800\ \frac{kg}{m^3}$ - sauso grunto vienetinis svoris

$\gamma_g := 2200\ \frac{kg}{m^3}$ - vandens prisotinto grunto vienetinis svoris

$\varphi_k := 30\ deg$ - grunto vidinės trinties kampas

$\gamma_{\varphi'} := 1,25$ - dalinis poveikio koeficientas

$\varphi_d := \varphi_k \cdot \gamma_\varphi$, $\varphi_d = 37,5$ deg

$\varphi_{bf} := \left(45 \text{ deg} - \frac{\varphi_d}{2}\right)$ $\varphi_{bf} = 26,25$ deg

$t_{pl} := 0$ mm - žemės dangos storis

$\gamma_{pl} := 1800 \frac{\text{kg}}{\text{m}^3}$ - žemės dangos vienetinis svoris

Gruntinio vandens charakteristikos:

$\gamma_v := 1000 \frac{\text{kg}}{\text{m}^3}$ - vandens vienetinis svoris

$D_{vl} := 2000$ mm - vandens lygis žemiau žemės paviršiaus (sankasos neimamos)

Skaičiavimai:

$\gamma_{G,dst} := 1,0$ - dalinis poveikio koef. esant destabilizuojančiam nuolatiniam poveikiui

$\gamma_{Q,dst} := 1,5$ - dalinis poveikio koef. esant destabilizuojančiam kintamam poveikiui

$\gamma_{G,stb} := 0,9$ - dalinis poveikio koef. esant stabilizuojančiam nuolatiniam poveikiui

$V_{gr,gs} = 240,57 \text{ m}^3$ - sauso grunto tūris

$V_{gr,g} = 133,36 \text{ m}^3$ - vandens prisotinto grunto tūris

$V_b := A_b \cdot t_b = 39,2 \text{ m}^3$ - plokštės tūris

$V_{pl} := A_{pl} \cdot t_{pl} = 0 \text{ m}^3$ - žemės dangos tūris

$G_{gr,gs,ck} := V_{gr,gs} \cdot \gamma_{gs} \cdot g = 4248,07$ kN - sauso grunto charakteristinis svoris

$G_{gr,g,ck} := V_{gr,g} \cdot \left(\gamma_g - \gamma_v\right) \cdot g = 1569,92$ kN - vandens prisotinto grunto charakteristinis svoris

$G_{r,ck} := m_r \cdot g = 1471,5$ kN - rezervuaro talpos charakteristinis svoris

$G_{pl,ck} := V_{pl} \cdot \gamma_{pl} \cdot g = 0$ kN - žemės dangos charakteristinis svoris

$G_{b,ck} := V_b \cdot \gamma_c \cdot g = 922,92$ kN - dugno plokštės charakteristinis svoris

$G_{stb,d} := \left(G_{gr,gs,ck} + G_{gr,g,ck} + G_{r,ck} + G_{pl,ck} + G_{b,ck}\right) \cdot \gamma_{G,stb}$

$G_{stb,d} = 7391,17$ kN - nuolatinis skaičiuotinis stabilizuojantis poveikis dėl sąvojo svorio

$R_d := R_{ck} \cdot \gamma_{G,stb} = 0$ kN - papildomas nuolatinis skaičiuotinis stabilizuojantis poveikis

$V_{dst,d} := \left(V_b + L_p \cdot B_p \cdot \left(H_p - D_{vl} - t_p\right)\right) \cdot \gamma_v \cdot g \cdot \gamma_{G,dst}$

$V_{dst,d} = 2906,21$ kN -nuolatinis skaičiuotinis destabilizuojantis poveikis

Tikriname sąlyga:

$V_{dst,d} \le G_{stb,d} + R_d$ $V_{dst,d} = 2906,2$ kN $G_{stb,d} + R_d = 7391,2$ kN

```
atsakymas := if V_dst,d ≤ G_stb,d + R_d
               "sąlyga tenkinama"
             else
               "sąlyga netenkinama"
```

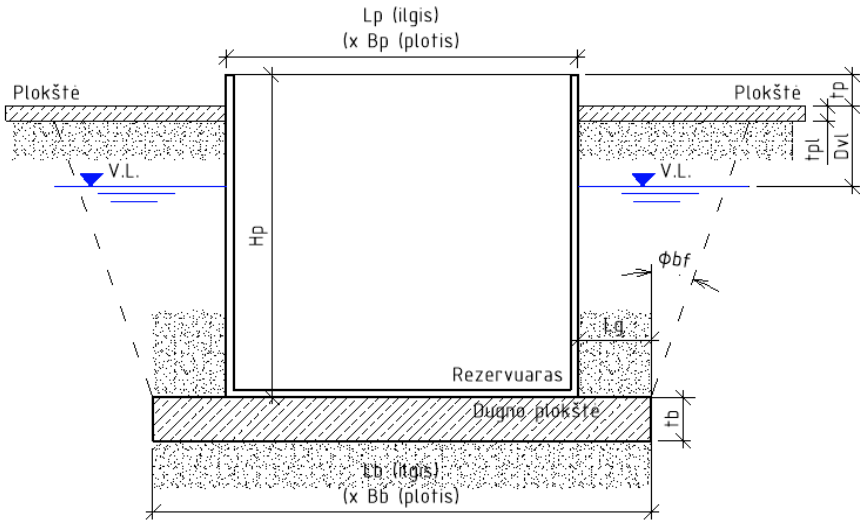
atsakymas = "sąlyga tenkinama"

Rezervuaro plūdrumo skaičiavimas-Perteklinių nuotekų ir dumblo talpos

pagal LST EN 1997-1:2006

PASTABA: Rezervuaras stačiakampis.

Pjūvis:



Rezervuaro charakteristikos:

$m_r := 221000\ kg$ - rezervuaro masė (vidinės, išorinės sienos dangtis)

$L_p := 15400\ mm$ - rezervuaro išorinis ilgis

$B_p := 9100\ mm$ - rezervuaro išorinis plotis

$H_p := 5070\ mm$ - rezervuaro aukštis

$t_p := 0\ mm$ - rezervuaro viršaus išsikišimas virš žemės paviršiaus

$R_{ck} := 0\ kN$ - Papildoma stabilizuojanti charakteristinė jėga

Dugno plokštės charakteristikos:

$Dugno_pl := "kvadratinė"$ - "apvali" arba "kvadratinė"

$L_b := (15400 + 2 \cdot 300)\ mm$ - dugno plokštės ilgis (arba skersmuo esant apvaliai plokštei)

$B_b := (9100 + 2 \cdot 300)\ mm$ - dugno plokštės plotis

$t_b := 350\ mm$ - dugno plokštės storis

$\gamma_c := 2400\ \frac{kg}{m^3}$ - dugno plokštės vienetinis svoris

$A_b = 155{,}2\ m^2$ - dugno plokštės plotas

Grunto charakteristikos:

$\gamma_{gs} := 1800\ \frac{kg}{m^3}$ - sauso grunto vienetinis svoris

$\gamma_g := 2200\ \frac{kg}{m^3}$ - vandens prisotinto grunto vienetinis svoris

$\varphi_k := 30\ deg$ - grunto vidinės trinties kampas

$\gamma_{\varphi'} := 1{,}25$ - dalinis poveikio koeficientas

$\varphi_d := \varphi_k \cdot \gamma_\varphi$, $\varphi_d = 37,5$ deg

$\varphi_{bf} := \left(45 \text{ deg} - \frac{\varphi_d}{2}\right)$ $\varphi_{bf} = 26,25$ deg

$t_{pl} := 0$ mm - žemės dangos storis

$\gamma_{pl} := 1800 \frac{\text{kg}}{\text{m}^3}$ - žemės dangos vienetinis svoris

Gruntinio vandens charakteristikos:

$\gamma_v := 1000 \frac{\text{kg}}{\text{m}^3}$ - vandens vienetinis svoris

$D_{vl} := 2000$ mm - vandens lygis žemiau žemės paviršiaus (sankasos neimamos)

Skaičiavimai:

$\gamma_{G,dst} := 1,0$ - dalinis poveikio koef. esant destabilizuojančiam nuolatiniam poveikiui

$\gamma_{Q,dst} := 1,5$ - dalinis poveikio koef. esant destabilizuojančiam kintamam poveikiui

$\gamma_{G,stb} := 0,9$ - dalinis poveikio koef. esant stabilizuojančiam nuolatiniam poveikiui

$V_{gr,gs} = 269,28 \text{ m}^3$ - sauso grunto tūris

$V_{gr,g} = 174,83 \text{ m}^3$ - vandens prisotinto grunto tūris

$V_b := A_b \cdot t_b = 54,32 \text{ m}^3$ - plokštės tūris

$V_{pl} := A_{pl} \cdot t_{pl} = 0 \text{ m}^3$ - žemės dangos tūris

$G_{gr,gs,ck} := V_{gr,gs} \cdot \gamma_{gs} \cdot g = 4754,93$ kN - sauso grunto charakteristinis svoris

$G_{gr,g,ck} := V_{gr,g} \cdot \left(\gamma_g - \gamma_v\right) \cdot g = 2058,05$ kN - vandens prisotinto grunto charakteristinis svoris

$G_{r,ck} := m_r \cdot g = 2168,01$ kN - rezervuaro talpos charakteristinis svoris

$G_{pl,ck} := V_{pl} \cdot \gamma_{pl} \cdot g = 0$ kN - žemės dangos charakteristinis svoris

$G_{b,ck} := V_b \cdot \gamma_c \cdot g = 1278,91$ kN - dugno plokštės charakteristinis svoris

$G_{stb,d} := \left(G_{gr,gs,ck} + G_{gr,g,ck} + G_{r,ck} + G_{pl,ck} + G_{b,ck}\right) \cdot \gamma_{G,stb}$

$G_{stb,d} = 9233,91$ kN - nuolatinis skaičiuotinis stabilizuojantis poveikis dėl sąvojo svorio

$R_d := R_{ck} \cdot \gamma_{G,stb} = 0$ kN - papildomas nuolatinis skaičiuotinis stabilizuojantis poveikis

$V_{dst,d} := \left(V_b + L_p \cdot B_p \cdot \left(H_p - D_{vl} - t_p\right)\right) \cdot \gamma_v \cdot g \cdot \gamma_{G,dst}$

$V_{dst,d} = 4753,43$ kN -nuolatinis skaičiuotinis destabilizuojantis poveikis

Tikriname sąlyga:

$V_{dst,d} \le G_{stb,d} + R_d$ $V_{dst,d} = 4753,4$ kN $G_{stb,d} + R_d = 9233,9$ kN

```
atsakymas := if V_dst,d ≤ G_stb,d + R_d
               "sąlyga tenkinama"
             else
               "sąlyga netenkinama"
```

atsakymas = "sąlyga tenkinama"

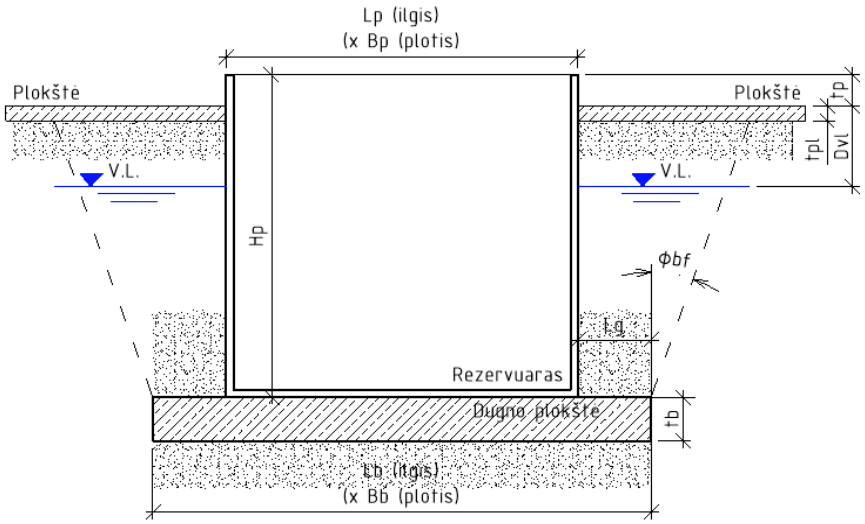
Rezervuaro plūdrumo skaičiavimas - Tretinio valymo pastatas

Priedas Nr.2

pagal LST EN 1997-1:2006

PASTABA: Rezervuaras stačiakampis.

Pjūvis:



Rezervuaro charakteristikos:

$m_r := 50000\ kg$ - rezervuaro masė (vidinės, išorinės sienos dangtis)

$L_p := 5800\ mm$ - rezervuaro išorinis ilgis

$B_p := 4800\ mm$ - rezervuaro išorinis plotis

$H_p := 3300\ mm$ - rezervuaro aukštis

$t_p := 0\ mm$ - rezervuaro viršaus išsikišimas virš žemės paviršiaus

$R_{ck} := 0\ kN$ - Papildoma stabilizuojanti charakteristinė jėga

Dugno plokštės charakteristikos:

$Dugno_pl := "kvadratinė"$ - "apvali" arba "kvadratinė"

$L_b := (5800 + 2 \cdot 300)\ mm$ - dugno plokštės ilgis (arba skersmuo esant apvaliai plokštei)

$B_b := (4800 + 2 \cdot 300)\ mm$ - dugno plokštės plotis

$t_b := 350\ mm$ - dugno plokštės storis

$\gamma_c := 2400\ \frac{kg}{m^3}$ - dugno plokštės vienetinis svoris

$A_b = 34,56\ m^2$ - dugno plokštės plotas

Grunto charakteristikos:

$\gamma_{gs} := 1800\ \frac{kg}{m^3}$ - sauso grunto vienetinis svoris

$\gamma_g := 2200\ \frac{kg}{m^3}$ - vandens prisotinto grunto vienetinis svoris

$\varphi_k := 30\ deg$ - grunto vidinės trinties kampas

$\gamma_{\varphi'} := 1,25$ - dalinis poveikio koeficientas

$\varphi_d := \varphi_k \cdot \gamma_\varphi$, $\varphi_d = 37,5\ \text{deg}$

$\varphi_{bf} := \left(45\ \text{deg} - \frac{\varphi_d}{2}\right)$ $\varphi_{bf} = 26,25\ \text{deg}$

$t_{pl} := 0\ \text{mm}$ - žemės dangos storis

$\gamma_{pl} := 1800\ \frac{\text{kg}}{\text{m}^3}$ - žemės dangos vienetinis svoris

Gruntinio vandens charakteristikos:

$\gamma_v := 1000\ \frac{\text{kg}}{\text{m}^3}$ - vandens vienetinis svoris

$D_{vl} := 0\ \text{mm}$ - vandens lygis žemiau žemės paviršiaus (sankasos neimamos)

Skaičiavimai:

$\gamma_{G,dst} := 1,0$ - dalinis poveikio koef. esant destabilizuojančiam nuolatiniam poveikiui

$\gamma_{Q,dst} := 1,5$ - dalinis poveikio koef. esant destabilizuojančiam kintamam poveikiui

$\gamma_{G,stb} := 0,9$ - dalinis poveikio koef. esant stabilizuojančiam nuolatiniam poveikiui

$V_{gr,gs} = 0$ - sauso grunto tūris

$V_{gr,g} = 97,17\ \text{m}^3$ - vandens prisotinto grunto tūris

$V_b := A_b \cdot t_b = 12,1\ \text{m}^3$ - plokštės tūris

$V_{pl} := A_{pl} \cdot t_{pl} = 0\ \text{m}^3$ - žemės dangos tūris

$G_{gr,gs,ck} := V_{gr,gs} \cdot \gamma_{gs} \cdot g = 0\ \text{kN}$ - sauso grunto charakteristinis svoris

$G_{gr,g,ck} := V_{gr,g} \cdot \left(\gamma_g - \gamma_v\right) \cdot g = 1143,91\ \text{kN}$ - vandens prisotinto grunto charakteristinis svoris

$G_{r,ck} := m_r \cdot g = 490,5\ \text{kN}$ - rezervuaro talpos charakteristinis svoris

$G_{pl,ck} := V_{pl} \cdot \gamma_{pl} \cdot g = 0\ \text{kN}$ - žemės dangos charakteristinis svoris

$G_{b,ck} := V_b \cdot \gamma_c \cdot g = 284,79\ \text{kN}$ - dugno plokštės charakteristinis svoris

$G_{stb,d} := \left(G_{gr,gs,ck} + G_{gr,g,ck} + G_{r,ck} + G_{pl,ck} + G_{b,ck}\right) \cdot \gamma_{G,stb}$

$G_{stb,d} = 1727,28\ \text{kN}$ - nuolatinis skaičiuotinis stabilizuojantis poveikis dėl sąvojo svorio

$R_d := R_{ck} \cdot \gamma_{G,stb} = 0\ \text{kN}$ - papildomas nuolatinis skaičiuotinis stabilizuojantis poveikis

$V_{dst,d} := \left(V_b + L_p \cdot B_p \cdot \left(H_p - D_{vl} - t_p\right)\right) \cdot \gamma_v \cdot g \cdot \gamma_{G,dst}$

$V_{dst,d} = 1019,93\ \text{kN}$ -nuolatinis skaičiuotinis destabilizuojantis poveikis

Tikriname sąlyga:

$V_{dst,d} \le G_{stb,d} + R_d$ $V_{dst,d} = 1019,9\ \text{kN}$ $G_{stb,d} + R_d = 1727,3\ \text{kN}$

```
atsakymas := if V_dst,d ≤ G_stb,d + R_d
               "sąlyga tenkinama"
             else
               "sąlyga netenkinama"
```

atsakymas = "sąlyga tenkinama"

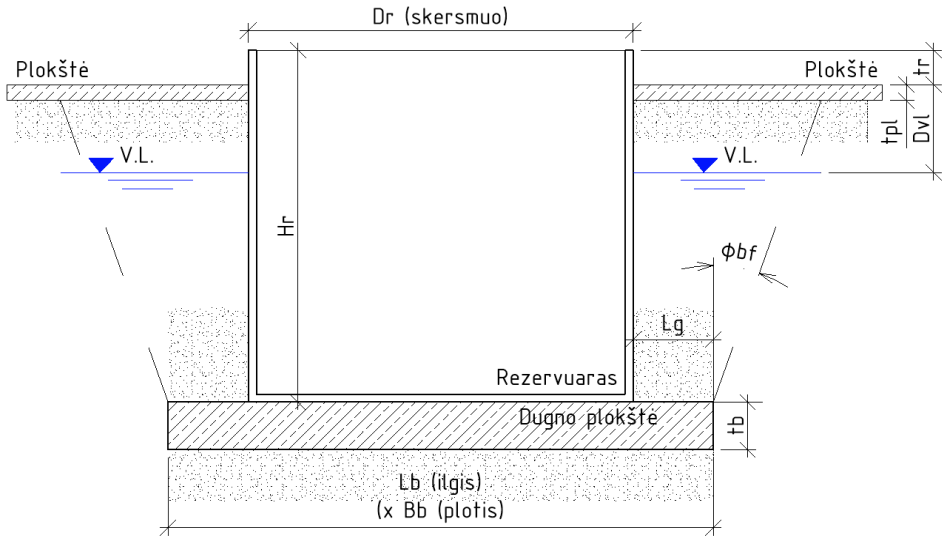
Rezervuaro plūdrumo skaičiavimas- Vietinių nuotekų siurblinė

Priedas Nr.2

pagal LST EN 1997-1:2006

PASTABA: Skaičiavimai taikomi esant "lengvam" rezervuarui ant gelžbetoninės plokštės. Rezervuaras apvalus.

