Architecture Construction Engineering

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PROJEKTO PAVADINIMAS:	**Visuomeninių pastatų paskirties grupės, gydymo paskirties pastato, Vydūno g. 56, Jurbarkas, rekonstravimo projektas**
ADRESAS:	**Vydūno g. 56, Jurbarkas**
SKLYPO KADASTRINIS NR.:	**9420/0007:102**
STATINIO UNIKALUS NR.:	**9491-3000-3071**
UŽSAKOVAS:	**Jurbarko rajono savivaldybė**
STATYTOJAS:	**Jurbarko rajono savivaldybė**
STATINIO KATEGORIJA:	**Ypatingasis statinys**
STATYBOS RŪŠIS:	**Rekonstravimas**
STATINIO NAUDOJIMO PASKIRTIS:	**Gydymo paskirties pastatas**
PROJEKTO RENGIMO ETAPAS:	**Techninis darbo projektas**
PROJEKTO DALIS:	**Konstrukcijų. Sprendinių detalieji skaičiavimai**
LAIDA:	**0**
PROJEKTO NUMERIS:	**IN2413-01-TDP-SK-S**

Direktorius	[redacted]	[redacted]
	AV. Parašas	
PV	[redacted]	[redacted]
	Parašas	
PDV.	[redacted]	[redacted]
	Parašas	

2025 m.

PROJEKTO SUDĖTIES ŽINIARAŠTIS				
Eil. Nr.	Bylos (segtuvo) žymuo	Laida	Pavadinimas	Pastabos
1.	BD	0	Bendroji	
2.	SP	0	Sklypo sutvarkymo	
3.	SA	0	Architektūrinė	
4.	T	0	Technologijos	
5.	SK	0	Konstrukcijų	
6.	VN	0	Vandentiekio ir nuotekų šalinimo (lauko ir vidaus)	
7.	ŠVOK	0	Šildymo, vėdinimo ir oro kondicionavimo	
8.	ŠT	0	Šilumos gamybos ir tiekimo	
9.	MD	0	Medicininių dujų	
10.	E	0	Elektrotechnikos (lauko ir vidaus)	
11.	ER	0	Elektroninių ryšių (telekomunikacijų)	
12.	LER	0	Lauko elektroninių ryšių (telekomunikacijų)	
13.	PVA	0	Procesų valdymo ir automatizacijos	
14.	GS	0	Gaisrinės saugos	
15.	AS	0	Apsauginės signalizacijos	
16.	GSS	0	Gaisro aptikimo ir signalizacijos	
17.	SO	0	Pasirengimo statybai ir statybos darbų organizavimo	
18.	KS	0	Statybos skaičiuojamosios kainos nustatymo	

PROJEKTO DALIES BYLŲ (SEGTUVŲ) SUDĖTIES ŽINIARAŠTIS				
Eil. Nr.	Bylos (segtuvo) žymuo	Laida	Pavadinimas	Pastabos
1.	IN2413-01-TDP-SK	0	Konstrukcijų (statinio konstrukcijos)	
3.	**IN2413-01-TDP-SK-S**	**0**	**Konstrukcijų. Sprendinių detalieji skaičiavimai**	

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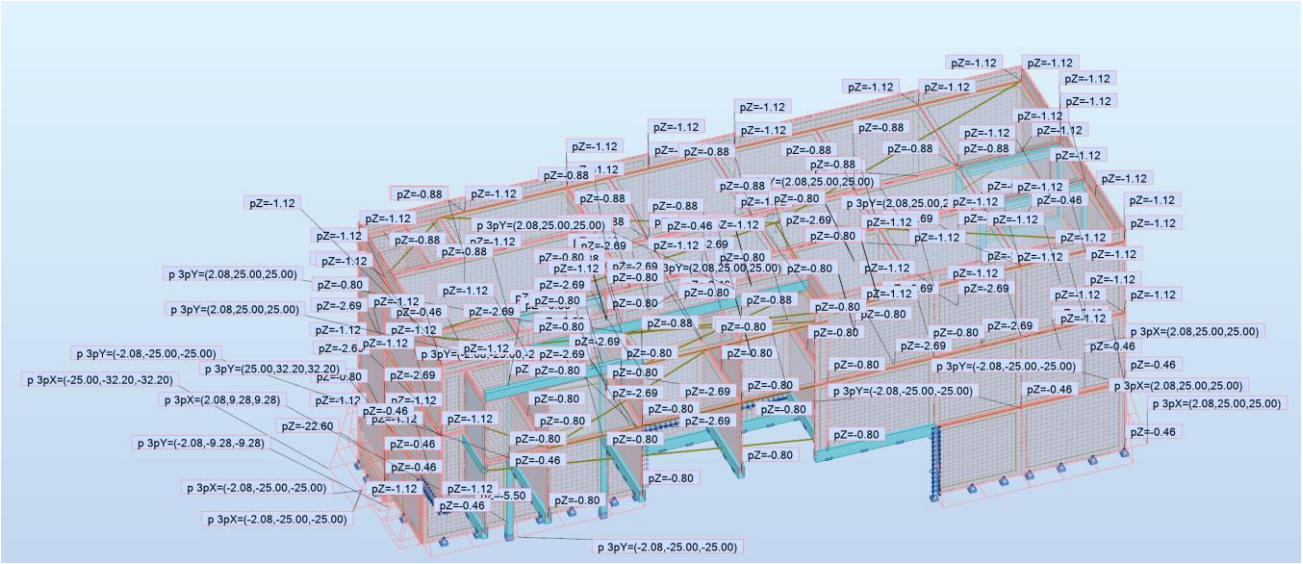
1. KONSTRUKCIJŲ SKAIČIAVIMAS

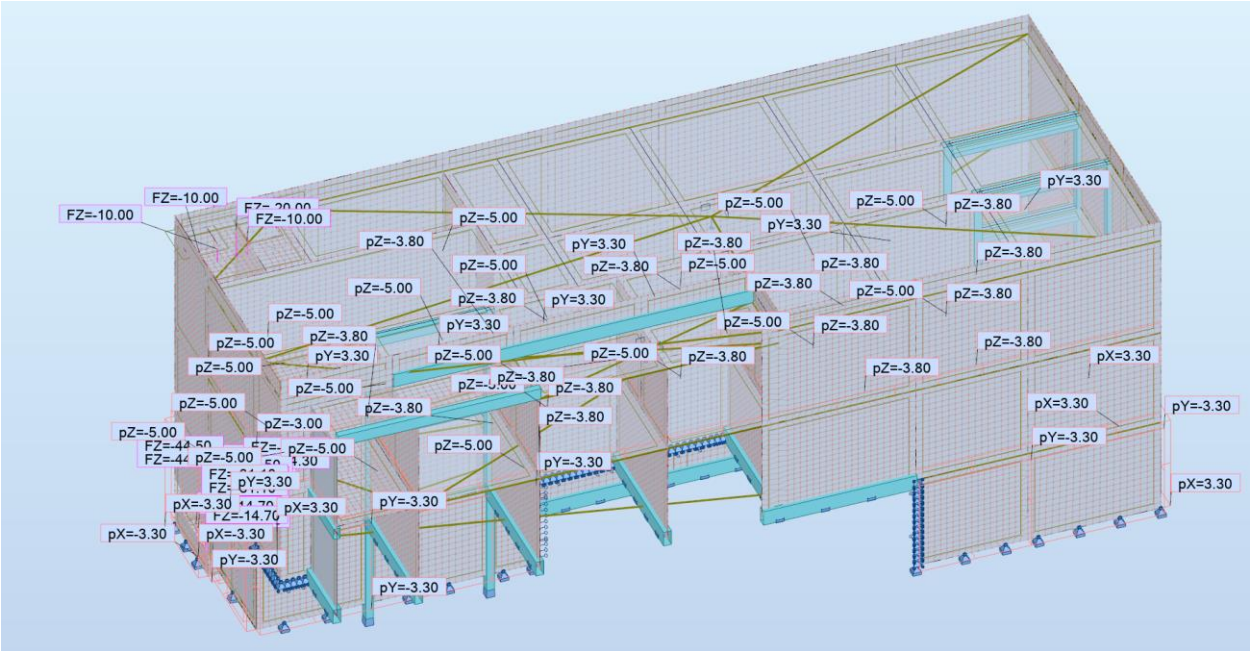
Laikančių konstrukcijų skaičiavimai atlikti baigtinių elementų skaičiavimo programa Autodesk Robot Structural Analysis Professional 2026.

Pastato skaičiuojamoji schema su veikiančiomis charakteristinėmis apkrovomis.

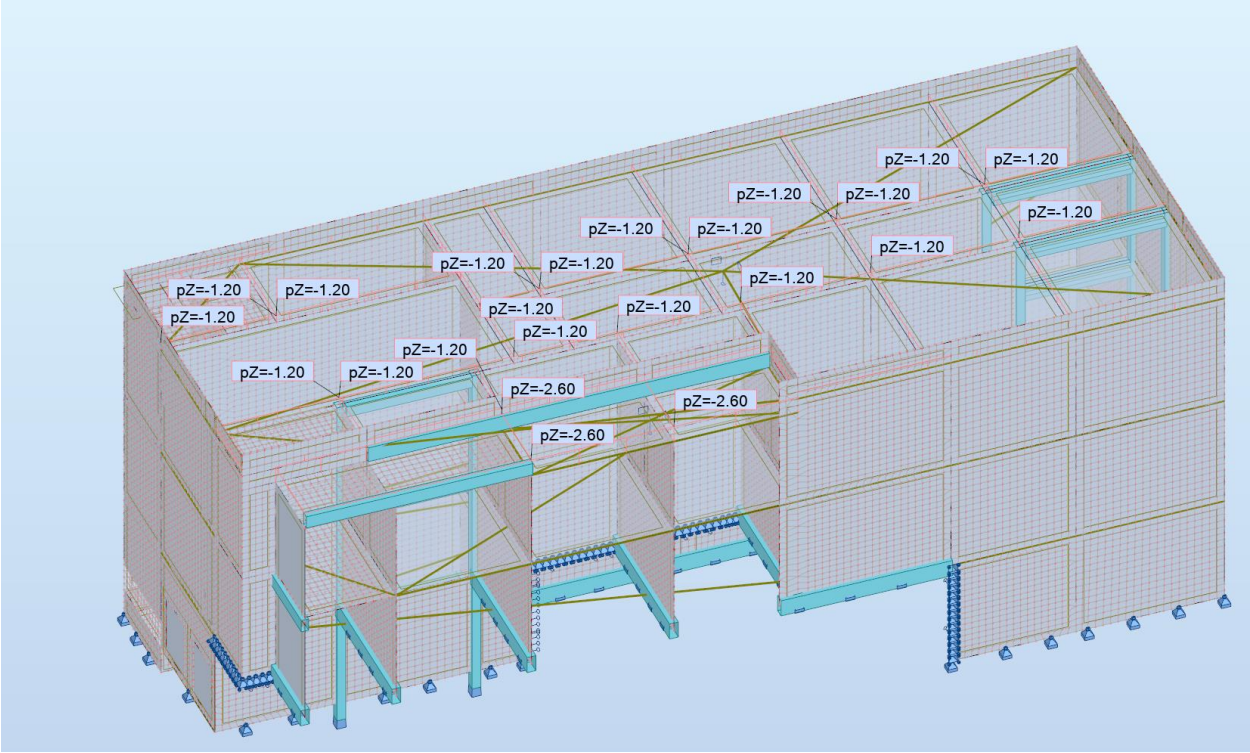
Nuolatinės apkrovos DL1:



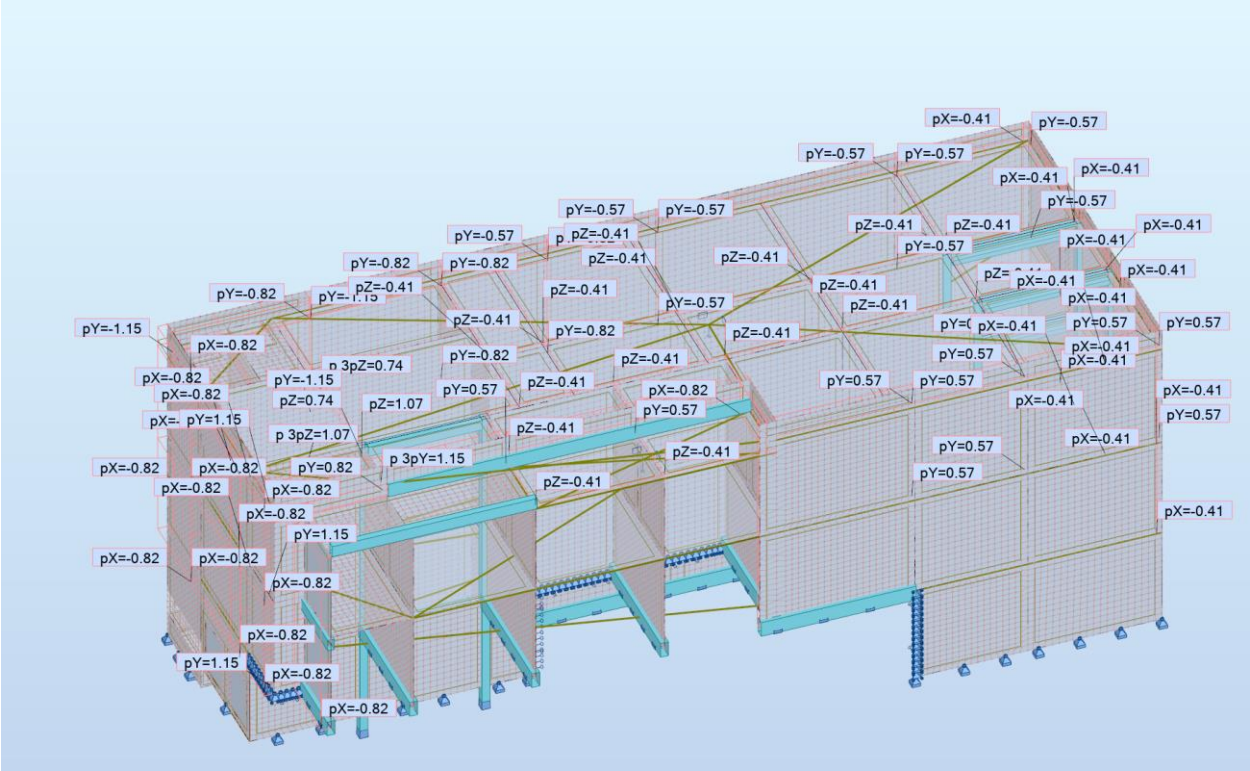
Naudojimo apkrovos LL1:



Sniego apkrova SN1:

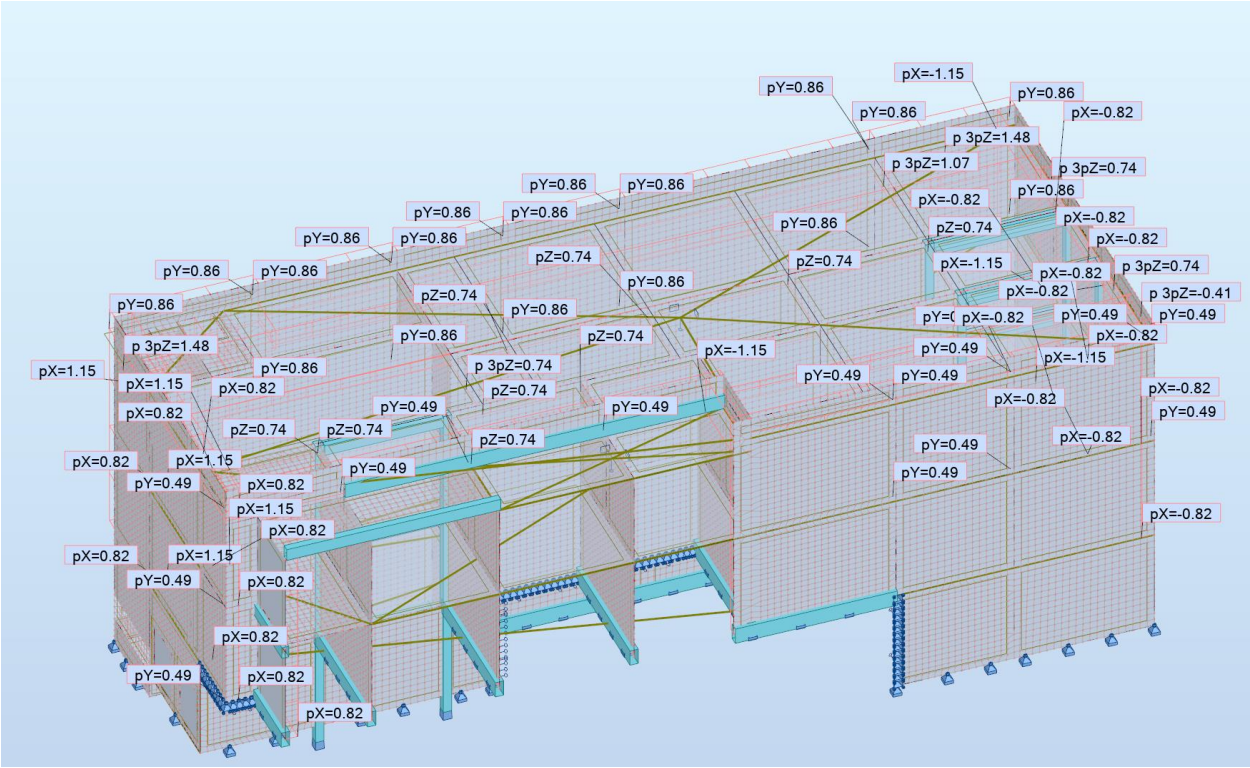


Vėjo apkrova WIND1:

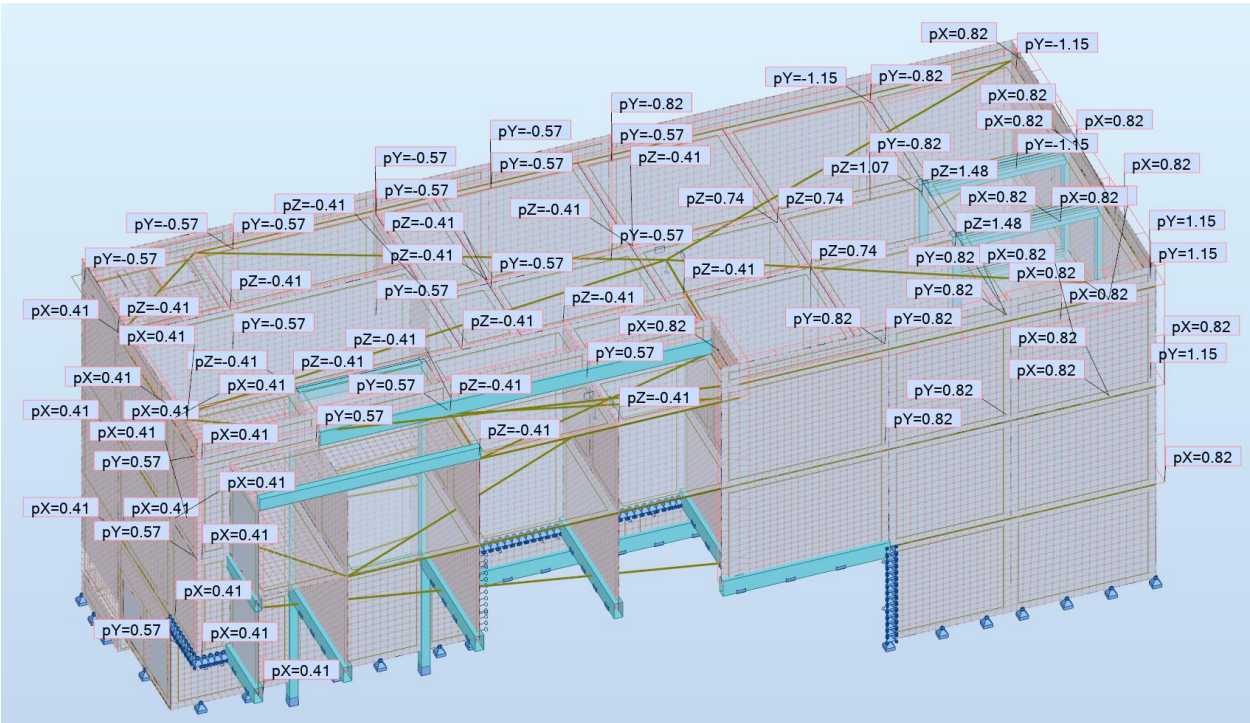


Vėjo apkrova WIND2:

	Lapas	Lapų	Laida
IN2413-01-TDP-SK-S	7	277	0

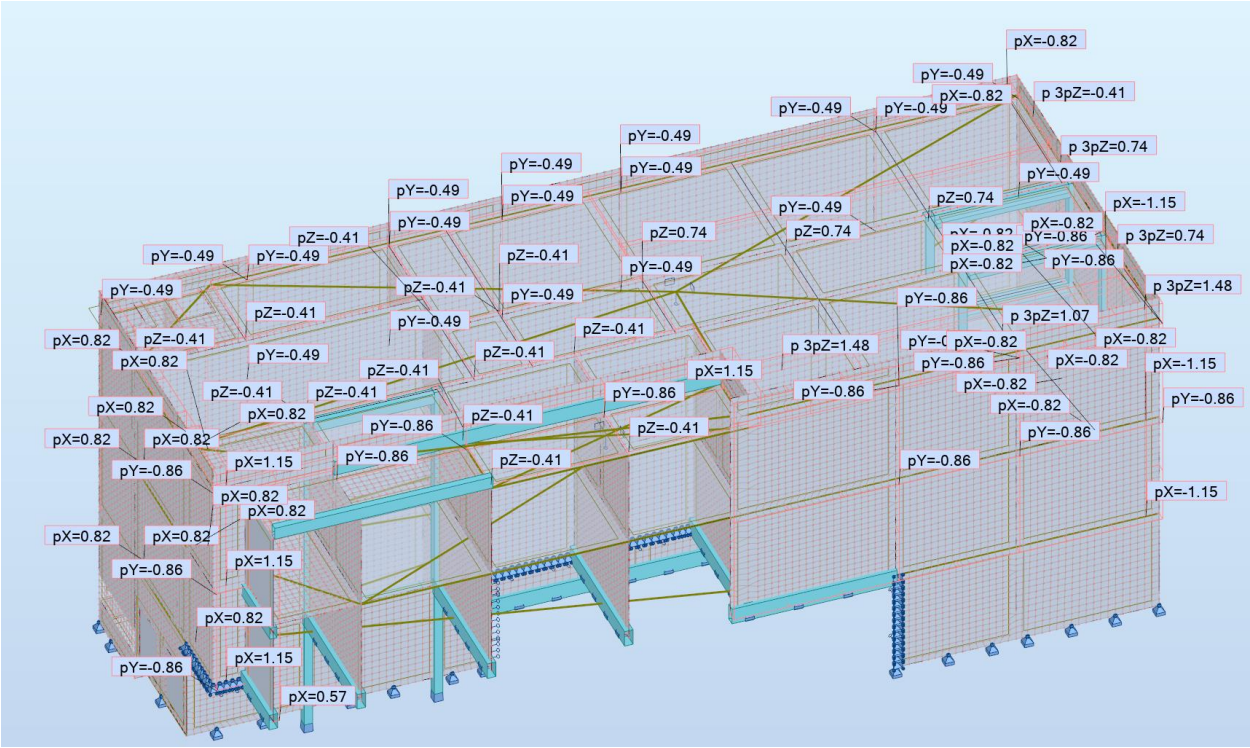


Vėjo apkrova WIND3:



Vėjo apkrova WIND4:

	Lapas	Lapų	Laida
IN2413-01-TDP-SK-S	8	277	0


pX=-0.82
pY=-0.49
p 3pZ=-0.41
p 3pZ=0.74
pZ=0.74
pX=-1.15
pY=-0.86
p 3pZ=1.48
p 3pZ=1.07
pZ=-0.41
pX=0.82
pX=1.15
pY=-0.86
pX=0.57

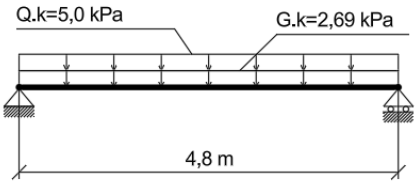
1.1. Surenkamų perdangos plokščių projektavimas

Projektuojamos standartinės įtempto gelžbetonio kiaurymėtos perdangos plokštės.

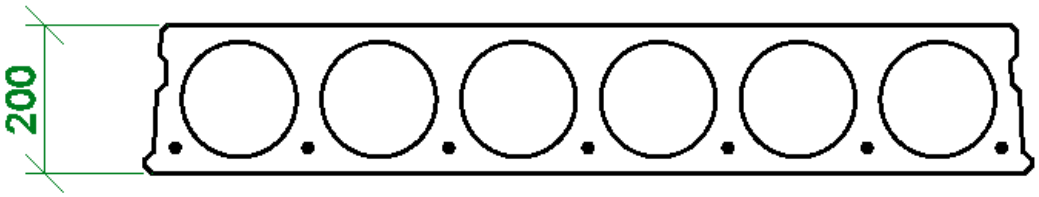
Perdangų armavimą pagal Projekto brėžiniuose pateiktas atrėmimo ir apkrovų schemas konstruoja gamintojas.

Perdangos plokščių minimalus atsparumas ugniai REI45.

Koridorių perdangų skaičiuojamoji schema:



Parinktas perdangos plokščių skerspjūvis:



Perdangos plokščių aukštis nustatomas pagal gamintojų apkrovų lenteles.

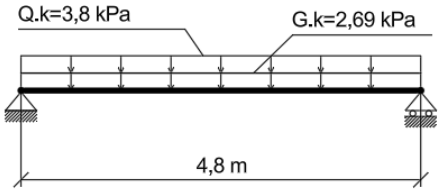
Pagal pateiktą apkrovimo schemą perdangos armavimo skaičiavimus atlieka gamintojas. Perdangos skaičiuotinė apkrova be perdangos savojo svorio ne mažesnė nei Q_d =15,6 kPa.

R60 AB AKSA gaminamų kiaurymėtų plokščių laikymo galios priklausomai nuo skaičiuotinio angos ilgio

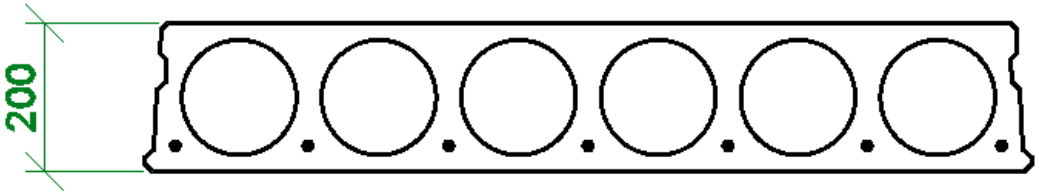
Skerspjūvis	Ugiaatsparumas, lynų diametras/kiekis, betono klasė	Skaičiuotinis ilgis (tarpatramis), m															
		5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		Maksimali **skaičiuotinė** apkrova be savojo plokštės svorio, kPa															
HCS200	**REI60-12/7-C50/60**	15,6	12,3	10,2	8,2	***	***	***	***	***	***	***	***	***	***	***	***
HCS220	**REI60-12/7-C50/60**	16,2	13	10,5	8,7	7,0	***	***	***	***	***	***	***	***	***	***	***
HCS265	**REI60-12/10-C50/60**	20,4	16,2	13,2	10,9	9,1	7,7	6,6	4,5	***	***	***	***	***	***	***	***
HCS300	**REI60-12/11-C50/60**	28,5	24,1	20,1	17,0	13,8	11,9	10,4	8,2	***	***	***	***	***	***	***	***
HCS320/A	**REI60-12/16-C50/60**	40,3	32,7	27,3	23,3	20,0	17,6	15,5	13,9	12,0	***	***	***	***	***	***	***
HCS400/A	**REI60-12/16-C50/60**	50,2	40,9	34,2	29,2	25,3	22,2	19,6	17,5	15,7	14,1	11,4	9,1	7,1	***	***	***
HCS500	**REI60-12/19-C50/60**	89,0	72,0	61,0	52,9	46,2	40,8	36,5	32,8	28,3	22,9	18,6	15,1	12,1	9,6	7,5	5,7

IŠVADA: perdangos parinktos iš standartinių įtempto gelžbetonio gaminių ir laikomoji galia užtikrinta. Perdangų armavimą pagal pareiktas apkrovas ir projekto brėžiniuose pateiktą geometriją parenka gamintojas.

Kitų tarpaukštinių perdangų skaičiuojamoji schema:



Parinktas perdangos plokščių skerspjūvis:



Perdangos plokščių aukštis nustatomas pagal gamintojų apkrovų lenteles.

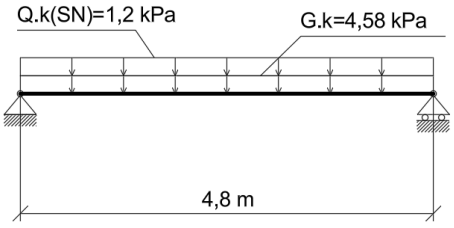
Pagal pateiktą apkrovimo schemą perdangos armavimo skaičiavimus atlieka gamintojas. Perdangos skaičiuotinė apkrova be perdangos savojo svorio ne mažesnė nei Q_d =15,6 kPa.

R60 AB AKSA gaminamų kiaurymėtų plokščių laikymo galios priklausomai nuo skaičiuotinio angos ilgio

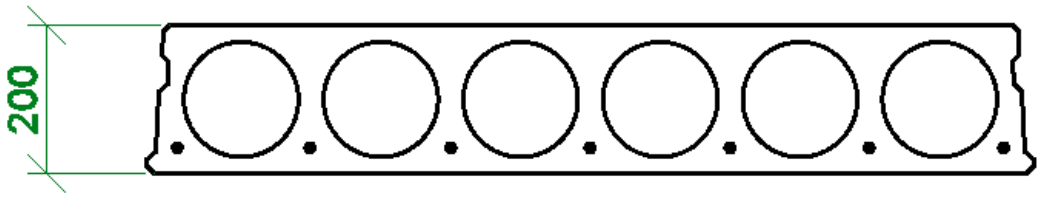
Skerspjūvis	Ugiaatsparumas, lynų diametras/kiekis, betono klasė	Skaičiuotinis ilgis (tarpatramis), m															
		5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		Maksimali **skaičiuotinė** apkrova be savojo plokštės svorio, kPa															
HCS200	**REI60-12/7-C50/60**	15,6	12,3	10,2	8,2	***	***	***	***	***	***	***	***	***	***	***	***
HCS220	**REI60-12/7-C50/60**	16,2	13	10,5	8,7	7,0	***	***	***	***	***	***	***	***	***	***	***
HCS265	**REI60-12/10-C50/60**	20,4	16,2	13,2	10,9	9,1	7,7	6,6	4,5	***	***	***	***	***	***	***	***
HCS300	**REI60-12/11-C50/60**	28,5	24,1	20,1	17,0	13,8	11,9	10,4	8,2	***	***	***	***	***	***	***	***
HCS320/A	**REI60-12/16-C50/60**	40,3	32,7	27,3	23,3	20,0	17,6	15,5	13,9	12,0	***	***	***	***	***	***	***
HCS400/A	**REI60-12/16-C50/60**	50,2	40,9	34,2	29,2	25,3	22,2	19,6	17,5	15,7	14,1	11,4	9,1	7,1	***	***	***
HCS500	**REI60-12/19-C50/60**	89,0	72,0	61,0	52,9	46,2	40,8	36,5	32,8	28,3	22,9	18,6	15,1	12,1	9,6	7,5	5,7

IŠVADA: perdangos parinktos iš standartinių įtempto gelžbetonio gaminių ir laikomoji galia užtikrinta. Perdangų armavimą pagal pareiktas apkrovas ir projekto brėžiniuose pateiktą geometriją parenka gamintojas.

Denginio perdangų skaičiuojamoji schema:



Parinktas perdangos plokščių skerspjūvis:



Perdangos plokščių aukštis nustatomas pagal gamintojų apkrovų lenteles.

Pagal pateiktą apkrovimo schemą perdangos armavimo skaičiavimus atlieka gamintojas. Perdangos skaičiuotinė apkrova be perdangos savojo svorio ne mažesnė nei Q_d =15,6 kPa.

R60 AB AKSA gaminamų kiaurymėtų plokščių laikymo galios priklausomai nuo skaičiuotinio angos ilgio

Skerspjūvis	Ugiaatsparumas, lynų diametras/kiekis, betono klasė	Skaičiuotinis ilgis (tarpatramis), m															
		5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		Maksimali **skaičiuotinė** apkrova be savojo plokštės svorio, kPa															
HCS200	**REI60-12/7-C50/60**	15,6	12,3	10,2	8,2	***	***	***	***	***	***	***	***	***	***	***	***
HCS220	**REI60-12/7-C50/60**	16,2	13	10,5	8,7	7,0	***	***	***	***	***	***	***	***	***	***	***
HCS265	**REI60-12/10-C50/60**	20,4	16,2	13,2	10,9	9,1	7,7	6,6	4,5	***	***	***	***	***	***	***	***
HCS300	**REI60-12/11-C50/60**	28,5	24,1	20,1	17,0	13,8	11,9	10,4	8,2	***	***	***	***	***	***	***	***
HCS320/A	**REI60-12/16-C50/60**	40,3	32,7	27,3	23,3	20,0	17,6	15,5	13,9	12,0	***	***	***	***	***	***	***
HCS400/A	**REI60-12/16-C50/60**	50,2	40,9	34,2	29,2	25,3	22,2	19,6	17,5	15,7	14,1	11,4	9,1	7,1	***	***	***
HCS500	**REI60-12/19-C50/60**	89,0	72,0	61,0	52,9	46,2	40,8	36,5	32,8	28,3	22,9	18,6	15,1	12,1	9,6	7,5	5,7

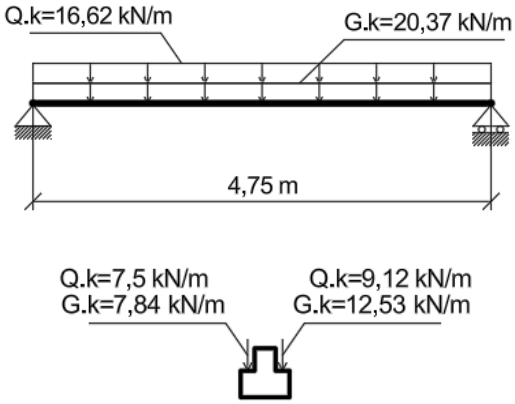
IŠVADA: perdangos parinktos iš standartinių įtempto gelžbetonio gaminių ir laikomoji galia užtikrinta. Perdangų armavimą pagal pareiktas apkrovas ir projekto brėžiniuose pateiktą geometriją parenka gamintojas.

1.2. T Rygelių projektavimas

Projektuojami standartiniai įtempto gelžbetonio surenkami rygeliai. Rygelių armavimą pagal pateiktas apkrovas ir atrėmimo schemas parenka gamintojas.

Rygelių minimalus atsparumas ugniai R45.

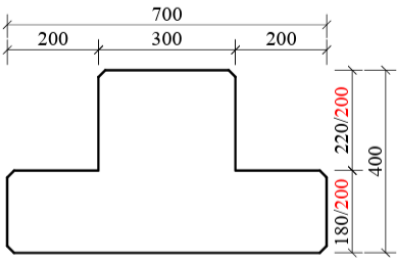
Rygelio skaičiuojamoji schema eksploatavimo stadijoje:



Rygelio geometrijos parinkimas:

RT rygelį veikianti skaičiuotinė apkrova be rygelio savojo svorio 49,11 kN/m, didžiausias ilgis 4,75 m, parenkama sija GRT1:

Preliminarus skerspjūvis:



Sija	b_{fl} x $h(h_{pl})$	*30*	*40*	*50*	*60*	*70*	*80*
GRT1	700x400(220)	7.70	6.80	6.30	5.90	5.50	4.88
GRT2	700x500(220)	9.20	8.30	7.80	7.25	6.65	6.30
GRT3	700x500(265)	9.40	8.40	7.80	7.20	6.70	6.40
GRT4	700x500(320)	9.35	8.40	7.80	7.20	6.75	6.45
GRT5	700x600(220)	10.90	9.90	9.20	8.70	8.19	7.73
GRT6	700x600(265)	11.36	10.17	9.30	8.70	8.20	7.70
GRT7	700x600(320)	11.15	10.00	9.34	8.61	8.27	7.80
GRT8	700x700(220)	13.46	12.10	11.10	10.30	9.70	9.30

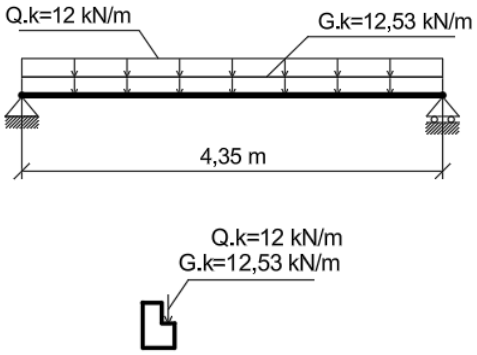
IŠVADA: rygeliai parinkti iš standartinių įtempto gelžbetonio gaminių ir laikomoji galia užtikrinta. Rygelių armavimą pagal pateiktas apkrovas ir projekto brėžiniuose pateiktą geometriją parenka gamintojas

1.3. L Rygelių projektavimas

Projektuojami standartiniai įtempto gelžbetonio surenkami rygeliai. Rygelių armavimą pagal pateiktas apkrovas ir atrėmimo schemas parenka gamintojas.

Rygelių minimalus atsparumas ugniai R45.

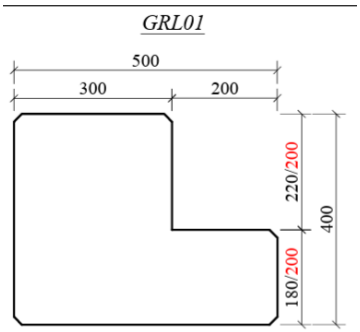
Rygelio skaičiuojamoji schema eksploatavimo stadijoje:



Rygelio geometrijos parinkimas:

RL rygelį veikianti skaičiuotinė apkrova be rygelio savojo svorio 32,52 kN/m, didžiausias ilgis 4,35 m, parenkama sija GRL1:

Preliminarus skerspjūvis:



Sija	b_{fl} x $h(h_{pl})$	30	40	50	60
GRL01	500x400(220)	7.80	6.97	6.34	5.95
GRL2	500x500(220)	9.32	8.38	7.80	7.34
GRL3	500x500(265)	9.40	8.40	7.81	7.35
GRL4	500x500(320)	9.54	8.44	7.84	7.37
GRL5	500x600(220)	11.07	9.93	9.27	8.73
GRL6	500x600(265)	11.11	9.96	9.28	8.74
GRL7	500x600(320)	11.22	9.98	9.30	8.76
GRL8	500x700(220)	13.37	11.96	10.92	10.12

IŠVADA: rygeliai parinkti iš standartinių įtempto gelžbetonio gaminių ir laikomoji galia užtikrinta. Rygelių armavimą pagal pateiktas apkrovas ir projekto brėžiniuose pateiktą geometriją parenka gamintojas

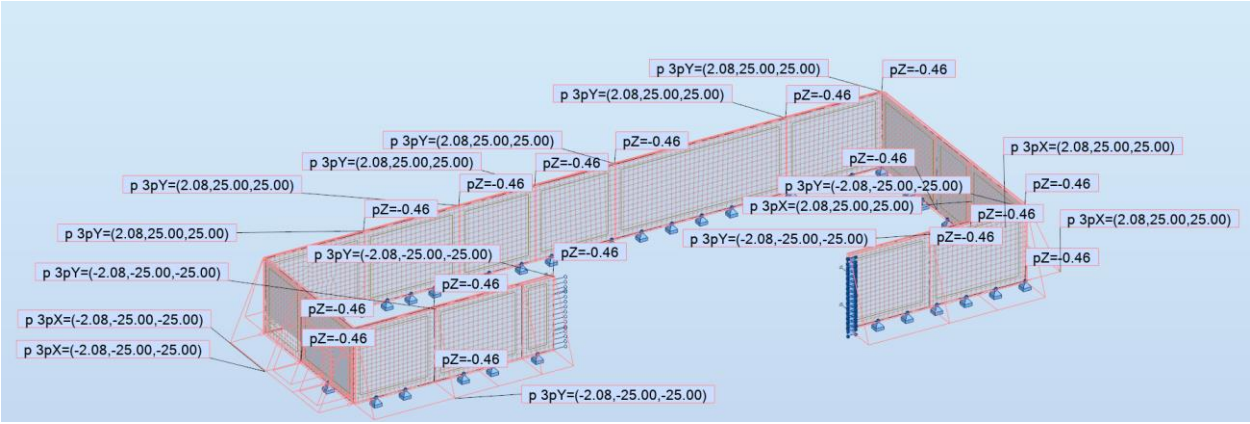
1.4. Monolitinių sienų projektavimas

Projektuojamos monolitinės 300 mm storio rūsio sienos.

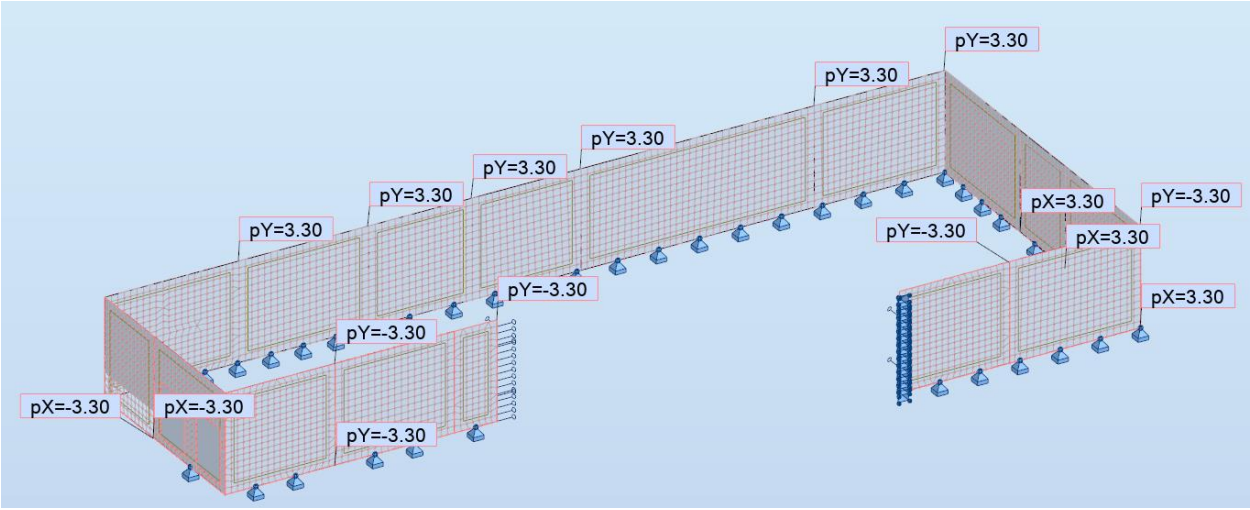
- Betonas: C25/30 XC2 W6;
- Armatūra: S500;
- Apsauginis betono sluoksnis: ne mažiau kaip armatūros skersmuo ir ne mažiau nei 30 mm iki pagrindinės armatūros krašto.
- Ugniaatsparumas R 45.

Skaičiuojamoji schema su veikiančiomis apkrovomis:

Nuolatinės apkrovos:

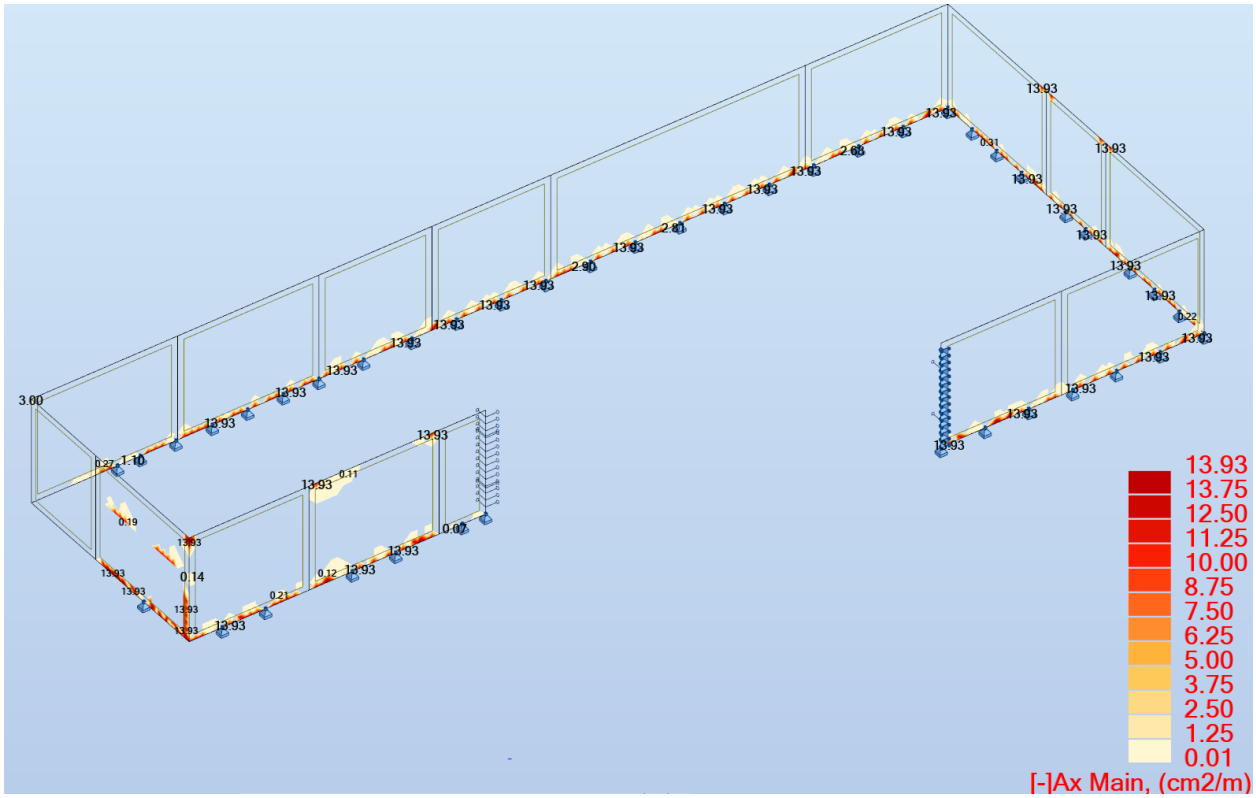


Naudojimo apkrovos:

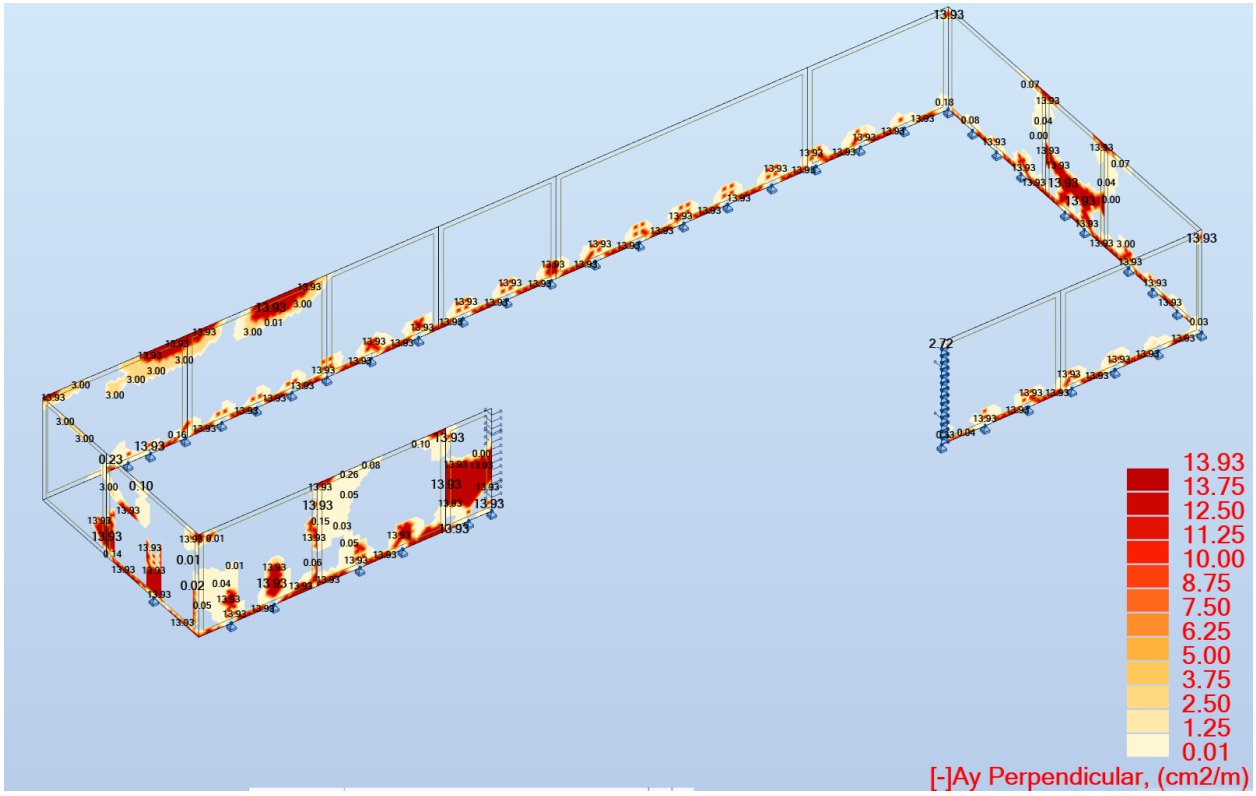


Reikalingas armavimo plotas:

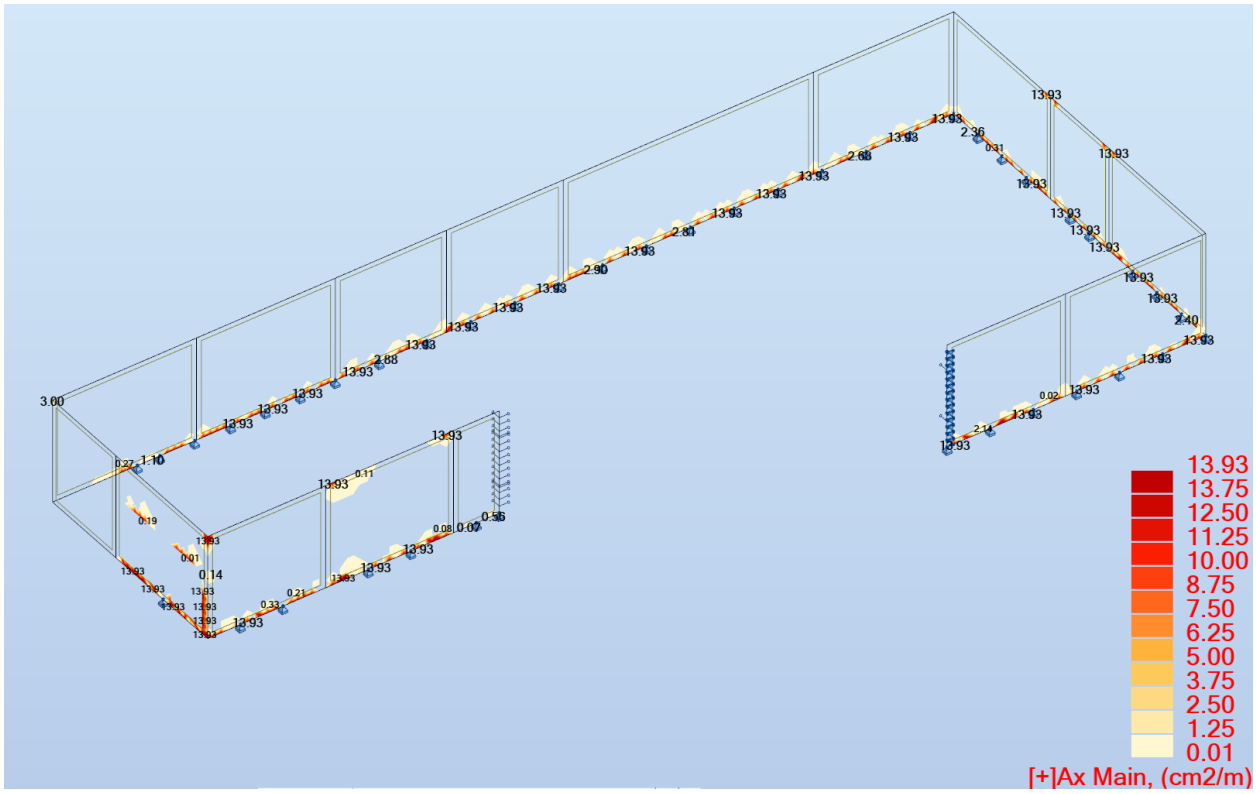
Priekinio tinklo armavimas X kryptimi:



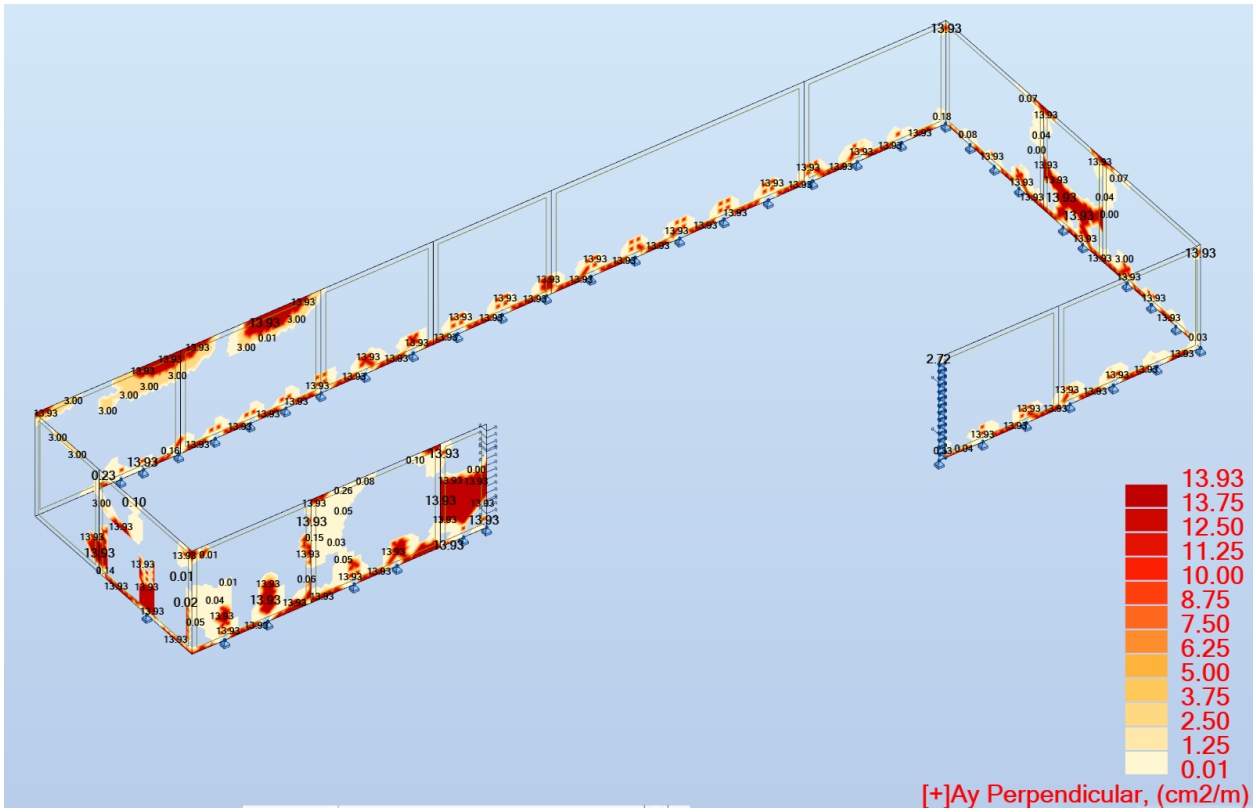
Priekinio tinklo armavimas Y kryptimi:



Galinio tinklo armavimas X kryptimi:

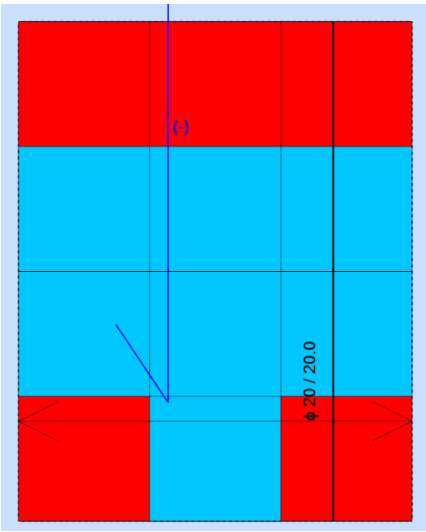


Galinio tinklo armavimas Y kryptimi:

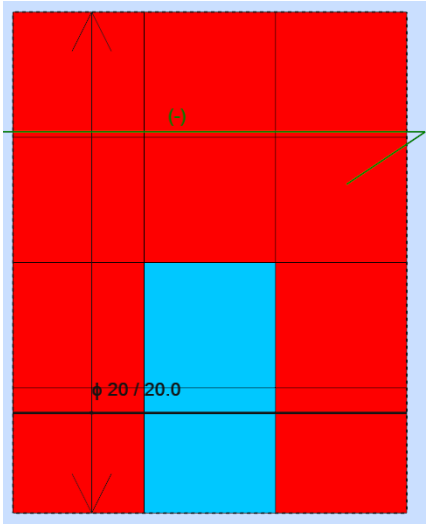


Visos sienos armuojamos vienodai. Pavojingiausios sienos reikalingas armavimas.

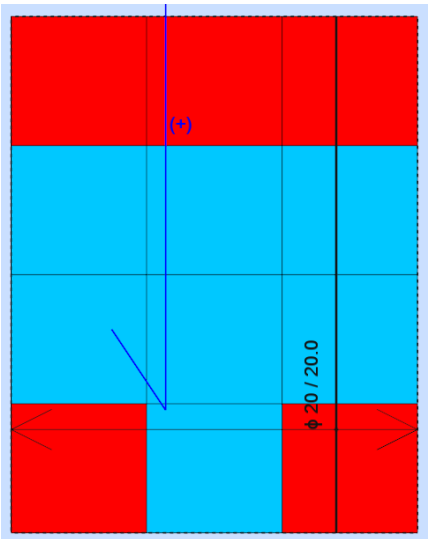
Priekinio tinklo armavimas X kryptimi:



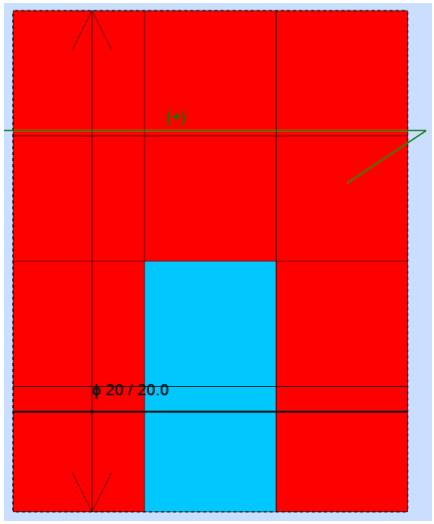
Priekinio tinklo armavimas Y kryptimi:



Galinio tinklo armavimas X kryptimi:



Galinio tinklo armavimas Y kryptimi:



1. Wall: Slab93 - Panel no. 93

1.1. Reinforcement:

- Type : siena
- Main reinforcement direction : 0°

Main reinforcement grade : B500B; Characteristic strength = 500.00 MPa
Horizontal branch of the stress-strain diagram

- Ductility class : B
- Bar diameters bottom d1 = 1.2 (cm) d2 = 1.2 (cm)
  top d1 = 1.2 (cm) d2 = 1.2 (cm)
- Cover bottom c1 = 3.0 (cm)
  top c2 = 3.0 (cm)
- Cover deviations Cdev = 1.0(cm), Cdur = 0.0(cm)

1.2. Concrete

Class : C25/30; Characteristic strength = 25.00 MPa
Rectangular stress distribution [3.1.7(3)]

- Density : 2501.36 (kG/m3)
- Concrete creep coefficient : 1.86
- Cement class : N

1.3. Hypothesis

- Calculations according to : EN 1992-1-1:2004/A1:2014
- Method of reinforcement area calculations : analytical
- Allowable cracking width
  - upper layer : 0.30 (mm)
  - lower layer : 0.30 (mm)
- Verification of punching : no
- Exposure
  - upper layer : XC2
  - lower layer : XC2
- Calculation type : compression/tension
- Structure class : S4

Modified partial coefficients:
a_{cc} = 0.9 1992-1-1 3.1.6 (1)P

1.4. Slab geometry

Thickness 0.30 (m)

Contour:

edge	beginning x1	beginning y1	end x2	end y2	length (m)
1	0.00	3.82	3.00	3.82	3.00
2	3.00	3.82	3.00	0.00	3.82
3	3.00	0.00	0.00	0.00	3.00
4	0.00	0.00	0.00	3.82	3.82

Support:

n°	Name	dimensions (m)	coordinates x	coordinates y	edge
72	linear	3.82 / 0.30	0.00	1.91	□
80	linear	3.82 / 0.30	3.00	1.91	□

* - head present

1.5. Calculation results:

1.5.1. Maximum forces + reinforcement

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Provided reinforcement (cm2/m):	15.71	15.71	15.71	15.71
Modified required reinforcement (cm2/m):	13.93	13.93	13.93	13.93
Original required reinforcement (cm2/m):	13.93	13.93	13.93	13.93
Coordinates (m):	0.25;3.82	0.25;3.82	0.00;3.82	0.00;3.82

1.5.2. Maximum forces + reinforcement

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Symbol: required area/provided area				
Ax(+) (cm2/m)	**13.93/15.71** 13.93/15.71	13.93/15.71	13.93/15.71	
Ax(-) (cm2/m)	13.93/15.71 13.93/15.71	**13.93/15.71**	13.93/15.71	
Ay(+) (cm2/m)	13.93/15.71 13.93/15.71	13.93/15.71	**13.93/15.71**	
Ay(-) (cm2/m)	13.93/15.71 **13.93/15.71**	13.93/15.71	13.93/15.71	
	SLS			
Mxx (kN*m/m)	3.00	3.00	2.85	2.85
Myy (kN*m/m)	0.51	0.51	2.36	2.36
Mxy (kN*m/m)	2.60	2.60	1.75	1.75
Nxx (kN/m)	157.08	157.08	111.75	111.75
Nyy (kN/m)	50.94	50.94	-175.94	-175.94
Nxy (kN/m)	-25.42	-25.42	56.74	56.74

	ULS			
Mxx (kN*m/m)	4.03	4.03	3.81	3.81
Myy (kN*m/m)	0.68	0.68	3.15	3.15
Mxy (kN*m/m)	3.48	3.48	2.34	2.34
Nxx (kN/m)	210.79	210.79	149.97	149.97
Nyy (kN/m)	68.39	68.39	-236.17	-236.17
Nxy (kN/m)	-34.12	-34.12	76.15	76.15
Coordinates (m)	0.25;3.82	0.25;3.82	0.00;3.82	0.00;3.82
Coordinates* (m)	0.00;7.73;0.58 0.00;7.98;0.58	0.00;7.73;0.58	0.00;7.98;0.58	

* - Coordinates in the structure global coordinate system

3. Results - detailing

List of solutions:
Reinforcement: bars

Solution no.	Reinforcement range Diameter / Weight	Total weight (kG)
1	-	565.43

Results for the solution no. 1
Reinforcement zones

Bottom reinforcement

Name	coordinates				Provided reinforcement	At
	x1	y1	x2	y2	ϕ (mm) / (cm)	(cm2/m) Ar (cm2/m)
1/1- Ax Main	0.00	3.82	3.00	0.00	20.0 / 20.0	13.93 < 15.71
1/2- Ay Perpendicular	0.00	3.82	3.00	0.00	20.0 / 20.0	13.93 < 15.71

Top reinforcement

Name	coordinates				Provided reinforcement	At
	x1	y1	x2	y2	ϕ (mm) / (cm)	(cm2/m) Ar (cm2/m)
1/3+ Ax Main	0.00	3.82	3.00	0.00	20.0 / 20.0	13.93 < 15.71
1/4+ Ay Perpendicular	0.00	3.82	3.00	0.00	20.0 / 20.0	13.93 < 15.71

4. Material survey

- Concrete volume = 3.44 (m3)
- Formwork = 11.46 (m2)
- Slab circumference = 13.64 (m)
- Area of openings = 0.00 (m2)

- Steel B500B
- Total weight = 553.89 (kG)

- Density = 161.11 (kG/m3)
- Average diameter = 20.0 (mm)
- Survey according to diameters:

Diameter	Length (m)	Number of identical elements:
20	2.94	38
20	3.76	30

IŠVADA: sienų laikomoji galia užtikrinta. Sienos armuojamos dviem vienodais tinklais – d20/d20/200/200, S500.

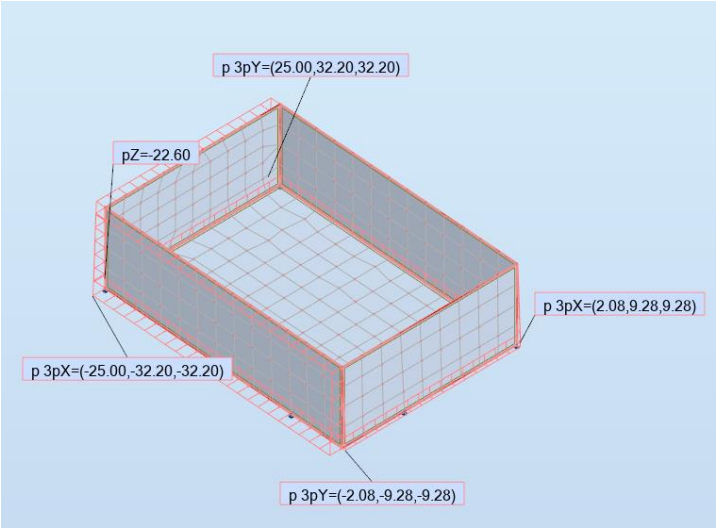
1.5. Lifto šachtos prieduobės projektavimas

Projektuojamos monolitinės 300 mm storio lifto šachtos prieduobes sienos ir 400mm sotrio prieduobės padas.

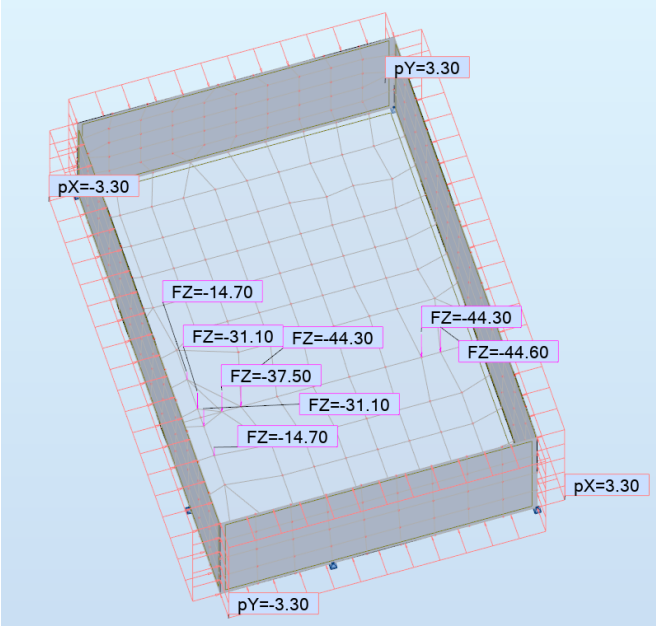
- Betonas: C25/30 XC2 W6;
- Armatūra: S500;
- Apsauginis betono sluoksnis: ne mažiau kaip armatūros skersmuo ir ne mažiau nei 30 mm iki pagrindinės armatūros krašto.
- Ugniaatsparumas R 45.