Pjūvis:



Rezervuaro charakteristikos:

$m_r := 160\ kg$ - rezervuaro masė

$D_r := 1000\ mm$ - rezervuaro išorinis skersmuo

$H_r := 2650\ mm$ - rezervuaro aukštis

$t_r := 0\ mm$ - rezervuaro viršaus išsikišimas virš žemės paviršiaus

$R_{ck} := 0\ kN$ - Papildoma stabilizuojanti charakteristinė jėga

Dugno plokštės charakteristikos:

$Dugno_pl := "apvali"$ - "apvali" arba "kvadratinė"

$L_b := 1500\ mm$ - dugno plokštės ilgis (arba skersmuo esant apvaliai plokštei)

$B_b := 1500\ mm$ - dugno plokštės plotis

$t_b := 120\ mm$ - dugno plokštės storis

$\gamma_c := 2400\ \frac{kg}{m^3}$ - dugno plokštės vienetinis svoris

$A_b = 1,77\ m^2$ - dugno plokštės plotas

Grunto charakteristikos:

$\gamma_{gs} := 1800\ \frac{kg}{m^3}$ - sauso grunto vienetinis svoris

$\gamma_g := 2200\ \frac{kg}{m^3}$ - vandens prisotinto grunto vienetinis svoris

$\varphi_k := 30\ deg$ - grunto vidinės trinties kampas

$\gamma_{\varphi,} := 1,25$ - dalinis poveikio koeficientas

$\varphi_d := \varphi_k \cdot \gamma_{\varphi,}$ $\varphi_d = 37,5\ deg$

$\varphi_{bf} := \left(45\ \text{deg} - \frac{\varphi_d}{2}\right)$ $\varphi_{bf} = 26,25\ \text{deg}$

$t_{pl} := 0\ \text{mm}$ - žemės dangos storis

$\gamma_{pl} := 1800\ \frac{\text{kg}}{\text{m}^3}$ - žemės dangos vienetinis svoris

Gruntinio vandens charakteristikos:

$\gamma_v := 1000\ \frac{\text{kg}}{\text{m}^3}$ - vandens vienetinis svoris

$D_{vl} := 0\ \text{mm}$ - vandens lygis žemiau žemės paviršiaus

Skaičiavimai:

$\gamma_{G,dst} := 1,0$ - dalinis poveikio koef. esant destabilizuojančiam nuolatiniam poveikiui

$\gamma_{Q,dst} := 1,5$ - dalinis poveikio koef. esant destabilizuojančiam kintamam poveikiui

$\gamma_{G,stb} := 0,9$ - dalinis poveikio koef. esant stabilizuojančiam nuolatiniam poveikiui

$V_{gr,gs} = 0$ - sauso grunto tūris

$V_{gr,g} = 15,49\ \text{m}^3$ - vandens prisotinto grunto tūris

$V_b := A_b \cdot t_b$ $V_b = 0,21\ \text{m}^3$ - plokštės tūris

$V_{pl} := A_{pl} \cdot t_{pl}$ $V_{pl} = 0$ - žemės dangos tūris

$G_{gr,gs,ck} := V_{gr,gs} \cdot \gamma_{gs} \cdot g$ $G_{gr,gs,ck} = 0\ \text{kN}$ - sauso grunto charakteristinis svoris

$G_{gr,g,ck} := V_{gr,g} \cdot \left(\gamma_g - \gamma_v\right) \cdot g$ $G_{gr,g,ck} = 182,4\ \text{kN}$ - vandens prisotinto grunto charakteristinis svoris

$G_{r,ck} := m_r \cdot g$ $G_{r,ck} = 1,5696\ \text{kN}$ - rezervuaro talpos charakteristinis svoris

$G_{pl,ck} := V_{pl} \cdot \gamma_{pl} \cdot g$ $G_{pl,ck} = 0\ \text{kN}$ - dugno plokštės charakteristinis svoris

$G_{stb,d} := \left(G_{gr,gs,ck} + G_{gr,g,ck} + G_{r,ck} + G_{pl,ck}\right) \cdot \gamma_{G,stb}$ - nuolatinis skaičiuotinis stabilizuojantis poveikis dėl sąvojo svorio

$G_{stb,d} = 165,56\ \text{kN}$

$R_d := R_{ck} \cdot \gamma_{G,stb}$ - papildomas nuolatinis skaičiuotinis stabilizuojantis poveikis

$R_d = 0\ \text{kN}$

$V_{dst,d} := \left(V_b + \frac{3,14 \cdot D_r^{\,2}}{4} \cdot \left(H_r - D_{vl} - t_r\right)\right) \cdot \gamma_v \cdot g \cdot \gamma_{G,dst}$ -nuolatinis skaičiuotinis destabilizuojantis poveikis

$V_{dst,d} = 22,49\ \text{kN}$

Tikriname sąlyga:

$V_{dst,d} \le G_{stb,d} + R_d$ $V_{dst,d} = 22,5\ \text{kN}$ $G_{stb,d} + R_d = 165,6\ \text{kN}$

```
atsakymas := if V_dst,d ≤ G_stb,d + R_d
               "sąlyga tenkinama"
             else
               "sąlyga netenkinama"
```

$atsakymas = \text{"sąlyga tenkinama"}$

Ankerius kuriais rezervuaro talpa tvirtinama prie dugno plokštės veikianti jėga:

$\left(\frac{3,14 \cdot D_r^{\,2}}{4} \cdot \left(H_r - D_{vl} - t_r\right)\right) \cdot \gamma_v \cdot g \cdot \gamma_{G,dst} - G_{r,ck} = 18,8\ \text{kN}$

Project: SK23010_DREVERNOS NVĮ

Updated: 2023-08-30 11:37 (GMT)

Created: 2023-06-30 04:59 (GMT)

Customer:

National annex: Lithuanian NA

Contact person: Tomas Sirusas

Engineer's contact info: Perkūnkiemio g. 4

Email: t.sirusas@konstruktyvas.lt

Telephone number: +37064310873

ID	Structural part	Updated	Created
1	Stogas (02) (apačia)	2023-08-30 11:00 (GMT)	2023-06-30 06:16 (GMT)
2	Stogas (02) (viršus)	2023-08-30 11:37 (GMT)	2023-06-30 05:00 (GMT)
3	Stogas (06) (viršus)	2023-08-30 11:37 (GMT)	2023-06-30 08:00 (GMT)

Structural part: Stogas (02) (apačia)

Updated: 2023-08-30 11:00 (GMT) **Version:** 1.1.31 (2023-06-30)

Created: 2023-06-30 06:16 (GMT)

Reliability class: RC2

Structure type: Roof purlin

Roof slope: 5.7 °

Deflection limit: L/100 (according to NA)

Profile type: Z-profile

Purlin direction: Longitudinal

Bottom flange deflection restricted: No

Design according to testing: No

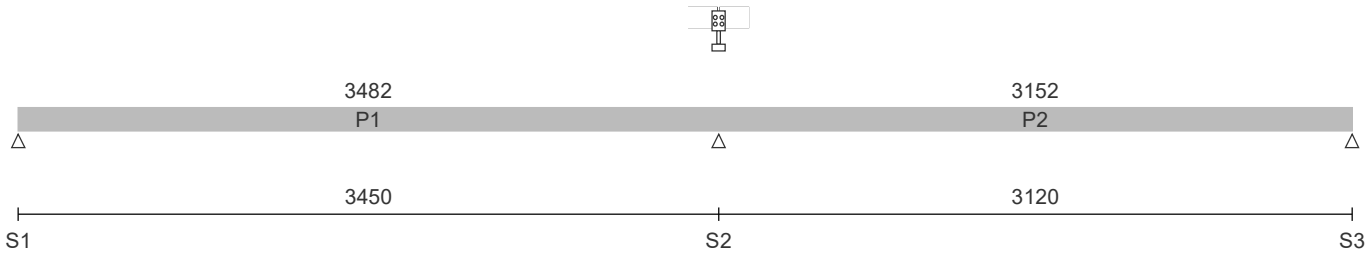
Chosen purlins fulfill design criteria. Maximum utilization rate: 84.5 %

Chosen fasteners fulfill design criteria. Maximum utilization rate: 15.7 %

Structural model

Left end: Distance to end of purlin: 35 mm

Right end: Distance to end of purlin: 35 mm



Selected purlin: LP-Z120

Purlin interval: 1050 mm

Total weight of the purlins: 3.4 kg/m^2

Global warming potential, GWP (A1...A3): 8.9 kg CO_2 eq. / m^2 Zinc-coated

Span	Thickness	Length
	[mm]	[mm]
P1	2.0	3482
P2	2.0	3152

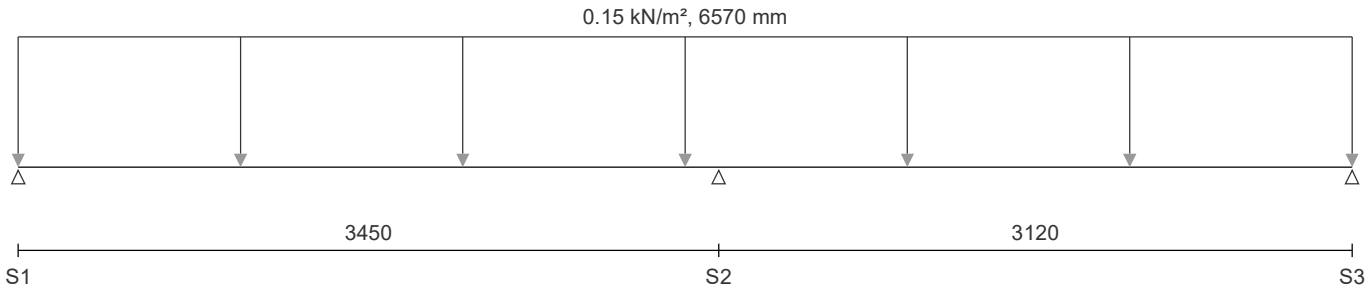
Supports and joints

Support	Axial support	Joint type
S1	Yes	End support
S2	Yes	Discontinuous
S3	Yes	End support

Dead load

Structure weight without purlins and sheeting: 0 kN/m^2

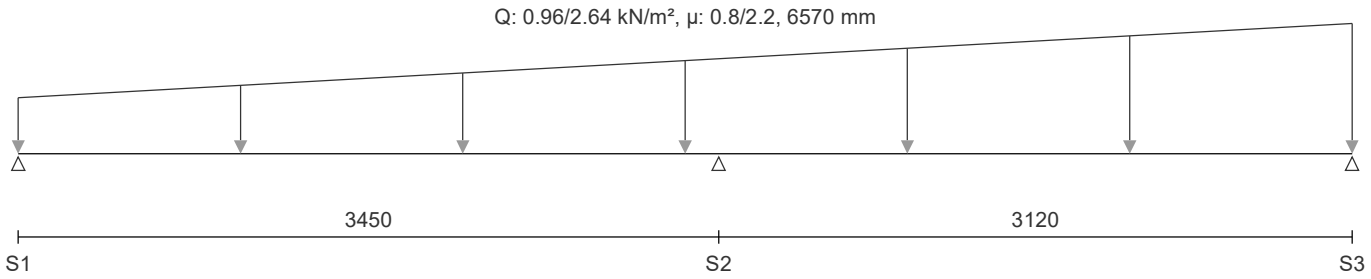
Total weight of the sheeting: 0.15 kN/m^2



Snow load

Basic snow load: 1.2 kN/m^2

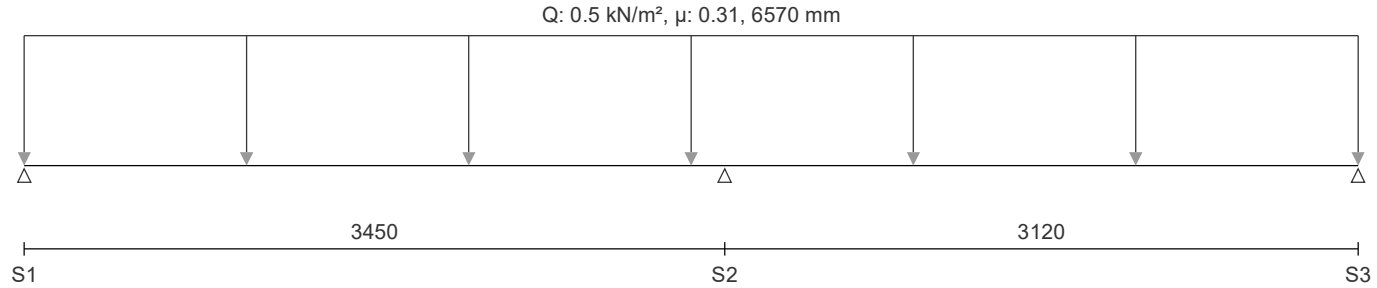
Movement: 0 %



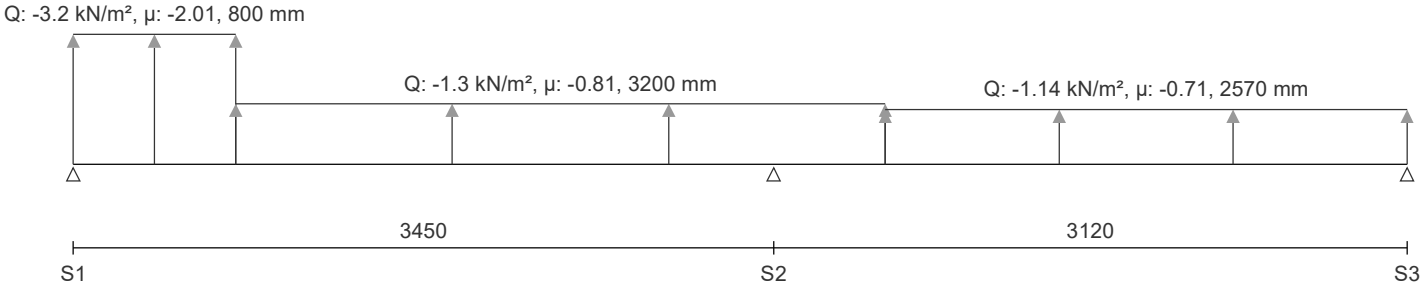
Wind load

Basic wind load: 1.593 kN/m^2

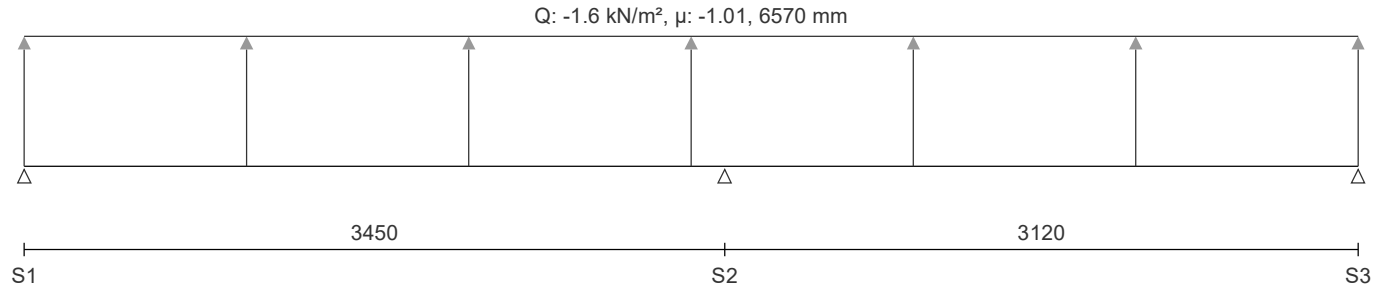
Case 1



Case 2

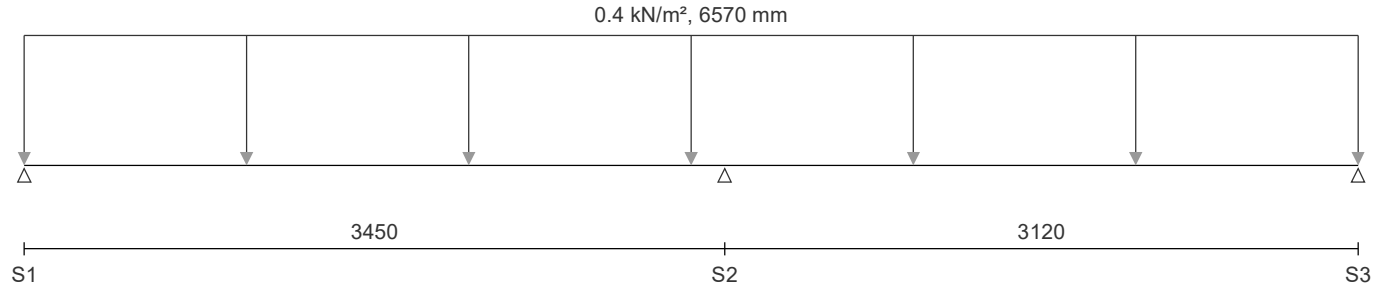


Case 3



Live load

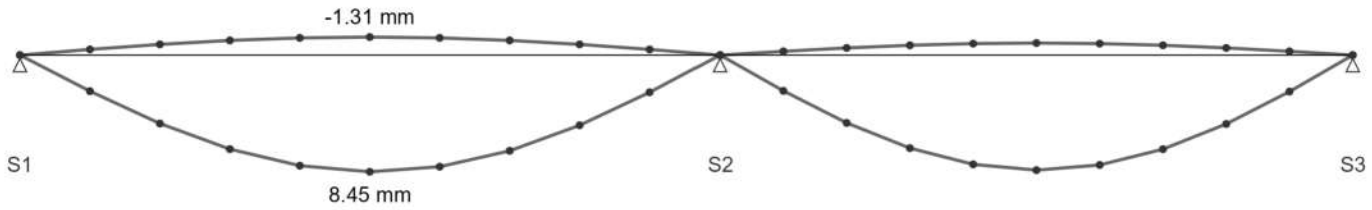
Load category: H: roofs



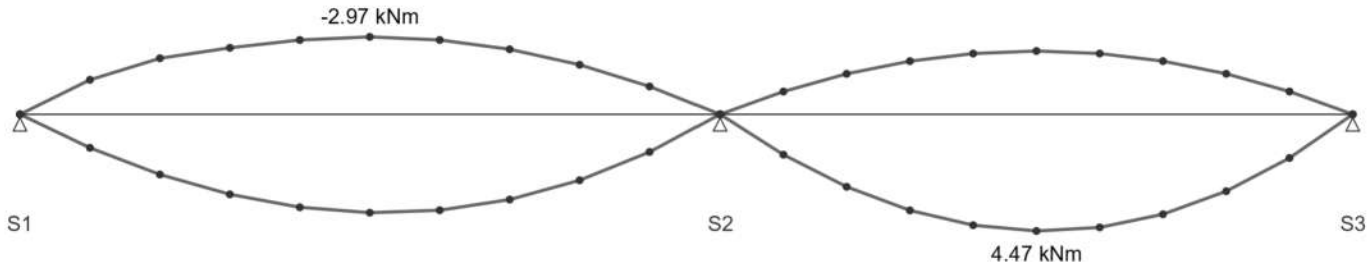
Utilization rates

Purlin	M	N	V	N/V/M	σ	D
	[kNm]	[kN]	[kN]		[MPa]	[mm]
P1	3.8 / 5.5 68.9 %	0.0 / 127.1 0.0 %	-4.7 / 45.7 10.3 %	68.9 %	-295.7 / 350.0 84.5 %	8.4 / 17.2 49.0 %
P2	4.5 / 5.5 81.7 %	0.0 / 127.1 0.0 %	-6.0 / 45.7 13.2 %	81.7 %	286.3 / 350.0 81.8 %	8.3 / 15.6 53.4 %

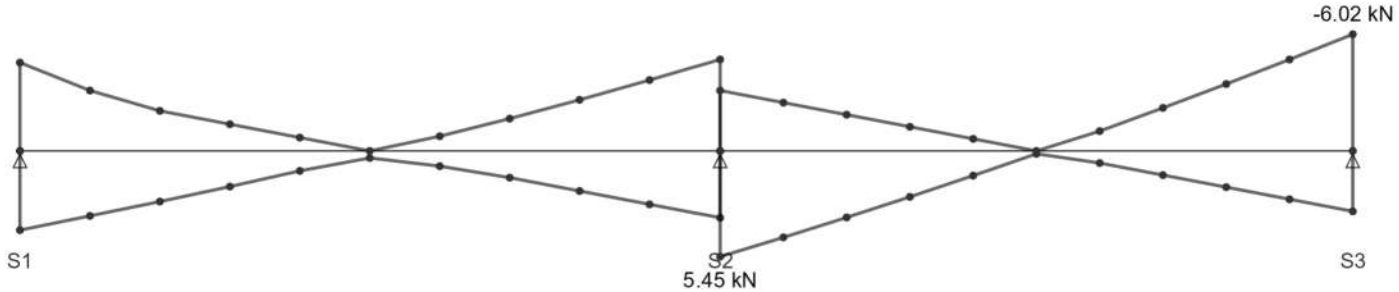
Deflection



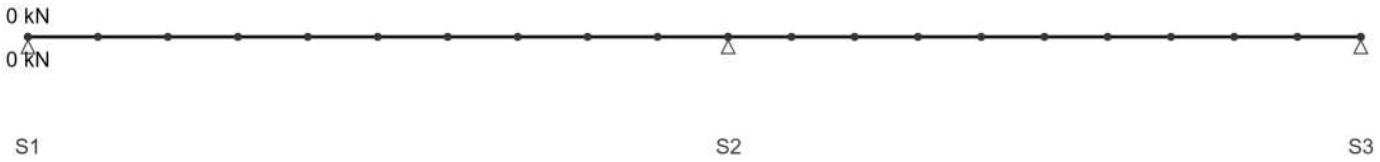
Bending moment



Shear force



Normal force



Support reactions

ULS

	Transverse direction		Axial direction	
Support	**Min**	**Max**	**Min**	**Max**
	[kN/purlin]	[kN/purlin]	[kN]	[kN]
S1	-4.55	4.08	0.0	0.0
S2	-6.56	10.17	0.0	0.0
S3	-3.11	6.02	0.0	0.0

Fasteners

Cleat wall thickness: 4 mm

Cleat steel grade: S355J2 (355/490)

Web fastener: M12 8.8

Fastener spacing in 4-hole cleat: 70 mm

Edge distance to the fastener at middle support: 32 mm

Gap width at support: 6 mm

Upper flange support from sandwich panel

Core material: PUR/PIR and XPS/EPS

Weight: 15 kg/m^2

Depth of profiling >= 30 mm (on the fastener head side surface): Yes

Support	Support fasteners pcs / support	Utilization rate [%]	Design criterion
S1	2	11.9	Bearing
S2	2 + 2	15.5	Bearing
S3	2	15.7	Bearing

Amount of fasteners

Total amount: 8 pcs / purlin row

Structural part: Stogas (02) (viršus)

Updated: 2023-08-30 11:37 (GMT) **Version:** 1.1.31 (2023-06-30)

Created: 2023-06-30 05:00 (GMT)

Reliability class: RC2

Structure type: Roof purlin

Roof slope: 5.7 °

Deflection limit: L/100 (according to NA)

Profile type: Z-profile

Purlin direction: Longitudinal

Bottom flange deflection restricted: No

Design according to testing: No

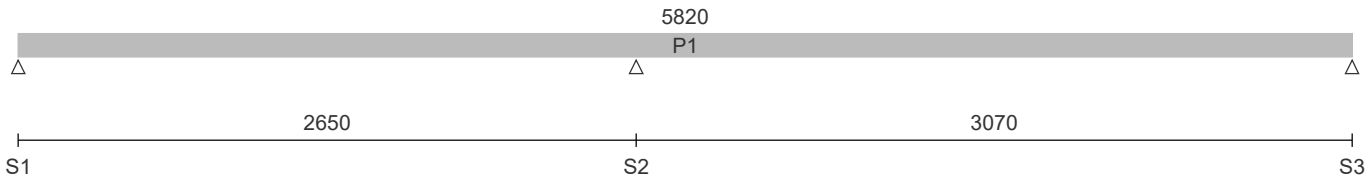
Chosen purlins fulfill design criteria. Maximum utilization rate: 61.0 %

Chosen fasteners fulfill design criteria. Maximum utilization rate: 19.0 %

Structural model

Left end: Distance to end of purlin: 50 mm

Right end: Distance to end of purlin: 50 mm



Selected purlin: LP-Z120

Purlin interval: 1050 mm

Total weight of the purlins: 3.4 kg/m^2

Global warming potential, GWP (A1...A3): 8.9 kg CO_2 eq. / m^2 Zinc-coated

Span	Thickness	Length
	[mm]	[mm]
P1	2.0	5820

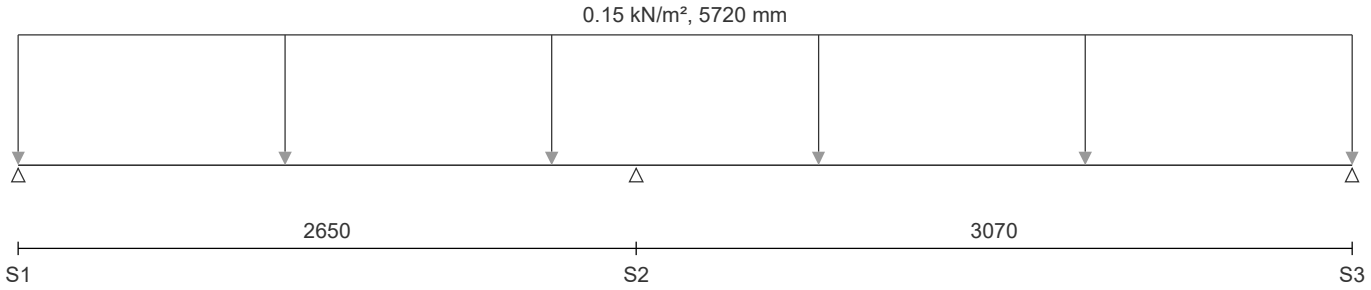
Supports and joints

Support	Axial support	Joint type
S1	Yes	End support
S2	Yes	Continuous
S3	Yes	End support