Skaičiuojamoji schema su veikiančiomis apkrovomis:

Nuolatinės apkrovos:



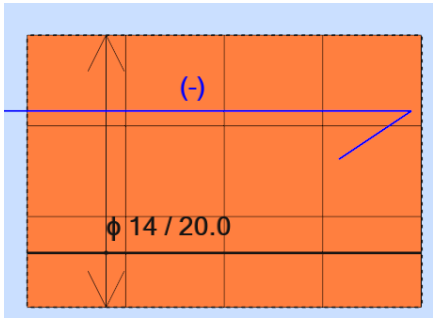
Naudojimo apkrovos:



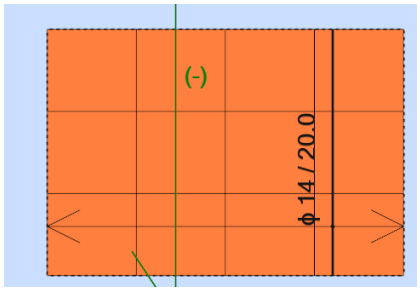
Pado armavimas

Reikalingas armavimas:

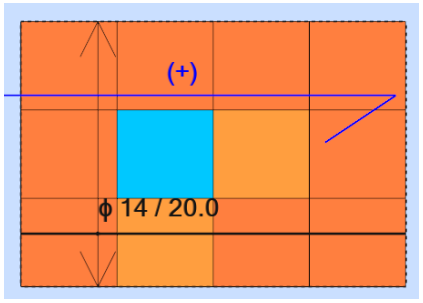
Apatinio tinklo armavimas X kryptimi:



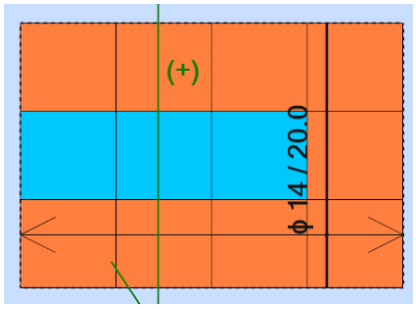
Apatinio tinklo armavimas Y kryptimi:



Viršutinio tinklo armavimas X kryptimi:



Viršutinio tinklo armavimas Y kryptimi:



1. Slab: Slab49 - Panel no. 49

1.1. Reinforcement:

- Type : prieduobes perdanga
- Main reinforcement direction : 0°

Main reinforcement grade : B500B; Characteristic strength = 500.00 MPa
Horizontal branch of the stress-strain diagram

- Ductility class : B
- Bar diameters bottom d1 = 1.2 (cm) d2 = 1.2 (cm)
  top d1 = 1.2 (cm) d2 = 1.2 (cm)
- Cover bottom c1 = 3.0 (cm)
  top c2 = 3.0 (cm)
- Cover deviations Cdev = 1.0(cm), Cdur = 0.0(cm)

1.2. Concrete

Class : C25/30; Characteristic strength = 25.00 MPa
Rectangular stress distribution [3.1.7(3)]

- Density : 2501.36 (kG/m3)
- Concrete creep coefficient : 1.82
- Cement class : N

1.3. Hypothesis

- Calculations according to : EN 1992-1-1:2004/A1:2014
- Method of reinforcement area calculations : analytical
- Allowable cracking width
  - upper layer : 0.30 (mm)
  - lower layer : 0.30 (mm)
- Allowable deflection : 1.5 (cm)
- Verification of punching : yes
- Exposure
  - upper layer : XC2
  - lower layer : XC2
- Calculation type : simple bending
- Structure class : S4

Modified partial coefficients:
a_{cc} = 0.9 1992-1-1 3.1.6 (1)P

1.4. Slab geometry

Thickness 0.40 (m)

Contour:

edge	beginning x1	beginning y1	end x2	end y2	length (m)
1	0.00	-2.25	3.26	-2.25	3.26
2	3.26	-2.25	3.26	0.00	2.25
3	3.26	0.00	0.00	0.00	3.26
4	0.00	0.00	0.00	-2.25	2.25

Support:

n°	Name	dimensions (m)	coordinates x	coordinates y	edge
0	linear	0.30 / 3.26	1.63	-2.25	□
0	linear	0.30 / 3.26	1.63	0.00	□
0	linear	2.25 / 0.30	3.26	-1.13	□
3204	linear	2.25 / 0.20	3.26	-1.13	□

0	linear	2.25 / 0.30	0.00	-1.13	□
21855	linear	0.50 / 0.50	1.60	-1.97	□
21856	linear	0.50 / 0.50	2.22	-1.97	□
7780	linear	0.50 / 0.50	1.98	-1.97	□
7781	linear	0.50 / 0.50	1.84	-1.97	□
5995	linear	0.50 / 0.50	1.91	-1.82	□
3294	linear	0.50 / 0.50	1.91	-1.68	□
5974	linear	0.50 / 0.50	1.91	-0.40	□
5998	linear	0.50 / 0.50	1.91	-0.27	□
7777	linear	0.50 / 0.50	2.46	-1.97	□
7779	linear	0.50 / 0.50	1.36	-1.97	□

* - head present

1.5. Calculation results:

1.5.1. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Provided reinforcement (cm2/m):	7.70	7.70	7.70	7.70
Modified required reinforcement (cm2/m):	7.06	6.91	6.91	7.07
Original required reinforcement (cm2/m):	7.06	6.91	6.91	7.07
Coordinates (m):	1.91;-0.00	1.67;-0.00	1.67;-0.00	1.91;-1.82

1.5.2. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Symbol: required area/provided area				
Ax(+) (cm2/m)	**7.06/7.70**	6.91/7.70	6.91/7.70	0.00/7.70
Ax(-) (cm2/m)	6.91/7.70	**6.91/7.70**	6.91/7.70	6.91/7.70
Ay(+) (cm2/m)	6.91/7.70	6.91/7.70	**6.91/7.70**	0.00/7.70
Ay(-) (cm2/m)	6.91/7.70	6.91/7.70	6.91/7.70	**7.07/7.70**
SLS				
Mxx (kN*m/m)	73.32	-15.68	-15.68	-74.66
Myy (kN*m/m)	69.88	14.94	14.94	-77.36
Mxy (kN*m/m)	5.25	-11.76	-11.76	-1.97
Nxx (kN/m)	-211.82	-205.79	-205.79	24.29
Nyy (kN/m)	-79.95	4.43	4.43	-31.54
Nxy (kN/m)	-92.07	85.12	85.12	-21.90
ULS				
Mxx (kN*m/m)	97.55	-20.62	-20.62	-97.57
Myy (kN*m/m)	92.22	19.69	19.69	-101.33
Mxy (kN*m/m)	7.00	-15.49	-15.49	-2.59
Nxx (kN/m)	-283.34	-276.37	-276.37	31.61
Nyy (kN/m)	-107.44	5.97	5.97	-42.56
Nxy (kN/m)	-123.49	113.63	113.63	-29.43
Coordinates (m)	1.91;-0.00	1.67;-0.00	1.67;-0.00	1.91;-1.82
Coordinates* (m)	30.18;1.91;-0.40 32.00;1.91;-0.40	30.18;1.67;-0.40	30.18;1.67;-0.40	

* - Coordinates in the structure global coordinate system

1.5.3. Punching

Support no. / Point	Location (m)			Geometry: (m)			
	x	y		a	b	d	h
P1 (21769)	1.60	-1.97	Force	0.50	0.50	-	-
P2 (21770)	2.22	-1.97	Force	0.50	0.50	-	-
P3 (57990)	1.98	-1.97	Force	0.50	0.50	-	-
P4 (57991)	1.84	-1.97	Force	0.50	0.50	-	-
P5 (57983)	1.91	-1.82	Force	0.50	0.50	-	-
P6 (57981)	1.91	-1.68	Force	0.50	0.50	-	-
P7 (57984)	1.91	-0.40	Force	0.50	0.50	-	-
P8 (57985)	1.91	-0.27	Force	0.50	0.50	-	-
P9 (57987)	2.46	-1.97	Force	0.50	0.50	-	-
P10 (57989)	1.36	-1.97	Force	0.50	0.50	-	-

Support no. / Point	Loads: (kN)		Critical perimeter (m)	
	Q	Qadm	u	Qadm / Q
P1 (21769)	0.00	0.00	0.00	##### < 1
P2 (21770)	0.00	0.00	0.00	##### < 1
P3 (57990)	0.00	0.00	0.00	##### < 1
P4 (57991)	0.00	0.00	0.00	##### < 1
P5 (57983)	97.50	235.12	1.62	2.41 > 1
P6 (57981)	115.18	235.12	1.62	2.04 > 1
P7 (57984)	115.18	235.12	1.62	2.04 > 1
P8 (57985)	0.00	0.00	0.00	##### < 1
P9 (57987)	0.00	0.00	0.00	##### < 1
P10 (57989)	0.00	0.00	0.00	##### < 1

Support no. / Point: P1 (21769)

uo = @V_U(Data_p=Uo)@
u1 = @V_U(Data_p=U1)@
ρLx = @VAL(Data_p=RoLx)@
ρLy = @VAL(Data_p=RoLy)@
heff = @V_U(Data_p=EffHeight)@
Ax = @V_U(Data_p=Ax)@
Ay = @V_U(Data_p=Ay)@
α = @VAL(Data_p=Alpha)@
ν = @VAL(Data_p=Ni)@
γc = @VAL(Data_p=Gamma_c)@
fcd = @V_U(Data_p=Fcd)@
vRdmax = @V_U(Data_p=VRdmax)@

vRdc = @V_U(Data_p=VRdc)@
v min = @V_U(Data_p=v_min)@
vEds = @V_U(Data_p=VEds)@
cRdc= @VAL(Data_p=CRdc)@
k = @VAL(Data_p=K)@
ρL = @VAL(Data_p=RoL)@
vlim = @V_U(Data_p=StressLimit)@
v (u1)= @V_U(Data_p=Stress)@
A = @V_U(Data_p=ShearArea)@

Support no. / Point: P2 (21770)

uo = @V_U(Data_p=Uo)@
u1 = @V_U(Data_p=U1)@
ρLx = @VAL(Data_p=RoLx)@
ρLy = @VAL(Data_p=RoLy)@
heff = @V_U(Data_p=EffHeight)@
Ax = @V_U(Data_p=Ax)@
Ay = @V_U(Data_p=Ay)@
α = @VAL(Data_p=Alpha)@

ν = @VAL(Data_p=Ni)@
γc = @VAL(Data_p=Gamma_c)@
fcd = @V_U(Data_p=Fcd)@
vRdmax = @V_U(Data_p=VRdmax)@

vRdc = @V_U(Data_p=VRdc)@
v min = @V_U(Data_p=v_min)@
vEds = @V_U(Data_p=VEds)@
cRdc= @VAL(Data_p=CRdc)@
k = @VAL(Data_p=K)@
ρL = @VAL(Data_p=RoL)@
vlim = @V_U(Data_p=StressLimit)@
v (u1)= @V_U(Data_p=Stress)@
A = @V_U(Data_p=ShearArea)@

Support no. / Point: P3 (57990)

uo = @V_U(Data_p=Uo)@
u1 = @V_U(Data_p=U1)@
ρLx = @VAL(Data_p=RoLx)@
ρLy = @VAL(Data_p=RoLy)@
heff = @V_U(Data_p=EffHeight)@
Ax = @V_U(Data_p=Ax)@
Ay = @V_U(Data_p=Ay)@
α = @VAL(Data_p=Alpha)@
ν = @VAL(Data_p=Ni)@
γc = @VAL(Data_p=Gamma_c)@
fcd = @V_U(Data_p=Fcd)@
vRdmax = @V_U(Data_p=VRdmax)@

vRdc = @V_U(Data_p=VRdc)@
v min = @V_U(Data_p=v_min)@
vEds = @V_U(Data_p=VEds)@
cRdc= @VAL(Data_p=CRdc)@
k = @VAL(Data_p=K)@
ρL = @VAL(Data_p=RoL)@
vlim = @V_U(Data_p=StressLimit)@
v (u1)= @V_U(Data_p=Stress)@
A = @V_U(Data_p=ShearArea)@

Support no. / Point: P4 (57991)

uo = @V_U(Data_p=Uo)@
u1 = @V_U(Data_p=U1)@
ρLx = @VAL(Data_p=RoLx)@
ρLy = @VAL(Data_p=RoLy)@
heff = @V_U(Data_p=EffHeight)@
Ax = @V_U(Data_p=Ax)@
Ay = @V_U(Data_p=Ay)@
α = @VAL(Data_p=Alpha)@
ν = @VAL(Data_p=Ni)@
γc = @VAL(Data_p=Gamma_c)@
fcd = @V_U(Data_p=Fcd)@
vRdmax = @V_U(Data_p=VRdmax)@

vRdc = @V_U(Data_p=VRdc)@
v min = @V_U(Data_p=v_min)@
vEds = @V_U(Data_p=VEds)@
cRdc= @VAL(Data_p=CRdc)@

k = @VAL(Data_p=K)@
ρL = @VAL(Data_p=RoL)@
vlim = @V_U(Data_p=StressLimit)@
v (u1)= @V_U(Data_p=Stress)@
A = @V_U(Data_p=ShearArea)@

Support no. / Point: P5 (57983)

uo = 1.00 (m)
u1 = 1.62 (m)
ρLx = 0.00
ρLy = 0.00
heff = 35.8 (cm)
Ax = 7.70 (cm2)
Ay = 7.70 (cm2)
α = 1.57
ν = 0.54
γc = 1.50
fcd = 16.67 (MPa)
vRdmax = 3.60 (MPa)
V = 97.50 (kN)
Mx = 0.00 (kN*m)
My = 0.00 (kN*m)
A = 1.22 (m2)
Kx = 0.60
Ky = 0.60
Wx = 0.43
Wy = 0.82

vRdc = 0.37 (MPa)
v min = 0.40 (MPa)
vEds = 0.27 (MPa)
cRdc= 0.12
k = 1.75
ρL = 0.00
vlim = 0.40 (MPa)
v (u1)= 0.17 (MPa)
A = 0.58 (m2)

Support no. / Point: P6 (57981)

uo = 1.00 (m)
u1 = 1.62 (m)
ρLx = 0.00
ρLy = 0.00
heff = 35.8 (cm)
Ax = 7.70 (cm2)
Ay = 7.70 (cm2)
α = 1.57
ν = 0.54
γc = 1.50
fcd = 16.67 (MPa)
vRdmax = 3.60 (MPa)
V = 115.18 (kN)
Mx = 0.00 (kN*m)
My = 0.00 (kN*m)
A = 1.27 (m2)
Kx = 0.60
Ky = 0.60

Wx = 0.51
Wy = 0.85

vRdc = 0.37 (MPa)
v min = 0.40 (MPa)
vEds = 0.32 (MPa)
cRdc= 0.12
k = 1.75
ρL = 0.00
vlim = 0.40 (MPa)
v (u1)= 0.20 (MPa)
A = 0.58 (m2)

Support no. / Point: P7 (57984)

uo = 1.00 (m)
u1 = 1.62 (m)
ρLx = 0.00
ρLy = 0.00
heff = 35.8 (cm)
Ax = 7.70 (cm2)
Ay = 7.70 (cm2)
α = 1.57
ν = 0.54
γc = 1.50
fcd = 16.67 (MPa)
vRdmax = 3.60 (MPa)
V = 115.18 (kN)
Mx = 0.00 (kN*m)
My = 0.00 (kN*m)
A = 1.21 (m2)
Kx = 0.60
Ky = 0.60
Wx = 0.42
Wy = 0.81

vRdc = 0.37 (MPa)
v min = 0.40 (MPa)
vEds = 0.32 (MPa)
cRdc= 0.12
k = 1.75
ρL = 0.00
vlim = 0.40 (MPa)
v (u1)= 0.20 (MPa)
A = 0.58 (m2)

Support no. / Point: P8 (57985)

uo = @V_U(Data_p=Uo)@
u1 = @V_U(Data_p=U1)@
ρLx = @VAL(Data_p=RoLx)@
ρLy = @VAL(Data_p=RoLy)@
heff = @V_U(Data_p=EffHeight)@
Ax = @V_U(Data_p=Ax)@
Ay = @V_U(Data_p=Ay)@
α = @VAL(Data_p=Alpha)@
ν = @VAL(Data_p=Ni)@
γc = @VAL(Data_p=Gamma_c)@
fcd = @V_U(Data_p=Fcd)@

vRdmax = @V_U(Data_p=VRdmax)@

vRdc = @V_U(Data_p=VRdc)@
v min = @V_U(Data_p=v_min)@
vEds = @V_U(Data_p=VEds)@
cRdc= @VAL(Data_p=CRdc)@
k = @VAL(Data_p=K)@
ρL = @VAL(Data_p=RoL)@
vlim = @V_U(Data_p=StressLimit)@
v (u1)= @V_U(Data_p=Stress)@
A = @V_U(Data_p=ShearArea)@

Support no. / Point: P9 (57987)

uo = @V_U(Data_p=Uo)@
u1 = @V_U(Data_p=U1)@
ρLx = @VAL(Data_p=RoLx)@
ρLy = @VAL(Data_p=RoLy)@
heff = @V_U(Data_p=EffHeight)@
Ax = @V_U(Data_p=Ax)@
Ay = @V_U(Data_p=Ay)@
α = @VAL(Data_p=Alpha)@
ν = @VAL(Data_p=Ni)@
γc = @VAL(Data_p=Gamma_c)@
fcd = @V_U(Data_p=Fcd)@
vRdmax = @V_U(Data_p=VRdmax)@

vRdc = @V_U(Data_p=VRdc)@
v min = @V_U(Data_p=v_min)@
vEds = @V_U(Data_p=VEds)@
cRdc= @VAL(Data_p=CRdc)@
k = @VAL(Data_p=K)@
ρL = @VAL(Data_p=RoL)@
vlim = @V_U(Data_p=StressLimit)@
v (u1)= @V_U(Data_p=Stress)@
A = @V_U(Data_p=ShearArea)@

Support no. / Point: P10 (57989)

uo = @V_U(Data_p=Uo)@
u1 = @V_U(Data_p=U1)@
ρLx = @VAL(Data_p=RoLx)@
ρLy = @VAL(Data_p=RoLy)@
heff = @V_U(Data_p=EffHeight)@
Ax = @V_U(Data_p=Ax)@
Ay = @V_U(Data_p=Ay)@
α = @VAL(Data_p=Alpha)@
ν = @VAL(Data_p=Ni)@
γc = @VAL(Data_p=Gamma_c)@
fcd = @V_U(Data_p=Fcd)@
vRdmax = @V_U(Data_p=VRdmax)@

vRdc = @V_U(Data_p=VRdc)@
v min = @V_U(Data_p=v_min)@
vEds = @V_U(Data_p=VEds)@
cRdc= @VAL(Data_p=CRdc)@
k = @VAL(Data_p=K)@
ρL = @VAL(Data_p=RoL)@
vlim = @V_U(Data_p=StressLimit)@

v (u1)= @V_U(Data_p=Stress)@
A = @V_U(Data_p=ShearArea)@

1.5.4. Deflection
|f(+)| = 0.0 (cm) <= f_{dop}(+) = 1.5 (cm)
|f(-)| = 0.0 (cm) <= f_{dop}(-) = 1.5 (cm)

1.5.5. Cracking
upper layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)
lower layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)

3. Results - detailing

List of solutions:
Reinforcement: bars

Solution no.	Reinforcement range Diameter / Weight	Total weight (kG)
1	-	177.06

Results for the solution no. 1
Reinforcement zones

Bottom reinforcement

Name	coordinates				Provided reinforcement	At Ar
	x1	y1	x2	y2	ϕ (mm) / (cm)	(cm2/m) (cm2/m)
1/1- Ax Main	0.00	-2.25	3.26	0.00	14.0 / 20.0	6.91 < 7.70
1/2- Ay Perpendicular	0.00	-2.25	3.26	0.00	14.0 / 20.0	7.07 < 7.70

Top reinforcement

Name	coordinates				Provided reinforcement	At Ar
	x1	y1	x2	y2	ϕ (mm) / (cm)	(cm2/m) (cm2/m)
1/3+ Ax Main	0.00	-2.25	3.26	0.00	14.0 / 20.0	7.06 < 7.70
1/4+ Ay Perpendicular	0.00	-2.25	3.26	0.00	14.0 / 20.0	6.91 < 7.70

4. Material survey

- Concrete volume = 2.93 (m3)
- Formwork = 7.32 (m2)
- Slab circumference = 11.01 (m)
- Area of openings = 0.00 (m2)

- Steel B500B
- Total weight = 169.68 (kG)
- Density = 57.92 (kG/m3)
- Average diameter = 14.0 (mm)
- Survey according to diameters:

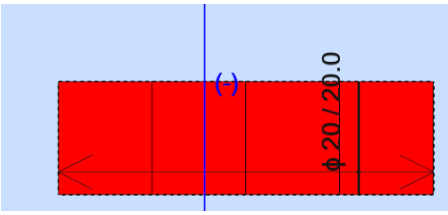
Diameter	Length (m)	Number of identical elements:
14	2.19	32
14	3.20	22

Išvada : laikomoji galia pakankama

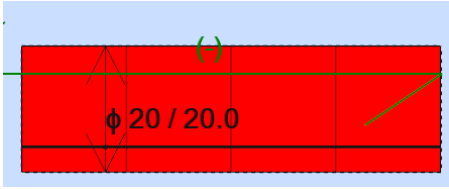
Prieduobės sienų armavimas

Visos prieduobės sienos armuojamos vienodai. Reikalingas armavimas:

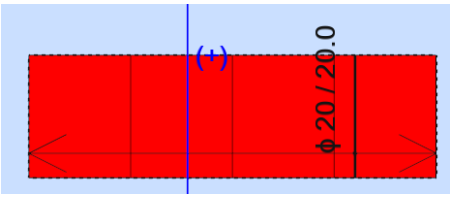
Priekinio tinklo armavimas X kryptimi:



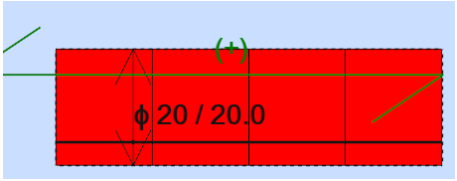
Priekinio tinklo armavimas Y kryptimi:



Galinio tinklo armavimas X kryptimi:



Galinio tinklo armavimas Y kryptimi:



1. Wall: Slab18 - Panel no. 18

1.1. Reinforcement:

- Type : siena

- Main reinforcement direction : 0°

Main reinforcement grade : B500B; Characteristic strength = 500.00 MPa
Horizontal branch of the stress-strain diagram

- Ductility class : B
- Bar diameters bottom d1 = 1.2 (cm) d2 = 1.2 (cm)
  top d1 = 1.2 (cm) d2 = 1.2 (cm)
- Cover bottom c1 = 3.0 (cm)
  top c2 = 3.0 (cm)
- Cover deviations Cdev = 1.0(cm), Cdur = 0.0(cm)

1.2. Concrete

Class : C25/30; Characteristic strength = 25.00 MPa
Rectangular stress distribution [3.1.7(3)]

- Density : 2501.36 (kG/m3)
- Concrete creep coefficient : 1.86
- Cement class : N

1.3. Hypothesis

- Calculations according to : EN 1992-1-1:2004/A1:2014
- Method of reinforcement area calculations : analytical
- Allowable cracking width
  - upper layer : 0.30 (mm)
  - lower layer : 0.30 (mm)
- Verification of punching : yes
- Exposure
  - upper layer : XC2
  - lower layer : XC2
- Calculation type : compression/tension
- Structure class : S4

Modified partial coefficients:
a_{cc} = 0.9 1992-1-1 3.1.6 (1)P

1.4. Slab geometry

Thickness 0.30 (m)

Contour:

edge	beginning x1	beginning y1	end x2	end y2	length (m)
1	0.00	-0.98	3.26	-0.98	3.26
2	3.26	-0.98	3.26	0.00	0.98
3	3.26	0.00	0.00	0.00	3.26
4	0.00	0.00	0.00	-0.98	0.98

Support:

n°	Name	dimensions (m)	coordinates x	coordinates y	edge
0	linear	0.40 / 3.26	1.63	-0.98	□
0	linear	0.98 / 0.30	3.26	-0.49	□
3204	point	0.15 / 0.20	3.26	-0.98	□
0	linear	0.98 / 0.30	0.00	-0.49	□

* - head present

1.5. Calculation results:

1.5.1. Maximum forces + reinforcement

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Provided reinforcement (cm2/m):	15.71	15.71	15.71	15.71
Modified required reinforcement (cm2/m):	13.93	13.93	13.93	13.93
Original required reinforcement (cm2/m):	13.93	13.93	13.93	13.93
Coordinates (m):	0.72;-0.98	0.72;-0.98	0.48;-0.98	0.48;-0.98

1.5.2. Maximum forces + reinforcement

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Symbol: required area/provided area				
Ax(+) (cm2/m)	**13.93/15.71** 5.58/15.71	13.93/15.71	5.58/15.71	
Ax(-) (cm2/m)	13.93/15.71 5.58/15.71	**13.93/15.71**	5.58/15.71	
Ay(+) (cm2/m)	13.93/15.71 13.93/15.71	13.93/15.71	**13.93/15.71**	
Ay(-) (cm2/m)	13.93/15.71 **13.93/15.71**	13.93/15.71	13.93/15.71	
	SLS			
Mxx (kN*m/m)	1.12	1.12	0.81	0.81
Myy (kN*m/m)	6.81	6.81	2.74	2.74
Mxy (kN*m/m)	5.94	5.94	5.07	5.07
Nxx (kN/m)	36.91	36.91	36.78	36.78
Nyy (kN/m)	46.65	46.65	-4.50	-4.50
Nxy (kN/m)	-14.05	-14.05	-27.14	-27.14
	ULS			
Mxx (kN*m/m)	1.51	1.51	1.09	1.09
Myy (kN*m/m)	9.19	9.19	3.70	3.70
Mxy (kN*m/m)	7.87	7.87	6.71	6.71
Nxx (kN/m)	49.71	49.71	49.47	49.47
Nyy (kN/m)	61.96	61.96	-5.89	-5.89
Nxy (kN/m)	-18.56	-18.56	-36.18	-36.18
Coordinates (m)	0.72;-0.98	0.72;-0.98	0.48;-0.98	0.48;-0.98
Coordinates* (m)	32.43;0.72;-0.40 32.43;0.48;-0.40	32.43;0.72;-0.40	32.43;0.48;-0.40	

* - Coordinates in the structure global coordinate system

3. Results - detailing

List of solutions:
Reinforcement: bars

Solution no.	**Reinforcement range Diameter / Weight**	**Total weight (kG)**

1	-	157.39

Results for the solution no. 1
Reinforcement zones

Bottom reinforcement

Name	coordinates Ar x1	y1	x2	y2	Provided reinforcement At ϕ (mm) / (cm)	(cm2/m) (cm2/m)
1/1- Ax Main	3.26	-0.98	0.00	0.00	20.0 / 20.0	13.93 < 15.71
1/2- Ay Perpendicular	3.26	-0.98	0.00	0.00	20.0 / 20.0	13.93 < 15.71

Top reinforcement

Name	coordinates Ar x1	y1	x2	y2	Provided reinforcement At ϕ (mm) / (cm)	(cm2/m) (cm2/m)
1/3+ Ax Main	3.26	-0.98	0.00	0.00	20.0 / 20.0	13.93 < 15.71
1/4+ Ay Perpendicular	3.26	-0.98	0.00	0.00	20.0 / 20.0	13.93 < 15.71

4. Material survey

- Concrete volume = 0.96 (m3)
- Formwork = 3.19 (m2)
- Slab circumference = 8.47 (m)
- Area of openings = 0.00 (m2)

- Steel B500B
- Total weight = 126.61 (kG)
- Density = 132.30 (kG/m3)
- Average diameter = 20.0 (mm)
- Survey according to diameters:

Diameter	Length (m)	Number of identical elements:
20	0.92	28
20	3.20	8

Išvada : laikomoji galia pakankama

1.6. Tarpaukštinės monolitinė perdangos plokštės projektavimas

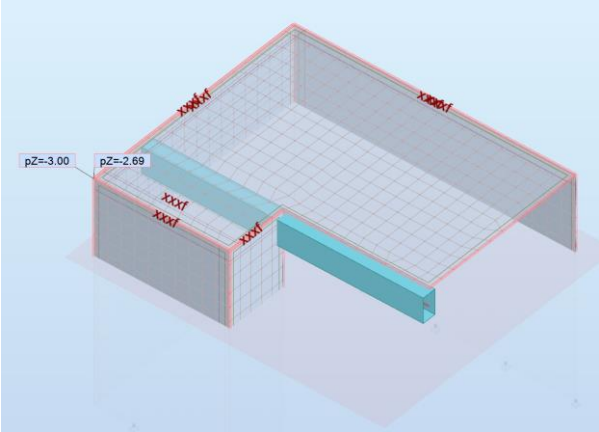
Projektuojama sijinė monolitinė GB perdanga.

- Betonas: C30/37 XC1;
- Armatūra: S500;

- Apsauginis betono sluoksnis: ne mažiau kaip armatūros skersmuo ir ne mažiau nei 30 mm iki pagrindinės armatūros krašto.
- Ugniaatsparumas REI 45;
- Projektuojamos perdangos storis: 200 mm, sijos skaičiuojamasis aukštis iki perdangos apačios 450mm, sijos plotis 250mm.

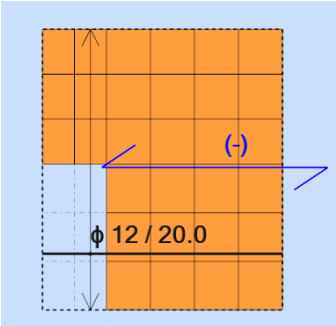
  Perdanga remiasi ant mūrių sienų lanksčiai.

Skaičiuojamoji schema su veikaincčiomis charakteristinėmis apkrovomis:

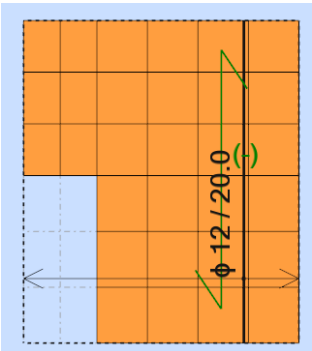


Reikalingas armavimas.

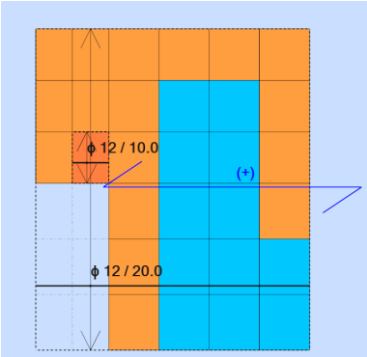
Apatinis armavimas X kryptimi:



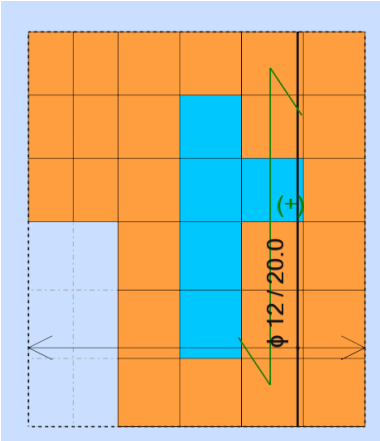
Apatinis armavimas Y kryptimi:



Viršutinis armavimas X kryptimi:



Viršutinis armavimas Y kryptimi:



1. Slab: Slab3 - Panel no. 3

1.1. Reinforcement:

- Type : perdanga
- Main reinforcement direction : 0°

Main reinforcement grade : B500B; Characteristic strength = 500.00 MPa
Horizontal branch of the stress-strain diagram

- Ductility class : B
- Bar diameters bottom d1 = 1.2 (cm) d2 = 1.2 (cm)
  top d1 = 1.2 (cm) d2 = 1.2 (cm)
- Cover bottom c1 = 3.0 (cm)
  top c2 = 3.0 (cm)
- Cover deviations Cdev = 1.0(cm), Cdur = 0.0(cm)

1.2. Concrete

Class : C30/37; Characteristic strength = 30.00 MPa
Rectangular stress distribution [3.1.7(3)]

- Density : 2501.36 (kG/m3)
- Concrete creep coefficient : 1.73
- Cement class : N

1.3. Hypothesis

- Calculations according to : EN 1992-1-1:2004/A1:2014

- Method of reinforcement area calculations : analytical
- Allowable cracking width
  - upper layer : 0.30 (mm)
  - lower layer : 0.30 (mm)
- Allowable deflection : 0.5 (cm)
- Verification of punching : yes
- Exposure
  - upper layer : XC1
  - lower layer : XC1
- Calculation type : simple bending
- Structure class : S4

Modified partial coefficients:

a_{cc} = 0.9 1992-1-1 3.1.6 (1)P

1.4. Slab geometry

Thickness 0.20 (m)

Contour:

edge	beginning x1	beginning y1	end x2	end y2	length (m)
1	0.00	0.00	4.24	0.00	4.24
2	4.24	0.00	4.24	-4.98	4.98
3	4.24	-4.98	1.13	-4.98	3.11
4	1.13	-4.98	1.13	-2.39	2.59
5	1.13	-2.39	0.00	-2.40	1.13
6	0.00	-2.40	0.00	0.00	2.40

Support:

n°	Name	dimensions (m)	coordinates x	coordinates y	edge
6	linear	4.98 / 0.25	1.13	-2.49	□
0	linear	0.25 / 1.13	0.57	-2.39	□
0	linear	0.25 / 1.13	0.57	-2.39	□
0	linear	0.25 / 4.24	2.12	0.00	□
0	linear	0.25 / 4.24	2.12	0.00	□
0	linear	2.40 / 0.25	0.00	-1.20	□
0	linear	2.40 / 0.25	0.00	-1.20	□
0	linear	4.98 / 0.25	4.24	-2.49	□
0	linear	2.40 / 0.25	4.24	-1.20	□
0	linear	2.59 / 0.25	4.24	-3.69	□
560	point	0.30 / 0.30	4.24	0.00	□
560	point	0.30 / 0.30	4.24	0.00	□

* - head present

1.5. Calculation results:

1.5.1. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Provided reinforcement (cm2/m):	11.31	5.65	5.65	5.65
Modified required reinforcement (cm2/m):	7.01	4.52	4.52	4.52

Original required reinforcement (cm2/m):				
	7.01	4.52	4.52	4.52
Coordinates (m):				
	0.90;-2.39	4.24;-2.39	4.00;-4.30	4.24;-2.39

1.5.2. Maximum moments + reinforcement for bending

	Ax(+)	**Ax(-)**	**Ay(+)**	**Ay(-)**
Symbol: required area/provided area				
Ax(+) (cm2/m)	**7.01/11.31**	0.09/5.65	0.00/5.65	0.09/5.65
Ax(-) (cm2/m)	4.52/5.65	**4.52/5.65**	4.52/5.65	4.52/5.65
Ay(+) (cm2/m)	4.52/5.65	0.28/5.65	**4.52/5.65**	0.28/5.65
Ay(-) (cm2/m)	4.52/5.65	4.52/5.65	4.52/5.65	**4.52/5.65**
	SLS			
Mxx (kN*m/m)	14.29	-0.10	-3.62	-0.10
Myy (kN*m/m)	4.43	-0.94	1.35	-0.94
Mxy (kN*m/m)	-10.60	0.85	3.02	0.85
Nxx (kN/m)	8.71	12.99	-21.82	12.99
Nyy (kN/m)	22.12	2.98	-3.29	2.98
Nxy (kN/m)	-32.58	4.67	-0.72	4.67
	ULS			
Mxx (kN*m/m)	19.05	-0.13	-4.83	-0.13
Myy (kN*m/m)	5.87	-1.27	1.78	-1.27
Mxy (kN*m/m)	-14.17	1.14	4.03	1.14
Nxx (kN/m)	11.41	17.32	-29.09	17.32
Nyy (kN/m)	29.49	3.97	-4.38	3.97
Nxy (kN/m)	-43.58	6.24	-0.96	6.24
Coordinates (m)	0.90;-2.39	4.24;-2.39	4.00;-4.30	4.24;-2.39
Coordinates* (m)	31.52;10.38;8.40	28.19;10.38;8.40	28.42;12.28;8.40	28.19;10.38;8.40

* - Coordinates in the structure global coordinate system

1.5.4. Deflection

|f(+)| = 0.0 (cm) <= $f_{dop}(+)$ = 0.5 (cm)
|f(-)| = 0.5 (cm) <= $f_{dop}(-)$ = 0.5 (cm)

1.5.5. Cracking

upper layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)
lower layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)

3. Results - detailing

List of solutions:
Reinforcement: bars

Solution no.	**Reinforcement range Diameter / Weight**	**Total weight (kG)**
1	-	325.35

Results for the solution no. 1
Reinforcement zones

Bottom reinforcement

Name	coordinates Ar x1	y1	x2	y2	Provided reinforcement ϕ (mm) / (cm)	At (cm2/m) (cm2/m)
1/1- Ax Main	0.00	-4.98	4.24	0.00	12.0 / 20.0	4.52 < 5.65
1/2- Ay Perpendicular	0.00	-4.98	4.24	0.00	12.0 / 20.0	4.52 < 5.65

Top reinforcement

Name	coordinates Ar x1	y1	x2	y2	Provided reinforcement ϕ (mm) / (cm)	At (cm2/m) (cm2/m)
1/3+ Ax Main	0.00	-4.98	4.24	0.00	12.0 / 20.0	4.52 < 5.65
1/4+(1/3+) Ax Main	0.57	-2.40	1.13	-1.60	12.0 / 10.0	7.01 < 11.31
1/5+ Ay Perpendicular	0.00	-4.98	4.24	0.00	12.0 / 20.0	4.52 < 5.65

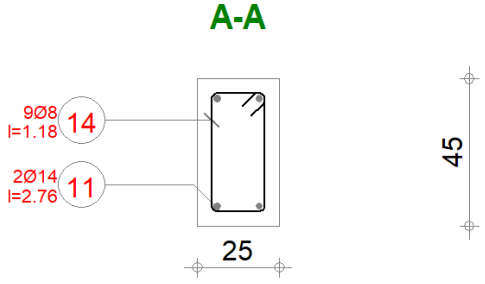
4. Material survey

- Concrete volume = 3.64 (m3)
- Formwork = 18.20 (m2)
- Slab circumference = 18.44 (m)
- Area of openings = 0.00 (m2)

- Steel B500B
- Total weight = 305.10 (kG)
- Density = 83.80 (kG/m3)
- Average diameter = 12.0 (mm)
- Survey according to diameters:

Diameter	Length (m)	Number of identical elements:
12	1.72	4
12	2.33	10
12	3.05	26
12	4.18	23
12	4.92	28

Monolitinės sijos armavimas:



1 Level:

- Name :
- Reference level : ---
- Maximum cracking : 0.30 (mm)
- Exposure : XC1
- Concrete creep coefficient : $\varphi_{\pi} = 1.75$
- Cement class : N
- Concrete age : 50 (years)
- Concrete age (loading moment) : 28 (days)
- Concrete age after erecting a structure : 365 (days)
- Structure class : S4
- Fire resistance class : no requirements

2 Beam: Beam269 Number of identical elements: 1

2.1 Material properties:

- Concrete : C30/37 $f_{ck} = 30.00$ (MPa)
  Rectangular stress distribution [3.1.7(3)]
  Density : 2501.36 (kG/m3)
  Aggregate size : 20.0 (mm)
- Longitudinal reinforcement: : B500B $f_{yk} = 500.00$ (MPa)
  Horizontal branch of the stress-strain diagram
  Ductility class : B
- Transversal reinforcement: : B500B $f_{yk} = 500.00$ (MPa)
  Horizontal branch of the stress-strain diagram
  Ductility class : B
- Additional reinforcement: : B500B $f_{yk} = 500.00$ (MPa)
  Horizontal branch of the stress-strain diagram
- Modified partial coefficients:
  $\alpha_{cc} = 0.9$ 1992-1-1 3.1.6 (1)P

2.2 Geometry:

2.2.1

Span	Position	L.supp. (m)	L (m)	R.supp. (m)
P1	**Span 0.25**	**2.14**	**0.25**	

Span length: $L_o = 2.39$ (m)
Section from 0.00 to 2.14 (m)
25.0 x 45.0 (cm)
without left slab
without right slab

2.2.2

Span	Position	L.supp. (m)	L (m)	R.supp. (m)

P2 Right cantilever 0.25 2.46 ----
Span length: L_o = 2.59 (m)
Section from 0.00 to 2.46 (m)
25.0 x 45.0 (cm)
without left slab
without right slab

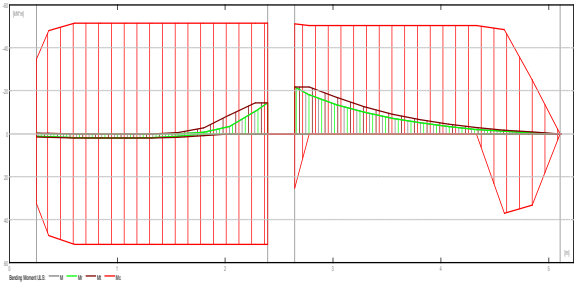
2.3 Calculation options:

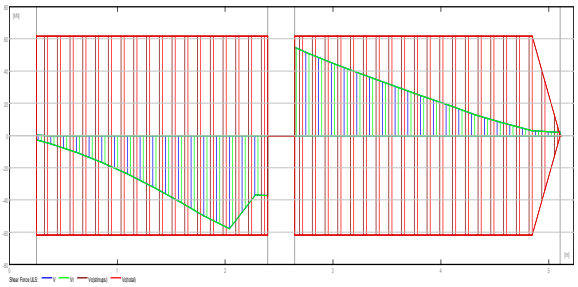
- Regulation of combinations : EN 1990:2002/AC:2010 (Eq.6.10)
- Calculations according to : EN 1992-1-1:2004/A1:2014
- Seismic dispositions : No requirements
- Precast beam : no
- Cover : bottom c = 4.0 (cm)
  : side c1= 4.0 (cm)
  : top c2= 4.0 (cm)
- Cover deviations : Cdev = 1.0(cm), Cdur = 0.0(cm)
- Coefficient β_2 =0.50 : long-term or cyclic load
- Method of shear calculations : strut inclination

2.4 Calculation results:

2.4.1 Internal forces in ULS

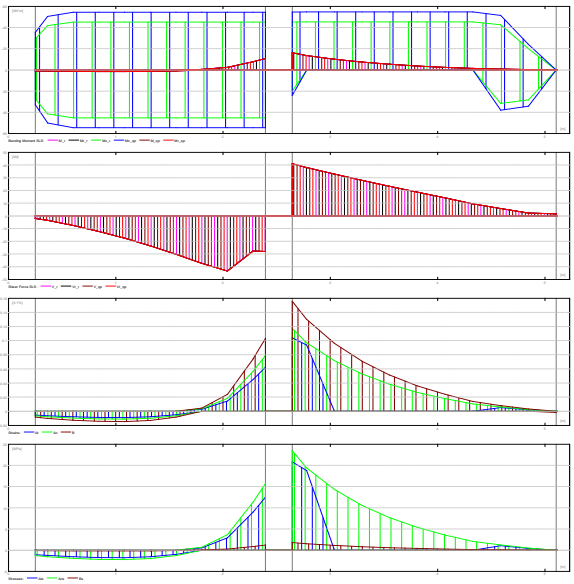
Span	Mt max. (kN*m)	Mt min. (kN*m)	Ml (kN*m)	Mr (kN*m)	Ql (kN)	Qr (kN)
P1	2.04	-2.69	1.51	-14.44	-2.68	-37.29
P2	0.22	-12.43	-21.78	0.22	54.91	2.09





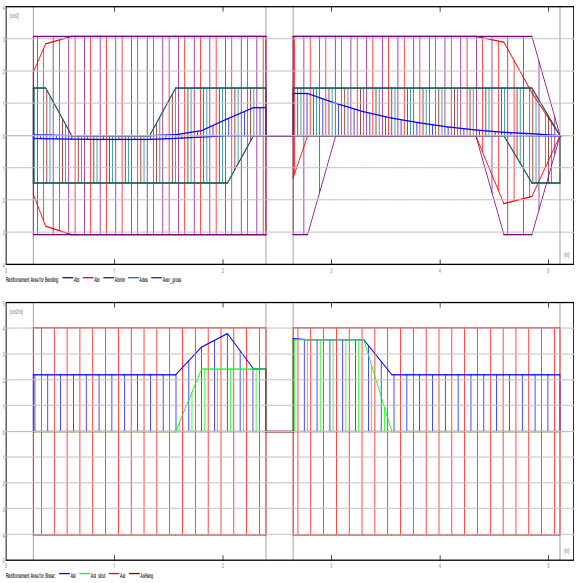
2.4.2 Internal forces in SLS

Span	Mt max. (kN*m)	Mt min. (kN*m)	Ml (kN*m)	Mr (kN*m)	Ql (kN)	Qr (kN)
P1	1.52	-0.49	0.84	-10.80	-2.01	-27.92
P2	0.16	-7.43	-16.29	0.16	41.05	1.58



2.4.3 Required reinforcement area

Span	Span (cm2)		Left support (cm2)		Right support (cm2)	
	bottom	top	bottom	top	bottom	top
P1	0.12	0.00	0.09	0.02	0.00	0.86
P2	0.01	0.00	0.00	1.31	0.01	0.00



2.4.4 Deflection and cracking

wt(QP) Total due to quasi-permanent combination
wt(QP)dop Allowable due to quasi-permanent combination
Dwt(QP) Deflection increment from the quasi-permanent load combination after erecting a structure.
Dwt(QP)dop Admissible deflection increment from the quasi-permanent load combination after erecting a structure.

wk - width of perpendicular cracks

Span	wt(QP) (cm)	wt(QP)dop (cm)	Dwt(QP) (cm)	Dwt(QP)dop (cm)	wk (mm)
P1	0.0	1.0	0.0	0.5	0.0
P2	0.3	1.0	0.1	0.5	0.0

2.5 Theoretical results - detailed results:

2.5.1 P1 : Span from 0.25 to 2.39 (m)

	ULS		SLS			
Abscissa (m)	M max. (kN*m)	M min. (kN*m)	M max. (kN*m)	M min. (kN*m)	A bottom (cm2)	A top (cm2)
0.25	1.51	-0.31	0.84	-0.23	0.09	0.02
0.36	1.68	-0.31	1.05	0.00	0.10	0.02
0.60	1.93	-0.00	1.32	0.00	0.11	0.00
0.84	2.02	-0.00	1.49	0.00	0.12	0.00
1.08	2.04	-0.00	1.52	0.00	0.12	0.00
1.32	1.98	-0.00	1.34	0.00	0.12	0.00
1.56	1.64	-0.49	0.87	0.00	0.09	0.03
1.80	0.89	-2.69	0.00	-0.49	0.05	0.15
2.04	0.04	-8.72	0.00	-2.50	0.00	0.52
2.28	0.00	-14.44	0.00	-7.79	0.00	0.86
2.39	0.00	-14.44	0.00	-10.80	0.00	0.86

	ULS	SLS	
Abscissa (m)	V max. (kN)	V max. (kN)	afp (mm)
0.25	-2.68	-2.01	0.0
0.36	-4.64	-3.47	0.0
0.60	-10.06	-7.53	0.0
0.84	-16.31	-12.20	0.0
1.08	-23.45	-17.54	0.0
1.32	-31.47	-23.54	0.0
1.56	-40.42	-30.23	0.0
1.80	-49.81	-37.25	0.0
2.04	-57.87	-43.28	0.0
2.28	-36.87	-27.61	0.0
2.39	-37.29	-27.92	0.0

2.5.2 P2 : Right cantilever from 2.64 to 5.10 (m)

	ULS		SLS			
Abscissa (m)	M max. (kN*m)	M min. (kN*m)	M max. (kN*m)	M min. (kN*m)	A bottom (cm2)	A top (cm2)
2.64	0.00	-21.78	0.00	-16.29	0.00	1.31
2.78	0.00	-21.78	0.00	-13.63	0.00	1.31
3.04	0.00	-16.83	0.00	-10.08	0.00	1.01
3.30	0.00	-12.43	0.00	-7.43	0.00	0.74
3.55	0.00	-9.12	0.00	-5.37	0.00	0.54
3.81	0.00	-6.55	0.00	-3.77	0.00	0.39
4.07	0.00	-4.54	0.00	-2.52	0.00	0.27
4.33	0.00	-2.95	0.00	-1.47	0.00	0.17
4.59	0.00	-1.72	0.00	-0.85	0.00	0.10
4.85	0.15	-0.93	0.00	-0.34	0.01	0.05
5.10	0.22	0.00	0.16	0.00	0.01	0.00

	ULS	SLS	
Abscissa (m)	V max. (kN)	V max. (kN)	afp (mm)
2.64	54.91	41.05	0.0
2.78	50.93	38.08	0.0
3.04	44.03	32.92	0.0
3.30	37.48	28.02	0.0
3.55	31.09	23.24	0.0
3.81	24.91	18.62	0.0
4.07	19.08	14.26	0.0
4.33	12.74	9.53	0.0
4.59	7.75	5.80	0.0
4.85	3.05	2.29	0.0
5.10	2.09	1.58	0.0

2.6 Reinforcement:

2.6.1 P1 : Span from 0.25 to 2.39 (m)

Longitudinal reinforcement:

- bottom (B500B)
  2 ϕ14 l = 2.76 from 0.04 to 2.80

Transversal reinforcement:

- main (B500B)
  stirrups 9 ϕ8 l = 1.18
  e = 1*0.07 + 8*0.25 (m)

2.6.2 P2 : Right cantilever from 2.64 to 5.10 (m)

Longitudinal reinforcement:

- bottom (B500B)
  2 ϕ14 l = 0.72 from 4.34 to 5.06
- assembling (bottom) (B500B)
  2 ϕ12 l = 2.81 from 2.21 to 5.02
- support (B500B)
  2 ϕ14 l = 5.14 from 0.04 to 5.06

Transversal reinforcement:

- main (B500B)
  stirrups 3 ϕ8 l = 1.18
  e = 1*1.71 + 2*0.25 (m)
  6 ϕ8 l = 1.17
  e = 1*0.21 + 5*0.25 (m)

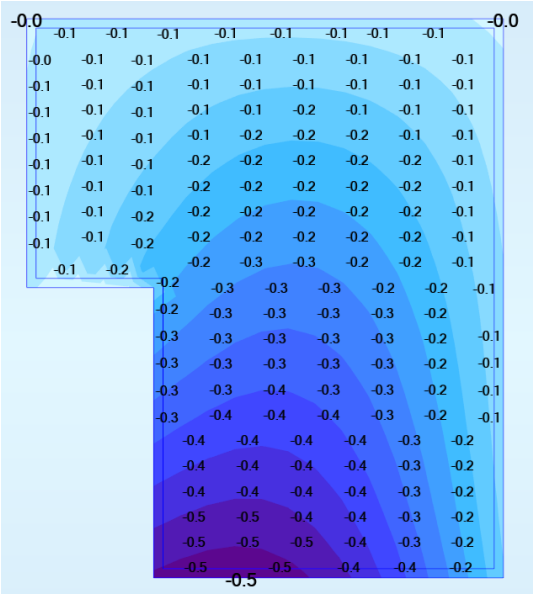
3 Material survey:

- Concrete volume = 0.57 (m3)
- Formwork = 5.97 (m2)

- Steel B500B
  - Total weight = 34.17 (kG)
  - Density = 59.50 (kG/m3)
  - Average diameter = 10.9 (mm)
  - Survey according to diameters:

Diameter (mm)	Length (m)	Weight (kG)	Number (No.)	Total weight (kG)
8	1.18	0.46	18	8.36
12	2.81	2.50	2	5.00
14	0.72	0.87	2	1.74
14	2.76	3.33	2	6.67
14	5.14	6.21	2	12.42

Monolitinės perdangos deformacijos:



Ribinis gembinio perdangos galo įlinkis (prie aliuminio stiklo vitrinos):

L/500 = 2,58/500 = 0,5 cm.

Perdangos įlinkis: 0,5 cm ≤ 0,5 cm.

IŠVADA: perdangos laikomoji galia užtikrinta. Įlinkiai neviršija ribinių.

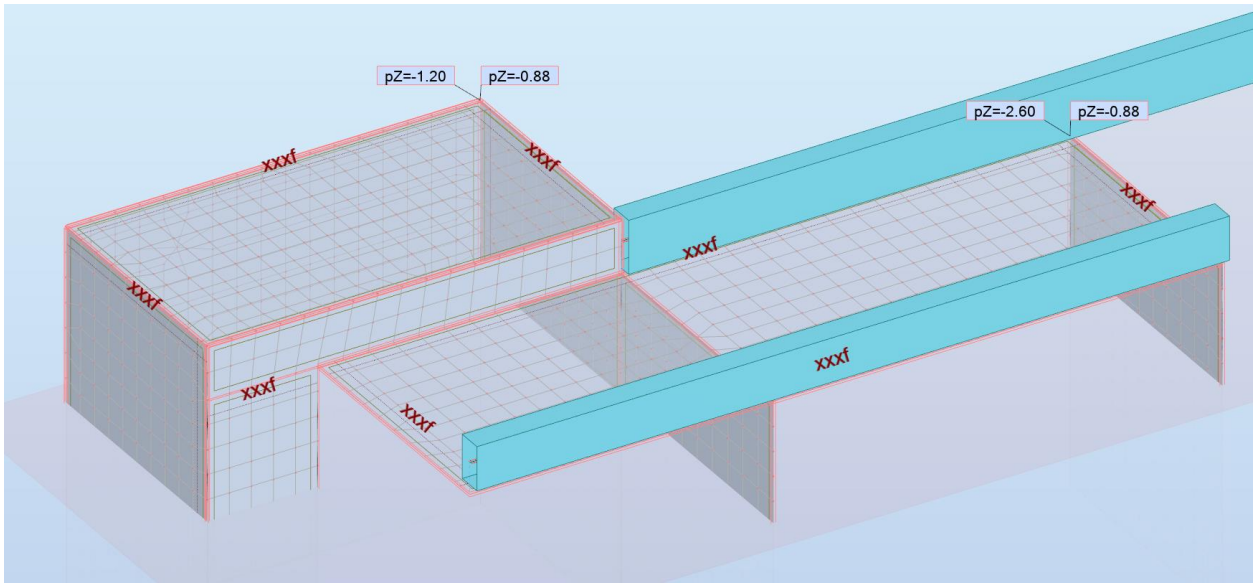
1.7. Denginio 2 lygių monolitinės perdangos plokštės projektavimas

Projektuojama dviejų lygių sijinė monolitinė GB perdanga.

- Betonas: C30/37 XC1;
- Armatūra: S500;
- Apsauginis betono sluoksnis: ne mažiau kaip armatūros skersmuo ir ne mažiau nei 30 mm iki pagrindinės armatūros krašto.
- Ugniaatsparumas REI 45;
- Projektuojamos perdangos storis: 200 mm, sijos skaičiuojamasis aukštis iki perdangos apačios 450mm, sijos plotis 250mm.

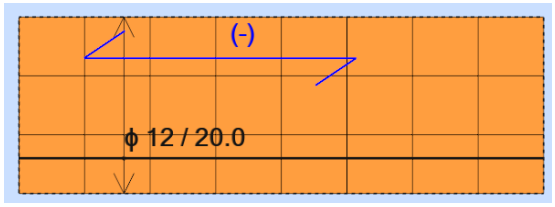
Perdanga remiasi ant mūrių sienų lanksčiai, perdanga per monolitinę sieną standžiai sujungiama su viršutine denginio perdanga per visą ilgį

Skaičiuojamoji schema su veikiančiomis charakteristinėmis apkrovomis:

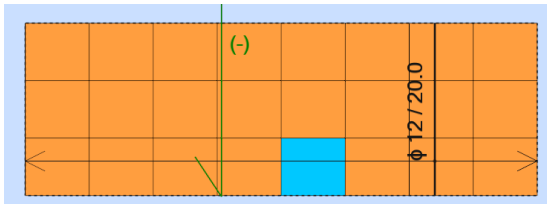


Žemesnės perdangos reikalingas armavimas.

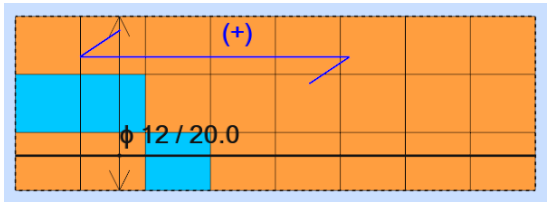
Apatinis armavimas X kryptimi:



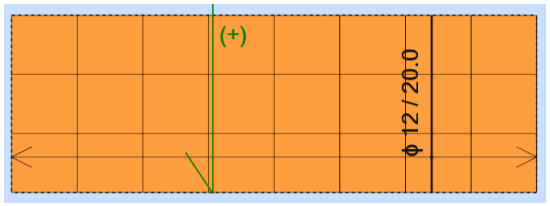
Apatinis armavimas Y kryptimi:



Viršutinis armavimas X kryptimi:



Viršutinis armavimas Y kryptimi:



1. Slab: Slab6 - Panel no. 6

1.1. Reinforcement:

- Type : perdanga
- Main reinforcement direction : 0°

Main reinforcement grade : B500B; Characteristic strength = 500.00 MPa
Horizontal branch of the stress-strain diagram

- Ductility class : B
- Bar diameters bottom d1 = 1.2 (cm) d2 = 1.2 (cm)
  top d1 = 1.2 (cm) d2 = 1.2 (cm)
- Cover bottom c1 = 3.0 (cm)
  top c2 = 3.0 (cm)
- Cover deviations Cdev = 1.0(cm), Cdur = 0.0(cm)

1.2. Concrete

Class : C30/37; Characteristic strength = 30.00 MPa
Rectangular stress distribution [3.1.7(3)]

- Density : 2501.36 (kG/m3)
- Concrete creep coefficient : 1.73
- Cement class : N

1.3. Hypothesis

- Calculations according to : EN 1992-1-1:2004/A1:2014
- Method of reinforcement area calculations : analytical
- Allowable cracking width
  - upper layer : 0.30 (mm)
  - lower layer : 0.30 (mm)
- Allowable deflection : 0.5 (cm)
- Verification of punching : no
- Exposure
  - upper layer : XC1
  - lower layer : XC1
- Calculation type : simple bending
- Structure class : S4

Modified partial coefficients:
a_{cc} = 0.9 1992-1-1 3.1.6 (1)P

1.4. Slab geometry

Thickness 0.20 (m)

Contour:

edge	beginning x1	beginning y1	end x2	end y2	length (m)
1	-0.00	-2.59	7.71	-2.59	7.71
2	7.71	-2.59	7.71	-0.00	2.59
3	7.71	-0.00	0.00	0.00	7.71
4	0.00	0.00	-0.00	-2.59	2.59

Support:

n°	Name	dimensions	coordinates	edge

		(m)	x	y	
74	linear	0.25 / 7.71	3.86	-0.00	□
0	linear	2.59 / 0.25	-0.00	-1.29	□
0	linear	0.25 / 4.60	2.30	-2.59	□
0	linear	2.59 / 0.25	4.60	-1.29	□
0	linear	0.20 / 3.11	6.16	-2.59	□
554	linear	0.25 / 4.60	2.30	-2.59	□

* - head present

1.5. Calculation results:

1.5.1. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Provided reinforcement (cm2/m):	5.65	5.65	5.65	5.65
Modified required reinforcement (cm2/m):	4.52	4.52	4.52	4.52
Original required reinforcement (cm2/m):	4.52	4.52	4.52	4.52
Coordinates (m):	-0.00;-2.59	0.26;-2.59	-0.00;-2.59	7.45;-1.17

1.5.2. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Symbol: required area/provided area				
Ax(+) (cm2/m)	**4.52/5.65**	4.52/5.65	4.52/5.65	0.23/5.65
Ax(-) (cm2/m)	4.52/5.65	**4.52/5.65**	4.52/5.65	4.52/5.65
Ay(+) (cm2/m)	4.52/5.65	4.52/5.65	**4.52/5.65**	0.00/5.65
Ay(-) (cm2/m)	0.00/0.00	0.00/0.00	0.00/0.00	**4.52/5.65**
	SLS			
Mxx (kN*m/m)	-11.01	5.90	-11.01	-1.13
Myy (kN*m/m)	-5.66	5.51	-5.66	-4.84
Mxy (kN*m/m)	9.47	12.18	9.47	2.55
Nxx (kN/m)	-175.57	-133.38	-175.57	-2.83
Nyy (kN/m)	-11.77	-14.13	-11.77	1.69
Nxy (kN/m)	54.08	29.60	54.08	6.25
	ULS			
Mxx (kN*m/m)	-14.79	7.93	-14.79	-1.51
Myy (kN*m/m)	-7.61	7.41	-7.61	-6.44
Mxy (kN*m/m)	12.74	16.37	12.74	3.41
Nxx (kN/m)	-235.44	-178.79	-235.44	-3.74
Nyy (kN/m)	-15.78	-18.94	-15.78	2.37
Nxy (kN/m)	72.59	39.72	72.59	8.38
Coordinates (m)	-0.00;-2.59	0.26;-2.59	-0.00;-2.59	7.45;-1.17
Coordinates* (m)	23.59;10.38;11.95 31.04;11.79;11.95	23.84;10.38;11.95	23.59;10.38;11.95	

* - Coordinates in the structure global coordinate system

1.5.4. Deflection

|f(+)| = 0.0 (cm) <= f_{dop}(+) = 0.5 (cm)

|f(-)| = 0.3 (cm) <= f_{dop}(-) = 0.5 (cm)

1.5.5. Cracking
upper layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)
lower layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)

3. Results - detailing

List of solutions:
Reinforcement: bars

Solution no.	**Reinforcement range Diameter / Weight**	**Total weight (kG)**
1	-	354.10

Results for the solution no. 1
Reinforcement zones

Bottom reinforcement

Name	**coordinates Ar**				**Provided reinforcement**	**At**
	x1	**y1**	**x2**	**y2**	**ϕ (mm) / (cm)**	**(cm2/m)**
1/1- Ax Main	0.00	-2.59	7.71	0.00	12.0 / 20.0	4.52 < 5.65
1/2- Ay Perpendicular	0.00	-2.59	7.71	0.00	12.0 / 20.0	4.52 < 5.65

Top reinforcement

Name	**coordinates Ar**				**Provided reinforcement**	**At**
	x1	**y1**	**x2**	**y2**	**ϕ (mm) / (cm)**	**(cm2/m)**
1/3+ Ax Main	0.00	-2.59	7.71	0.00	12.0 / 20.0	4.52 < 5.65
1/4+ Ay Perpendicular	0.00	-2.59	7.71	0.00	12.0 / 20.0	4.52 < 5.65

4. Material survey

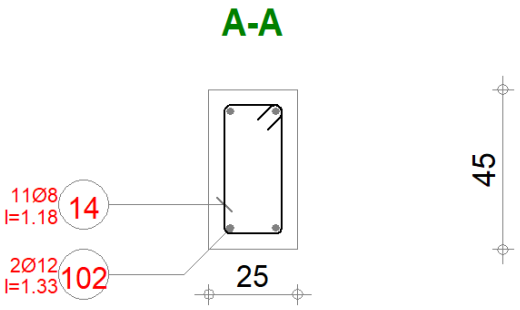
- Concrete volume = 3.99 (m3)
- Formwork = 19.94 (m2)
- Slab circumference = 20.59 (m)
- Area of openings = 0.00 (m2)

- Steel B500B
- Total weight = 342.64 (kG)
- Density = 85.94 (kG/m3)
- Average diameter = 12.0 (mm)
- Survey according to diameters:

Diameter Length Number of identical elements:

	(m)	
12	2.53	74
12	7.65	26

Monolitinės sijos reikalingas armavimas:



1 Level:

- Name :
- Reference level : ---
- Maximum cracking : 0.30 (mm)
- Exposure : XC1
- Concrete creep coefficient : $\varphi_{\pi} = 1.75$
- Cement class : N
- Concrete age : 50 (years)
- Concrete age (loading moment) : 28 (days)
- Concrete age after erecting a structure : 365 (days)
- Structure class : S4
- Fire resistance class : no requirements

2 Beam: Beam270 Number of identical elements: 1

2.1 Material properties:

- Concrete :
  C30/37 $f_{ck} = 30.00$ (MPa)
  Rectangular stress distribution [3.1.7(3)]
  Density : 2501.36 (kG/m3)
  Aggregate size : 20.0 (mm)
- Longitudinal reinforcement: :
  B500B $f_{yk} = 500.00$ (MPa)
  Horizontal branch of the stress-strain diagram
  Ductility class : B
- Transversal reinforcement: :
  B500B $f_{yk} = 500.00$ (MPa)
  Horizontal branch of the stress-strain diagram
  Ductility class : B
- Additional reinforcement: :
  B500B $f_{yk} = 500.00$ (MPa)
  Horizontal branch of the stress-strain diagram
- Modified partial coefficients:

α_{cc} = 0.9 1992-1-1 3.1.6 (1)P

2.2 Geometry:

2.2.1	Span	Position	L.supp. (m)	L (m)	R.supp. (m)
	P1	**Left cantilever**	**----**	**2.99**	**0.25**

Span length: L_o = 3.11 (m)
Section from 0.00 to 2.99 (m)
25.0 x 45.0 (cm)
without left slab
without right slab

2.2.2	Span	Position	L.supp. (m)	L (m)	R.supp. (m)
	P2	**Span 0.25**	**4.35**	**0.25**	

Span length: L_o = 4.60 (m)
Section from 0.00 to 4.35 (m)
25.0 x 45.0 (cm)
without left slab
without right slab

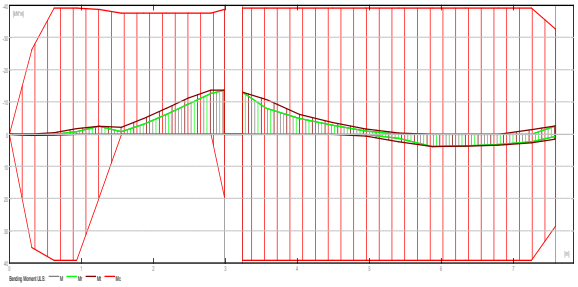
2.3 Calculation options:

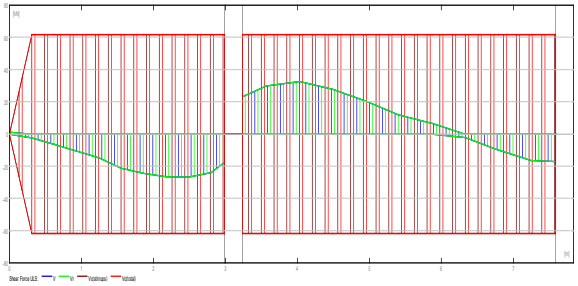
- Regulation of combinations : EN 1990:2002/AC:2010 (Eq.6.10)
- Calculations according to : EN 1992-1-1:2004/A1:2014
- Seismic dispositions : No requirements
- Precast beam : no
- Cover : bottom c = 4.0 (cm)
  : side c1= 4.0 (cm)
  : top c2= 4.0 (cm)
- Cover deviations : Cdev = 1.0(cm), Cdur = 0.0(cm)
- Coefficient β_2 =0.50 : long-term or cyclic load
- Method of shear calculations : strut inclination

2.4 Calculation results:

2.4.1 Internal forces in ULS

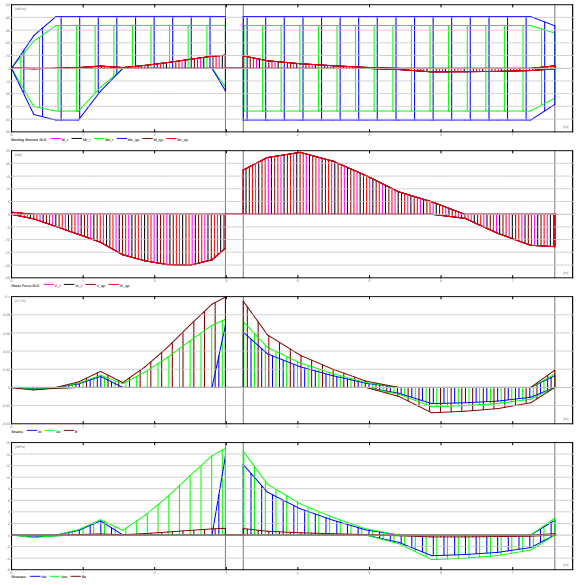
Span	Mt max. (kN*m)	Mt min. (kN*m)	Ml (kN*m)	Mr (kN*m)	Ql (kN)	Qr (kN)
P1	0.36	-8.05	0.06	-13.68	1.09	-17.80
P2	3.83	-3.60	-13.09	-2.61	23.24	-17.06





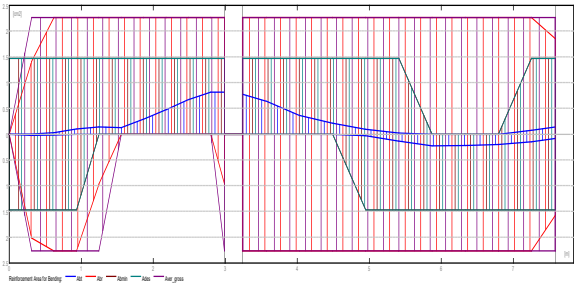
2.4.2 Internal forces in SLS

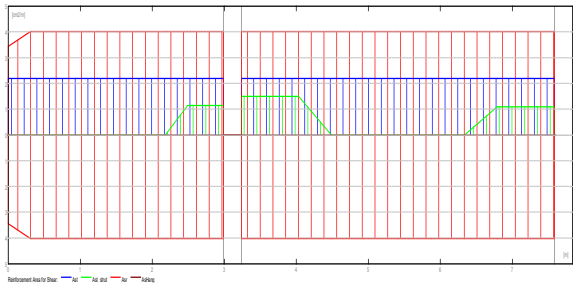
Span	Mt max. (kN*m)	Mt min. (kN*m)	Ml (kN*m)	Mr (kN*m)	Ql (kN)	Qr (kN)
P1	0.27	-4.56	0.04	-10.24	0.81	-13.33
P2	2.87	-2.06	-9.79	-1.96	17.39	-12.75



2.4.3 Required reinforcement area

Span	Span (cm2)		Left support (cm2)		Right support (cm2)	
	bottom	top	bottom	top	bottom	top
P1	0.02	0.00	0.00	0.00	0.00	0.82
P2	0.23	0.00	0.00	0.78	0.08	0.14





2.4.4 Deflection and cracking

wt(QP) Total due to quasi-permanent combination
wt(QP)dop Allowable due to quasi-permanent combination
Dwt(QP) Deflection increment from the quasi-permanent load combination after erecting a structure.
Dwt(QP)dop Admissible deflection increment from the quasi-permanent load combination after erecting a structure.

wk - width of perpendicular cracks

Span	wt(QP) (cm)	wt(QP)dop (cm)	Dwt(QP) (cm)	Dwt(QP)dop (cm)	wk (mm)
P1	0.2	1.2	0.1	0.6	0.0
P2	0.0	1.8	0.0	0.9	0.0

2.5 Theoretical results - detailed results:

2.5.1 P1 : Left cantilever from 0.00 to 2.99 (m)

	ULS		SLS			
Abscissa (m)	M max. (kN*m)	M min. (kN*m)	M max. (kN*m)	M min. (kN*m)	A bottom (cm2)	A top (cm2)
0.00	0.06	-0.05	0.04	-0.04	0.00	0.00
0.31	0.36	-0.03	0.27	0.00	0.02	0.00
0.62	0.27	-0.48	0.10	0.00	0.01	0.03
0.93	0.08	-1.77	0.00	-0.62	0.00	0.10
1.24	0.00	-2.43	0.00	-1.82	0.00	0.14
1.56	0.00	-2.16	0.00	-0.58	0.00	0.13
1.87	0.00	-4.88	0.00	-2.35	0.00	0.29
2.18	0.00	-8.05	0.00	-4.56	0.00	0.48
2.49	0.00	-11.30	0.00	-7.05	0.00	0.67
2.80	0.00	-13.66	0.00	-9.45	0.00	0.81
2.99	0.00	-13.68	0.00	-10.24	0.00	0.82

	ULS	SLS	
Abscissa (m)	V max. (kN)	V max. (kN)	afp (mm)
0.00	1.09	0.81	0.0
0.31	-2.41	-1.81	0.0
0.62	-6.43	-4.81	0.0
0.93	-10.58	-7.92	0.0
1.24	-14.76	-11.04	0.0

1.56	-21.35	-15.98	0.0
1.87	-24.44	-18.29	0.0
2.18	-26.49	-19.82	0.0
2.49	-26.83	-20.08	0.0
2.80	-23.95	-17.93	0.0
2.99	-17.80	-13.33	0.0

2.5.2 P2 : Span from 3.24 to 7.59 (m)

	ULS		SLS			
Abscissa (m)	M max. (kN*m)	M min. (kN*m)	M max. (kN*m)	M min. (kN*m)	A bottom (cm2)	A top (cm2)
3.24	0.00	-13.09	0.00	-9.79	0.00	0.78
3.57	0.00	-10.76	0.00	-5.97	0.00	0.64
4.03	0.00	-6.11	0.00	-3.65	0.00	0.36
4.49	0.00	-3.60	0.00	-2.06	0.00	0.21
4.95	0.54	-1.67	0.00	-0.73	0.03	0.10
5.41	2.34	-0.38	1.02	0.00	0.14	0.02
5.87	3.83	-0.00	2.87	0.00	0.23	0.00
6.33	3.70	-0.00	2.71	0.00	0.22	0.00
6.79	3.37	-0.00	2.41	0.00	0.20	0.00
7.25	2.67	-1.42	1.75	0.00	0.15	0.08
7.59	1.55	-2.61	0.47	-1.96	0.08	0.14

	ULS	SLS	
Abscissa (m)	V max. (kN)	V max. (kN)	afp (mm)
3.24	23.24	17.39	0.0
3.57	29.79	22.29	0.0
4.03	32.55	24.35	0.0
4.49	27.87	20.85	0.0
4.95	20.37	15.24	0.0
5.41	11.80	8.83	0.0
5.87	6.55	4.90	0.0
6.33	-2.11	-1.57	0.0
6.79	-10.00	-7.47	0.0
7.25	-16.38	-12.25	0.0
7.59	-17.06	-12.75	0.0

2.6 Reinforcement:

2.6.1 P1 : Left cantilever from 0.00 to 2.99 (m)

Longitudinal reinforcement:

- bottom (B500B)
  2 ϕ12 l = 1.34 from 0.04 to 1.38
- assembling (bottom) (B500B)
  2 ϕ12 l = 2.61 from 0.81 to 3.42

Transversal reinforcement:

- main (B500B)
  stirrups 11 ϕ8 l = 1.18
  e = 1*0.29 + 10*0.25 (m)

2.6.2 P2 : Span from 3.24 to 7.59 (m)

Longitudinal reinforcement:

- bottom (B500B)
  2 ϕ12 l = 4.94 from 2.86 to 7.80
- support (B500B)
  2 ϕ12 l = 7.85 from 0.04 to 7.80

Transversal reinforcement:

- main (B500B)
  stirrups 18 ϕ8 l = 1.18
  e = 1*0.05 + 17*0.25 (m)

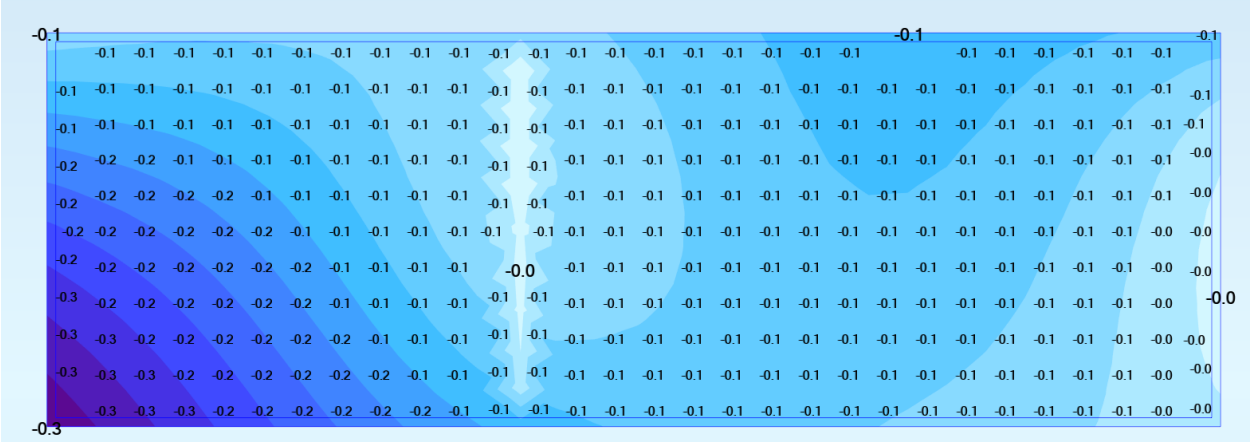
3 Material survey:

- Concrete volume = 0.88 (m3)
- Formwork = 9.11 (m2)

- Steel B500B
  - Total weight = 43.20 (kG)
  - Density = 49.00 (kG/m3)
  - Average diameter = 10.0 (mm)
  - Survey according to diameters:

Diameter (mm)	Length (m)	Weight (kG)	Number (No.)	Total weight (kG)
8	1.18	0.46	29	13.47
12	1.34	1.19	2	2.37
12	2.61	2.32	2	4.64
12	4.94	4.39	2	8.78
12	7.85	6.97	2	13.95

Monolitinės perdangos deformacijos:



Ribinis perdangos ribinis įlinkis:

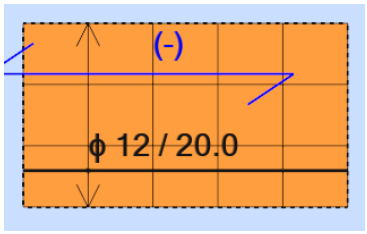
L/500 = 2,58/500 = 0,5 cm.