Dead load

Structure weight without purlins and sheeting: 0 kN/m^2

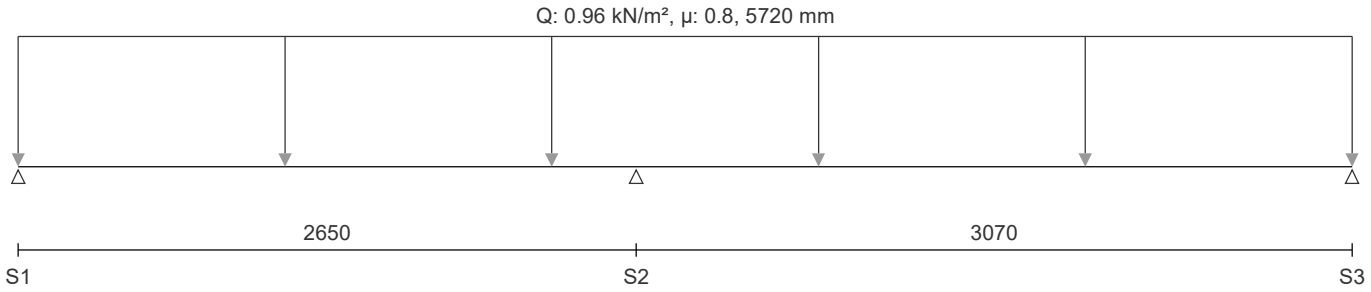
Total weight of the sheeting: 0.15 kN/m^2



Snow load

Basic snow load: 1.2 kN/m^2

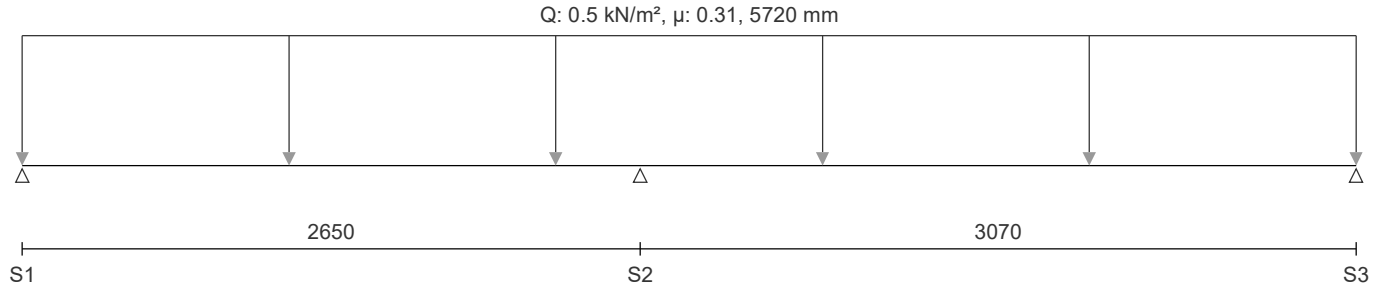
Movement: 0 %



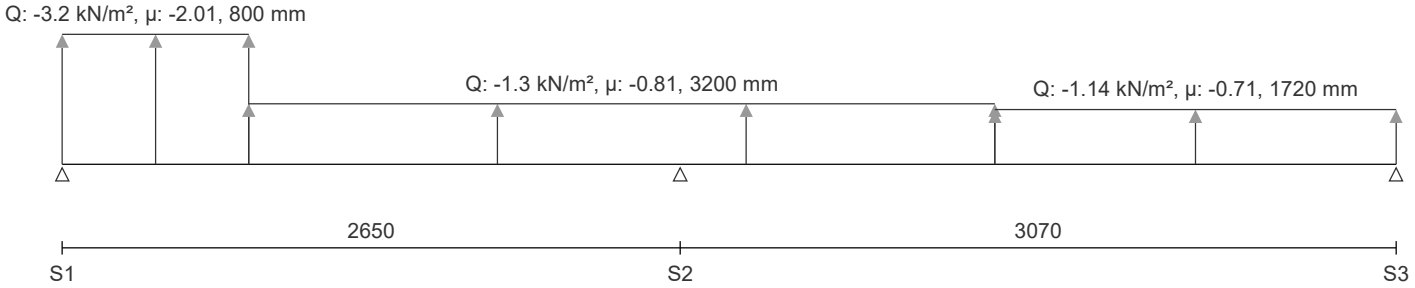
Wind load

Basic wind load: 1.593 kN/m^2

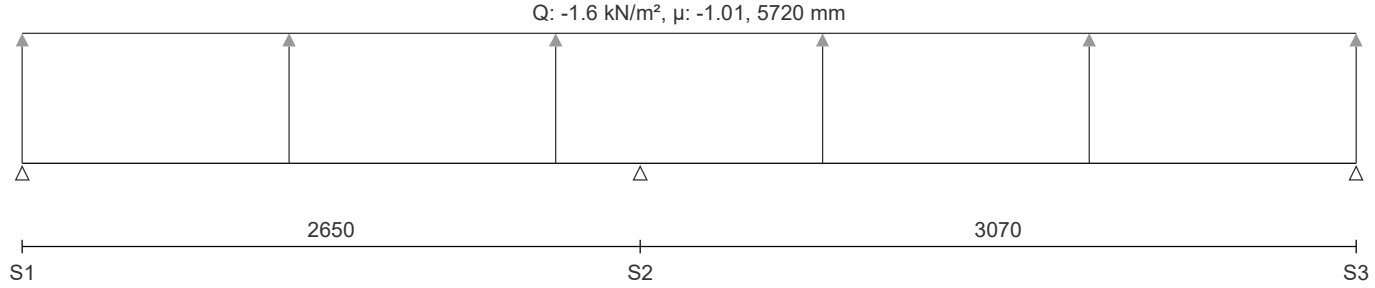
Case 1



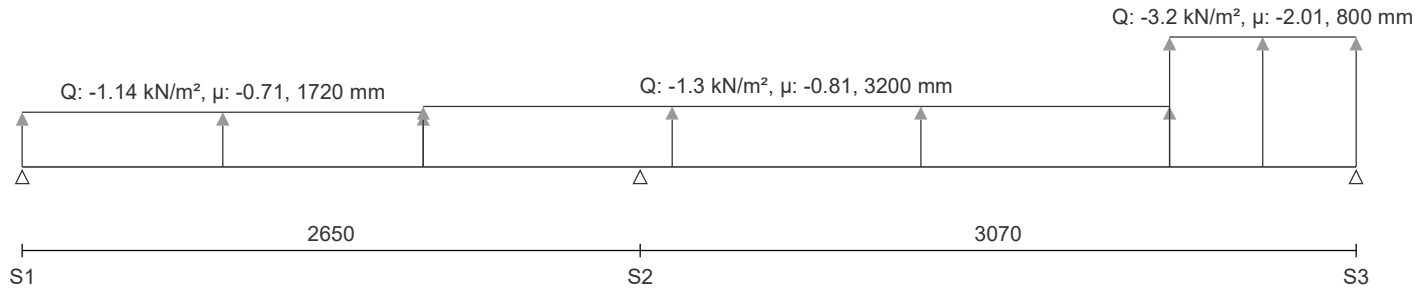
Case 2



Case 3

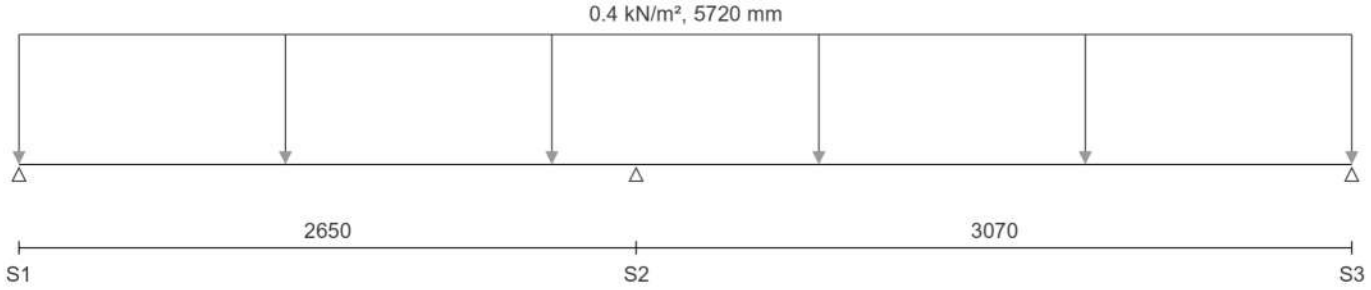


Case 4



Live load

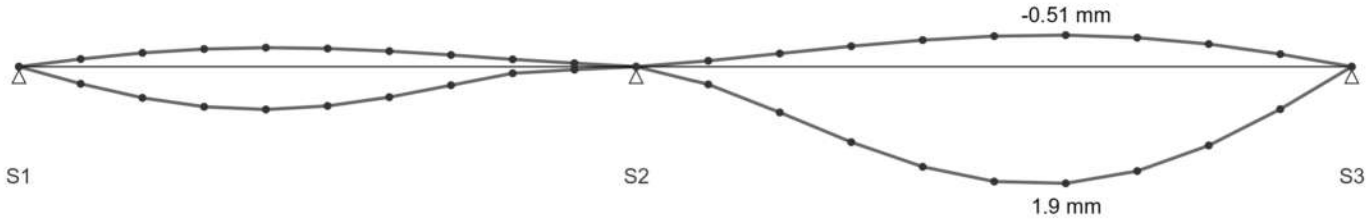
Load category: H: roofs



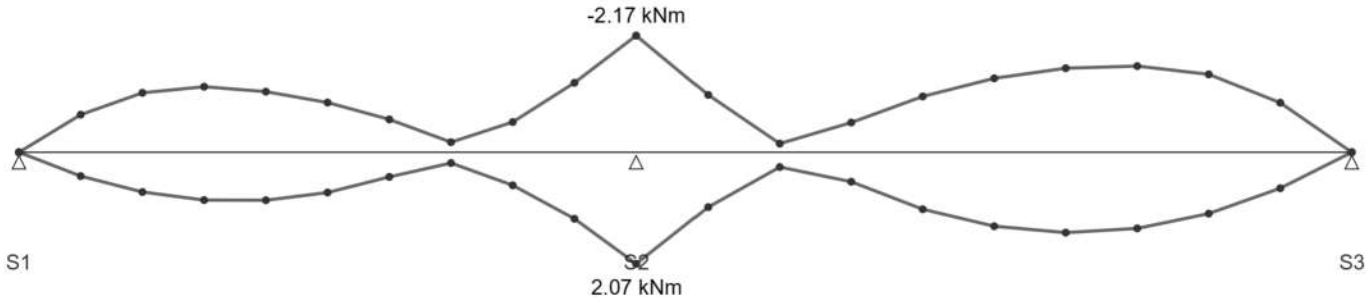
Utilization rates

Purlin	M	N	V	N/V/M	σ	D
	[kNm]	[kN]	[kN]		[MPa]	[mm]
	2.2 / 5.5	0.0 / 127.1	3.9 / 45.7		-213.3 / 350.0	1.9 / 15.3
P1	39.6 %	0.0 %	8.6 %	39.6 %	61.0 %	12.4 %

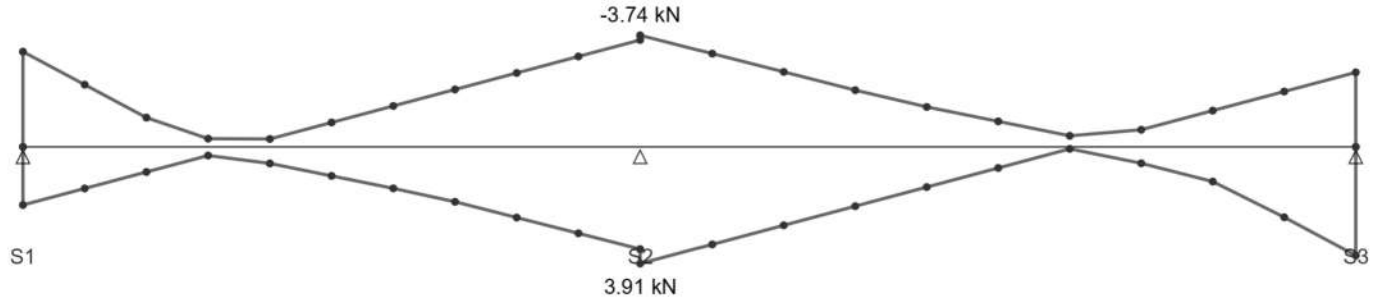
Deflection



Bending moment



Shear force



Normal force

Support reactions

ULS

	Transverse direction		Axial direction	
Support	**Min**	**Max**	**Min**	**Max**
	[kN/purlin]	[kN/purlin]	[kN]	[kN]
S1	-3.19	1.95	0.0	0.0
S2	-7.17	7.5	0.0	0.0
S3	-3.64	2.5	0.0	0.0

Fasteners

Cleat wall thickness: 4 mm

Cleat steel grade: S355J2 (355/490)

Web fastener: M12 8.8

Upper flange support from sandwich panel

Core material: PUR/PIR and XPS/EPS

Weight: 15 kg/m^2

Depth of profiling >= 30 mm (on the fastener head side surface): Yes

	Support fasteners		
Support	**pcs / support**	**Utilization rate** [%]	**Design criterion**
S1	2	8.1	Bearing
S2	2	19.0	Bearing
S3	2	9.2	Bearing

Amount of fasteners

Total amount: 6 pcs / purlin row

Structural part: Stogas (06) (viršus)

Updated: 2023-08-30 11:37 (GMT) **Version:** 1.1.31 (2023-06-30)

Created: 2023-06-30 08:00 (GMT)

Reliability class: RC2

Structure type: Roof purlin

Roof slope: 5.7 °

Deflection limit: L/100 (according to NA)

Profile type: Z-profile

Purlin direction: Longitudinal

Bottom flange deflection restricted: No

Design according to testing: No

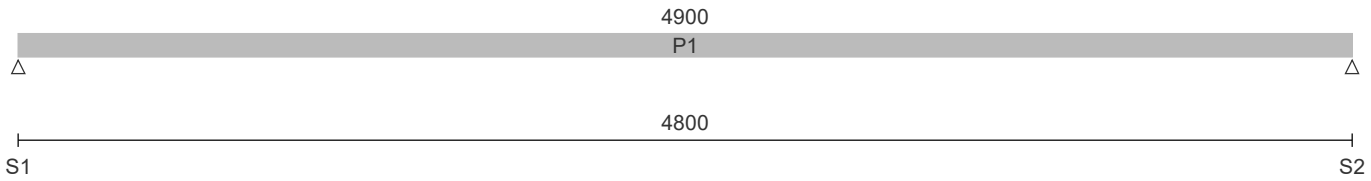
Chosen purlins fulfill design criteria. Maximum utilization rate: 62.9 %

Chosen fasteners fulfill design criteria. Maximum utilization rate: 12.4 %

Structural model

Left end: Distance to end of purlin: 50 mm

Right end: Distance to end of purlin: 50 mm



Selected purlin: LP-Z200

Purlin interval: 950 mm

Total weight of the purlins: 6.2 kg/m^2

Global warming potential, GWP (A1...A3): 16.1 kg CO_2 eq. / m^2 Zinc-coated

Span	Thickness	Length
	[mm]	[mm]
P1	2.0	4900

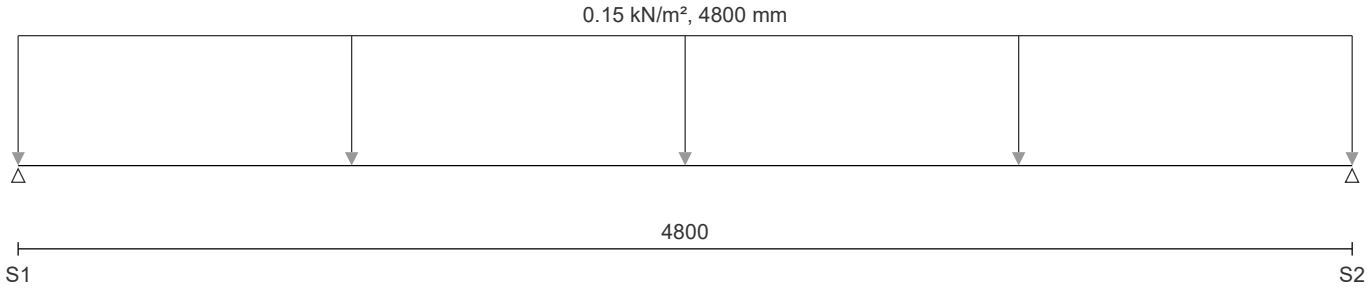
Supports and joints

Support	Axial support	Joint type
S1	Yes	End support
S2	Yes	End support

Dead load

Structure weight without purlins and sheeting: 0 kN/m^2

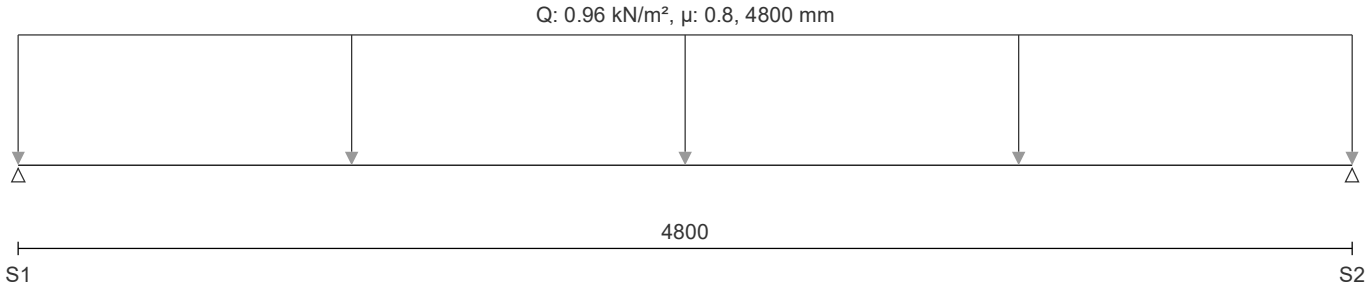
Total weight of the sheeting: 0.15 kN/m^2



Snow load

Basic snow load: 1.2 kN/m^2

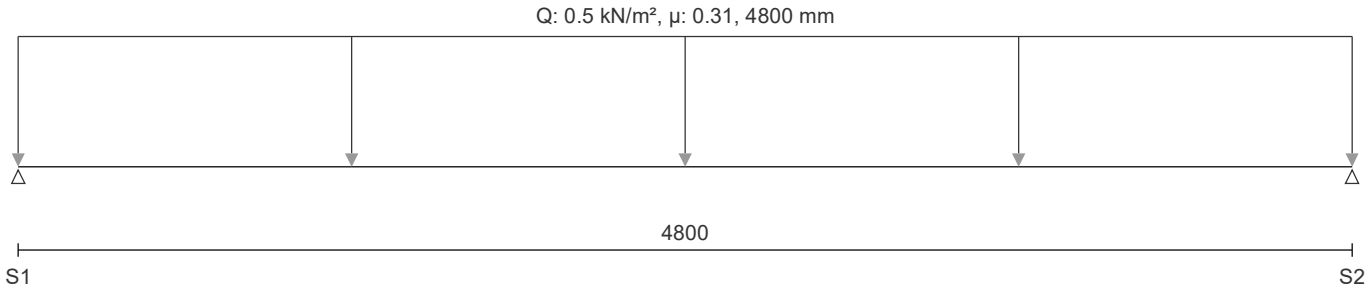
Movement: 0 %



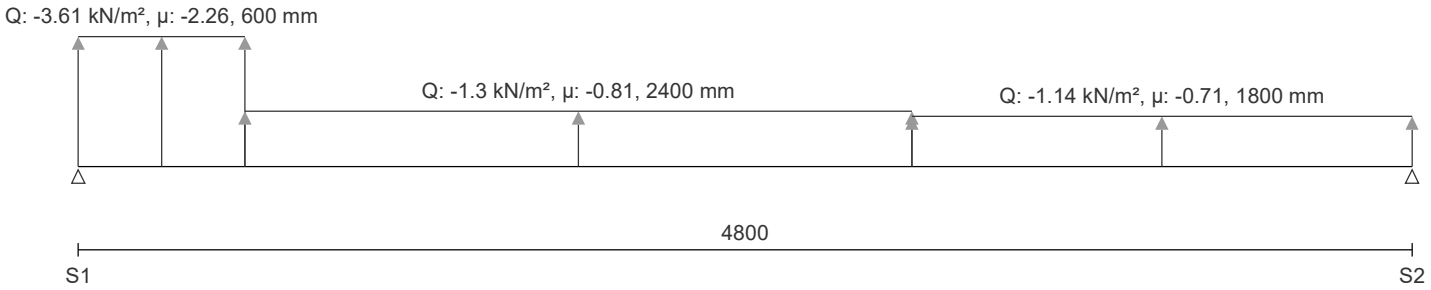
Wind load

Basic wind load: 1.593 kN/m^2

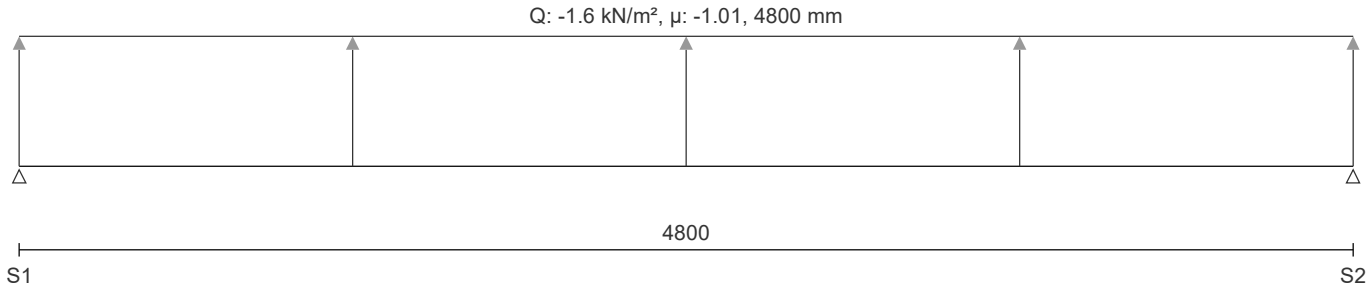
Case 1



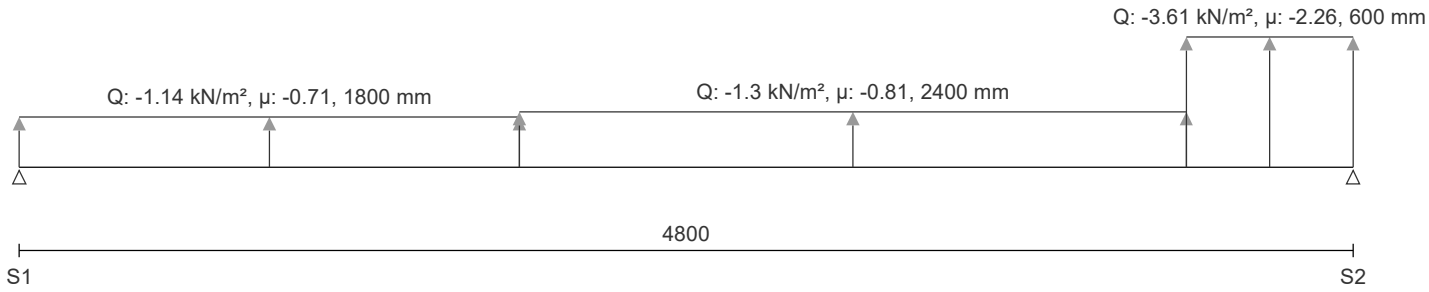
Case 2



Case 3

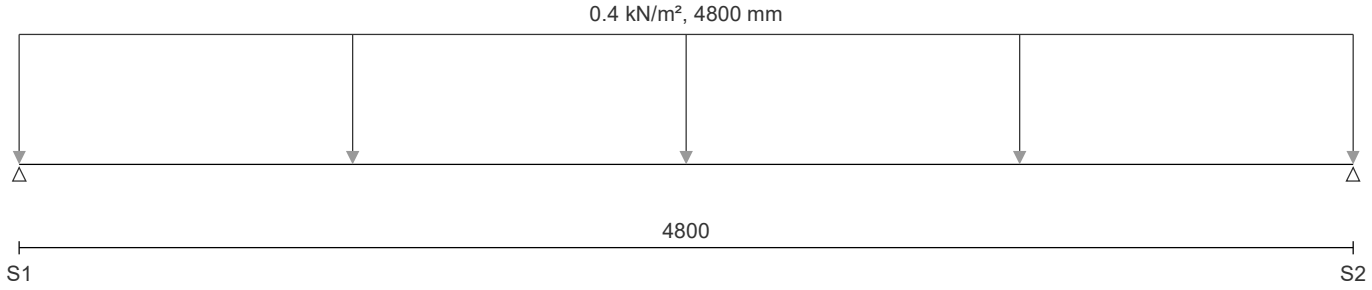


Case 4



Live load

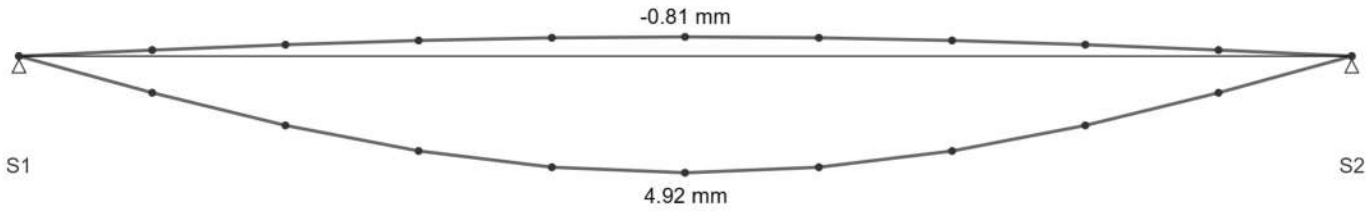
Load category: H: roofs



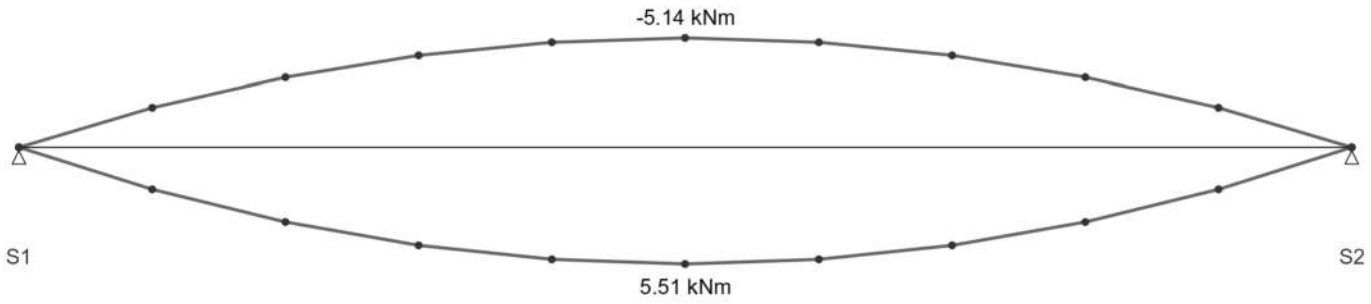
Utilization rates

Purlin	M	N	V	N/V/M	σ	D
	[kNm]	[kN]	[kN]		[MPa]	[mm]
	5.5 / 15.1	0.0 / 163.7	-4.9 / 45.7		-220.1 / 350.0	4.9 / 24.0
P1	36.4 %	0.0 %	10.7 %	36.4 %	62.9 %	20.5 %

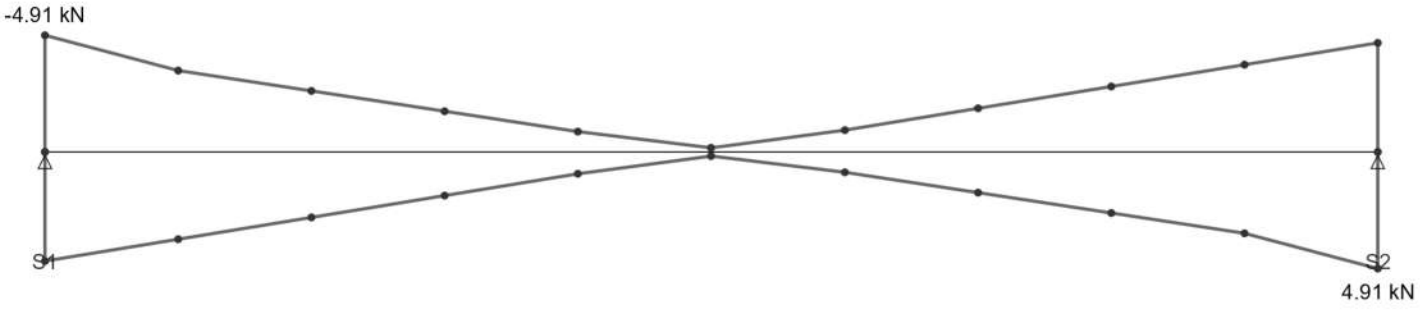
Deflection



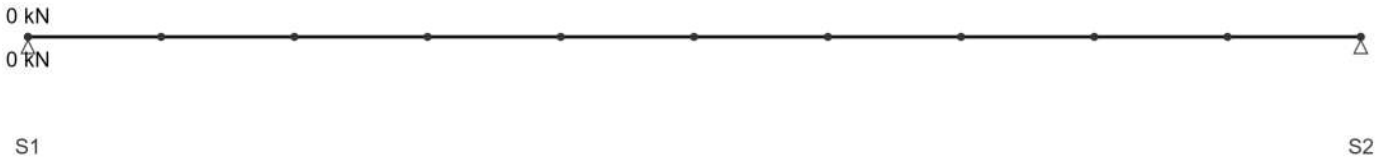
Bending moment



Shear force



Normal force



Support reactions

ULS

	Transverse direction		Axial direction	
Support	**Min**	**Max**	**Min**	**Max**
	[kN/purlin]	[kN/purlin]	[kN]	[kN]
S1	-4.91	4.59	0.0	0.0
S2	-4.91	4.59	0.0	0.0

Fasteners

Cleat wall thickness: 4 mm

Cleat steel grade: S355J2 (355/490)

Web fastener: M12 8.8

Upper flange support from sandwich panel

Core material: PUR/PIR and XPS/EPS

Weight: 15 kg/m^2

Depth of profiling >= 30 mm (on the fastener head side surface): Yes

	Support fasteners		
Support	**pcs / support**	**Utilization rate**	**Design criterion**
		[%]	
S1	2	12.4	Bearing
S2	2	12.4	Bearing

Amount of fasteners

Total amount: 4 pcs / purlin row

Project: SK23010_DREVERNOS NVĮ

Updated: 2023-09-04 11:49 (GMT)

Created: 2023-06-29 10:13 (GMT)

Customer:

National annex:

Design according to standards EN 14509 (2014), EN 1991, EN 1993.

Contact person: Tomas Sirusas

Engineer's contact info: Perkūnkiemio g. 4

Email: t.sirusas@konstruktyvas.lt

Telephone number: +37064310873

ID	Structural part	Updated	Created
1	Stogas_Žemesnis (02)	2023-09-04 11:49 (GMT)	2023-06-29 11:39 (GMT)

Structural part: Stogas_Žemesnis (02)

Updated: 2023-09-04 11:49 (GMT)

Created: 2023-06-29 11:39 (GMT)

Structure type: Roof

Design situation: Normal

Deflection limit: L/200 (according to NA), for long-term loads L/100

Roof slope: 5.7 °

Panel direction: Horizontal direction

Effect of temperature difference: Influence included

Temperature of the inside face: Summer: 20 °C, winter (case 1): 8 °C, winter (case 2): 8 °C

Temperature of the outside face: Summer: 80 °C, winter (case 1): -30 °C, winter (case 2): 0 °C

Please note the following:

➤ Design performed using plastic calculation model.

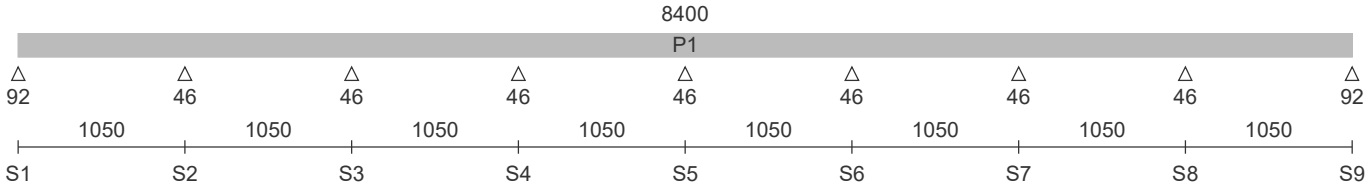
Chosen panels fulfill design criteria. Maximum utilization rate: 69.5 %

Chosen fasteners fulfill design criteria. Maximum utilization rate: 97.1 %

Structural model

Left end: Distance to end of panel: 0 mm

Right end: Distance to end of panel: 0 mm



Selected panels

	T, outer / T, inner **	U-value	Rw-value	Length	Weight
	[mm]	[W/m^{2}K]	[dB]	[mm]	[kg / pcs]
[P1] SP2C 160/120 E-PIR TL	0.6 / 0.6	0.18	24	8400	103.2

*[7] Please note that the fasteners are dimensioned assuming that the head of the fastener and washer are against the first mentioned thickness.

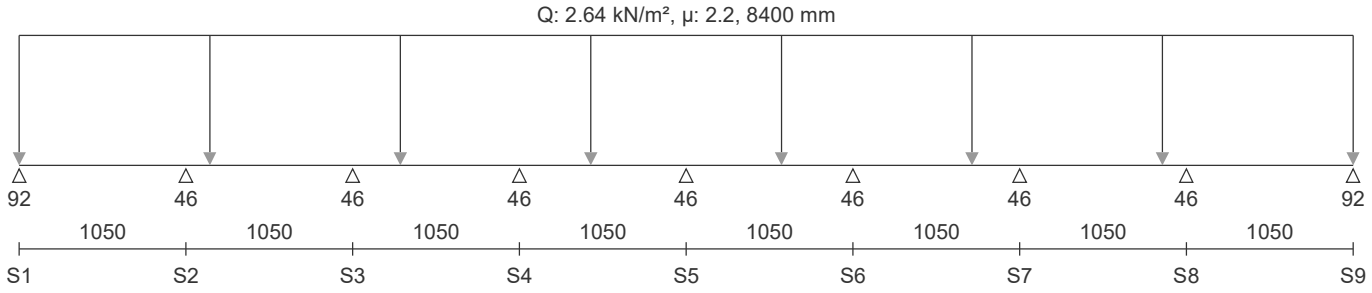
Supports and joints

Support	Support width [mm]	Joint type
S1	92	End support
S2	46	Continuous
S3	46	Continuous
S4	46	Continuous
S5	46	Continuous
S6	46	Continuous
S7	46	Continuous
S8	46	Continuous
S9	92	End support

Snow load

Basic snow load: 1.2 kN/m^2

Movement: 0 %



Wind load

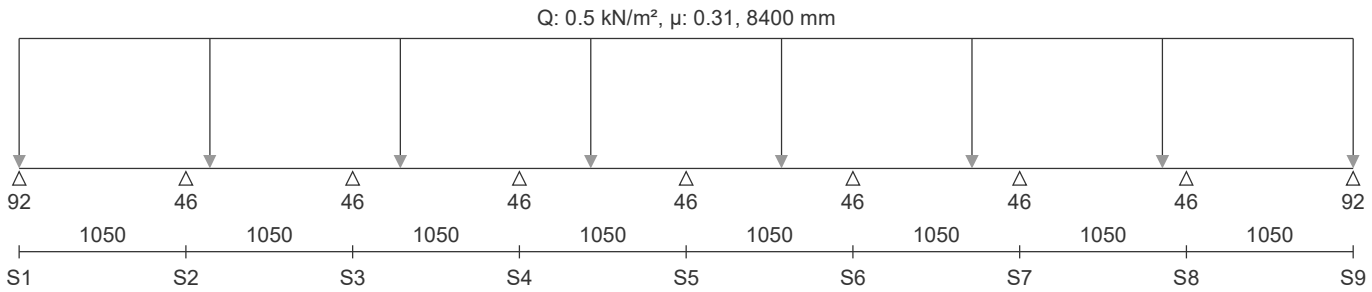
Basic wind load: 1.593 kN/m^2

Basic wind velocity: 32 m/s

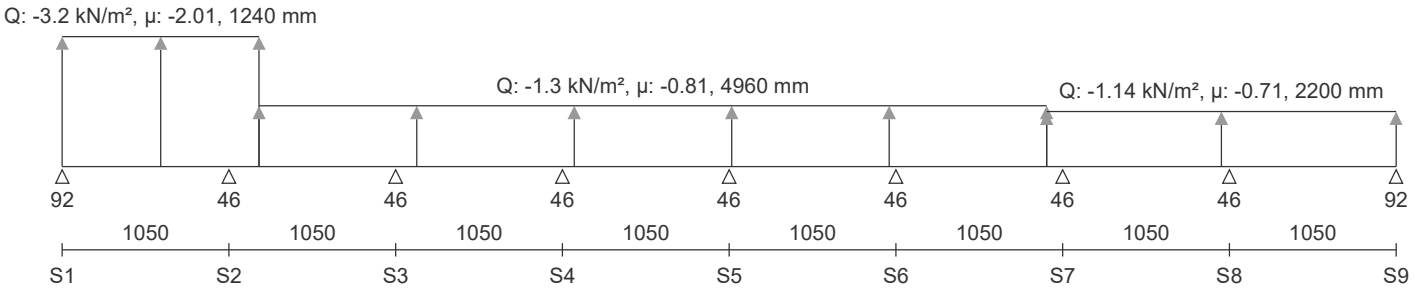
Ground class: I Lakes or flat horizantal area