Perdangos įlinkis: 0,3 cm < 0,5 cm.

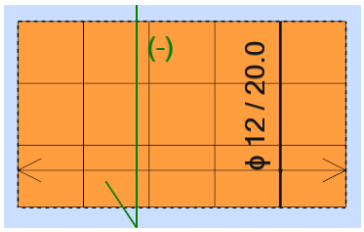
IŠVADA: perdangos laikomoji galia užtikrinta. Įlinkiai neviršija ribinių.

Viršutinės perdangos reikalingas armavimas.

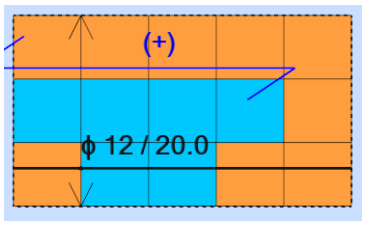
Apatinis armavimas X kryptimi:



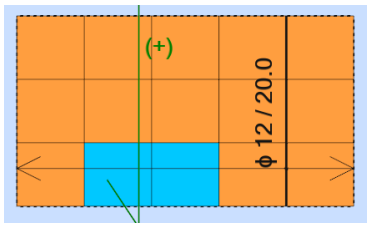
Apatinis armavimas Y kryptimi:



Viršutinis armavimas X kryptimi:



Viršutinis armavimas Y kryptimi:



1. Slab: Slab5 - Panel no. 5

1.1. Reinforcement:

- Type : perdanga
- Main reinforcement direction : 0°

Main reinforcement grade : B500B; Characteristic strength = 500.00 MPa
Horizontal branch of the stress-strain diagram

- Ductility class : B
- Bar diameters bottom d1 = 1.2 (cm) d2 = 1.2 (cm)
  top d1 = 1.2 (cm) d2 = 1.2 (cm)
- Cover bottom c1 = 3.0 (cm)
  top c2 = 3.0 (cm)
- Cover deviations Cdev = 1.0(cm), Cdur = 0.0(cm)

1.2. Concrete

Class : C30/37; Characteristic strength = 30.00 MPa
Rectangular stress distribution [3.1.7(3)]

- Density : 2501.36 (kG/m3)

- Concrete creep coefficient : 1.73
- Cement class : N

1.3. Hypothesis

- Calculations according to : EN 1992-1-1:2004/A1:2014
- Method of reinforcement area calculations : analytical
- Allowable cracking width
  - upper layer : 0.30 (mm)
  - lower layer : 0.30 (mm)
- Allowable deflection : 0.5 (cm)
- Verification of punching : yes
- Exposure
  - upper layer : XC1
  - lower layer : XC1
- Calculation type : simple bending
- Structure class : S4

Modified partial coefficients:

a_{cc} = 0.9 1992-1-1 3.1.6 (1)P

1.4. Slab geometry

Thickness 0.20 (m)

Contour:

edge	beginning x1	beginning y1	end x2	end y2	length (m)
1	-0.00	-2.40	4.24	-2.40	4.24
2	4.24	-2.40	4.24	-0.00	2.39
3	4.24	-0.00	0.00	0.00	4.24
4	0.00	0.00	-0.00	-2.40	2.40

Support:

n°	Name	dimensions (m)	coordinates x	coordinates y	edge
558	point	0.30 / 0.30	-0.00	-2.40	□
0	linear	0.25 / 4.24	2.12	-2.40	□
0	linear	2.40 / 0.25	-0.00	-1.20	□
0	linear	0.20 / 4.24	2.12	-0.00	□
0	linear	0.25 / 4.24	2.12	-0.00	□
0	linear	2.40 / 0.25	4.24	-1.20	□
0	linear	2.40 / 0.25	4.24	-1.20	□

* - head present

1.5. Calculation results:

1.5.1. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Provided reinforcement (cm2/m):	5.65	5.65	5.65	5.65
Modified required reinforcement (cm2/m):	4.52	4.52	4.52	4.52
Original required reinforcement (cm2/m):				

	4.52	4.52	4.52	4.52
Coordinates (m):	4.24;-1.63	4.24;-0.00	4.01;-1.52	4.24;-
0.00				

1.5.2. Maximum moments + reinforcement for bending

	Ax(+)	**Ax(-)**	**Ay(+)**	**Ay(-)**
Symbol: required area/provided area				
Ax(+) (cm2/m)	**4.52/5.65**	0.60/5.65	4.52/5.65	0.60/5.65
Ax(-) (cm2/m)	4.52/5.65	**4.52/5.65**	4.52/5.65	4.52/5.65
Ay(+) (cm2/m)	4.52/5.65	0.16/5.65	**4.52/5.65**	0.16/5.65
Ay(-) (cm2/m)	4.52/5.65	4.52/5.65	4.52/5.65	**4.52/5.65**
	SLS			
Mxx (kN*m/m)	0.52	-3.41	-1.02	-3.41
Myy (kN*m/m)	1.22	-6.53	0.78	-6.53
Mxy (kN*m/m)	-1.38	1.48	-1.21	1.48
Nxx (kN/m)	3.65	-19.80	3.79	-19.80
Nyy (kN/m)	48.61	7.13	40.67	7.13
Nxy (kN/m)	1.85	-19.05	2.68	-19.05
	ULS			
Mxx (kN*m/m)	0.69	-4.56	-1.36	-4.56
Myy (kN*m/m)	1.63	-8.73	1.02	-8.73
Mxy (kN*m/m)	-1.85	1.99	-1.63	1.99
Nxx (kN/m)	4.77	-26.42	4.97	-26.42
Nyy (kN/m)	65.07	9.47	54.44	9.47
Nxy (kN/m)	2.42	-25.46	3.54	-25.46
Coordinates (m)	4.24;-1.63	4.24;-0.00	4.01;-1.52	4.24;-
0.00				
Coordinates* (m)	32.43;8.75;12.50 32.43;10.38;12.50	32.43;10.38;12.50	32.19;8.85;12.50	

* - Coordinates in the structure global coordinate system

1.5.4. Deflection

|f(+)| = 0.0 (cm) <= $f_{dop}(+)$ = 0.5 (cm)
|f(-)| = 0.2 (cm) <= $f_{dop}(-)$ = 0.5 (cm)

1.5.5. Cracking

upper layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)
lower layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)

3. Results - detailing

List of solutions:
Reinforcement: bars

Solution no.	**Reinforcement range Diameter / Weight**	**Total weight (kG)**
1	-	180.46

Results for the solution no. 1
Reinforcement zones

Bottom reinforcement

Name	coordinates x1	y1	x2	y2	Provided reinforcement ϕ (mm) / (cm)	At (cm2/m)	Ar (cm2/m)
1/1- Ax Main	0.00	-2.40	4.24	0.00	12.0 / 20.0	4.52	< 5.65
1/2- Ay Perpendicular	0.00	-2.40	4.24	0.00	12.0 / 20.0	4.52	< 5.65

Top reinforcement

Name	coordinates x1	y1	x2	y2	Provided reinforcement ϕ (mm) / (cm)	At (cm2/m)	Ar (cm2/m)
1/3+ Ax Main	0.00	-2.40	4.24	0.00	12.0 / 20.0	4.52	< 5.65
1/4+ Ay Perpendicular	0.00	-2.40	4.24	0.00	12.0 / 20.0	4.52	< 5.65

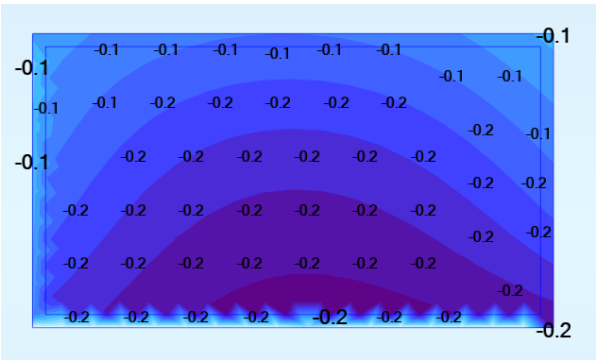
4. Material survey

- Concrete volume = 2.03 (m3)
- Formwork = 10.16 (m2)
- Slab circumference = 13.27 (m)
- Area of openings = 0.00 (m2)

- Steel B500B
- Total weight = 153.08 (kG)
- Density = 75.34 (kG/m3)
- Average diameter = 12.0 (mm)
- Survey according to diameters:

Diameter	Length (m)	Number of identical elements:
12	2.33	38
12	4.18	20

Monolitinės perdangos deformacijos:



Ribinis perdangos ribinis įlinkis:

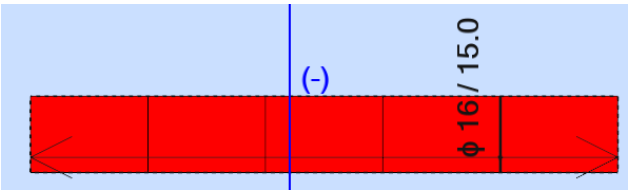
L/200 = 4,24/200 = 2,1 cm.

Perdangos įlinkis: 0,2 cm < 2,1 cm.

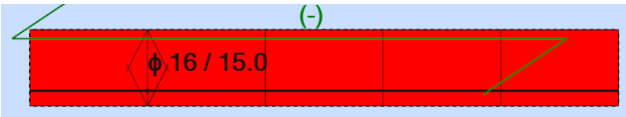
IŠVADA: perdangos laikomoji galia užtikrinta. Įlinkiai neviršija ribinių.

Jungiamos monolitinės sienos reikalingas armavimas:

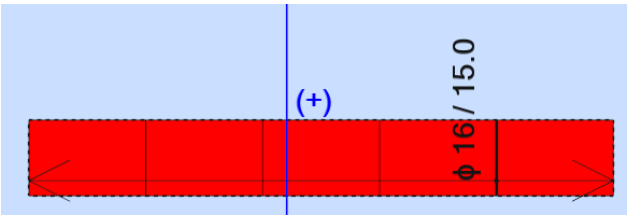
Apatinis armavimas X kryptimi:



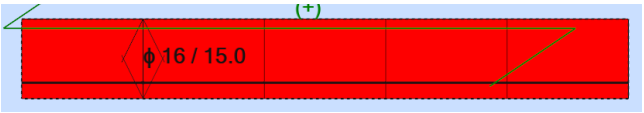
Apatinis armavimas Y kryptimi:



Viršutinis armavimas X kryptimi:



Viršutinis armavimas Y kryptimi:



1. Wall: Slab1 - Panel no. 1

1.1. Reinforcement:

- Type : siena
- Main reinforcement direction : 0°

Main reinforcement grade : B500B; Characteristic strength = 500.00 MPa
Horizontal branch of the stress-strain diagram

- Ductility class : B
- Bar diameters bottom d1 = 1.2 (cm) d2 = 1.2 (cm)
  top d1 = 1.2 (cm) d2 = 1.2 (cm)
- Cover bottom c1 = 3.0 (cm)
  top c2 = 3.0 (cm)
- Cover deviations Cdev = 1.0(cm), Cdur = 0.0(cm)

1.2. Concrete

Class : C30/37; Characteristic strength = 30.00 MPa
Rectangular stress distribution [3.1.7(3)]

- Density : 2501.36 (kG/m3)
- Concrete creep coefficient : 1.73
- Cement class : N

1.3. Hypothesis

- Calculations according to : EN 1992-1-1:2004/A1:2014
- Method of reinforcement area calculations : analytical
- Allowable cracking width
  - upper layer : 0.30 (mm)
  - lower layer : 0.30 (mm)
- Verification of punching : no
- Exposure
  - upper layer : XC2
  - lower layer : XC2
- Calculation type : compression/tension
- Structure class : S4

Modified partial coefficients:

a_{cc} = 0.9 1992-1-1 3.1.6 (1)P

1.4. Slab geometry

Thickness 0.20 (m)

Contour:

edge	beginning x1	beginning y1	end x2	end y2	length (m)
1	0.00	0.55	4.24	0.55	4.24
2	4.24	0.55	4.24	0.00	0.55
3	4.24	0.00	0.00	0.00	4.24
4	0.00	0.00	0.00	0.55	0.55

Support:

n°	Name	dimensions (m)	coordinates x	coordinates y	edge
0	linear	0.55 / 0.25	0.00	0.28	□
0	linear	0.55 / 0.25	4.24	0.28	□
0	linear	0.20 / 3.11	2.69	0.00	□
0	linear	0.20 / 4.24	2.12	0.55	□

* - head present

1.5. Calculation results:

1.5.1. Maximum forces + reinforcement

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Provided reinforcement (cm2/m):	13.40	13.40	13.40	13.40
Modified required reinforcement (cm2/m):	10.36	10.36	10.36	10.36
Original required reinforcement (cm2/m):	10.36	10.36	10.36	10.36

Coordinates (m):	0.00;0.55	0.00;0.55	0.00;0.28	0.00;0.28

1.5.2. Maximum forces + reinforcement

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Symbol: required area/provided area				
Ax(+) (cm2/m)	**10.36/13.40** 10.36/13.40	10.36/13.40	10.36/13.40	
Ax(-) (cm2/m)	10.36/13.40 10.36/13.40	**10.36/13.40**	10.36/13.40	
Ay(+) (cm2/m)	10.36/13.40 10.36/13.40	10.36/13.40	**10.36/13.40**	
Ay(-) (cm2/m)	10.36/13.40 **10.36/13.40**	10.36/13.40	10.36/13.40	
	SLS			
Mxx (kN*m/m)	-0.28	-0.28	-0.37	-0.37
Myy (kN*m/m)	-4.46	-4.46	-2.00	-2.00
Mxy (kN*m/m)	1.27	1.27	0.48	0.48
Nxx (kN/m)	-7.16	-7.16	6.14	6.14
Nyy (kN/m)	34.80	34.80	-9.62	-9.62
Nxy (kN/m)	-21.30	-21.30	-30.23	-30.23
	ULS			
Mxx (kN*m/m)	-0.37	-0.37	-0.49	-0.49
Myy (kN*m/m)	-5.96	-5.96	-2.67	-2.67
Mxy (kN*m/m)	1.69	1.69	0.64	0.64
Nxx (kN/m)	-9.52	-9.52	8.15	8.15
Nyy (kN/m)	46.43	46.43	-12.72	-12.72
Nxy (kN/m)	-28.52	-28.52	-40.48	-40.48
Coordinates (m)	0.00;0.55	0.00;0.55	0.00;0.28	0.00;0.28
Coordinates* (m)	32.43;10.38;12.50 32.43;10.38;12.23	32.43;10.38;12.50	32.43;10.38;12.23	

* - Coordinates in the structure global coordinate system

3. Results - detailing

List of solutions:
Reinforcement: bars

Solution no.	Reinforcement range Diameter / Weight	Total weight (kG)
1	-	98.23

Results for the solution no. 1
Reinforcement zones

Bottom reinforcement

Name	coordinates x1	y1	x2	y2	Provided reinforcement ϕ (mm) / (cm)	At (cm2/m)	Ar
1/1- Ax Main	4.24	-0.00	0.00	0.55	16.0 / 15.0	10.36	< 13.40
1/2- Ay Perpendicular	4.24	-0.00	0.00	0.55	16.0 / 15.0	10.36	< 13.40

Top reinforcement

Name	coordinates				Provided reinforcement	At
	x1	y1	x2	y2	ϕ (mm) / (cm)	Ar (cm2/m)
1/3+ Ax Main	4.24	-0.00	0.00	0.55	16.0 / 15.0	10.36 < 13.40
1/4+ Ay Perpendicular	4.24	-0.00	0.00	0.55	16.0 / 15.0	10.36 < 13.40

4. Material survey

- Concrete volume = 0.47 (m3)
- Formwork = 2.33 (m2)
- Slab circumference = 9.58 (m)
- Area of openings = 0.00 (m2)

- Steel B500B
- Total weight = 79.85 (kG)
- Density = 171.12 (kG/m3)
- Average diameter = 16.0 (mm)
- Survey according to diameters:

Diameter	Length (m)	Number of identical elements:
16	0.49	52
16	4.18	6

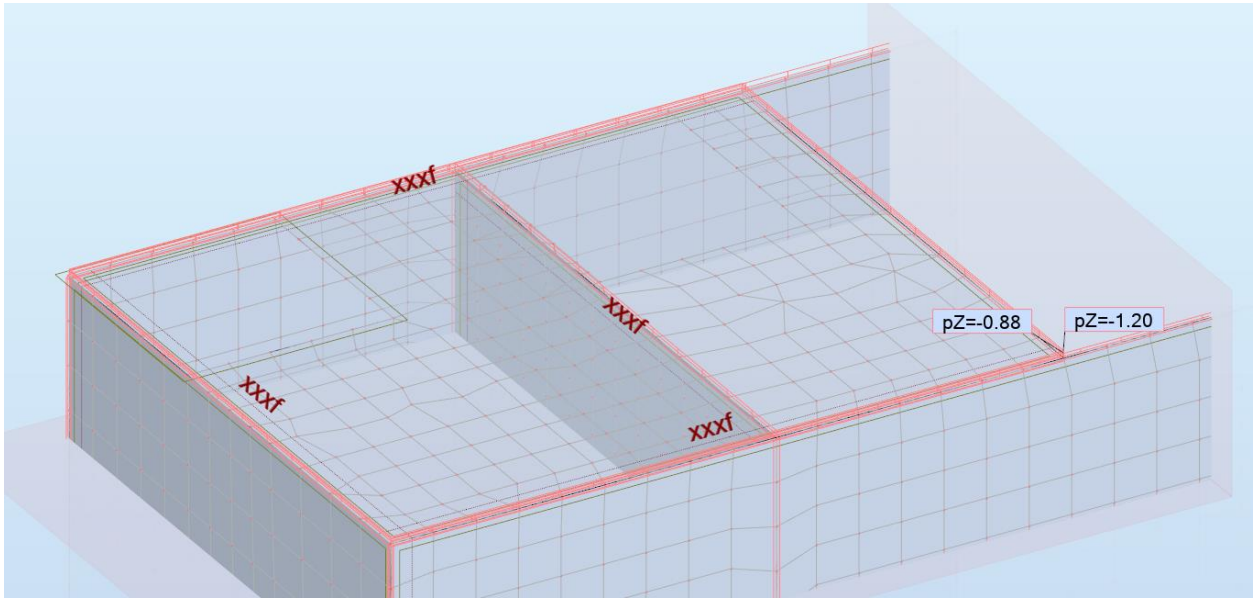
IŠVADA: sienos laikomoji galia užtikrinta.

1.8. Lifto ir laiptinės monolitinės perdangos plokštės projektavimas

Projektuojama monolitinė GB perdanga.

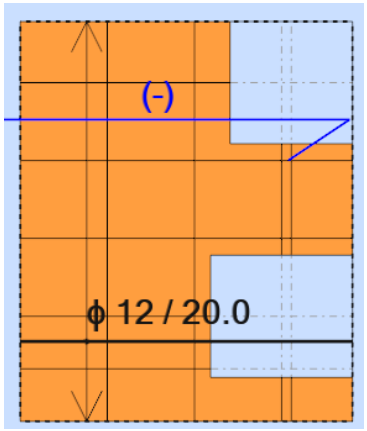
- Betonas: C30/37 XC1;
- Armatūra: S500;
- Apsauginis betono sluoksnis: ne mažiau kaip armatūros skersmuo ir ne mažiau nei 30 mm iki pagrindinės armatūros krašto.
- Ugniaatsparumas REI 45;
- Projektuojamos perdangos storis: 200 mm
- Perdanga remiasi ant mūrių sienų lanksčiai.
-

Skaičiuojamoji schema su veikiančiomis charakteristinėmis apkrovomis:

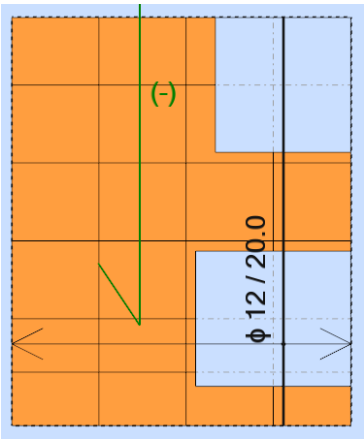


Žemesnės perdangos reikalingas armavimas.

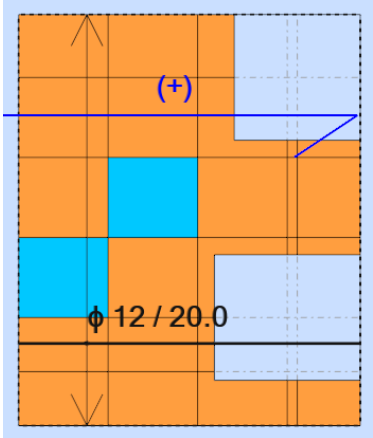
Apatinis armavimas X kryptimi:



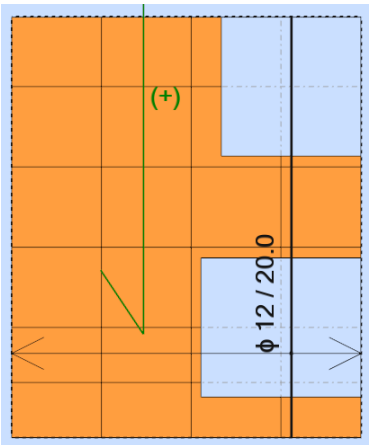
Apatinis armavimas Y kryptimi:



Viršutinis armavimas X kryptimi:



Viršutinis armavimas Y kryptimi:



1. Slab: Slab256 - Panel no. 256

1.1. Reinforcement:

- Type : perdanga1
- Main reinforcement direction : 0°

Main reinforcement grade : B500B; Characteristic strength = 500.00 MPa
Horizontal branch of the stress-strain diagram

- Ductility class : B

- Bar diameters — bottom d1 = 1.2 (cm) d2 = 1.2 (cm); top d1 = 1.2 (cm) d2 = 1.2 (cm)
- Cover — bottom c1 = 3.0 (cm); top c2 = 3.0 (cm)
- Cover deviations — Cdev = 1.0(cm), Cdur = 0.0(cm)

1.2. Concrete

Class : C30/37; Characteristic strength = 30.00 MPa
Rectangular stress distribution [3.1.7(3)]

- Density : 2501.36 (kG/m3)
- Concrete creep coefficient : 1.73
- Cement class : N

1.3. Hypothesis

- Calculations according to : EN 1992-1-1:2004/A1:2014
- Method of reinforcement area calculations : analytical
- Allowable cracking width
  - upper layer : 0.30 (mm)
  - lower layer : 0.30 (mm)
- Allowable deflection : 1.5 (cm)
- Verification of punching : yes
- Exposure
  - upper layer : XC1
  - lower layer : XC1
- Calculation type : simple bending
- Structure class : S4

Modified partial coefficients:

a_{cc} = 0.9 1992-1-1 3.1.6 (1)P

1.4. Slab geometry

Thickness 0.20 (m)

Contour:

edge	beginning x1	beginning y1	end x2	end y2	length (m)
1	0.00	0.00	3.26	0.00	3.26
2	3.26	0.00	3.26	3.93	3.93
3	3.26	3.93	0.00	3.93	3.26
4	0.00	3.93	0.00	0.00	3.93

Support:

n°	Name	dimensions (m)	coordinates x	coordinates y	edge
0	linear	0.38 / 0.25	3.26	0.19	□
0	linear	0.38 / 0.25	3.26	0.19	□
0	linear	0.25 / 1.96	0.98	3.93	□
0	linear	0.25 / 1.96	0.98	3.93	□
0	linear	0.25 / 1.77	0.88	1.68	□
35673	linear	0.50 / 0.50	1.22	3.77	□
35676	linear	0.50 / 0.50	1.22	1.96	□
35678	linear	0.50 / 0.50	1.22	3.10	□
35672	linear	0.50 / 0.50	1.22	2.38	□

* - head present

1.5. Calculation results:

1.5.1. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Provided reinforcement (cm2/m):	5.65	5.65	5.65	5.65
Modified required reinforcement (cm2/m):	4.52	4.52	4.52	4.52
Original required reinforcement (cm2/m):	4.52	4.52	4.52	4.52
Coordinates (m):	3.26;0.19	3.26;0.19	3.26;0.19	3.26;0.19

1.5.2. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Symbol: required area/provided area				
Ax(+) (cm2/m)	**4.52/5.65**	4.52/5.65	4.52/5.65	4.52/5.65
Ax(-) (cm2/m)	4.52/5.65	**4.52/5.65**	4.52/5.65	4.52/5.65
Ay(+) (cm2/m)	4.52/5.65	4.52/5.65	**4.52/5.65**	4.52/5.65
Ay(-) (cm2/m)	4.52/5.65	4.52/5.65	4.52/5.65	**4.52/5.65**
SLS				
Mxx (kN*m/m)	5.77	5.77	5.77	5.77
Myy (kN*m/m)	-1.48	-1.48	-1.48	-1.48
Mxy (kN*m/m)	2.76	2.76	2.76	2.76
Nxx (kN/m)	10.40	10.40	10.40	10.40
Nyy (kN/m)	17.00	17.00	17.00	17.00
Nxy (kN/m)	3.71	3.71	3.71	3.71
ULS				
Mxx (kN*m/m)	7.59	7.59	7.59	7.59
Myy (kN*m/m)	-1.93	-1.93	-1.93	-1.93
Mxy (kN*m/m)	3.62	3.62	3.62	3.62
Nxx (kN/m)	13.88	13.88	13.88	13.88
Nyy (kN/m)	22.28	22.28	22.28	22.28
Nxy (kN/m)	4.86	4.86	4.86	4.86
Coordinates (m)	3.26;0.19	3.26;0.19	3.26;0.19	3.26;0.19
Coordinates* (m)	28.69;0.00;12.50	28.69;0.00;12.50	28.69;0.00;12.50	
	28.69;0.00;12.50			

* - Coordinates in the structure global coordinate system

1.5.3. Punching

Support no. / Point	Location (m)			Geometry: (m)			
	x	y		a	b	d	h
P1 (35627)	1.22	3.77	Force	0.50	0.50	-	-
P2 (35630)	1.22	1.96	Force	0.50	0.50	-	-
P3 (35632)	1.22	3.10	Force	0.50	0.50	-	-
P4 (35626)	1.22	2.38	Force	0.50	0.50	-	-

Support no. / Point	Loads: (kN)		Critical perimeter (m)	
	Q	Qadm	u	Qadm / Q
P1 (35627)	0.00	0.00	0.00	##### < 1
P2 (35630)	0.00	0.00	0.00	##### < 1

P3 (35632)	13.00	83.13	0.97	6.39 > 1
P4 (35626)	26.00	83.13	0.97	3.20 > 1

Support no. / Point: P1 (35627)

uo = @V_U(Data_p=Uo)@
u1 = @V_U(Data_p=U1)@
ρLx = @VAL(Data_p=RoLx)@
ρLy = @VAL(Data_p=RoLy)@
heff = @V_U(Data_p=EffHeight)@
Ax = @V_U(Data_p=Ax)@
Ay = @V_U(Data_p=Ay)@
α = @VAL(Data_p=Alpha)@
ν = @VAL(Data_p=Ni)@
γc = @VAL(Data_p=Gamma_c)@
fcd = @V_U(Data_p=Fcd)@
vRdmax = @V_U(Data_p=VRdmax)@

vRdc = @V_U(Data_p=VRdc)@
v min = @V_U(Data_p=v_min)@
vEds = @V_U(Data_p=VEds)@
cRdc= @VAL(Data_p=CRdc)@
k = @VAL(Data_p=K)@
ρL = @VAL(Data_p=RoL)@
vlim = @V_U(Data_p=StressLimit)@
v (u1)= @V_U(Data_p=Stress)@
A = @V_U(Data_p=ShearArea)@

Support no. / Point: P2 (35630)

uo = @V_U(Data_p=Uo)@
u1 = @V_U(Data_p=U1)@
ρLx = @VAL(Data_p=RoLx)@
ρLy = @VAL(Data_p=RoLy)@
heff = @V_U(Data_p=EffHeight)@
Ax = @V_U(Data_p=Ax)@
Ay = @V_U(Data_p=Ay)@
α = @VAL(Data_p=Alpha)@
ν = @VAL(Data_p=Ni)@
γc = @VAL(Data_p=Gamma_c)@
fcd = @V_U(Data_p=Fcd)@
vRdmax = @V_U(Data_p=VRdmax)@

vRdc = @V_U(Data_p=VRdc)@
v min = @V_U(Data_p=v_min)@
vEds = @V_U(Data_p=VEds)@
cRdc= @VAL(Data_p=CRdc)@
k = @VAL(Data_p=K)@
ρL = @VAL(Data_p=RoL)@
vlim = @V_U(Data_p=StressLimit)@
v (u1)= @V_U(Data_p=Stress)@
A = @V_U(Data_p=ShearArea)@

Support no. / Point: P3 (35632)

uo = 0.47 (m)
u1 = 0.97 (m)
ρLx = 0.00
ρLy = 0.00
heff = 15.8 (cm)

Ax = 5.65 (cm2)
Ay = 5.65 (cm2)
α = 1.57
ν = 0.53
γc = 1.50
fcd = 20.00 (MPa)
vRdmax = 4.22 (MPa)
V = 13.00 (kN)
Mx = 0.00 (kN*m)
My = 0.00 (kN*m)
A = 0.32 (m2)
Kx = 0.60
Ky = 0.60
Wx = 0.07
Wy = 0.16

vRdc = 0.53 (MPa)
v min = 0.54 (MPa)
vEds = 0.17 (MPa)
cRdc= 0.12
k = 2.00
ρL = 0.00
vlim = 0.54 (MPa)
v (u1)= 0.08 (MPa)
A = 0.15 (m2)

Support no. / Point: P4 (35626)

uo = 0.47 (m)
u1 = 0.97 (m)
ρLx = 0.00
ρLy = 0.00
heff = 15.8 (cm)
Ax = 5.65 (cm2)
Ay = 5.65 (cm2)
α = 1.57
ν = 0.53
γc = 1.50
fcd = 20.00 (MPa)
vRdmax = 4.22 (MPa)
V = 26.00 (kN)
Mx = 0.00 (kN*m)
My = 0.00 (kN*m)
A = 0.32 (m2)
Kx = 0.60
Ky = 0.60
Wx = 0.18
Wy = 0.17

vRdc = 0.53 (MPa)
v min = 0.54 (MPa)
vEds = 0.35 (MPa)
cRdc= 0.12
k = 2.00
ρL = 0.00
vlim = 0.54 (MPa)
v (u1)= 0.17 (MPa)
A = 0.15 (m2)

1.5.4. Deflection
|f(+)| = 0.1 (cm) <= $f_{dop}(+)$ = 1.5 (cm)
|f(-)| = 0.3 (cm) <= $f_{dop}(-)$ = 1.5 (cm)

1.5.5. Cracking
upper layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)
lower layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)

3. Results - detailing

List of solutions:
Reinforcement: bars

Solution no.	Reinforcement range Diameter / Weight	Total weight (kG)
1	-	162.57

Results for the solution no. 1
Reinforcement zones

Bottom reinforcement

Name	coordinates				Provided reinforcement	At Ar
	x1	y1	x2	y2	ϕ (mm) / (cm)	(cm2/m)
1/1- Ax Main	0.00	0.00	3.26	3.93	12.0 / 20.0	4.52 < 5.65
1/2- Ay Perpendicular	0.00	0.00	3.26	3.93	12.0 / 20.0	4.52 < 5.65

Top reinforcement

Name	coordinates				Provided reinforcement	At Ar
	x1	y1	x2	y2	ϕ (mm) / (cm)	(cm2/m)
1/3+ Ax Main	0.00	0.00	3.26	3.93	12.0 / 20.0	4.52 < 5.65
1/4+ Ay Perpendicular	0.00	0.00	3.26	3.93	12.0 / 20.0	4.52 < 5.65

4. Material survey

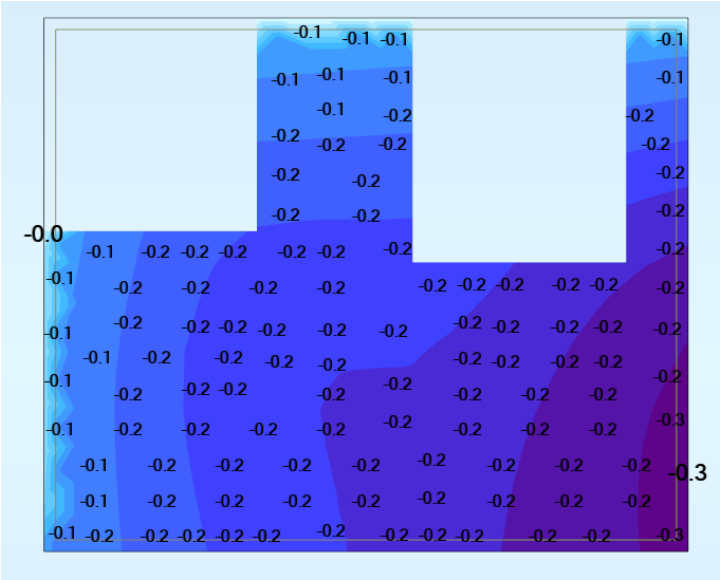
- Concrete volume = 2.56 (m3)
- Formwork = 12.78 (m2)
- Slab circumference = 14.36 (m)
- Area of openings = 3.62 (m2)

- Steel B500B

- Total weight = 171.94 (kG)
- Density = 67.29 (kG/m3)
- Average diameter = 12.0 (mm)
- Survey according to diameters:

Diameter	Length (m)	Number of identical elements:
12	0.32	12
12	0.89	12
12	1.51	4
12	1.71	12
12	1.90	12
12	2.19	6
12	2.20	4
12	3.20	12
12	3.87	18

Monolitinės perdangos deformacijos:



Ribinis perdangos ribinis įlinkis:

L/200 = 3,25/200 = 1,6 cm.

Perdangos įlinkis: 0,3 cm < 1,6 cm.

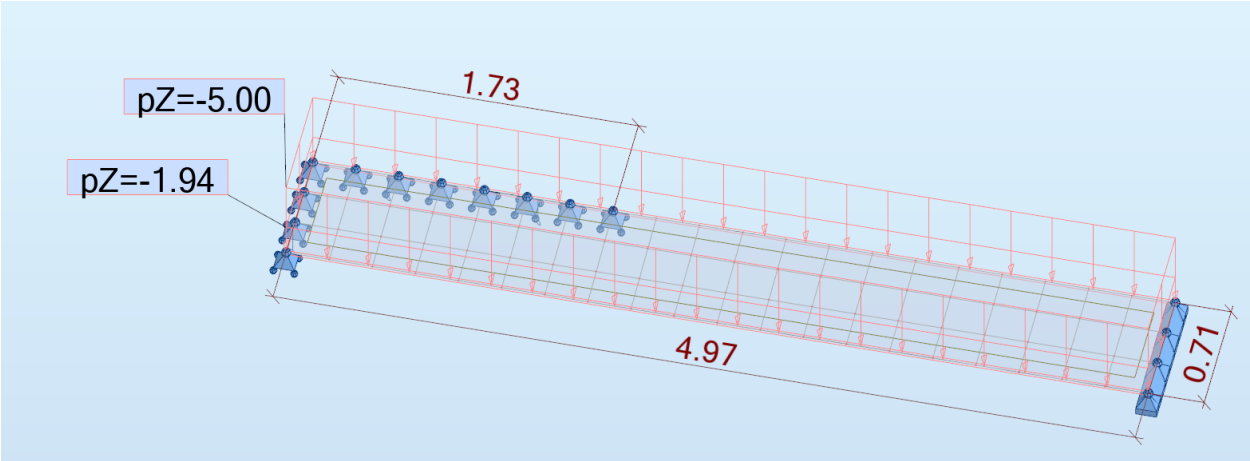
IŠVADA: perdangos laikomoji galia užtikrinta. Įlinkiai neviršija ribinių.

1.9. MP-7 monolitinės perdangos plokštės projektavimas

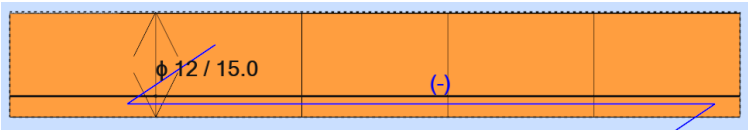
Projektuojama monolitinė GB perdanga.

- Betonas: C30/37 XC1;
- Armatūra: S500;
- Apsauginis betono sluoksnis: ne mažiau kaip armatūros skersmuo ir ne mažiau nei 30 mm iki pagrindinės armatūros krašto.
- Ugniaatsparumas REI 45;
- Projektuojamos perdangos storis: 200 mm;
- Perdanga remiasi ant mūrių sienų lanksčiai.

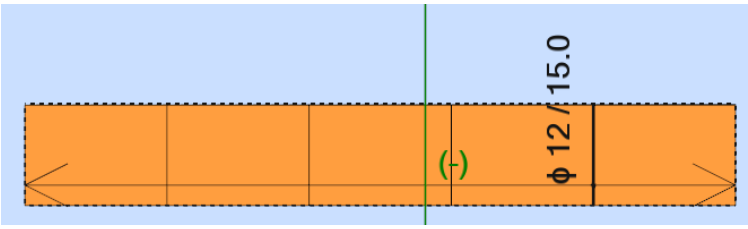
Skaičiuojamoji schema su veikiančiomis charakteristinėmis apkrovomis:



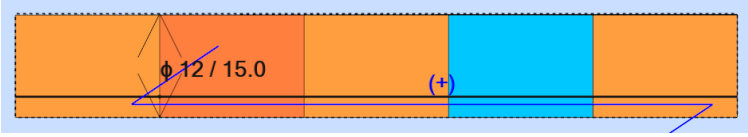
Apatinis armavimas X kryptimi:



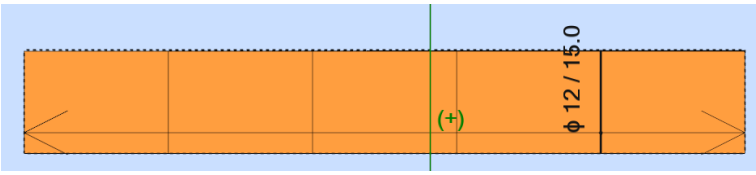
Apatinis armavimas Y kryptimi:



Viršutinis armavimas X kryptimi:



Viršutinis armavimas Y kryptimi:



1. Slab: Slab1 - Panel no. 1

1.1. Reinforcement:

- Type : perdanga
- Main reinforcement direction : 0°

Main reinforcement grade : B500B; Characteristic strength = 500.00 MPa
Horizontal branch of the stress-strain diagram

- Ductility class : B
- Bar diameters bottom d1 = 1.2 (cm) d2 = 1.2 (cm)
  top d1 = 1.2 (cm) d2 = 1.2 (cm)
- Cover bottom c1 = 3.0 (cm)
  top c2 = 3.0 (cm)
- Cover deviations Cdev = 1.0(cm), Cdur = 0.0(cm)

1.2. Concrete

Class : C30/37; Characteristic strength = 30.00 MPa
Rectangular stress distribution [3.1.7(3)]

- Density : 2501.36 (kG/m3)
- Concrete creep coefficient : 1.73
- Cement class : N

1.3. Hypothesis

- Calculations according to : EN 1992-1-1:2004/A1:2014
- Method of reinforcement area calculations : analytical
- Allowable cracking width
  - upper layer : 0.30 (mm)
  - lower layer : 0.30 (mm)
- Allowable deflection : 2.5 (cm)
- Verification of punching : no
- Exposure
  - upper layer : XC1
  - lower layer : XC1
- Calculation type : simple bending
- Structure class : S4

Modified partial coefficients:
a_{cc} = 0.9 1992-1-1 3.1.6 (1)P

1.4. Slab geometry

Thickness 0.20 (m)

Contour:

edge	beginning x1	beginning y1	end x2	end y2	length (m)
1	0.00	-0.70	4.97	-0.70	4.97

2	4.97	-0.70	4.97	0.01	0.71
3	4.97	0.01	0.00	0.00	4.97
4	0.00	0.00	0.00	-0.70	0.70

Support:

n°	Name	dimensions (m)	coordinates x	y	edge

* - head present

1.5. Calculation results:

1.5.1. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Provided reinforcement (cm2/m):	7.54	7.54	7.54	7.54
Modified required reinforcement (cm2/m):	6.10	4.52	4.52	4.52
Original required reinforcement (cm2/m):	6.10	4.52	4.52	4.52
Coordinates (m):	1.73;0.00	0.25;-0.70	0.00;-0.70	0.25;-0.70

1.5.2. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Symbol: required area/provided area				
Ax(+) (cm2/m)	**6.10/7.54**	4.52/7.54	4.52/7.54	4.52/7.54
Ax(-) (cm2/m)	4.52/7.54	**4.52/7.54**	4.52/7.54	4.52/7.54
Ay(+) (cm2/m)	4.52/7.54	4.52/7.54	**4.52/7.54**	4.52/7.54
Ay(-) (cm2/m)	4.52/7.54	4.52/7.54	4.52/7.54	**4.52/7.54**
SLS				
Mxx (kN*m/m)	28.77	-1.94	5.20	-1.94
Myy (kN*m/m)	7.10	-0.99	4.94	-0.99
Mxy (kN*m/m)	-2.11	-3.97	-4.06	-3.97
Nxx (kN/m)	0.00	0.00	0.00	0.00
Nyy (kN/m)	0.00	0.00	0.00	0.00
Nxy (kN/m)	0.00	0.00	0.00	0.00
ULS				
Mxx (kN*m/m)	38.23	-2.58	6.92	-2.58
Myy (kN*m/m)	9.43	-1.31	6.57	-1.31
Mxy (kN*m/m)	-2.80	-5.27	-5.40	-5.27
Nxx (kN/m)	0.00	0.00	0.00	0.00
Nyy (kN/m)	0.00	0.00	0.00	0.00
Nxy (kN/m)	0.00	0.00	0.00	0.00
Coordinates (m)	1.73;0.00	0.25;-0.70	0.00;-0.70	0.25;-0.70
Coordinates* (m)	1.73;0.70;0.00 0.25;0.00;0.00	0.25;0.00;0.00	0.00;0.00;0.00	

* - Coordinates in the structure global coordinate system

1.5.4. Deflection

|f(+)| = 0.0 (cm) <= f_{dop}(+) = 2.5 (cm)

|f(-)| = 0.3 (cm) <= f_{dop}(-) = 2.5 (cm)

1.5.5. Cracking
upper layer
ax = 0.22 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)
lower layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)

3. Results - detailing

List of solutions:
Reinforcement: bars

Solution no.	**Reinforcement range Diameter / Weight**	**Total weight (kG)**
1	-	82.69

Results for the solution no. 1
Reinforcement zones

Bottom reinforcement

Name	**coordinates Ar**				**Provided reinforcement**	**At**
	x1	**y1**	**x2**	**y2**	**ϕ (mm) / (cm)**	**(cm2/m)**
1/1- Ax Main	0.00	-0.70	4.97	0.01	12.0 / 15.0	4.52 < 7.54
1/2- Ay Perpendicular	0.00	-0.70	4.97	0.01	12.0 / 15.0	4.52 < 7.54

Top reinforcement

Name	**coordinates Ar**				**Provided reinforcement**	**At**
	x1	**y1**	**x2**	**y2**	**ϕ (mm) / (cm)**	**(cm2/m)**
1/3+ Ax Main	0.00	-0.70	4.97	0.01	12.0 / 15.0	6.10 < 7.54
1/4+ Ay Perpendicular	0.00	-0.70	4.97	0.01	12.0 / 15.0	4.52 < 7.54

4. Material survey

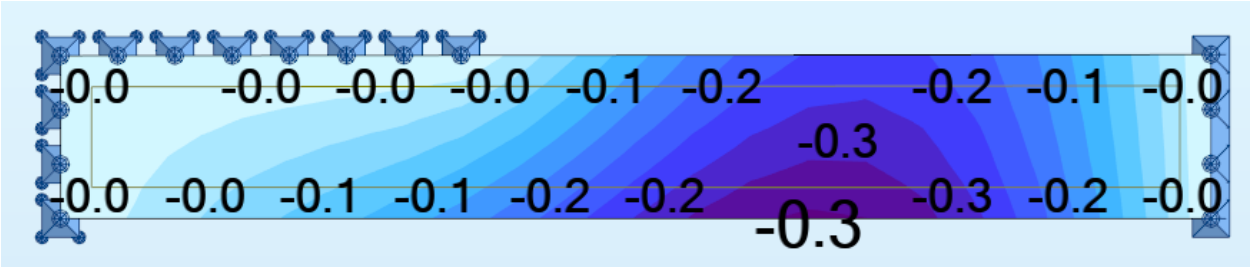
- Concrete volume = 0.70 (m3)
- Formwork = 3.49 (m2)
- Slab circumference = 11.35 (m)
- Area of openings = 0.00 (m2)

- Steel B500B
- Total weight = 81.27 (kG)
- Density = 116.38 (kG/m3)
- Average diameter = 12.0 (mm)
- Survey according to diameters:

Diameter Length Number of identical elements:

	(m)	
12	0.64	66
12	4.91	10

Monolitinės perdangos deformacijos:



Ribinis perdangos ribinis įlinkis:

L/200 = 4,97/200 = 2,5 cm.

Perdangos įlinkis: 0,3 cm < 2,5 cm.

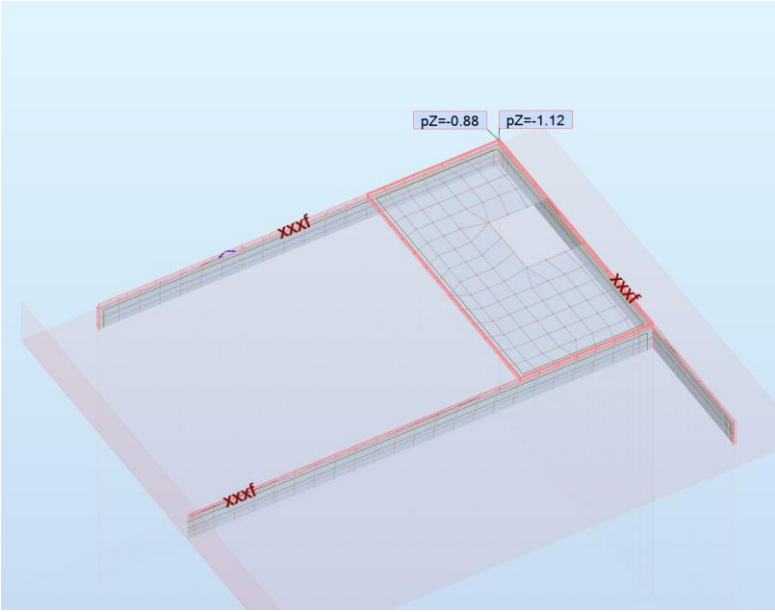
IŠVADA: perdangos laikomoji galia užtikrinta. Įlinkiai neviršija ribinių.

1.10. MP-8 monolitinės perdangos plokštės projektavimas

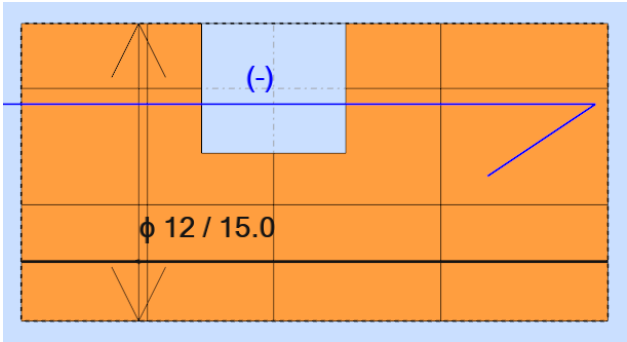
Projektuojama monolitinė GB perdanga.

- Betonas: C30/37 XC1;
- Armatūra: S500;
- Apsauginis betono sluoksnis: ne mažiau kaip armatūros skersmuo ir ne mažiau nei 30 mm iki pagrindinės armatūros krašto.
- Ugniaatsparumas REI 45;
- Projektuojamos perdangos storis: 200 mm;
- Perdanga remiasi ant mūrių sienų lanksčiai.

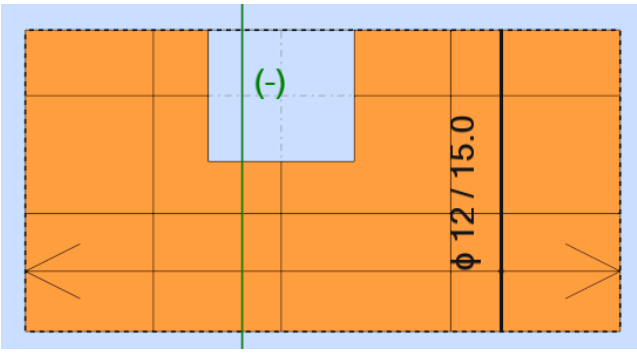
Skaičiuojamoji schema su veikiančiomis charakteristinėmis apkrovomis:



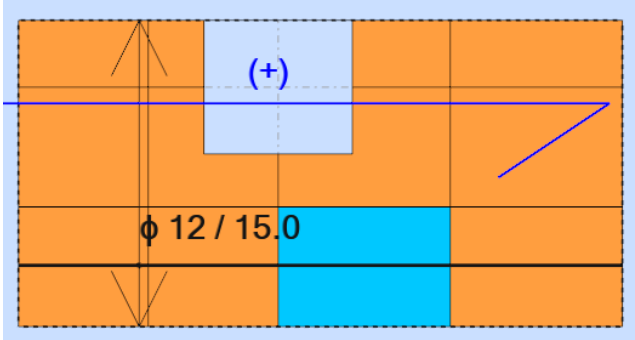
Apatinis armavimas X kryptimi:



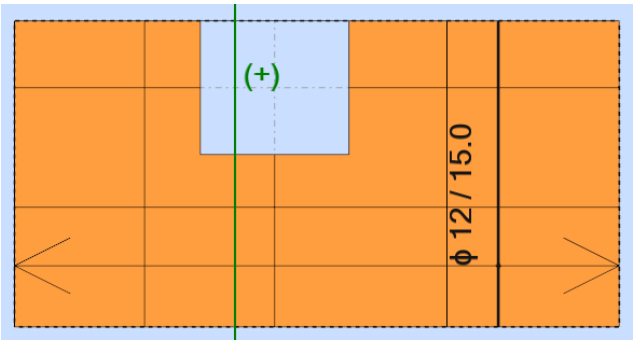
Apatinis armavimas Y kryptimi:



Viršutinis armavimas X kryptimi:



Viršutinis armavimas Y kryptimi:



1. Slab: Slab34 - Panel no. 34

1.1. Reinforcement:

- Type : perdanga1
- Main reinforcement direction : 0°

Main reinforcement grade : B500B; Characteristic strength = 500.00 MPa
Horizontal branch of the stress-strain diagram

- Ductility class : B
- Bar diameters bottom d1 = 1.2 (cm) d2 = 1.2 (cm)
  top d1 = 1.2 (cm) d2 = 1.2 (cm)
- Cover bottom c1 = 3.0 (cm)
  top c2 = 3.0 (cm)
- Cover deviations Cdev = 1.0(cm), Cdur = 0.0(cm)

1.2. Concrete

Class : C30/37; Characteristic strength = 30.00 MPa
Rectangular stress distribution [3.1.7(3)]

- Density : 2501.36 (kG/m3)
- Concrete creep coefficient : 1.73
- Cement class : N

1.3. Hypothesis

- Calculations according to : EN 1992-1-1:2004/A1:2014
- Method of reinforcement area calculations : analytical
- Allowable cracking width
  - upper layer : 0.30 (mm)
  - lower layer : 0.30 (mm)
- Allowable deflection : 1.5 (cm)
- Verification of punching : no
- Exposure
  - upper layer : XC1
  - lower layer : XC1
- Calculation type : simple bending
- Structure class : S4

Modified partial coefficients:

a_{cc} = 0.9 1992-1-1 3.1.6 (1)P

1.4. Slab geometry

Thickness 0.20 (m)

Contour:

edge	beginning		end		length
	x1	y1	x2	y2	(m)
1	0.00	0.00	3.25	0.00	3.25
2	3.25	0.00	3.25	-1.65	1.65
3	3.25	-1.65	0.00	-1.65	3.25
4	0.00	-1.65	0.00	0.00	1.65

Support:

n°	Name	dimensions (m)	coordinates x	y	edge
0	linear	0.25 / 1.00	0.50	0.00	□
0	linear	1.65 / 0.25	0.00	-0.82	□
0	linear	1.65 / 0.25	0.00	-0.82	□
0	linear	1.65 / 0.25	3.25	-0.83	□

* - head present

1.5. Calculation results:

1.5.1. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Provided reinforcement (cm2/m):	7.54	7.54	7.54	7.54
Modified required reinforcement (cm2/m):	4.52	4.52	4.52	4.52
Original required reinforcement (cm2/m):				

	4.52	4.52	4.52	4.52
Coordinates (m):	0.00;-0.94	3.02;-1.03	0.00;-0.94	3.02;-1.03

1.5.2. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Symbol: required area/provided area				
Ax(+) (cm2/m)	**4.52/7.54**	0.25/7.54	4.52/7.54	0.25/7.54
Ax(-) (cm2/m)	4.52/7.54	**4.52/7.54**	4.52/7.54	4.52/7.54
Ay(+) (cm2/m)	4.52/7.54	0.19/7.54	**4.52/7.54**	0.19/7.54
Ay(-) (cm2/m)	4.52/7.54	4.52/7.54	4.52/7.54	**4.52/7.54**
	SLS			
Mxx (kN*m/m)	0.36	-0.84	0.36	-0.84
Myy (kN*m/m)	0.45	-1.18	0.45	-1.18
Mxy (kN*m/m)	-2.78	1.92	-2.78	1.92
Nxx (kN/m)	-2.25	-0.11	-2.25	-0.11
Nyy (kN/m)	-1.50	0.01	-1.50	0.01
Nxy (kN/m)	1.00	-0.01	1.00	-0.01
	ULS			
Mxx (kN*m/m)	0.47	-1.12	0.47	-1.12
Myy (kN*m/m)	0.60	-1.58	0.60	-1.58
Mxy (kN*m/m)	-3.73	2.57	-3.73	2.57
Nxx (kN/m)	-2.94	-0.14	-2.94	-0.14
Nyy (kN/m)	-1.95	0.01	-1.95	0.01
Nxy (kN/m)	1.32	-0.01	1.32	-0.01
Coordinates (m)	0.00;-0.94	3.02;-1.03	0.00;-0.94	3.02;-1.03
Coordinates* (m)	23.19;0.00;12.50 23.28;3.02;12.50	23.28;3.02;12.50	23.19;0.00;12.50	

* - Coordinates in the structure global coordinate system

1.5.4. Deflection

|f(+)| = 0.0 (cm) <= $f_{dop}(+)$ = 1.5 (cm)
|f(-)| = 0.3 (cm) <= $f_{dop}(-)$ = 1.5 (cm)

1.5.5. Cracking

upper layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)
lower layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)

3. Results - detailing

List of solutions:
Reinforcement: bars

Solution no.	Reinforcement range Diameter / Weight	Total weight (kG)
1	-	113.55

Results for the solution no. 1
Reinforcement zones

Bottom reinforcement

Name	coordinates x1	y1	x2	y2	Provided reinforcement ϕ (mm) / (cm)	At Ar (cm2/m)
1/1- Ax Main	0.00	-1.65	3.25	0.00	12.0 / 15.0	4.52 < 7.54
1/2- Ay Perpendicular	0.00	-1.65	3.25	0.00	12.0 / 15.0	4.52 < 7.54

Top reinforcement

Name	coordinates x1	y1	x2	y2	Provided reinforcement ϕ (mm) / (cm)	At Ar (cm2/m)
1/3+ Ax Main	0.00	-1.65	3.25	0.00	12.0 / 15.0	4.52 < 7.54
1/4+ Ay Perpendicular	0.00	-1.65	3.25	0.00	12.0 / 15.0	4.52 < 7.54

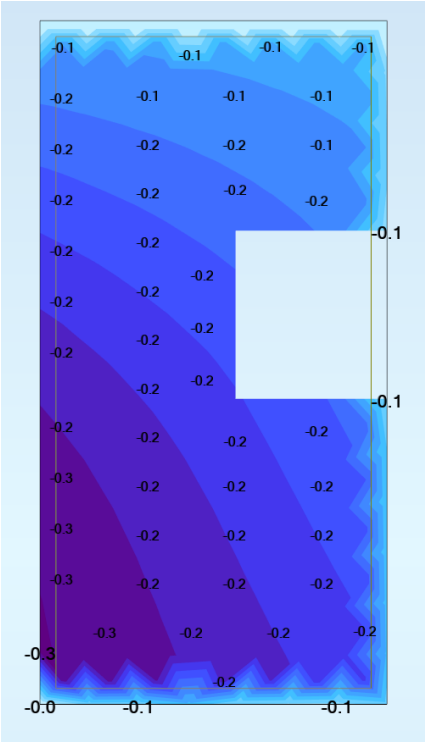
4. Material survey

- Concrete volume = 1.07 (m3)
- Formwork = 5.37 (m2)
- Slab circumference = 9.81 (m)
- Area of openings = 0.58 (m2)

- Steel B500B
- Total weight = 113.01 (kG)
- Density = 105.21 (kG/m3)
- Average diameter = 12.0 (mm)
- Survey according to diameters:

Diameter	Length (m)	Number of identical elements:
12	0.87	10
12	0.94	8
12	1.38	8
12	1.39	10
12	1.59	30
12	3.19	12

Monolitinės perdangos deformacijos:



Ribinis perdangos ribinis įlinkis:

L/200 = 3,25/200 = 2,6 cm.

Perdangos įlinkis: 0,3 cm < 2,6 cm.

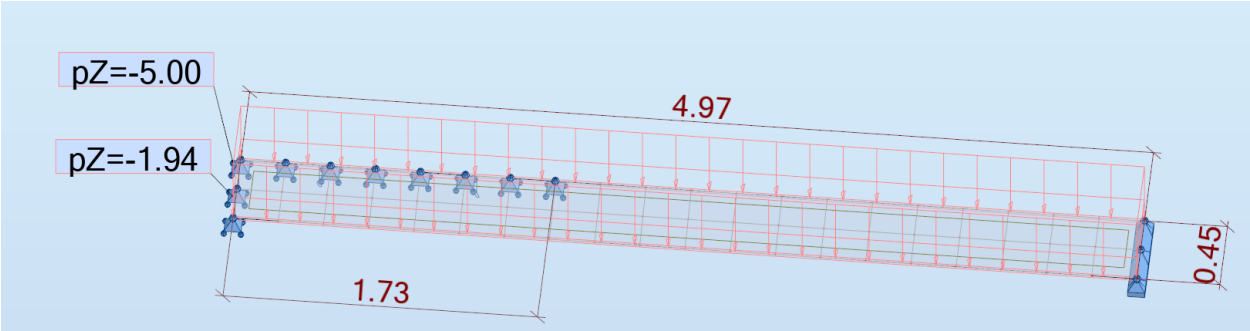
IŠVADA: perdangos laikomoji galia užtikrinta. Įlinkiai neviršija ribinių.

1.11. MP-9 monolitinės perdangos plokštės projektavimas

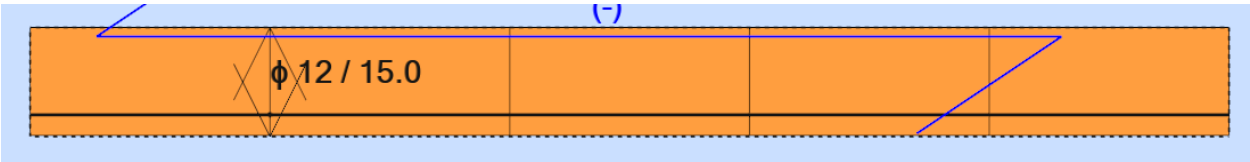
Projektuojama monolitinė GB perdanga.

- Betonas: C30/37 XC1;
- Armatūra: S500;
- Apsauginis betono sluoksnis: ne mažiau kaip armatūros skersmuo ir ne mažiau nei 30 mm iki pagrindinės armatūros krašto.
- Ugniaatsparumas REI 45;
- Projektuojamos perdangos storis: 200 mm;
- Perdanga remiasi ant mūrių sienų lanksčiai.

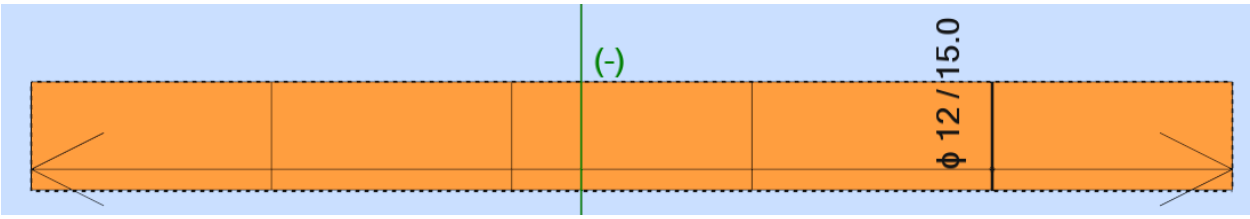
Skaičiuojamoji schema su veikiančiomis charakteristinėmis apkrovomis:



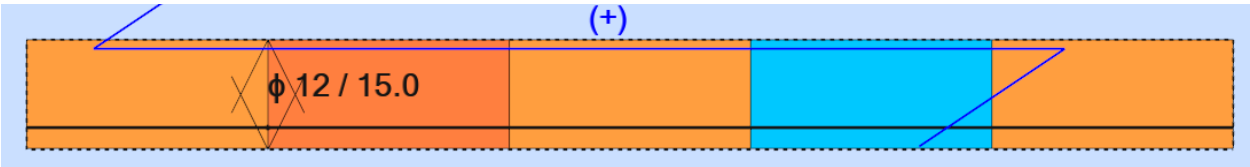
Apatinis armavimas X kryptimi:



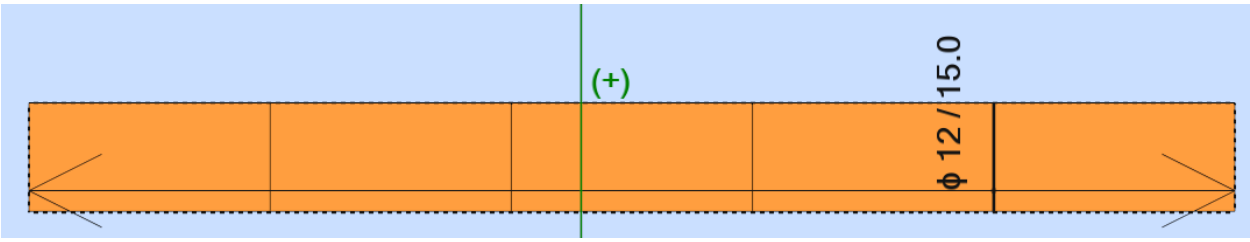
Apatinis armavimas Y kryptimi:



Viršutinis armavimas X kryptimi:



Viršutinis armavimas Y kryptimi:



1. Slab: Slab1 - Panel no. 1

1.1. Reinforcement:

- Type : perdanga
- Main reinforcement direction : 0°

Main reinforcement grade : B500B; Characteristic strength = 500.00 MPa
Horizontal branch of the stress-strain diagram

- Ductility class : B
- Bar diameters bottom d1 = 1.2 (cm) d2 = 1.2 (cm)
  top d1 = 1.2 (cm) d2 = 1.2 (cm)
- Cover bottom c1 = 3.0 (cm)
  top c2 = 3.0 (cm)
- Cover deviations Cdev = 1.0(cm), Cdur = 0.0(cm)

1.2. Concrete

Class : C30/37; Characteristic strength = 30.00 MPa
Rectangular stress distribution [3.1.7(3)]

- Density : 2501.36 (kG/m3)
- Concrete creep coefficient : 1.73
- Cement class : N

1.3. Hypothesis

- Calculations according to : EN 1992-1-1:2004/A1:2014
- Method of reinforcement area calculations : analytical
- Allowable cracking width
  - upper layer : 0.30 (mm)
  - lower layer : 0.30 (mm)
- Allowable deflection : 2.5 (cm)
- Verification of punching : no
- Exposure
  - upper layer : XC1
  - lower layer : XC1
- Calculation type : simple bending
- Structure class : S4

Modified partial coefficients:
a_{cc} = 0.9 1992-1-1 3.1.6 (1)P

1.4. Slab geometry

Thickness 0.20 (m)

Contour:

edge	beginning x1	y1	end x2	y2	length (m)
1	0.00	-0.45	4.97	-0.45	4.97
2	4.97	-0.45	4.97	0.00	0.45
3	4.97	0.00	0.00	0.00	4.97
4	0.00	0.00	0.00	-0.45	0.45

Support:

n°	Name	dimensions (m)	coordinates x	y	edge

* - head present

1.5. Calculation results:

1.5.1. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Provided reinforcement (cm2/m):	7.54	7.54	7.54	7.54
Modified required reinforcement (cm2/m):	4.81	4.52	4.52	4.52
Original required reinforcement (cm2/m):	4.81	4.52	4.52	4.52
Coordinates (m):	1.73;0.00	0.25;-0.45	0.00;-0.45	0.25;-0.45

1.5.2. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Symbol: required area/provided area				
Ax(+) (cm2/m)	**4.81/7.54**	4.52/7.54	4.52/7.54	4.52/7.54
Ax(-) (cm2/m)	4.52/7.54	**4.52/7.54**	4.52/7.54	4.52/7.54
Ay(+) (cm2/m)	4.52/7.54	4.52/7.54	**4.52/7.54**	4.52/7.54
Ay(-) (cm2/m)	4.52/7.54	4.52/7.54	4.52/7.54	**4.52/7.54**
SLS				
Mxx (kN*m/m)	23.04	-1.30	3.59	-1.30
Myy (kN*m/m)	5.22	-0.73	3.47	-0.73
Mxy (kN*m/m)	-1.84	-2.82	-2.90	-2.82
Nxx (kN/m)	0.00	0.00	0.00	0.00
Nyy (kN/m)	0.00	0.00	0.00	0.00
Nxy (kN/m)	0.00	0.00	0.00	0.00
ULS				
Mxx (kN*m/m)	30.62	-1.72	4.77	-1.72
Myy (kN*m/m)	6.93	-0.97	4.61	-0.97
Mxy (kN*m/m)	-2.44	-3.74	-3.85	-3.74
Nxx (kN/m)	0.00	0.00	0.00	0.00
Nyy (kN/m)	0.00	0.00	0.00	0.00
Nxy (kN/m)	0.00	0.00	0.00	0.00
Coordinates (m)	1.73;0.00	0.25;-0.45	0.00;-0.45	0.25;-0.45
Coordinates* (m)	1.73;0.45;0.00 0.25;0.00;0.00	0.25;0.00;0.00	0.00;0.00;0.00	

* - Coordinates in the structure global coordinate system

1.5.4. Deflection
|f(+)| = 0.0 (cm) <= f_{dop}(+) = 2.5 (cm)
|f(-)| = 0.1 (cm) <= f_{dop}(-) = 2.5 (cm)

1.5.5. Cracking
upper layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)
lower layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)

3. Results - detailing

List of solutions:
Reinforcement: bars

Solution no.	**Reinforcement range Diameter / Weight**	**Total weight (kG)**
1	-	52.38

Results for the solution no. 1
Reinforcement zones

Bottom reinforcement

Name	**coordinates Ar**				**Provided reinforcement**	**At**
	x1	**y1**	**x2**	**y2**	**ϕ (mm) / (cm)**	**(cm2/m)**
1/1- Ax Main	0.00	-0.45	4.97	0.00	12.0 / 15.0	4.52 < 7.54
1/2- Ay Perpendicular	0.00	-0.45	4.97	0.00	12.0 / 15.0	4.52 < 7.54

Top reinforcement

Name	**coordinates Ar**				**Provided reinforcement**	**At**
	x1	**y1**	**x2**	**y2**	**ϕ (mm) / (cm)**	**(cm2/m)**
1/3+ Ax Main	0.00	-0.45	4.97	0.00	12.0 / 15.0	4.81 < 7.54
1/4+ Ay Perpendicular	0.00	-0.45	4.97	0.00	12.0 / 15.0	4.52 < 7.54

4. Material survey

- Concrete volume = 0.44 (m3)
- Formwork = 2.21 (m2)
- Slab circumference = 10.83 (m)
- Area of openings = 0.00 (m2)

- Steel B500B
- Total weight = 48.73 (kG)
- Density = 110.17 (kG/m3)
- Average diameter = 12.0 (mm)

- Survey according to diameters:

Diameter	Length (m)	Number of identical elements:
12	0.39	66
12	4.91	6

Monolitinės perdangos deformacijos:



Ribinis perdangos ribinis įlinkis:

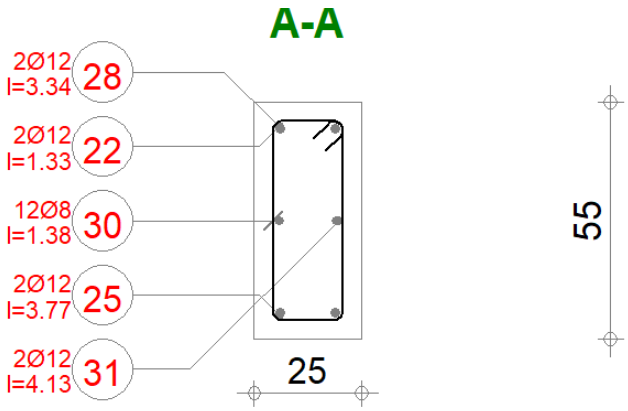
L/200 = 4,97/200 = 2,5 cm.

Perdangos įlinkis: 0,1 cm < 2,5 cm.

IŠVADA: perdangos laikomoji galia užtikrinta. Įlinkiai neviršija ribinių.