Building height: 6200 mm

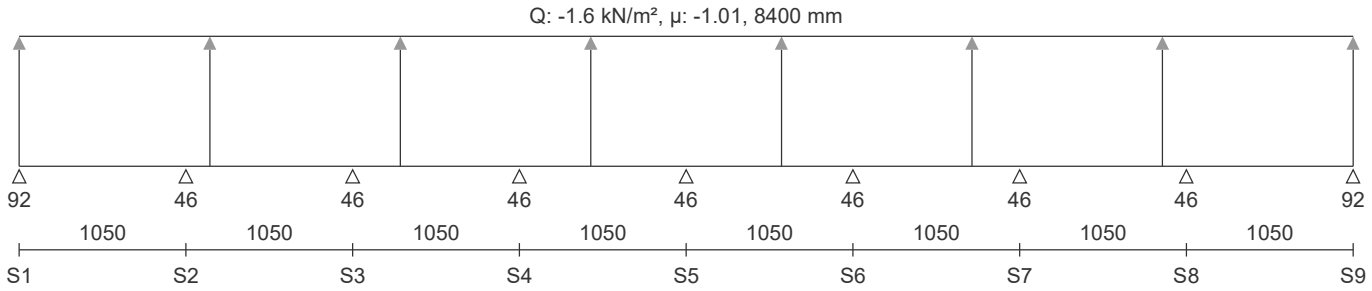
Case 1



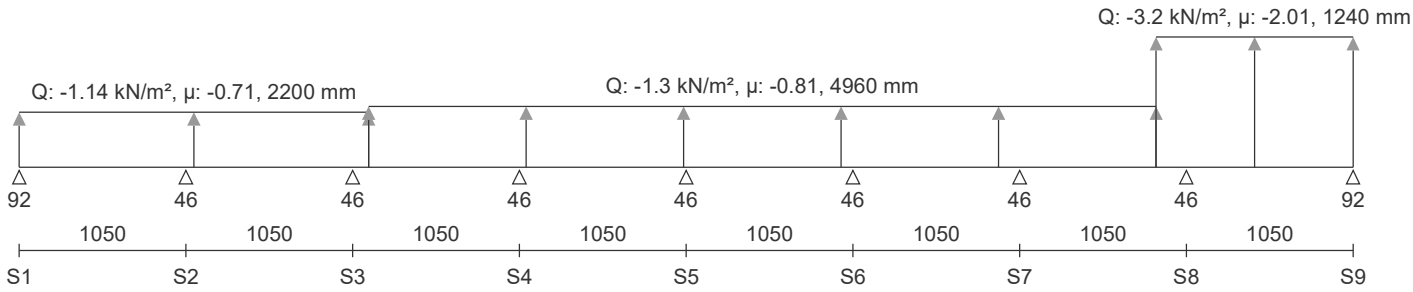
Case 2



Case 3

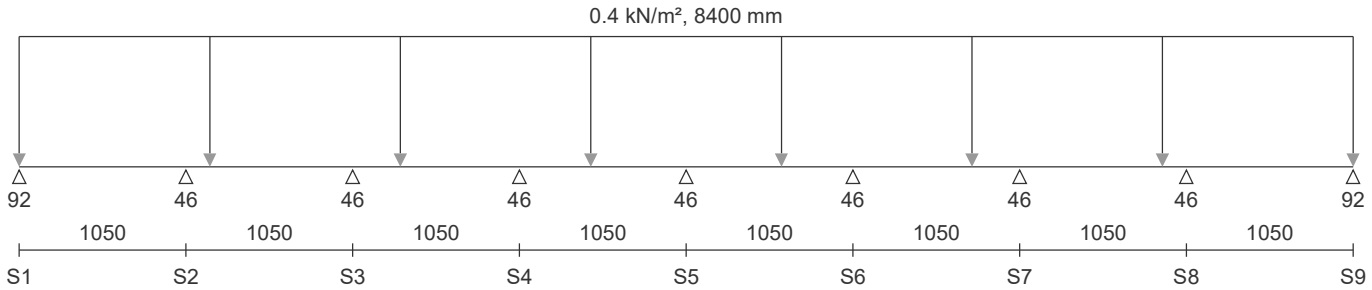


Case 4



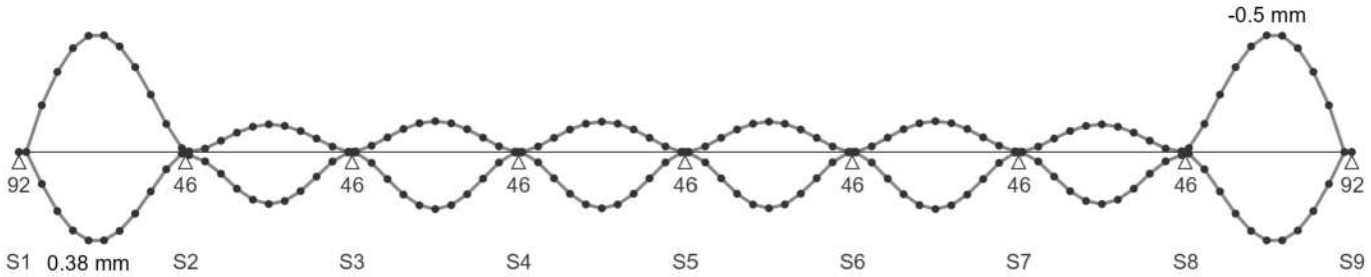
Live load

Load category: H: roofs

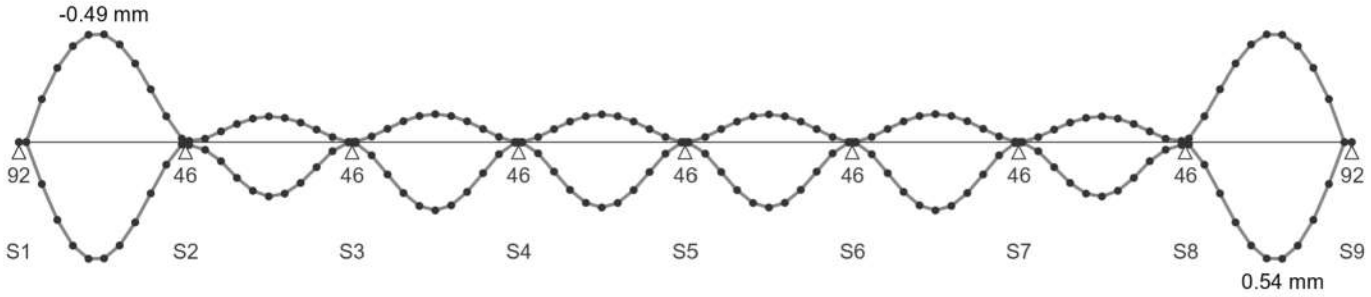


Deflection, creep off

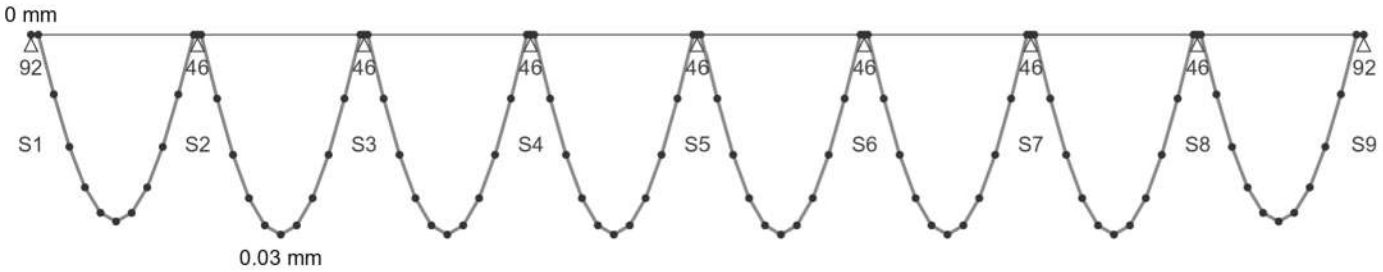
Combination, creep off



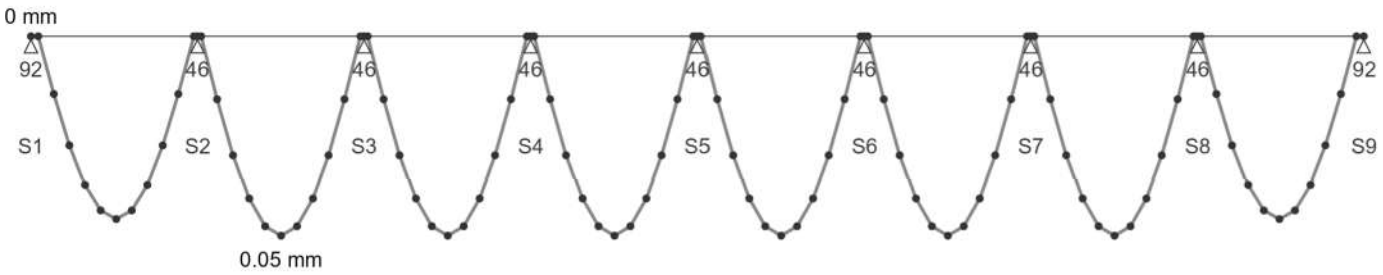
Combination, creep on



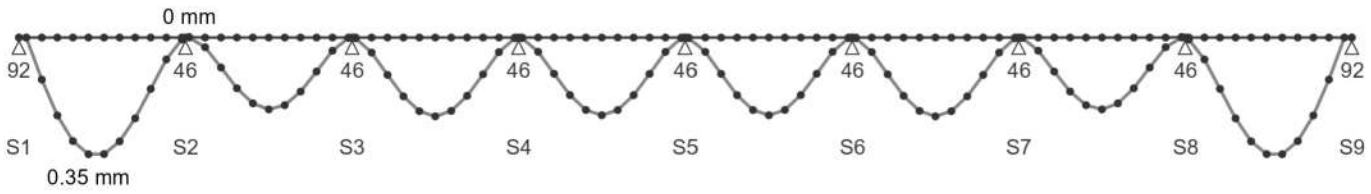
Dead loads, creep off



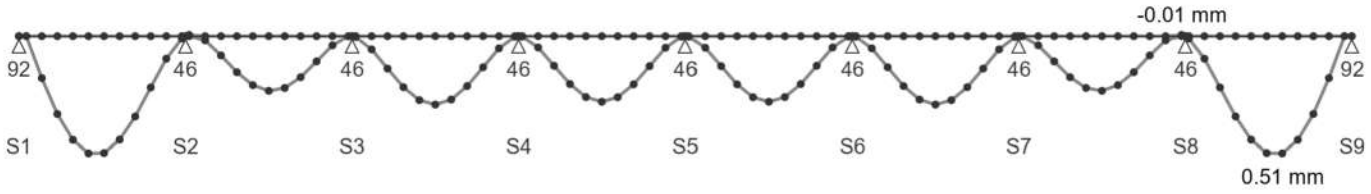
Dead loads, creep on



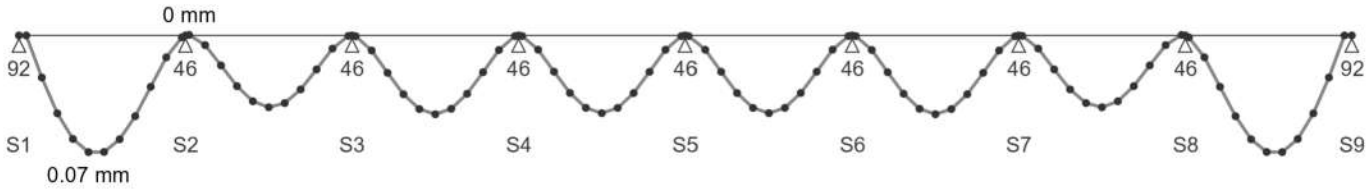
Snow loads, creep off



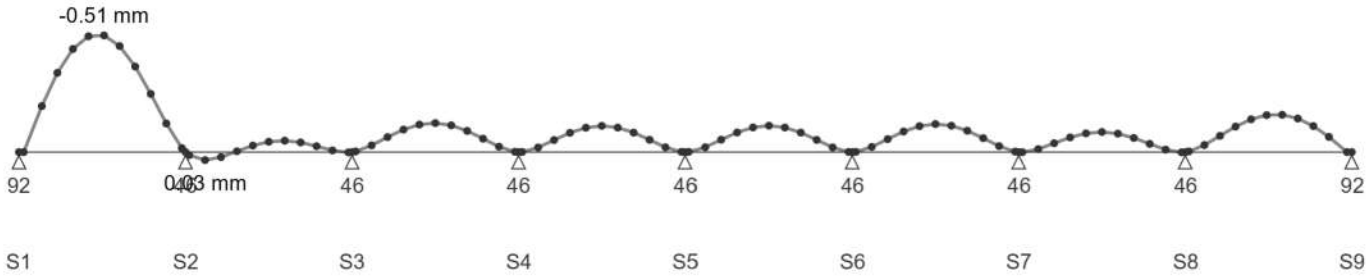
Snow loads, creep on



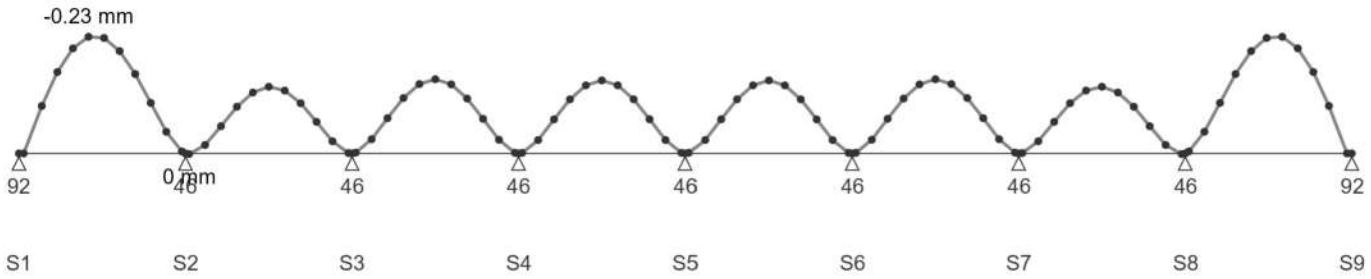
Wind loads, case 1



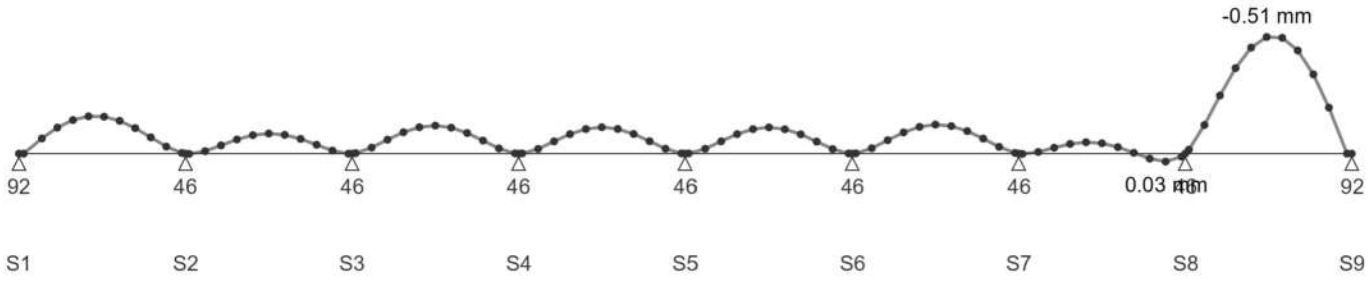
Wind loads, case 2



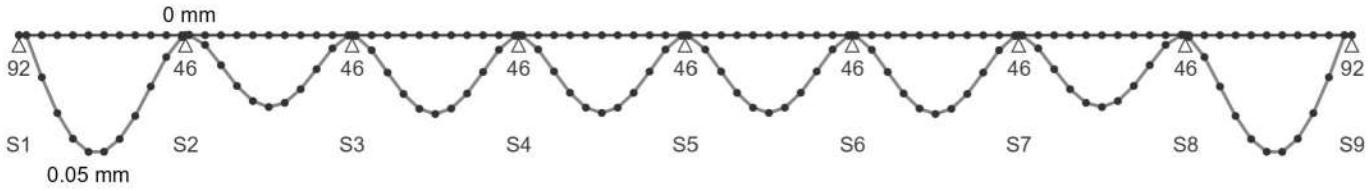
Wind loads, case 3



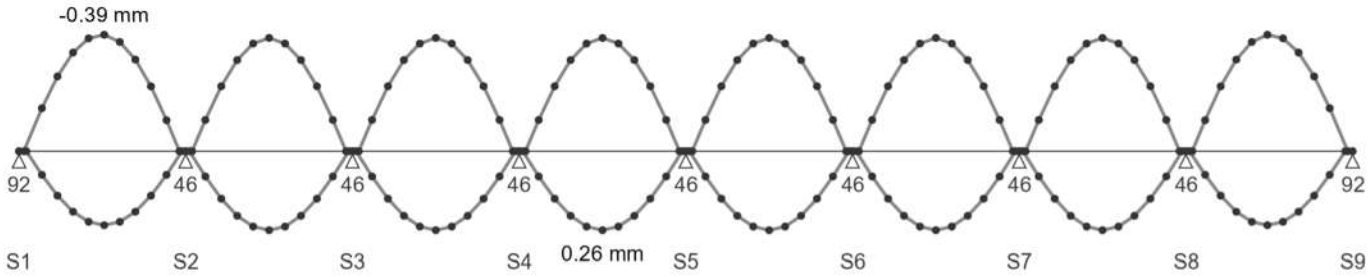
Wind loads, case 4



Live loads

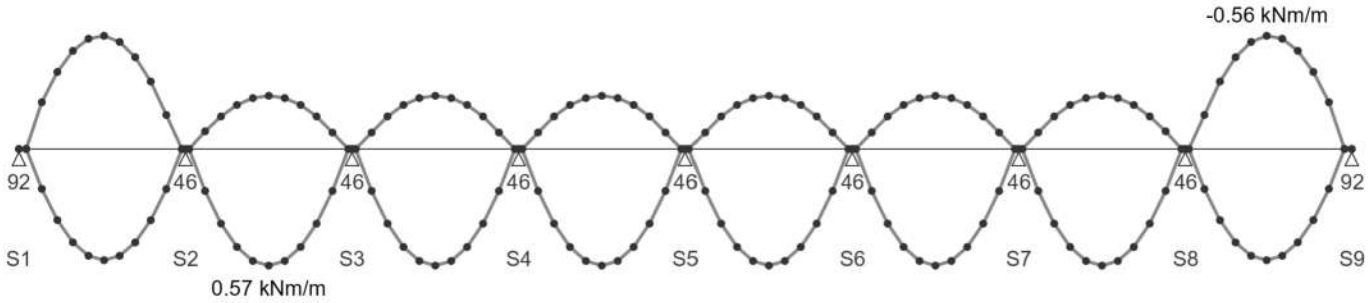


Temperature loads

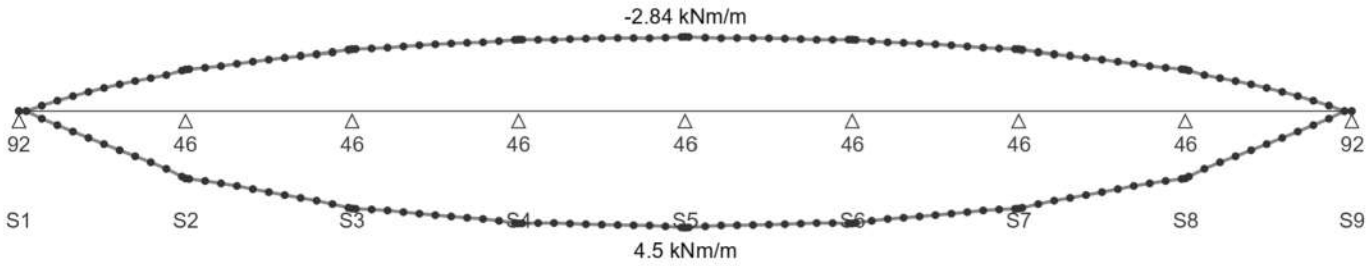


Bending moment

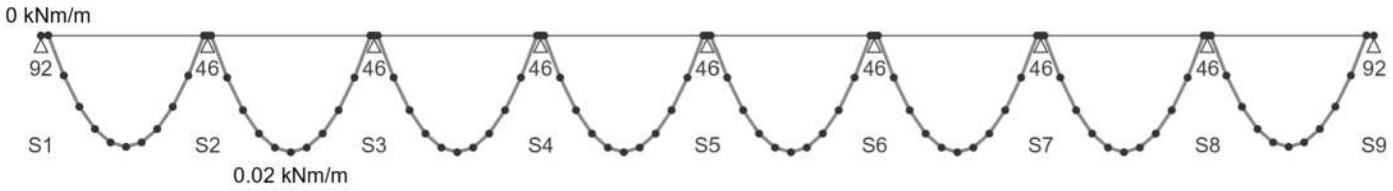
Combination, ULS



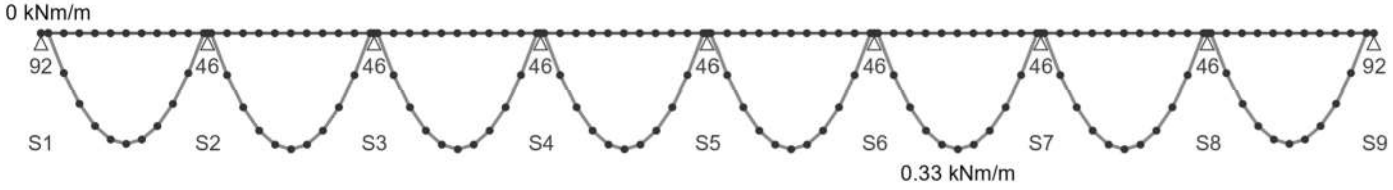
Combination, SLS



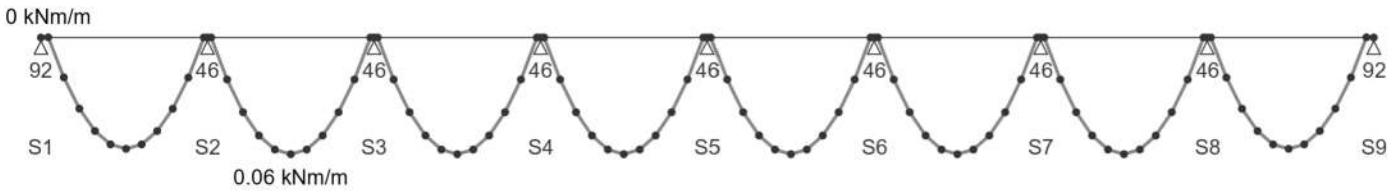
Dead loads



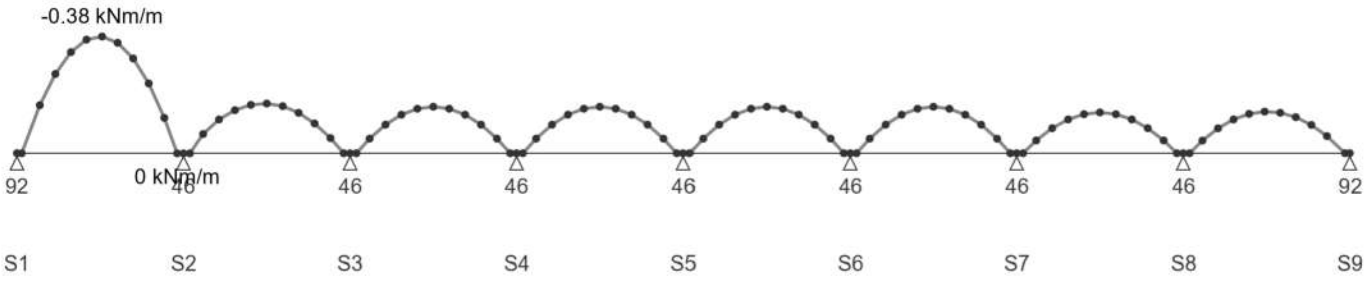
Snow loads



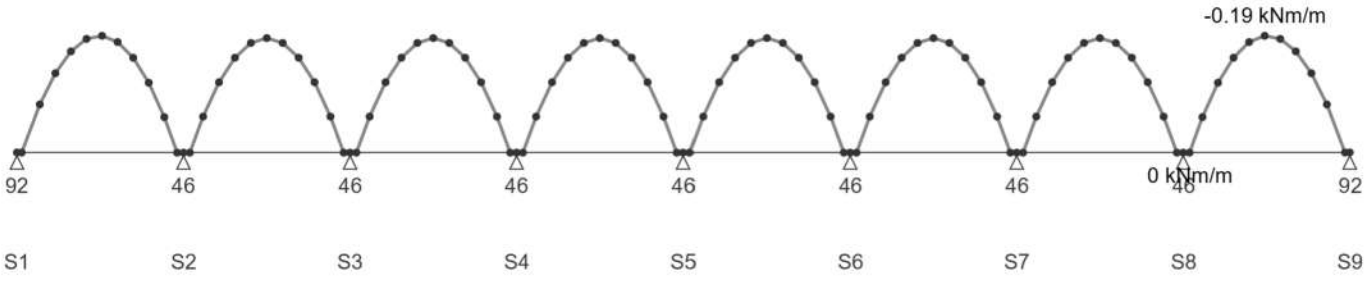
Wind loads, case 1



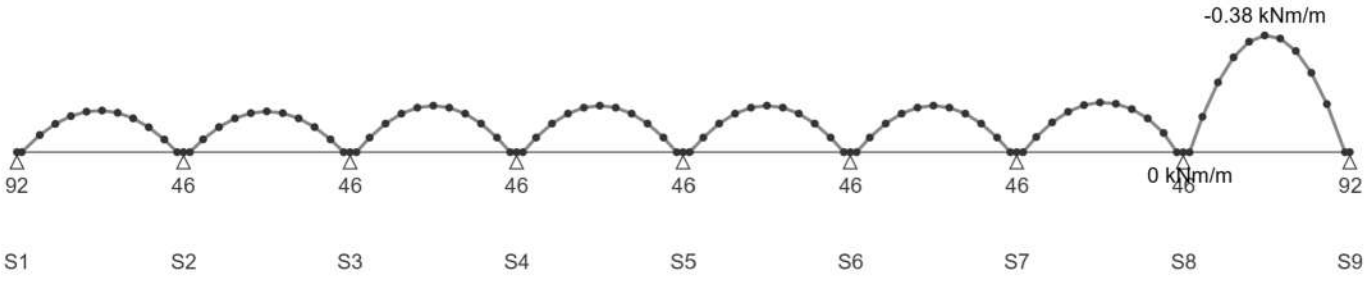
Wind loads, case 2



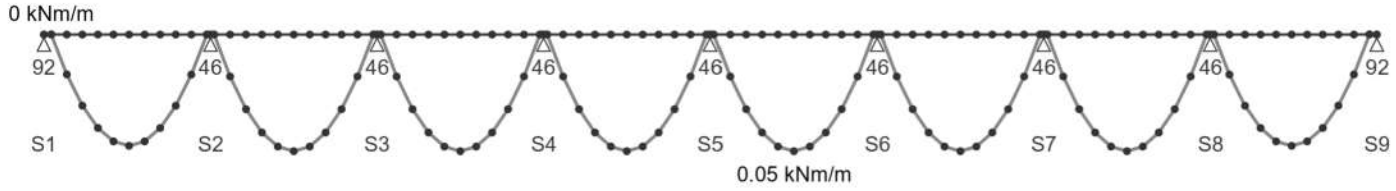
Wind loads, case 3



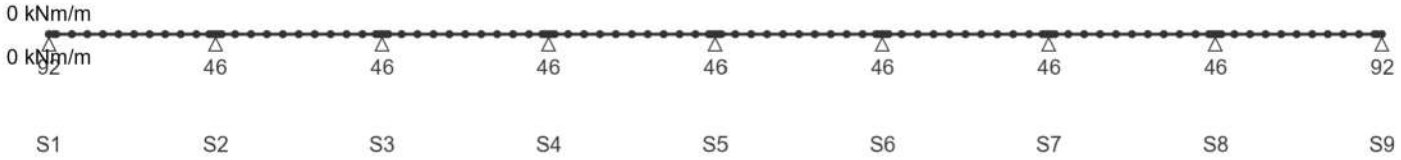
Wind loads, case 4



Live loads

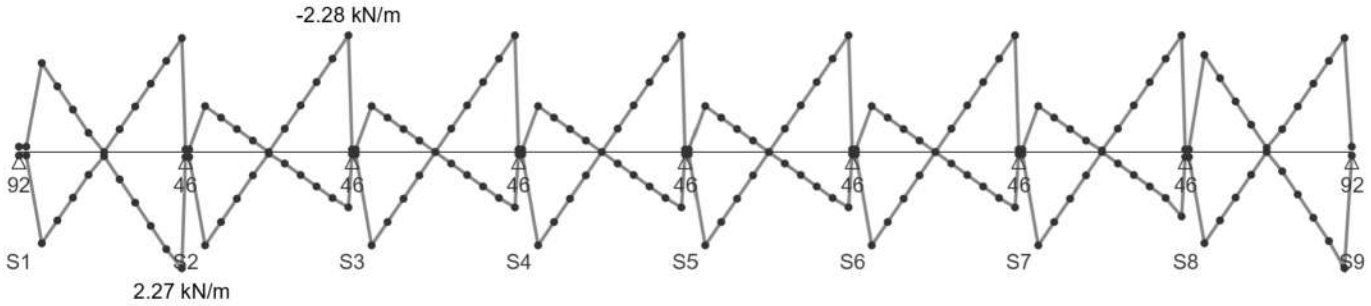


Temperature loads

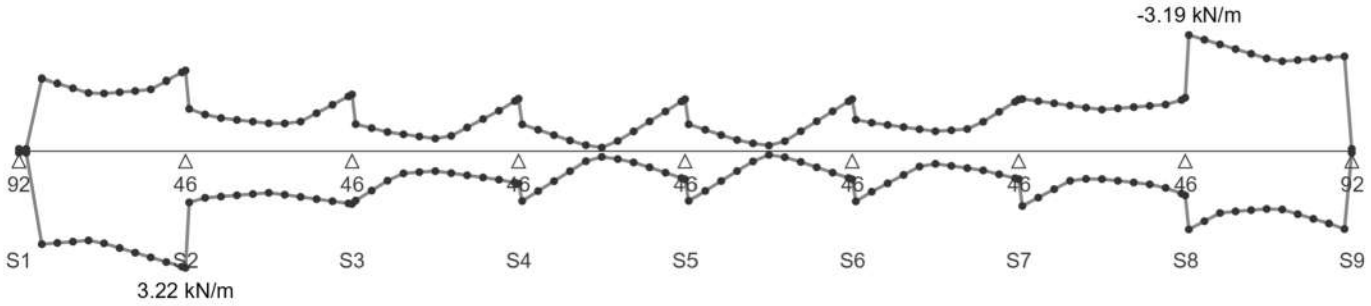


Shear force

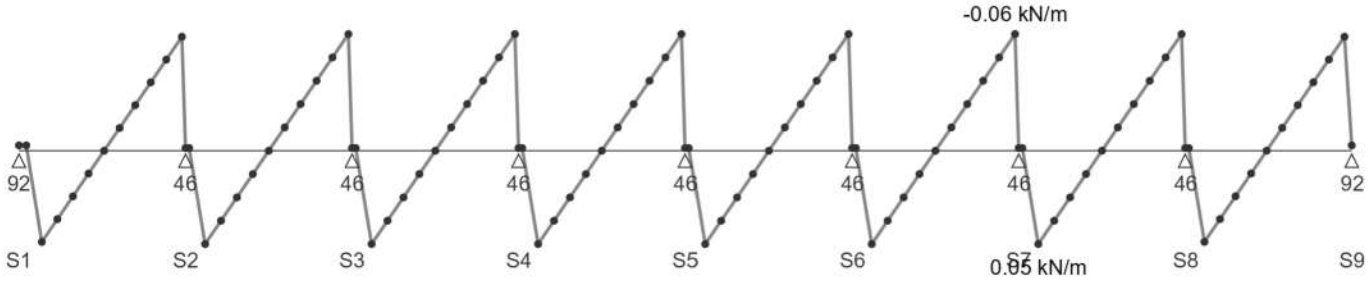
Combination, ULS



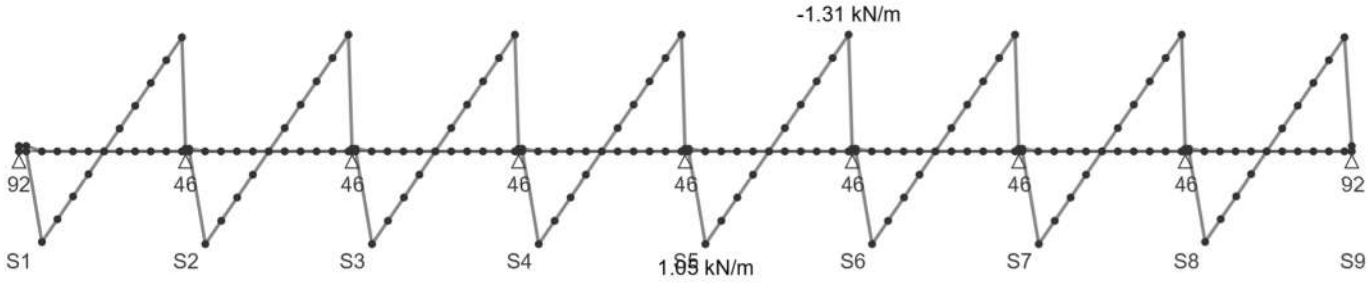
Combination, SLS



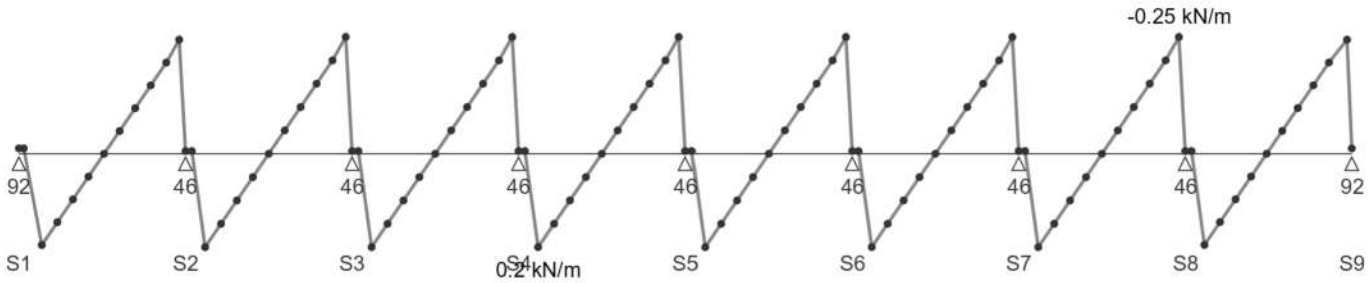
Dead loads



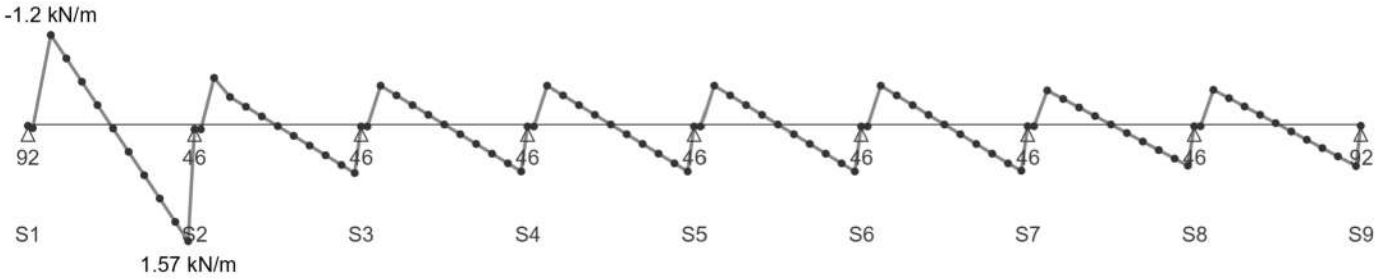
Snow loads



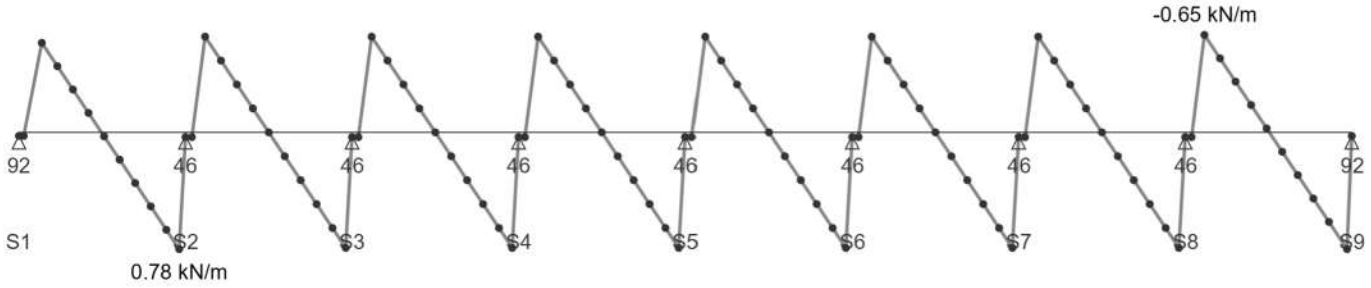
Wind loads, case 1



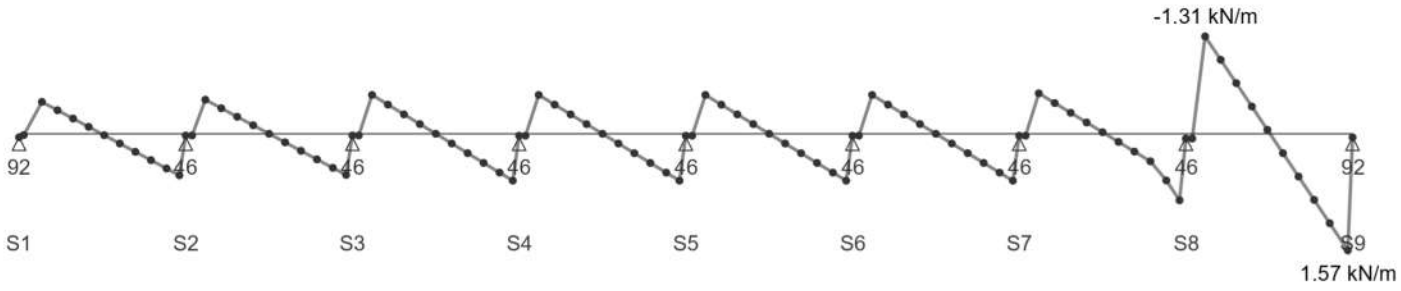
Wind loads, case 2



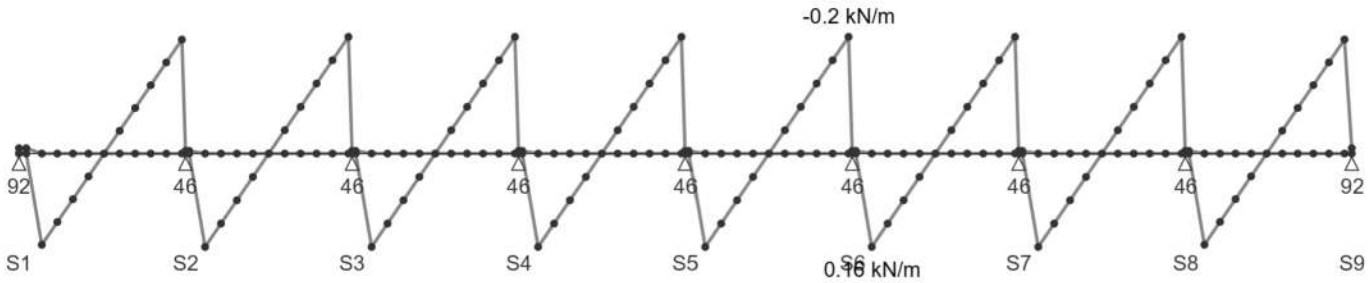
Wind loads, case 3



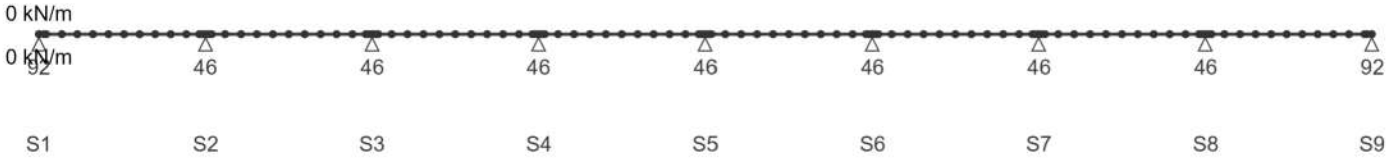
Wind loads, case 4



Live loads



Temperature loads



Utilization rates

Panel	Bending stress		Shear stress	Support force	Deflection
	External facing	Internal facing			
	[MPa]	[MPa]	[MPa]	[kN/m]	[mm]
P1	-104.0 / 150.5 (SLS) 69.1 %	-41.6 / 72.0 (SLS) 57.7 %	0.012 / 0.027 46.5 %	2.4 / 3.4 69.5 %	-0.5 / 5.2 [L/200] 9.6 %

Support reactions

Ultimate limit state

		Max			Min	
Support	**Total**	**Left**	**Right**	**Total**	**Left**	**Right**
	[kN/m]	[kN/m]	[kN/m]	[kN/m]	[kN/m]	[kN/m]
S1	3.97	0.0	3.97	-3.63	0.0	-3.63
S2	5.81	2.33	2.38	-5.48	-2.48	-1.42
S3	5.01	2.38	2.38	-2.87	-1.17	-1.17
S4	4.98	2.38	2.38	-2.7	-1.17	-1.17
S5	4.92	2.38	2.38	-2.63	-1.17	-1.17
S6	4.98	2.38	2.38	-2.7	-1.17	-1.17
S7	5.01	2.38	2.38	-2.87	-1.17	-1.17
S8	5.81	2.38	2.33	-5.48	-1.42	-2.48
S9	3.97	3.97	0.0	-3.63	-3.63	0.0

Dead loads

		Max	
Support	**Total**	**Left**	**Right**
	[kN/m]	[kN/m]	[kN/m]
S1	0.07	0.0	0.07
S2	0.14	0.06	0.06
S3	0.13	0.06	0.06
S4	0.13	0.06	0.06
S5	0.13	0.06	0.06
S6	0.13	0.06	0.06
S7	0.13	0.06	0.06