1.12. GB sijos parapeto atrėmimui tarp 4 ir 5 ašies projektavimas

Reikalingas armavimas:



1 Level:

- Name :
- Reference level : ---
- Maximum cracking : 0.30 (mm)
- Exposure : XC1
- Concrete creep coefficient : φ_{π} = 2.09
- Cement class : N
- Concrete age : 50 (years)
- Concrete age (loading moment) : 28 (days)
- Concrete age after erecting a structure : 365 (days)
- Structure class : S4
- Fire resistance class : no requirements

2 Beam: Beam239 Number of identical elements: 1

2.1 Material properties:

- Concrete : C20/25 f_{ck} = 20.00 (MPa)
  Rectangular stress distribution [3.1.7(3)]
  Density : 2501.36 (kG/m3)
  Aggregate size : 20.0 (mm)
- Longitudinal reinforcement: : B500B f_{yk} = 500.00 (MPa)
  Horizontal branch of the stress-strain diagram
  Ductility class : B
- Transversal reinforcement: : B500B f_{yk} = 500.00 (MPa)
  Horizontal branch of the stress-strain diagram
  Ductility class : B
- Additional reinforcement: : B500B f_{yk} = 500.00 (MPa)
  Horizontal branch of the stress-strain diagram

- Modified partial coefficients:
  α_{cc} = 0.9 1992-1-1 3.1.6 (1)P

2.2 Geometry:

2.2.1

Span	Position	L.supp. (m)	L (m)	R.supp. (m)
P1	**Span 0.25**	**3.97**	**0.25**	

Span length: L_o = 4.22 (m)
Section from 0.00 to 3.97 (m)
25.0 x 55.0 (cm)
without left slab
without right slab

2.2.2

Span	Position	L.supp. (m)	L (m)	R.supp. (m)
P2	**Span 0.25**	**4.60**	**0.25**	

Span length: L_o = 4.85 (m)
Section from 0.00 to 4.60 (m)
25.0 x 55.0 (cm)
without left slab
without right slab

2.2.3

Span	Position	L.supp. (m)	L (m)	R.supp. (m)
P3	**Span 0.25**	**4.35**	**0.25**	

Span length: L_o = 4.60 (m)
Section from 0.00 to 4.35 (m)
25.0 x 55.0 (cm)
without left slab
without right slab

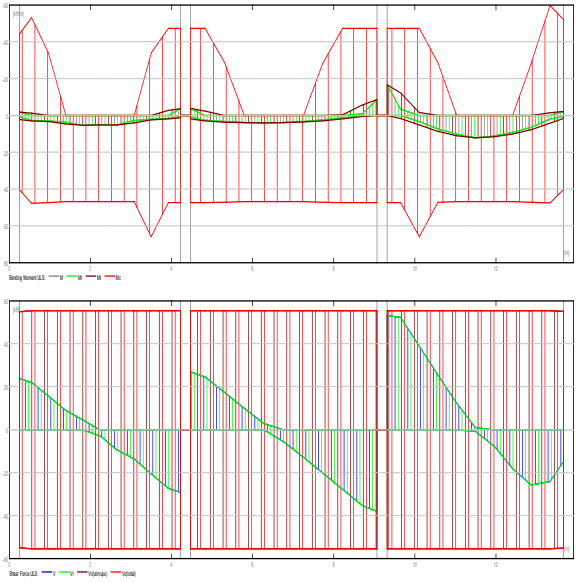
2.3 Calculation options:

- Regulation of combinations : EN 1990:2002/AC:2010 (Eq.6.10)
- Calculations according to : EN 1992-1-1:2004/A1:2014
- Seismic dispositions : No requirements
- Precast beam : no
- Cover : bottom c = 4.0 (cm)
  : side c1= 4.0 (cm)
  : top c2= 4.0 (cm)
- Cover deviations : Cdev = 1.0(cm), Cdur = 0.0(cm)
- Coefficient β_2 =0.50 : long-term or cyclic load
- Method of shear calculations : strut inclination

2.4 Calculation results:

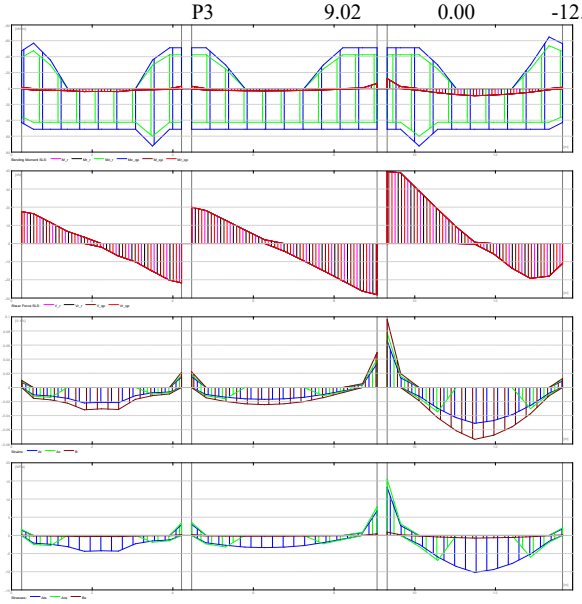
2.4.1 Internal forces in ULS

Span	Mt max. (kN*m)	Mt min. (kN*m)	Ml (kN*m)	Mr (kN*m)	Ql (kN)	Qr (kN)
P1	5.24	-0.00	2.22	-3.75	23.79	-29.22
P2	4.02	-0.00	-3.87	-8.64	26.94	-37.97
P3	12.10	-0.00	-16.79	-2.25	53.25	-14.81



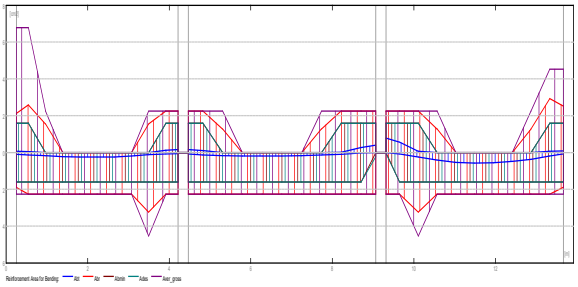
2.4.2 Internal forces in SLS

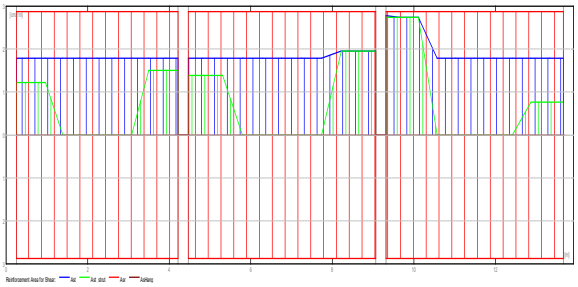
Span	Mt max. (kN*m)	Mt min. (kN*m)	Ml (kN*m)	Mr (kN*m)	Ql (kN)	Qr (kN)
P1	3.89	0.00	-1.32	-2.78	17.64	-21.65
P2	2.99	0.00	-2.87	-6.42	19.96	-28.16
P3	9.02	0.00	-12.50	-1.67	39.65	-11.04



2.4.3 Required reinforcement area

Span	Span (cm2)		Left support (cm2)		Right support (cm2)	
	bottom	top	bottom	top	bottom	top
P1	0.25	0.00	0.10	0.08	0.06	0.17
P2	0.19	0.00	0.08	0.17	0.00	0.41
P3	0.57	0.00	0.00	0.80	0.07	0.10





2.4.4 Deflection and cracking

wt(QP) Total due to quasi-permanent combination
wt(QP)dop Allowable due to quasi-permanent combination
Dwt(QP) Deflection increment from the quasi-permanent load combination after erecting a structure.
Dwt(QP)dop Admissible deflection increment from the quasi-permanent load combination after erecting a structure.

wk - width of perpendicular cracks

Span	wt(QP) (cm)	wt(QP)dop (cm)	Dwt(QP) (cm)	Dwt(QP)dop (cm)	wk (mm)
P1	0.0	1.7	0.0	0.8	0.0
P2	0.0	1.9	0.0	1.0	0.0
P3	0.0	1.8	0.0	0.9	0.0

2.5 Theoretical results - detailed results:

2.5.1 P1 : Span from 0.25 to 4.22 (m)

	ULS		SLS			
Abscissa (m)	M max. (kN*m)	M min. (kN*m)	M max. (kN*m)	M min. (kN*m)	A bottom (cm2)	A top (cm2)
0.25	2.22	-1.78	0.59	-1.32	0.10	0.08
0.55	2.87	-1.34	2.00	0.00	0.13	0.06
0.97	3.37	-0.00	2.24	0.00	0.16	0.00
1.39	4.51	-0.00	2.73	0.00	0.21	0.00
1.81	5.24	-0.00	3.89	0.00	0.25	0.00
2.23	5.14	-0.00	3.73	0.00	0.24	0.00
2.65	5.16	-0.00	3.83	0.00	0.24	0.00
3.08	4.03	-0.00	2.05	0.00	0.19	0.00
3.50	2.40	-0.00	1.49	0.00	0.11	0.00
3.92	1.81	-2.82	1.19	0.00	0.08	0.12
4.22	1.31	-3.75	0.35	-2.78	0.06	0.17

	ULS	SLS	
Abscissa (m)	V max. (kN)	V max. (kN)	afp (mm)
0.25	23.79	17.64	0.0
0.55	22.14	16.41	0.0
0.97	15.71	11.66	0.0
1.39	8.97	6.66	0.0

1.81	4.69	3.49	0.0
2.23	-2.69	-2.00	0.0
2.65	-9.33	-6.91	0.0
3.08	-13.64	-10.11	0.0
3.50	-20.50	-15.19	0.0
3.92	-27.24	-20.18	0.0
4.22	-29.22	-21.65	0.0

2.5.2 P2 : Span from 4.47 to 9.07 (m)

	ULS		SLS			
Abscissa (m)	M max. (kN*m)	M min. (kN*m)	M max. (kN*m)	M min. (kN*m)	A bottom (cm2)	A top (cm2)
4.47	1.82	-3.87	0.49	-2.87	0.08	0.17
4.83	2.92	-2.40	1.89	0.00	0.13	0.10
5.31	3.60	-0.00	2.51	0.00	0.17	0.00
5.80	3.93	-0.00	2.86	0.00	0.19	0.00
6.28	4.02	-0.00	2.99	0.00	0.19	0.00
6.77	3.93	-0.00	2.86	0.00	0.18	0.00
7.25	3.56	-0.00	2.47	0.00	0.17	0.00
7.74	2.86	-0.00	1.83	0.00	0.13	0.00
8.22	1.81	-0.43	0.94	0.00	0.08	0.02
8.71	0.58	-5.71	0.00	-0.71	0.03	0.27
9.07	0.00	-8.64	0.00	-6.42	0.00	0.41

	ULS	SLS	
Abscissa (m)	V max. (kN)	V max. (kN)	afp (mm)
4.47	26.94	19.96	0.0
4.83	24.57	18.21	0.0
5.31	17.34	12.86	0.0
5.80	10.02	7.43	0.0
6.28	2.84	2.11	0.0
6.77	-5.64	-4.21	0.0
7.25	-12.84	-9.54	0.0
7.74	-20.17	-14.97	0.0
8.22	-27.75	-20.59	0.0
8.71	-35.32	-26.19	0.0
9.07	-37.97	-28.16	0.0

2.5.3 P3 : Span from 9.32 to 13.67 (m)

	ULS		SLS			
Abscissa (m)	M max. (kN*m)	M min. (kN*m)	M max. (kN*m)	M min. (kN*m)	A bottom (cm2)	A top (cm2)
9.32	0.00	-16.79	0.00	-12.50	0.00	0.80
9.65	1.58	-12.33	0.00	-2.58	0.07	0.58
10.11	5.21	-1.68	2.45	0.00	0.24	0.08
10.57	8.67	-0.00	5.44	0.00	0.41	0.00
11.03	11.09	-0.00	7.57	0.00	0.52	0.00
11.49	12.10	-0.00	9.02	0.00	0.57	0.00
11.95	11.63	-0.00	8.34	0.00	0.55	0.00
12.41	10.17	-0.00	6.87	0.00	0.48	0.00
12.87	7.73	-0.00	4.72	0.00	0.36	0.00
13.33	4.14	-1.49	1.55	0.00	0.19	0.07
13.67	1.57	-2.25	0.42	-1.67	0.07	0.10

	ULS	SLS	
Abscissa (m)	V max. (kN)	V max. (kN)	afp (mm)
9.32	53.25	39.65	0.0
9.65	52.34	38.97	0.0
10.11	38.87	28.94	0.0
10.57	25.44	18.93	0.0
11.03	12.34	9.17	0.0
11.49	0.95	0.71	0.0
11.95	-7.42	-5.56	0.0
12.41	-18.13	-13.54	0.0
12.87	-25.71	-19.18	0.0
13.33	-24.10	-17.96	0.0
13.67	-14.81	-11.04	0.0

2.6 Reinforcement:

2.6.1 P1 : Span from 0.25 to 4.22 (m)

Longitudinal reinforcement:

- bottom (B500B)
  2 ϕ12 l = 3.77 from 0.04 to 3.71
- assembling (top) (B500B)
  2 ϕ12 l = 4.19 from 0.14 to 4.33
- support (B500B)
  2 ϕ12 l = 1.33 from 0.04 to 1.37
  1 ϕ12 l = 1.80 from 0.05 to 0.05

Surface reinforcement (B500B):

2 ϕ12 l = 4.14 from 0.17 to 4.30
pins 1 ∅8 l = 0.33
e = 1*1.98 (m)

Transversal reinforcement:

- main (B500B)
  stirrups 12 ϕ8 l = 1.38
  e = 1*0.06 + 11*0.35 (m)
  2 ϕ12 l = 4.14
  e = 1*-0.08 (m)

  pins 2 ϕ12 l = 4.14
  e = 1*-0.08 (m)

2.6.2 P2 : Span from 4.47 to 9.07 (m)

Longitudinal reinforcement:

- bottom (B500B)
  2 ϕ12 l = 7.34 from 3.13 to 10.47
- assembling (top) (B500B)
  2 ϕ12 l = 4.08 from 4.48 to 8.56
- support (B500B)
  2 ϕ12 l = 2.54 from 3.10 to 5.64
  2 ϕ12 l = 3.50 from 7.40 to 10.90

Surface reinforcement (B500B):

2 ϕ12 l = 4.77 from 4.38 to 9.15
pins 1 ∅8 l = 0.33
e = 1*2.30 (m)

Transversal reinforcement:

- main (B500B)
  stirrups 14 ϕ8 l = 1.38
  e = 1*0.03 + 13*0.35 (m)
  2 ϕ12 l = 4.77
  e = 1*-0.08 (m)

  pins 2 ϕ12 l = 4.77
  e = 1*-0.08 (m)

2.6.3 P3 : Span from 9.32 to 13.67 (m)

Longitudinal reinforcement:

- bottom (B500B)
  2 ϕ12 l = 4.07 from 9.90 to 13.88
- assembling (top) (B500B)
  2 ϕ12 l = 3.96 from 9.74 to 13.70
- support (B500B)
  2 ϕ12 l = 1.34 from 12.54 to 13.88
  1 ϕ12 l = 1.80 from 13.86 to 13.86

Surface reinforcement (B500B):

2 ϕ12 l = 4.52 from 9.23 to 13.75
pins 1 ∅8 l = 0.33
e = 1*2.18 (m)

Transversal reinforcement:

- main (B500B)
  stirrups 13 ϕ8 l = 1.38
  e = 1*0.08 + 12*0.35 (m)
  2 ϕ12 l = 4.52
  e = 1*-0.08 (m)

  pins 2 ϕ12 l = 4.52
  e = 1*-0.08 (m)

3 Material survey:

- Concrete volume = 1.91 (m3)
- Formwork = 18.81 (m2)

- Steel B500B
  - Total weight = 112.76 (kG)
  - Density = 58.93 (kG/m3)
  - Average diameter = 10.6 (mm)
  - Survey according to diameters:

Diameter (mm)	Length (m)	Weight (kG)	Number (No.)	Total weight (kG)
8	0.33	0.13	3	0.39
8	1.38	0.54	39	21.19
12	1.33	1.18	4	4.72
12	1.80	1.60	2	3.19
12	2.54	2.26	2	4.52
12	3.50	3.11	2	6.21
12	3.77	3.35	2	6.69
12	3.96	3.51	2	7.03
12	4.07	3.62	4	14.47
12	4.14	3.67	2	7.34
12	4.19	3.72	2	7.43
12	4.52	4.01	2	8.03
12	4.77	4.24	2	8.47
12	7.34	6.52	2	13.04

Išvada: laikomoji galia pakankama

1.13. GB kolonų projektavimas

- Betonas: C30/37;
- Aplinkos klasė XC2;
- Kolonos su pamatu jungiamos standžiai;
- Apsauginis betono sluoksnis: ne mažiau kaip armatūros skersmuo ir ne mažiau nei 30 mm iki skersinės armatūros krašto;
- Ugniaatsparumas R45 (atstumas iki išilginės armatūros centro ≥ 40 mm).

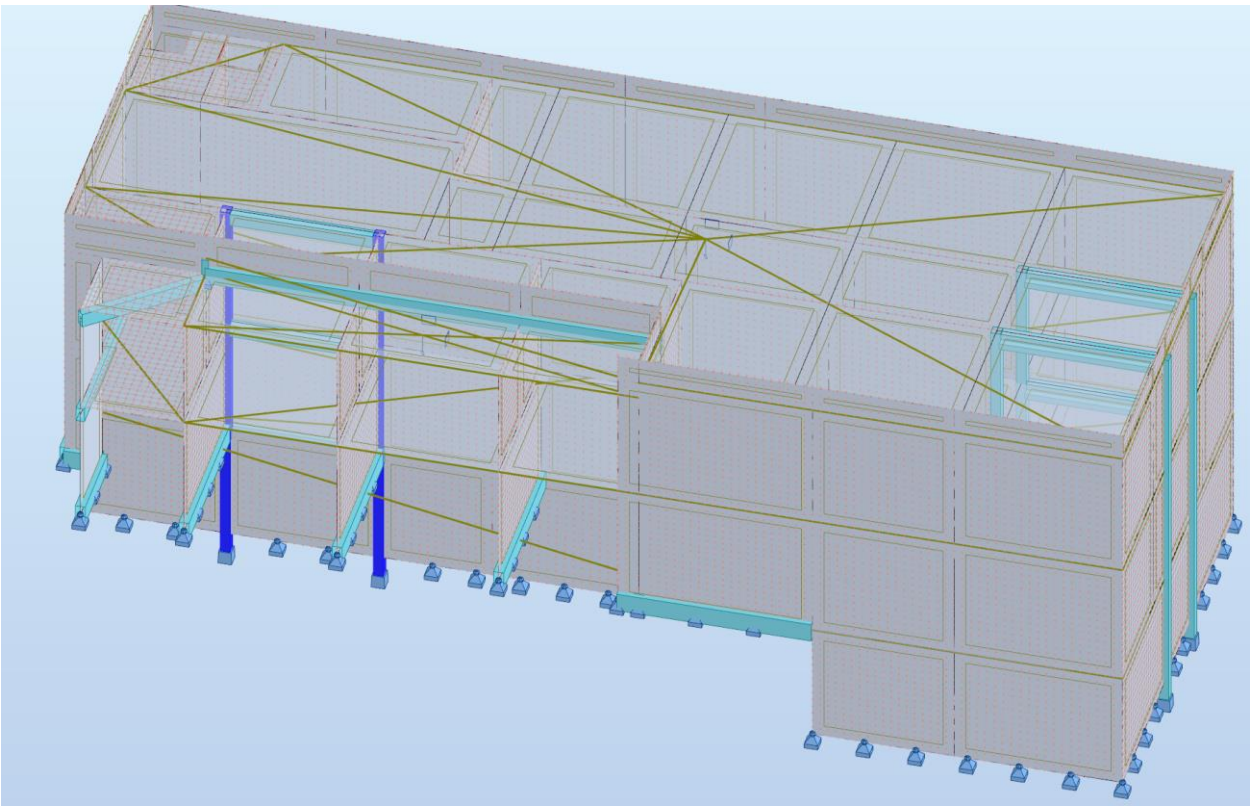
Projektuojamos kolonos skerspjūvis: 300x300 mm.

Kolonos projektuojamos montavimo ir eksloatavimo stadijoje. Kolonų atsparumą transportavimo ir kėlimo metu turi įvertinti Gamintojas.

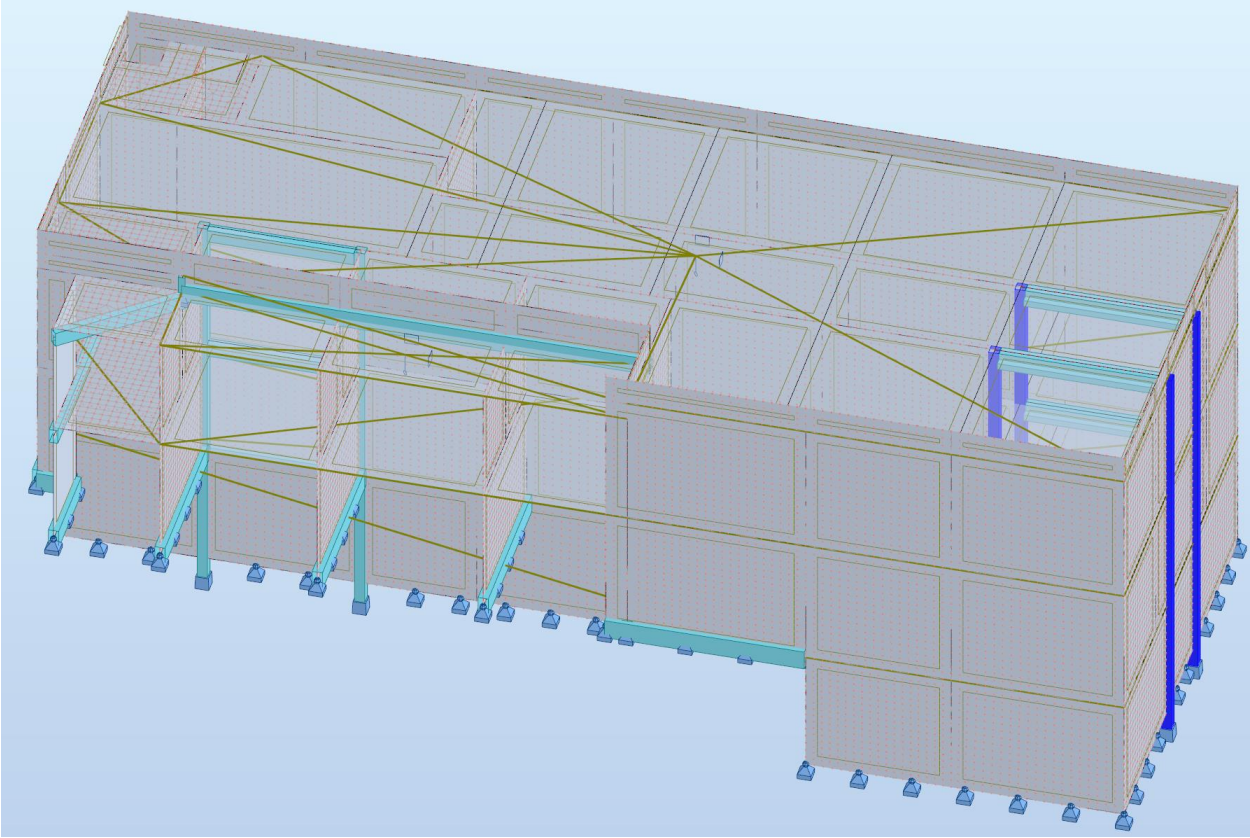
Išilginės armatūros kiekis negali būti mažesnis nei nurodyta skaičiavimuose.

Kolonų išdėstymas:

Kolonos K-1:

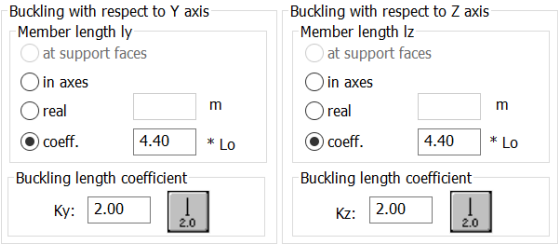


Kolonos K-2:

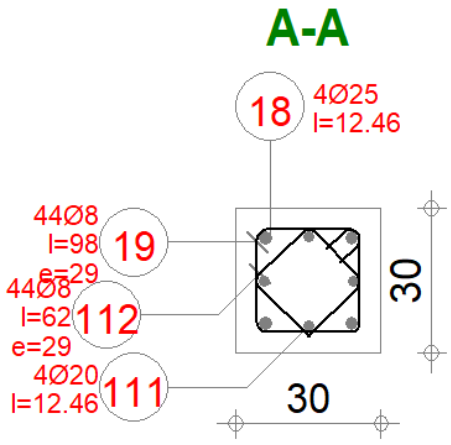


K-1 ir K-2 Kolonos geometrinis ilgis: 12,50 m.

Skaičiuojamieji ilgiai:



K-1 ir K-2 kolonos reikalingas armavimas:



1 Level:

- Name :
- Reference level : 0.00 (m)
- Concrete creep coefficient : φ_p = 1.77
- Cement class : N
- Environment class : XC2
- Structure class : S4

2 Column: Column74..73

Number of identical elements: 2

2.1 Material properties:

- Concrete : C30/37 f_{ck} = 30.00 (MPa)
  Unit weight : 2501.36 (kG/m3)
  Aggregate size : 20.0 (mm)
- Longitudinal reinforcement: : B500B f_{yk} = 500.00 (MPa)
  Ductility class : B
- Transversal reinforcement: : B500B f_{yk} = 500.00 (MPa)
- Modified partial coefficients:
  α_{cc} = 0.9 1992-1-1 3.1.6 (1)P

2.2 Geometry:

2.2.1	Rectangular	30.0 x 30.0 (cm)
2.2.2	Height: L	= 12.50 (m)
2.2.3	Slab thickness	= 0.00 (m)
2.2.4	Beam height	= 0.00 (m)
2.2.5	Cover	= 4.0 (cm)

2.3 Calculation options:

- Calculations according to : EN 1992-1-1:2004/A1:2014
- Seismic dispositions : No requirements
- Precast column : yes
- Pre-design : no
- Slenderness taken into account : yes
- Compression : with bending
- Ties : to slab
- Fire resistance class : No requirements

2.4 Calculation results:

Safety factors Rd/Ed = 1.23 > 1.0

2.4.1 ULS/ALS Analysis

Design combination: ULS/3=1*1.35 + 2*1.30 + 4*0.78 + 3*0.91 (C)
Combination type: ULS
Internal forces:

Nsd = 497.90 (kN) Msdy = -8.41 (kN*m) Msdz = 0.31 (kN*m)
Design forces:
Cross-section in the middle of the column
N = 497.90 (kN) N*etotz = -62.38 (kN*m) N*etoty= 9.96 (kN*m)

Eccentricity:		ez (My/N) (cm)	ey (Mz/N) (cm)
Initial	e0:	-1.7	0.1
Imperfection	ei:	2.1	0.0
I order (e0 + ei)	e0Ed:	0.4	0.1
Minimal	eEdmin:	2.0	2.0
Total	eEd:	-12.5	2.0

2.4.1.1. Detailed analysis-Direction Y:

2.4.1.1.1 Slenderness analysis

Non-sway structure

L (m)	Lo (m)	λ	λlim	
4.40	8.80	101.61	30.79	Slender column

2.4.1.1.2 Buckling analysis

MA = -3.54 (kN*m) MB = -1.68 (kN*m) MC = -8.41 (kN*m)
Case: Cross-section in the middle of the column, Slenderness taken into account
M0 = -8.41 (kN*m)
ei = θ1* lo/2 = 2.1 (cm)
θ1 = θo ∗ αh * αm = 0.00
θo = 0.01
αh = 0.95
αm = (0,5(1+1/m))^0.5 = 1.00
m = 1.00
Method based on nominal stiffness

$$\left[1+\frac{\beta}{(N_B/N)-1}\right] = 3.31$$

β = 1.00
Nb = (π^2 * EJ)/ lo^2 = 713.57 (kN)
EJ = Kc*Ecd*Jc+Ks*Es*Js = 5598.88 (kN*m2)
φef = 1.77
Jc = 67500.0 (cm4)
Js = 2069.7 (cm4)
Kc = 0.08 ()
Ks = 1.00 ()
MEdmin = 9.96 (kN*m)

$$M_{Ed} = \max\left\{M_{Ed\min}; \left[1+\frac{\beta}{(N_B/N)-1}\right]M_{0Ed}\right\} = -62.38 \text{ (kN*m)}$$

2.4.1.2. Detailed analysis-Direction Z:

2.4.1.2.1 Slenderness analysis

Non-sway structure

L (m)	Lo (m)	λ	λlim	
4.40	8.80	101.61	30.79	Slender column

2.4.1.2.2 Buckling analysis

MA = -0.41 (kN*m) MB = 0.03 (kN*m) MC = 0.31 (kN*m)
Case: Cross-section in the middle of the column, Slenderness taken into account

M0 = 0.31 (kN*m)
ei = 0.0 (cm)
Method based on nominal stiffness

$$\left[1+\frac{\beta}{(N_B/N)-1}\right] = 3.31$$

β = 1.00
Nb = (π^2 * EJ)/ lo^2 = 713.57 (kN)
EJ = Kc*Ecd*Jc+Ks*Es*Js = 5598.88 (kN*m2)
φef = 1.77
Jc = 67500.0 (cm4)
Js = 2069.7 (cm4)
Kc = 0.08 ()
Ks = 1.00 ()
MEdmin = 9.96 (kN*m)

$$M_{Ed} = \max\left\{M_{Ed\min};\left[1+\frac{\beta}{(N_B/N)-1}\right]M_{0Ed}\right\} = 9.96 \text{ (kN*m)}$$

2.4.2 Reinforcement:

Real (provided) area	Asr = 32.20 (cm2)
Ratio:	ρ = 3.58 %

2.5 Reinforcement:

Main bars (B500B):
- 4 ϕ20 l = 12.46 (m)
- 4 ϕ25 l = 12.46 (m)

Transversal reinforcement: (B500B):

stirrups:	44 ϕ8	l = 0.98 (m)
	44 ϕ8	l = 0.62 (m)

3 Material survey:

- Concrete volume = 2.25 (m3)
- Formwork = 30.00 (m2)

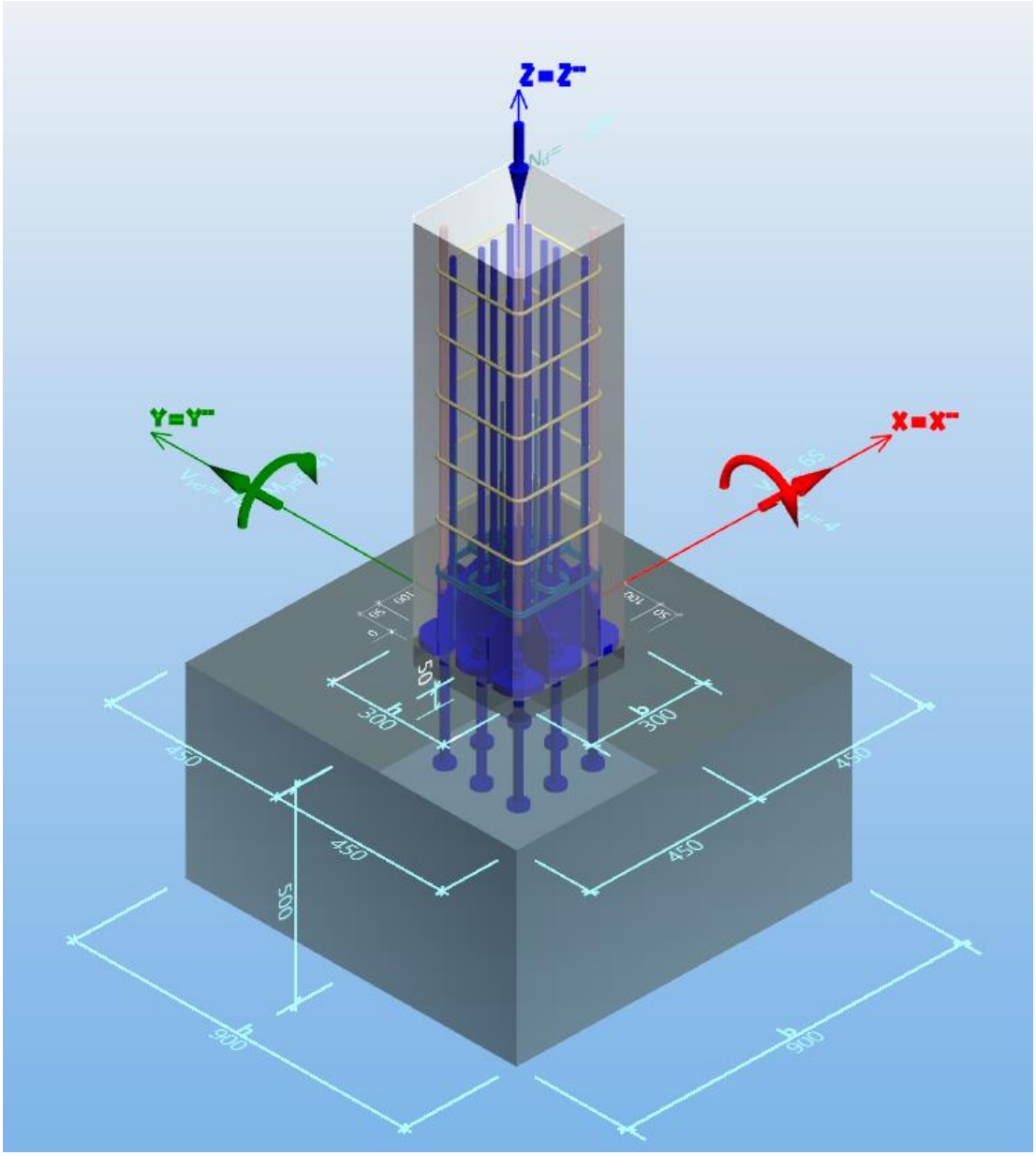
- Steel B500B
  - Total weight = 685.75 (kG)
  - Density = 304.78 (kG/m3)
  - Average diameter = 16.5 (mm)
  - Reinforcement survey:

Diameter	Length (m)	Weight (kG)	Number (No.)	Total weight (kG)
8	0.62	0.25	88	21.68
8	0.98	0.39	88	33.92
20	12.46	30.74	8	245.91
25	12.46	48.03	8	384.23

IŠVADA: kolonų laikomoji galia užtikrinta.

Kolonų bazės projektavimas

Kolonų bazės inkariniai varžtai pagal atramines reakcijas pamate parenkami „Peikko Designer“ programa.



Summary

Name	Stage	#	Load Case	Page No.	Max Utilization	Status
Column 1	Final	1	Vmax	5	85%	OK
	Final	2	N min	6	38%	OK
	Final	3	N max	7	25%	OK

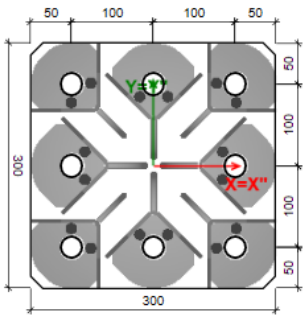
Materials and Geometry

Column: 300x300

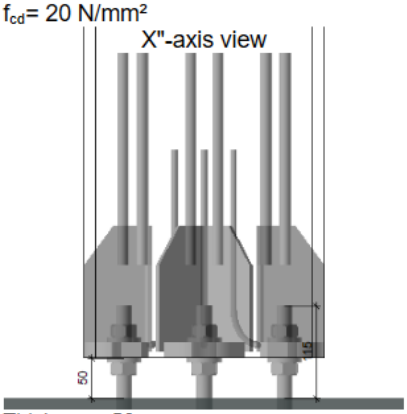
Concrete: C30/37

f_{cd}= 20 N/mm²

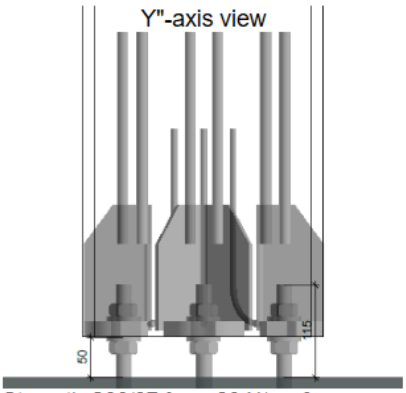
Plane View



X"-axis view



Y"-axis view



Grouting:

Thickness: 50 mm

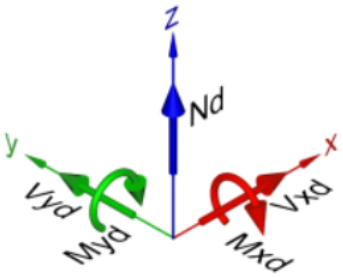
Strength C30/37 f_{cd} = 20 N/mm²

X; Y = local coordinate system of profile
X"; Y" = local coordinate system of anchors

oad Cases

NOTE: Loads are defined in the local coordinate system of the profile.

(Design loads)



Final Stage

#	Name	N_d [kN]	M_{xd} [kNm]	M_{yd} [kNm]	V_{xd} [kN]	V_{yd} [kN]
1	Vmax	-201.0	4.0	41.0	65.0	14.0
2	N min	-102.0	1.0	23.0	35.0	1.0
3	N max	-498.0	1.0	2.0	10.0	1.0

Erection stage

No load case for this stage defined

Fire Situation Loads

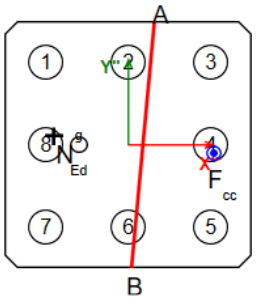
No load case for this stage defined

Load Case #1 : Vmax : Nd=-201.0, Mxd=4.0, Myd=41.0, Vxd=65.0, Vyd=14.0

Steel Failure: Sufficient capacity **Concrete failure: Sufficient capacity**

Steel failure verification

Design value of normal compressive force in the column	$N_{c,Ed}$	-201	kN
Friction coefficient (between base plate and grout layer)	C_{fd}	0.2	
Joint friction resistance	$F_{f,Rd}$	40.2	kN
Resultant shear force	V_{sd}	66.49	kN
Resultant shear force taking account friction contribution	$V_{sd,f}$	26.29	kN



Neutral axis in (X"/Y") = A(33.0 / 150.0); B(4.5 / -150.0)
Resultant tension force in (X"/Y") = N_{Ed}(-90.5/9.7)
Resultant compression force (concrete) in (X"/Y") = F_{cc}(103.4/-10.2)

Bolt Pos.	Acting axial force [kN]	Design tension resistance [kN]	Axial capacity usage [%]	Acting shear force [kN]	Design shear resistance [kN]	Shear capacity usage [%]	Interaction [%]
1	34.5	88.2	39.1	4.38	31.3	14.0	41.9
2	7.59	88.2	8.6	4.38	31.3	14.0	20.2
3	-19.3	88.2	21.9	4.38	31.3	14.0	n/r
4	-21.8	88.2	24.8	4.38	31.3	14.0	n/r
5	-24.4	88.2	27.7	4.38	31.3	14.0	n/r
6	2.48	88.2	2.8	4.38	31.3	14.0	16.0
7	29.4	88.2	33.3	0.0	31.3	0.0	n/r
8	31.9	88.2	36.2	0.0	31.3	0.0	n/r

Concrete failure verifications

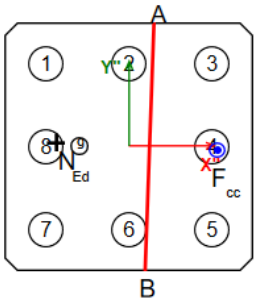
Proof	Load [kN]	Capacity [kN]	Utilization [%]	Status
Pull-Out Failure	34.5	168.5	20.5	Ok
Cone failure				Ok
Concrete decisive:				
1) Foundation (Plain Concrete)	105.8	190.8	55.5	
2) Assigned Hanger Reinforcement	0.0	0.0	n/r	
3) Requirement of Strut and Tie Model	0.0	0.0	n/r	
Splitting Failure				Ok
Concrete decisive:				
1) Foundation (Plain Concrete)	105.8	181.3	58.4	
2)Assigned Splitting Reinforcement || X	0.0	0.0	-	
3)Assigned Splitting Reinforcement || Y	0.0	0.0	-	
Blow-Out Failure	0.0	0.0	n/r	Ok
Pry-out failure	26.3	460.3	5.7	Ok
Edge failure				Ok
Concrete decisive:				
1) -X (Left) Edge (Plain Concrete)	5.5	99.3	5.6	
2) +X (Right) Edge (Plain Concrete)	26.3	48.1	54.7	
3) +Y (Top) Edge (Plain Concrete)	26.3	97.3	27.0	
4) -Y (Bottom) Edge (Plain Concrete)	25.7	99.3	25.9	
5)Assigned Edge Reinforcement (-X)	1.7	0.0	n/r	
6)Assigned Edge Reinforcement (+X)	15.8	0.0	n/r	
7)Assigned Edge Reinforcement (+Y)	8.6	0.0	n/r	
8)Assigned Edge Reinforcement (-Y)	7.9	0.0	n/r	
Combined Resistance	$\beta_N+\beta_V \le 1.2$ or $\beta_N^{1.5}+\beta_V^{1.5} \le 1$		85.1	Ok

Load Case #2 : N min : Nd=-102.0, Mxd=1.0, Myd=23.0, Vxd=35.0, Vyd=1.0

Steel Failure: Sufficient capacity **Concrete failure: Sufficient capacity**

Steel failure verification

Design value of normal compressive force in the column	$N_{c,Ed}$	-102	kN
Friction coefficient (between base plate and grout layer)	C_{fd}	0.2	
Joint friction resistance	$F_{f,Rd}$	20.4	kN
Resultant shear force	V_{sd}	35.01	kN
Resultant shear force taking account friction contribution	$V_{sd,f}$	14.61	kN



Neutral axis in (X"/Y") = A(30.5 / 150.0); B(18.3 / -150.0)
Resultant tension force in (X"/Y") = N^{9}_{Ed}(-88.4/3.8)
Resultant compression force (concrete) in (X"/Y") = F_{cc}(106.2/-4.9)

Bolt Pos.	Acting axial force [kN]	Design tension resistance [kN]	Axial capacity usage [%]	Acting shear force [kN]	Design shear resistance [kN]	Shear capacity usage [%]	Interaction [%]
1	19.4	88.2	22.0	2.44	31.3	7.8	23.5
2	4.30	88.2	4.9	2.44	31.3	7.8	11.3
3	-10.8	88.2	12.3	2.44	31.3	7.8	n/r
4	-11.4	88.2	13.0	2.44	31.3	7.8	n/r
5	-12.0	88.2	13.7	2.44	31.3	7.8	n/r
6	3.08	88.2	3.5	2.44	31.3	7.8	10.3
7	18.2	88.2	20.6	0.0	31.3	0.0	n/r
8	18.8	88.2	21.3	0.0	31.3	0.0	n/r

Concrete failure verifications

Proof	Load [kN]	Capacity [kN]	Utilization [%]	Status
Pull-Out Failure	19.4	168.5	11.5	Ok
Cone failure				Ok
Concrete decisive:				
1) Foundation (Plain Concrete)	63.8	192.6	33.1	
2) Assigned Hanger Reinforcement	0.0	0.0	n/r	
3) Requirement of Strut and Tie Model	0.0	0.0	n/r	
Splitting Failure				Ok
Concrete decisive:				
1) Foundation (Plain Concrete)	63.8	182.9	34.9	
2)Assigned Splitting Reinforcement || X	0.0	0.0	-	
3)Assigned Splitting Reinforcement || Y	0.0	0.0	-	
Blow-Out Failure	0.0	0.0	n/r	Ok
Pry-out failure	14.6	464.6	3.1	Ok
Edge failure				Ok
Concrete decisive:				
1) -X (Left) Edge (Plain Concrete)	0.4	99.3	0.4	
2) +X (Right) Edge (Plain Concrete)	14.6	47.3	30.9	
3) +Y (Top) Edge (Plain Concrete)	14.6	103.5	14.1	
4) -Y (Bottom) Edge (Plain Concrete)	14.6	99.3	14.7	
5)Assigned Edge Reinforcement (-X)	0.1	0.0	n/r	
6)Assigned Edge Reinforcement (+X)	8.9	0.0	n/r	
7)Assigned Edge Reinforcement (+Y)	4.5	0.0	n/r	
8)Assigned Edge Reinforcement (-Y)	4.5	0.0	n/r	
Combined Resistance	$\beta_N+\beta_V \le 1.2$ or $\beta_N^{1.5}+\beta_V^{1.5} \le 1$		37.8	Ok

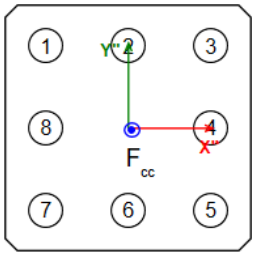
Load Case #3 : N max : Nd=-498.0, Mxd=1.0, Myd=2.0, Vxd=10.0, Vyd=1.0

Steel Failure: Sufficient capacity **Concrete failure: Sufficient capacity**

Steel failure verification

Design value of normal compressive force in the column	$N_{c,Ed}$	-498	kN
Friction coefficient (between base plate and grout layer)	C_{fd}	0.2	
Joint friction resistance	$F_{f,Rd}$	99.6	kN
Resultant shear force	V_{sd}	10.05	kN
Resultant shear force taking account friction contribution	$V_{sd,f}$	0	kN

Resultant compression force (concrete) in (X"/Y") = F_{cc}(4.0/-2.0)



Bolt Pos.	Acting axial force [kN]	Design tension resistance [kN]	Axial capacity usage [%]	Acting shear force [kN]	Design shear resistance [kN]	Shear capacity usage [%]	Interaction [%]
1	-10.9	88.2	12.4	0.0	31.3	0.0	n/r
2	-11.6	88.2	13.2	0.0	31.3	0.0	n/r
3	-12.3	88.2	14.0	0.0	31.3	0.0	n/r
4	-12.7	88.2	14.4	0.0	31.3	0.0	n/r
5	-13.0	88.2	14.8	0.0	31.3	0.0	n/r
6	-12.3	88.2	14.0	0.0	31.3	0.0	n/r
7	-11.6	88.2	13.2	0.0	31.3	0.0	n/r
8	-11.3	88.2	12.8	0.0	31.3	0.0	n/r

Concrete failure verifications

Proof	Load [kN]	Capacity [kN]	Utilization [%]	Status
Pull-Out Failure	0.0	0.0	0.0	Ok
Cone failure				Ok
Concrete decisive:				
1) Foundation (Plain Concrete)	0.0	0.0	n/r	
2) Assigned Hanger Reinforcement	0.0	0.0	n/r	
3) Requirement of Strut and Tie Model	0.0	0.0	n/r	
Splitting Failure				Ok
Concrete decisive:				
1) Foundation (Plain Concrete)	0.0	0.0	n/r	
2)Assigned Splitting Reinforcement || X	0.0	0.0	-	
3)Assigned Splitting Reinforcement || Y	0.0	0.0	-	
Blow-Out Failure	0.0	0.0	n/r	Ok
Pry-out failure	0.0	0.0	n/r	Ok
Edge failure				Ok
Concrete decisive:				
1) -X (Left) Edge (Plain Concrete)	0.0	0.0	n/r	
2) +X (Right) Edge (Plain Concrete)	0.0	0.0	n/r	
3) +Y (Top) Edge (Plain Concrete)	0.0	0.0	n/r	
4) -Y (Bottom) Edge (Plain Concrete)	0.0	0.0	n/r	
5)Assigned Edge Reinforcement (-X)	0.0	0.0	n/r	
6)Assigned Edge Reinforcement (+X)	0.0	0.0	n/r	
7)Assigned Edge Reinforcement (+Y)	0.0	0.0	n/r	
8)Assigned Edge Reinforcement (-Y)	0.0	0.0	n/r	
Combined Resistance	$\beta_N \leq 1$		0.0	Ok

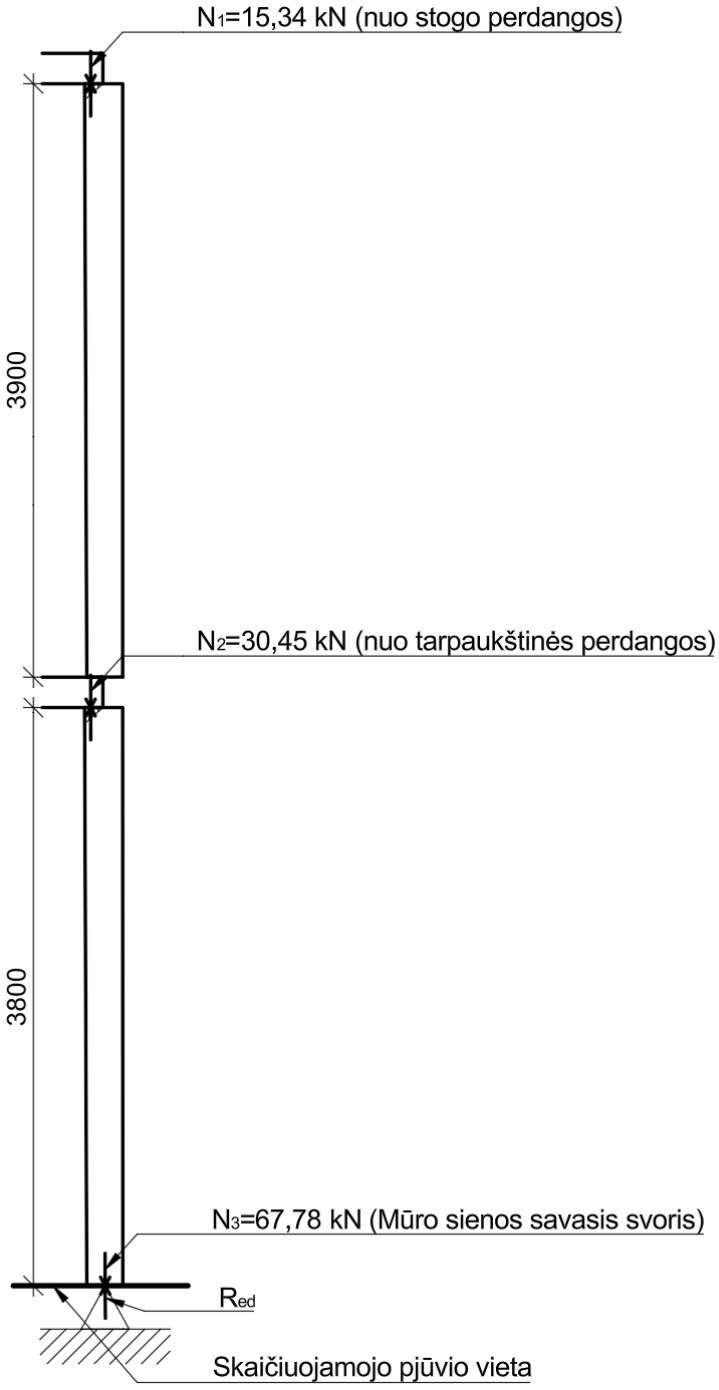
IŠVADA: kolonų bazės laikomoji galia užtikrinta.

1.14. Mūrinių konstrukcijų projektavimas

1.14.1. Išorinių mūrinių sienų projektavimas

Tikrinamas mūrinės kolonos tarp langų apatinio pjūvio prie pamato gniuždomasis stipris, kai siena iš silikatinių blokelių 15MPa gniuždomojo stiprio su plonasluoksniu skiediniu 10MPa gniuždomojo stiprio. Kolonos skerspjūvis 1200x250mm. Sienos aukštis iki perdangos apačios 3,90m. Kolonos armuojamos MURFOR tinkleliais kas 2 eilę.

Išorinės mūro kolonos skaičiuojamoji schema su veikiančiomis apkrovomis į 1 tiesinį metrą:



Tikrinamas kolonos aukščio ir storio leistinasis santykis:

Sienos aukštis:

$h := 3.90 \quad m$

Sienos storis:

$t := 0.25 \quad m$

Laisvasis sienos ilgis:

$l := 1.2 \quad m$

Efektyvus sienos storis, kai siena be pilaistrų:

$t_{ef} := t = 0.25 \quad m$

Sienų, suvaržytų viršuje ir apačioje gelžbetoninėmis perdangomis arba stogais, esančiais iš abiejų pusių tame pačiame aukštyje, arba suvaržytų gelžbetonine perdanga, esančia tik iš vienos pusės ir atremta ant ne mažiau kaip 2/3 sienos storio, kai apkrovos ekscentricitetas yra didesnis už 0,25 sienos storio:

$\rho_2 := 1$

$h_{ef} := \rho_2 \cdot h = 3.9 \quad m$

Sienos liaunis:

$$\lambda := \frac{h_{ef}}{t_{ef}} = 15.6$$

$Ats1 := if(\lambda > 27, "LIAUNIS BLOGAS", "LIAUNIS GERAS") = "LIAUNIS GERAS"$

Aukščio ir storio santykis:

$$\frac{h}{t} = 15.6$$

Išvada: sąlyga tenkinama, geometrija teisinga

Nearmuoto mūro gniuždomojo stiprio nustatymas:

$f_b := 15 \quad MPa$

$f_m := 10 \quad MPa$

$K := 0.55$

$f_k := K \cdot f_b^{0.85} = 5.496 \quad MPa$

$$f_d := \frac{f_k}{\gamma_M} = 1.832 \quad MPa$$

Tikrinama centriškai gniuždomos mūrinės kolonos laikomoji galia. Kolonos armavimas nevertinamas:

Čia apatiniame pjūvyje veikianti apkrova $N_{ed} = N_1 + N_2 + N_3 = 15{,}34 + 30{,}45 + 67{,}78 = 114\ kN/m$

Sienos aukštis

$l := 3.90$ m

Sienos storis

$h := 0.25$ m

$y := \frac{h}{2} = 0.125$ m

Veikianti ašinė jėga

$N_{ed} := 114$ kN

Skaičiuojamasis elemento aukštis

$l_0 := l = 3.9$ m

Santykis

$\lambda_h := \frac{l_0}{h} = 15.6$

Mūro tamprumo charakteristika iš 16 lentelės

$\alpha := 1000$

Klupumo koeficientas iš 19 lentelės

$\varphi := 0.77$

Elemento skerspjūvio plotas

$A := h \cdot 1 = 0.25$ m2

$e_{0lt} := 0.085$ m

$N_{Edlt} := 114$ kN

$\eta := 0.14$ iš 21 lentelės

$$m_{lt} := \text{if}\left[h \geq 0.3, 1, 1 - \eta \cdot \frac{N_{Edlt}}{N_{ed}} \cdot \left(1 + \frac{1.2 \cdot e_{0lt}}{h}\right)\right] = 0.803$$

Skaičiuojamasis mūro gniuždomasis stipris

$f_d := 1.83 \cdot 10^3 = 1.83 \times 10^3$ kPa

$N_{Rd} := m_{lt} \cdot \varphi \cdot f_d \cdot A = 282.835$ kN

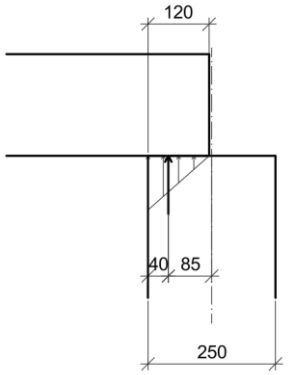
$\frac{N_{ed}}{N_{Rd}} = 0.403$

Išvada: laikomoji galia pakankama.

Tikrinama ekscentriškai gniuždomos kolonos laikomoji galia nuo ekscentriškai pridėtų perdangų apkrovų. Kolonos armavimas nevertinamas.

Čia apatiniame pjūvyje veikianti ekscentrinė apkrova $N_{ed} = N_1 + N_2 = 15{,}34 + 30{,}45 = 46\ kN/m$

Perdangos atrėmimo schema ir ekscentriciteto nustatymas:



Sienos aukštis

$l := 3.90$ m

Sienos ilgis (atstumas tarp skersinių sienų)

$l_{0s} := 1$ m

Sienos storis

$h := 0.25$ m

$y := \frac{h}{2} = 0.125$ m

Veikianti ašinė jėga

$N_{ed} := 46.22$ kN

Jėgos pridėjimo ekscentricitetas

$e_0 := 0.085$ m

Skaičiuojamasis elemento aukštis

$l_0 := l = 3.9$ m

Santykis

$\lambda_h := \frac{l_0}{h} = 15.6$

Mūro tamprumo charakteristika iš 16 lentelės

$\alpha := 1000$

Klupumo koeficientas iš 19 lentelės

$\varphi := 0.77$

Gniuždomos zonos aukštis

$h_c := h - 2 \cdot e_0 = 0.08$

Gniuždomos zonos santykis

$\lambda_{hc} := \frac{l}{h_c} = 48.75$

Gniuždomos zonos klupumo koeficientas iš 19 lentelės

$\varphi_c := 0.16$

$\varphi_1 := \frac{\varphi + \varphi_c}{2} = 0.465$

Elemento skerspjūvio plotas

$A := h \cdot l_{0s} = 0.25$ m2

$A_c := A \cdot \left(1 - \frac{2 \cdot e_0}{h}\right) = 0.08$

$e_{0lt} := e_0 = 0.085$ m

$N_{Edlt} := 46.22$ kN

$\eta := 0.11$ iš 21 lentelės

$$m_{lt} := if\left[h \geq 300, 1, 1 - \eta \cdot \frac{N_{Edlt}}{N_{ed}} \cdot \left(1 + \frac{1.2 \cdot e_{0lt}}{h}\right)\right] = 0.845$$

$$\omega := 1 + \frac{e_0}{h} = 1.34$$ iš 20 lentelės

Skaičiuojamasis mūro gniuždomasis stipris

$f_d := 1.82 \cdot 10^3 = 1.82 \times 10^3$ kPa

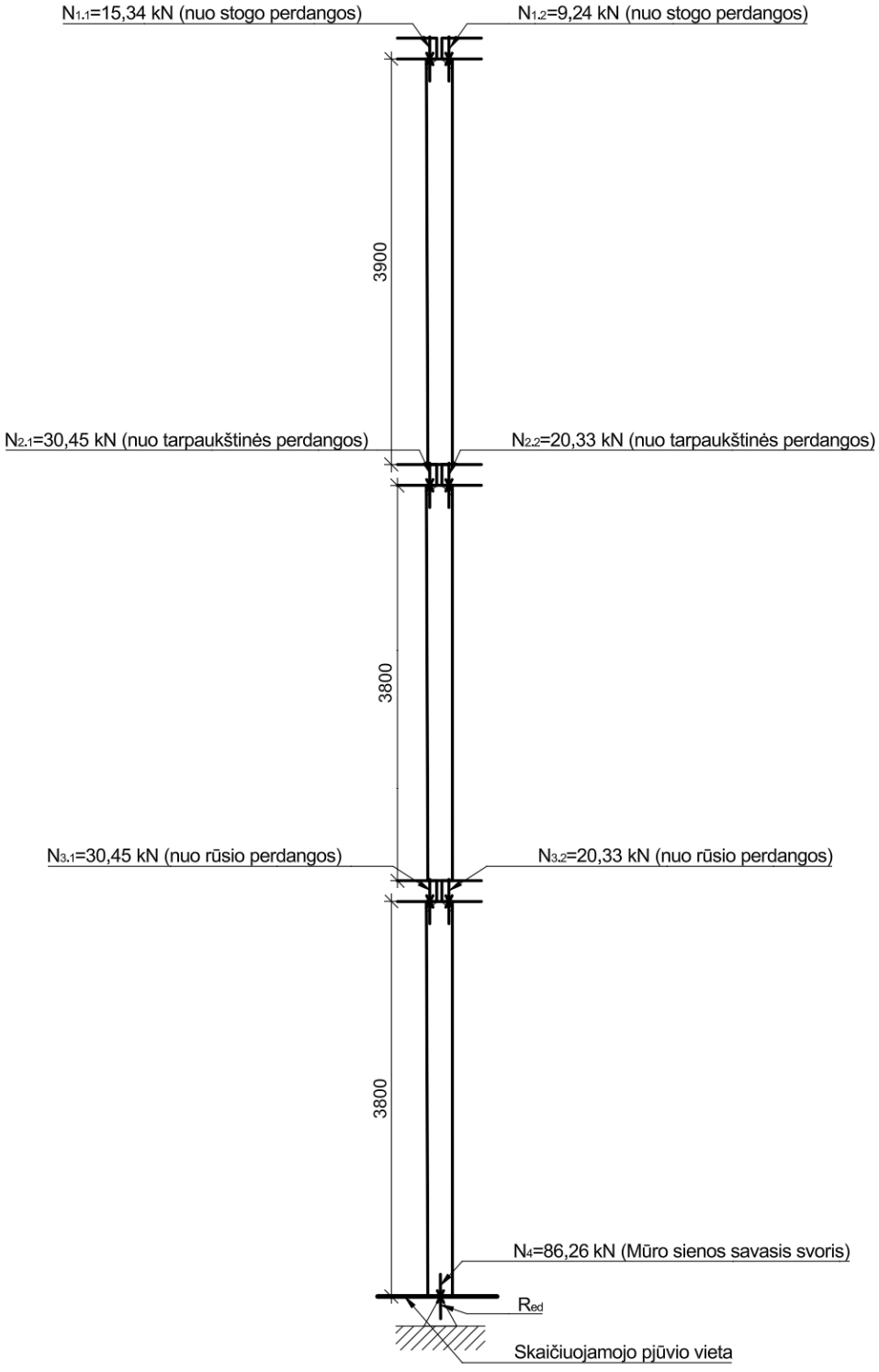
$N_{Rd} := m_{lt} \cdot \varphi_1 \cdot f_d \cdot A_c \cdot \omega = 76.672$ kN

$$\frac{N_{ed}}{N_{Rd}} = 0.603$$

Išvada: laikomoji galia pakankama

1.14.2. Vidinių mūrinių sienų projektavimas

Tikrinamas mūrinės sienos apatinio pjūvio prie pamato gniuždomasis stipris, kai siena iš silikatinių blokelių 15MPa gniuždomojo stiprio su plonasluoksniu skiediniu 10MPa gniuždomojo stiprio. sienos storis 250mm. Sienos aukštis iki perdangos apačios 3,90m. Kolonos armuojamos MURFOR tinkleliais kas 2 eilę. Išorinės mūro kolonos skaičiuojamoji schema su veikiančiomis apkrovomis į 1tiesinį metrą:



Tikrinamas kolonos aukščio ir storio leistinasis santykis:

Sienos aukštis:

$h := 3.90$ m

Sienos storis:

$t := 0.25$ m

Laisvasis sienos ilgis:

$l := 18.23$ m

Efektyvus sienos storis, kai siena be pilaistrų:

$t_{ef} := t = 0.25$ m

Koeficientas efektyviajam sienos aukščiui nustatyti, kai siena sustandinta dvejuose vertikaliuose kraštuose ir GB perdangomis ir sustandinta abejuose kraštuose, ekscentricitetas didesnis už 0,25 sienos storio:

$\rho_2 := 1$

Kai h<1,15*l

$$\rho_4 := \frac{1}{1 + \left(\frac{\rho_2 \cdot h}{l}\right)^2} \cdot \rho_2 = 0.956$$

Efektyvusis sienos aukštis:

$h_{ef} := \rho_4 \cdot h = 3.729$ m

Sienos liaunis:

$$\lambda := \frac{h_{ef}}{t_{ef}} = 14.917$$

$Ats1 := if(\lambda > 27, "LIAUNIS\ BLOGAS", "LIAUNIS\ GERAS") = "LIAUNIS\ GERAS"$

Aukščio ir storio santykis:

$$\frac{h}{t} = 15.6$$

Ilgio ir storio santykis:

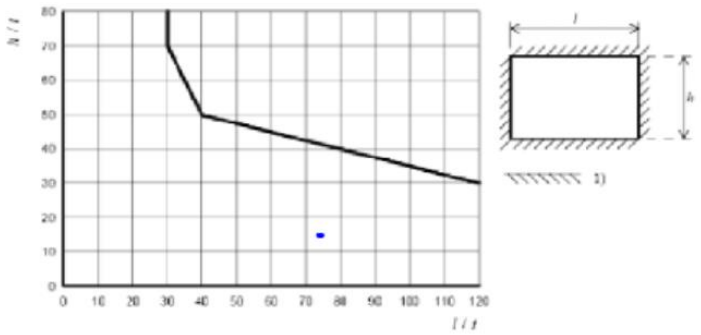
$$\frac{l}{t} = 72.92$$

Tinkamumo ribinio būvio sienų aukščio bei ilgio ir storio santykių ribinės reikšmės

(1) Nepaisant sienos atitikimo saugos ribiniam būviui, kurį reikia patikrinti, jos matmenis reikia riboti pagal F.1, F.2 arba F.3 paveikslus, atsižvelgiant į įtvirtų sąlygas, parodytas paveikaluose, kai *h* yra prošvaisinis sienos aukštis, *l* – sienos ilgis, o *t* – sienos storis; tuščiavidurėms sienoms reikia taikyt t_{ef} vietoje *t*.

(2) Kai sienos yra įtvirtintos viršuje, bet ne galuose, *h* turi nevirišyti 30 *t*.

(3) Šis priedas galioja, kai sienos arba vieno tuščiavidurės sienos sluoksnio storis yra ne mažesnis nei 100 mm.



Iš grafiko nustatyta, kad santykiai tenkinami

Išvada: sąlyga tenkinama, geometrija teisinga

Nearmuoto mūro gniuždomojo stiprio nustatymas:

$f_{bw} := 15$ MPa

$f_{mw} := 10$ MPa

$K := 0.55$

$f_k := K \cdot f_b^{0.85} = 5.496$ MPa

$f_d := \frac{f_k}{\gamma_M} = 1.832$ MPa

Tikrinama centriškai gniuždomos mūrinės sienos laikomoji galia. Sienos armavimas nevertinamas:

Čia apatiniame pjūvyje veikianti apkrova $N_{ed} = N_{1.1} + N_{2.1} + N_{3.1} + N_{1.2} + N_{2.2} + N_{3.2} + N_4 = 15{,}34 + 30{,}45 + 30{,}45 + 9{,}24 + 20{,}33 + 20{,}33 + 86{,}26 = 212\ kN/m$

Sienos aukštis

$l := 3.90$ m

Sienos storis

$h := 0.25$ m

$y := \frac{h}{2} = 0.125$ m

Veikianti ašinė jėga

$N_{ed} := 212$ kN

Skaičiuojamasis elemento aukštis

$l_0 := l = 3.9$ m

Santykis

$\lambda_h := \frac{l_0}{h} = 15.6$

Mūro tamprumo charakteristika iš 16 lentelės

$\alpha := 1000$

Klupumo koeficientas iš 19 lentelės

$\varphi := 0.77$

Elemento skerspjūvio plotas

$A := h \cdot 1 = 0.25$ m2

$e_{0lt} := 0.092$ m

$N_{Edlt} := 212$ kN

$\eta := 0.14$ iš 21 lentelės

$m_{lt} := \text{if}\left[h \geq 0.3, 1, 1 - \eta \cdot \frac{N_{Edlt}}{N_{ed}} \cdot \left(1 + \frac{1.2 \cdot e_{0lt}}{h}\right)\right] = 0.798$

Skaičiuojamasis mūro gniuždomasis stipris

$f_d := 1.83 \cdot 10^3 = 1.83 \times 10^3$ kPa

$N_{Rd} := m_{lt} \cdot \varphi \cdot f_d \cdot A = 281.177$ kN

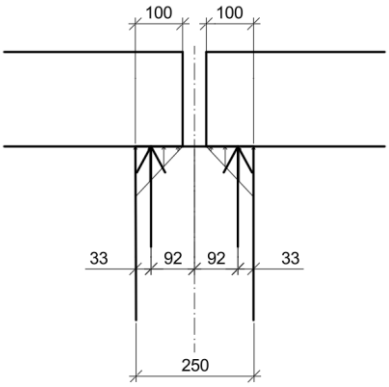
$\frac{N_{ed}}{N_{Rd}} = 0.754$

Išvada: laikomoji galia pakankama.

Tikrinama ekscentriškai gniuždomos sienos laikomoji galia nuo ekscentriškai pridėtų perdangų apkrovų. Sienos armavimas nevertinamas.

Čia apatiniame pjūvyje veikianti ekscentrinė apkrova $N_{ed} = (N_{1.1} + N_{2.1} + N_{3.1}) - (N_{1.2} + N_{2.2} + N_{3.2}) = (15{,}34 + 30{,}45 + 30{,}45) - (9{,}24 + 20{,}33 + 20{,}33) = 26{,}34\ kN/m$

Perdangos atrėmimo schema ir ekscentriciteto nustatymas:



Sienos aukštis

$l := 3.90$ m

Sienos ilgis (atstumas tarp skersinių sienų)

$l_{0s} := 1$ m

Sienos storis

$h := 0.25$ m

$y := \frac{h}{2} = 0.125$ m

Veikianti ašinė jėga

$N_{ed} := 26.34$ kN

Jėgos pridėjimo ekscentricitetas

$e_0 := 0.092$ m

Skaičiuojamasis elemento aukštis

$l_0 := 1 = 3.9$ m

Santykis

$\lambda_h := \frac{l_0}{h} = 15.6$

Mūro tamprumo charakteristika iš 16 lentelės

$\alpha := 1000$

Klupumo koeficientas iš 19 lentelės

$\varphi := 0.77$

Gniuždomos zonos aukštis

$h_c := h - 2 \cdot e_0 = 0.066$

Gniuždomos zonos santykis

$\lambda_{hc} := \frac{1}{h_c} = 59.091$

Gniuždomos zonos klupumo koeficientas iš 19 lentelės

$\varphi_c := 0.12$

$\varphi_1 := \frac{\varphi + \varphi_c}{2} = 0.445$

Elemento skerspjūvio plotas

$A := h \cdot l_{0s} = 0.25$ m2

$A_c := A \cdot \left(1 - \frac{2 \cdot e_0}{h}\right) = 0.066$

$e_{0lt} := e_0 = 0.092$ m

$N_{Edlt} := 26.34$ kN

$\eta := 0.11$ iš 21 lentelės

$m_{lt} := if\left[h \geq 300, 1, 1 - \eta \cdot \frac{N_{Edlt}}{N_{ed}} \cdot \left(1 + \frac{1.2 \cdot e_{0lt}}{h}\right)\right] = 0.841$

$\omega := 1 + \frac{e_0}{h} = 1.368$ iš 20 lentelės

Skaičiuojamasis mūro gniuždomasis stipris

$f_d := 1.82 \cdot 10^3 = 1.82 \times 10^3$ kPa

$N_{Rd} := m_{lt} \cdot \varphi_1 \cdot f_d \cdot A_c \cdot \omega = 61.528$ kN

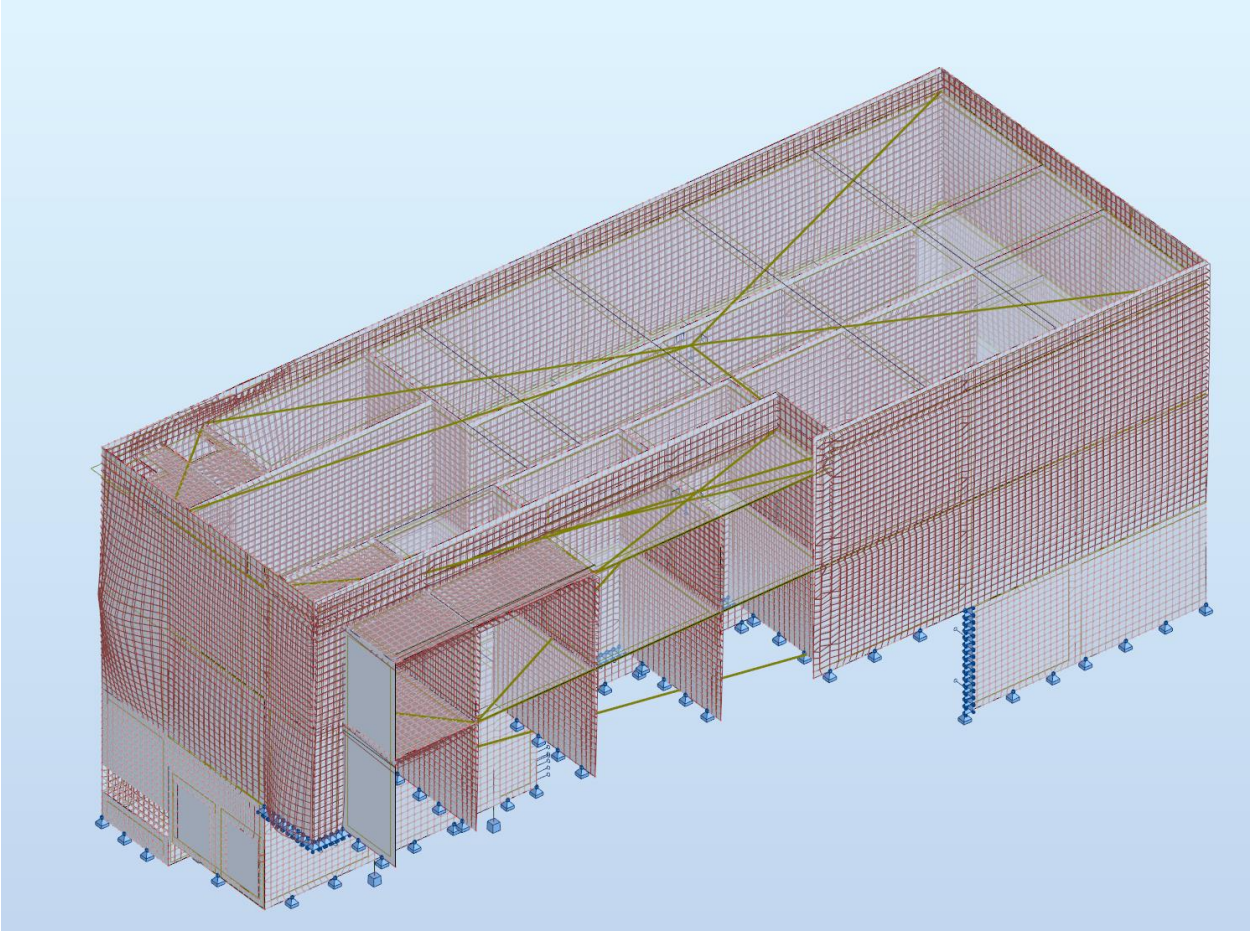
$\frac{N_{ed}}{N_{Rd}} = 0.428$

Išvada: laikomoji galia pakankama.

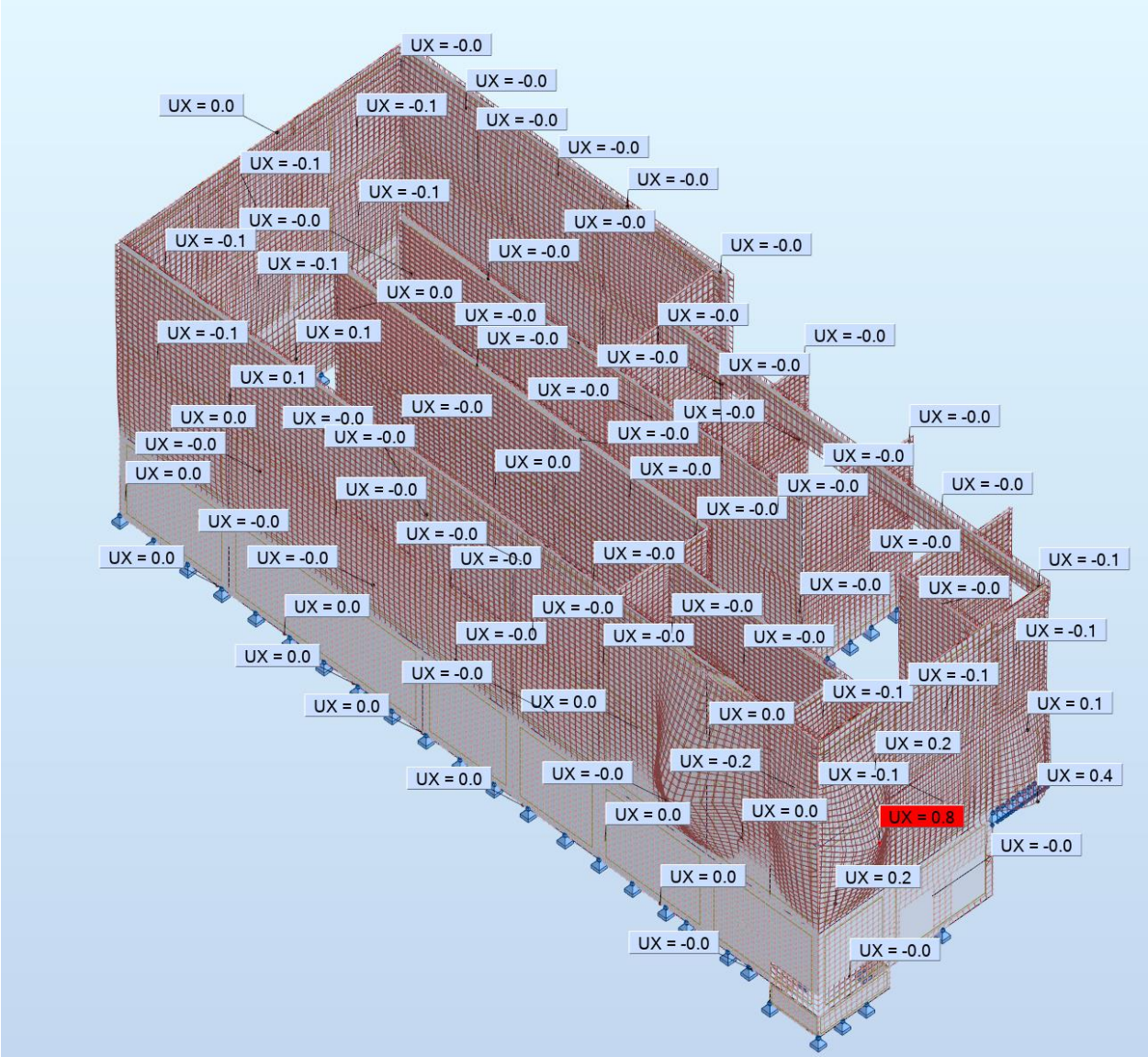
1.15. Statinio tinkamumo ribinis būvis

GB sijų ir perdangų įlinkiai pateikti elementų armavimo skaičiavimuose įvertinus GB konstrukcijų valkšnumą. Šiame skyriuje pateikiami bendri pastato horizontalūs poslinkiai.

Pastato deformuota schema veikiant tinkamumo ribinio būvio apkrovų deriniui:



Sienų deformuota schema veikiant pavojingiausiam tinkamumo ribinio būvio apkrovų deriniui:


UX = -0.0
UX = -0.0
UX = 0.0
UX = -0.1
UX = -0.0
UX = -0.0
UX = -0.1
UX = -0.0
UX = -0.1
UX = -0.0
UX = -0.0
UX = -0.1
UX = -0.0
UX = -0.0
UX = 0.0
UX = -0.0
UX = -0.0
UX = -0.1
UX = 0.1
UX = -0.0
UX = -0.0
UX = -0.0
UX = 0.1
UX = -0.0
UX = -0.0
UX = 0.0
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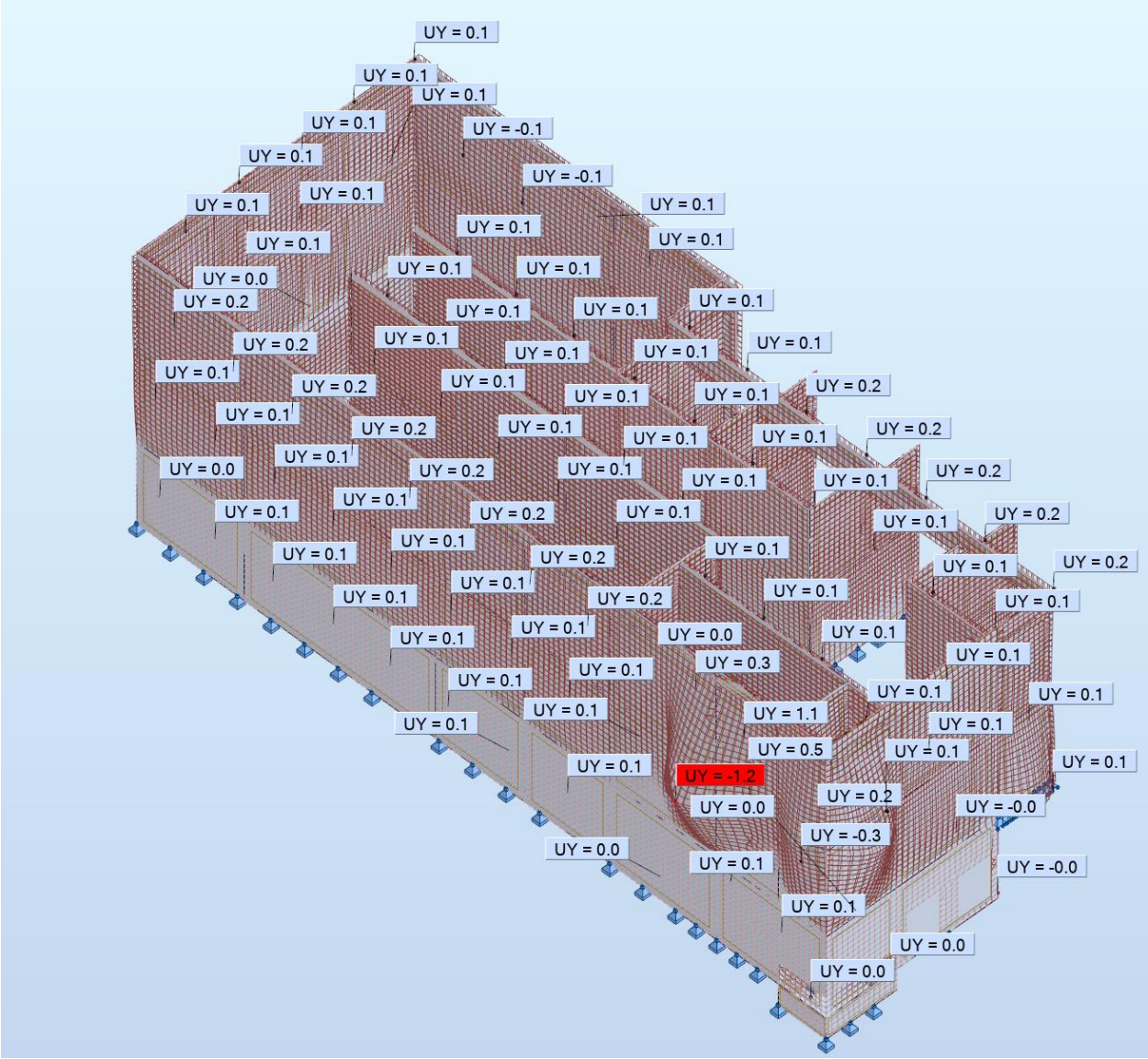
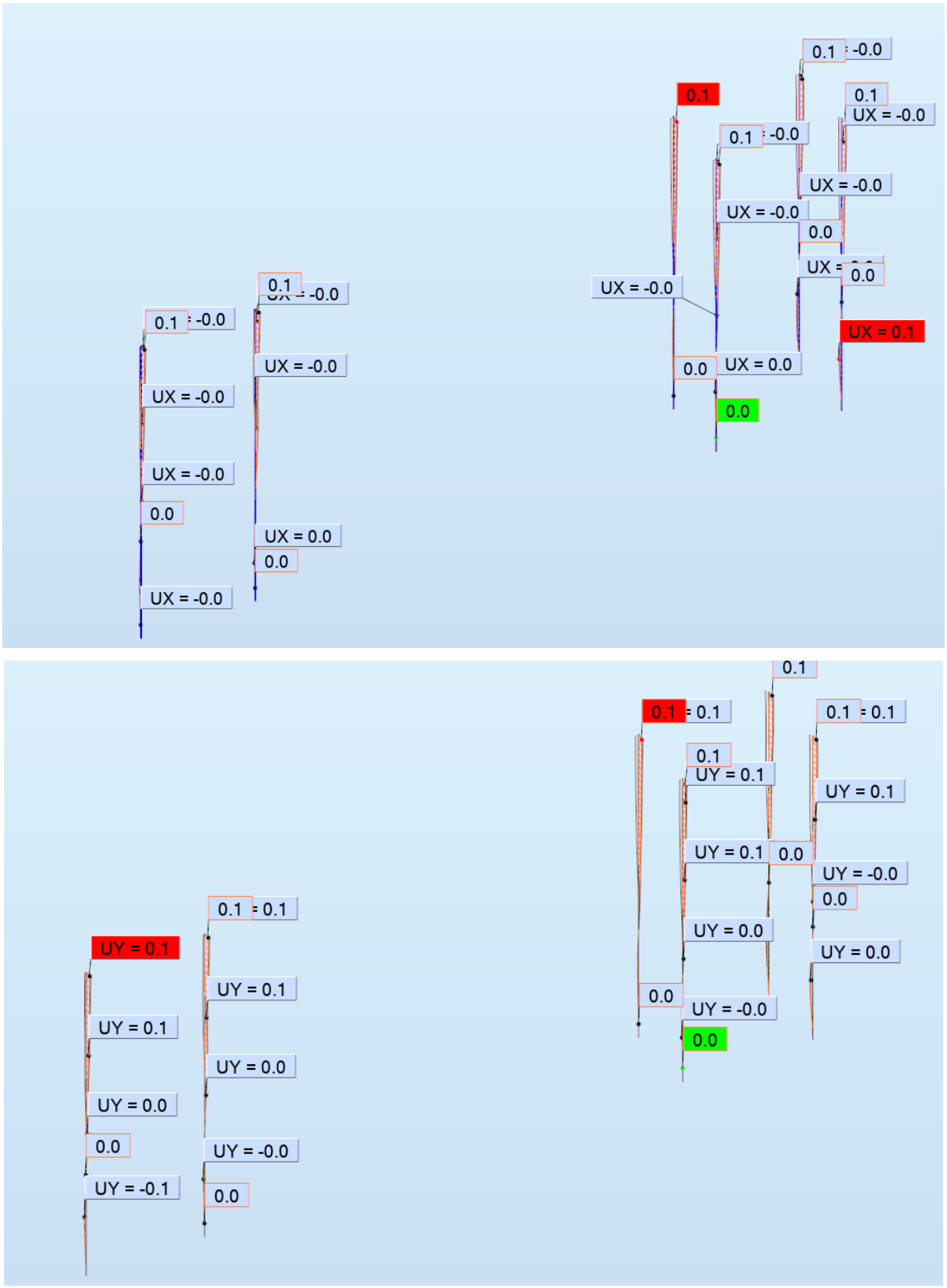
UX = -0.0
UX = -0.0
UX = -0.0
UX = 0.0
UX = -0.0
UX = -0.0
UX = -0.0
UX = -0.0
UX = -0.1
UX = 0.0
UX = -0.0
UX = -0.0
UX = -0.0
UX = -0.0
UX = -0.1
UX = 0.0
UX = -0.0
UX = -0.0
UX = -0.0
UX = -0.1
UX = -0.1
UX = 0.0
UX = 0.0
UX = 0.0
UX = 0.1
UX = 0.2
UX = -0.2
UX = -0.0
UX = -0.1
UX = 0.4
UX = 0.0
UX = 0.0
UX = 0.8
UX = -0.0
UX = 0.0
UX = 0.2
UX = -0.0
UX = -0.0



U_{max} = 1,2 cm ≤ h/500 = 8,93/500 = 1,7 cm

IŠVADA: Sienų ir pastato horizontalios deformacijos neviršija ribinių.

Kolonų deformuota schema veikiant pavojingiausiam tinkamumo ribinio būvio apkrovų deriniui:



U_{max} = 0,1 cm ≤ h_s/500 = 8.93/500 = 1,7 cm

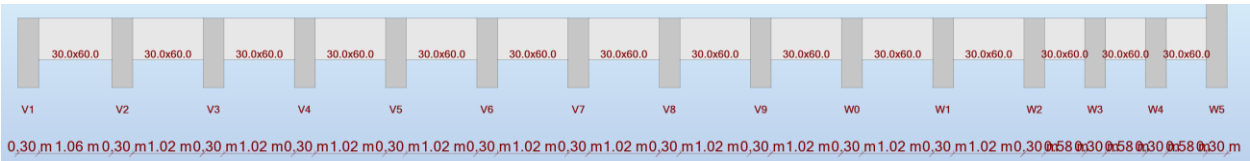
IŠVADA: Kolonų horizontalios deformacijos neviršija ribinių.

1.16. Rostverkų skaičiavimas

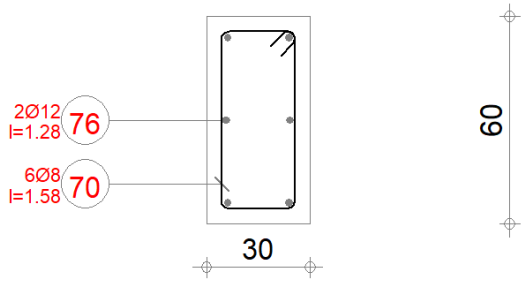
Rostverkai projektuojami kaip nekarpyta daugiaatramė sija su lanksčiomis atramomis ties polių vietomis.

Rostverkų betonas ne žemesnės klasės nei C25/30 XC2. Armatūra S500.

Visi rostverkai armuojami vienodai. Pavojingiausio rostverko skaičiuojamoji schema:



Reikalingas armavimas:



1 Level:

- Name :
- Reference level : ---
- Maximum cracking : 0.30 (mm)
- Exposure : XC2
- Concrete creep coefficient : φ_{π} = 1.90
- Cement class : N
- Concrete age : 50 (years)
- Concrete age (loading moment) : 28 (days)
- Concrete age after erecting a structure : 365 (days)
- Structure class : S4
- Fire resistance class : no requirements

2 Beam: Beam258 Number of identical elements: 1

2.1 Material properties:

- Concrete : C25/30 f_{ck} = 25.00 (MPa)
  Rectangular stress distribution [3.1.7(3)]
  Density : 2501.36 (kG/m3)
  Aggregate size : 20.0 (mm)
- Longitudinal reinforcement: : B500B f_{yk} = 500.00 (MPa)
  Horizontal branch of the stress-strain diagram

- Transversal reinforcement: :
  Ductility class : B
  B500B f_{yk} = 500.00 (MPa)
  Horizontal branch of the stress-strain diagram
- Additional reinforcement: :
  Ductility class : B
  B500B f_{yk} = 500.00 (MPa)
  Horizontal branch of the stress-strain diagram
- Modified partial coefficients:
  α_{cc} = 0.9 1992-1-1 3.1.6 (1)P

2.2 Geometry:

2.2.1

Span	Position	L.supp. (m)	L (m)	R.supp. (m)
P1	**Span 0.30**	**1.06**	**0.30**	

Span length: L_o = 1.36 (m)
Section from 0.00 to 1.06 (m)
30.0 x 60.0 (cm)
without left slab
without right slab

2.2.2

Span	Position	L.supp. (m)	L (m)	R.supp. (m)
P2	**Span 0.30**	**1.02**	**0.30**	

Span length: L_o = 1.32 (m)
Section from 0.00 to 1.02 (m)
30.0 x 60.0 (cm)
without left slab
without right slab

2.2.3

Span	Position	L.supp. (m)	L (m)	R.supp. (m)
P3	**Span 0.30**	**1.02**	**0.30**	

Span length: L_o = 1.32 (m)
Section from 0.00 to 1.02 (m)
30.0 x 60.0 (cm)
without left slab
without right slab

2.2.4

Span	Position	L.supp. (m)	L (m)	R.supp. (m)
P4	**Span 0.30**	**1.02**	**0.30**	

Span length: L_o = 1.32 (m)
Section from 0.00 to 1.02 (m)
30.0 x 60.0 (cm)
without left slab
without right slab

2.2.5

Span	Position	L.supp. (m)	L (m)	R.supp. (m)
P5	**Span 0.30**	**1.02**	**0.30**	

Span length: L_o = 1.32 (m)

Section from 0.00 to 1.02 (m)
30.0 x 60.0 (cm)
without left slab
without right slab

2.2.6

Span	Position	L.supp. (m)	L (m)	R.supp. (m)
P6	**Span 0.30**	**1.02**	**0.30**	

Span length: L_o = 1.32 (m)
Section from 0.00 to 1.02 (m)
30.0 x 60.0 (cm)
without left slab
without right slab

2.2.7

Span	Position	L.supp. (m)	L (m)	R.supp. (m)
P7	**Span 0.30**	**1.02**	**0.30**	

Span length: L_o = 1.32 (m)
Section from 0.00 to 1.02 (m)
30.0 x 60.0 (cm)
without left slab
without right slab

2.2.8

Span	Position	L.supp. (m)	L (m)	R.supp. (m)
P8	**Span 0.30**	**1.02**	**0.30**	

Span length: L_o = 1.32 (m)
Section from 0.00 to 1.02 (m)
30.0 x 60.0 (cm)
without left slab
without right slab

2.2.9

Span	Position	L.supp. (m)	L (m)	R.supp. (m)
P9	**Span 0.30**	**1.02**	**0.30**	

Span length: L_o = 1.32 (m)
Section from 0.00 to 1.02 (m)
30.0 x 60.0 (cm)
without left slab
without right slab

2.2.10

Span	Position	L.supp. (m)	L (m)	R.supp. (m)
P10	**Span 0.30**	**1.02**	**0.30**	

Span length: L_o = 1.32 (m)
Section from 0.00 to 1.02 (m)
30.0 x 60.0 (cm)
without left slab
without right slab

2.2.11

Span	Position	L.supp. (m)	L (m)	R.supp. (m)
P11	**Span 0.30**	**1.02**	**0.30**	

Span length: L_o = 1.32 (m)
Section from 0.00 to 1.02 (m)
30.0 x 60.0 (cm)
without left slab
without right slab

2.2.12	Span	Position	L.supp. (m)	L (m)	R.supp. (m)
	P12	**Span 0.30**	**0.58**	**0.30**	

Span length: L_o = 0.88 (m)
Section from 0.00 to 0.58 (m)
30.0 x 60.0 (cm)
without left slab
without right slab

2.2.13	Span	Position	L.supp. (m)	L (m)	R.supp. (m)
	P13	**Span 0.30**	**0.58**	**0.30**	

Span length: L_o = 0.88 (m)
Section from 0.00 to 0.58 (m)
30.0 x 60.0 (cm)
without left slab
without right slab

2.2.14	Span	Position	L.supp. (m)	L (m)	R.supp. (m)
	P14	**Span 0.30**	**0.58**	**0.30**	

Span length: L_o = 0.88 (m)
Section from 0.00 to 0.58 (m)
30.0 x 60.0 (cm)
without left slab
without right slab

2.3 Calculation options:

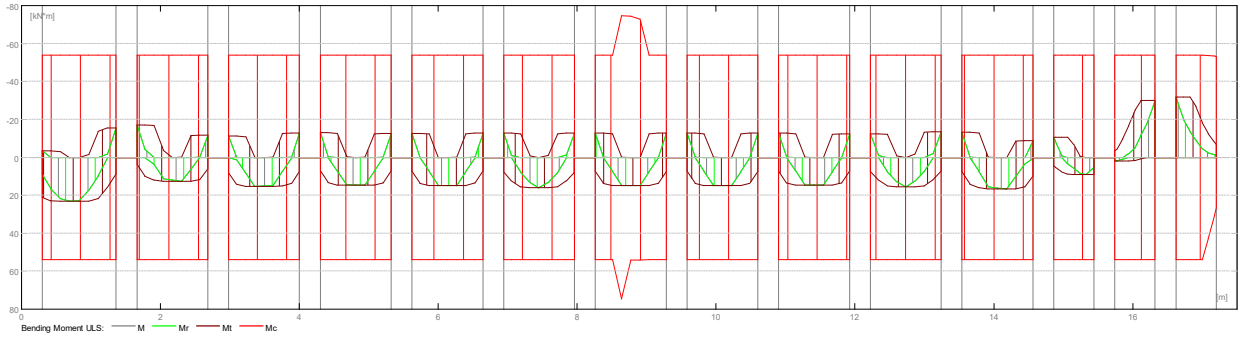
- Regulation of combinations : EN 1990:2002/AC:2010 (Eq.6.10)
- Calculations according to : EN 1992-1-1:2004/A1:2014
- Seismic dispositions : No requirements
- Precast beam : no
- Cover : bottom c = 4.5 (cm)
  : side c1= 4.5 (cm)
  : top c2= 4.5 (cm)
- Cover deviations : Cdev = 1.0(cm), Cdur = 0.0(cm)
- Coefficient β_2 =0.50 : long-term or cyclic load
- Method of shear calculations : strut inclination

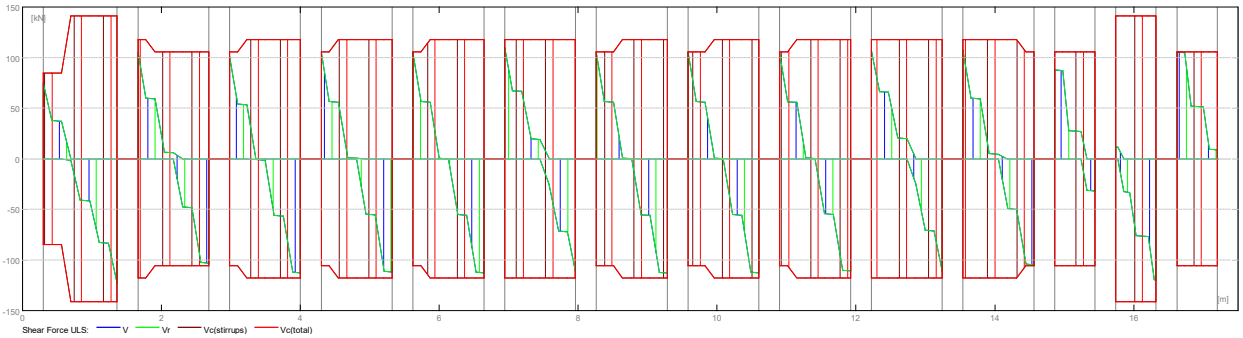
2.4 Calculation results:

2.4.1 Internal forces in ULS

Span	Mt max. (kN*m)	Mt min. (kN*m)	Ml (kN*m)	Mr (kN*m)	Ql (kN)	Qr (kN)
P1	23.17	-1.37	21.10	-15.42	74.64	-122.71
P2	12.67	-3.75	-17.18	-11.78	105.28	-103.00
P3	15.31	-0.08	-11.16	-12.90	101.19	-112.71
P4	14.60	-0.25	-13.00	-12.71	104.83	-111.82
P5	14.83	-0.00	-12.66	-12.81	104.82	-112.67
P6	15.90	-1.05	-12.78	-12.73	109.74	-111.80
P7	14.84	-0.03	-12.80	-12.81	105.24	-112.89
P8	14.83	-0.02	-12.81	-12.75	105.23	-112.66

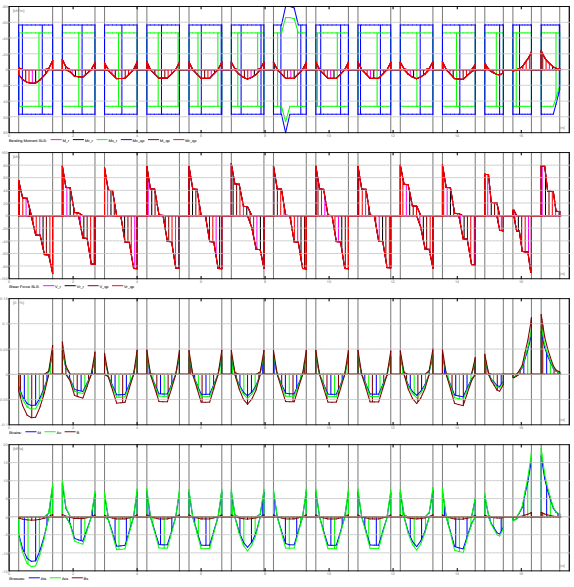
P9	14.72	-0.08	-12.81	-12.39	104.62	-110.80
P10	15.49	-1.68	-12.46	-13.51	107.10	-111.19
P11	16.65	-0.15	-13.20	9.95	107.45	-104.78
P12	8.94	-10.68	-10.68	8.94	87.72	-31.94
P13	1.84	-30.12	-3.36	-30.12	11.48	-119.80
P14	0.00	-31.70	-31.70	-6.58	105.60	8.70





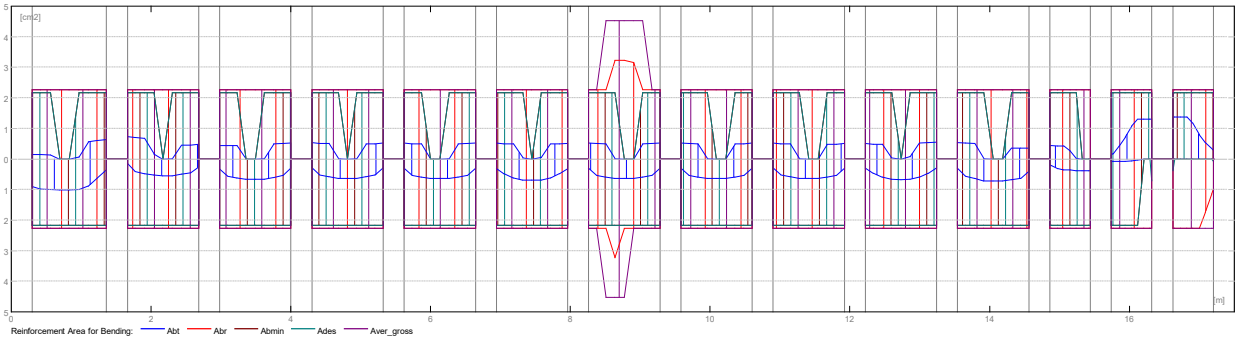
2.4.2 Internal forces in SLS

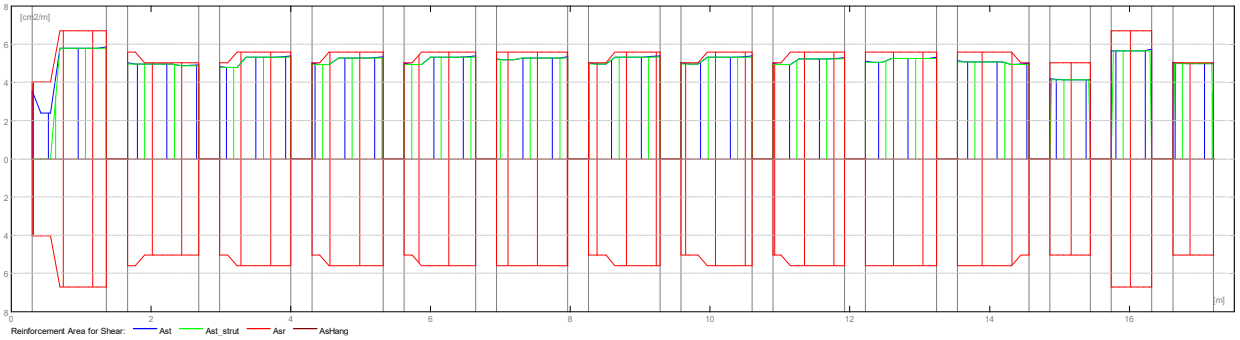
Span	Mt max. (kN*m)	Mt min. (kN*m)	Ml (kN*m)	Mr (kN*m)	Ql (kN)	Qr (kN)
P1	17.31	0.00	6.64	-11.52	55.74	-91.65
P2	9.47	0.00	-12.83	-8.80	78.64	-76.96
P3	11.44	0.00	-8.34	-9.64	75.61	-84.22
P4	10.91	0.00	-9.71	-9.50	78.33	-83.56
P5	11.08	0.00	-9.46	-9.57	78.33	-84.20
P6	11.88	0.00	-9.55	-9.52	82.01	-83.55
P7	11.09	0.00	-9.57	-9.57	78.65	-84.36
P8	11.09	0.00	-9.58	-9.53	78.64	-84.20
P9	11.00	0.00	-9.57	-9.26	78.19	-82.81
P10	11.58	0.00	-9.31	-10.10	80.04	-83.10
P11	12.44	0.00	-9.87	-6.65	80.31	-78.32
P12	6.69	0.00	-7.98	4.00	65.59	-23.86
P13	1.38	-8.71	1.17	-22.56	8.53	-89.65
P14	0.00	-10.16	-23.74	-0.94	79.03	6.54



2.4.3 Required reinforcement area

Span	Span (cm2)		Left support (cm2)		Right support (cm2)	
	bottom	top	bottom	top	bottom	top
P1	1.01	0.00	0.90	0.15	0.35	0.63
P2	0.55	0.00	0.15	0.73	0.25	0.48
P3	0.66	0.00	0.33	0.45	0.30	0.53
P4	0.63	0.00	0.29	0.53	0.29	0.52
P5	0.64	0.00	0.30	0.52	0.30	0.52
P6	0.69	0.00	0.31	0.52	0.32	0.51
P7	0.64	0.00	0.30	0.52	0.30	0.52
P8	0.64	0.00	0.30	0.52	0.30	0.52
P9	0.64	0.00	0.29	0.52	0.30	0.51
P10	0.67	0.00	0.31	0.51	0.29	0.55
P11	0.72	0.00	0.31	0.54	0.39	0.35
P12	0.39	0.00	0.19	0.44	0.39	0.00
P13	0.08	0.00	0.07	0.14	0.00	1.31
P14	0.00	0.00	0.00	1.38	0.00	0.28





2.4.4 Deflection and cracking

wt(QP) Total due to quasi-permanent combination
wt(QP)dop Allowable due to quasi-permanent combination
Dwt(QP) Deflection increment from the quasi-permanent load combination after erecting a structure.
Dwt(QP)dop Admissible deflection increment from the quasi-permanent load combination after erecting a structure.

wk - width of perpendicular cracks

Span	wt(QP) (cm)	wt(QP)dop (cm)	Dwt(QP) (cm)	Dwt(QP)dop (cm)	wk (mm)
P1	0.0	0.5	0.0	0.3	0.0
P2	0.0	0.5	0.0	0.3	0.0
P3	0.0	0.5	0.0	0.3	0.0
P4	0.0	0.5	0.0	0.3	0.0
P5	0.0	0.5	0.0	0.3	0.0
P6	0.0	0.5	0.0	0.3	0.0
P7	0.0	0.5	0.0	0.3	0.0
P8	0.0	0.5	0.0	0.3	0.0
P9	0.0	0.5	0.0	0.3	0.0
P10	0.0	0.5	0.0	0.3	0.0
P11	0.0	0.5	0.0	0.3	0.0
P12	0.0	0.4	0.0	0.2	0.0
P13	-0.0	0.4	-0.0	0.2	0.0
P14	0.0	0.4	0.0	0.2	0.0

2.5 Theoretical results - detailed results:

2.5.1 P1 : Span from 0.30 to 1.36 (m)

	ULS		SLS			
Abscissa (m)	M max. (kN*m)	M min. (kN*m)	M max. (kN*m)	M min. (kN*m)	A bottom (cm2)	A top (cm2)
0.30	21.10	-3.48	6.64	-2.60	0.90	0.15
0.42	22.85	-3.48	12.40	0.00	0.98	0.15
0.56	23.17	-3.03	16.19	0.00	0.99	0.13
0.69	23.17	-0.00	17.31	0.00	1.01	0.00
0.83	23.17	-0.00	17.09	0.00	1.01	0.00
0.97	23.11	-1.37	12.90	0.00	1.00	0.06
1.10	21.67	-13.68	7.25	0.00	0.89	0.56
1.24	15.64	-15.42	0.00	-1.31	0.61	0.60
1.36	8.59	-15.42	0.00	-11.52	0.35	0.63

	ULS	SLS	
Abscissa (m)	V max. (kN)	V max. (kN)	afp (mm)
0.30	74.64	55.74	0.0
0.42	37.68	28.14	0.0
0.56	36.87	27.54	0.0
0.69	-1.52	-1.13	0.0
0.83	-40.76	-30.45	0.0
0.97	-41.57	-31.05	0.0
1.10	-82.81	-61.85	0.0
1.24	-83.62	-62.45	0.0
1.36	-122.71	-91.65	0.0

2.5.2 P2 : Span from 1.66 to 2.68 (m)

	ULS		SLS			
Abscissa (m)	M max. (kN*m)	M min. (kN*m)	M max. (kN*m)	M min. (kN*m)	A bottom (cm2)	A top (cm2)
1.66	3.58	-17.18	0.00	-12.83	0.15	0.73
1.78	10.03	-17.18	0.00	-3.33	0.41	0.70
1.91	11.89	-16.84	2.75	0.00	0.48	0.68
2.04	12.56	-3.75	8.39	0.00	0.53	0.16

2.17	12.67	-0.00	8.98	0.00	0.55	0.00
2.30	12.67	-0.09	9.47	0.00	0.55	0.00
2.44	12.67	-11.47	4.75	0.00	0.50	0.45
2.57	11.67	-11.78	0.05	-0.08	0.45	0.46
2.68	6.22	-11.78	0.01	-8.80	0.25	0.48

Abscissa (m)	ULS V max. (kN)	SLS V max. (kN)	afp (mm)
1.66	105.28	78.64	0.0
1.78	59.84	44.69	0.0
1.91	59.05	44.11	0.0
2.04	6.66	4.97	0.0
2.17	5.88	4.39	0.0
2.30	-47.38	-35.41	0.0
2.44	-48.17	-35.99	0.0
2.57	-102.32	-76.45	0.0
2.68	-103.00	-76.96	0.0

2.5.3 P3 : Span from 2.98 to 4.00 (m)

Abscissa (m)	ULS M max. (kN*m)	ULS M min. (kN*m)	SLS M max. (kN*m)	SLS M min. (kN*m)	A bottom (cm2)	A top (cm2)
2.98	8.22	-11.16	0.13	-8.34	0.33	0.45
3.10	14.21	-11.16	0.98	0.00	0.57	0.45
3.23	15.31	-10.87	6.26	0.00	0.62	0.44
3.36	15.31	-0.00	11.44	0.00	0.66	0.00
3.49	15.31	-0.00	11.32	0.00	0.66	0.00
3.62	15.29	-0.08	11.11	0.00	0.66	0.00
3.76	15.11	-12.57	5.56	0.00	0.60	0.50
3.89	13.69	-12.90	0.00	-0.07	0.54	0.51
4.00	7.27	-12.90	0.00	-9.64	0.30	0.53

Abscissa (m)	ULS V max. (kN)	SLS V max. (kN)	afp (mm)
2.98	101.19	75.61	0.0
3.10	53.99	40.34	0.0
3.23	53.20	39.75	0.0
3.36	-0.83	-0.62	0.0
3.49	-1.62	-1.21	0.0
3.62	-55.88	-41.76	0.0
3.76	-56.67	-42.34	0.0
3.89	-112.03	-83.71	0.0
4.00	-112.71	-84.22	0.0

2.5.4 P4 : Span from 4.30 to 5.32 (m)

Abscissa (m)	ULS M max. (kN*m)	ULS M min. (kN*m)	SLS M max. (kN*m)	SLS M min. (kN*m)	A bottom (cm2)	A top (cm2)
4.30	7.02	-13.00	0.00	-9.71	0.29	0.53
4.42	13.33	-13.00	0.00	-0.22	0.52	0.51
4.55	14.58	-12.66	5.37	0.00	0.58	0.50
4.68	14.60	-0.25	10.83	0.00	0.63	0.01
4.81	14.60	-0.00	10.91	0.00	0.63	0.00
4.94	14.60	-0.00	10.91	0.00	0.63	0.00
5.08	14.60	-12.38	5.49	0.00	0.58	0.49
5.21	13.44	-12.71	0.02	-0.00	0.53	0.50
5.32	7.18	-12.71	0.00	-9.50	0.29	0.52

Abscissa (m)	ULS V max. (kN)	SLS V max. (kN)	afp (mm)
4.30	104.83	78.33	0.0
4.42	56.78	42.43	0.0
4.55	56.00	41.84	0.0
4.68	1.22	0.90	0.0
4.81	0.43	0.32	0.0
4.94	-54.51	-40.74	0.0
5.08	-55.30	-41.32	0.0

5.21	-111.14	-83.06	0.0
5.32	-111.82	-83.56	0.0

2.5.5 P5 : Span from 5.62 to 6.64 (m)

	ULS		SLS			
Abscissa	M max.	M min.	M max.	M min.	A bottom	A top
(m)	(kN*m)	(kN*m)	(kN*m)	(kN*m)	(cm2)	(cm2)
5.62	7.34	-12.66	0.01	-9.46	0.30	0.52
5.74	13.63	-12.66	0.07	0.00	0.54	0.50
5.87	14.83	-12.33	5.61	0.00	0.59	0.49
6.00	14.83	-0.00	11.06	0.00	0.64	0.00
6.13	14.83	-0.00	11.08	0.00	0.64	0.00
6.26	14.83	-0.00	11.04	0.00	0.64	0.00
6.40	14.82	-12.47	5.55	0.00	0.59	0.50
6.53	13.60	-12.81	0.03	-0.00	0.53	0.50
6.64	7.26	-12.81	0.00	-9.57	0.30	0.52

	ULS	SLS	
Abscissa	V max.	V max.	afp
(m)	(kN)	(kN)	(mm)
5.62	104.82	78.33	0.0
5.74	56.53	42.24	0.0
5.87	55.74	41.65	0.0
6.00	0.75	0.56	0.0
6.13	-0.11	-0.08	0.0
6.26	-55.20	-41.26	0.0
6.40	-55.99	-41.84	0.0
6.53	-111.99	-83.70	0.0
6.64	-112.67	-84.20	0.0

2.5.6 P6 : Span from 6.94 to 7.96 (m)

	ULS		SLS			
Abscissa	M max.	M min.	M max.	M min.	A bottom	A top
(m)	(kN*m)	(kN*m)	(kN*m)	(kN*m)	(cm2)	(cm2)
6.94	7.68	-12.78	0.00	-9.55	0.31	0.52
7.06	12.47	-12.78	0.00	-0.74	0.49	0.50
7.19	15.49	-12.47	5.87	0.00	0.62	0.50
7.32	15.90	-0.84	9.97	0.00	0.69	0.04
7.45	15.90	-0.00	11.88	0.00	0.69	0.00
7.58	15.90	-1.05	9.86	0.00	0.68	0.04
7.72	15.47	-12.43	6.14	0.00	0.62	0.50
7.85	12.40	-12.73	0.00	-0.93	0.48	0.50
7.96	8.02	-12.73	0.00	-9.52	0.32	0.51

	ULS	SLS	
Abscissa	V max.	V max.	afp
(m)	(kN)	(kN)	(mm)
6.94	109.74	82.01	0.0
7.06	67.35	50.33	0.0
7.19	66.57	49.75	0.0
7.32	19.80	14.80	0.0
7.45	19.02	14.22	0.0
7.58	-25.96	-19.40	0.0
7.72	-71.26	-53.26	0.0
7.85	-72.04	-53.84	0.0
7.96	-111.80	-83.55	0.0

2.5.7 P7 : Span from 8.26 to 9.28 (m)

	ULS		SLS			
Abscissa	M max.	M min.	M max.	M min.	A bottom	A top
(m)	(kN*m)	(kN*m)	(kN*m)	(kN*m)	(cm2)	(cm2)
8.26	7.28	-12.80	0.00	-9.57	0.30	0.52
8.38	13.62	-12.80	0.01	-0.02	0.53	0.50
8.51	14.83	-12.47	5.57	0.00	0.59	0.50
8.64	14.84	-0.03	11.05	0.00	0.64	0.00
8.77	14.84	-0.00	11.09	0.00	0.64	0.00
8.90	14.84	-0.00	11.06	0.00	0.64	0.00
9.04	14.83	-12.47	5.57	0.00	0.59	0.50
9.17	13.63	-12.81	0.04	0.00	0.54	0.50

9.28	7.28	-12.81	0.01	-9.57	0.30	0.52

Abscissa (m)	ULS V max. (kN)	SLS V max. (kN)	afp (mm)
8.26	105.24	78.65	0.0
8.38	56.78	42.43	0.0
8.51	55.99	41.84	0.0
8.64	0.82	0.61	0.0
8.77	0.03	-0.02	0.0
8.90	-55.28	-41.32	0.0
9.04	-56.06	-41.90	0.0
9.17	-112.21	-83.86	0.0
9.28	-112.89	-84.36	0.0

2.5.8 P8 : Span from 9.58 to 10.60 (m)

Abscissa (m)	ULS M max. (kN*m)	M min. (kN*m)	SLS M max. (kN*m)	M min. (kN*m)	A bottom (cm2)	A top (cm2)
9.58	7.28	-12.81	0.00	-9.58	0.30	0.52
9.70	13.62	-12.81	0.00	-0.02	0.53	0.50
9.83	14.83	-12.48	5.56	0.00	0.59	0.50
9.96	14.83	-0.02	11.05	0.00	0.64	0.00
10.09	14.83	-0.00	11.09	0.00	0.64	0.00
10.22	14.83	-0.00	11.07	0.00	0.64	0.00
10.36	14.83	-12.41	5.58	0.00	0.59	0.49
10.49	13.64	-12.75	0.07	0.00	0.54	0.50
10.60	7.30	-12.75	0.01	-9.53	0.30	0.52

Abscissa (m)	ULS V max. (kN)	SLS V max. (kN)	afp (mm)
9.58	105.23	78.64	0.0
9.70	56.76	42.41	0.0
9.83	55.97	41.83	0.0
9.96	0.81	0.60	0.0
10.09	0.03	0.02	0.0
10.22	-55.19	-41.25	0.0
10.36	-55.97	-41.83	0.0
10.49	-111.98	-83.69	0.0
10.60	-112.66	-84.20	0.0

2.5.9 P9 : Span from 10.90 to 11.92 (m)

Abscissa (m)	ULS M max. (kN*m)	M min. (kN*m)	SLS M max. (kN*m)	M min. (kN*m)	A bottom (cm2)	A top (cm2)
10.90	7.17	-12.81	0.00	-9.57	0.29	0.52
11.02	13.48	-12.81	0.00	-0.07	0.53	0.50
11.15	14.71	-12.47	5.49	0.00	0.59	0.50
11.28	14.72	-0.08	10.94	0.00	0.64	0.00
11.41	14.72	-0.00	11.00	0.00	0.64	0.00
11.54	14.72	-0.00	11.00	0.00	0.64	0.00
11.68	14.72	-12.07	5.61	0.00	0.59	0.48
11.81	13.58	-12.39	0.20	0.00	0.53	0.49
11.92	7.35	-12.39	0.03	-9.26	0.30	0.51

Abscissa (m)	ULS V max. (kN)	SLS V max. (kN)	afp (mm)
10.90	104.62	78.19	0.0
11.02	56.45	42.18	0.0
11.15	55.66	41.60	0.0
11.28	1.04	0.77	0.0
11.41	0.25	0.19	0.0
11.54	-54.25	-40.55	0.0
11.68	-55.04	-41.13	0.0
11.81	-110.12	-82.31	0.0
11.92	-110.80	-82.81	0.0

2.5.10 P10 : Span from 12.22 to 13.24 (m)

	ULS		SLS			
Abscissa (m)	M max. (kN*m)	M min. (kN*m)	M max. (kN*m)	M min. (kN*m)	A bottom (cm2)	A top (cm2)
12.22	7.56	-12.46	0.00	-9.31	0.31	0.51
12.34	12.02	-12.46	0.00	-0.76	0.47	0.49
12.47	15.07	-12.16	5.78	0.00	0.60	0.48
12.60	15.49	-0.85	9.59	0.00	0.67	0.04
12.73	15.49	-0.00	11.58	0.00	0.67	0.00
12.86	15.49	-1.68	9.35	0.00	0.67	0.07
13.00	15.02	-13.21	5.51	0.00	0.59	0.52
13.13	11.69	-13.51	0.00	-1.49	0.46	0.53
13.24	7.21	-13.51	0.00	-10.10	0.29	0.55

	ULS	SLS	
Abscissa (m)	V max. (kN)	V max. (kN)	afp (mm)
12.22	107.10	80.04	0.0
12.34	66.52	49.71	0.0
12.47	65.73	49.13	0.0
12.60	20.58	15.38	0.0
12.73	19.79	14.79	0.0
12.86	-25.21	-18.84	0.0
13.00	-70.58	-52.76	0.0
13.13	-71.37	-53.34	0.0
13.24	-111.19	-83.10	0.0

2.5.11 P11 : Span from 13.54 to 14.56 (m)

	ULS		SLS			
Abscissa (m)	M max. (kN*m)	M min. (kN*m)	M max. (kN*m)	M min. (kN*m)	A bottom (cm2)	A top (cm2)
13.54	7.54	-13.20	0.00	-9.87	0.31	0.54
13.66	14.23	-13.20	0.00	-0.13	0.56	0.52
13.79	15.99	-12.86	5.76	0.00	0.64	0.51
13.92	16.56	-0.15	11.56	0.00	0.72	0.01
14.05	16.65	-0.00	12.03	0.00	0.72	0.00
14.18	16.65	-0.00	12.44	0.00	0.72	0.00
14.32	16.65	-8.66	7.55	0.00	0.68	0.35
14.45	15.60	-8.90	2.61	0.00	0.64	0.36
14.56	9.95	-8.90	0.36	-6.65	0.39	0.35

	ULS	SLS	
Abscissa (m)	V max. (kN)	V max. (kN)	afp (mm)
13.54	107.45	80.31	0.0
13.66	59.85	44.73	0.0
13.79	59.07	44.15	0.0
13.92	5.16	3.84	0.0
14.05	4.37	3.26	0.0
14.18	-49.21	-36.79	0.0
14.32	-49.99	-37.37	0.0
14.45	-104.10	-77.82	0.0
14.56	-104.78	-78.32	0.0

2.5.12 P12 : Span from 14.86 to 15.44 (m)

	ULS		SLS			
Abscissa (m)	M max. (kN*m)	M min. (kN*m)	M max. (kN*m)	M min. (kN*m)	A bottom (cm2)	A top (cm2)
14.86	4.61	-10.68	0.00	-7.98	0.19	0.44
14.89	5.33	-10.68	0.00	-6.27	0.22	0.44
14.98	7.72	-10.68	0.00	-0.56	0.31	0.43
15.06	8.79	-10.68	2.60	0.00	0.35	0.42
15.15	8.94	-6.57	4.42	0.00	0.36	0.26
15.24	8.94	-0.57	6.20	0.00	0.38	0.02
15.33	8.94	-0.00	6.69	0.00	0.39	0.00
15.42	8.94	-0.00	4.62	0.00	0.39	0.00
15.44	8.94	-0.00	4.00	0.00	0.39	0.00

	ULS	SLS	
Abscissa	V max.	V max.	afp

(m)	(kN)	(kN)	(mm)
14.86	87.72	65.59	0.0
14.89	87.57	65.48	0.0
14.98	87.04	65.09	0.0
15.06	27.83	20.82	0.0
15.15	27.31	20.43	0.0
15.24	26.79	20.04	0.0
15.33	-31.26	-23.36	0.0
15.42	-31.78	-23.75	0.0
15.44	-31.94	-23.86	0.0

2.5.13 P13 : Span from 15.74 to 16.32 (m)

	ULS		SLS			
Abscissa	M max.	M min.	M max.	M min.	A bottom	A top
(m)	(kN*m)	(kN*m)	(kN*m)	(kN*m)	(cm2)	(cm2)
15.74	1.84	-3.36	1.17	0.00	0.07	0.14
15.77	1.84	-4.22	1.38	0.00	0.08	0.17
15.86	1.84	-10.02	0.71	0.00	0.08	0.43
15.94	1.84	-16.75	0.00	-1.51	0.08	0.72
16.03	1.63	-24.94	0.00	-3.69	0.07	1.08
16.12	0.72	-30.12	0.00	-8.71	0.03	1.31
16.21	0.00	-30.12	0.00	-13.76	0.00	1.31
16.30	0.00	-30.12	0.00	-20.23	0.00	1.31
16.32	0.00	-30.12	0.00	-22.56	0.00	1.31

	ULS	SLS	
Abscissa	V max.	V max.	afp
(m)	(kN)	(kN)	(mm)
15.74	11.48	8.53	0.0
15.77	11.32	8.42	0.0
15.86	-32.54	-24.40	0.0
15.94	-33.07	-24.79	0.0
16.03	-75.90	-56.82	0.0
16.12	-76.42	-57.21	0.0
16.21	-76.95	-57.60	0.0
16.30	-119.64	-89.53	0.0
16.32	-119.80	-89.65	0.0

2.5.14 P14 : Span from 16.62 to 17.20 (m)

	ULS		SLS			
Abscissa	M max.	M min.	M max.	M min.	A bottom	A top
(m)	(kN*m)	(kN*m)	(kN*m)	(kN*m)	(cm2)	(cm2)
16.62	0.00	-31.70	0.00	-23.74	0.00	1.38
16.65	0.00	-31.70	0.00	-21.68	0.00	1.38
16.74	0.00	-31.70	0.00	-14.75	0.00	1.38
16.82	0.00	-31.70	0.00	-10.16	0.00	1.38
16.91	0.00	-26.74	0.00	-6.74	0.00	1.16
17.00	0.00	-18.23	0.00	-3.36	0.00	0.79
17.09	0.00	-12.47	0.00	-1.71	0.00	0.54
17.18	0.00	-7.92	0.00	-1.10	0.00	0.34
17.20	0.00	-6.58	0.00	-0.94	0.00	0.28

	ULS	SLS	
Abscissa	V max.	V max.	afp
(m)	(kN)	(kN)	(mm)
16.62	105.60	79.03	0.0
16.65	105.44	78.91	0.0
16.74	104.92	78.52	0.0
16.82	52.13	39.03	0.0
16.91	51.60	38.64	0.0
17.00	51.08	38.25	0.0
17.09	9.38	7.05	0.0
17.18	8.86	6.66	0.0
17.20	8.70	6.54	0.0

2.6 Reinforcement:

2.6.1 P1 : Span from 0.30 to 1.36 (m)

Longitudinal reinforcement:

Surface reinforcement (B500B):

2 ϕ12 l = 1.27 from 0.20 to 1.47
pins 1 ∅8 l = 0.37
e = 1*0.53 (m)

Transversal reinforcement:

- main (B500B)

stirrups 6 ϕ8 l = 1.54
e = 1*0.07 + 1*0.25 + 4*0.15 (m)
2 ϕ12 l = 1.27
e = 1*-0.10 (m)

pins 2 ϕ12 l = 1.27
e = 1*-0.10 (m)

2.6.2 P2 : Span from 1.66 to 2.68 (m)

Longitudinal reinforcement:

Surface reinforcement (B500B):

2 ϕ12 l = 1.23 from 1.56 to 2.79
pins 1 ∅8 l = 0.37
e = 1*0.51 (m)

Transversal reinforcement:

- main (B500B)

stirrups 5 ϕ8 l = 1.54
e = 1*0.04 + 1*0.18 + 3*0.20 (m)
2 ϕ12 l = 1.23
e = 1*-0.10 (m)

pins 2 ϕ12 l = 1.23
e = 1*-0.10 (m)

2.6.3 P3 : Span from 2.98 to 4.00 (m)

Longitudinal reinforcement:

Surface reinforcement (B500B):

2 ϕ12 l = 1.23 from 2.88 to 4.11
pins 1 ∅8 l = 0.37
e = 1*0.51 (m)

Transversal reinforcement:

- main (B500B)

stirrups 5 ϕ8 l = 1.54
e = 1*0.20 + 4*0.18 (m)
2 ϕ12 l = 1.23
e = 1*-0.10 (m)

pins 2 ϕ12 l = 1.23
e = 1*-0.10 (m)

2.6.4 P4 : Span from 4.30 to 5.32 (m)

Longitudinal reinforcement:

- bottom (B500B)

2 ϕ12 l = 8.94 from 0.05 to 8.89

- support (B500B)

2 ϕ12 l = 9.27 from 0.05 to 9.10

Surface reinforcement (B500B):

2 ϕ12 l = 1.23 from 4.20 to 5.43
pins 1 ∅8 l = 0.37
e = 1*0.51 (m)

Transversal reinforcement:

- main (B500B)

stirrups 5 ϕ8 l = 1.54
e = 1*0.20 + 4*0.18 (m)
2 ϕ12 l = 1.23

e = 1*-0.10 (m)

pins 2 ϕ12 l = 1.23
e = 1*-0.10 (m)

2.6.5 P5 : Span from 5.62 to 6.64 (m)

Longitudinal reinforcement:

Surface reinforcement (B500B):

2 ϕ12 l = 1.23 from 5.52 to 6.75
pins 1 ∅8 l = 0.37
e = 1*0.51 (m)

Transversal reinforcement:

- main (B500B)

stirrups 5 ϕ8 l = 1.54
e = 1*0.20 + 4*0.18 (m)
2 ϕ12 l = 1.23
e = 1*-0.11 (m)

pins 2 ϕ12 l = 1.23
e = 1*-0.11 (m)

2.6.6 P6 : Span from 6.94 to 7.96 (m)

Longitudinal reinforcement:

Surface reinforcement (B500B):

2 ϕ12 l = 1.23 from 6.84 to 8.07
pins 1 ∅8 l = 0.37
e = 1*0.51 (m)

Transversal reinforcement:

- main (B500B)

stirrups 6 ϕ8 l = 1.54
e = 1*0.06 + 5*0.18 (m)
2 ϕ12 l = 1.23
e = 1*-0.11 (m)

pins 2 ϕ12 l = 1.23
e = 1*-0.11 (m)

2.6.7 P7 : Span from 8.26 to 9.28 (m)

Longitudinal reinforcement:

Surface reinforcement (B500B):

2 ϕ12 l = 1.23 from 8.16 to 9.39
pins 1 ∅8 l = 0.37
e = 1*0.51 (m)

Transversal reinforcement:

- main (B500B)

stirrups 5 ϕ8 l = 1.54
e = 1*0.10 + 1*0.20 + 3*0.18 (m)
2 ϕ12 l = 1.23
e = 1*-0.11 (m)

pins 2 ϕ12 l = 1.23
e = 1*-0.11 (m)

2.6.8 P8 : Span from 9.58 to 10.60 (m)

Longitudinal reinforcement:

Surface reinforcement (B500B):

2 ϕ12 l = 1.23 from 9.48 to 10.71
pins 1 ∅8 l = 0.37
e = 1*0.51 (m)

Transversal reinforcement:

- main (B500B)

stirrups 5 ϕ8 l = 1.54

e = 1*0.10 + 1*0.20 + 3*0.18 (m)
2 ϕ12 l = 1.23
e = 1*-0.11 (m)

pins 2 ϕ12 l = 1.23
e = 1*-0.11 (m)

2.6.9 P9 : Span from 10.90 to 11.92 (m)

Longitudinal reinforcement:

Surface reinforcement (B500B):

2 ϕ12 l = 1.23 from 10.80 to 12.03
pins 1 ∅8 l = 0.37
e = 1*0.51 (m)

Transversal reinforcement:

- main (B500B)

stirrups 5 ϕ8 l = 1.54
e = 1*0.20 + 4*0.18 (m)
2 ϕ12 l = 1.23
e = 1*-0.11 (m)

pins 2 ϕ12 l = 1.23
e = 1*-0.11 (m)

2.6.10 P10 : Span from 12.22 to 13.24 (m)

Longitudinal reinforcement:

- bottom (B500B)

2 ϕ12 l = 8.94 from 8.41 to 17.35

- support (B500B)

2 ϕ12 l = 9.27 from 8.41 to 17.46

Surface reinforcement (B500B):

2 ϕ12 l = 1.23 from 12.12 to 13.35
pins 1 ∅8 l = 0.37
e = 1*0.51 (m)

Transversal reinforcement:

- main (B500B)

stirrups 6 ϕ8 l = 1.54
e = 1*0.06 + 5*0.18 (m)
2 ϕ12 l = 1.23
e = 1*-0.11 (m)

pins 2 ϕ12 l = 1.23
e = 1*-0.11 (m)

2.6.11 P11 : Span from 13.54 to 14.56 (m)

Longitudinal reinforcement:

Surface reinforcement (B500B):

2 ϕ12 l = 1.23 from 13.44 to 14.67
pins 1 ∅8 l = 0.37
e = 1*0.51 (m)

Transversal reinforcement:

- main (B500B)

stirrups 5 ϕ8 l = 1.54
e = 1*0.10 + 4*0.18 (m)
2 ϕ12 l = 1.23
e = 1*-0.11 (m)

pins 2 ϕ12 l = 1.23
e = 1*-0.11 (m)

2.6.12 P12 : Span from 14.86 to 15.44 (m)

Longitudinal reinforcement:

Surface reinforcement (B500B):

2 ϕ12 l = 0.79 from 14.76 to 15.55
pins 1 ∅8 l = 0.37
e = 1*0.29 (m)

Transversal reinforcement:

- main (B500B)

stirrups 3 ϕ8 l = 1.54
e = 1*0.09 + 2*0.20 (m)
2 ϕ12 l = 0.79
e = 1*-0.11 (m)

pins 2 ϕ12 l = 0.79
e = 1*-0.11 (m)

2.6.13 P13 : Span from 15.74 to 16.32 (m)

Longitudinal reinforcement:

Surface reinforcement (B500B):

2 ϕ12 l = 0.79 from 15.64 to 16.43
pins 1 ∅8 l = 0.37
e = 1*0.29 (m)

Transversal reinforcement:

- main (B500B)

stirrups 4 ϕ8 l = 1.54
e = 1*0.07 + 3*0.15 (m)
2 ϕ12 l = 0.79
e = 1*-0.11 (m)

pins 2 ϕ12 l = 0.79
e = 1*-0.11 (m)

2.6.14 P14 : Span from 16.62 to 17.20 (m)

Longitudinal reinforcement:

Surface reinforcement (B500B):

2 ϕ12 l = 0.79 from 16.52 to 17.31
pins 1 ∅8 l = 0.37
e = 1*0.29 (m)

Transversal reinforcement:

- main (B500B)

stirrups 2 ϕ8 l = 1.54
e = 1*0.18 + 1*0.20 (m)
2 ϕ12 l = 0.79
e = 1*-0.11 (m)

pins 2 ϕ12 l = 0.79
e = 1*-0.11 (m)

3 Material survey:

- Concrete volume = 3.15 (m3)
- Formwork = 25.26 (m2)

- Steel B500B
  - Total weight = 135.67 (kG)
  - Density = 43.06 (kG/m3)
  - Average diameter = 10.0 (mm)
  - Survey according to diameters:

Diameter (mm)	Length (m)	Weight (kG)	Number (No.)	Total weight (kG)
8	0.37	0.15	14	2.03
8	1.54	0.61	67	40.63

12	0.79	0.70	6	4.21
12	1.23	1.09	20	21.85
12	1.27	1.13	2	2.26
12	8.94	7.94	4	31.76
12	9.27	8.23	4	32.93

Išvada: laikomoji galia pakankama. Rostverkas armuojamas 4xd12 pagrindiniais išilginiais strypais.

1.17. Pamatų projektavimas

Pamatų betonas ne žemesnės klasės nei C25/30 XC2. Armatūra S500. Pamatų atramines reakcijas žiūrėti kartu su atraminių reakcijų planu. Atraminių reakcijų taškų numeriai patiekti reakcijų plane.