S8	0.14	0.06	0.06
S9	0.07	0.07	0.0

Snow loads

Support	Total	Max Left	Max Right
	[kN/m]	[kN/m]	[kN/m]
S1	1.4	0.0	1.4
S2	2.99	1.34	1.37
S3	2.75	1.37	1.37
S4	2.76	1.37	1.37
S5	2.75	1.37	1.37
S6	2.76	1.37	1.37
S7	2.75	1.37	1.37
S8	2.99	1.37	1.34
S9	1.4	1.4	0.0

Wind loads, case 1

Support	Total	Max Left	Max Right
	[kN/m]	[kN/m]	[kN/m]
S1	0.27	0.0	0.27
S2	0.56	0.26	0.26
S3	0.53	0.26	0.26
S4	0.53	0.26	0.26
S5	0.53	0.26	0.26
S6	0.53	0.26	0.26
S7	0.53	0.26	0.26
S8	0.56	0.26	0.26
S9	0.27	0.27	0.0

Wind loads, case 2

Support	Total	Max Left	Right
	[kN/m]	[kN/m]	[kN/m]
S1	-1.66	0.0	-1.66
S2	-2.99	-1.71	-1.01
S3	-1.39	-0.7	-0.68
S4	-1.38	-0.68	-0.68
S5	-1.37	-0.68	-0.68
S6	-1.38	-0.68	-0.68
S7	-1.27	-0.67	-0.6
S8	-1.28	-0.6	-0.6
S9	-0.59	-0.59	0.0

Wind loads, case 3

Support	Total	Max Left	Right
	[kN/m]	[kN/m]	[kN/m]
S1	-0.83	0.0	-0.83
S2	-1.81	-0.85	-0.84
S3	-1.68	-0.84	-0.84
S4	-1.68	-0.84	-0.84
S5	-1.68	-0.84	-0.84
S6	-1.68	-0.84	-0.84
S7	-1.68	-0.84	-0.84
S8	-1.81	-0.84	-0.85
S9	-0.83	-0.83	0.0

Wind loads, case 4

Support	Total	Max Left	Right
	[kN/m]	[kN/m]	[kN/m]
S1	-0.59	0.0	-0.59
S2	-1.28	-0.6	-0.6
S3	-1.27	-0.6	-0.67
S4	-1.38	-0.68	-0.68
S5	-1.37	-0.68	-0.68
S6	-1.38	-0.68	-0.68
S7	-1.39	-0.68	-0.7
S8	-2.99	-1.01	-1.71
S9	-1.66	-1.66	0.0

Live loads

Support	Total	Max Left	Right
	[kN/m]	[kN/m]	[kN/m]
S1	0.21	0.0	0.21
S2	0.45	0.2	0.21
S3	0.42	0.21	0.21
S4	0.42	0.21	0.21
S5	0.42	0.21	0.21
S6	0.42	0.21	0.21
S7	0.42	0.21	0.21
S8	0.45	0.21	0.2
S9	0.21	0.21	0.0

Temperature loads, summer

Support	Total	Max Left	Right
	[kN/m]	[kN/m]	[kN/m]
S1	2.46	0.0	2.46
S2	-1.32	0.0	0.0
S3	-0.6	0.0	0.0
S4	-0.39	0.0	0.0
S5	-0.31	0.0	0.0
S6	-0.39	0.0	0.0
S7	-0.6	0.0	0.0
S8	-1.32	0.0	0.0
S9	2.46	2.46	0.0

Temperature loads, winter (case 1)

Support	Total	Max Left	Right
	[kN/m]	[kN/m]	[kN/m]
S1	-1.57	0.0	-1.57
S2	0.83	0.0	0.0
S3	0.39	0.0	0.0
S4	0.25	0.0	0.0
S5	0.2	0.0	0.0
S6	0.25	0.0	0.0
S7	0.39	0.0	0.0
S8	0.83	0.0	0.0
S9	-1.57	-1.57	0.0

Temperature loads, winter (case 2)

Support	Total	Max Left	Right
	[kN/m]	[kN/m]	[kN/m]
S1	-0.82	0.0	-0.82
S2	0.44	0.0	0.0
S3	0.2	0.0	0.0
S4	0.13	0.0	0.0
S5	0.11	0.0	0.0
S6	0.13	0.0	0.0
S7	0.2	0.0	0.0
S8	0.44	0.0	0.0
S9	-0.82	-0.82	0.0

Fasteners

Base material: Steel

Support steel yield strength: 355 N/mm^2

Support wall thickness: 5 mm

Washer: S19, stainless steel

Minimum distances between the fastener and end of the panel:

Left end: 30 mm

Right end: 30 mm

Fastener type: Ruukki SP screw CB XXX steel 4.0-12

Fastener material: carbon steel

Support	Pcs	Reaction force* [kN/m]	N_{Ed} [kN]	N_{Rd} [kN]	V_{Ed} [kN]	V_{Rd} [kN]	Utilization rate [%]	Design criterion
S1	3	3.63	1.21	1.65	0.0	1.2	73.1	Pull through
S2	3	5.48	1.83	1.88	0.0	1.2	97.1	Pull through
S3	3	2.87	0.96	1.88	0.0	1.2	50.8	Pull through
S4	3	2.7	0.9	1.88	0.0	1.2	47.9	Pull through
S5	3	2.63	0.88	1.88	0.0	1.2	46.6	Pull through
S6	3	2.7	0.9	1.88	0.0	1.2	47.9	Pull through
S7	3	2.87	0.96	1.88	0.0	1.2	50.8	Pull through
S8	3	5.48	1.83	1.88	0.0	1.2	97.1	Pull through
S9	3	3.63	1.21	1.65	0.0	1.2	73.1	Pull through

* Pulling force from support

Design calculations are valid using the selected fastener. If any other fastener is used, design of the fasteners must be checked again.