A1 saugos ribinio būvio atraminės reakcijos:

Taškas/ kombinacija	FX (kN)	FY (kN)	FZ (kN)	MX (kNm)	MY (kNm)	MZ (kNm)
1/ 42 (C)	-33.37>>	-0.21	141.39	0.31	-25.23	0
1/ 17 (C)	-39.60<<	-0.45	162.8	0.67	-30.45	0
1/ 41 (C)	-33.67	0.22>>	142.44	-0.32	-25.5	0
1/ 36 (C)	-37.87	-0.62<<	157.24	0.9	-29.01	0
1/ 10 (C)	-39.57	-0.25	167.54>>	0.37	-30.43	0
1/ 43 (C)	-33.37	-0.21	139.21<<	0.31	-25.23	0
1/ 36 (C)	-37.87	-0.62	157.24	0.90>>	-29.01	0
1/ 41 (C)	-33.67	0.22	142.44	-0.32<<	-25.5	0
1/ 42 (C)	-33.37	-0.21	141.39	0.31	-25.23>>	0
1/ 17 (C)	-39.6	-0.45	162.8	0.67	-30.45<<	0
1/ 34 (C)	-37.54	-0.22	156.54	0.32	-28.71	0.00>>
1/ 45 (C)	-33.7	-0.61	139.92	0.89	-25.53	-0.00<<
2/ 43 (C)	-14.86>>	0	258.7	0.04	-2.58	0.01
2/ 10 (C)	-22.45<<	-0.01	385.5	0.05	-3.9	0.01
2/ 32 (C)	-19.8	0.03>>	342.04	-0.3	-3.44	-0.07
2/ 45 (C)	-15.36	-0.03<<	267.86	0.31	-2.67	0.08
2/ 10 (C)	-22.45	-0.01	385.50>>	0.05	-3.9	0.01
2/ 43 (C)	-14.86	0	258.70<<	0.04	-2.58	0.01
2/ 45 (C)	-15.36	-0.03	267.86	0.31>>	-2.67	0.08
2/ 32 (C)	-19.8	0.03	342.04	-0.30<<	-3.44	-0.07
2/ 43 (C)	-14.86	0	258.7	0.04	-2.58>>	0.01
2/ 10 (C)	-22.45	-0.01	385.5	0.05	-3.90<<	0.01
2/ 45 (C)	-15.36	-0.03	267.86	0.31	-2.67	0.08>>
2/ 32 (C)	-19.8	0.03	342.04	-0.3	-3.44	-0.07<<
3/ 16 (C)	1.65>>	37.2	67.05	-24.15	0.61	3.84
3/ 41 (C)	1.20<<	31.69	49.53	-20.33	0.44	3.21
3/ 13 (C)	1.53	37.29>>	61.83	-24.22	0.56	3.85
3/ 44 (C)	1.38	31.54<<	57.47	-20.21	0.51	3.19
3/ 16 (C)	1.65	37.2	67.05>>	-24.15	0.61	3.84
3/ 41 (C)	1.2	31.69	49.53<<	-20.33	0.44	3.21
3/ 44 (C)	1.38	31.54	57.47	-20.21>>	0.51	3.19

3/ 13 (C)	1.53	37.29	61.83	-24.22<<	0.56	3.85
3/ 16 (C)	1.65	37.2	67.05	-24.15	0.61>>	3.84
3/ 41 (C)	1.2	31.69	49.53	-20.33	0.44<<	3.21
3/ 13 (C)	1.53	37.29	61.83	-24.22	0.56	3.85>>
3/ 44 (C)	1.38	31.54	57.47	-20.21	0.51	3.19<<
4/ 14 (C)	14.40>>	57.37	183.97	-35.5	4.44	-1
4/ 39 (C)	11.91<<	48.63	149.5	-29.73	3.69	-0.81
4/ 13 (C)	14.03	57.49>>	174	-35.58	4.36	-1.01
4/ 44 (C)	12.4	48.54<<	159.36	-29.66	3.82	-0.81
4/ 16 (C)	14.3	57.33	186.29>>	-35.47	4.39	-1
4/ 41 (C)	12.06	48.79	141.04<<	-29.84	3.8	-0.82
4/ 44 (C)	12.4	48.54	159.36	-29.66>>	3.82	-0.81
4/ 13 (C)	14.03	57.49	174	-35.58<<	4.36	-1.01
4/ 14 (C)	14.4	57.37	183.97	-35.5	4.44>>	-1
4/ 39 (C)	11.91	48.63	149.5	-29.73	3.69<<	-0.81
4/ 44 (C)	12.4	48.54	159.36	-29.66	3.82	-0.81>>
4/ 13 (C)	14.03	57.49	174	-35.58	4.36	-1.01<<
5/ 42 (C)	-33.32>>	0.19	141.36	-0.28	-25.21	0
5/ 13 (C)	-39.53<<	0.46	162.51	-0.68	-30.42	0
5/ 32 (C)	-37.8	0.63>>	156.84	-0.93	-28.97	0
5/ 45 (C)	-33.63	-0.21<<	142.53	0.3	-25.49	0
5/ 10 (C)	-39.51	0.18	167.59>>	-0.27	-30.4	0
5/ 43 (C)	-33.33	0.19	139.23<<	-0.27	-25.21	0
5/ 45 (C)	-33.63	-0.21	142.53	0.30>>	-25.49	0
5/ 32 (C)	-37.8	0.63	156.84	-0.93<<	-28.97	0
5/ 42 (C)	-33.32	0.19	141.36	-0.28	-25.21>>	0
5/ 13 (C)	-39.53	0.46	162.51	-0.68	-30.42<<	0
5/ 41 (C)	-33.64	0.62	139.58	-0.91	-25.49	-0.00>>
5/ 34 (C)	-37.49	0.2	156.49	-0.29	-28.69	-0.00<<
6/ 43 (C)	-15.94>>	0	271.49	-0.01	-2.76	0
6/ 10 (C)	-23.91<<	0	402.39	-0.01	-4.15	0
6/ 45 (C)	-16.44	0.10>>	280.44	0.34	-2.85	0.09
6/ 32 (C)	-21.15	-0.12<<	357.74	-0.44	-3.67	-0.11
6/ 10 (C)	-23.91	0	402.39>>	-0.01	-4.15	0
6/ 43 (C)	-15.94	0	271.49<<	-0.01	-2.76	0
6/ 45 (C)	-16.44	0.1	280.44	0.34>>	-2.85	0.09
6/ 32 (C)	-21.15	-0.12	357.74	-0.44<<	-3.67	-0.11
6/ 43 (C)	-15.94	0	271.49	-0.01	-2.76>>	0
6/ 10 (C)	-23.91	0	402.39	-0.01	-4.15<<	0
6/ 45 (C)	-16.44	0.1	280.44	0.34	-2.85	0.09>>
6/ 32 (C)	-21.15	-0.12	357.74	-0.44	-3.67	-0.11<<

7/ 45 (C)	10.18>>	-47.88	343.48	0	0	0
7/ 12 (C)	-8.63<<	-59.68	407.68	0	0	0
7/ 38 (C)	9.32	-46.34>>	338.44	0	0	0
7/ 17 (C)	-4.38	-60.51<<	403.45	0	0	0
7/ 12 (C)	-8.63	-59.68	407.68>>	0	0	0
7/ 39 (C)	9.84	-46.59	335.83<<	0	0	0
7/ 14 (C)	-5.44	-59.81	407.24	-0.00>>	0	0
7/ 39 (C)	9.84	-46.59	335.83	-0.00<<	0	0
7/ 12 (C)	-8.63	-59.68	407.68	0	0.00>>	0
7/ 45 (C)	10.18	-47.88	343.48	0	0.00<<	0
7/ 39 (C)	9.84	-46.59	335.83	0	0	-0.00>>
7/ 12 (C)	-8.63	-59.68	407.68	0	0	-0.00<<
8/ 12 (C)	85.06>>	-269.78	475.98	0	0	0
8/ 45 (C)	71.36<<	-195.98	354.67	0	0	0
8/ 39 (C)	71.44	-191.40>>	347.97	0	0	0
8/ 12 (C)	85.06	-269.78<<	475.98	0	0	0
8/ 12 (C)	85.06	-269.78	475.98>>	0	0	0
8/ 39 (C)	71.44	-191.4	347.97<<	0	0	0
8/ 39 (C)	71.44	-191.4	347.97	-0.00>>	0	0
8/ 12 (C)	85.06	-269.78	475.98	-0.00<<	0	0
8/ 39 (C)	71.44	-191.4	347.97	0	-0.00>>	0
8/ 12 (C)	85.06	-269.78	475.98	0	-0.00<<	0
8/ 39 (C)	71.44	-191.4	347.97	0	0	-0.00>>
8/ 12 (C)	85.06	-269.78	475.98	0	0	-0.00<<
9/ 33 (C)	57.20>>	45.4	311.71	0	0	0
9/ 38 (C)	49.03<<	40.74	288.99	0	0	0
9/ 10 (C)	53.72	47.47>>	338.49	0	0	0
9/ 41 (C)	54.59	40.68<<	278.14	0	0	0
9/ 16 (C)	53.78	47.46	344.72>>	0	0	0
9/ 41 (C)	54.59	40.68	278.14<<	0	0	0
9/ 10 (C)	53.72	47.47	338.49	0.00>>	0	0
9/ 45 (C)	49.38	40.72	294.35	0.00<<	0	0
9/ 14 (C)	55.91	47.45	343.91	0	0.00>>	0
9/ 39 (C)	49.27	40.74	283.97	0	0.00<<	0
9/ 10 (C)	53.72	47.47	338.49	0	0	-0.00>>
9/ 43 (C)	52.92	40.7	293.01	0	0	-0.00<<
10/ 33 (C)	42.92>>	86.44	277.68	0	0	0
10/ 44 (C)	34.30<<	76.7	270.53	0	0	0
10/ 13 (C)	42.31	90.55>>	296.67	0	0	0
10/ 44 (C)	34.3	76.70<<	270.53	0	0	0
10/ 16 (C)	38.12	90.48	314.23>>	0	0	0
10/ 41 (C)	41.03	76.8	244.71<<	0	0	0
10/ 68 (C)	35.5	76.73	263.08	-0.00>>	0	0

10/ 13 (C)	42.31	90.55	296.67	-0.00<<	0	0
10/ 33 (C)	42.92	86.44	277.68	0	0.00>>	0
10/ 44 (C)	34.3	76.7	270.53	0	0.00<<	0
10/ 44 (C)	34.3	76.7	270.53	0	0	-0.00>>
10/ 13 (C)	42.31	90.55	296.67	0	0	-0.00<<
11/ 17 (C)	53.87>>	-80.06	429.72	0	0	0
11/ 40 (C)	49.03<<	-59.59	376.74	0	0	0
11/ 40 (C)	49.03	-59.59>>	376.74	0	0	0
11/ 17 (C)	53.87	-80.06<<	429.72	0	0	0
11/ 16 (C)	53.85	-79.76	432.79>>	0	0	0
11/ 39 (C)	50.28	-62.63	369.38<<	0	0	0
11/ 41 (C)	49.06	-59.89	373.67	-0.00>>	0	0
11/ 16 (C)	53.85	-79.76	432.79	-0.00<<	0	0
11/ 16 (C)	53.85	-79.76	432.79	0	0.00>>	0
11/ 39 (C)	50.28	-62.63	369.38	0	0.00<<	0
11/ 17 (C)	53.87	-80.06	429.72	0	0	0.00>>
11/ 40 (C)	49.03	-59.59	376.74	0	0	0.00<<
12/ 36 (C)	0.02>>	-7.03	233.25	0	0	0
12/ 43 (C)	-0.00<<	-7.81	212.28	0	0	0
12/ 45 (C)	0.02	-5.39>>	196.42	0	0	0
12/ 32 (C)	0	-15.93<<	287.1	0	0	0
12/ 32 (C)	0	-15.93	287.10>>	0	0	0
12/ 45 (C)	0.02	-5.39	196.42<<	0	0	0
12/ 32 (C)	0	-15.93	287.1	0.00>>	0	0
12/ 45 (C)	0.02	-5.39	196.42	0.00<<	0	0
12/ 41 (C)	0	-14.29	250.27	0	-0.00>>	0
12/ 8 (C)	0.01	-11.41	263.45	0	-0.00<<	0
12/ 41 (C)	0	-14.29	250.27	0	0	0.00>>
12/ 34 (C)	0	-9.45	249.11	0	0	-0.00<<
13/ 44 (C)	0.02>>	-5.7	172.44	0	0	0
13/ 35 (C)	-0.01<<	-9.79	204.25	0	0	0
13/ 45 (C)	0.02	-5.16>>	159.54	0	0	0
13/ 32 (C)	-0.01	-16.87<<	255.74	0	0	0
13/ 32 (C)	-0.01	-16.87	255.74>>	0	0	0
13/ 45 (C)	0.02	-5.16	159.54<<	0	0	0
13/ 32 (C)	-0.01	-16.87	255.74	0.00>>	0	0
13/ 45 (C)	0.02	-5.16	159.54	0.00<<	0	0
13/ 43 (C)	-0.01	-8.42	180.14	0	-0.00>>	0
13/ 10 (C)	0	-10.92	225.9	0	-0.00<<	0
13/ 67 (C)	0	-10.35	203.51	0	0	-0.00>>
13/ 35 (C)	-0.01	-9.79	204.25	0	0	-0.00<<
14/ 16 (C)	76.32>>	58.01	205.1	0	0	0
14/ 41 (C)	60.81<<	47.8	165.05	0	0	0
14/ 16 (C)	76.32	58.01>>	205.1	0	0	0
14/ 41 (C)	60.81	47.80<<	165.05	0	0	0

14/ 16 (C)	76.32	58.01	205.10>>	0	0	0
14/ 41 (C)	60.81	47.8	165.05<<	0	0	0
14/ 16 (C)	76.32	58.01	205.1	0.00>>	0	0
14/ 41 (C)	60.81	47.8	165.05	0.00<<	0	0
14/ 41 (C)	60.81	47.8	165.05	0	-0.00>>	0
14/ 16 (C)	76.32	58.01	205.1	0	-0.00<<	0
14/ 41 (C)	60.81	47.8	165.05	0	0	-0.00>>
14/ 16 (C)	76.32	58.01	205.1	0	0	-0.00<<
15/ 36 (C)	0.02>>	-5.37	179.5	0	0	0
15/ 41 (C)	-0.00<<	-14.46	208.6	0	0	0
15/ 45 (C)	0.02	-3.68>>	143.4	0	0	0
15/ 32 (C)	0	-16.15<<	244.69	0	0	0
15/ 32 (C)	0	-16.15	244.69>>	0	0	0
15/ 45 (C)	0.02	-3.68	143.40<<	0	0	0
15/ 32 (C)	0	-16.15	244.69	0.00>>	0	0
15/ 45 (C)	0.02	-3.68	143.4	0.00<<	0	0
15/ 43 (C)	0	-7.69	169.07	0	-0.00>>	0
15/ 36 (C)	0.02	-5.37	179.5	0	-0.00<<	0
15/ 35 (C)	0	-8.9	191.6	0	0	0.00>>
15/ 67 (C)	0.01	-9.37	191.82	0	0	0.00<<
16/ 45 (C)	-4.42>>	0.18	148.32	0	0	0
16/ 34 (C)	-9.15<<	-9.39	222.28	0	0	0
16/ 45 (C)	-4.42	0.18>>	148.32	0	0	0
16/ 32 (C)	-7.79	-14.38<<	248.4	0	0	0
16/ 32 (C)	-7.79	-14.38	248.40>>	0	0	0
16/ 45 (C)	-4.42	0.18	148.32<<	0	0	0
16/ 38 (C)	-4.93	-7.5	189.24	-0.00>>	0	0
16/ 35 (C)	-8.99	-9.05	215.82	-0.00<<	0	0
16/ 30 (C)	-5.39	-8.24	201.76	0	0.00>>	0
16/ 43 (C)	-8.53	-8.32	203.3	0	0.00<<	0
16/ 45 (C)	-4.42	0.18	148.32	0	0	0.00>>
16/ 34 (C)	-9.15	-9.39	222.28	0	0	-0.00<<
17/ 12 (C)	70.28>>	-58.38	200.65	0	0	0
17/ 45 (C)	55.81<<	-48.22	161.69	0	0	0
17/ 45 (C)	55.81	-48.22>>	161.69	0	0	0
17/ 12 (C)	70.28	-58.38<<	200.65	0	0	0
17/ 12 (C)	70.28	-58.38	200.65>>	0	0	0
17/ 45 (C)	55.81	-48.22	161.69<<	0	0	0
17/ 12 (C)	70.28	-58.38	200.65	0.00>>	0	0
17/ 45 (C)	55.81	-48.22	161.69	0.00<<	0	0
17/ 45 (C)	55.81	-48.22	161.69	0	-0.00>>	0
17/ 12 (C)	70.28	-58.38	200.65	0	-0.00<<	0
17/ 45 (C)	55.81	-48.22	161.69	0	0	-0.00>>
17/ 12 (C)	70.28	-58.38	200.65	0	0	-0.00<<
19/ 31 (C)	2.83>>	0	18.08	0	0	0

19/ 40 (C)	-2.89<<	0	18.21	0	0	0
19/ 8 (C)	0	0.0>>	18.32	0	0	0
19/ 8 (C)	0	0.0<<	18.32	0	0	0
19/ 36 (C)	-1.95	0	18.49>>	0	0	0
19/ 39 (C)	2.83	0	18.08<<	0	0	0
19/ 39 (C)	2.83	0	18.08	0.00>>	0	0
19/ 36 (C)	-1.95	0	18.49	-0.00<<	0	0
19/ 8 (C)	0	0	18.32	0	0.0>>	0
19/ 8 (C)	0	0	18.32	0	0.0<<	0
19/ 37 (C)	-1.95	0	18.48	0	0	0.00>>
19/ 38 (C)	2.83	0	18.08	0	0	-0.00<<
20/ 38 (C)	2.52>>	0	12.5	0	0	0
20/ 37 (C)	-1.93<<	0	8.6	0	0	0
20/ 8 (C)	0.01	0.0>>	10.22	0	0	0
20/ 8 (C)	0.01	0.0<<	10.22	0	0	0
20/ 39 (C)	2.52	0	12.56>>	0	0	0
20/ 36 (C)	-1.93	0	8.54<<	0	0	0
20/ 39 (C)	2.52	0	12.56	0.00>>	0	0
20/ 36 (C)	-1.93	0	8.54	-0.00<<	0	0
20/ 8 (C)	0.01	0	10.22	0	0.0>>	0
20/ 8 (C)	0.01	0	10.22	0	0.0<<	0
20/ 30 (C)	2.52	0	12.5	0	0	0.00>>
20/ 45 (C)	-1.93	0	8.6	0	0	-0.00<<
21/ 8 (C)	0.0>>	0	30.23	0	0	0
21/ 8 (C)	0.0<<	0	30.23	0	0	0
21/ 8 (C)	0	0.0>>	30.23	0	0	0
21/ 8 (C)	0	0.0<<	30.23	0	0	0
21/ 8 (C)	0	0	30.23>>	0	0	0
21/ 18 (C)	0	0	18.81<<	0	0	0
21/ 8 (C)	0	0	30.23	0.00>>	0	0
21/ 18 (C)	0	0	18.81	0.0<<	0	0
21/ 8 (C)	0	0	30.23	0	0.0>>	0
21/ 8 (C)	0	0	30.23	0	0.0<<	0
21/ 8 (C)	0	0	30.23	0	0	0.0>>
21/ 8 (C)	0	0	30.23	0	0	0.0<<
22/ 8 (C)	0.0>>	0	27.29	0	0	0
22/ 8 (C)	0.0<<	0	27.29	0	0	0
22/ 8 (C)	0	0.0>>	27.29	0	0	0
22/ 8 (C)	0	0.0<<	27.29	0	0	0
22/ 8 (C)	0	0	27.29>>	0	0	0
22/ 18 (C)	0	0	17.20<<	0	0	0
22/ 8 (C)	0	0	27.29	-0.00>>	0	0
22/ 18 (C)	0	0	17.2	-0.00<<	0	0
22/ 8 (C)	0	0	27.29	0	0.0>>	0
22/ 8 (C)	0	0	27.29	0	0.0<<	0

22/ 8 (C)	0	0	27.29	0	0	0.0>>
22/ 8 (C)	0	0	27.29	0	0	0.0<<
23/ 43 (C)	1.13>>	0	193.56	0	0	0
23/ 30 (C)	0.71<<	-0.02	247.76	0	0	0
23/ 32 (C)	0.81	0.25>>	239.02	0	0	0
23/ 45 (C)	0.84	-0.20<<	195.05	0	0	0
23/ 10 (C)	0.74	0	263.17>>	0	0	0
23/ 43 (C)	1.13	0	193.56<<	0	0	0
23/ 41 (C)	0.84	0.25	193.96	0.00>>	0	0
23/ 36 (C)	0.82	-0.2	240.11	-0.00<<	0	0
23/ 41 (C)	0.84	0.25	193.96	0	-0.00>>	0
23/ 10 (C)	0.74	0	263.17	0	-0.00<<	0
23/ 43 (C)	1.13	0	193.56	0	0	-0.00>>
23/ 36 (C)	0.82	-0.2	240.11	0	0	-0.00<<
24/ 43 (C)	0.25>>	-0.01	219.71	0	0	0
24/ 10 (C)	-0.43<<	-0.01	292.76	0	0	0
24/ 32 (C)	-0.28	0.12>>	266.94	0	0	0
24/ 45 (C)	-0.08	-0.10<<	219.26	0	0	0
24/ 10 (C)	-0.43	-0.01	292.76>>	0	0	0
24/ 41 (C)	-0.09	0.12	218.02<<	0	0	0
24/ 45 (C)	-0.08	-0.1	219.26	0.00>>	0	0
24/ 32 (C)	-0.28	0.12	266.94	-0.00<<	0	0
24/ 10 (C)	-0.43	-0.01	292.76	0	0.00>>	0
24/ 43 (C)	0.25	-0.01	219.71	0	0.00<<	0
24/ 41 (C)	-0.09	0.12	218.02	0	0	-0.00>>
24/ 36 (C)	-0.27	-0.1	268.18	0	0	-0.00<<
25/ 39 (C)	3.37>>	-1.87	251.7	0	0	0
25/ 36 (C)	-5.43<<	-1.2	285.68	0	0	0
25/ 45 (C)	-5.38	-0.27>>	261.05	0	0	0
25/ 32 (C)	-3.68	-11.10<<	296.64	0	0	0
25/ 12 (C)	-2.38	-9.16	302.19>>	0	0	0
25/ 39 (C)	3.37	-1.87	251.70<<	0	0	0
25/ 41 (C)	-3.63	-10.17	272.01	-0.00>>	0	0
25/ 16 (C)	-3.43	-3.22	295.62	-0.00<<	0	0
25/ 35 (C)	-2.03	-3.48	287.58	0	0.00>>	0
25/ 38 (C)	3.37	-1.97	257.05	0	-0.00<<	0
25/ 38 (C)	3.37	-1.97	257.05	0	0	0.00>>
25/ 37 (C)	-5.42	-1.1	280.33	0	0	-0.00<<
35/ 16 (C)	39.66>>	61.91	82.97	0	0	0
35/ 41 (C)	28.78<<	52.62	61.32	0	0	0
35/ 13 (C)	36.44	62.02>>	76.28	0	0	0
35/ 44 (C)	33.68	52.44<<	71.5	0	0	0
35/ 16 (C)	39.66	61.91	82.97>>	0	0	0
35/ 41 (C)	28.78	52.62	61.32<<	0	0	0
35/ 12 (C)	37.15	62.01	77.74	0.00>>	0	0

35/ 43 (C)	32.23	52.49	68.61	-0.00<<	0	0
35/ 41 (C)	28.78	52.62	61.32	0	-0.00>>	0
35/ 16 (C)	39.66	61.91	82.97	0	-0.00<<	0
35/ 45 (C)	32.97	52.46	70.04	0	0	-0.00>>
35/ 12 (C)	37.15	62.01	77.74	0	0	-0.00<<
36/ 43 (C)	0.28>>	0	214.73	0	0	0
36/ 10 (C)	-0.20<<	0	282.29	0	0	0
36/ 32 (C)	-0.12	0.07>>	257.84	0	0	0
36/ 45 (C)	0.01	-0.05<<	212.46	0	0	0
36/ 10 (C)	-0.2	0	282.29>>	0	0	0
36/ 41 (C)	-0.03	0.07	211.12<<	0	0	0
36/ 41 (C)	-0.03	0.07	211.12	0.00>>	0	0
36/ 30 (C)	-0.19	-0.01	265.99	-0.00<<	0	0
36/ 39 (C)	-0.09	-0.01	219.27	0	-0.00>>	0
36/ 34 (C)	0.19	0	261.45	0	-0.00<<	0
36/ 30 (C)	-0.19	-0.01	265.99	0	0	0.00>>
36/ 45 (C)	0.01	-0.05	212.46	0	0	-0.00<<
37/ 43 (C)	0.33>>	0	218.24	0	0	0
37/ 30 (C)	0.03<<	0	267.78	0	0	0
37/ 45 (C)	0.17	0.01>>	214.65	0	0	0
37/ 32 (C)	0.07	-0.03<<	259.83	0	0	0
37/ 10 (C)	0.03	0	284.19>>	0	0	0
37/ 41 (C)	0.09	-0.02	213.00<<	0	0	0
37/ 45 (C)	0.17	0.01	214.65	-0.00>>	0	0
37/ 32 (C)	0.07	-0.03	259.83	-0.00<<	0	0
37/ 10 (C)	0.03	0	284.19	0	0.00>>	0
37/ 43 (C)	0.33	0	218.24	0	-0.00<<	0
37/ 43 (C)	0.33	0	218.24	0	0	0.00>>
37/ 32 (C)	0.07	-0.03	259.83	0	0	-0.00<<
38/ 43 (C)	0.15>>	-0.01	219.42	0	0	0
38/ 10 (C)	-0.07<<	-0.01	283.91	0	0	0
38/ 45 (C)	0.13	0.00>>	215.31	0	0	0
38/ 32 (C)	-0.02	-0.02<<	259.79	0	0	0
38/ 10 (C)	-0.07	-0.01	283.91>>	0	0	0
38/ 41 (C)	0.01	-0.01	213.13<<	0	0	0
38/ 45 (C)	0.13	0	215.31	-0.00>>	0	0
38/ 32 (C)	-0.02	-0.02	259.79	-0.00<<	0	0
38/ 10 (C)	-0.07	-0.01	283.91	0	0.00>>	0
38/ 43 (C)	0.15	-0.01	219.42	0	-0.00<<	0
38/ 43 (C)	0.15	-0.01	219.42	0	0	0.00>>
38/ 30 (C)	-0.07	-0.01	267.51	0	0	-0.00<<
39/ 45 (C)	0.11>>	0	216.06	0	0	0
39/ 10 (C)	-0.14<<	-0.01	283.33	0	0	0
39/ 45 (C)	0.11	-0.00>>	216.06	0	0	0
39/ 32 (C)	-0.06	-0.02<<	259.55	0	0	0

39/ 10 (C)	-0.14	-0.01	283.33>>	0	0	0
39/ 41 (C)	-0.02	-0.02	213.09<<	0	0	0
39/ 44 (C)	0.1	0	221.8	0.00>>	0	0
39/ 9 (C)	-0.12	-0.01	275.97	-0.00<<	0	0
39/ 10 (C)	-0.14	-0.01	283.33	0	0.00>>	0
39/ 45 (C)	0.11	0	216.06	0	-0.00<<	0
39/ 45 (C)	0.11	0	216.06	0	0	0.00>>
39/ 32 (C)	-0.06	-0.02	259.55	0	0	-0.00<<
40/ 45 (C)	0.03>>	-0.01	216.75	0	0	0
40/ 10 (C)	-0.24<<	-0.02	282.46	0	0	0
40/ 45 (C)	0.03	-0.01>>	216.75	0	0	0
40/ 32 (C)	-0.1	-0.02<<	259.24	0	0	0
40/ 10 (C)	-0.24	-0.02	282.46>>	0	0	0
40/ 41 (C)	-0.03	-0.02	213.05<<	0	0	0
40/ 40 (C)	-0.04	-0.02	218.76	0.00>>	0	0
40/ 37 (C)	-0.03	-0.01	257.23	0.00<<	0	0
40/ 30 (C)	-0.24	-0.02	266.1	0	0.00>>	0
40/ 45 (C)	0.03	-0.01	216.75	0	-0.00<<	0
40/ 45 (C)	0.03	-0.01	216.75	0	0	0.00>>
40/ 30 (C)	-0.24	-0.02	266.1	0	0	-0.00<<
41/ 41 (C)	-0.09>>	-0.02	212.39	0	0	0
41/ 10 (C)	-0.49<<	-0.02	280.23	0	0	0
41/ 45 (C)	-0.21	-0.02>>	216.19	0	0	0
41/ 32 (C)	-0.22	-0.03<<	258.03	0	0	0
41/ 14 (C)	-0.43	-0.02	280.44>>	0	0	0
41/ 41 (C)	-0.09	-0.02	212.39<<	0	0	0
41/ 44 (C)	-0.23	-0.02	221.81	-0.00>>	0	0
41/ 11 (C)	-0.47	-0.02	274.6	-0.00<<	0	0
41/ 10 (C)	-0.49	-0.02	280.23	0	0.00>>	0
41/ 41 (C)	-0.09	-0.02	212.39	0	0.00<<	0
41/ 41 (C)	-0.09	-0.02	212.39	0	0	-0.00>>
41/ 10 (C)	-0.49	-0.02	280.23	0	0	-0.00<<
42/ 41 (C)	-0.28>>	-0.04	213.77	0	0	0
42/ 10 (C)	-1.07<<	-0.05	279.03	0	0	0
42/ 45 (C)	-0.72	-0.04>>	216.05	0	0	0
42/ 12 (C)	-0.78	-0.05<<	276.71	0	0	0
42/ 14 (C)	-0.98	-0.05	279.67>>	0	0	0
42/ 41 (C)	-0.28	-0.04	213.77<<	0	0	0
42/ 32 (C)	-0.55	-0.05	258.79	-0.00>>	0	0
42/ 45 (C)	-0.72	-0.04	216.05	-0.00<<	0	0
42/ 39 (C)	-0.77	-0.04	217.64	0	-0.00>>	0
42/ 32 (C)	-0.55	-0.05	258.79	0	-0.00<<	0
42/ 32 (C)	-0.55	-0.05	258.79	0	0	0.00>>
42/ 39 (C)	-0.77	-0.04	217.64	0	0	0.00<<
43/ 41 (C)	-1.46>>	-0.02	204.17	0	0	0

43/ 16 (C)	-3.13<<	-0.02	261.57	0	0	0
43/ 45 (C)	-2.32	-0.02>>	203.45	0	0	0
43/ 12 (C)	-2.61	-0.03<<	262	0	0	0
43/ 14 (C)	-2.96	-0.03	263.62>>	0	0	0
43/ 45 (C)	-2.32	-0.02	203.45<<	0	0	0
43/ 12 (C)	-2.61	-0.03	262	0.00>>	0	0
43/ 45 (C)	-2.32	-0.02	203.45	0.00<<	0	0
43/ 14 (C)	-2.96	-0.03	263.62	0	0.00>>	0
43/ 41 (C)	-1.46	-0.02	204.17	0	0.00<<	0
43/ 41 (C)	-1.46	-0.02	204.17	0	0	0.00>>
43/ 16 (C)	-3.13	-0.02	261.57	0	0	-0.00<<
44/ 41 (C)	-5.03>>	-0.13	227.81	0	0	0
44/ 16 (C)	-8.32<<	-0.14	277.53	0	0	0
44/ 45 (C)	-6.12	-0.12>>	217.42	0	0	0
44/ 12 (C)	-7.67	-0.15<<	283.77	0	0	0
44/ 12 (C)	-7.67	-0.15	283.77>>	0	0	0
44/ 45 (C)	-6.12	-0.12	217.42<<	0	0	0
44/ 40 (C)	-5.22	-0.13	232.99	0.00>>	0	0
44/ 11 (C)	-8.09	-0.14	273.94	-0.00<<	0	0
44/ 45 (C)	-6.12	-0.12	217.42	0	-0.00>>	0
44/ 12 (C)	-7.67	-0.15	283.77	0	-0.00<<	0
44/ 12 (C)	-7.67	-0.15	283.77	0	0	0.00>>
44/ 45 (C)	-6.12	-0.12	217.42	0	0	0.00<<
45/ 14 (C)	13.67>>	2.57	350.41	0	0	0
45/ 39 (C)	9.72<<	1.09	286.49	0	0	0
45/ 32 (C)	12.5	3.11>>	338.23	0	0	0
45/ 45 (C)	9.98	0.71<<	285.07	0	0	0
45/ 12 (C)	13.57	3.03	352.89>>	0	0	0
45/ 45 (C)	9.98	0.71	285.07<<	0	0	0
45/ 12 (C)	13.57	3.03	352.89	0.00>>	0	0
45/ 45 (C)	9.98	0.71	285.07	0.00<<	0	0
45/ 45 (C)	9.98	0.71	285.07	0	-0.00>>	0
45/ 12 (C)	13.57	3.03	352.89	0	-0.00<<	0
45/ 32 (C)	12.5	3.11	338.23	0	0	-0.00>>
45/ 45 (C)	9.98	0.71	285.07	0	0	-0.00<<
46/ 69 (C)	-0.20>>	-8.01	200.28	0	0	0
46/ 11 (C)	-0.22<<	-10.29	226.45	0	0	0
46/ 40 (C)	-0.21	-7.93>>	198.22	0	0	0
46/ 17 (C)	-0.22	-10.42<<	227.56	0	0	0
46/ 16 (C)	-0.21	-10.26	229.91>>	0	0	0
46/ 41 (C)	-0.21	-8.09	195.87<<	0	0	0
46/ 41 (C)	-0.21	-8.09	195.87	-0.00>>	0	0
46/ 16 (C)	-0.21	-10.26	229.91	-0.00<<	0	0
46/ 17 (C)	-0.22	-10.42	227.56	0	-0.00>>	0
46/ 70 (C)	-0.2	-8.27	201.74	0	-0.00<<	0

46/ 41 (C)	-0.21	-8.09	195.87	0	0	-0.00>>
46/ 14 (C)	-0.21	-10.07	228.93	0	0	-0.00<<
47/ 41 (C)	-8.08>>	-6.56	172.72	0	0	0
47/ 14 (C)	-10.92<<	-7.75	204.83	0	0	0
47/ 41 (C)	-8.08	-6.56>>	172.72	0	0	0
47/ 16 (C)	-10.84	-7.82<<	200.76	0	0	0
47/ 12 (C)	-10.82	-7.71	207.92>>	0	0	0
47/ 45 (C)	-8.13	-6.75	160.79<<	0	0	0
47/ 45 (C)	-8.13	-6.75	160.79	-0.00>>	0	0
47/ 12 (C)	-10.82	-7.71	207.92	-0.00<<	0	0
47/ 12 (C)	-10.82	-7.71	207.92	0	0.00>>	0
47/ 45 (C)	-8.13	-6.75	160.79	0	0.00<<	0
47/ 45 (C)	-8.13	-6.75	160.79	0	0	-0.00>>
47/ 32 (C)	-10.05	-7.36	200.16	0	0	-0.00<<
48/ 10 (C)	28.41>>	0	326.8	0	0	0
48/ 41 (C)	20.15<<	1.12	232.82	0	0	0
48/ 32 (C)	25.41	1.14>>	293.36	0	0	0
48/ 45 (C)	20.3	-0.88<<	234.24	0	0	0
48/ 10 (C)	28.41	0	326.80>>	0	0	0
48/ 43 (C)	20.27	0.02	227.99<<	0	0	0
48/ 32 (C)	25.41	1.14	293.36	0.00>>	0	0
48/ 43 (C)	20.27	0.02	227.99	0.00<<	0	0
48/ 10 (C)	28.41	0	326.8	0	0.00>>	0
48/ 43 (C)	20.27	0.02	227.99	0	0.00<<	0
48/ 8 (C)	28.15	0.12	322.68	0	0	0.00>>
48/ 45 (C)	20.3	-0.88	234.24	0	0	0.00<<
49/ 14 (C)	2.58>>	-0.04	114.05	0	0	0
49/ 39 (C)	2.03<<	0.03	90.88	0	0	0
49/ 45 (C)	2.08	0.40>>	87.76	0	0	0
49/ 32 (C)	2.34	-0.54<<	106.17	0	0	0
49/ 10 (C)	2.42	-0.01	116.23>>	0	0	0
49/ 43 (C)	2.28	-0.02	87.23<<	0	0	0
49/ 32 (C)	2.34	-0.54	106.17	0.00>>	0	0
49/ 45 (C)	2.08	0.4	87.76	-0.00<<	0	0
49/ 43 (C)	2.28	-0.02	87.23	0	-0.00>>	0
49/ 10 (C)	2.42	-0.01	116.23	0	-0.00<<	0
49/ 45 (C)	2.08	0.4	87.76	0	0	0.00>>
49/ 32 (C)	2.34	-0.54	106.17	0	0	-0.00<<
50/ 10 (C)	23.45>>	-0.11	302.58	0	0	0
50/ 41 (C)	16.58<<	0.65	214.88	0	0	0
50/ 32 (C)	20.93	0.66>>	271.12	0	0	0
50/ 45 (C)	16.6	-0.70<<	216.19	0	0	0
50/ 10 (C)	23.45	-0.11	302.58>>	0	0	0
50/ 43 (C)	16.64	-0.08	209.87<<	0	0	0
50/ 32 (C)	20.93	0.66	271.12	0.00>>	0	0

50/ 18 (C)	17.3	-0.04	221.36	0.00<<	0	0
50/ 10 (C)	23.45	-0.11	302.58	0	0.00>>	0
50/ 43 (C)	16.64	-0.08	209.87	0	0.00<<	0
50/ 43 (C)	16.64	-0.08	209.87	0	0	-0.00>>
50/ 36 (C)	20.96	-0.69	272.43	0	0	-0.00<<
51/ 43 (C)	-0.98>>	0.05	85.56	0	0	0
51/ 10 (C)	-2.06<<	0.07	113.62	0	0	0
51/ 45 (C)	-1.18	0.43>>	85.95	0	0	0
51/ 32 (C)	-1.7	-0.40<<	103.94	0	0	0
51/ 10 (C)	-2.06	0.07	113.62>>	0	0	0
51/ 43 (C)	-0.98	0.05	85.56<<	0	0	0
51/ 45 (C)	-1.18	0.43	85.95	0.00>>	0	0
51/ 32 (C)	-1.7	-0.4	103.94	-0.00<<	0	0
51/ 43 (C)	-0.98	0.05	85.56	0	-0.00>>	0
51/ 10 (C)	-2.06	0.07	113.62	0	-0.00<<	0
51/ 16 (C)	-1.97	0.26	111.59	0	0	0.00>>
51/ 41 (C)	-1.15	-0.4	85.86	0	0	0.00<<
52/ 44 (C)	-18.84>>	63.72	208.41	0	0	0
52/ 33 (C)	-25.07<<	71.62	249.06	0	0	0
52/ 12 (C)	-24.11	74.98>>	257.13	0	0	0
52/ 45 (C)	-19	63.72<<	205.22	0	0	0
52/ 12 (C)	-24.11	74.98	257.13>>	0	0	0
52/ 45 (C)	-19	63.72	205.22<<	0	0	0
52/ 13 (C)	-24.28	74.98	253.95	0.00>>	0	0
52/ 44 (C)	-18.84	63.72	208.41	0.00<<	0	0
52/ 45 (C)	-19	63.72	205.22	0	-0.00>>	0
52/ 32 (C)	-24.9	71.62	252.25	0	-0.00<<	0
52/ 45 (C)	-19	63.72	205.22	0	0	-0.00>>
52/ 32 (C)	-24.9	71.62	252.25	0	0	-0.00<<
53/ 44 (C)	-12.25>>	70.14	207.25	0	0	0
53/ 33 (C)	-18.13<<	79.14	243.71	0	0	0
53/ 17 (C)	-14.25	83.01>>	239.3	0	0	0
53/ 40 (C)	-17.44	70.13<<	225.36	0	0	0
53/ 12 (C)	-17.27	83	253.56>>	0	0	0
53/ 45 (C)	-12.34	70.14	203.85<<	0	0	0
53/ 12 (C)	-17.27	83	253.56	0.00>>	0	0
53/ 45 (C)	-12.34	70.14	203.85	0.00<<	0	0
53/ 44 (C)	-12.25	70.14	207.25	0	-0.00>>	0
53/ 33 (C)	-18.13	79.14	243.71	0	-0.00<<	0
53/ 44 (C)	-12.25	70.14	207.25	0	0	-0.00>>
53/ 33 (C)	-18.13	79.14	243.71	0	0	-0.00<<
54/ 45 (C)	-23.28>>	70.72	189.28	0	0	0
54/ 12 (C)	-30.58<<	83.72	233.15	0	0	0
54/ 16 (C)	-27.79	83.72>>	225.42	0	0	0
54/ 41 (C)	-27.93	70.72<<	202.17	0	0	0

54/ 12 (C)	-30.58	83.72	233.15>>	0	0	0
54/ 45 (C)	-23.28	70.72	189.28<<	0	0	0
54/ 41 (C)	-27.93	70.72	202.17	-0.00>>	0	0
54/ 16 (C)	-27.79	83.72	225.42	-0.00<<	0	0
54/ 16 (C)	-27.79	83.72	225.42	0	0.00>>	0
54/ 41 (C)	-27.93	70.72	202.17	0	0.00<<	0
54/ 16 (C)	-27.79	83.72	225.42	0	0	0.00>>
54/ 41 (C)	-27.93	70.72	202.17	0	0	0.00<<
55/ 45 (C)	-33.07>>	70.05	162.37	0	0	0
55/ 12 (C)	-41.91<<	82.9	198.3	0	0	0
55/ 16 (C)	-39.71	82.90>>	193.01	0	0	0
55/ 41 (C)	-36.73	70.05<<	171.2	0	0	0
55/ 12 (C)	-41.91	82.9	198.30>>	0	0	0
55/ 45 (C)	-33.07	70.05	162.37<<	0	0	0
55/ 17 (C)	-39.17	82.9	190.18	0.00>>	0	0
55/ 40 (C)	-37.27	70.05	174.03	0.00<<	0	0
55/ 45 (C)	-33.07	70.05	162.37	0	-0.00>>	0
55/ 12 (C)	-41.91	82.9	198.3	0	-0.00<<	0
55/ 45 (C)	-33.07	70.05	162.37	0	0	-0.00>>
55/ 12 (C)	-41.91	82.9	198.3	0	0	-0.00<<
56/ 45 (C)	-36.38>>	63.87	107.91	0	0	0
56/ 12 (C)	-45.17<<	75.14	130.6	0	0	0
56/ 16 (C)	-43.62	75.14>>	127.6	0	0	0
56/ 41 (C)	-38.96	63.87<<	112.91	0	0	0
56/ 12 (C)	-45.17	75.14	130.60>>	0	0	0
56/ 45 (C)	-36.38	63.87	107.91<<	0	0	0
56/ 45 (C)	-36.38	63.87	107.91	-0.00>>	0	0
56/ 12 (C)	-45.17	75.14	130.6	-0.00<<	0	0
56/ 45 (C)	-36.38	63.87	107.91	0	-0.00>>	0
56/ 12 (C)	-45.17	75.14	130.6	0	-0.00<<	0
56/ 45 (C)	-36.38	63.87	107.91	0	0	0.00>>
56/ 12 (C)	-45.17	75.14	130.6	0	0	-0.00<<
58/ 32 (C)	-7.10>>	-73.25	238.15	0	0	0
58/ 45 (C)	-13.71<<	-65.24	237.75	0	0	0
58/ 41 (C)	-8.14	-65.20>>	213.56	0	0	0
58/ 16 (C)	-11.33	-76.72<<	267.54	0	0	0
58/ 16 (C)	-11.33	-76.72	267.54>>	0	0	0
58/ 41 (C)	-8.14	-65.2	213.56<<	0	0	0
58/ 17 (C)	-11.79	-76.72	264.5	0.00>>	0	0
58/ 40 (C)	-7.68	-65.2	216.6	0.00<<	0	0
58/ 32 (C)	-7.1	-73.25	238.15	0	-0.00>>	0
58/ 45 (C)	-13.71	-65.24	237.75	0	-0.00<<	0
58/ 32 (C)	-7.1	-73.25	238.15	0	0	0.00>>
58/ 45 (C)	-13.71	-65.24	237.75	0	0	-0.00<<
59/ 32 (C)	-0.13>>	-80.42	247.27	0	0	0

59/ 45 (C)	-6.62<<	-71.26	238.68	0	0	0
59/ 44 (C)	-6.24	-71.26>>	242.17	0	0	0
59/ 13 (C)	-1.31	-84.34<<	258.42	0	0	0
59/ 16 (C)	-4.14	-84.33	273.07>>	0	0	0
59/ 41 (C)	-1.26	-71.28	220.08<<	0	0	0
59/ 40 (C)	-0.87	-71.28	223.57	-0.00>>	0	0
59/ 17 (C)	-4.53	-84.33	269.57	-0.00<<	0	0
59/ 12 (C)	-0.92	-84.34	261.91	0	0.00>>	0
59/ 39 (C)	-4.97	-71.27	235.25	0	0.00<<	0
59/ 12 (C)	-0.92	-84.34	261.91	0	0	0.00>>
59/ 39 (C)	-4.97	-71.27	235.25	0	0	0.00<<
60/ 32 (C)	10.72>>	-80.53	258.89	0	0	0
60/ 45 (C)	5.11<<	-71.37	243.31	0	0	0
60/ 45 (C)	5.11	-71.37>>	243.31	0	0	0
60/ 12 (C)	10.61	-84.46<<	273.3	0	0	0
60/ 16 (C)	8.4	-84.46	281.60>>	0	0	0
60/ 41 (C)	8.79	-71.37	229.48<<	0	0	0
60/ 38 (C)	6.7	-71.37	245.27	0.00>>	0	0
60/ 33 (C)	10.32	-80.53	254.98	0.00<<	0	0
60/ 41 (C)	8.79	-71.37	229.48	0	-0.00>>	0
60/ 30 (C)	8.22	-80.53	270.77	0	-0.00<<	0
60/ 10 (C)	9.11	-84.46	280.43	0	0	0.00>>
60/ 41 (C)	8.79	-71.37	229.48	0	0	0.00<<
61/ 32 (C)	3.25>>	-80.1	263.8	0	0	0
61/ 45 (C)	-0.19<<	-70.99	244.17	0	0	0
61/ 45 (C)	-0.19	-70.99>>	244.17	0	0	0
61/ 12 (C)	2.93	-84.00<<	277.9	0	0	0
61/ 16 (C)	1.33	-84	284.36>>	0	0	0
61/ 41 (C)	2.48	-70.99	233.41<<	0	0	0
61/ 12 (C)	2.93	-84	277.9	0.00>>	0	0
61/ 39 (C)	0.61	-70.99	243.14	0.00<<	0	0
61/ 12 (C)	2.93	-84	277.9	0	0.00>>	0
61/ 39 (C)	0.61	-70.99	243.14	0	0.00<<	0
61/ 12 (C)	2.93	-84	277.9	0	0	0.00>>
61/ 39 (C)	0.61	-70.99	243.14	0	0	0.00<<
62/ 34 (C)	3.44>>	-79.9	271.56	0	0	0
62/ 45 (C)	0.96<<	-70.82	246.31	0	0	0
62/ 45 (C)	0.96	-70.82>>	246.31	0	0	0
62/ 12 (C)	2.94	-83.80<<	282.42	0	0	0
62/ 16 (C)	2	-83.8	287.83>>	0	0	0
62/ 41 (C)	2.52	-70.82	237.30<<	0	0	0
62/ 68 (C)	1.68	-70.82	250.86	-0.00>>	0	0
62/ 17 (C)	1.88	-83.8	283.6	-0.00<<	0	0
62/ 12 (C)	2.94	-83.8	282.42	0	0.00>>	0
62/ 39 (C)	1.42	-70.82	245.78	0	0.00<<	0

62/ 40 (C)	2.64	-70.82	241.52	0	0	-0.00>>
62/ 17 (C)	1.88	-83.8	283.6	0	0	-0.00<<
63/ 42 (C)	-0.74>>	-70.78	244.37	0	0	0
63/ 37 (C)	-2.45<<	-79.86	271.2	0	0	0
63/ 45 (C)	-2.35	-70.78>>	244.31	0	0	0
63/ 12 (C)	-1.8	-83.74<<	281.15	0	0	0
63/ 16 (C)	-2.33	-83.74	285.96>>	0	0	0
63/ 41 (C)	-1.46	-70.78	236.30<<	0	0	0
63/ 40 (C)	-1.46	-70.78	240.54	0.00>>	0	0
63/ 17 (C)	-2.33	-83.74	281.72	0.00<<	0	0
63/ 14 (C)	-1.36	-83.74	283.45	0	0.00>>	0
63/ 39 (C)	-2.13	-70.78	244.04	0	0.00<<	0
63/ 69 (C)	-1.66	-70.78	244.56	0	0	0.00>>
63/ 15 (C)	-1.37	-83.74	279.22	0	0	0.00<<
64/ 34 (C)	5.24>>	-79.81	273.94	0	0	0
64/ 45 (C)	3.56<<	-70.74	245.35	0	0	0
64/ 39 (C)	3.61	-70.74>>	245.16	0	0	0
64/ 12 (C)	4.38	-83.69<<	282.78	0	0	0
64/ 16 (C)	4.29	-83.69	287.36>>	0	0	0
64/ 41 (C)	3.71	-70.74	237.72<<	0	0	0
64/ 40 (C)	3.78	-70.74	241.98	-0.00>>	0	0
64/ 15 (C)	4.92	-83.69	281.44	-0.00<<	0	0
64/ 33 (C)	4.15	-79.81	264.79	0	-0.00>>	0
64/ 38 (C)	3.68	-70.74	249.43	0	-0.00<<	0
64/ 11 (C)	4.25	-83.69	282.98	0	0	0.00>>
64/ 40 (C)	3.78	-70.74	241.98	0	0	0.00<<
65/ 43 (C)	-2.45>>	-70.78	245.81	0	0	0
65/ 12 (C)	-4.03<<	-83.73	285.34	0	0	0
65/ 39 (C)	-3.34	-70.78>>	247.37	0	0	0
65/ 12 (C)	-4.03	-83.73<<	285.34	0	0	0
65/ 16 (C)	-3.97	-83.73	289.97>>	0	0	0
65/ 41 (C)	-3.37	-70.78	239.90<<	0	0	0
65/ 11 (C)	-3.93	-83.73	285.54	0.00>>	0	0
65/ 42 (C)	-2.53	-70.78	250.1	0.00<<	0	0
65/ 14 (C)	-3.48	-83.73	288.89	0	0.00>>	0
65/ 39 (C)	-3.34	-70.78	247.37	0	0.00<<	0
65/ 11 (C)	-3.93	-83.73	285.54	0	0	0.00>>
65/ 42 (C)	-2.53	-70.78	250.1	0	0	0.00<<
66/ 14 (C)	8.88>>	-83.73	278.97	0	0	0
66/ 41 (C)	6.83<<	-70.78	231.18	0	0	0
66/ 39 (C)	7.58	-70.78>>	238.64	0	0	0
66/ 12 (C)	8.13	-83.73<<	274.97	0	0	0
66/ 16 (C)	8.71	-83.73	279.68>>	0	0	0
66/ 41 (C)	6.83	-70.78	231.18<<	0	0	0
66/ 41 (C)	6.83	-70.78	231.18	-0.00>>	0	0

66/ 10 (C)	8.58	-83.73	279.44	-0.00<<	0	0
66/ 41 (C)	6.83	-70.78	231.18	0	-0.00>>	0
66/ 10 (C)	8.58	-83.73	279.44	0	-0.00<<	0
66/ 38 (C)	7.66	-70.78	242.74	0	0	0.00>>
66/ 13 (C)	8.06	-83.73	270.87	0	0	0.00<<
67/ 45 (C)	-4.15>>	-70.9	248.49	0	0	0
67/ 12 (C)	-6.45<<	-83.89	284.82	0	0	0
67/ 39 (C)	-4.47	-70.90>>	247.77	0	0	0
67/ 12 (C)	-6.45	-83.89<<	284.82	0	0	0
67/ 16 (C)	-5.67	-83.89	290.25>>	0	0	0
67/ 41 (C)	-5.45	-70.9	239.45<<	0	0	0
67/ 67 (C)	-4.97	-70.9	251.46	-0.00>>	0	0
67/ 11 (C)	-5.68	-83.89	285.62	-0.00<<	0	0
67/ 13 (C)	-6.27	-83.89	280.63	0	0.00>>	0
67/ 38 (C)	-4.66	-70.9	251.96	0	-0.00<<	0
67/ 40 (C)	-5.63	-70.9	243.64	0	0	0.00>>
67/ 11 (C)	-5.68	-83.89	285.62	0	0	0.00<<
68/ 45 (C)	0.05>>	-70.37	250.75	0	0	0
68/ 32 (C)	-3.10<<	-79.39	270.83	0	0	0
68/ 41 (C)	-2.36	-70.37>>	239.76	0	0	0
68/ 16 (C)	-1.32	-83.26<<	291.83	0	0	0
68/ 16 (C)	-1.32	-83.26	291.83>>	0	0	0
68/ 41 (C)	-2.36	-70.37	239.76<<	0	0	0
68/ 40 (C)	-2.54	-70.37	243.84	-0.00>>	0	0
68/ 11 (C)	-1.4	-83.26	286.95	-0.00<<	0	0
68/ 13 (C)	-2.59	-83.26	281.15	0	-0.00>>	0
68/ 38 (C)	-0.56	-70.37	253.51	0	-0.00<<	0
68/ 11 (C)	-1.4	-83.26	286.95	0	0	0.00>>
68/ 40 (C)	-2.54	-70.37	243.84	0	0	0.00<<
69/ 45 (C)	-0.79>>	-73.82	247.44	0	0	0
69/ 32 (C)	-5.17<<	-83.26	263.23	0	0	0
69/ 40 (C)	-4.24	-73.81>>	237.31	0	0	0
69/ 11 (C)	-2.73	-87.32<<	281.11	0	0	0
69/ 16 (C)	-2.81	-87.32	286.21>>	0	0	0
69/ 41 (C)	-4	-73.82	233.50<<	0	0	0
69/ 17 (C)	-2.57	-87.32	282.4	0.00>>	0	0
69/ 38 (C)	-1.29	-73.83	249.1	-0.00<<	0	0
69/ 17 (C)	-2.57	-87.32	282.4	0	0.00>>	0
69/ 38 (C)	-1.29	-73.83	249.1	0	-0.00<<	0
69/ 17 (C)	-2.57	-87.32	282.4	0	0	0.00>>
69/ 38 (C)	-1.29	-73.83	249.1	0	0	0.00<<
70/ 39 (C)	-9.54>>	-61.26	241.79	0	0	0
70/ 12 (C)	-15.26<<	-71.8	269.35	0	0	0
70/ 40 (C)	-13.08	-61.15>>	229.93	0	0	0
70/ 11 (C)	-12.99	-71.87<<	275.08	0	0	0

70/ 16 (C)	-13.72	-71.84	280.35>>	0	0	0
70/ 41 (C)	-12.71	-61.16	226.45<<	0	0	0
70/ 68 (C)	-10.55	-61.22	245.17	0.00>>	0	0
70/ 33 (C)	-14.79	-68.6	250.86	0.00<<	0	0
70/ 41 (C)	-12.71	-61.16	226.45	0	-0.00>>	0
70/ 10 (C)	-13.37	-71.86	278.56	0	-0.00<<	0
70/ 41 (C)	-12.71	-61.16	226.45	0	0	-0.00>>
70/ 30 (C)	-12	-68.69	269.68	0	0	-0.00<<
71/ 39 (C)	-19.11>>	-71.24	241.34	0	0	0
71/ 16 (C)	-24.93<<	-84.76	275.4	0	0	0
71/ 69 (C)	-21.05	-70.63>>	233.76	0	0	0
71/ 11 (C)	-23.2	-85.06<<	269.8	0	0	0
71/ 16 (C)	-24.93	-84.76	275.40>>	0	0	0
71/ 41 (C)	-20.57	-70.83	223.36<<	0	0	0
71/ 13 (C)	-24.07	-84.81	259.01	-0.00>>	0	0
71/ 71 (C)	-21.43	-70.76	246.66	-0.00<<	0	0
71/ 13 (C)	-24.07	-84.81	259.01	0	-0.00>>	0
71/ 42 (C)	-21.55	-70.93	243.2	0	-0.00<<	0
71/ 13 (C)	-24.07	-84.81	259.01	0	0	-0.00>>
71/ 42 (C)	-21.55	-70.93	243.2	0	0	-0.00<<
72/ 11 (C)	13.11>>	-26.71	227.34	0	0	0
72/ 40 (C)	3.05<<	-25.2	181.02	0	0	0
72/ 44 (C)	4.95	-25.12>>	199.01	0	0	0
72/ 13 (C)	9.35	-26.74<<	217.96	0	0	0
72/ 16 (C)	10.19	-26.67	230.26>>	0	0	0
72/ 41 (C)	3.35	-25.22	179.52<<	0	0	0
72/ 38 (C)	9.32	-25.16	196.66	-0.00>>	0	0
72/ 13 (C)	9.35	-26.74	217.96	-0.00<<	0	0
72/ 11 (C)	13.11	-26.71	227.34	0	0.00>>	0
72/ 44 (C)	4.95	-25.12	199.01	0	-0.00<<	0
72/ 11 (C)	13.11	-26.71	227.34	0	0	0.00>>
72/ 44 (C)	4.95	-25.12	199.01	0	0	-0.00<<
73/ 41 (C)	-3.63>>	-6.86	107.79	0	0	0
73/ 16 (C)	-4.75<<	-11.75	144.9	0	0	0
73/ 41 (C)	-3.63	-6.86>>	107.79	0	0	0
73/ 16 (C)	-4.75	-11.75<<	144.9	0	0	0
73/ 14 (C)	-4.68	-11.74	145.60>>	0	0	0
73/ 41 (C)	-3.63	-6.86	107.79<<	0	0	0
73/ 38 (C)	-3.91	-7.06	111.89	-0.00>>	0	0
73/ 13 (C)	-4.39	-11.53	140.47	-0.00<<	0	0
73/ 12 (C)	-4.48	-11.59	143.38	0	0.00>>	0
73/ 39 (C)	-3.83	-7.01	108.98	0	0.00<<	0
73/ 41 (C)	-3.63	-6.86	107.79	0	0	-0.00>>
73/ 16 (C)	-4.75	-11.75	144.9	0	0	-0.00<<
74/ 11 (C)	21.71>>	-47.74	266.13	0	0	0

74/ 40 (C)	9.86<<	-38.51	207.35	0	0	0
74/ 39 (C)	16.45	-36.10>>	224.51	0	0	0
74/ 12 (C)	17.65	-49.20<<	256.51	0	0	0
74/ 16 (C)	18.98	-47.96	272.00>>	0	0	0
74/ 41 (C)	10.15	-38.46	205.66<<	0	0	0
74/ 45 (C)	12.37	-36.39	231.49	-0.00>>	0	0
74/ 12 (C)	17.65	-49.2	256.51	-0.00<<	0	0
74/ 11 (C)	21.71	-47.74	266.13	0	0.00>>	0
74/ 44 (C)	12.08	-36.44	233.18	0	0.00<<	0
74/ 38 (C)	16.16	-36.15	226.21	0	0	-0.00>>
74/ 12 (C)	17.65	-49.2	256.51	0	0	-0.00<<
75/ 13 (C)	43.20>>	10.07	243.32	0	0	0
75/ 68 (C)	37.02<<	8.77	226.35	0	0	0
75/ 10 (C)	43.13	10.60>>	244.48	0	0	0
75/ 41 (C)	37.13	8.09<<	223	0	0	0
75/ 14 (C)	43.15	10.25	250.47>>	0	0	0
75/ 39 (C)	37.04	8.88	220.68<<	0	0	0
75/ 14 (C)	43.15	10.25	250.47	0.00>>	0	0
75/ 39 (C)	37.04	8.88	220.68	0.00<<	0	0
75/ 17 (C)	43.18	10.18	246.75	0	0.00>>	0
75/ 38 (C)	37.02	8.93	223.23	0	0.00<<	0
75/ 14 (C)	43.15	10.25	250.47	0	0	0.00>>
75/ 45 (C)	37.09	8.27	228.7	0	0	0.00<<
76/ 39 (C)	-13.40>>	-39.53	197.48	0	0	0
76/ 36 (C)	-18.52<<	-43.8	220.77	0	0	0
76/ 40 (C)	-14.59	-38.98>>	184.96	0	0	0
76/ 11 (C)	-16.18	-45.69<<	222.98	0	0	0
76/ 16 (C)	-18.39	-45.62	226.58>>	0	0	0
76/ 41 (C)	-14.22	-38.99	182.49<<	0	0	0
76/ 44 (C)	-16.84	-39.41	201.83	0.00>>	0	0
76/ 13 (C)	-16.67	-45.37	213.99	0.00<<	0	0
76/ 13 (C)	-16.67	-45.37	213.99	0	-0.00>>	0
76/ 44 (C)	-16.84	-39.41	201.83	0	-0.00<<	0
76/ 13 (C)	-16.67	-45.37	213.99	0	0	0.00>>
76/ 44 (C)	-16.84	-39.41	201.83	0	0	-0.00<<
77/ 39 (C)	-12.26>>	-53.04	187.09	0	0	0
77/ 36 (C)	-18.07<<	-59.42	208.33	0	0	0
77/ 40 (C)	-13.59	-52.50>>	176.75	0	0	0
77/ 11 (C)	-14.88	-62.17<<	211.68	0	0	0
77/ 16 (C)	-17.59	-62.12	214.48>>	0	0	0
77/ 41 (C)	-13.24	-52.51	174.59<<	0	0	0
77/ 13 (C)	-15.47	-61.85	204.18	0.00>>	0	0
77/ 44 (C)	-16.55	-52.95	190.31	0.00<<	0	0
77/ 13 (C)	-15.47	-61.85	204.18	0	0.00>>	0
77/ 44 (C)	-16.55	-52.95	190.31	0	-0.00<<	0

77/ 33 (C)	-14.76	-58.97	192.61	0	0	-0.00>>
77/ 44 (C)	-16.55	-52.95	190.31	0	0	-0.00<<
78/ 39 (C)	-8.34>>	-56.37	183.86	0	0	0
78/ 36 (C)	-13.89<<	-63.61	204.18	0	0	0
78/ 39 (C)	-8.34	-56.37>>	183.86	0	0	0
78/ 16 (C)	-13.09	-66.69<<	210.64	0	0	0
78/ 16 (C)	-13.09	-66.69	210.64>>	0	0	0
78/ 41 (C)	-11	-56.38	172.92<<	0	0	0
78/ 39 (C)	-8.34	-56.37	183.86	-0.00>>	0	0
78/ 12 (C)	-11.92	-66.68	203.66	-0.00<<	0	0
78/ 11 (C)	-9.97	-66.67	208.27	0	0.00>>	0
78/ 44 (C)	-13.29	-56.4	186.51	0	0.00<<	0
78/ 11 (C)	-9.97	-66.67	208.27	0	0	0.00>>
78/ 44 (C)	-13.29	-56.4	186.51	0	0	0.00<<
79/ 31 (C)	9.74>>	-58.95	204.92	0	0	0
79/ 40 (C)	1.66<<	-53.03	175.3	0	0	0
79/ 39 (C)	7.4	-52.52>>	185.77	0	0	0
79/ 12 (C)	5.96	-62.11<<	206.58	0	0	0
79/ 16 (C)	6.32	-61.86	214.32>>	0	0	0
79/ 41 (C)	1.93	-53.03	173.61<<	0	0	0
79/ 39 (C)	7.4	-52.52	185.77	-0.00>>	0	0
79/ 14 (C)	6.54	-61.86	213.27	-0.00<<	0	0
79/ 11 (C)	9.51	-61.8	212.18	0	-0.00>>	0
79/ 44 (C)	2.26	-52.62	188.22	0	-0.00<<	0
79/ 13 (C)	6.23	-62.11	204.88	0	0	0.00>>
79/ 44 (C)	2.26	-52.62	188.22	0	0	-0.00<<
80/ 16 (C)	7.93>>	0.15	247.73	0	0	0
80/ 39 (C)	4.76<<	0.12	191.66	0	0	0
80/ 12 (C)	7.73	0.17>>	248.14	0	0	0
80/ 45 (C)	5.18	0.11<<	193.61	0	0	0
80/ 14 (C)	7.9	0.16	248.45>>	0	0	0
80/ 39 (C)	4.76	0.12	191.66<<	0	0	0
80/ 10 (C)	7.67	0.15	246.56	0.00>>	0	0
80/ 43 (C)	5.14	0.12	194.81	0.00<<	0	0
80/ 32 (C)	6.86	0.16	233.14	0	0.00>>	0
80/ 45 (C)	5.18	0.11	193.61	0	0.00<<	0
80/ 12 (C)	7.73	0.17	248.14	0	0	0.00>>
80/ 43 (C)	5.14	0.12	194.81	0	0	0.00<<
81/ 16 (C)	1.79>>	0.19	249.52	0	0	0
81/ 39 (C)	1.06<<	0.12	185.85	0	0	0
81/ 12 (C)	1.64	0.19>>	248.66	0	0	0
81/ 39 (C)	1.06	0.12<<	185.85	0	0	0
81/ 14 (C)	1.78	0.19	249.98>>	0	0	0
81/ 39 (C)	1.06	0.12	185.85<<	0	0	0
81/ 40 (C)	1.15	0.12	192.89	-0.00>>	0	0

81/ 9 (C)	1.64	0.19	245.18	-0.00<<	0	0
81/ 39 (C)	1.06	0.12	185.85	0	-0.00>>	0
81/ 14 (C)	1.78	0.19	249.98	0	-0.00<<	0
81/ 41 (C)	1.07	0.12	188.67	0	0	-0.00>>
81/ 14 (C)	1.78	0.19	249.98	0	0	-0.00<<
82/ 42 (C)	-1.01>>	0	195.56	0	0	0
82/ 13 (C)	-1.94<<	-0.05	239.2	0	0	0
82/ 41 (C)	-1.12	0.06>>	187.54	0	0	0
82/ 10 (C)	-1.9	-0.08<<	242.34	0	0	0
82/ 14 (C)	-1.87	-0.08	245.84>>	0	0	0
82/ 39 (C)	-1.07	0	185.15<<	0	0	0
82/ 18 (C)	-1.07	0.02	189.52	0.00>>	0	0
82/ 30 (C)	-1.65	-0.07	225.33	-0.00<<	0	0
82/ 13 (C)	-1.94	-0.05	239.2	0	0.00>>	0
82/ 44 (C)	-1.05	0	194.76	0	0.00<<	0
82/ 43 (C)	-1.02	0	190.98	0	0	-0.00>>
82/ 12 (C)	-1.93	-0.05	243.78	0	0	-0.00<<
83/ 41 (C)	-1.58>>	0.83	197.28	0	0	0
83/ 16 (C)	-2.26<<	1.54	254.86	0	0	0
83/ 16 (C)	-2.26	1.54>>	254.86	0	0	0
83/ 41 (C)	-1.58	0.83<<	197.28	0	0	0
83/ 14 (C)	-2.2	1.54	255.70>>	0	0	0
83/ 39 (C)	-1.62	0.89	194.20<<	0	0	0
83/ 10 (C)	-2.13	1.53	252.09	0.00>>	0	0
83/ 41 (C)	-1.58	0.83	197.28	0.00<<	0	0
83/ 45 (C)	-1.85	0.9	198.83	0	-0.00>>	0
83/ 12 (C)	-2.1	1.5	253.93	0	-0.00<<	0
83/ 31 (C)	-1.93	1.34	230.13	0	0	0.00>>
83/ 40 (C)	-1.63	0.83	201.99	0	0	0.00<<
84/ 42 (C)	-53.26>>	3.09	210.8	0	0	0
84/ 17 (C)	-63.17<<	2.34	245.11	0	0	0
84/ 32 (C)	-60.28	4.72>>	237.8	0	0	0
84/ 45 (C)	-53.52	1.68<<	209.8	0	0	0
84/ 10 (C)	-63.14	3.19	251.58>>	0	0	0
84/ 43 (C)	-53.26	3.05	207.47<<	0	0	0
84/ 45 (C)	-53.52	1.68	209.8	-0.00>>	0	0
84/ 12 (C)	-63.15	4.16	248.97	-0.00<<	0	0
84/ 44 (C)	-53.52	1.72	213.13	0	-0.00>>	0
84/ 9 (C)	-63.09	3.25	247.08	0	-0.00<<	0
84/ 14 (C)	-63.01	3.2	247.05	0	0	0.00>>
84/ 45 (C)	-53.52	1.68	209.8	0	0	0.00<<
85/ 42 (C)	-53.24>>	-3.03	210.79	0	0	0
85/ 13 (C)	-63.13<<	-2.18	244.86	0	0	0
85/ 40 (C)	-53.49	-1.58>>	212.76	0	0	0
85/ 37 (C)	-60.26	-4.57<<	234.71	0	0	0

85/ 10 (C)	-63.12	-3.2	251.60>>	0	0	0
85/ 43 (C)	-53.25	-3.05	207.47<<	0	0	0
85/ 16 (C)	-63.13	-3.95	249.06	0.00>>	0	0
85/ 41 (C)	-53.49	-1.59	209.44	0.00<<	0	0
85/ 12 (C)	-63.13	-2.17	248.18	0	0.00>>	0
85/ 39 (C)	-53.47	-3.32	215.14	0	0.00<<	0
85/ 42 (C)	-53.24	-3.03	210.79	0	0	-0.00>>
85/ 13 (C)	-63.13	-2.18	244.86	0	0	-0.00<<
86/ 45 (C)	-47.45>>	21.66	184.3	0	0	0
86/ 12 (C)	-55.69<<	30.7	225.61	0	0	0
86/ 32 (C)	-53.24	31.50>>	222.11	0	0	0
86/ 45 (C)	-47.45	21.66<<	184.3	0	0	0
86/ 12 (C)	-55.69	30.7	225.61>>	0	0	0
86/ 45 (C)	-47.45	21.66	184.30<<	0	0	0
86/ 45 (C)	-47.45	21.66	184.3	-0.00>>	0	0
86/ 32 (C)	-53.24	31.5	222.11	-0.00<<	0	0
86/ 39 (C)	-47.48	25.34	196.92	0	-0.00>>	0
86/ 8 (C)	-55.68	28.23	220.75	0	-0.00<<	0
86/ 67 (C)	-47.48	25.45	199.37	0	0	0.00>>
86/ 13 (C)	-55.69	30.63	223.05	0	0	0.00<<
87/ 42 (C)	-67.02>>	1.77	210.69	0	0	0
87/ 17 (C)	-79.50<<	-3.81	238.72	0	0	0
87/ 41 (C)	-67.24	6.85>>	215.34	0	0	0
87/ 36 (C)	-75.86	-4.22<<	230.3	0	0	0
87/ 12 (C)	-79.49	0.56	246.99>>	0	0	0
87/ 45 (C)	-67.26	-0.96	206.70<<	0	0	0
87/ 16 (C)	-79.5	-4.13	241.81	0.00>>	0	0
87/ 41 (C)	-67.24	6.85	215.34	0.00<<	0	0
87/ 17 (C)	-79.5	-3.81	238.72	0	0.00>>	0
87/ 42 (C)	-67.02	1.77	210.69	0	0.00<<	0
87/ 42 (C)	-67.02	1.77	210.69	0	0	-0.00>>
87/ 13 (C)	-79.49	0.88	243.9	0	0	-0.00<<
88/ 40 (C)	-49.68>>	13.23	202.43	0	0	0
88/ 15 (C)	-58.64<<	7.48	215.13	0	0	0
88/ 41 (C)	-49.68	13.41>>	199.8	0	0	0
88/ 36 (C)	-55.93	4.61<<	205.41	0	0	0
88/ 12 (C)	-58.6	10.15	224.10>>	0	0	0
88/ 45 (C)	-49.69	5.77	186.24<<	0	0	0
88/ 36 (C)	-55.93	4.61	205.41	-0.00>>	0	0
88/ 41 (C)	-49.68	13.41	199.8	-0.00<<	0	0
88/ 43 (C)	-49.74	8.65	189.23	0	-0.00>>	0
88/ 12 (C)	-58.6	10.15	224.1	0	-0.00<<	0
88/ 11 (C)	-58.61	7.71	219.33	0	0	-0.00>>
88/ 42 (C)	-49.74	8.46	191.87	0	0	-0.00<<
89/ 42 (C)	-67.50>>	-2.37	211.33	0	0	0

89/ 13 (C)	-80.06<<	3.7	238.76	0	0	0
89/ 32 (C)	-76.38	4.31>>	230.05	0	0	0
89/ 45 (C)	-67.73	-7.09<<	215.97	0	0	0
89/ 10 (C)	-80.04	1.33	247.84>>	0	0	0
89/ 41 (C)	-67.73	0.92	206.59<<	0	0	0
89/ 45 (C)	-67.73	-7.09	215.97	-0.00>>	0	0
89/ 12 (C)	-80.06	4.13	241.71	-0.00<<	0	0
89/ 13 (C)	-80.06	3.7	238.76	0	0.00>>	0
89/ 42 (C)	-67.5	-2.37	211.33	0	0.00<<	0
89/ 45 (C)	-67.73	-7.09	215.97	0	0	0.00>>
89/ 14 (C)	-79.92	1.9	242.79	0	0	0.00<<
90/ 40 (C)	-46.88>>	-22.47	184.9	0	0	0
90/ 17 (C)	-55.01<<	-31.79	221.88	0	0	0
90/ 40 (C)	-46.88	-22.47>>	184.9	0	0	0
90/ 37 (C)	-52.59	-32.55<<	218.52	0	0	0
90/ 16 (C)	-55.01	-31.77	224.14>>	0	0	0
90/ 41 (C)	-46.88	-22.49	182.64<<	0	0	0
90/ 36 (C)	-52.59	-32.53	220.78	0.00>>	0	0
90/ 41 (C)	-46.88	-22.49	182.64	0.00<<	0	0
90/ 36 (C)	-52.59	-32.53	220.78	0	0.00>>	0
90/ 41 (C)	-46.88	-22.49	182.64	0	0.00<<	0
90/ 40 (C)	-46.88	-22.47	184.9	0	0	-0.00>>
90/ 17 (C)	-55.01	-31.79	221.88	0	0	-0.00<<
91/ 45 (C)	-49.72>>	-12.07	199.31	0	0	0
91/ 14 (C)	-58.70<<	-6.04	217.03	0	0	0
91/ 32 (C)	-55.99	-2.99>>	203.75	0	0	0
91/ 45 (C)	-49.72	-12.07<<	199.31	0	0	0
91/ 16 (C)	-58.66	-8.56	223.07>>	0	0	0
91/ 41 (C)	-49.74	-4.37	184.95<<	0	0	0
91/ 45 (C)	-49.72	-12.07	199.31	0.00>>	0	0
91/ 32 (C)	-55.99	-2.99	203.75	0.00<<	0	0
91/ 42 (C)	-49.78	-7.56	191.65	0	-0.00>>	0
91/ 13 (C)	-58.67	-4.25	212.04	0	-0.00<<	0
91/ 15 (C)	-58.7	-6.35	214.62	0	0	0.00>>
91/ 40 (C)	-49.74	-4.07	187.36	0	0	0.00<<
92/ 30 (C)	0.02>>	2.78	150.25	0	0	0
92/ 45 (C)	-0.01<<	8.73	137.31	0	0	0
92/ 44 (C)	-0.01	8.76>>	141.4	0	0	0
92/ 33 (C)	0.01	-7.91<<	134.62	0	0	0
92/ 16 (C)	0	5.21	155.58>>	0	0	0
92/ 41 (C)	0	-7.62	123.15<<	0	0	0
92/ 41 (C)	0	-7.62	123.15	-0.00>>	0	0
92/ 36 (C)	-0.01	8.47	152.88	-0.00<<	0	0
92/ 15 (C)	0	1.27	149.63	0	0.00>>	0
92/ 38 (C)	0.01	3.07	138.78	0	-0.00<<	0

92/ 41 (C)	0	-7.62	123.15	0	0	-0.00>>
92/ 34 (C)	0	1.95	149.78	0	0	-0.00<<
93/ 39 (C)	0.06>>	-1.9	127.02	0	0	0
93/ 36 (C)	-0.17<<	4.16	148.37	0	0	0
93/ 45 (C)	-0.17	4.92>>	134.11	0	0	0
93/ 32 (C)	0.02	-12.39<<	149.15	0	0	0
93/ 12 (C)	0	-9.24	152.47>>	0	0	0
93/ 39 (C)	0.06	-1.9	127.02<<	0	0	0
93/ 36 (C)	-0.17	4.16	148.37	0.00>>	0	0
93/ 43 (C)	0.05	-2.72	128.48	0.00<<	0	0
93/ 38 (C)	0.06	-2.1	131.81	0	0.00>>	0
93/ 37 (C)	-0.17	4.35	143.58	0	0.00<<	0
93/ 37 (C)	-0.17	4.35	143.58	0	0	0.00>>
93/ 38 (C)	0.06	-2.1	131.81	0	0	-0.00<<
94/ 36 (C)	0.08>>	6.38	128.63	0	0	0
94/ 43 (C)	-0.00<<	-0.04	120.98	0	0	0
94/ 45 (C)	0.07	6.87>>	115.37	0	0	0
94/ 32 (C)	0.02	-10.63<<	131.84	0	0	0
94/ 14 (C)	0.02	-1.22	136.84>>	0	0	0
94/ 45 (C)	0.07	6.87	115.37<<	0	0	0
94/ 42 (C)	0	-0.1	125.13	0.00>>	0	0
94/ 37 (C)	0.08	6.44	124.48	-0.00<<	0	0
94/ 39 (C)	0.01	0.79	119.73	0	0.00>>	0
94/ 34 (C)	0	-0.54	134.23	0	-0.00<<	0
94/ 30 (C)	0.02	0.29	132.99	0	0	0.00>>
94/ 45 (C)	0.07	6.87	115.37	0	0	-0.00<<
95/ 41 (C)	0.00>>	-3.44	131.23	0	0	0
95/ 36 (C)	-0.00<<	10.24	167.06	0	0	0
95/ 36 (C)	0	10.24>>	167.06	0	0	0
95/ 41 (C)	0	-3.44<<	131.23	0	0	0
95/ 16 (C)	0	8.01	171.12>>	0	0	0
95/ 41 (C)	0	-3.44	131.23<<	0	0	0
95/ 41 (C)	0	-3.44	131.23	-0.00>>	0	0
95/ 36 (C)	0	10.24	167.06	-0.00<<	0	0
95/ 31 (C)	0	5.97	158.29	0	0.00>>	0
95/ 44 (C)	0	9.82	151.46	0	-0.00<<	0
95/ 31 (C)	0	5.97	158.29	0	0	0.00>>
95/ 40 (C)	0	-3.05	136.95	0	0	0.00<<
96/ 41 (C)	0.00>>	-9.86	115.3	0	0	0
96/ 36 (C)	-0.00<<	1.72	141.78	0	0	0
96/ 44 (C)	0	2.18>>	127.76	0	0	0
96/ 33 (C)	0	-10.31<<	129.32	0	0	0
96/ 16 (C)	0	-0.72	146.69>>	0	0	0
96/ 41 (C)	0	-9.86	115.30<<	0	0	0
96/ 45 (C)	0	2.11	120.1	-0.00>>	0	0

96/ 32 (C)	0	-10.24	136.99	-0.00<<	0	0
96/ 35 (C)	0	-2.72	133.78	0	0.00>>	0
96/ 38 (C)	0	-1.52	127.39	0	-0.00<<	0
96/ 42 (C)	0	-2.2	127.43	0	0	-0.00>>
96/ 31 (C)	0	-2.05	133.74	0	0	-0.00<<
97/ 36 (C)	0.00>>	5.92	144.43	0	0	0
97/ 41 (C)	-0.00<<	-6.33	127.25	0	0	0
97/ 44 (C)	0	5.95>>	129.68	0	0	0
97/ 33 (C)	0	-6.36<<	142	0	0	0
97/ 12 (C)	0	-3.54	154.19>>	0	0	0
97/ 45 (C)	0	5.66	122.75<<	0	0	0
97/ 32 (C)	0	-6.07	148.92	0.00>>	0	0
97/ 45 (C)	0	5.66	122.75	-0.00<<	0	0
97/ 43 (C)	0	1.31	125.95	0	0.00>>	0
97/ 30 (C)	0	2.25	147.05	0	-0.00<<	0
97/ 43 (C)	0	1.31	125.95	0	0	0.00>>
97/ 32 (C)	0	-6.07	148.92	0	0	-0.00<<
98/ 30 (C)	0.07>>	6.84	249.02	0	0	0
98/ 43 (C)	0.01<<	5.34	219.58	0	0	0
98/ 36 (C)	0.05	9.82>>	257.99	0	0	0
98/ 41 (C)	0.03	-2.98<<	203.27	0	0	0
98/ 16 (C)	0.06	7.63	267.70>>	0	0	0
98/ 41 (C)	0.03	-2.98	203.27<<	0	0	0
98/ 41 (C)	0.03	-2.98	203.27	-0.00>>	0	0
98/ 16 (C)	0.06	7.63	267.7	-0.00<<	0	0
98/ 39 (C)	0.05	6.34	211.55	0	0.00>>	0
98/ 34 (C)	0.02	5.83	257.05	0	-0.00<<	0
98/ 42 (C)	0.01	5.71	227.3	0	0	-0.00>>
98/ 11 (C)	0.06	5.46	254.6	0	0	-0.00<<
99/ 38 (C)	0.01>>	-1.82	141.14	0	0	0
99/ 35 (C)	-0.01<<	-3.22	152.19	0	0	0
99/ 45 (C)	0	0.95>>	135.7	0	0	0
99/ 32 (C)	-0.01	-10.55<<	154.74	0	0	0
99/ 14 (C)	-0.01	-4.09	165.75>>	0	0	0
99/ 41 (C)	0	-9.89	130.69<<	0	0	0
99/ 45 (C)	0	0.95	135.7	-0.00>>	0	0
99/ 32 (C)	-0.01	-10.55	154.74	-0.00<<	0	0
99/ 8 (C)	0	-4.94	163.98	0	0.00>>	0
99/ 43 (C)	-0.01	-2.6	135.9	0	-0.00<<	0
99/ 43 (C)	-0.01	-2.6	135.9	0	0	-0.00>>
99/ 30 (C)	0.01	-2.45	157.43	0	0	-0.00<<
100/ 38 (C)	-0.02>>	2.98	111.84	0	0	0
100/ 15 (C)	-0.05<<	1.18	123.63	0	0	0
100/ 44 (C)	-0.02	5.70>>	110.42	0	0	0
100/ 33 (C)	-0.04	-5.55<<	122.49	0	0	0

100/ 12 (C)	-0.05	-3.03	132.44>>	0	0	0
100/ 45 (C)	-0.02	5.48	103.77<<	0	0	0
100/ 14 (C)	-0.05	1.39	130.28	0.00>>	0	0
100/ 39 (C)	-0.02	2.77	105.19	0.00<<	0	0
100/ 35 (C)	-0.05	1.82	118.9	0	0.00>>	0
100/ 67 (C)	-0.02	0.8	116.18	0	-0.00<<	0
100/ 42 (C)	-0.03	2.17	113.93	0	0	0.00>>
100/ 17 (C)	-0.04	3.3	121.53	0	0	-0.00<<
101/ 30 (C)	0.03>>	4.15	295.96	0	0	0
101/ 43 (C)	-0.01<<	4.07	258.81	0	0	0
101/ 44 (C)	0.02	7.05>>	273.05	0	0	0
101/ 33 (C)	0.01	-4.64<<	277.56	0	0	0
101/ 16 (C)	0.02	4.3	316.49>>	0	0	0
101/ 41 (C)	0.01	-4.05	244.71<<	0	0	0
101/ 41 (C)	0.01	-4.05	244.71	-0.00>>	0	0
101/ 16 (C)	0.02	4.3	316.49	-0.00<<	0	0
101/ 38 (C)	0.03	4.75	263.11	0	0.00>>	0
101/ 33 (C)	0.01	-4.64	277.56	0	0.00<<	0
101/ 43 (C)	-0.01	4.07	258.81	0	0	0.00>>
101/ 30 (C)	0.03	4.15	295.96	0	0	-0.00<<
102/ 31 (C)	0.01>>	-0.96	160.72	0	0	0
102/ 42 (C)	-0.01<<	-0.73	159.94	0	0	0
102/ 44 (C)	0.01	1.83>>	160.25	0	0	0
102/ 33 (C)	0	-8.75<<	160.3	0	0	0
102/ 16 (C)	0.01	-0.86	178.70>>	0	0	0
102/ 41 (C)	0	-8.08	146.58<<	0	0	0
102/ 45 (C)	0.01	1.66	151.21	-0.00>>	0	0
102/ 32 (C)	0	-8.58	169.34	-0.00<<	0	0
102/ 40 (C)	0	-7.91	155.63	0	-0.00>>	0
102/ 31 (C)	0.01	-0.96	160.72	0	-0.00<<	0
102/ 38 (C)	0.01	-0.12	156.05	0	0	0.00>>
102/ 35 (C)	0	-1.57	164.61	0	0	-0.00<<
103/ 31 (C)	0.00>>	3.28	99.15	0	0	0
103/ 42 (C)	-0.01<<	3.53	104.01	0	0	0
103/ 44 (C)	0	6.01>>	100.59	0	0	0
103/ 33 (C)	0	-4.41<<	108.15	0	0	0
103/ 64 (C)	0	-1.75	115.80>>	0	0	0
103/ 39 (C)	0	3.63	92.88<<	0	0	0
103/ 16 (C)	0	3.78	110.71	0.00>>	0	0
103/ 41 (C)	-0.01	-4.06	101.89	0.00<<	0	0
103/ 41 (C)	-0.01	-4.06	101.89	0	0.00>>	0
103/ 34 (C)	-0.01	3.18	110.28	0	-0.00<<	0
103/ 43 (C)	-0.01	3.17	97.21	0	0	-0.00>>
103/ 30 (C)	0	3.64	105.95	0	0	-0.00<<
104/ 30 (C)	3.30>>	-2.95	193.48	0	0	0

104/ 43 (C)	-2.76<<	-4.21	175.23	0	0	0
104/ 45 (C)	2.09	4.39>>	162.37	0	0	0
104/ 34 (C)	-2.29	-4.22<<	194.2	0	0	0
104/ 12 (C)	0.99	-1.67	204.16>>	0	0	0
104/ 45 (C)	2.09	4.39	162.37<<	0	0	0
104/ 18 (C)	0.81	-0.08	174.18	0.00>>	0	0
104/ 36 (C)	2.56	4.38	181.34	-0.00<<	0	0
104/ 43 (C)	-2.76	-4.21	175.23	0	-0.00>>	0
104/ 32 (C)	0.55	-2.71	201.58	0	-0.00<<	0
104/ 39 (C)	2.83	-2.93	174.51	0	0	0.00>>
104/ 32 (C)	0.55	-2.71	201.58	0	0	-0.00<<
105/ 30 (C)	4.18>>	-2.81	227.16	0	0	0
105/ 43 (C)	-2.23<<	-4.05	203.07	0	0	0
105/ 36 (C)	3.63	4.30>>	215.64	0	0	0
105/ 43 (C)	-2.23	-4.05<<	203.07	0	0	0
105/ 12 (C)	1.24	-1.48	235.30>>	0	0	0
105/ 45 (C)	2.99	4.3	193.11<<	0	0	0
105/ 32 (C)	0.44	-2.47	229.76	0.00>>	0	0
105/ 45 (C)	2.99	4.3	193.11	-0.00<<	0	0
105/ 10 (C)	3.48	-1.68	233.74	0	0.00>>	0
105/ 43 (C)	-2.23	-4.05	203.07	0	0.00<<	0
105/ 36 (C)	3.63	4.3	215.64	0	0	0.00>>
105/ 39 (C)	3.54	-2.81	204.64	0	0	-0.00<<
107/ 43 (C)	-5.07>>	0	36.06	0	0	0
107/ 10 (C)	-7.08<<	0	48.01	0	0	0
107/ 32 (C)	-6.39	0.00>>	43.86	0	0	0
107/ 45 (C)	-5.12	-0.01<<	36.2	0	0	0
107/ 10 (C)	-7.08	0	48.01>>	0	0	0
107/ 43 (C)	-5.07	0	36.06<<	0	0	0
107/ 39 (C)	-5.36	0	37.62	-0.00>>	0	0
107/ 32 (C)	-6.39	0	43.86	-0.00<<	0	0
107/ 10 (C)	-7.08	0	48.01	0	0.00>>	0
107/ 43 (C)	-5.07	0	36.06	0	0.00<<	0
107/ 12 (C)	-6.93	0	47.12	0	0	0.00>>
107/ 43 (C)	-5.07	0	36.06	0	0	0.00<<
109/ 38 (C)	0.81>>	-2.39	94.89	0	0	0
109/ 35 (C)	-1.56<<	-0.77	95.45	0	0	0
109/ 37 (C)	-1	2.24>>	95.98	0	0	0
109/ 38 (C)	0.81	-2.39<<	94.89	0	0	0
109/ 12 (C)	-0.66	-0.28	109.05>>	0	0	0
109/ 43 (C)	-1.18	-0.78	87.33<<	0	0	0
109/ 30 (C)	0.44	-2.38	103.01	0.00>>	0	0
109/ 18 (C)	0.17	0.07	93.87	0.00<<	0	0
109/ 45 (C)	-0.63	2.23	87.87	0	-0.00>>	0
109/ 12 (C)	-0.66	-0.28	109.05	0	-0.00<<	0

109/ 39 (C)	0.73	-2.39	92.63	0	0	0.00>>
109/ 34 (C)	-1.48	-0.77	97.72	0	0	-0.00<<
111/ 43 (C)	-7.72>>	0	89.84	0	0	0
111/ 10 (C)	-11.07<<	0.01	118.68	0	0	0
111/ 45 (C)	-7.85	0.04>>	90.12	0	0	0
111/ 32 (C)	-9.92	-0.04<<	108.68	0	0	0
111/ 10 (C)	-11.07	0.01	118.68>>	0	0	0
111/ 43 (C)	-7.72	0	89.84<<	0	0	0
111/ 45 (C)	-7.85	0.04	90.12	0.00>>	0	0
111/ 30 (C)	-10.36	0.01	112.24	-0.00<<	0	0
111/ 43 (C)	-7.72	0	89.84	0	-0.00>>	0
111/ 10 (C)	-11.07	0.01	118.68	0	-0.00<<	0
111/ 10 (C)	-11.07	0.01	118.68	0	0	0.00>>
111/ 41 (C)	-7.82	-0.04	89.97	0	0	0.00<<
114/ 43 (C)	-4.87>>	-0.01	115.87	0	0	0
114/ 10 (C)	-7.33<<	-0.02	158.47	0	0	0
114/ 32 (C)	-6.5	0.10>>	143.83	0	0	0
114/ 45 (C)	-5.06	-0.11<<	117.23	0	0	0
114/ 10 (C)	-7.33	-0.02	158.47>>	0	0	0
114/ 43 (C)	-4.87	-0.01	115.87<<	0	0	0
114/ 32 (C)	-6.5	0.1	143.83	0.00>>	0	0
114/ 45 (C)	-5.06	-0.11	117.23	-0.00<<	0	0
114/ 10 (C)	-7.33	-0.02	158.47	0	0.00>>	0
114/ 43 (C)	-4.87	-0.01	115.87	0	0.00<<	0
114/ 45 (C)	-5.06	-0.11	117.23	0	0	-0.00>>
114/ 12 (C)	-7.12	0.06	155.17	0	0	-0.00<<
125/ 39 (C)	-6.07>>	-4.77	152.48	0	0	0
125/ 36 (C)	-11.27<<	-3.12	170.85	0	0	0
125/ 45 (C)	-9.92	-2.43>>	153.41	0	0	0
125/ 32 (C)	-10.47	-12.02<<	204.43	0	0	0
125/ 32 (C)	-10.47	-12.02	204.43>>	0	0	0
125/ 39 (C)	-6.07	-4.77	152.48<<	0	0	0
125/ 36 (C)	-11.27	-3.12	170.85	0.00>>	0	0
125/ 41 (C)	-9.12	-11.34	186.99	0.00<<	0	0
125/ 10 (C)	-8.61	-6.18	180.89	0	0.00>>	0
125/ 45 (C)	-9.92	-2.43	153.41	0	0.00<<	0
125/ 38 (C)	-6.17	-4.96	156.64	0	0	0.00>>
125/ 9 (C)	-9.51	-6.75	184.65	0	0	-0.00<<
154/ 16 (C)	56.01>>	88.24	218.33	0	0	0
154/ 41 (C)	42.74<<	74.79	162.17	0	0	0
154/ 13 (C)	51.99	88.29>>	202.84	0	0	0
154/ 44 (C)	48.64	74.71<<	185.5	0	0	0
154/ 16 (C)	56.01	88.24	218.33>>	0	0	0
154/ 41 (C)	42.74	74.79	162.17<<	0	0	0
154/ 45 (C)	47.45	74.72	181.75	0.00>>	0	0

154/ 12 (C)	53.18	88.28	206.59	-0.00<<	0	0
154/ 16 (C)	56.01	88.24	218.33	0	0.00>>	0
154/ 41 (C)	42.74	74.79	162.17	0	0.00<<	0
154/ 44 (C)	48.64	74.71	185.5	0	0	-0.00>>
154/ 13 (C)	51.99	88.29	202.84	0	0	-0.00<<
203/ 16 (C)	54.31>>	81.13	170.87	0	0	0
203/ 41 (C)	41.08<<	68.87	126.07	0	0	0
203/ 13 (C)	51.13	81.15>>	158.42	0	0	0
203/ 44 (C)	45.78	68.83<<	144.91	0	0	0
203/ 16 (C)	54.31	81.13	170.87>>	0	0	0
203/ 41 (C)	41.08	68.87	126.07<<	0	0	0
203/ 16 (C)	54.31	81.13	170.87	-0.00>>	0	0
203/ 41 (C)	41.08	68.87	126.07	-0.00<<	0	0
203/ 16 (C)	54.31	81.13	170.87	0	0.00>>	0
203/ 41 (C)	41.08	68.87	126.07	0	0.00<<	0
203/ 16 (C)	54.31	81.13	170.87	0	0	0.00>>
203/ 41 (C)	41.08	68.87	126.07	0	0	0.00<<
218/ 41 (C)	1.42>>	2.65	217.47	0	0	0
218/ 36 (C)	-1.79<<	8.38	253.39	0	0	0
218/ 16 (C)	-1.54	9.57>>	273.64	0	0	0
218/ 41 (C)	1.42	2.65<<	217.47	0	0	0
218/ 12 (C)	0.04	8.38	279.92>>	0	0	0
218/ 39 (C)	-0.79	4.55	203.29<<	0	0	0
218/ 38 (C)	-0.9	4.69	206.5	-0.00>>	0	0
218/ 13 (C)	0.15	8.24	276.71	-0.00<<	0	0
218/ 39 (C)	-0.79	4.55	203.29	0	-0.00>>	0
218/ 12 (C)	0.04	8.38	279.92	0	-0.00<<	0
218/ 41 (C)	1.42	2.65	217.47	0	0	-0.00>>
218/ 10 (C)	-1.29	9.52	271.41	0	0	-0.00<<
363/ 41 (C)	-16.88>>	34.89	310.71	0	0	0
363/ 16 (C)	-37.57<<	40.62	383.3	0	0	0
363/ 34 (C)	-34.65	40.94>>	373.64	0	0	0
363/ 41 (C)	-16.88	34.89<<	310.71	0	0	0
363/ 16 (C)	-37.57	40.62	383.30>>	0	0	0
363/ 41 (C)	-16.88	34.89	310.71<<	0	0	0
363/ 16 (C)	-37.57	40.62	383.3	0.00>>	0	0
363/ 41 (C)	-16.88	34.89	310.71	0.00<<	0	0
363/ 16 (C)	-37.57	40.62	383.3	0	0.00>>	0
363/ 41 (C)	-16.88	34.89	310.71	0	0.00<<	0
363/ 17 (C)	-36.9	39.82	380.99	0	0	-0.00>>
363/ 40 (C)	-17.55	35.69	313.02	0	0	-0.00<<
364/ 16 (C)	122.15>>	121.15	407.88	0	0	0
364/ 41 (C)	99.20<<	63.86	279.71	0	0	0
364/ 16 (C)	122.15	121.15>>	407.88	0	0	0
364/ 41 (C)	99.2	63.86<<	279.71	0	0	0

364/ 16 (C)	122.15	121.15	407.88>>	0	0	0
364/ 41 (C)	99.2	63.86	279.71<<	0	0	0
364/ 16 (C)	122.15	121.15	407.88	0.00>>	0	0
364/ 39 (C)	104.18	65.62	296.08	0.00<<	0	0
364/ 41 (C)	99.2	63.86	279.71	0	-0.00>>	0
364/ 16 (C)	122.15	121.15	407.88	0	-0.00<<	0
364/ 10 (C)	120.82	120.13	401.45	0	0	-0.00>>
364/ 45 (C)	106.4	67.32	306.81	0	0	-0.00<<

A2 saugos ribinio būvio atraminės reakcijos:

Taškas/ kombinacija	FX (kN)	FY (kN)	FZ (kN)	MX (kNm)	MY (kNm)	MZ (kNm)
1/ 58 (C)	-24.67>>	-0.16	104.31	0.23	-18.64	0
1/ 28 (C)	-30.90<<	-0.4	125.72	0.59	-23.87	0
1/ 57 (C)	-24.97	0.27>>	105.36	-0.4	-18.92	0
1/ 52 (C)	-29.17	-0.56<<	120.17	0.83	-22.43	0
1/ 21 (C)	-30.87	-0.2	130.46>>	0.29	-23.84	0
1/ 59 (C)	-24.67	-0.16	102.14<<	0.23	-18.65	0
1/ 52 (C)	-29.17	-0.56	120.17	0.83>>	-22.43	0
1/ 57 (C)	-24.97	0.27	105.36	-0.40<<	-18.92	0
1/ 58 (C)	-24.67	-0.16	104.31	0.23	-18.64>>	0
1/ 28 (C)	-30.9	-0.4	125.72	0.59	-23.87<<	0
1/ 50 (C)	-28.84	-0.17	119.46	0.24	-22.13	0.00>>
1/ 61 (C)	-25.01	-0.56	102.84	0.81	-18.95	-0.00<<
2/ 59 (C)	-10.75>>	0	187.34	0.03	-1.86	0.01
2/ 21 (C)	-18.34<<	0	314.14	0.04	-3.19	0.01
2/ 48 (C)	-15.69	0.03>>	270.68	-0.3	-2.73	-0.07
2/ 61 (C)	-11.25	-0.03<<	196.5	0.31	-1.96	0.07
2/ 21 (C)	-18.34	0	314.14>>	0.04	-3.19	0.01
2/ 59 (C)	-10.75	0	187.34<<	0.03	-1.86	0.01
2/ 61 (C)	-11.25	-0.03	196.5	0.31>>	-1.96	0.07
2/ 48 (C)	-15.69	0.03	270.68	-0.30<<	-2.73	-0.07
2/ 59 (C)	-10.75	0	187.34	0.03	-1.86>>	0.01
2/ 21 (C)	-18.34	0	314.14	0.04	-3.19<<	0.01
2/ 61 (C)	-11.25	-0.03	196.5	0.31	-1.96	0.07>>
2/ 48 (C)	-15.69	0.03	270.68	-0.3	-2.73	-0.07<<
3/ 27 (C)	1.32>>	29	53.22	-18.89	0.49	3.01
3/ 57 (C)	0.86<<	23.49	35.7	-15.07	0.32	2.38
3/ 24 (C)	1.2	29.09>>	48	-18.96	0.44	3.03

3/ 60 (C)	1.05	23.35<<	43.64	-14.96	0.39	2.36
3/ 27 (C)	1.32	29	53.22>>	-18.89	0.49	3.01
3/ 57 (C)	0.86	23.49	35.70<<	-15.07	0.32	2.38
3/ 60 (C)	1.05	23.35	43.64	-14.96>>	0.39	2.36
3/ 24 (C)	1.2	29.09	48	-18.96<<	0.44	3.03
3/ 27 (C)	1.32	29	53.22	-18.89	0.49>>	3.01
3/ 57 (C)	0.86	23.49	35.7	-15.07	0.32<<	2.38
3/ 24 (C)	1.2	29.09	48	-18.96	0.44	3.03>>
3/ 60 (C)	1.05	23.35	43.64	-14.96	0.39	2.36<<
4/ 25 (C)	11.24>>	44.75	145.13	-27.79	3.46	-0.79
4/ 55 (C)	8.75<<	36.02	110.67	-22.02	2.7	-0.6
4/ 24 (C)	10.87	44.87>>	135.17	-27.87	3.38	-0.8
4/ 60 (C)	9.24	35.93<<	120.53	-21.95	2.83	-0.59
4/ 27 (C)	11.14	44.71	147.46>>	-27.76	3.41	-0.79
4/ 57 (C)	8.9	36.17	102.21<<	-22.12	2.81	-0.61
4/ 60 (C)	9.24	35.93	120.53	-21.95>>	2.83	-0.59
4/ 24 (C)	10.87	44.87	135.17	-27.87<<	3.38	-0.8
4/ 25 (C)	11.24	44.75	145.13	-27.79	3.46>>	-0.79
4/ 55 (C)	8.75	36.02	110.67	-22.02	2.70<<	-0.6
4/ 60 (C)	9.24	35.93	120.53	-21.95	2.83	-0.59>>
4/ 24 (C)	10.87	44.87	135.17	-27.87	3.38	-0.80<<
5/ 58 (C)	-24.64>>	0.14	104.32	-0.2	-18.63	0
5/ 24 (C)	-30.85<<	0.41	125.47	-0.6	-23.84	0
5/ 48 (C)	-29.12	0.58>>	119.8	-0.85	-22.39	0
5/ 61 (C)	-24.95	-0.26<<	105.48	0.38	-18.91	0
5/ 21 (C)	-30.83	0.13	130.55>>	-0.19	-23.82	0
5/ 59 (C)	-24.64	0.13	102.19<<	-0.19	-18.63	0
5/ 61 (C)	-24.95	-0.26	105.48	0.38>>	-18.91	0
5/ 48 (C)	-29.12	0.58	119.8	-0.85<<	-22.39	0
5/ 58 (C)	-24.64	0.14	104.32	-0.2	-18.63>>	0
5/ 24 (C)	-30.85	0.41	125.47	-0.6	-23.84<<	0
5/ 57 (C)	-24.96	0.57	102.54	-0.83	-18.92	-0.00>>
5/ 50 (C)	-28.8	0.14	119.45	-0.21	-22.11	-0.00<<
6/ 59 (C)	-11.55>>	0.01	196.93	0	-2	0
6/ 21 (C)	-19.52<<	0.01	327.82	0.01	-3.39	0
6/ 61 (C)	-12.05	0.10>>	205.87	0.35	-2.09	0.09

6/ 48 (C)	-16.75	-0.12<<	283.18	-0.43	-2.91	-0.11
6/ 21 (C)	-19.52	0.01	327.82>>	0.01	-3.39	0
6/ 59 (C)	-11.55	0.01	196.93<<	0	-2	0
6/ 61 (C)	-12.05	0.1	205.87	0.35>>	-2.09	0.09
6/ 48 (C)	-16.75	-0.12	283.18	-0.43<<	-2.91	-0.11
6/ 59 (C)	-11.55	0.01	196.93	0	-2.00>>	0
6/ 21 (C)	-19.52	0.01	327.82	0.01	-3.39<<	0
6/ 61 (C)	-12.05	0.1	205.87	0.35	-2.09	0.09>>
6/ 48 (C)	-16.75	-0.12	283.18	-0.43	-2.91	-0.11<<
7/ 61 (C)	8.28>>	-35.68	254.36	0	0	0
7/ 23 (C)	-10.52<<	-47.47	318.56	0	0	0
7/ 54 (C)	7.43	-34.13>>	249.32	0	0	0
7/ 28 (C)	-6.27	-48.31<<	314.33	0	0	0
7/ 23 (C)	-10.52	-47.47	318.56>>	0	0	0
7/ 55 (C)	7.95	-34.39	246.71<<	0	0	0
7/ 25 (C)	-7.34	-47.61	318.12	-0.00>>	0	0
7/ 55 (C)	7.95	-34.39	246.71	-0.00<<	0	0
7/ 23 (C)	-10.52	-47.47	318.56	0	0.00>>	0
7/ 61 (C)	8.28	-35.68	254.36	0	0.00<<	0
7/ 55 (C)	7.95	-34.39	246.71	0	0	-0.00>>
7/ 23 (C)	-10.52	-47.47	318.56	0	0	-0.00<<
8/ 23 (C)	66.47>>	-218.4	382.26	0	0	0
8/ 61 (C)	52.77<<	-144.6	260.94	0	0	0
8/ 55 (C)	52.85	-140.02>>	254.25	0	0	0
8/ 23 (C)	66.47	-218.40<<	382.26	0	0	0
8/ 23 (C)	66.47	-218.4	382.26>>	0	0	0
8/ 55 (C)	52.85	-140.02	254.25<<	0	0	0
8/ 55 (C)	52.85	-140.02	254.25	-0.00>>	0	0
8/ 23 (C)	66.47	-218.4	382.26	-0.00<<	0	0
8/ 55 (C)	52.85	-140.02	254.25	0	-0.00>>	0
8/ 23 (C)	66.47	-218.4	382.26	0	-0.00<<	0
8/ 55 (C)	52.85	-140.02	254.25	0	0	-0.00>>
8/ 23 (C)	66.47	-218.4	382.26	0	0	-0.00<<
9/ 49 (C)	43.81>>	34.85	237.08	0	0	0
9/ 54 (C)	35.64<<	30.19	214.37	0	0	0
9/ 21 (C)	40.33	36.92>>	263.86	0	0	0
9/ 57 (C)	41.2	30.13<<	203.52	0	0	0
9/ 27 (C)	40.39	36.91	270.09>>	0	0	0
9/ 57 (C)	41.2	30.13	203.52<<	0	0	0
9/ 21 (C)	40.33	36.92	263.86	0.00>>	0	0
9/ 61 (C)	35.99	30.16	219.73	0.00<<	0	0
9/ 25 (C)	42.52	36.9	269.28	0	0.00>>	0

9/ 55 (C)	35.88	30.18	209.35	0	0.00<<	0
9/ 21 (C)	40.33	36.92	263.86	0	0	-0.00>>
9/ 59 (C)	39.53	30.15	218.38	0	0	-0.00<<
10/ 49 (C)	33.20>>	66.54	211.1	0	0	0
10/ 60 (C)	24.58<<	56.8	203.94	0	0	0
10/ 24 (C)	32.59	70.65>>	230.08	0	0	0
10/ 60 (C)	24.58	56.80<<	203.94	0	0	0
10/ 27 (C)	28.4	70.59	247.64>>	0	0	0
10/ 57 (C)	31.31	56.9	178.12<<	0	0	0
10/ 78 (C)	25.78	56.83	196.5	-0.00>>	0	0
10/ 24 (C)	32.59	70.65	230.08	-0.00<<	0	0
10/ 49 (C)	33.2	66.54	211.1	0	0.00>>	0
10/ 60 (C)	24.58	56.8	203.94	0	0.00<<	0
10/ 60 (C)	24.58	56.8	203.94	0	0	-0.00>>
10/ 24 (C)	32.59	70.65	230.08	0	0	-0.00<<
11/ 28 (C)	40.92>>	-63.76	331.37	0	0	0
11/ 56 (C)	36.08<<	-43.29	278.39	0	0	0
11/ 56 (C)	36.08	-43.29>>	278.39	0	0	0
11/ 28 (C)	40.92	-63.76<<	331.37	0	0	0
11/ 27 (C)	40.9	-63.47	334.44>>	0	0	0
11/ 55 (C)	37.33	-46.33	271.03<<	0	0	0
11/ 57 (C)	36.11	-43.59	275.32	-0.00>>	0	0
11/ 27 (C)	40.9	-63.47	334.44	-0.00<<	0	0
11/ 27 (C)	40.9	-63.47	334.44	0	0.00>>	0
11/ 55 (C)	37.33	-46.33	271.03	0	0.00<<	0
11/ 28 (C)	40.92	-63.76	331.37	0	0	0.00>>
11/ 56 (C)	36.08	-43.29	278.39	0	0	0.00<<
12/ 52 (C)	0.02>>	-4.63	176.74	0	0	0
12/ 59 (C)	-0.01<<	-5.4	155.77	0	0	0
12/ 61 (C)	0.02	-2.99>>	139.9	0	0	0
12/ 48 (C)	0	-13.52<<	230.59	0	0	0
12/ 48 (C)	0	-13.52	230.59>>	0	0	0
12/ 61 (C)	0.02	-2.99	139.90<<	0	0	0
12/ 48 (C)	0	-13.52	230.59	0.00>>	0	0
12/ 61 (C)	0.02	-2.99	139.9	0.00<<	0	0
12/ 57 (C)	0	-11.89	193.76	0	-0.00>>	0
12/ 19 (C)	0.01	-9.01	206.94	0	-0.00<<	0
12/ 57 (C)	0	-11.89	193.76	0	0	0.00>>
12/ 50 (C)	0	-7.04	192.6	0	0	-0.00<<
13/ 60 (C)	0.02>>	-3.21	124.45	0	0	0
13/ 51 (C)	-0.01<<	-7.31	156.27	0	0	0
13/ 61 (C)	0.02	-2.68>>	111.55	0	0	0
13/ 48 (C)	-0.01	-14.38<<	207.76	0	0	0
13/ 48 (C)	-0.01	-14.38	207.76>>	0	0	0
13/ 61 (C)	0.02	-2.68	111.55<<	0	0	0

13/ 48 (C)	-0.01	-14.38	207.76	0.00>>	0	0
13/ 61 (C)	0.02	-2.68	111.55	0.00<<	0	0
13/ 59 (C)	-0.01	-5.93	132.16	0	-0.00>>	0
13/ 21 (C)	0	-8.43	177.91	0	-0.00<<	0
13/ 77 (C)	0	-7.86	155.52	0	0	-0.00>>
13/ 51 (C)	-0.01	-7.31	156.27	0	0	-0.00<<
14/ 27 (C)	59.79>>	45.11	159.25	0	0	0
14/ 57 (C)	44.28<<	34.9	119.2	0	0	0
14/ 27 (C)	59.79	45.11>>	159.25	0	0	0
14/ 57 (C)	44.28	34.90<<	119.2	0	0	0
14/ 27 (C)	59.79	45.11	159.25>>	0	0	0
14/ 57 (C)	44.28	34.9	119.20<<	0	0	0
14/ 27 (C)	59.79	45.11	159.25	0.00>>	0	0
14/ 57 (C)	44.28	34.9	119.2	0.00<<	0	0
14/ 57 (C)	44.28	34.9	119.2	0	-0.00>>	0
14/ 27 (C)	59.79	45.11	159.25	0	-0.00<<	0
14/ 57 (C)	44.28	34.9	119.2	0	0	-0.00>>
14/ 27 (C)	59.79	45.11	159.25	0	0	-0.00<<
15/ 52 (C)	0.02>>	-3.12	134.79	0	0	0
15/ 57 (C)	-0.00<<	-12.21	163.89	0	0	0
15/ 61 (C)	0.01	-1.43>>	98.69	0	0	0
15/ 48 (C)	0	-13.90<<	199.98	0	0	0
15/ 48 (C)	0	-13.9	199.98>>	0	0	0
15/ 61 (C)	0.01	-1.43	98.69<<	0	0	0
15/ 48 (C)	0	-13.9	199.98	0.00>>	0	0
15/ 61 (C)	0.01	-1.43	98.69	0.00<<	0	0
15/ 59 (C)	0	-5.44	124.36	0	-0.00>>	0
15/ 52 (C)	0.02	-3.12	134.79	0	-0.00<<	0
15/ 51 (C)	0	-6.65	146.89	0	0	0.00>>
15/ 77 (C)	0	-7.12	147.11	0	0	0.00<<
16/ 61 (C)	-2.85>>	1.94	99.05	0	0	0
16/ 50 (C)	-7.58<<	-7.62	173.01	0	0	0
16/ 61 (C)	-2.85	1.94>>	99.05	0	0	0
16/ 48 (C)	-6.22	-12.62<<	199.12	0	0	0
16/ 48 (C)	-6.22	-12.62	199.12>>	0	0	0
16/ 61 (C)	-2.85	1.94	99.05<<	0	0	0
16/ 54 (C)	-3.36	-5.74	139.97	-0.00>>	0	0
16/ 51 (C)	-7.43	-7.29	166.54	-0.00<<	0	0
16/ 46 (C)	-3.82	-6.47	152.49	0	0.00>>	0
16/ 59 (C)	-6.96	-6.55	154.02	0	0.00<<	0
16/ 61 (C)	-2.85	1.94	99.05	0	0	0.00>>
16/ 50 (C)	-7.58	-7.62	173.01	0	0	-0.00<<
17/ 23 (C)	55.07>>	-45.4	155.82	0	0	0
17/ 61 (C)	40.60<<	-35.24	116.85	0	0	0
17/ 61 (C)	40.6	-35.24>>	116.85	0	0	0

17/ 23 (C)	55.07	-45.40<<	155.82	0	0	0
17/ 23 (C)	55.07	-45.4	155.82>>	0	0	0
17/ 61 (C)	40.6	-35.24	116.85<<	0	0	0
17/ 23 (C)	55.07	-45.4	155.82	0.00>>	0	0
17/ 61 (C)	40.6	-35.24	116.85	0.00<<	0	0
17/ 61 (C)	40.6	-35.24	116.85	0	-0.00>>	0
17/ 23 (C)	55.07	-45.4	155.82	0	-0.00<<	0
17/ 61 (C)	40.6	-35.24	116.85	0	0	-0.00>>
17/ 23 (C)	55.07	-45.4	155.82	0	0	-0.00<<
19/ 47 (C)	2.83>>	0	13.33	0	0	0
19/ 56 (C)	-2.89<<	0	13.47	0	0	0
19/ 19 (C)	0	0.0>>	13.57	0	0	0
19/ 19 (C)	0	0.0<<	13.57	0	0	0
19/ 52 (C)	-1.95	0	13.74>>	0	0	0
19/ 55 (C)	2.83	0	13.33<<	0	0	0
19/ 55 (C)	2.83	0	13.33	0.00>>	0	0
19/ 52 (C)	-1.95	0	13.74	-0.00<<	0	0
19/ 19 (C)	0	0	13.57	0	0.0>>	0
19/ 19 (C)	0	0	13.57	0	0.0<<	0
19/ 53 (C)	-1.95	0	13.74	0	0	0.00>>
19/ 54 (C)	2.83	0	13.34	0	0	-0.00<<
20/ 54 (C)	2.52>>	0	9.83	0	0	0
20/ 53 (C)	-1.93<<	0	5.93	0	0	0
20/ 19 (C)	0.01	0.0>>	7.56	0	0	0
20/ 19 (C)	0.01	0.0<<	7.56	0	0	0
20/ 55 (C)	2.52	0	9.90>>	0	0	0
20/ 52 (C)	-1.93	0	5.87<<	0	0	0
20/ 55 (C)	2.52	0	9.9	0.00>>	0	0
20/ 52 (C)	-1.93	0	5.87	-0.00<<	0	0
20/ 19 (C)	0.01	0	7.56	0	0.0>>	0
20/ 19 (C)	0.01	0	7.56	0	0.0<<	0
20/ 46 (C)	2.52	0	9.83	0	0	0.00>>
20/ 61 (C)	-1.93	0	5.93	0	0	-0.00<<
21/ 19 (C)	0.0>>	0	25.35	0	0	0
21/ 19 (C)	0.0<<	0	25.35	0	0	0
21/ 19 (C)	0	0.0>>	25.35	0	0	0
21/ 19 (C)	0	0.0<<	25.35	0	0	0
21/ 19 (C)	0	0	25.35>>	0	0	0
21/ 29 (C)	0	0	13.94<<	0	0	0
21/ 19 (C)	0	0	25.35	0.00>>	0	0
21/ 29 (C)	0	0	13.94	0.0<<	0	0
21/ 19 (C)	0	0	25.35	0	0.0>>	0
21/ 19 (C)	0	0	25.35	0	0.0<<	0
21/ 19 (C)	0	0	25.35	0	0	0.0>>
21/ 19 (C)	0	0	25.35	0	0	0.0<<

22/ 19 (C)	0.0>>	0	22.83	0	0	0
22/ 19 (C)	0.0<<	0	22.83	0	0	0
22/ 19 (C)	0	0.0>>	22.83	0	0	0
22/ 19 (C)	0	0.0<<	22.83	0	0	0
22/ 19 (C)	0	0	22.83>>	0	0	0
22/ 29 (C)	0	0	12.74<<	0	0	0
22/ 19 (C)	0	0	22.83	-0.00>>	0	0
22/ 29 (C)	0	0	12.74	-0.00<<	0	0
22/ 19 (C)	0	0	22.83	0	0.0>>	0
22/ 19 (C)	0	0	22.83	0	0.0<<	0
22/ 19 (C)	0	0	22.83	0	0	0.0>>
22/ 19 (C)	0	0	22.83	0	0	0.0<<
23/ 59 (C)	0.91>>	-0.01	141.98	0	0	0
23/ 46 (C)	0.50<<	-0.03	196.18	0	0	0
23/ 48 (C)	0.6	0.25>>	187.44	0	0	0
23/ 61 (C)	0.63	-0.21<<	143.47	0	0	0
23/ 21 (C)	0.52	-0.01	211.59>>	0	0	0
23/ 59 (C)	0.91	-0.01	141.98<<	0	0	0
23/ 57 (C)	0.62	0.25	142.38	0.00>>	0	0
23/ 52 (C)	0.6	-0.2	188.53	-0.00<<	0	0
23/ 57 (C)	0.62	0.25	142.38	0	-0.00>>	0
23/ 21 (C)	0.52	-0.01	211.59	0	-0.00<<	0
23/ 59 (C)	0.91	-0.01	141.98	0	0	-0.00>>
23/ 52 (C)	0.6	-0.2	188.53	0	0	-0.00<<
24/ 59 (C)	0.28>>	-0.01	161.79	0	0	0
24/ 21 (C)	-0.39<<	-0.01	234.85	0	0	0
24/ 48 (C)	-0.25	0.12>>	209.02	0	0	0
24/ 61 (C)	-0.05	-0.10<<	161.34	0	0	0
24/ 21 (C)	-0.39	-0.01	234.85>>	0	0	0
24/ 57 (C)	-0.06	0.12	160.10<<	0	0	0
24/ 61 (C)	-0.05	-0.1	161.34	0.00>>	0	0
24/ 48 (C)	-0.25	0.12	209.02	-0.00<<	0	0
24/ 21 (C)	-0.39	-0.01	234.85	0	0.00>>	0
24/ 59 (C)	0.28	-0.01	161.79	0	0.00<<	0
24/ 57 (C)	-0.06	0.12	160.1	0	0	-0.00>>
24/ 52 (C)	-0.23	-0.1	210.26	0	0	-0.00<<
25/ 55 (C)	3.46>>	-0.72	182.93	0	0	0
25/ 52 (C)	-5.35<<	-0.05	216.92	0	0	0
25/ 61 (C)	-5.3	0.88>>	192.29	0	0	0
25/ 48 (C)	-3.6	-9.95<<	227.87	0	0	0
25/ 23 (C)	-2.29	-8.01	233.43>>	0	0	0
25/ 55 (C)	3.46	-0.72	182.93<<	0	0	0
25/ 57 (C)	-3.55	-9.02	203.24	-0.00>>	0	0
25/ 27 (C)	-3.34	-2.07	226.85	-0.00<<	0	0
25/ 51 (C)	-1.95	-2.33	218.81	0	0.00>>	0

25/ 54 (C)	3.45	-0.82	188.28	0	-0.00<<	0
25/ 54 (C)	3.45	-0.82	188.28	0	0	0.00>>
25/ 53 (C)	-5.34	0.04	211.57	0	0	-0.00<<
35/ 27 (C)	31.59>>	48.29	65.8	0	0	0
35/ 57 (C)	20.71<<	39	44.16	0	0	0
35/ 24 (C)	28.37	48.40>>	59.11	0	0	0
35/ 60 (C)	25.6	38.82<<	54.33	0	0	0
35/ 27 (C)	31.59	48.29	65.80>>	0	0	0
35/ 57 (C)	20.71	39	44.16<<	0	0	0
35/ 23 (C)	29.08	48.39	60.57	0.00>>	0	0
35/ 59 (C)	24.15	38.87	51.44	-0.00<<	0	0
35/ 57 (C)	20.71	39	44.16	0	-0.00>>	0
35/ 27 (C)	31.59	48.29	65.8	0	-0.00<<	0
35/ 61 (C)	24.9	38.84	52.87	0	0	-0.00>>
35/ 23 (C)	29.08	48.39	60.57	0	0	-0.00<<
36/ 59 (C)	0.29>>	0	158.68	0	0	0
36/ 21 (C)	-0.19<<	0	226.24	0	0	0
36/ 48 (C)	-0.11	0.07>>	201.79	0	0	0
36/ 61 (C)	0.02	-0.06<<	156.41	0	0	0
36/ 21 (C)	-0.19	0	226.24>>	0	0	0
36/ 57 (C)	-0.01	0.06	155.07<<	0	0	0
36/ 57 (C)	-0.01	0.06	155.07	0.00>>	0	0
36/ 46 (C)	-0.18	-0.01	209.94	-0.00<<	0	0
36/ 55 (C)	-0.08	-0.01	163.22	0	-0.00>>	0
36/ 50 (C)	0.2	0	205.4	0	-0.00<<	0
36/ 46 (C)	-0.18	-0.01	209.94	0	0	0.00>>
36/ 61 (C)	0.02	-0.06	156.41	0	0	-0.00<<
37/ 59 (C)	0.31>>	0	161.72	0	0	0
37/ 46 (C)	0.01<<	0	211.25	0	0	0
37/ 61 (C)	0.15	0.01>>	158.12	0	0	0
37/ 48 (C)	0.05	-0.02<<	203.31	0	0	0
37/ 21 (C)	0.01	0	227.66>>	0	0	0
37/ 57 (C)	0.07	-0.02	156.48<<	0	0	0
37/ 61 (C)	0.15	0.01	158.12	0.00>>	0	0
37/ 48 (C)	0.05	-0.02	203.31	-0.00<<	0	0
37/ 21 (C)	0.01	0	227.66	0	0.00>>	0
37/ 59 (C)	0.31	0	161.72	0	-0.00<<	0
37/ 59 (C)	0.31	0	161.72	0	0	0.00>>
37/ 48 (C)	0.05	-0.02	203.31	0	0	-0.00<<
38/ 59 (C)	0.15>>	0	162.89	0	0	0
38/ 21 (C)	-0.07<<	0	227.38	0	0	0
38/ 61 (C)	0.13	0.00>>	158.78	0	0	0
38/ 48 (C)	-0.02	-0.01<<	203.26	0	0	0
38/ 21 (C)	-0.07	0	227.38>>	0	0	0
38/ 57 (C)	0.02	-0.01	156.60<<	0	0	0

38/ 61 (C)	0.13	0	158.78	-0.00>>	0	0
38/ 48 (C)	-0.02	-0.01	203.26	-0.00<<	0	0
38/ 21 (C)	-0.07	0	227.38	0	0.00>>	0
38/ 59 (C)	0.15	0	162.89	0	-0.00<<	0
38/ 59 (C)	0.15	0	162.89	0	0	0.00>>
38/ 46 (C)	-0.07	0	210.98	0	0	-0.00<<
39/ 61 (C)	0.13>>	0	159.59	0	0	0
39/ 21 (C)	-0.13<<	-0.01	226.85	0	0	0
39/ 61 (C)	0.13	-0.00>>	159.59	0	0	0
39/ 48 (C)	-0.04	-0.01<<	203.08	0	0	0
39/ 21 (C)	-0.13	-0.01	226.85>>	0	0	0
39/ 57 (C)	0	-0.01	156.62<<	0	0	0
39/ 60 (C)	0.12	0	165.33	0.00>>	0	0
39/ 20 (C)	-0.1	-0.01	219.5	-0.00<<	0	0
39/ 21 (C)	-0.13	-0.01	226.85	0	0.00>>	0
39/ 61 (C)	0.13	0	159.59	0	-0.00<<	0
39/ 61 (C)	0.13	0	159.59	0	0	0.00>>
39/ 48 (C)	-0.04	-0.01	203.08	0	0	-0.00<<
40/ 61 (C)	0.06>>	-0.01	160.38	0	0	0
40/ 21 (C)	-0.21<<	-0.01	226.09	0	0	0
40/ 61 (C)	0.06	-0.01>>	160.38	0	0	0
40/ 48 (C)	-0.07	-0.02<<	202.87	0	0	0
40/ 21 (C)	-0.21	-0.01	226.09>>	0	0	0
40/ 57 (C)	0	-0.01	156.68<<	0	0	0
40/ 56 (C)	-0.01	-0.02	162.39	0.00>>	0	0
40/ 53 (C)	0	-0.01	200.86	0.00<<	0	0
40/ 46 (C)	-0.21	-0.01	209.73	0	0.00>>	0
40/ 61 (C)	0.06	-0.01	160.38	0	-0.00<<	0
40/ 61 (C)	0.06	-0.01	160.38	0	0	0.00>>
40/ 46 (C)	-0.21	-0.01	209.73	0	0	-0.00<<
41/ 57 (C)	-0.02>>	-0.02	156.35	0	0	0
41/ 21 (C)	-0.42<<	-0.02	224.19	0	0	0
41/ 61 (C)	-0.14	-0.01>>	160.15	0	0	0
41/ 48 (C)	-0.15	-0.02<<	201.99	0	0	0
41/ 25 (C)	-0.36	-0.02	224.40>>	0	0	0
41/ 57 (C)	-0.02	-0.02	156.35<<	0	0	0
41/ 60 (C)	-0.16	-0.01	165.77	-0.00>>	0	0
41/ 22 (C)	-0.4	-0.02	218.56	-0.00<<	0	0
41/ 21 (C)	-0.42	-0.02	224.19	0	0.00>>	0
41/ 57 (C)	-0.02	-0.02	156.35	0	0.00<<	0
41/ 57 (C)	-0.02	-0.02	156.35	0	0	-0.00>>
41/ 21 (C)	-0.42	-0.02	224.19	0	0	-0.00<<
42/ 57 (C)	-0.13>>	-0.03	157.71	0	0	0
42/ 21 (C)	-0.91<<	-0.04	222.97	0	0	0
42/ 61 (C)	-0.57	-0.03>>	160	0	0	0

42/ 23 (C)	-0.62	-0.04<<	220.65	0	0	0
42/ 25 (C)	-0.82	-0.04	223.61>>	0	0	0
42/ 57 (C)	-0.13	-0.03	157.71<<	0	0	0
42/ 48 (C)	-0.4	-0.04	202.73	-0.00>>	0	0
42/ 61 (C)	-0.57	-0.03	160	-0.00<<	0	0
42/ 55 (C)	-0.61	-0.03	161.58	0	-0.00>>	0
42/ 48 (C)	-0.4	-0.04	202.73	0	-0.00<<	0
42/ 48 (C)	-0.4	-0.04	202.73	0	0	0.00>>
42/ 55 (C)	-0.61	-0.03	161.58	0	0	0.00<<
43/ 57 (C)	-0.94>>	-0.02	151.11	0	0	0
43/ 27 (C)	-2.62<<	-0.02	208.51	0	0	0
43/ 61 (C)	-1.81	-0.01>>	150.39	0	0	0
43/ 23 (C)	-2.1	-0.02<<	208.95	0	0	0
43/ 25 (C)	-2.45	-0.02	210.57>>	0	0	0
43/ 61 (C)	-1.81	-0.01	150.39<<	0	0	0
43/ 23 (C)	-2.1	-0.02	208.95	0.00>>	0	0
43/ 61 (C)	-1.81	-0.01	150.39	0.00<<	0	0
43/ 25 (C)	-2.45	-0.02	210.57	0	0.00>>	0
43/ 57 (C)	-0.94	-0.02	151.11	0	0.00<<	0
43/ 57 (C)	-0.94	-0.02	151.11	0	0	0.00>>
43/ 27 (C)	-2.62	-0.02	208.51	0	0	-0.00<<
44/ 57 (C)	-3.56>>	-0.1	170.04	0	0	0
44/ 27 (C)	-6.85<<	-0.11	219.77	0	0	0
44/ 61 (C)	-4.65	-0.09>>	159.65	0	0	0
44/ 23 (C)	-6.2	-0.12<<	226	0	0	0
44/ 23 (C)	-6.2	-0.12	226.00>>	0	0	0
44/ 61 (C)	-4.65	-0.09	159.65<<	0	0	0
44/ 56 (C)	-3.74	-0.1	175.22	0.00>>	0	0
44/ 22 (C)	-6.62	-0.11	216.17	-0.00<<	0	0
44/ 61 (C)	-4.65	-0.09	159.65	0	-0.00>>	0
44/ 23 (C)	-6.2	-0.12	226	0	-0.00<<	0
44/ 23 (C)	-6.2	-0.12	226	0	0	0.00>>
44/ 61 (C)	-4.65	-0.09	159.65	0	0	0.00<<
45/ 25 (C)	11.09>>	2.2	275.18	0	0	0
45/ 55 (C)	7.14<<	0.72	211.26	0	0	0
45/ 48 (C)	9.92	2.73>>	263	0	0	0
45/ 61 (C)	7.4	0.34<<	209.84	0	0	0
45/ 23 (C)	11	2.66	277.66>>	0	0	0
45/ 61 (C)	7.4	0.34	209.84<<	0	0	0
45/ 23 (C)	11	2.66	277.66	0.00>>	0	0
45/ 61 (C)	7.4	0.34	209.84	0.00<<	0	0
45/ 61 (C)	7.4	0.34	209.84	0	-0.00>>	0
45/ 23 (C)	11	2.66	277.66	0	-0.00<<	0
45/ 48 (C)	9.92	2.73	263	0	0	-0.00>>
45/ 61 (C)	7.4	0.34	209.84	0	0	-0.00<<

46/ 79 (C)	-0.15>>	-5.81	148.81	0	0	0
46/ 22 (C)	-0.17<<	-8.09	174.99	0	0	0
46/ 56 (C)	-0.15	-5.73>>	146.76	0	0	0
46/ 28 (C)	-0.16	-8.22<<	176.1	0	0	0
46/ 27 (C)	-0.16	-8.06	178.45>>	0	0	0
46/ 57 (C)	-0.15	-5.89	144.41<<	0	0	0
46/ 57 (C)	-0.15	-5.89	144.41	-0.00>>	0	0
46/ 27 (C)	-0.16	-8.06	178.45	-0.00<<	0	0
46/ 28 (C)	-0.16	-8.22	176.1	0	-0.00>>	0
46/ 80 (C)	-0.15	-6.08	150.28	0	-0.00<<	0
46/ 57 (C)	-0.15	-5.89	144.41	0	0	-0.00>>
46/ 25 (C)	-0.16	-7.87	177.47	0	0	-0.00<<
47/ 57 (C)	-5.97>>	-4.82	129.51	0	0	0
47/ 25 (C)	-8.81<<	-6.02	161.63	0	0	0
47/ 57 (C)	-5.97	-4.82>>	129.51	0	0	0
47/ 27 (C)	-8.73	-6.09<<	157.56	0	0	0
47/ 23 (C)	-8.71	-5.98	164.71>>	0	0	0
47/ 61 (C)	-6.02	-5.01	117.59<<	0	0	0
47/ 61 (C)	-6.02	-5.01	117.59	-0.00>>	0	0
47/ 23 (C)	-8.71	-5.98	164.71	-0.00<<	0	0
47/ 23 (C)	-8.71	-5.98	164.71	0	0.00>>	0
47/ 61 (C)	-6.02	-5.01	117.59	0	0.00<<	0
47/ 61 (C)	-6.02	-5.01	117.59	0	0	-0.00>>
47/ 48 (C)	-7.93	-5.63	156.95	0	0	-0.00<<
48/ 21 (C)	22.97>>	-0.02	264.75	0	0	0
48/ 57 (C)	14.71<<	1.1	170.77	0	0	0
48/ 48 (C)	19.97	1.11>>	231.31	0	0	0
48/ 61 (C)	14.86	-0.90<<	172.19	0	0	0
48/ 21 (C)	22.97	-0.02	264.75>>	0	0	0
48/ 59 (C)	14.84	0	165.94<<	0	0	0
48/ 48 (C)	19.97	1.11	231.31	0.00>>	0	0
48/ 59 (C)	14.84	0	165.94	0.00<<	0	0
48/ 21 (C)	22.97	-0.02	264.75	0	0.00>>	0
48/ 59 (C)	14.84	0	165.94	0	0.00<<	0
48/ 19 (C)	22.72	0.09	260.63	0	0	0.00>>
48/ 61 (C)	14.86	-0.9	172.19	0	0	0.00<<
49/ 25 (C)	2.03>>	-0.03	90.85	0	0	0
49/ 55 (C)	1.48<<	0.05	67.69	0	0	0
49/ 61 (C)	1.53	0.42>>	64.56	0	0	0
49/ 48 (C)	1.79	-0.53<<	82.97	0	0	0
49/ 21 (C)	1.88	0	93.04>>	0	0	0
49/ 59 (C)	1.74	0	64.04<<	0	0	0
49/ 48 (C)	1.79	-0.53	82.97	0.00>>	0	0
49/ 61 (C)	1.53	0.42	64.56	-0.00<<	0	0
49/ 59 (C)	1.74	0	64.04	0	-0.00>>	0

49/ 21 (C)	1.88	0	93.04	0	-0.00<<	0
49/ 61 (C)	1.53	0.42	64.56	0	0	0.00>>
49/ 48 (C)	1.79	-0.53	82.97	0	0	-0.00<<
50/ 21 (C)	18.96>>	-0.1	245.19	0	0	0
50/ 57 (C)	12.09<<	0.66	157.49	0	0	0
50/ 48 (C)	16.45	0.67>>	213.73	0	0	0
50/ 61 (C)	12.12	-0.69<<	158.8	0	0	0
50/ 21 (C)	18.96	-0.1	245.19>>	0	0	0
50/ 59 (C)	12.16	-0.07	152.48<<	0	0	0
50/ 48 (C)	16.45	0.67	213.73	0.00>>	0	0
50/ 29 (C)	12.81	-0.03	163.97	0.00<<	0	0
50/ 21 (C)	18.96	-0.1	245.19	0	0.00>>	0
50/ 59 (C)	12.16	-0.07	152.48	0	0.00<<	0
50/ 59 (C)	12.16	-0.07	152.48	0	0	-0.00>>
50/ 52 (C)	16.47	-0.68	215.04	0	0	-0.00<<
51/ 59 (C)	-0.66>>	0.04	62.75	0	0	0
51/ 21 (C)	-1.74<<	0.06	90.81	0	0	0
51/ 61 (C)	-0.87	0.42>>	63.15	0	0	0
51/ 48 (C)	-1.38	-0.41<<	81.13	0	0	0
51/ 21 (C)	-1.74	0.06	90.81>>	0	0	0
51/ 59 (C)	-0.66	0.04	62.75<<	0	0	0
51/ 61 (C)	-0.87	0.42	63.15	0.00>>	0	0
51/ 48 (C)	-1.38	-0.41	81.13	-0.00<<	0	0
51/ 59 (C)	-0.66	0.04	62.75	0	-0.00>>	0
51/ 21 (C)	-1.74	0.06	90.81	0	-0.00<<	0
51/ 27 (C)	-1.65	0.26	88.79	0	0	0.00>>
51/ 57 (C)	-0.83	-0.41	63.05	0	0	0.00<<
52/ 60 (C)	-13.23>>	47.2	151.71	0	0	0
52/ 49 (C)	-19.46<<	55.09	192.37	0	0	0
52/ 23 (C)	-18.51	58.45>>	200.43	0	0	0
52/ 61 (C)	-13.39	47.20<<	148.53	0	0	0
52/ 23 (C)	-18.51	58.45	200.43>>	0	0	0
52/ 61 (C)	-13.39	47.2	148.53<<	0	0	0
52/ 24 (C)	-18.67	58.45	197.25	0.00>>	0	0
52/ 60 (C)	-13.23	47.2	151.71	0.00<<	0	0
52/ 61 (C)	-13.39	47.2	148.53	0	-0.00>>	0
52/ 48 (C)	-19.3	55.09	195.55	0	-0.00<<	0
52/ 61 (C)	-13.39	47.2	148.53	0	0	-0.00>>
52/ 48 (C)	-19.3	55.09	195.55	0	0	-0.00<<
53/ 60 (C)	-8.37>>	51.96	151.57	0	0	0
53/ 49 (C)	-14.26<<	60.96	188.03	0	0	0
53/ 28 (C)	-10.37	64.83>>	183.62	0	0	0

53/ 56 (C)	-13.56	51.95<<	169.68	0	0	0
53/ 23 (C)	-13.4	64.82	197.88>>	0	0	0
53/ 61 (C)	-8.46	51.96	148.17<<	0	0	0
53/ 23 (C)	-13.4	64.82	197.88	0.00>>	0	0
53/ 61 (C)	-8.46	51.96	148.17	0.00<<	0	0
53/ 60 (C)	-8.37	51.96	151.57	0	-0.00>>	0
53/ 49 (C)	-14.26	60.96	188.03	0	-0.00<<	0
53/ 60 (C)	-8.37	51.96	151.57	0	0	-0.00>>
53/ 49 (C)	-14.26	60.96	188.03	0	0	-0.00<<
54/ 61 (C)	-16.59>>	52.39	138.09	0	0	0
54/ 23 (C)	-23.89<<	65.39	181.96	0	0	0
54/ 27 (C)	-21.1	65.39>>	174.23	0	0	0
54/ 57 (C)	-21.24	52.38<<	150.98	0	0	0
54/ 23 (C)	-23.89	65.39	181.96>>	0	0	0
54/ 61 (C)	-16.59	52.39	138.09<<	0	0	0
54/ 57 (C)	-21.24	52.38	150.98	-0.00>>	0	0
54/ 27 (C)	-21.1	65.39	174.23	-0.00<<	0	0
54/ 27 (C)	-21.1	65.39	174.23	0	0.00>>	0
54/ 57 (C)	-21.24	52.38	150.98	0	0.00<<	0
54/ 27 (C)	-21.1	65.39	174.23	0	0	0.00>>
54/ 57 (C)	-21.24	52.38	150.98	0	0	0.00<<
55/ 61 (C)	-23.94>>	51.89	118.76	0	0	0
55/ 23 (C)	-32.78<<	64.74	154.69	0	0	0
55/ 27 (C)	-30.58	64.74>>	149.4	0	0	0
55/ 57 (C)	-27.6	51.89<<	127.59	0	0	0
55/ 23 (C)	-32.78	64.74	154.69>>	0	0	0
55/ 61 (C)	-23.94	51.89	118.76<<	0	0	0
55/ 28 (C)	-30.04	64.74	146.57	0.00>>	0	0
55/ 56 (C)	-28.14	51.89	130.42	0.00<<	0	0
55/ 61 (C)	-23.94	51.89	118.76	0	-0.00>>	0
55/ 23 (C)	-32.78	64.74	154.69	0	-0.00<<	0
55/ 61 (C)	-23.94	51.89	118.76	0	0	-0.00>>
55/ 23 (C)	-32.78	64.74	154.69	0	0	-0.00<<
56/ 61 (C)	-26.53>>	47.31	79.06	0	0	0
56/ 23 (C)	-35.32<<	58.58	101.75	0	0	0
56/ 27 (C)	-33.77	58.58>>	98.75	0	0	0
56/ 57 (C)	-29.11	47.31<<	84.05	0	0	0
56/ 23 (C)	-35.32	58.58	101.75>>	0	0	0
56/ 61 (C)	-26.53	47.31	79.06<<	0	0	0
56/ 61 (C)	-26.53	47.31	79.06	-0.00>>	0	0

56/ 23 (C)	-35.32	58.58	101.75	-0.00<<	0	0
56/ 61 (C)	-26.53	47.31	79.06	0	-0.00>>	0
56/ 23 (C)	-35.32	58.58	101.75	0	-0.00<<	0
56/ 61 (C)	-26.53	47.31	79.06	0	0	0.00>>
56/ 23 (C)	-35.32	58.58	101.75	0	0	-0.00<<
58/ 48 (C)	-4.25>>	-56.34	179.13	0	0	0
58/ 61 (C)	-10.86<<	-48.33	178.73	0	0	0
58/ 57 (C)	-5.29	-48.29>>	154.54	0	0	0
58/ 27 (C)	-8.48	-59.82<<	208.52	0	0	0
58/ 27 (C)	-8.48	-59.82	208.52>>	0	0	0
58/ 57 (C)	-5.29	-48.29	154.54<<	0	0	0
58/ 28 (C)	-8.95	-59.82	205.48	0.00>>	0	0
58/ 56 (C)	-4.83	-48.29	157.58	0.00<<	0	0
58/ 48 (C)	-4.25	-56.34	179.13	0	-0.00>>	0
58/ 61 (C)	-10.86	-48.33	178.73	0	-0.00<<	0
58/ 48 (C)	-4.25	-56.34	179.13	0	0	0.00>>
58/ 61 (C)	-10.86	-48.33	178.73	0	0	-0.00<<
59/ 48 (C)	0.92>>	-61.94	187.3	0	0	0
59/ 61 (C)	-5.58<<	-52.79	178.71	0	0	0
59/ 60 (C)	-5.19	-52.79>>	182.21	0	0	0
59/ 24 (C)	-0.26	-65.86<<	198.45	0	0	0
59/ 27 (C)	-3.1	-65.85	213.10>>	0	0	0
59/ 57 (C)	-0.21	-52.8	160.11<<	0	0	0
59/ 56 (C)	0.18	-52.8	163.61	-0.00>>	0	0
59/ 28 (C)	-3.48	-65.85	209.61	-0.00<<	0	0
59/ 23 (C)	0.13	-65.86	201.94	0	0.00>>	0
59/ 55 (C)	-3.92	-52.79	175.28	0	0.00<<	0
59/ 23 (C)	0.13	-65.86	201.94	0	0	0.00>>
59/ 55 (C)	-3.92	-52.79	175.28	0	0	0.00<<
60/ 48 (C)	8.93>>	-62.03	197.13	0	0	0
60/ 61 (C)	3.32<<	-52.86	181.55	0	0	0
60/ 61 (C)	3.32	-52.86>>	181.55	0	0	0
60/ 23 (C)	8.82	-65.96<<	211.55	0	0	0
60/ 27 (C)	6.61	-65.96	219.84>>	0	0	0
60/ 57 (C)	7.01	-52.87	167.73<<	0	0	0
60/ 54 (C)	4.91	-52.86	183.51	0.00>>	0	0
60/ 49 (C)	8.53	-62.03	193.23	0.00<<	0	0
60/ 57 (C)	7.01	-52.87	167.73	0	-0.00>>	0
60/ 46 (C)	6.44	-62.03	209.01	0	-0.00<<	0
60/ 21 (C)	7.33	-65.96	218.68	0	0	0.00>>
60/ 57 (C)	7.01	-52.87	167.73	0	0	0.00<<
61/ 48 (C)	2.98>>	-61.69	201.46	0	0	0
61/ 61 (C)	-0.46<<	-52.59	181.83	0	0	0
61/ 61 (C)	-0.46	-52.59>>	181.83	0	0	0

61/ 23 (C)	2.66	-65.60<<	215.56	0	0	0
61/ 27 (C)	1.06	-65.6	222.01>>	0	0	0
61/ 57 (C)	2.21	-52.59	171.06<<	0	0	0
61/ 23 (C)	2.66	-65.6	215.56	0.00>>	0	0
61/ 55 (C)	0.34	-52.59	180.79	0.00<<	0	0
61/ 23 (C)	2.66	-65.6	215.56	0	0.00>>	0
61/ 55 (C)	0.34	-52.59	180.79	0	-0.00<<	0
61/ 23 (C)	2.66	-65.6	215.56	0	0	0.00>>
61/ 55 (C)	0.34	-52.59	180.79	0	0	0.00<<
62/ 50 (C)	3.00>>	-61.54	208.45	0	0	0
62/ 61 (C)	0.53<<	-52.46	183.2	0	0	0
62/ 61 (C)	0.53	-52.46>>	183.2	0	0	0
62/ 23 (C)	2.51	-65.43<<	219.32	0	0	0
62/ 27 (C)	1.57	-65.43	224.72>>	0	0	0
62/ 57 (C)	2.09	-52.46	174.20<<	0	0	0
62/ 78 (C)	1.25	-52.46	187.76	-0.00>>	0	0
62/ 28 (C)	1.45	-65.43	220.5	-0.00<<	0	0
62/ 23 (C)	2.51	-65.43	219.32	0	0.00>>	0
62/ 55 (C)	0.98	-52.46	182.68	0	0.00<<	0
62/ 56 (C)	2.21	-52.46	178.42	0	0	-0.00>>
62/ 28 (C)	1.45	-65.43	220.5	0	0	-0.00<<
63/ 58 (C)	-0.22>>	-52.43	181.68	0	0	0
63/ 53 (C)	-1.93<<	-61.5	208.51	0	0	0
63/ 61 (C)	-1.84	-52.43>>	181.62	0	0	0
63/ 23 (C)	-1.29	-65.39<<	218.46	0	0	0
63/ 27 (C)	-1.82	-65.39	223.26>>	0	0	0
63/ 57 (C)	-0.95	-52.43	173.61<<	0	0	0
63/ 56 (C)	-0.95	-52.43	177.84	0.00>>	0	0
63/ 28 (C)	-1.82	-65.39	219.03	0.00<<	0	0
63/ 25 (C)	-0.85	-65.39	220.76	0	0.00>>	0
63/ 55 (C)	-1.62	-52.43	181.34	0	0.00<<	0
63/ 79 (C)	-1.15	-52.43	181.86	0	0	0.00>>
63/ 26 (C)	-0.86	-65.39	216.53	0	0	0.00<<
64/ 50 (C)	4.30>>	-61.47	210.94	0	0	0
64/ 61 (C)	2.62<<	-52.4	182.35	0	0	0
64/ 55 (C)	2.67	-52.40>>	182.16	0	0	0
64/ 23 (C)	3.44	-65.35<<	219.77	0	0	0
64/ 27 (C)	3.35	-65.35	224.36>>	0	0	0
64/ 57 (C)	2.77	-52.4	174.71<<	0	0	0
64/ 56 (C)	2.83	-52.4	178.98	-0.00>>	0	0
64/ 26 (C)	3.98	-65.35	218.44	-0.00<<	0	0
64/ 49 (C)	3.21	-61.47	201.79	0	-0.00>>	0
64/ 54 (C)	2.74	-52.4	186.43	0	-0.00<<	0
64/ 22 (C)	3.31	-65.35	219.98	0	0	0.00>>
64/ 56 (C)	2.83	-52.4	178.98	0	0	0.00<<

65/ 59 (C)	-1.58>>	-52.43	182.24	0	0	0
65/ 23 (C)	-3.17<<	-65.38	221.77	0	0	0
65/ 55 (C)	-2.47	-52.43>>	183.8	0	0	0
65/ 23 (C)	-3.17	-65.38<<	221.77	0	0	0
65/ 27 (C)	-3.1	-65.38	226.39>>	0	0	0
65/ 57 (C)	-2.51	-52.43	176.32<<	0	0	0
65/ 22 (C)	-3.06	-65.38	221.96	0.00>>	0	0
65/ 58 (C)	-1.67	-52.43	186.53	0.00<<	0	0
65/ 25 (C)	-2.61	-65.38	225.32	0	0.00>>	0
65/ 55 (C)	-2.47	-52.43	183.8	0	0.00<<	0
65/ 22 (C)	-3.06	-65.38	221.96	0	0	0.00>>
65/ 58 (C)	-1.67	-52.43	186.53	0	0	0.00<<
66/ 25 (C)	6.96>>	-65.38	217.65	0	0	0
66/ 57 (C)	4.91<<	-52.43	169.86	0	0	0
66/ 55 (C)	5.67	-52.43>>	177.32	0	0	0
66/ 23 (C)	6.21	-65.38<<	213.65	0	0	0
66/ 27 (C)	6.79	-65.38	218.36>>	0	0	0
66/ 57 (C)	4.91	-52.43	169.86<<	0	0	0
66/ 57 (C)	4.91	-52.43	169.86	-0.00>>	0	0
66/ 21 (C)	6.67	-65.38	218.12	-0.00<<	0	0
66/ 57 (C)	4.91	-52.43	169.86	0	-0.00>>	0
66/ 21 (C)	6.67	-65.38	218.12	0	-0.00<<	0
66/ 54 (C)	5.74	-52.43	181.42	0	0	0.00>>
66/ 24 (C)	6.14	-65.38	209.55	0	0	0.00<<
67/ 61 (C)	-2.93>>	-52.52	184.85	0	0	0
67/ 23 (C)	-5.23<<	-65.5	221.18	0	0	0
67/ 55 (C)	-3.25	-52.52>>	184.13	0	0	0
67/ 23 (C)	-5.23	-65.50<<	221.18	0	0	0
67/ 27 (C)	-4.45	-65.5	226.61>>	0	0	0
67/ 57 (C)	-4.23	-52.52	175.81<<	0	0	0
67/ 77 (C)	-3.75	-52.52	187.82	-0.00>>	0	0
67/ 22 (C)	-4.46	-65.5	221.98	-0.00<<	0	0
67/ 24 (C)	-5.05	-65.5	216.99	0	0.00>>	0
67/ 54 (C)	-3.44	-52.52	188.32	0	-0.00<<	0
67/ 56 (C)	-4.41	-52.52	179.99	0	0	0.00>>
67/ 22 (C)	-4.46	-65.5	221.98	0	0	0.00<<
68/ 61 (C)	0.29>>	-52.13	186.75	0	0	0
68/ 48 (C)	-2.86<<	-61.15	206.83	0	0	0
68/ 57 (C)	-2.13	-52.13>>	175.76	0	0	0
68/ 27 (C)	-1.08	-65.02<<	227.83	0	0	0
68/ 27 (C)	-1.08	-65.02	227.83>>	0	0	0
68/ 57 (C)	-2.13	-52.13	175.76<<	0	0	0
68/ 56 (C)	-2.3	-52.13	179.84	-0.00>>	0	0
68/ 22 (C)	-1.16	-65.02	222.95	-0.00<<	0	0
68/ 24 (C)	-2.35	-65.01	217.15	0	-0.00>>	0

68/ 54 (C)	-0.32	-52.13	189.51	0	-0.00<<	0
68/ 22 (C)	-1.16	-65.02	222.95	0	0	0.00>>
68/ 56 (C)	-2.3	-52.13	179.84	0	0	0.00<<
69/ 61 (C)	-0.28>>	-54.69	184.64	0	0	0
69/ 48 (C)	-4.66<<	-64.12	200.42	0	0	0
69/ 56 (C)	-3.74	-54.68>>	174.5	0	0	0
69/ 22 (C)	-2.23	-68.18<<	218.3	0	0	0
69/ 27 (C)	-2.31	-68.18	223.40>>	0	0	0
69/ 57 (C)	-3.5	-54.68	170.69<<	0	0	0
69/ 28 (C)	-2.07	-68.18	219.59	0.00>>	0	0
69/ 54 (C)	-0.79	-54.69	186.29	-0.00<<	0	0
69/ 28 (C)	-2.07	-68.18	219.59	0	0.00>>	0
69/ 54 (C)	-0.79	-54.69	186.29	0	-0.00<<	0
69/ 28 (C)	-2.07	-68.18	219.59	0	0	0.00>>
69/ 54 (C)	-0.79	-54.69	186.29	0	0	0.00<<
70/ 55 (C)	-6.76>>	-45.39	180.13	0	0	0
70/ 23 (C)	-12.48<<	-55.93	207.69	0	0	0
70/ 56 (C)	-10.3	-45.28>>	168.27	0	0	0
70/ 22 (C)	-10.21	-56.00<<	213.42	0	0	0
70/ 27 (C)	-10.93	-55.97	218.69>>	0	0	0
70/ 57 (C)	-9.92	-45.29	164.79<<	0	0	0
70/ 78 (C)	-7.77	-45.36	183.51	0.00>>	0	0
70/ 49 (C)	-12.01	-52.73	189.2	0.00<<	0	0
70/ 57 (C)	-9.92	-45.29	164.79	0	-0.00>>	0
70/ 21 (C)	-10.58	-55.99	216.9	0	-0.00<<	0
70/ 57 (C)	-9.92	-45.29	164.79	0	0	-0.00>>
70/ 46 (C)	-9.21	-52.82	208.02	0	0	-0.00<<
71/ 55 (C)	-13.91>>	-52.85	179.93	0	0	0
71/ 27 (C)	-19.72<<	-66.37	213.99	0	0	0
71/ 79 (C)	-15.84	-52.24>>	172.35	0	0	0
71/ 22 (C)	-17.99	-66.66<<	208.39	0	0	0
71/ 27 (C)	-19.72	-66.37	213.99>>	0	0	0
71/ 57 (C)	-15.36	-52.44	161.94<<	0	0	0
71/ 24 (C)	-18.87	-66.41	197.59	-0.00>>	0	0
71/ 81 (C)	-16.23	-52.36	185.25	-0.00<<	0	0
71/ 24 (C)	-18.87	-66.41	197.59	0	-0.00>>	0
71/ 58 (C)	-16.34	-52.53	181.78	0	-0.00<<	0
71/ 24 (C)	-18.87	-66.41	197.59	0	0	-0.00>>
71/ 58 (C)	-16.34	-52.53	181.78	0	0	-0.00<<
72/ 22 (C)	11.49>>	-20.19	177.64	0	0	0
72/ 56 (C)	1.44<<	-18.68	131.32	0	0	0
72/ 60 (C)	3.33	-18.60>>	149.31	0	0	0