Fasteners per panel row: 27

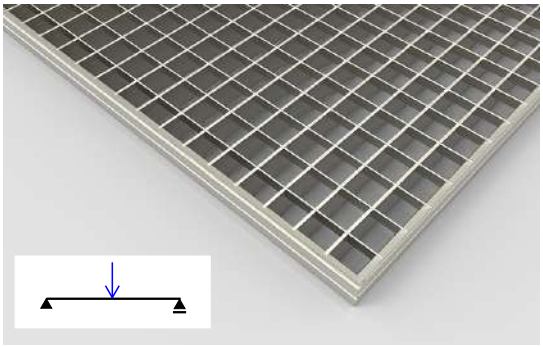
Total amount: 351

Calculation of grating

C-01-v2.2

Company: Sostinės konstruktoriai
Author: Shir Shah Hashimi
Project: Vilnius
Project code: None

Grating information



PRESSED GRATING
RR 35-2
33.33x33.33

calc. type	Standard
max-UC	0.74
weight	26.5 kg/m^2

Geometry

Clearspan in bearing direction	L	=	1125	mm
Nett height bearing bar	hb	=	35	mm
Width bearing bar	bb	=	2	mm
Height cross bar	hc	=	10	mm
Width cross bar	bc	=	2	mm
Bearing bar pitch	t	=	33.33	mm
Cross bar pitch	t_{cross}	=	33.33	mm
Weight grating	W	=	26.5	kg/m^2

Material - Steel S235

Design yield stress	fyd	=	235	N/mm^2
Modulus of elasticity	E	=	210000	N/mm^2

Loads and Safety

Loads: Loads determined manually
Safety: Safety- and reduction factor according Ral-GZ 638

Loads and safety factors

Distributed load	Fv	=	2.0	kN/m^2
Point load on contact area	Fp	=	1.5	kN
Point load width in bearing bar direction	bt	=	200	mm
Point load width in cross bar direction	bq	=	200	mm
Load factor	y	=	1.5	-
Reduction factor (on bearing bar height)	v	=	0.9	-
Deflection limit	$ulim$	=	5.62	mm

Load combinations

LCM1	Strength point load	ULS	$y * Fp$
LCM2	Stiffness point load	SLS	$1.0 * Fp$
LCM3	Strength distributed load	ULS	$y * Fv$
LCM4	Stiffness distributed load	SLS	$1.0 * Fv$

Calculation according RAL-GZ 638

Summary

LCM1	Strength point load	173 from 235 N/mm^2
LCM2	Stiffness point load	3.6 from 5.62 mm
LCM3	Strength distributed load	43 from 235 N/mm^2
LCM4	Stiffness distributed load	1.0 from 5.62 mm

Pointload strength check [LCM1]

Correction spreading for t_{cross}	α_{spread}	$= min[\ \frac{33.33}{t_{cross}}\ ;\ 1.2\ ]$	=	1.0	-
Number of effective bars[i]	M_{bars}	$= (\frac{-hb}{60} + \frac{11}{3}) * \alpha_{spread}$	=	3.08	-
Number of loaded bars	N_{bars}	$= (\frac{bq}{t}) + M_{bars}$	=	9.08	-
Moment of resisting grating	$W_{el,p}$	$= \frac{bb*hb^2}{6} * N_{bars} * \nu$	=	3338	mm^3
Moment due to loads	$M_{ed,p}$	$= y * \frac{Fp*10^3*(L-\frac{bt}{2})}{4}$	=	576562	Nmm
Stress due to loads	σ_p	$= \frac{M_{ed,p}}{W_{el,p}}$	=	173	N/mm^2
Unity check	UC	$= \frac{\sigma_p}{fyd}$	=	0.74	-

Pointload stiffness check [LCM2]

Number of loaded bars	N_{bars}	$= (\frac{bq}{t}) + M_{bars}$	=	9.08	-
Moment of inertia	I_p	$= \frac{bb*hb^3}{12} * N_{bars} * \nu$	=	58411	mm^4
Calculation of deformation	f_p	$= \frac{Fp*10^3}{384*E*I_p} * (8*L^3 - 4*L*bt^2 + bt^3)$	=	3.57	mm
Allowable deformation	$f_{allowed}$	$= \frac{1}{200} * L$	=	5.62	mm
Unity check	UC	$= \frac{f_p}{f_{allowed}}$	=	0.64	-

Distributed load strength check [LCM3]

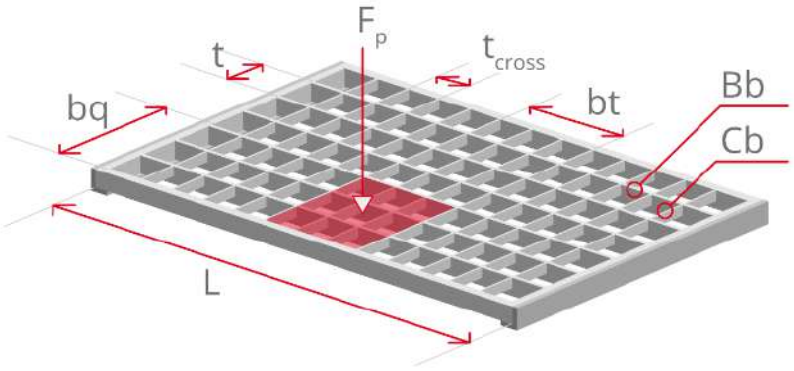
Number of loaded bars	N_{bars}	$= 1.0$	=	1.0	-
Moment of resisting grating	$W_{el,v}$	$= \frac{bb*hb^2}{6} * N_{bars} * \nu$	=	368	mm^3
Moment due to loads	$M_{ed,v}$	$= y * \frac{Fv*10^{-3}*t*L^2}{8}$	=	15819	Nmm
Stress due to loads	σ_v	$= \frac{M_{ed,v}}{W_{el,v}}$	=	43	N/mm^2
Unity check	UC	$= \frac{\sigma_v}{fyd}$	=	0.18	-

Distributed load stiffness check [LCM4]

Number of loaded bars	N_{bars}	$= 1.0$	=	1.0	-
Moment of inertia	I_v	$= \frac{bb*hb^3}{12} * N_{bars} * \nu$	=	6431	mm^4
Calculation of deformation	f_v	$= \frac{5}{384} * \frac{Fv*10^{-3}*t*L^4}{E*I_v}$	=	1.03	mm
Allowable deformation	$f_{allowed}$	$= \frac{1}{200} * L$	=	5.62	mm
Unity check	UC	$= \frac{f_v}{f_{allowed}}$	=	0.18	-

i =Derived from Ral-GZ 638, table 1

Legend



L	Clear span
bt	Point load width in bearing bar direction, fixed at 200 mm
bq	Point load width in cross bar direction, fixed at 200 mm
F_p	Point load
t	Bearing bar pitch
t_{cross}	Cross bar pitch
Bb	Bearing bar
Cb	Cross bar

Contact

More information or request your quotation:

Staco Nederland B.V.
T +31 (0)77 474 29 29
E info@stacoroosters.nl

Staco Belgium N.V.
T +32 (0)3 711 36 23
E info@staco.be

Staco Gratings UK Ltd
T +44 (0)1634 72 33 72
E info@stacogratings.co.uk

Staco Deutschland GmbH
T +49 (0)2166 6876 0
E info@staco.de

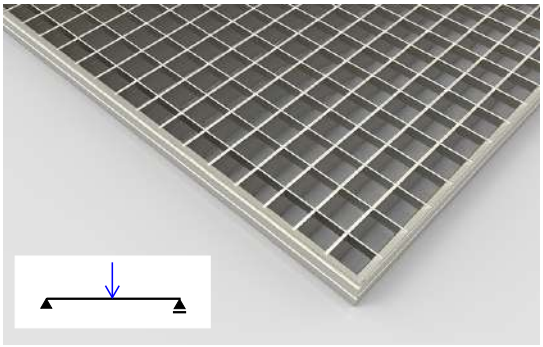
Staco Polska Sp. z o.o.
T +48 12 281 3505
E info@staco.pl

Calculation of grating

C-01-v2.2

Company: Sostinės konstruktoriai
Author: Shir Shah Hashimi
Project: Vilnius
Project code: None

Grating information



PRESSED GRATING
RR 35-2
33.33x33.33

calc. type	Standard
max-UC	0.79
weight	26.5 kg/m^2

Geometry

Clearspan in bearing direction	L	=	1200	mm
Nett height bearing bar	hb	=	35	mm
Width bearing bar	bb	=	2	mm
Height cross bar	hc	=	10	mm
Width cross bar	bc	=	2	mm
Bearing bar pitch	t	=	33.33	mm
Cross bar pitch	t_{cross}	=	33.33	mm
Weight grating	W	=	26.5	kg/m^2

Material - Steel S235

Design yield stress	fyd	=	235	N/mm^2
Modulus of elasticity	E	=	210000	N/mm^2

Loads and Safety

Loads: Loads determined manually
Safety: Safety- and reduction factor according Ral-GZ 638

Loads and safety factors

Distributed load	Fv	=	2.0	kN/m^2
Point load on contact area	Fp	=	1.5	kN
Point load width in bearing bar direction	bt	=	200	mm
Point load width in cross bar direction	bq	=	200	mm
Load factor	y	=	1.5	-
Reduction factor (on bearing bar height)	v	=	0.9	-
Deflection limit	$ulim$	=	6.0	mm

Load combinations

LCM1	Strength point load	ULS	$y * Fp$
LCM2	Stiffness point load	SLS	$1.0 * Fp$
LCM3	Strength distributed load	ULS	$y * Fv$
LCM4	Stiffness distributed load	SLS	$1.0 * Fv$

Calculation according RAL-GZ 638

Summary

LCM1	Strength point load	185 from 235 N/mm^2
LCM2	Stiffness point load	4.3 from 6.0 mm
LCM3	Strength distributed load	49 from 235 N/mm^2
LCM4	Stiffness distributed load	1.3 from 6.0 mm

Pointload strength check [LCM1]

Correction spreading for t_{cross}	α_{spread}	$= min[\ \frac{33.33}{t_{cross}}\ ;\ 1.2\ ]$	=	1.0	-
Number of effective bars[i]	M_{bars}	$= (\frac{-hb}{60} + \frac{11}{3}) * \alpha_{spread}$	=	3.08	-
Number of loaded bars	N_{bars}	$= (\frac{bq}{t}) + M_{bars}$	=	9.08	-
Moment of resisting grating	$W_{el,p}$	$= \frac{bb*hb^2}{6} * N_{bars} * \nu$	=	3338	mm^3
Moment due to loads	$M_{ed,p}$	$= y * \frac{Fp*10^3*(L-\frac{bt}{2})}{4}$	=	618750	Nmm
Stress due to loads	σ_p	$= \frac{M_{ed,p}}{W_{el,p}}$	=	185	N/mm^2
Unity check	UC	$= \frac{\sigma_p}{fyd}$	=	0.79	-

Pointload stiffness check [LCM2]

Number of loaded bars	N_{bars}	$= (\frac{bq}{t}) + M_{bars}$	=	9.08	-
Moment of inertia	I_p	$= \frac{bb*hb^3}{12} * N_{bars} * \nu$	=	58411	mm^4
Calculation of deformation	f_p	$= \frac{Fp*10^3}{384*E*I_p} * (8*L^3 - 4*L*bt^2 + bt^3)$	=	4.34	mm
Allowable deformation	$f_{allowed}$	$= \frac{1}{200} * L$	=	6.0	mm
Unity check	UC	$= \frac{f_p}{f_{allowed}}$	=	0.72	-

Distributed load strength check [LCM3]

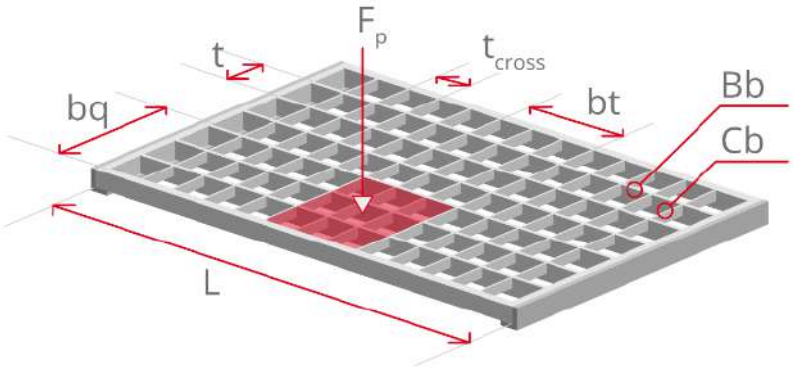
Number of loaded bars	N_{bars}	$= 1.0$	=	1.0	-
Moment of resisting grating	$W_{el,v}$	$= \frac{bb*hb^2}{6} * N_{bars} * \nu$	=	368	mm^3
Moment due to loads	$M_{ed,v}$	$= y * \frac{Fv*10^{-3}*t*L^2}{8}$	=	17998	Nmm
Stress due to loads	σ_v	$= \frac{M_{ed,v}}{W_{el,v}}$	=	49	N/mm^2
Unity check	UC	$= \frac{\sigma_v}{fyd}$	=	0.21	-

Distributed load stiffness check [LCM4]

Number of loaded bars	N_{bars}	$= 1.0$	=	1.0	-
Moment of inertia	I_v	$= \frac{bb*hb^3}{12} * N_{bars} * \nu$	=	6431	mm^4
Calculation of deformation	f_v	$= \frac{5}{384} * \frac{Fv*10^{-3}*t*L^4}{E*I_v}$	=	1.33	mm
Allowable deformation	$f_{allowed}$	$= \frac{1}{200} * L$	=	6.0	mm
Unity check	UC	$= \frac{f_v}{f_{allowed}}$	=	0.22	-

i =Derived from Ral-GZ 638, table 1

Legend



L	Clear span
bt	Point load width in bearing bar direction, fixed at 200 mm
bq	Point load width in cross bar direction, fixed at 200 mm
F_p	Point load
t	Bearing bar pitch
t_{cross}	Cross bar pitch
Bb	Bearing bar
Cb	Cross bar

Contact

More information or request your quotation:

Staco Nederland B.V.
T +31 (0)77 474 29 29
E info@stacoroosters.nl

Staco Belgium N.V.
T +32 (0)3 711 36 23
E info@staco.be

Staco Gratings UK Ltd
T +44 (0)1634 72 33 72
E info@stacogratings.co.uk

Staco Deutschland GmbH
T +49 (0)2166 6876 0
E info@staco.de

Staco Polska Sp. z o.o.
T +48 12 281 3505
E info@staco.pl

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Fastening point:			

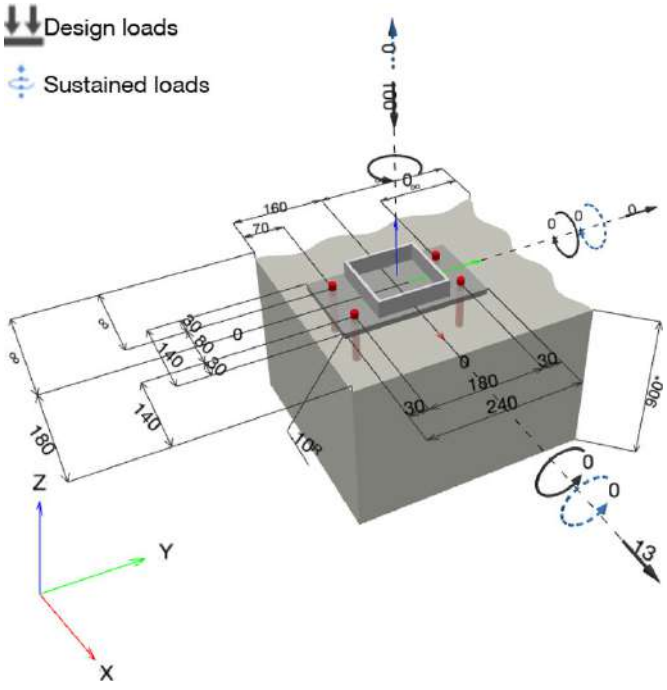
Specifier's comments:

1 Input data

Anchor type and diameter:	**HIT-HY 200-R V3 + HAS-U A4 M12**
Return period (service life in years):	50
Item number:	2223842 HAS-U A4 M12x110 (element) / 2262134 HIT-HY 200-R V3 (adhesive)
Effective embedment depth:	$h_{ef,opti}$ = 70.0 mm ($h_{ef,limit}$ = 240.0 mm)
Material:	A4
Evaluation Service Report:	ETA 19/0601
Issued I Valid:	2023-06-02 | -
Proof:	Design Method EN 1992-4, Chemical
Stand-off installation:	e_b = 0.0 mm (no stand-off); t = 10.0 mm
Anchor plate[R]:	l_x x l_y x t = 140.0 mm x 240.0 mm x 10.0 mm; (Recommended plate thickness: not calculated)
Profile:	Square hollow, 120 x 120 x 5,0; (L x W x T) = 120.0 mm x 120.0 mm x 5.0 mm
Base material:	cracked concrete, C30/37, $f_{c,cyl}$ = 30.00 N/mm^2; h = 900.0 mm, Temp. short/long: 40/24 °C, User-defined partial material safety factor γ_c = 1.500
Installation:	**hammer drilled hole, Installation condition: Dry**
Reinforcement:	no reinforcement or reinforcement spacing >= 150 mm (any Ø) or >= 100 mm (Ø <= 10 mm)
	no longitudinal edge reinforcement

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

Geometry [mm] & Loading [kN, kNm]



Input data and results must be checked for conformity with the existing conditions and for plausibility!
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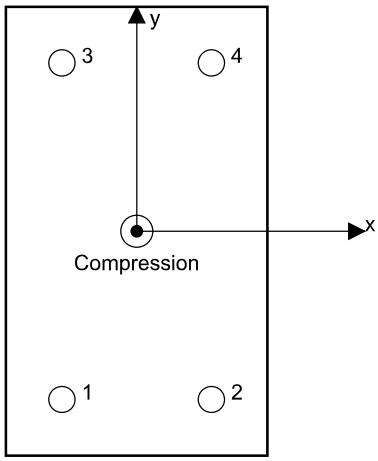
1.1 Load combination

Case	Description	Forces [kN] / Moments [kNm]	Seismic	Fire	Max. Util. Anchor [%]
1	Combination 1	N = -100.000; V_x = 13.000; V_y = 0.000; M_x = 0.000; M_y = 0.000; M_z = 0.000; N_{sus} = 0.000; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	no	94
2	Combination 2	N = 0.000; V_x = 0.000; V_y = -8.000; M_x = 0.000; M_y = 0.000; M_z = 0.000; N_{sus} = 0.000; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	no	93
3	Combination 3	N = 30.000; V_x = 0.000; V_y = 0.000; M_x = 0.000; M_y = 0.000; M_z = 0.000; N_{sus} = 0.000; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	no	87

2 Load case/Resulting anchor forces

Controlling load case: 1 Combination 1



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

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	0.000	3.250	3.250	0.000
2	0.000	3.250	3.250	0.000
3	0.000	3.250	3.250	0.000
4	0.000	3.250	3.250	0.000

max. concrete compressive strain: 0.10 [‰]
max. concrete compressive stress: 2.98 [N/mm^2]
resulting tension force in (x/y)=(0.0/0.0): 0.000 [kN]
resulting compression force in (x/y)=(0.0/0.0): 100.000 [kN]

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

Input data and results must be checked for conformity with the existing conditions and for plausibility!
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3 Tension load (EN 1992-4, Section 7.2.1)

	Load [kN]	Capacity [kN]	Utilization β_N [%]	Status
Steel Strength*	N/A	N/A	N/A	N/A
Concrete Breakout Failure**	N/A	N/A	N/A	N/A
Splitting failure**	N/A	N/A	N/A	N/A

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

Input data and results must be checked for conformity with the existing conditions and for plausibility!
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4 Shear load (EN 1992-4, Section 7.2.2)

	Load [kN]	Capacity [kN]	Utilization β_V [%]	Status
Steel Strength (without lever arm)*	3.250	18.913	18	OK
Steel failure (with lever arm)*	N/A	N/A	N/A	N/A
Pryout Strength**	13.000	69.194	19	OK
Concrete edge failure in direction x+**	13.000	13.928	94	OK

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

4.1 Steel Strength (without lever arm)

$V_{Ed} \leq V_{Rd,s} = \frac{V_{Rk,s}}{\gamma_{M,s}}$ EN 1992-4, Table 7.2

$V_{Rk,s} = k_7 \cdot V^0_{Rk,s}$ EN 1992-4, Eq. (7.35)

$V^0_{Rk,s}$ [kN]	k_7	$V_{Rk,s}$ [kN]	$\gamma_{M,s}$	$V_{Rd,s}$ [kN]	V_{Ed} [kN]
29.505	1.000	29.505	1.560	18.913	3.250

4.2 Pryout Strength (Concrete Breakout Strength controls)

$V_{Ed} \leq V_{Rd,cp} = \frac{V_{Rk,cp}}{\gamma_{M,c,p}}$ EN 1992-4, Table 7.2

$V_{Rk,cp} = k_8 \cdot \min\{N_{Rk,c}; N_{Rk,p}\}$ EN 1992-4, Eq. (7.39c)

$N_{Rk,c} = N^0_{Rk,c} \cdot \frac{A_{c,N}}{A^0_{c,N}} \cdot \psi_{s,N} \cdot \psi_{re,N} \cdot \psi_{ec1,N} \cdot \psi_{ec2,N} \cdot \psi_{M,N}$ EN 1992-4, Eq. (7.1)

$N^0_{Rk,c} = k_1 \cdot \sqrt{f_{ck}} \cdot h_{ef}^{1,5}$ EN 1992-4, Eq. (7.2)

$A^0_{c,N} = s_{cr,N} \cdot s_{cr,N}$ EN 1992-4, Eq. (7.3)

$\psi_{s,N} = 0.7 + 0.3 \cdot \frac{c}{c_{cr,N}} \leq 1.00$ EN 1992-4, Eq. (7.4)

$\psi_{ec1,N} = \frac{1}{1 + \left(\frac{2 \cdot e_{V,1}}{s_{cr,N}}\right)} \leq 1.00$ EN 1992-4, Eq. (7.6)

$\psi_{ec2,N} = \frac{1}{1 + \left(\frac{2 \cdot e_{V,2}}{s_{cr,N}}\right)} \leq 1.00$ EN 1992-4, Eq. (7.6)

$\psi_{M,N} = 1$ EN 1992-4, Eq. (7.7)

$A_{c,N}$ [mm²]	$A^0_{c,N}$ [mm²]	$c_{cr,N}$ [mm]	$s_{cr,N}$ [mm]	k_8	$f_{c,cyl}$ [N/mm²]
102,950	44,100	105.0	210.0	2.000	30.00

$e_{c1,V}$ [mm]	$\psi_{ec1,N}$	$e_{c2,V}$ [mm]	$\psi_{ec2,N}$	$\psi_{s,N}$	$\psi_{re,N}$	$\psi_{M,N}$
0.0	1.000	0.0	1.000	0.900	1.000	1.000

k_1	$N^0_{Rk,c}$ [kN]	$\gamma_{M,c,p}$	$V_{Rd,cp}$ [kN]	V_{Ed} [kN]
7.700	24.700	1.500	69.194	13.000

Group anchor ID
1-4

Input data and results must be checked for conformity with the existing conditions and for plausibility!
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4.3 Concrete edge failure in direction x+

$$V_{Ed} \le V_{Rd,c} = \frac{V_{Rk,c}}{\gamma_{M,c}}$$ EN 1992-4, Table 7.2

$$V_{Rk,c} = k_T \cdot V^0_{Rk,c} \cdot \frac{A_{c,V}}{A^0_{c,V}} \cdot \psi_{s,V} \cdot \psi_{h,V} \cdot \psi_{\alpha,V} \cdot \psi_{ec,V} \cdot \psi_{re,V}$$ EN 1992-4, Eq. (7.40)

$$V^0_{Rk,c} = k_9 \cdot d_{nom}^{\alpha} \cdot l_f^{\beta} \cdot \sqrt{f_{ck}} \cdot c_1^{1,5}$$ EN 1992-4, Eq. (7.41)

$$\alpha = 0.1 \cdot \left(\frac{l_f}{c_1}\right)^{0,5}$$ EN 1992-4, Eq. (7.42)

$$\beta = 0.1 \cdot \left(\frac{d_{nom}}{c_1}\right)^{0,2}$$ EN 1992-4, Eq. (7.43)

$$A^0_{c,V} = 4.5 \cdot c_1^2$$ EN 1992-4, Eq. (7.44)

$$\psi_{s,V} = 0.7 + 0.3 \cdot \frac{c_2}{1.5 \cdot c_1} \le 1.00$$ EN 1992-4, Eq. (7.45)

$$\psi_{h,V} = \left(\frac{1.5 \cdot c_1}{h}\right)^{0,5} \ge 1.00$$ EN 1992-4, Eq. (7.46)

$$\psi_{ec,V} = \frac{1}{1 + \left(\frac{2 \cdot e_V}{3 \cdot c_1}\right)} \le 1.00$$ EN 1992-4, Eq. (7.47)

$$\psi_{\alpha,V} = \sqrt{\frac{1}{(\cos \alpha_V)^2 + (0.5 \cdot \sin \alpha_V)^2}} \ge 1.00$$ EN 1992-4, Eq. (7.48)

l_f [mm]	d_{nom} [mm]	k_9	α	β	$f_{c,cyl}$ [N/mm²]
70.0	12.00	1.700	0.071	0.061	30.00

c_1 [mm]	$A_{c,V}$ [mm²]	$A^0_{c,V}$ [mm²]
140.0	96,600	88,200

$\psi_{s,V}$	$\psi_{h,V}$	α_V [°]	$\psi_{\alpha,V}$	$e_{c,V}$ [mm]	$\psi_{ec,V}$	$\psi_{re,V}$
0.800	1.000	0.00	1.000	0.0	1.000	1.000

$V^0_{Rk,c}$ [kN]	k_T	$\gamma_{M,c}$	$V_{Rd,c}$ [kN]	V_{Ed} [kN]
23.845	1.0	1.500	13.928	13.000

5 Displacements (highest loaded anchor)

Short term loading:

N_{Sk} = 0.000 [kN] δ_N = 0.0000 [mm]

V_{Sk} = 2.407 [kN] δ_V = 0.1204 [mm]

δ_{NV} = 0.1204 [mm]

Long term loading:

N_{Sk} = 0.000 [kN] δ_N = 0.0000 [mm]

V_{Sk} = 2.407 [kN] δ_V = 0.1926 [mm]

δ_{NV} = 0.1926 [mm]

Comments: Tension displacements are valid with half of the required installation torque moment for uncracked concrete! Shear displacements are valid without friction between the concrete and the anchor plate! The gap due to the drilled hole and clearance hole tolerances are not included in this calculation!

The acceptable anchor displacements depend on the fastened construction and must be defined by the designer!

Input data and results must be checked for conformity with the existing conditions and for plausibility!
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6 Warnings

- The anchor design methods in PROFIS Engineering require rigid anchor plates per current regulations (AS 5216:2021, ETAG 001/Annex C, EOTA TR029 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 CBFEM 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!
- Checking the transfer of loads into the base material is required in accordance with EN 1992-4, Annex A!
- The design is only valid if the clearance hole in the fixture is not larger than the value given in Table 6.1 of EN 1992-4! For larger diameters of the clearance hole see section 6.2.2 of EN 1992-4!
- The accessory list in this report is for the information of the user only. In any case, the instructions for use provided with the product have to be followed to ensure a proper installation.
- For the determination of the $\psi_{re,v}$ (concrete edge failure) the minimum concrete cover defined in the design settings is used as the concrete cover of the edge reinforcement.
- Bore hole cleaning must be performed according to instructions for use (blow twice with oil-free compressed air (min. 6 bar), brush twice, blow twice with oil-free compressed air (min. 6 bar)).
- Characteristic bond resistances depend on short- and long-term temperatures.
- Edge reinforcement is not required to avoid splitting failure
- The characteristic bond resistances depend on the return period (service life in years): 50

Fastening meets the design criteria!

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7 Installation data

Anchor plate, steel: S 355; E = 210,000.00 N/mm^2; f_{yk} = 355.00 N/mm^2

Profile: Square hollow, 120 x 120 x 5,0; (L x W x T) = 120.0 mm x 120.0 mm x 5.0 mm

Hole diameter in the fixture: d_f = 14.0 mm

Plate thickness (input): 10.0 mm

Recommended plate thickness: not calculated

Drilling method: Hammer drilled

Cleaning: Compressed air cleaning of the drilled hole according to instructions for use is required

Anchor type and diameter: HIT-HY 200-R V3 + HAS-U A4 M12

Item number: 2223842 HAS-U A4 M12x110 (element) / 2262134 HIT-HY 200-R V3 (adhesive)

Maximum installation torque: 40 Nm

Hole diameter in the base material: 14.0 mm

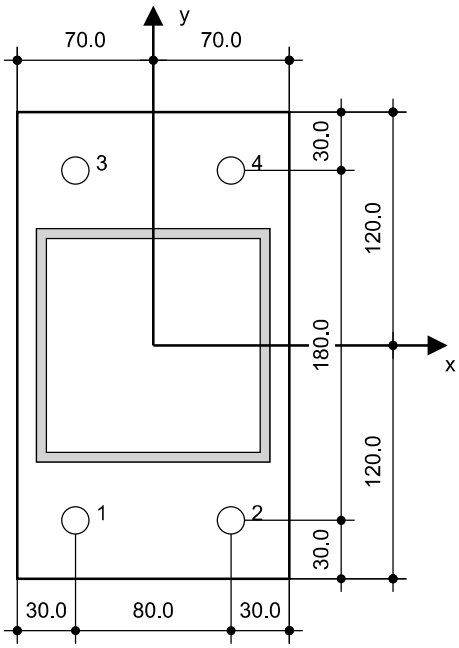
Hole depth in the base material: 70.0 mm

Minimum thickness of the base material: 100.0 mm

Hilti HAS-U threaded rod with HIT-HY 200-R V3 injection mortar with 70 mm embedment h_ef, M12, Stainless steel, Hammer drilled installation per ETA 19/0601

7.1 Recommended accessories

Drilling	Cleaning	Setting
• Suitable Rotary Hammer • Properly sized drill bit	• Compressed air with required accessories to blow from the bottom of the hole • Proper diameter wire brush	• Dispenser including cassette and mixer • For deep installations, a piston plug is necessary • Torque wrench



Coordinates Anchor [mm]

Anchor	x	y	c_{-x}	c_{+x}	c_{-y}	c_{+y}
1	-40.0	-90.0	-	220.0	70.0	-
2	40.0	-90.0	-	140.0	70.0	-
3	-40.0	90.0	-	220.0	250.0	-
4	40.0	90.0	-	140.0	250.0	-

Input data and results must be checked for conformity with the existing conditions and for plausibility!
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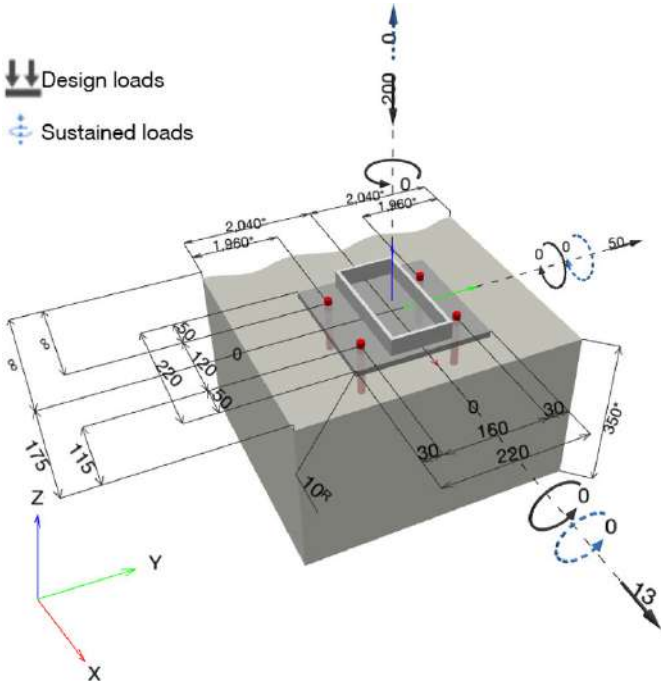
Specifier's comments:

1 Input data

Anchor type and diameter:	**HIT-HY 200-R V3 + HAS-U A4 M12**
Return period (service life in years):	50
Item number:	2223842 HAS-U A4 M12x110 (element) / 2262134 HIT-HY 200-R V3 (adhesive)
Effective embedment depth:	$h_{ef,opti}$ = 76.0 mm ($h_{ef,limit}$ = 240.0 mm)
Material:	A4
Evaluation Service Report:	ETA 19/0601
Issued I Valid:	2023-06-02 | -
Proof:	Design Method EN 1992-4, Chemical
Stand-off installation:	e_b = 0.0 mm (no stand-off); t = 10.0 mm
Anchor plate[R]:	l_x x l_y x t = 220.0 mm x 220.0 mm x 10.0 mm; (Recommended plate thickness: not calculated)
Profile:	Rectangular hollow, 200 x 100 x6; (L x W x T) = 200.0 mm x 100.0 mm x 6.0 mm
Base material:	cracked concrete, C30/37, $f_{c,cyl}$ = 30.00 N/mm^2; h = 350.0 mm, Temp. short/long: 40/24 °C, User-defined partial material safety factor γ_c = 1.500
Installation:	**hammer drilled hole, Installation condition: Dry**
Reinforcement:	no reinforcement or reinforcement spacing >= 150 mm (any Ø) or >= 100 mm (Ø <= 10 mm) no longitudinal edge reinforcement

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

Geometry [mm] & Loading [kN, kNm]



Input data and results must be checked for conformity with the existing conditions and for plausibility!
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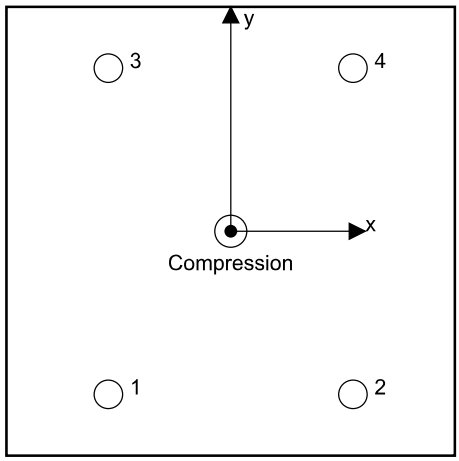
1.1 Load combination

Case	Description	Forces [kN] / Moments [kNm]	Seismic	Fire	Max. Util. Anchor [%]
1	Combination 1	N = -200.000; V_x = 13.000; V_y = 50.000; M_x = 0.000; M_y = 0.000; M_z = 0.000; N_{sus} = 0.000; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	no	100
2	Combination 2	N = 0.000; V_x = 15.000; V_y = 0.000; M_x = 0.000; M_y = 0.000; M_z = 0.000; N_{sus} = 0.000; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	no	84
3	Combination 3	N = 40.000; V_x = 0.000; V_y = 0.000; M_x = 0.000; M_y = 0.000; M_z = 0.000; N_{sus} = 0.000; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	no	83

2 Load case/Resulting anchor forces

Controlling load case: 1 Combination 1



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

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	0.000	12.916	3.250	12.500
2	0.000	12.916	3.250	12.500
3	0.000	12.916	3.250	12.500
4	0.000	12.916	3.250	12.500

max. concrete compressive strain: 0.14 [‰]
max. concrete compressive stress: 4.13 [N/mm^2]
resulting tension force in (x/y)=(0.0/0.0): 0.000 [kN]
resulting compression force in (x/y)=(0.0/0.0): 200.000 [kN]

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

Input data and results must be checked for conformity with the existing conditions and for plausibility!
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3 Tension load (EN 1992-4, Section 7.2.1)

	Load [kN]	Capacity [kN]	Utilization β_N [%]	Status
Steel Strength*	N/A	N/A	N/A	N/A
Concrete Breakout Failure**	N/A	N/A	N/A	N/A
Splitting failure**	N/A	N/A	N/A	N/A

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

Input data and results must be checked for conformity with the existing conditions and for plausibility!
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Company:		Page:	4
Address:		Specifier:	
Phone I Fax:	|	E-Mail:	
Design:	Drafts_Drafts_Concrete - Jul 13, 2023	Date:	2023-09-04
Fastening point:			

4 Shear load (EN 1992-4, Section 7.2.2)

	Load [kN]	Capacity [kN]	Utilization β_V [%]	Status
Steel Strength (without lever arm)*	12.916	18.913	69	OK
Steel failure (with lever arm)*	N/A	N/A	N/A	N/A
Pryout Strength**	51.662	96.772	54	OK
Concrete edge failure in direction x+**	28.178	28.226	100	OK

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

4.1 Steel Strength (without lever arm)

$V_{Ed} \leq V_{Rd,s} = \frac{V_{Rk,s}}{\gamma_{M,s}}$ EN 1992-4, Table 7.2

$V_{Rk,s} = k_7 \cdot V^0_{Rk,s}$ EN 1992-4, Eq. (7.35)

$V^0_{Rk,s}$ [kN]	k_7	$V_{Rk,s}$ [kN]	$\gamma_{M,s}$	$V_{Rd,s}$ [kN]	V_{Ed} [kN]
29.505	1.000	29.505	1.560	18.913	12.916

4.2 Pryout Strength (Concrete Breakout Strength controls)

$V_{Ed} \leq V_{Rd,cp} = \frac{V_{Rk,cp}}{\gamma_{M,c,p}}$ EN 1992-4, Table 7.2

$V_{Rk,cp} = k_8 \cdot \min\{N_{Rk,c}; N_{Rk,p}\}$ EN 1992-4, Eq. (7.39c)

$N_{Rk,c} = N^0_{Rk,c} \cdot \frac{A_{c,N}}{A^0_{c,N}} \cdot \psi_{s,N} \cdot \psi_{re,N} \cdot \psi_{ec1,N} \cdot \psi_{ec2,N} \cdot \psi_{M,N}$ EN 1992-4, Eq. (7.1)

$N^0_{Rk,c} = k_1 \cdot \sqrt{f_{ck}} \cdot h_{ef}^{1,5}$ EN 1992-4, Eq. (7.2)

$A^0_{c,N} = s_{cr,N} \cdot s_{cr,N}$ EN 1992-4, Eq. (7.3)

$\psi_{s,N} = 0.7 + 0.3 \cdot \frac{c}{c_{cr,N}} \leq 1.00$ EN 1992-4, Eq. (7.4)

$\psi_{ec1,N} = \frac{1}{1 + \left(\frac{2 \cdot e_{V,1}}{s_{cr,N}}\right)} \leq 1.00$ EN 1992-4, Eq. (7.6)

$\psi_{ec2,N} = \frac{1}{1 + \left(\frac{2 \cdot e_{V,2}}{s_{cr,N}}\right)} \leq 1.00$ EN 1992-4, Eq. (7.6)

$\psi_{M,N} = 1$ EN 1992-4, Eq. (7.7)

$A_{c,N}$ [mm²]	$A^0_{c,N}$ [mm²]	$c_{cr,N}$ [mm]	$s_{cr,N}$ [mm]	k_8	$f_{c,cyl}$ [N/mm²]
135,024	51,984	114.0	228.0	2.000	30.00

$e_{c1,V}$ [mm]	$\psi_{ec1,N}$	$e_{c2,V}$ [mm]	$\psi_{ec2,N}$	$\psi_{s,N}$	$\psi_{re,N}$	$\psi_{M,N}$
0.0	1.000	0.0	1.000	1.000	1.000	1.000

k_1	$N^0_{Rk,c}$ [kN]	$\gamma_{M,c,p}$	$V_{Rd,cp}$ [kN]	V_{Ed} [kN]
7.700	27.943	1.500	96.772	51.662

Group anchor ID
1-4

Input data and results must be checked for conformity with the existing conditions and for plausibility!
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4.3 Concrete edge failure in direction x+

$$V_{Ed} \le V_{Rd,c} = \frac{V_{Rk,c}}{\gamma_{M,c}}$$ EN 1992-4, Table 7.2

$$V_{Rk,c} = k_T \cdot V^0_{Rk,c} \cdot \frac{A_{c,V}}{A^0_{c,V}} \cdot \psi_{s,V} \cdot \psi_{h,V} \cdot \psi_{\alpha,V} \cdot \psi_{ec,V} \cdot \psi_{re,V}$$ EN 1992-4, Eq. (7.40)

$$V^0_{Rk,c} = k_9 \cdot d_{nom}^{\alpha} \cdot l_f^{\beta} \cdot \sqrt{f_{ck}} \cdot c_1^{1,5}$$ EN 1992-4, Eq. (7.41)

$$\alpha = 0.1 \cdot \left(\frac{l_f}{c_1}\right)^{0,5}$$ EN 1992-4, Eq. (7.42)

$$\beta = 0.1 \cdot \left(\frac{d_{nom}}{c_1}\right)^{0,2}$$ EN 1992-4, Eq. (7.43)

$$A^0_{c,V} = 4.5 \cdot c_1^2$$ EN 1992-4, Eq. (7.44)

$$\psi_{s,V} = 0.7 + 0.3 \cdot \frac{c_2}{1.5 \cdot c_1} \le 1.00$$ EN 1992-4, Eq. (7.45)

$$\psi_{h,V} = \left(\frac{1.5 \cdot c_1}{h}\right)^{0,5} \ge 1.00$$ EN 1992-4, Eq. (7.46)

$$\psi_{ec,V} = \frac{1}{1 + \left(\frac{2 \cdot e_V}{3 \cdot c_1}\right)} \le 1.00$$ EN 1992-4, Eq. (7.47)

$$\psi_{\alpha,V} = \sqrt{\frac{1}{(\cos \alpha_V)^2 + (0.5 \cdot \sin \alpha_V)^2}} \ge 1.00$$ EN 1992-4, Eq. (7.48)

l_f [mm]	d_{nom} [mm]	k_9	α	β	$f_{c,cyl}$ [N/mm²]
76.0	12.00	1.700	0.081	0.064	30.00

c_1 [mm]	$A_{c,V}$ [mm²]	$A^0_{c,V}$ [mm²]
115.0	87,112	59,512

$\psi_{s,V}$	$\psi_{h,V}$	α_V [°]	$\psi_{\alpha,V}$	$e_{c,V}$ [mm]	$\psi_{ec,V}$	$\psi_{re,V}$
1.000	1.000	62.53	1.562	0.0	1.000	1.000

$V^0_{Rk,c}$ [kN]	k_T	$\gamma_{M,c}$	$V_{Rd,c}$ [kN]	V_{Ed} [kN]
18.513	1.0	1.500	28.226	28.178

5 Displacements (highest loaded anchor)

Short term loading:

N_{Sk} = 0.000 [kN] δ_N = 0.0000 [mm]

V_{Sk} = 9.567 [kN] δ_V = 0.4784 [mm]

δ_{NV} = 0.4784 [mm]

Long term loading:

N_{Sk} = 0.000 [kN] δ_N = 0.0000 [mm]

V_{Sk} = 9.567 [kN] δ_V = 0.7654 [mm]

δ_{NV} = 0.7654 [mm]

Comments: Tension displacements are valid with half of the required installation torque moment for uncracked concrete! Shear displacements are valid without friction between the concrete and the anchor plate! The gap due to the drilled hole and clearance hole tolerances are not included in this calculation!

The acceptable anchor displacements depend on the fastened construction and must be defined by the designer!

Input data and results must be checked for conformity with the existing conditions and for plausibility!
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6 Warnings

- The anchor design methods in PROFIS Engineering require rigid anchor plates per current regulations (AS 5216:2021, ETAG 001/Annex C, EOTA TR029 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 CBFEM 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!
- Checking the transfer of loads into the base material is required in accordance with EN 1992-4, Annex A!
- The design is only valid if the clearance hole in the fixture is not larger than the value given in Table 6.1 of EN 1992-4! For larger diameters of the clearance hole see section 6.2.2 of EN 1992-4!
- The accessory list in this report is for the information of the user only. In any case, the instructions for use provided with the product have to be followed to ensure a proper installation.
- For the determination of the $\psi_{re,v}$ (concrete edge failure) the minimum concrete cover defined in the design settings is used as the concrete cover of the edge reinforcement.
- Bore hole cleaning must be performed according to instructions for use (blow twice with oil-free compressed air (min. 6 bar), brush twice, blow twice with oil-free compressed air (min. 6 bar)).
- Characteristic bond resistances depend on short- and long-term temperatures.
- Edge reinforcement is not required to avoid splitting failure
- The characteristic bond resistances depend on the return period (service life in years): 50

Fastening meets the design criteria!

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7 Installation data

Anchor plate, steel: S 355; E = 210,000.00 N/mm^2; f_{yk} = 355.00 N/mm^2

Profile: Rectangular hollow, 200 x 100 x6; (L x W x T) = 200.0 mm x 100.0 mm x 6.0 mm

Hole diameter in the fixture: d_f = 14.0 mm

Plate thickness (input): 10.0 mm

Recommended plate thickness: not calculated

Drilling method: Hammer drilled

Cleaning: Compressed air cleaning of the drilled hole according to instructions for use is required

Anchor type and diameter: HIT-HY 200-R V3 + HAS-U A4 M12

Item number: 2223842 HAS-U A4 M12x110 (element) / 2262134 HIT-HY 200-R V3 (adhesive)

Maximum installation torque: 40 Nm

Hole diameter in the base material: 14.0 mm

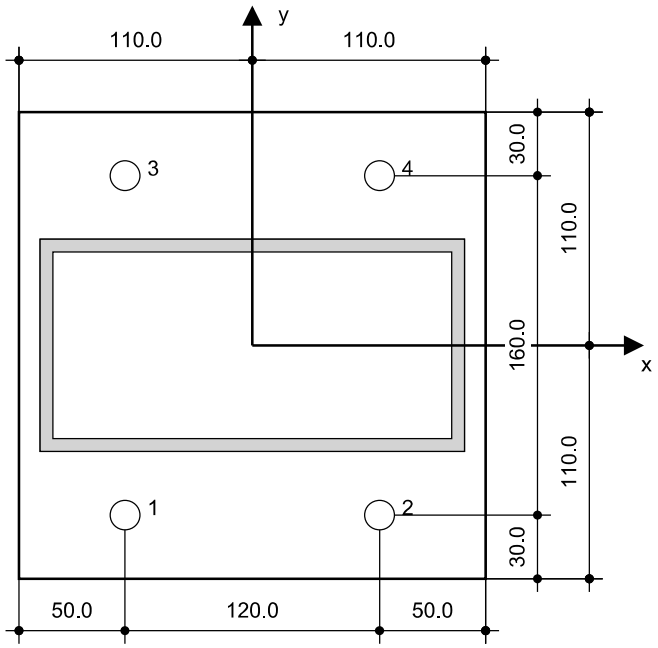
Hole depth in the base material: 76.0 mm

Minimum thickness of the base material: 106.0 mm

Hilti HAS-U threaded rod with HIT-HY 200-R V3 injection mortar with 76 mm embedment h_ef, M12, Stainless steel, Hammer drilled installation per ETA 19/0601

7.1 Recommended accessories

Drilling	Cleaning	Setting
• Suitable Rotary Hammer • Properly sized drill bit	• Compressed air with required accessories to blow from the bottom of the hole • Proper diameter wire brush	• Dispenser including cassette and mixer • For deep installations, a piston plug is necessary • Torque wrench



Coordinates Anchor [mm]

Anchor	x	y	c_{-x}	c_{+x}	c_{-y}	c_{+y}
1	-60.0	-80.0	-	235.0	1,960.0	2,120.0
2	60.0	-80.0	-	115.0	1,960.0	2,120.0
3	-60.0	80.0	-	235.0	2,120.0	1,960.0
4	60.0	80.0	-	115.0	2,120.0	1,960.0

Input data and results must be checked for conformity with the existing conditions and for plausibility!
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