72/ 24 (C)	7.73	-20.21<<	168.26	0	0	0
72/ 27 (C)	8.57	-20.15	180.56>>	0	0	0
72/ 57 (C)	1.73	-18.7	129.82<<	0	0	0
72/ 54 (C)	7.7	-18.64	146.96	-0.00>>	0	0
72/ 24 (C)	7.73	-20.21	168.26	-0.00<<	0	0
72/ 22 (C)	11.49	-20.19	177.64	0	0.00>>	0
72/ 60 (C)	3.33	-18.6	149.31	0	-0.00<<	0
72/ 22 (C)	11.49	-20.19	177.64	0	0	0.00>>
72/ 60 (C)	3.33	-18.6	149.31	0	0	-0.00<<
73/ 57 (C)	-2.63>>	-5.04	79.23	0	0	0
73/ 27 (C)	-3.75<<	-9.94	116.34	0	0	0
73/ 57 (C)	-2.63	-5.04>>	79.23	0	0	0
73/ 27 (C)	-3.75	-9.94<<	116.34	0	0	0
73/ 25 (C)	-3.68	-9.92	117.04>>	0	0	0
73/ 57 (C)	-2.63	-5.04	79.23<<	0	0	0
73/ 54 (C)	-2.91	-5.25	83.34	-0.00>>	0	0
73/ 24 (C)	-3.39	-9.72	111.91	-0.00<<	0	0
73/ 23 (C)	-3.48	-9.78	114.82	0	0.00>>	0
73/ 55 (C)	-2.82	-5.19	80.42	0	0.00<<	0
73/ 57 (C)	-2.63	-5.04	79.23	0	0	-0.00>>
73/ 27 (C)	-3.75	-9.94	116.34	0	0	-0.00<<
74/ 22 (C)	18.32>>	-38.1	208.87	0	0	0
74/ 56 (C)	6.47<<	-28.87	150.09	0	0	0
74/ 55 (C)	13.05	-26.46>>	167.26	0	0	0
74/ 23 (C)	14.25	-39.56<<	199.25	0	0	0
74/ 27 (C)	15.59	-38.32	214.75>>	0	0	0
74/ 57 (C)	6.75	-28.82	148.40<<	0	0	0
74/ 61 (C)	8.97	-26.75	174.23	-0.00>>	0	0
74/ 23 (C)	14.25	-39.56	199.25	-0.00<<	0	0
74/ 22 (C)	18.32	-38.1	208.87	0	0.00>>	0
74/ 60 (C)	8.69	-26.8	175.92	0	0.00<<	0
74/ 54 (C)	12.77	-26.51	168.95	0	0	-0.00>>
74/ 23 (C)	14.25	-39.56	199.25	0	0	-0.00<<
75/ 24 (C)	33.59>>	7.89	184.79	0	0	0
75/ 78 (C)	27.41<<	6.59	167.82	0	0	0
75/ 21 (C)	33.52	8.42>>	185.94	0	0	0
75/ 57 (C)	27.52	5.90<<	164.46	0	0	0
75/ 25 (C)	33.54	8.07	191.93>>	0	0	0
75/ 55 (C)	27.43	6.69	162.15<<	0	0	0
75/ 25 (C)	33.54	8.07	191.93	0.00>>	0	0
75/ 55 (C)	27.43	6.69	162.15	0.00<<	0	0
75/ 28 (C)	33.57	8	188.21	0	0.00>>	0
75/ 54 (C)	27.41	6.75	164.69	0	0.00<<	0
75/ 25 (C)	33.54	8.07	191.93	0	0	0.00>>
75/ 61 (C)	27.49	6.09	170.17	0	0	0.00<<

76/ 55 (C)	-9.69>>	-29.35	147.28	0	0	0
76/ 52 (C)	-14.81<<	-33.63	170.57	0	0	0
76/ 56 (C)	-10.88	-28.80>>	134.76	0	0	0
76/ 22 (C)	-12.47	-35.51<<	172.79	0	0	0
76/ 27 (C)	-14.67	-35.44	176.39>>	0	0	0
76/ 57 (C)	-10.51	-28.81	132.29<<	0	0	0
76/ 60 (C)	-13.12	-29.24	151.63	0.00>>	0	0
76/ 24 (C)	-12.96	-35.19	163.8	0.00<<	0	0
76/ 24 (C)	-12.96	-35.19	163.8	0	0.00>>	0
76/ 60 (C)	-13.12	-29.24	151.63	0	-0.00<<	0
76/ 24 (C)	-12.96	-35.19	163.8	0	0	0.00>>
76/ 60 (C)	-13.12	-29.24	151.63	0	0	-0.00<<
77/ 55 (C)	-8.78>>	-39.36	139.33	0	0	0
77/ 52 (C)	-14.59<<	-45.73	160.57	0	0	0
77/ 56 (C)	-10.12	-38.82>>	129	0	0	0
77/ 22 (C)	-11.4	-48.49<<	163.93	0	0	0
77/ 27 (C)	-14.12	-48.43	166.72>>	0	0	0
77/ 57 (C)	-9.77	-38.82	126.83<<	0	0	0
77/ 24 (C)	-11.99	-48.17	156.42	0.00>>	0	0
77/ 60 (C)	-13.08	-39.27	142.55	0.00<<	0	0
77/ 24 (C)	-11.99	-48.17	156.42	0	0.00>>	0
77/ 60 (C)	-13.08	-39.27	142.55	0	-0.00<<	0
77/ 49 (C)	-11.28	-45.29	144.85	0	0	-0.00>>
77/ 60 (C)	-13.08	-39.27	142.55	0	0	-0.00<<
78/ 55 (C)	-5.67>>	-41.75	136.73	0	0	0
78/ 52 (C)	-11.23<<	-48.99	157.05	0	0	0
78/ 55 (C)	-5.67	-41.75>>	136.73	0	0	0
78/ 27 (C)	-10.42	-52.07<<	163.51	0	0	0
78/ 27 (C)	-10.42	-52.07	163.51>>	0	0	0
78/ 57 (C)	-8.33	-41.76	125.79<<	0	0	0
78/ 55 (C)	-5.67	-41.75	136.73	-0.00>>	0	0
78/ 23 (C)	-9.25	-52.06	156.53	-0.00<<	0	0
78/ 22 (C)	-7.31	-52.05	161.14	0	0.00>>	0
78/ 60 (C)	-10.63	-41.79	139.38	0	-0.00<<	0
78/ 22 (C)	-7.31	-52.05	161.14	0	0	0.00>>
78/ 60 (C)	-10.63	-41.79	139.38	0	0	0.00<<
79/ 47 (C)	8.61>>	-45.27	157.37	0	0	0
79/ 56 (C)	0.53<<	-39.35	127.76	0	0	0
79/ 55 (C)	6.28	-38.84>>	138.22	0	0	0
79/ 23 (C)	4.83	-48.43<<	159.03	0	0	0
79/ 27 (C)	5.19	-48.18	166.78>>	0	0	0
79/ 57 (C)	0.8	-39.35	126.06<<	0	0	0

79/ 55 (C)	6.28	-38.84	138.22	-0.00>>	0	0
79/ 25 (C)	5.41	-48.18	165.73	-0.00<<	0	0
79/ 22 (C)	8.39	-48.12	164.63	0	-0.00>>	0
79/ 60 (C)	1.13	-38.94	140.67	0	-0.00<<	0
79/ 24 (C)	5.1	-48.43	157.33	0	0	0.00>>
79/ 60 (C)	1.13	-38.94	140.67	0	0	-0.00<<
80/ 27 (C)	6.62>>	0.12	197.31	0	0	0
80/ 55 (C)	3.45<<	0.08	141.24	0	0	0
80/ 23 (C)	6.42	0.13>>	197.72	0	0	0
80/ 61 (C)	3.87	0.08<<	143.19	0	0	0
80/ 25 (C)	6.6	0.12	198.03>>	0	0	0
80/ 55 (C)	3.45	0.08	141.24<<	0	0	0
80/ 21 (C)	6.37	0.12	196.14	0.00>>	0	0
80/ 59 (C)	3.83	0.09	144.39	0.00<<	0	0
80/ 48 (C)	5.55	0.13	182.72	0	0.00>>	0
80/ 61 (C)	3.87	0.08	143.19	0	0.00<<	0
80/ 23 (C)	6.42	0.13	197.72	0	0	0.00>>
80/ 59 (C)	3.83	0.09	144.39	0	0	0.00<<
81/ 27 (C)	1.48>>	0.15	200.28	0	0	0
81/ 55 (C)	0.74<<	0.09	136.62	0	0	0
81/ 23 (C)	1.33	0.16>>	199.43	0	0	0
81/ 55 (C)	0.74	0.09<<	136.62	0	0	0
81/ 25 (C)	1.47	0.15	200.74>>	0	0	0
81/ 55 (C)	0.74	0.09	136.62<<	0	0	0
81/ 56 (C)	0.84	0.09	143.66	-0.00>>	0	0
81/ 20 (C)	1.33	0.15	195.95	-0.00<<	0	0
81/ 55 (C)	0.74	0.09	136.62	0	-0.00>>	0
81/ 25 (C)	1.47	0.15	200.74	0	-0.00<<	0
81/ 57 (C)	0.76	0.09	139.43	0	0	-0.00>>
81/ 25 (C)	1.47	0.15	200.74	0	0	-0.00<<
82/ 58 (C)	-0.73>>	0	146.42	0	0	0
82/ 24 (C)	-1.67<<	-0.05	190.07	0	0	0
82/ 57 (C)	-0.84	0.05>>	138.4	0	0	0
82/ 21 (C)	-1.63	-0.09<<	193.2	0	0	0
82/ 25 (C)	-1.6	-0.09	196.70>>	0	0	0
82/ 55 (C)	-0.8	-0.01	136.01<<	0	0	0
82/ 29 (C)	-0.79	0.02	140.39	0.00>>	0	0
82/ 46 (C)	-1.38	-0.07	176.19	-0.00<<	0	0
82/ 24 (C)	-1.67	-0.05	190.07	0	0.00>>	0
82/ 60 (C)	-0.77	-0.01	145.62	0	0.00<<	0
82/ 59 (C)	-0.74	0	141.85	0	0	-0.00>>
82/ 23 (C)	-1.65	-0.05	194.64	0	0	-0.00<<
83/ 57 (C)	-1.14>>	0.6	145.73	0	0	0
83/ 27 (C)	-1.83<<	1.32	203.31	0	0	0
83/ 27 (C)	-1.83	1.32>>	203.31	0	0	0

83/ 57 (C)	-1.14	0.60<<	145.73	0	0	0
83/ 25 (C)	-1.76	1.31	204.15>>	0	0	0
83/ 55 (C)	-1.18	0.66	142.65<<	0	0	0
83/ 21 (C)	-1.69	1.31	200.54	0.00>>	0	0
83/ 57 (C)	-1.14	0.6	145.73	0.00<<	0	0
83/ 61 (C)	-1.41	0.68	147.28	0	-0.00>>	0
83/ 23 (C)	-1.67	1.27	202.38	0	-0.00<<	0
83/ 47 (C)	-1.49	1.11	178.58	0	0	0.00>>
83/ 56 (C)	-1.19	0.61	150.44	0	0	0.00<<
84/ 58 (C)	-39.42>>	2.26	155.56	0	0	0
84/ 28 (C)	-49.32<<	1.51	189.87	0	0	0
84/ 48 (C)	-46.43	3.88>>	182.55	0	0	0
84/ 61 (C)	-39.68	0.85<<	154.55	0	0	0
84/ 21 (C)	-49.3	2.36	196.34>>	0	0	0
84/ 59 (C)	-39.42	2.22	152.22<<	0	0	0
84/ 61 (C)	-39.68	0.85	154.55	-0.00>>	0	0
84/ 23 (C)	-49.3	3.32	193.72	-0.00<<	0	0
84/ 60 (C)	-39.68	0.89	157.89	0	-0.00>>	0
84/ 20 (C)	-49.25	2.42	191.84	0	-0.00<<	0
84/ 25 (C)	-49.16	2.37	191.81	0	0	0.00>>
84/ 61 (C)	-39.68	0.85	154.55	0	0	0.00<<
85/ 58 (C)	-39.41>>	-2.25	155.56	0	0	0
85/ 24 (C)	-49.29<<	-1.39	189.63	0	0	0
85/ 56 (C)	-39.65	-0.79>>	157.53	0	0	0
85/ 53 (C)	-46.42	-3.78<<	179.48	0	0	0
85/ 21 (C)	-49.28	-2.41	196.37>>	0	0	0
85/ 59 (C)	-39.41	-2.26	152.24<<	0	0	0
85/ 27 (C)	-49.29	-3.16	193.84	0.00>>	0	0
85/ 57 (C)	-39.65	-0.8	154.21	0.00<<	0	0
85/ 23 (C)	-49.29	-1.38	192.95	0	0.00>>	0
85/ 55 (C)	-39.63	-2.53	159.91	0	0.00<<	0
85/ 58 (C)	-39.41	-2.25	155.56	0	0	-0.00>>
85/ 24 (C)	-49.29	-1.39	189.63	0	0	-0.00<<
86/ 61 (C)	-35.14>>	15.08	133.56	0	0	0
86/ 23 (C)	-43.38<<	24.12	174.87	0	0	0
86/ 48 (C)	-40.93	24.93>>	171.37	0	0	0
86/ 61 (C)	-35.14	15.08<<	133.56	0	0	0
86/ 23 (C)	-43.38	24.12	174.87>>	0	0	0
86/ 61 (C)	-35.14	15.08	133.56<<	0	0	0
86/ 61 (C)	-35.14	15.08	133.56	-0.00>>	0	0

86/ 48 (C)	-40.93	24.93	171.37	-0.00<<	0	0
86/ 55 (C)	-35.17	18.77	146.18	0	-0.00>>	0
86/ 19 (C)	-43.37	21.65	170.01	0	-0.00<<	0
86/ 77 (C)	-35.17	18.88	148.63	0	0	0.00>>
86/ 24 (C)	-43.38	24.06	172.31	0	0	0.00<<
87/ 58 (C)	-49.61>>	1.14	155.34	0	0	0
87/ 28 (C)	-62.09<<	-4.44	183.37	0	0	0
87/ 57 (C)	-49.83	6.22>>	159.99	0	0	0
87/ 52 (C)	-58.45	-4.85<<	174.95	0	0	0
87/ 23 (C)	-62.08	-0.07	191.64>>	0	0	0
87/ 61 (C)	-49.85	-1.59	151.35<<	0	0	0
87/ 27 (C)	-62.09	-4.76	186.46	0.00>>	0	0
87/ 57 (C)	-49.83	6.22	159.99	0.00<<	0	0
87/ 28 (C)	-62.09	-4.44	183.37	0	0.00>>	0
87/ 58 (C)	-49.61	1.14	155.34	0	0.00<<	0
87/ 58 (C)	-49.61	1.14	155.34	0	0	-0.00>>
87/ 24 (C)	-62.08	0.24	188.55	0	0	-0.00<<
88/ 56 (C)	-36.79>>	10.85	151.89	0	0	0
88/ 26 (C)	-45.75<<	5.1	164.58	0	0	0
88/ 57 (C)	-36.79	11.03>>	149.25	0	0	0
88/ 52 (C)	-43.04	2.23<<	154.86	0	0	0
88/ 23 (C)	-45.72	7.77	173.56>>	0	0	0
88/ 61 (C)	-36.8	3.39	135.70<<	0	0	0
88/ 52 (C)	-43.04	2.23	154.86	-0.00>>	0	0
88/ 57 (C)	-36.79	11.03	149.25	-0.00<<	0	0
88/ 59 (C)	-36.85	6.27	138.69	0	-0.00>>	0
88/ 23 (C)	-45.72	7.77	173.56	0	-0.00<<	0
88/ 22 (C)	-45.72	5.32	168.79	0	0	-0.00>>
88/ 58 (C)	-36.85	6.08	141.33	0	0	-0.00<<
89/ 58 (C)	-49.96>>	-1.67	155.9	0	0	0
89/ 24 (C)	-62.52<<	4.4	183.34	0	0	0
89/ 48 (C)	-58.85	5.01>>	174.62	0	0	0
89/ 61 (C)	-50.19	-6.39<<	160.54	0	0	0
89/ 21 (C)	-62.51	2.03	192.42>>	0	0	0
89/ 57 (C)	-50.19	1.62	151.17<<	0	0	0
89/ 61 (C)	-50.19	-6.39	160.54	-0.00>>	0	0
89/ 23 (C)	-62.52	4.83	186.29	-0.00<<	0	0
89/ 24 (C)	-62.52	4.4	183.34	0	0.00>>	0
89/ 58 (C)	-49.96	-1.67	155.9	0	0.00<<	0
89/ 61 (C)	-50.19	-6.39	160.54	0	0	0.00>>

89/ 25 (C)	-62.39	2.6	187.36	0	0	0.00<<
90/ 56 (C)	-34.72>>	-15.63	134.44	0	0	0
90/ 28 (C)	-42.85<<	-24.94	171.42	0	0	0
90/ 56 (C)	-34.72	-15.63>>	134.44	0	0	0
90/ 53 (C)	-40.43	-25.70<<	168.06	0	0	0
90/ 27 (C)	-42.85	-24.92	173.68>>	0	0	0
90/ 57 (C)	-34.72	-15.65	132.18<<	0	0	0
90/ 52 (C)	-40.43	-25.68	170.32	0.00>>	0	0
90/ 57 (C)	-34.72	-15.65	132.18	0.00<<	0	0
90/ 52 (C)	-40.43	-25.68	170.32	0	0.00>>	0
90/ 57 (C)	-34.72	-15.65	132.18	0	0.00<<	0
90/ 56 (C)	-34.72	-15.63	134.44	0	0	-0.00>>
90/ 28 (C)	-42.85	-24.94	171.42	0	0	-0.00<<
91/ 61 (C)	-36.83>>	-10.01	148.97	0	0	0
91/ 25 (C)	-45.80<<	-3.99	166.69	0	0	0
91/ 48 (C)	-43.09	-0.93>>	153.42	0	0	0
91/ 61 (C)	-36.83	-10.01<<	148.97	0	0	0
91/ 27 (C)	-45.76	-6.5	172.73>>	0	0	0
91/ 57 (C)	-36.84	-2.32	134.61<<	0	0	0
91/ 61 (C)	-36.83	-10.01	148.97	0.00>>	0	0
91/ 48 (C)	-43.09	-0.93	153.42	0.00<<	0	0
91/ 58 (C)	-36.89	-5.51	141.31	0	-0.00>>	0
91/ 24 (C)	-45.77	-2.2	161.71	0	-0.00<<	0
91/ 26 (C)	-45.8	-4.3	164.28	0	0	0.00>>
91/ 56 (C)	-36.84	-2.01	137.03	0	0	0.00<<
92/ 46 (C)	0.02>>	2.55	116.09	0	0	0
92/ 61 (C)	-0.01<<	8.49	103.15	0	0	0
92/ 60 (C)	-0.01	8.53>>	107.24	0	0	0
92/ 49 (C)	0.01	-8.14<<	100.46	0	0	0
92/ 27 (C)	0	4.98	121.41>>	0	0	0
92/ 57 (C)	0	-7.86	88.98<<	0	0	0
92/ 57 (C)	0	-7.86	88.98	-0.00>>	0	0
92/ 52 (C)	-0.01	8.24	118.71	-0.00<<	0	0
92/ 26 (C)	0	1.04	115.47	0	0.00>>	0
92/ 54 (C)	0.02	2.84	104.61	0	-0.00<<	0
92/ 57 (C)	0	-7.86	88.98	0	0	-0.00>>
92/ 50 (C)	0	1.72	115.62	0	0	-0.00<<
93/ 55 (C)	0.07>>	-1.09	92.53	0	0	0
93/ 52 (C)	-0.16<<	4.97	113.88	0	0	0
93/ 61 (C)	-0.16	5.74>>	99.61	0	0	0
93/ 48 (C)	0.04	-11.57<<	114.66	0	0	0

93/ 23 (C)	0.01	-8.43	117.98>>	0	0	0
93/ 55 (C)	0.07	-1.09	92.53<<	0	0	0
93/ 52 (C)	-0.16	4.97	113.88	0.00>>	0	0
93/ 59 (C)	0.06	-1.9	93.99	0.00<<	0	0
93/ 54 (C)	0.07	-1.28	97.32	0	0.00>>	0
93/ 53 (C)	-0.16	5.17	109.09	0	-0.00<<	0
93/ 53 (C)	-0.16	5.17	109.09	0	0	0.00>>
93/ 54 (C)	0.07	-1.28	97.32	0	0	-0.00<<
94/ 52 (C)	0.07>>	6.71	98.1	0	0	0
94/ 59 (C)	-0.01<<	0.29	90.46	0	0	0
94/ 61 (C)	0.06	7.20>>	84.85	0	0	0
94/ 48 (C)	0.01	-10.30<<	101.32	0	0	0
94/ 25 (C)	0.01	-0.89	106.32>>	0	0	0
94/ 61 (C)	0.06	7.2	84.85<<	0	0	0
94/ 58 (C)	-0.01	0.23	94.6	0.00>>	0	0
94/ 53 (C)	0.07	6.77	93.96	-0.00<<	0	0
94/ 55 (C)	0.01	1.12	89.21	0	0.00>>	0
94/ 50 (C)	-0.01	-0.21	103.71	0	-0.00<<	0
94/ 46 (C)	0.01	0.62	102.47	0	0	0.00>>
94/ 61 (C)	0.06	7.2	84.85	0	0	-0.00<<
95/ 57 (C)	0.00>>	-4.32	95.14	0	0	0
95/ 52 (C)	-0.00<<	9.36	130.97	0	0	0
95/ 52 (C)	0	9.36>>	130.97	0	0	0
95/ 57 (C)	0	-4.32<<	95.14	0	0	0
95/ 27 (C)	0	7.13	135.04>>	0	0	0
95/ 57 (C)	0	-4.32	95.14<<	0	0	0
95/ 57 (C)	0	-4.32	95.14	-0.00>>	0	0
95/ 52 (C)	0	9.36	130.97	-0.00<<	0	0
95/ 47 (C)	0	5.08	122.2	0	0.00>>	0
95/ 60 (C)	0	8.94	115.37	0	-0.00<<	0
95/ 47 (C)	0	5.08	122.2	0	0	0.00>>
95/ 56 (C)	0	-3.93	100.86	0	0	-0.00<<
96/ 57 (C)	0.00>>	-8.95	84.88	0	0	0
96/ 52 (C)	-0.00<<	2.63	111.35	0	0	0
96/ 60 (C)	0	3.09>>	97.34	0	0	0
96/ 49 (C)	0	-9.41<<	98.89	0	0	0
96/ 27 (C)	0	0.19	116.26>>	0	0	0
96/ 57 (C)	0	-8.95	84.88<<	0	0	0
96/ 61 (C)	0	3.02	89.67	0.00>>	0	0
96/ 48 (C)	0	-9.34	106.56	-0.00<<	0	0
96/ 51 (C)	0	-1.81	103.35	0	0.00>>	0
96/ 54 (C)	0	-0.61	96.97	0	-0.00<<	0
96/ 58 (C)	0	-1.29	97	0	0	-0.00>>
96/ 47 (C)	0	-1.14	103.32	0	0	-0.00<<
97/ 52 (C)	0.00>>	5.91	112.12	0	0	0

97/ 57 (C)	-0.00<<	-6.34	94.94	0	0	0
97/ 60 (C)	0	5.94>>	97.37	0	0	0
97/ 49 (C)	0	-6.37<<	109.69	0	0	0
97/ 23 (C)	0	-3.55	121.88>>	0	0	0
97/ 61 (C)	0	5.65	90.45<<	0	0	0
97/ 48 (C)	0	-6.07	116.62	0.00>>	0	0
97/ 61 (C)	0	5.65	90.45	-0.00<<	0	0
97/ 59 (C)	0	1.31	93.65	0	0.00>>	0
97/ 46 (C)	0	2.24	114.75	0	-0.00<<	0
97/ 59 (C)	0	1.31	93.65	0	0	0.00>>
97/ 48 (C)	0	-6.07	116.62	0	0	-0.00<<
98/ 46 (C)	0.06>>	5.87	193.82	0	0	0
98/ 59 (C)	0.00<<	4.37	164.38	0	0	0
98/ 52 (C)	0.04	8.86>>	202.78	0	0	0
98/ 57 (C)	0.02	-3.94<<	148.06	0	0	0
98/ 27 (C)	0.05	6.66	212.50>>	0	0	0
98/ 57 (C)	0.02	-3.94	148.06<<	0	0	0
98/ 57 (C)	0.02	-3.94	148.06	-0.00>>	0	0
98/ 27 (C)	0.05	6.66	212.5	-0.00<<	0	0
98/ 55 (C)	0.04	5.38	156.35	0	0.00>>	0
98/ 50 (C)	0.02	4.86	201.85	0	-0.00<<	0
98/ 58 (C)	0	4.75	172.1	0	0	-0.00>>
98/ 22 (C)	0.05	4.5	199.4	0	0	-0.00<<
99/ 54 (C)	0.01>>	-0.78	106.67	0	0	0
99/ 51 (C)	-0.01<<	-2.19	117.72	0	0	0
99/ 61 (C)	0	1.99>>	101.23	0	0	0
99/ 48 (C)	-0.01	-9.52<<	120.28	0	0	0
99/ 25 (C)	-0.01	-3.06	131.28>>	0	0	0
99/ 57 (C)	0	-8.85	96.22<<	0	0	0
99/ 61 (C)	0	1.99	101.23	-0.00>>	0	0
99/ 48 (C)	-0.01	-9.52	120.28	-0.00<<	0	0
99/ 19 (C)	0	-3.9	129.51	0	0.00>>	0
99/ 59 (C)	-0.01	-1.56	101.43	0	-0.00<<	0
99/ 59 (C)	-0.01	-1.56	101.43	0	0	-0.00>>
99/ 46 (C)	0.01	-1.41	122.96	0	0	-0.00<<
100/ 54 (C)	-0.01>>	2.85	84.18	0	0	0
100/ 26 (C)	-0.04<<	1.05	95.98	0	0	0
100/ 60 (C)	-0.01	5.57>>	82.76	0	0	0
100/ 49 (C)	-0.04	-5.68<<	94.83	0	0	0
100/ 23 (C)	-0.04	-3.16	104.78>>	0	0	0
100/ 61 (C)	-0.02	5.36	76.11<<	0	0	0
100/ 25 (C)	-0.04	1.26	102.63	0.00>>	0	0
100/ 55 (C)	-0.02	2.64	77.53	0.00<<	0	0
100/ 51 (C)	-0.04	1.69	91.24	0	0.00>>	0
100/ 77 (C)	-0.02	0.67	88.52	0	-0.00<<	0

100/ 58 (C)	-0.02	2.04	86.28	0	0	0.00>>
100/ 28 (C)	-0.04	3.17	93.87	0	0	-0.00<<
101/ 46 (C)	0.03>>	3.66	229.59	0	0	0
101/ 59 (C)	-0.01<<	3.58	192.44	0	0	0
101/ 60 (C)	0.01	6.56>>	206.69	0	0	0
101/ 49 (C)	0.01	-5.14<<	211.19	0	0	0
101/ 27 (C)	0.02	3.8	250.13>>	0	0	0
101/ 57 (C)	0.01	-4.55	178.34<<	0	0	0
101/ 57 (C)	0.01	-4.55	178.34	-0.00>>	0	0
101/ 27 (C)	0.02	3.8	250.13	-0.00<<	0	0
101/ 54 (C)	0.03	4.25	196.74	0	0.00>>	0
101/ 49 (C)	0.01	-5.14	211.19	0	-0.00<<	0
101/ 59 (C)	-0.01	3.58	192.44	0	0	0.00>>
101/ 46 (C)	0.03	3.66	229.59	0	0	-0.00<<
102/ 47 (C)	0.01>>	-0.26	122.27	0	0	0
102/ 58 (C)	-0.01<<	-0.04	121.49	0	0	0
102/ 60 (C)	0	2.52>>	121.8	0	0	0
102/ 49 (C)	0	-8.05<<	121.84	0	0	0
102/ 27 (C)	0.01	-0.17	140.24>>	0	0	0
102/ 57 (C)	0	-7.39	108.12<<	0	0	0
102/ 61 (C)	0	2.35	112.75	-0.00>>	0	0
102/ 48 (C)	0	-7.88	130.89	-0.00<<	0	0
102/ 56 (C)	0	-7.22	117.17	0	-0.00>>	0
102/ 47 (C)	0.01	-0.26	122.27	0	-0.00<<	0
102/ 54 (C)	0.01	0.57	117.6	0	0	0.00>>
102/ 51 (C)	0	-0.87	126.16	0	0	-0.00<<
103/ 47 (C)	0.00>>	2.94	74.07	0	0	0
103/ 58 (C)	-0.01<<	3.19	78.94	0	0	0
103/ 60 (C)	0	5.67>>	75.52	0	0	0
103/ 49 (C)	0	-4.75<<	83.08	0	0	0
103/ 74 (C)	0	-2.09	90.73>>	0	0	0
103/ 55 (C)	0	3.29	67.81<<	0	0	0
103/ 27 (C)	0	3.44	85.64	0.00>>	0	0
103/ 57 (C)	0	-4.4	76.81	0.00<<	0	0
103/ 57 (C)	0	-4.4	76.81	0	0.00>>	0
103/ 50 (C)	-0.01	2.84	85.21	0	-0.00<<	0
103/ 59 (C)	-0.01	2.83	72.14	0	0	-0.00>>
103/ 46 (C)	0	3.3	80.88	0	0	-0.00<<
104/ 46 (C)	3.09>>	-2.93	148.32	0	0	0
104/ 59 (C)	-2.97<<	-4.18	130.07	0	0	0
104/ 61 (C)	1.88	4.41>>	117.21	0	0	0
104/ 50 (C)	-2.5	-4.20<<	149.05	0	0	0
104/ 23 (C)	0.78	-1.65	159.01>>	0	0	0
104/ 61 (C)	1.88	4.41	117.21<<	0	0	0
104/ 29 (C)	0.6	-0.06	129.02	0.00>>	0	0

104/ 52 (C)	2.35	4.4	136.19	-0.00<<	0	0
104/ 59 (C)	-2.97	-4.18	130.07	0	-0.00>>	0
104/ 48 (C)	0.34	-2.69	156.42	0	-0.00<<	0
104/ 55 (C)	2.62	-2.91	129.35	0	0	0.00>>
104/ 48 (C)	0.34	-2.69	156.42	0	0	-0.00<<
105/ 46 (C)	3.85>>	-2.81	174.58	0	0	0
105/ 59 (C)	-2.55<<	-4.05	150.48	0	0	0
105/ 52 (C)	3.3	4.30>>	163.05	0	0	0
105/ 59 (C)	-2.55	-4.05<<	150.48	0	0	0
105/ 23 (C)	0.92	-1.48	182.71>>	0	0	0
105/ 61 (C)	2.67	4.3	140.53<<	0	0	0
105/ 48 (C)	0.12	-2.47	177.17	0.00>>	0	0
105/ 61 (C)	2.67	4.3	140.53	-0.00<<	0	0
105/ 21 (C)	3.16	-1.68	181.16	0	0.00>>	0
105/ 59 (C)	-2.55	-4.05	150.48	0	0.00<<	0
105/ 52 (C)	3.3	4.3	163.05	0	0	0.00>>
105/ 55 (C)	3.22	-2.81	152.05	0	0	-0.00<<
107/ 59 (C)	-3.71>>	0	26.46	0	0	0
107/ 21 (C)	-5.72<<	0	38.41	0	0	0
107/ 48 (C)	-5.02	0.01>>	34.27	0	0	0
107/ 61 (C)	-3.76	-0.01<<	26.61	0	0	0
107/ 21 (C)	-5.72	0	38.41>>	0	0	0
107/ 59 (C)	-3.71	0	26.46<<	0	0	0
107/ 55 (C)	-4	0	28.02	-0.00>>	0	0
107/ 48 (C)	-5.02	0.01	34.27	-0.00<<	0	0
107/ 21 (C)	-5.72	0	38.41	0	0.00>>	0
107/ 59 (C)	-3.71	0	26.46	0	0.00<<	0
107/ 23 (C)	-5.56	0	37.52	0	0	0.00>>
107/ 59 (C)	-3.71	0	26.46	0	0	0.00<<
109/ 54 (C)	0.76>>	-2.41	70.56	0	0	0
109/ 51 (C)	-1.60<<	-0.79	71.11	0	0	0
109/ 53 (C)	-1.04	2.22>>	71.65	0	0	0
109/ 54 (C)	0.76	-2.41<<	70.56	0	0	0
109/ 23 (C)	-0.7	-0.3	84.71>>	0	0	0
109/ 59 (C)	-1.23	-0.8	63.00<<	0	0	0
109/ 46 (C)	0.39	-2.4	78.67	0.00>>	0	0
109/ 29 (C)	0.13	0.05	69.54	0.00<<	0	0
109/ 61 (C)	-0.67	2.21	63.53	0	-0.00>>	0
109/ 23 (C)	-0.7	-0.3	84.71	0	-0.00<<	0
109/ 55 (C)	0.68	-2.41	68.29	0	0	0.00>>
109/ 50 (C)	-1.52	-0.79	73.38	0	0	-0.00<<
111/ 59 (C)	-5.63>>	0	65.96	0	0	0
111/ 21 (C)	-8.97<<	0.01	94.81	0	0	0
111/ 61 (C)	-5.76	0.04>>	66.24	0	0	0
111/ 48 (C)	-7.83	-0.04<<	84.8	0	0	0

111/ 21 (C)	-8.97	0.01	94.81>>	0	0	0
111/ 59 (C)	-5.63	0	65.96<<	0	0	0
111/ 61 (C)	-5.76	0.04	66.24	0.00>>	0	0
111/ 46 (C)	-8.26	0.01	88.36	-0.00<<	0	0
111/ 59 (C)	-5.63	0	65.96	0	-0.00>>	0
111/ 21 (C)	-8.97	0.01	94.81	0	-0.00<<	0
111/ 21 (C)	-8.97	0.01	94.81	0	0	0.00>>
111/ 57 (C)	-5.73	-0.04	66.09	0	0	0.00<<
114/ 59 (C)	-3.52>>	-0.01	84.76	0	0	0
114/ 21 (C)	-5.98<<	-0.02	127.36	0	0	0
114/ 48 (C)	-5.15	0.10>>	112.72	0	0	0
114/ 61 (C)	-3.71	-0.11<<	86.12	0	0	0
114/ 21 (C)	-5.98	-0.02	127.36>>	0	0	0
114/ 59 (C)	-3.52	-0.01	84.76<<	0	0	0
114/ 48 (C)	-5.15	0.1	112.72	0.00>>	0	0
114/ 61 (C)	-3.71	-0.11	86.12	-0.00<<	0	0
114/ 21 (C)	-5.98	-0.02	127.36	0	0.00>>	0
114/ 59 (C)	-3.52	-0.01	84.76	0	0.00<<	0
114/ 61 (C)	-3.71	-0.11	86.12	0	0	-0.00>>
114/ 23 (C)	-5.77	0.06	124.07	0	0	-0.00<<
125/ 55 (C)	-4.06>>	-3.2	109.52	0	0	0
125/ 52 (C)	-9.26<<	-1.55	127.9	0	0	0
125/ 61 (C)	-7.91	-0.86>>	110.46	0	0	0
125/ 48 (C)	-8.47	-10.46<<	161.47	0	0	0
125/ 48 (C)	-8.47	-10.46	161.47>>	0	0	0
125/ 55 (C)	-4.06	-3.2	109.52<<	0	0	0
125/ 52 (C)	-9.26	-1.55	127.9	0.00>>	0	0
125/ 57 (C)	-7.12	-9.77	144.04	0.00<<	0	0
125/ 21 (C)	-6.61	-4.61	137.93	0	0.00>>	0
125/ 61 (C)	-7.91	-0.86	110.46	0	0.00<<	0
125/ 54 (C)	-4.17	-3.4	113.68	0	0	0.00>>
125/ 20 (C)	-7.51	-5.18	141.7	0	0	-0.00<<
154/ 27 (C)	44.20>>	68.86	173.38	0	0	0
154/ 57 (C)	30.92<<	55.41	117.21	0	0	0
154/ 24 (C)	40.18	68.91>>	157.88	0	0	0
154/ 60 (C)	36.83	55.33<<	140.54	0	0	0
154/ 27 (C)	44.2	68.86	173.38>>	0	0	0
154/ 57 (C)	30.92	55.41	117.21<<	0	0	0
154/ 61 (C)	35.64	55.34	136.79	0.00>>	0	0
154/ 23 (C)	41.37	68.9	161.63	-0.00<<	0	0
154/ 27 (C)	44.2	68.86	173.38	0	0.00>>	0
154/ 57 (C)	30.92	55.41	117.21	0	0.00<<	0
154/ 60 (C)	36.83	55.33	140.54	0	0	-0.00>>
154/ 24 (C)	40.18	68.91	157.88	0	0	-0.00<<
203/ 27 (C)	43.07>>	63.28	135.83	0	0	0

203/ 57 (C)	29.84<<	51.02	91.03	0	0	0
203/ 24 (C)	39.89	63.30>>	123.38	0	0	0
203/ 60 (C)	34.54	50.98<<	109.87	0	0	0
203/ 27 (C)	43.07	63.28	135.83>>	0	0	0
203/ 57 (C)	29.84	51.02	91.03<<	0	0	0
203/ 27 (C)	43.07	63.28	135.83	-0.00>>	0	0
203/ 57 (C)	29.84	51.02	91.03	-0.00<<	0	0
203/ 27 (C)	43.07	63.28	135.83	0	0.00>>	0
203/ 57 (C)	29.84	51.02	91.03	0	0.00<<	0
203/ 27 (C)	43.07	63.28	135.83	0	0	0.00>>
203/ 57 (C)	29.84	51.02	91.03	0	0	0.00<<
218/ 57 (C)	1.46>>	1.67	162.67	0	0	0
218/ 52 (C)	-1.75<<	7.4	198.59	0	0	0
218/ 27 (C)	-1.51	8.59>>	218.84	0	0	0
218/ 57 (C)	1.46	1.67<<	162.67	0	0	0
218/ 23 (C)	0.07	7.4	225.12>>	0	0	0
218/ 55 (C)	-0.76	3.57	148.49<<	0	0	0
218/ 54 (C)	-0.86	3.71	151.7	0.00>>	0	0
218/ 24 (C)	0.18	7.26	221.91	-0.00<<	0	0
218/ 55 (C)	-0.76	3.57	148.49	0	-0.00>>	0
218/ 23 (C)	0.07	7.4	225.12	0	-0.00<<	0
218/ 57 (C)	1.46	1.67	162.67	0	0	-0.00>>
218/ 21 (C)	-1.26	8.54	216.61	0	0	-0.00<<
363/ 57 (C)	-11.27>>	25.43	225.88	0	0	0
363/ 27 (C)	-31.96<<	31.16	298.47	0	0	0
363/ 50 (C)	-29.04	31.48>>	288.81	0	0	0
363/ 57 (C)	-11.27	25.43<<	225.88	0	0	0
363/ 27 (C)	-31.96	31.16	298.47>>	0	0	0
363/ 57 (C)	-11.27	25.43	225.88<<	0	0	0
363/ 27 (C)	-31.96	31.16	298.47	0.00>>	0	0
363/ 57 (C)	-11.27	25.43	225.88	0.00<<	0	0
363/ 27 (C)	-31.96	31.16	298.47	0	0.00>>	0
363/ 57 (C)	-11.27	25.43	225.88	0	0.00<<	0
363/ 28 (C)	-31.29	30.36	296.16	0	0	-0.00>>
363/ 56 (C)	-11.94	26.23	228.19	0	0	-0.00<<
364/ 27 (C)	95.33>>	104.15	331.64	0	0	0
364/ 57 (C)	72.38<<	46.86	203.47	0	0	0
364/ 27 (C)	95.33	104.15>>	331.64	0	0	0
364/ 57 (C)	72.38	46.86<<	203.47	0	0	0
364/ 27 (C)	95.33	104.15	331.64>>	0	0	0
364/ 57 (C)	72.38	46.86	203.47<<	0	0	0
364/ 27 (C)	95.33	104.15	331.64	0.00>>	0	0
364/ 55 (C)	77.35	48.62	219.84	0.00<<	0	0

364/ 57 (C)	72.38	46.86	203.47	0	-0.00>>	0
364/ 27 (C)	95.33	104.15	331.64	0	-0.00<<	0
364/ 21 (C)	93.99	103.13	325.2	0	0	-0.00>>
364/ 61 (C)	79.58	50.32	230.57	0	0	-0.00<<

Pagal LST EN 1990:2004 STR ir GEO ribiniam būviui apkrovų deriniai sudaromi pagal formulę:

$$\sum_{j\geq 1}\gamma_{G,j}G_{k,j}\,"+"\,\gamma_p P\,"+"\,\gamma_{Q,1}Q_{k,1}\,"+"\sum_{i>1}\gamma_{Q,i}\Psi_{0,i}Q_{k,i};$$

čia: "+" reiškia derinimas su; $G_{k,j}$ ir $Q_{k,j}$ yra nuolatinių ir kintamų apkrovų charakteristinės reikšmės, γ_G ir γ_Q yra daliniai nuolatinių ir kintamųjų poveikių koeficientai, kurie atsižvelgia į įrąžų skaičiavimo modelių neapibrėžtumus, skaičiuojamosios schemos neapibrėžtumus, galimas perkrovas ir t.t.; Ψ_0,i – kintamojo poveikio derintinės reikšmės koeficientas.

Daliniai koeficientai poveikiams (γ_F) ir jų efektams (γ_E):

Poveikis		**Žymuo**	**Apkrovimo grupė**	
			A1	**A2**
Nuolatinis	Nepalankus	γ_G	1,35	1,0
	Palankus		1,0	1,0
Kintamasis	Nepalankus	γ_Q	1,3	1,3
	Palankus		0	0

1.17.1. Pamato po kolonomis skaičiavimas

Projektuojami poliniai pamatai su galvena po kolonomis. Galvenos matmenys 0,9x0,9x0,5(h) m. Polis 400 mm skersmens. Poliai remiami į abs. Alt +26.3 (IGS 8) polių geometrinis ilgis 3,20 m. Mažiausias grunto kūginis stipris q_c = 15,7MPa; šoninė trintis f_s = 15-200 kPa pagal sluoksnius.

Gniuždomo poliaus laikomosios galios skaičiavimas:

Veikiančios įrąžos:

$N_{Ed.1} := 498 \cdot 10^{-3} = 0.498$ MN

$N_{Ed.2} := 407 \cdot 10^{-3} = 0.407$ MN

Daliniai koeficientai:

Daliniai medžiagų patikimumo koef. atvejui M1:

$\gamma_{\varphi.1} := 1$

$\gamma_{c.1} := 1$

$\gamma_{cu.1} := 1$

$\gamma_{qu.1} := 1$

$\gamma_{\gamma 1} := 1$

Daliniai medžiagų patikimumo koef. atvejui M2:

$\gamma_{\varphi.2} := 1.25$

$\gamma_{c.2} := 1.25$

$\gamma_{cu.2} := 1.4$

$\gamma_{qu.2} := 1.4$

$\gamma_{\gamma 2} := 1$

Daliniai koeficientai CFA polių pagrindo atsparumui

	R1	R2	R3	R4
Polio pado laikomoji galia	$\gamma_{b1} := 1.1$	$\gamma_{b2} := 1.1$	$\gamma_{b3} := 1.0$	$\gamma_{b4} := 1.45$
Polio kamieno šoninio paviršiaus alikomoji galia gniuždymui	$\gamma_{s1} := 1.0$	$\gamma_{s2} := 1.1$	$\gamma_{s3} := 1.0$	$\gamma_{s4} := 1.30$
Polio pado suminis atsparumas gniuždymui	$\gamma_{t1} := 1.1$	$\gamma_{t2} := 1.1$	$\gamma_{t3} := 1.0$	$\gamma_{t4} := 1.40$
Polio laikomoji galia tempimui	$\gamma_{st1} := 1.25$	$\gamma_{st2} := 1.15$	$\gamma_{st3} := 1.1$	$\gamma_{st4} := 1.60$

$\alpha_b := 0.5$

$\xi_3 := 1.33$

Grunto rodikliai:

$\rho := 21 \ \frac{kN}{m^3}$

$q_c := 15.7$ MPa

$f_{s1} := 0.16$ MPa $f_{s2} := 0.14$ MPa $f_{s3} := 0.015$ MPa $f_{s4} := 0.20$ MPa $f_{s5} := 0.0$ MPa $f_{s6} := 0.0$ MPa $f_{s7} := 0.0$ MPa

Geometriniai rodikliai:

$f_{s8} := 0.0$ MPa

$h_1 := 0.0$ m $h_2 := 0.6$ m $h_3 := 1.6$ m $h_4 := 1.0$ m $h_5 := 0.$ m $h_6 := 0$ m $h_7 := 0.0$ m $h_8 := 0.0$ m

$d := 0.4 \cdot 0.95 = 0.38$ m

$A_p := \frac{\pi \cdot d^2}{4} = 0.113$ m^2

$A_{š1} := \pi \cdot d \cdot h_1 = 0$ m^2 $A_{š2} := \pi \cdot d \cdot h_2 = 0.716$ m^2 $A_{š3} := \pi \cdot d \cdot h_3 = 1.91$ m^2

$A_{š4} := \pi \cdot d \cdot h_4 = 1.194$ m^2 $A_{š5} := \pi \cdot d \cdot h_5 = 0$ m^2 $A_{š6} := \pi \cdot d \cdot h_6 = 0$ m^2

$A_{š7} := \pi \cdot d \cdot h_7 = 0$ m^2 $A_{š8} := \pi \cdot d \cdot h_8 = 0$ m^2

Pirmas projektavimo atvejis:
A1+M1+R1

$q_b := \alpha_b \cdot q_c = 7.85$ MPa

$R_b := q_b \cdot A_p = 0.89$ MN

$R_s := f_{s1} \cdot A_{š1} + f_{s2} \cdot A_{š2} + f_{s3} \cdot A_{š3} + f_{s4} \cdot A_{š4} + f_{s5} \cdot A_{š5} + f_{s6} \cdot A_{š6} + f_{s7} \cdot A_{š7} + f_{s8} \cdot A_{š8} = 0.368$

$$R_{c.cal1} := \frac{R_b}{\gamma_{b1}} + \frac{R_s}{\gamma_{s1}} = 1.177 \quad \text{MN}$$

$$R_{c.k1} := \frac{R_{c.cal1}}{\xi_3} = 0.885 \quad \text{MN}$$

$$R_{c.d1} := \frac{R_{c.k1}}{\gamma_{t1}} = 0.805 \quad \text{MN}$$

$$\frac{N_{Ed.1}}{R_{c.d1}} = 0.619$$

Antras projektavimo atvejis:
A2+M1+R4

$$R_{c.cal2} := \frac{R_b}{\gamma_{b4}} + \frac{R_s}{\gamma_{s4}} = 0.897 \quad \text{MN}$$

$$R_{c.k2} := \frac{R_{c.cal2}}{\xi_3} = 0.674 \quad \text{MN}$$

$$R_{c.d2} := \frac{R_{c.k2}}{\gamma_{t4}} = 0.482 \quad \text{MN}$$

$$\frac{N_{Ed.2}}{R_{c.d2}} = 0.845$$

IŠVADA: sąlyga tenkinama.

Lenkimo poliaus laikomosios galios skaičiavimas:

$q_c := 15700\ kPa$ $f_{si1} := 160\ kPa$ $f_{si2} := 140$ $f_{si3} := 15$ $f_{si4} := 200$ $f_{si5} := 0$ $f_{si6} := 0$ $f_{si7} := 0$ $f_{si8} := 0$

$N := 201$ kN $h_1 := 0.0$ $h_2 := 0.6$ $h_3 := 1.6$ $h_4 := 1.0$ $h_5 := 0.0$ $h_6 := 0.0$ $h_7 := 0.0$ $h_8 := 0.0$

$M_d := 42$ kNm

$Q_d := 66$ kN

$d := 0.4$ m

Poliaus geometrinis ilgis:

$h := 3.20$ m

Pagrindo stiprumas po pamato padu: iš 6.22, 6.23 grafikų

$$R_{s2} := 0.12 \cdot q_c \cdot 10^{-3} + 0.24 = 2.124 \quad MPa$$

$$A_b := 3.14 \cdot \frac{\left(d^2\right)}{4} = 0.126$$

Trinties jėga prie pamato šonų:

$$F_f := 3.14 \cdot d \cdot \left(h_1 \cdot \frac{f_{si1}}{3} + h_2 \cdot \frac{f_{si2}}{3} + h_3 \cdot \frac{f_{si3}}{3} + h_4 \cdot \frac{f_{si4}}{3} + h_5 \cdot \frac{f_{si5}}{3} + h_6 \cdot \frac{f_{si6}}{3} + h_7 \cdot \frac{f_{si7}}{3} + h_8 \cdot \frac{f_{si8}}{3} \right) = 128.949 \quad kN$$

Slėgis po pamato padu:

$$p := \frac{\left(N - F_f\right)}{A_b} = 573.652 \quad kPa$$ ne daugiau nei Rs2

Pasisukimas ir pasislinkimas

Skaičiuojamasis pamato gylis:

$d_d := h_1 + h_2 + h_3 + h_4 + h_5 + h_6 + h_7 + h_8 = 3.2$ m

Horiozntalios jėgos nuo momento aukštis virš pamato

$$h_m := \frac{M_d}{Q_d} = 0.636$$

Horizontalios jėgos pridėties taško skaičiuojamasis aukštis:

$h_d := h - d_d + h_m = 0.636$ m

$$\eta := \frac{\left(1.5 \cdot h_d + 0.5 \cdot d_d\right)}{1.5 \cdot h_d + d_d} = 0.615$$ $\mu := 0.5$

kai Ff<N:

Pamato posūkiui besipriešinančių jėgų atstojamoji:

$$F_Q := \frac{\left[\left(N - F_f\right) \cdot \mu \cdot d_d + 1.5 \cdot F_f \cdot \frac{d}{\pi}\right]}{2 \cdot \left(1.5 \cdot h_d + d_d\right)} = 16.838 \quad kN$$

$pamatas := if\left[F_Q \geq 0.5 \cdot (\eta + 1) \cdot Q_d, "nepasisuka", "pasisuka"\right] = "pasisuka"$

Pamato posukio centro gylis nuo skaičiuojamojo pagrindo paviršiaus z0:

$$z_0 := \frac{d_d}{1 + \frac{(Q_d \cdot \eta - F_Q)}{Q_d - F_Q}} = 2.158 \quad m$$

kadangi := if$(z_0 < d_d, \text{"u formule tinka"}, \text{"netinka"}) = \text{"u formule tinka"}$

$R_{s0.5} := 0.04 q_c \cdot 10^{-3} + 0.1 = 0.728$

Horizontalus pagrindo standumo modulis:

$$C_h := \frac{R_{s0.5} \cdot 10^3}{0.005 \cdot d} = 3.64 \times 10^5$$

$u_u := 0.01 \cdot d = 4 \times 10^{-3}$ m

$i_u := 0.005$ m

$$:= \left[4Q_d \cdot \frac{(1.5h_d + d_d)}{C_h \cdot d \cdot d_d^{\,2}}\right] \cdot \left[1 + \frac{(h - d_d)}{z_0}\right] \cdot \left(1 - \frac{F_Q}{Q_d}\right) = 5.48 \times 10^{-4} \quad m$$

poslinkis := if$(u < u_u, \text{"poslinkis leistinas"}, \text{"poslinkis neleistinas"}) = \text{"poslinkis leistinas"}$

$$:= \frac{u}{(z_0 + h - d_d)} = 2.539 \times 10^{-4} \quad m$$

pasisukimas := if$(i < i_u, \text{"pasisukimas leistinas"}, \text{"pasisukimas neleistinas"}) = \text{"pasisukimas leistinas"}$

Gylis kuriame veikia didžiausias lenkimo momentas

Grunto prie pamato šoninio paviršiaus vidutinis stipris:

$$R_f := \frac{F_f}{\pi \cdot d \cdot d_d} = 32.067 \quad kN$$

Gylis, kuriame veikia didžiausias lenkimo momentas:

$$z_m := z_0 - \sqrt{z_0^{\,2} - \frac{\left(1 - \frac{d^2 \cdot R_f}{2 \cdot Q_d}\right) \cdot d_d^{\,2} \cdot z_0}{2 \cdot (1.5 \cdot h_d + d_d)}} = 0.709 \quad m$$

Didžiausias polių veikiantis lenkimo momentas:

$$M := Q_d \cdot (h_d + z_m) - \frac{2 \cdot Q_d}{3 \cdot d_d^{\,2} \cdot z_0} \cdot (1.5 \cdot h_d + d_d)(3 \cdot z_0 - z_m) \cdot z_m^{\,2} - \frac{d^2}{2} \cdot R_f \cdot z_m = 63.003 \ kNm$$

IŠVADA: sąlyga tenkinama

1.17.2. Pamatų po sienomis skaičiavimas

Projektuojami poliniai pamatai po sienomis. Polis 300 mm skersmens. Poliai remiami į abs. Alt +26.3 (IGS 8) polių geometrinis ilgis 3,15 m. Mažiausias grunto kūginis stipris q_c = 15,7MPa; šoninė trintis f_s = 15-200 kPa pagal sluoksnius.

Gniuždomo poliaus laikomosios galios skaičiavimas:

Veikiančios įrąžos:

$N_{Ed.1} := 337 \cdot 10^{-3} = 0.337$ MN

$N_{Ed.2} := 270 \cdot 10^{-3} = 0.27$ MN

Daliniai koeficientai:

Daliniai medžiagų patikimumo koef. atvejui M1:

$\gamma_{\varphi.1} := 1$

$\gamma_{c.1} := 1$

$\gamma_{cu.1} := 1$

$\gamma_{qu.1} := 1$

$\gamma_{\gamma 1} := 1$

Daliniai medžiagų patikimumo koef. atvejui M2:

$\gamma_{\varphi.2} := 1.25$

$\gamma_{c.2} := 1.25$

$\gamma_{cu.2} := 1.4$

$\gamma_{qu.2} := 1.4$

$\gamma_{\gamma 2} := 1$

Daliniai koeficientai CFA polių pagrindo atsparumui

	R1	R2	R3	R4
Polio pado laikomoji galia	$\gamma_{b1} := 1.1$	$\gamma_{b2} := 1.1$	$\gamma_{b3} := 1.0$	$\gamma_{b4} := 1.45$
Polio kamieno šoninio paviršiaus alikomoji galia gniuždymui	$\gamma_{s1} := 1.0$	$\gamma_{s2} := 1.1$	$\gamma_{s3} := 1.0$	$\gamma_{s4} := 1.30$
Polio pado suminis atsparumas gniuždymui	$\gamma_{t1} := 1.1$	$\gamma_{t2} := 1.1$	$\gamma_{t3} := 1.0$	$\gamma_{t4} := 1.40$
Polio laikomoji galia tempimui	$\gamma_{st1} := 1.25$	$\gamma_{st2} := 1.15$	$\gamma_{st3} := 1.1$	$\gamma_{st4} := 1.60$

$\alpha_b := 0.5$

$\xi_3 := 1.33$

Grunto rodikliai:

$\rho := 21 \ \frac{kN}{m^3}$

$q_c := 15.7$ MPa

$f_{s1} := 0.16$ MPa $f_{s2} := 0.014$ MPa $f_{s3} := 0.015$ MPa $f_{s4} := 0.20$ MPa $f_{s5} := 0.0$ MPa $f_{s6} := 0.0$ MPa $f_{s7} := 0.0$ MPa

Geometriniai rodikliai: $f_{s8} := 0.0$ MPa

$h_1 := 0.0$ m $h_2 := 0.55$ m $h_3 := 1.6$ m $h_4 := 1.0$ m $h_5 := 0.$ m $h_6 := 0$ m $h_7 := 0.0$ m $h_8 := 0.0$ m

$d := 0.3 \cdot 0.95 = 0.285$ m

$A_p := \frac{\pi \cdot d^2}{4} = 0.064$ m^2

$A_{š1} := \pi \cdot d \cdot h_1 = 0$ m^2 $A_{š2} := \pi \cdot d \cdot h_2 = 0.492$ m^2 $A_{š3} := \pi \cdot d \cdot h_3 = 1.433$ m^2

$A_{š4} := \pi \cdot d \cdot h_4 = 0.895$ m^2 $A_{š5} := \pi \cdot d \cdot h_5 = 0$ m^2 $A_{š6} := \pi \cdot d \cdot h_6 = 0$ m^2

$A_{š7} := \pi \cdot d \cdot h_7 = 0$ m^2 $A_{š8} := \pi \cdot d \cdot h_8 = 0$ m^2

Pirmas projektavimo atvejis:
A1+M1+R1

$q_b := \alpha_b \cdot q_c = 7.85$ MPa

$R_b := q_b \cdot A_p = 0.501$ MN

$R_s := f_{s1} \cdot A_{š1} + f_{s2} \cdot A_{š2} + f_{s3} \cdot A_{š3} + f_{s4} \cdot A_{š4} + f_{s5} \cdot A_{š5} + f_{s6} \cdot A_{š6} + f_{s7} \cdot A_{š7} + f_{s8} \cdot A_{š8} = 0.207$

$$R_{c.cal1} := \frac{R_b}{\gamma_{b1}} + \frac{R_s}{\gamma_{s1}} = 0.663 \quad \text{MN}$$

$$R_{c.k1} := \frac{R_{c.cal1}}{\xi_3} = 0.498 \quad \text{MN}$$

$$R_{c.d1} := \frac{R_{c.k1}}{\gamma_{t1}} = 0.453 \quad \text{MN}$$

$$\frac{N_{Ed.1}}{R_{c.d1}} = 0.744$$

Antras projektavimo atvejis:
A2+M1+R4

$$R_{c.cal2} := \frac{R_b}{\gamma_{b4}} + \frac{R_s}{\gamma_{s4}} = 0.505 \quad \text{MN}$$

$$R_{c.k2} := \frac{R_{c.cal2}}{\xi_3} = 0.38 \quad \text{MN}$$

$$R_{c.d2} := \frac{R_{c.k2}}{\gamma_{t4}} = 0.271 \quad \text{MN}$$

$$\frac{N_{Ed.2}}{R_{c.d2}} = 0.996$$

IŠVADA: sąlyga tenkinama

Lenkimo poliaus laikomosios galios skaičiavimas:

$q_c := 15700\ kPa$ $f_{si1} := 160\ kPa$ $f_{si2} := 140$ $f_{si3} := 15$ $f_{si4} := 200$ $f_{si5} := 0$ $f_{si6} := 0$ $f_{si7} := 0$ $f_{si8} := 0$

$N := 242$ kN $h_1 := 0.0$ $h_2 := 0.5$ $h_3 := 1.6$ $h_4 := 1.0$ $h_5 := 0.0$ $h_6 := 0.0$ $h_7 := 0.0$ $h_8 := 0.0$

$M_d := 0.1$ kNm

$Q_d := 102$ kN

$d := 0.3$ m

Poliaus geometrinis ilgis:

$h := 3.15$ m

Pagrindo stiprumas po pamato padu: iš 6.22, 6.23 grafikų

$$R_{s2} := 0.12 \cdot q_c \cdot 10^{-3} + 0.24 = 2.124 \quad MPa$$

$$A_b := 3.14 \cdot \frac{\left(d^2\right)}{4} = 0.071$$

Trinties jėga prie pamato šonų:

$$F_f := 3.14 \cdot d \cdot \left(h_1 \cdot \frac{f_{si1}}{3} + h_2 \cdot \frac{f_{si2}}{3} + h_3 \cdot \frac{f_{si3}}{3} + h_4 \cdot \frac{f_{si4}}{3} + h_5 \cdot \frac{f_{si5}}{3} + h_6 \cdot \frac{f_{si6}}{3} + h_7 \cdot \frac{f_{si7}}{3} + h_8 \cdot \frac{f_{si8}}{3} \right) = 94.514 \quad kN$$

Slėgis po pamato padu:

$$p := \frac{\left(N - F_f\right)}{A_b} = 2.088 \times 10^{3} \quad kPa$$ ne daugiau nei Rs2

Pasisukimas ir pasislinkimas

Skaičiuojamasis pamato gylis:

$d_d := h_1 + h_2 + h_3 + h_4 + h_5 + h_6 + h_7 + h_8 = 3.15$ m

Horiozntalios jėgos nuo momento aukštis virš pamato

$$h_m := \frac{M_d}{Q_d} = 9.804 \times 10^{-4}$$

Horizontalios jėgos pridėties taško skaičiuojamasis aukštis:

$h_d := h - d_d + h_m = 9.804 \times 10^{-4}$ m

$$\eta := \frac{\left(1.5 \cdot h_d + 0.5 \cdot d_d\right)}{1.5 \cdot h_d + d_d} = 0.5 \qquad \mu := 0.5$$

kai Ff<N:

Pamato posūkiui besipriešinančių jėgų atstojamoji:

$$F_Q := \frac{\left[\left(N - F_f\right) \cdot \mu \cdot d_d + 1.5 \cdot F_f \cdot \frac{d}{\pi}\right]}{2 \cdot \left(1.5 \cdot h_d + d_d\right)} = 39.002 \quad kN$$

$pamatas := if\left[F_Q \geq 0.5 \cdot (\eta + 1) \cdot Q_d, "nepasisuka", "pasisuka"\right] = "pasisuka"$

Pamato posukio centro gylis nuo skaičiuojamojo pagrindo paviršiaus z0:

$$z_0 := \frac{d_d}{1 + \frac{(Q_d \cdot \eta - F_Q)}{Q_d - F_Q}} = 2.645 \quad m$$

kadangi := if$(z_0 < d_d$, "u formule tinka", "netinka"$)$ = "u formule tinka"

$R_{s0.5} := 0.04 q_c \cdot 10^{-3} + 0.1 = 0.728$

Horizontalus pagrindo standumo modulis:

$$C_h := \frac{R_{s0.5} \cdot 10^3}{0.005 \cdot d} = 4.853 \times 10^5$$

$u_u := 0.01 \cdot d = 3 \times 10^{-3}$ m

$i_u := 0.005$ m

$$u := \left[4 Q_d \cdot \frac{(1.5 h_d + d_d)}{C_h \cdot d \cdot d_d^{\,2}}\right] \cdot \left[1 + \frac{(h - d_d)}{z_0}\right] \cdot \left(1 - \frac{F_Q}{Q_d}\right) = 5.497 \times 10^{-4} \quad m$$

poslinkis := if$(u < u_u$, "poslinkis leistinas", "poslinkis neleistinas"$)$ = "poslinkis leistinas"

$$i := \frac{u}{(z_0 + h - d_d)} = 2.078 \times 10^{-4} \quad m$$

pasisukimas := if$(i < i_u$, "pasisukimas leistinas", "pasisukimas neleistinas"$)$ = "pasisukimas leistinas"

Gylis kuriame veikia didžiausias lenkimo momentas

Grunto prie pamato šoninio paviršiaus vidutinis stipris:

$$R_f := \frac{F_f}{\pi \cdot d \cdot d_d} = 31.836 \quad kN$$

Gylis, kuriame veikia didžiausias lenkimo momentas:

$$z_m := z_0 - \sqrt{z_0^{\,2} - \frac{\left(1 - \frac{d^2 \cdot R_f}{2 \cdot Q_d}\right) \cdot d_d^{\,2} \cdot z_0}{2 \cdot (1.5 \cdot h_d + d_d)}} = 0.945 \quad m$$

Didžiausias polių veikiantis lenkimo momentas:

$$M := Q_d \cdot (h_d + z_m) - \frac{2 \cdot Q_d}{3 \cdot d_d^{\,2} \cdot z_0} \cdot (1.5 \cdot h_d + d_d)(3 \cdot z_0 - z_m) \cdot z_m^{\,2} - \frac{d^2}{2} \cdot R_f \cdot z_m = 44.165 \ kNm$$

IŠVADA: sąlyga tenkinama

1.17.3. Pamatų po lifto šachta skaičiavimas

Projektuojami poliniai pamatai po lifto šachtos padu. Poliai 400 mm skersmens. Poliai remiami į abs. Alt +26.3 (IGS 8) polių geometrinis ilgis 3,15 m. Mažiausias grunto kūginis stipris q_c = 15,7MPa; šoninė trintis f_s = 15-200 kPa pagal sluoksnius.

Gniuždomo poliaus laikomosios galios skaičiavimas:

Veikiančios įrąžos:

$N_{Ed.1} := 560 \cdot 10^{-3} = 0.56$ MN

$N_{Ed.2} := 479 \cdot 10^{-3} = 0.479$ MN

Daliniai koeficientai:

Daliniai medžiagų patikimumo koef. atvejui M1:

$\gamma_{\varphi.1} := 1$

$\gamma_{c.1} := 1$

$\gamma_{cu.1} := 1$

$\gamma_{qu.1} := 1$

$\gamma_{\gamma 1} := 1$

Daliniai medžiagų patikimumo koef. atvejui M2:

$\gamma_{\varphi.2} := 1.25$

$\gamma_{c.2} := 1.25$

$\gamma_{cu.2} := 1.4$

$\gamma_{qu.2} := 1.4$

$\gamma_{\gamma 2} := 1$

Daliniai koeficientai CFA polių pagrindo atsparumui

	R1	R2	R3	R4
Polio pado laikomoji galia	$\gamma_{b1} := 1.1$	$\gamma_{b2} := 1.1$	$\gamma_{b3} := 1.0$	$\gamma_{b4} := 1.45$
Polio kamieno šoninio paviršiaus alikomoji galia gniuždymui	$\gamma_{s1} := 1.0$	$\gamma_{s2} := 1.1$	$\gamma_{s3} := 1.0$	$\gamma_{s4} := 1.30$
Polio pado suminis atsparumas gniuždymui	$\gamma_{t1} := 1.1$	$\gamma_{t2} := 1.1$	$\gamma_{t3} := 1.0$	$\gamma_{t4} := 1.40$
Polio laikomoji galia tempimui	$\gamma_{st1} := 1.25$	$\gamma_{st2} := 1.15$	$\gamma_{st3} := 1.1$	$\gamma_{st4} := 1.60$

$\alpha_b := 0.5$

$\xi_3 := 1.33$

Grunto rodikliai:

$\rho := 21 \ \frac{kN}{m^3}$

$q_c := 15.7$ MPa

$f_{s1} := 0.16$ MPa $f_{s2} := 0.14$ MPa $f_{s3} := 0.015$ MPa $f_{s4} := 0.2$ MPa $f_{s5} := 0.0$ MPa $f_{s6} := 0.0$ MPa $f_{s7} := 0.0$ MPa

Geometriniai rodikliai: $f_{s8} := 0.0$ MPa

$h_1 := 0.$ m $h_2 := 0.$ m $h_3 := 1.37$ m $h_4 := 1.78$ m $h_5 := 0.$ m $h_6 := 0$ m $h_7 := 0.0$ m $h_8 := 0.0$ m

$d := 0.4 \cdot 0.95 = 0.38$ m

$A_p := \frac{\pi \cdot d^2}{4} = 0.113$ m^2

$A_{š1} := \pi \cdot d \cdot h_1 = 0$ m^2 $A_{š2} := \pi \cdot d \cdot h_2 = 0$ m^2 $A_{š3} := \pi \cdot d \cdot h_3 = 1.636$ m^2

$A_{š4} := \pi \cdot d \cdot h_4 = 2.125$ m^2 $A_{š5} := \pi \cdot d \cdot h_5 = 0$ m^2 $A_{š6} := \pi \cdot d \cdot h_6 = 0$ m^2

$A_{š7} := \pi \cdot d \cdot h_7 = 0$ m^2 $A_{š8} := \pi \cdot d \cdot h_8 = 0$ m^2

Pirmas projektavimo atvejis:
A1+M1+R1

$q_b := \alpha_b \cdot q_c = 7.85$ MPa

$R_b := q_b \cdot A_p = 0.89$ MN

$R_s := f_{s1} \cdot A_{š1} + f_{s2} \cdot A_{š2} + f_{s3} \cdot A_{š3} + f_{s4} \cdot A_{š4} + f_{s5} \cdot A_{š5} + f_{s6} \cdot A_{š6} + f_{s7} \cdot A_{š7} + f_{s8} \cdot A_{š8} = 0.45$

$$R_{c.cal1} := \frac{R_b}{\gamma_{b1}} + \frac{R_s}{\gamma_{s1}} = 1.259 \quad \text{MN}$$

$$R_{c.k1} := \frac{R_{c.cal1}}{\xi_3} = 0.947 \quad \text{MN}$$

$$R_{c.d1} := \frac{R_{c.k1}}{\gamma_{t1}} = 0.86 \quad \text{MN}$$

$$\frac{N_{Ed.1}}{R_{c.d1}} = 0.651$$

Antras projektavimo atvejis:
A2+M1+R4

$$R_{c.cal2} := \frac{R_b}{\gamma_{b4}} + \frac{R_s}{\gamma_{s4}} = 0.96 \quad \text{MN}$$

$$R_{c.k2} := \frac{R_{c.cal2}}{\xi_3} = 0.722 \quad \text{MN}$$

$$R_{c.d2} := \frac{R_{c.k2}}{\gamma_{t4}} = 0.515 \quad \text{MN}$$

$$\frac{N_{Ed.2}}{R_{c.d2}} = 0.929$$

IŠVADA: sąlyga tenkinama

Lenkimo poliaus laikomosios galios skaičiavimas:

$q_c := 15700\ kPa$ $f_{si1} := 160\ kPa$ $f_{si2} := 140$ $f_{si3} := 15$ $f_{si4} := 200$ $f_{si5} := 0$ $f_{si6} := 0$ $f_{si7} := 0$ $f_{si8} := 0$

$N := 218$ kN $h_1 := 0.0$ $h_2 := 0.0$ $h_3 := 1.37$ $h_4 := 1.78$ $h_5 := 0.0$ $h_6 := 0.0$ $h_7 := 0.0$ $h_8 := 0.0$

$M_d := 0.1$ kNm

$Q_d := 102$ kN

$d := 0.4$ m

Poliaus geometrinis ilgis:

$h := 3.15$ m

Pagrindo stiprumas po pamato padu: iš 6.22, 6.23 grafikų

$$R_{s2} := 0.12 \cdot q_c \cdot 10^{-3} + 0.24 = 2.124 \quad MPa$$

$$A_b := 3.14 \cdot \frac{\left(d^2\right)}{4} = 0.126$$

Trinties jėga prie pamato šonų:

$$F_f := 3.14 \cdot d \cdot \left(h_1 \cdot \frac{f_{si1}}{3} + h_2 \cdot \frac{f_{si2}}{3} + h_3 \cdot \frac{f_{si3}}{3} + h_4 \cdot \frac{f_{si4}}{3} + h_5 \cdot \frac{f_{si5}}{3} + h_6 \cdot \frac{f_{si6}}{3} + h_7 \cdot \frac{f_{si7}}{3} + h_8 \cdot \frac{f_{si8}}{3} \right) = 157.649 \quad kN$$

Slėgis po pamato padu:

$$p := \frac{\left(N - F_f\right)}{A_b} = 480.502 \quad kPa$$ ne daugiau nei Rs2

Pasisukimas ir pasislinkimas

Skaičiuojamasis pamato gylis:

$$d_d := h_1 + h_2 + h_3 + h_4 + h_5 + h_6 + h_7 + h_8 = 3.15 \quad m$$

Horiozntalios jėgos nuo momento aukštis virš pamato

$$h_m := \frac{M_d}{Q_d} = 9.804 \times 10^{-4}$$

Horizontalios jėgos pridėties taško skaičiuojamasis aukštis:

$$h_d := h - d_d + h_m = 9.804 \times 10^{-4}\ m$$

$$\eta := \frac{\left(1.5 \cdot h_d + 0.5 \cdot d_d\right)}{1.5 \cdot h_d + d_d} = 0.5 \qquad \mu := 0.5$$

kai Ff<N:

Pamato posūkiui besipriešinančių jėgų atstojamoji:

$$F_Q := \frac{\left[\left(N - F_f\right) \cdot \mu \cdot d_d + 1.5 \cdot F_f \cdot \frac{d}{\pi}\right]}{2 \cdot \left(1.5 \cdot h_d + d_d\right)} = 19.858 \quad kN$$

$$pamatas := if\left[F_Q \geq 0.5 \cdot (\eta + 1) \cdot Q_d, "nepasisuka", "pasisuka"\right] = "pasisuka"$$

Pamato posukio centro gylis nuo skaičiuojamojo pagrindo paviršiaus z0:

$$z_0 := \frac{d_d}{1 + \frac{(Q_d \cdot \eta - F_Q)}{Q_d - F_Q}} = 2.284 \quad m$$

$kadangi := if(z_0 < d_d, "u formule tinka", "netinka") = "u formule tinka"$

$$R_{s0.5} := 0.04 q_c \cdot 10^{-3} + 0.1 = 0.728$$

Horizontalus pagrindo standumo modulis:

$$C_h := \frac{R_{s0.5} \cdot 10^3}{0.005 \cdot d} = 3.64 \times 10^5$$

$$u_u := 0.01 \cdot d = 4 \times 10^{-3} \quad m$$

$$i_u := 0.005 \; m$$

$$u := \left[4 Q_d \cdot \frac{(1.5 h_d + d_d)}{C_h \cdot d \cdot d_d^{\,2}}\right] \cdot \left[1 + \frac{(h - d_d)}{z_0}\right] \cdot \left(1 - \frac{F_Q}{Q_d}\right) = 7.167 \times 10^{-4} \quad m$$

$poslinkis := if(u < u_u, "poslinkis leistinas", "poslinkis neleistinas") = "poslinkis leistinas"$

$$i := \frac{u}{(z_0 + h - d_d)} = 3.139 \times 10^{-4} \quad m$$

$pasisukimas := if(i < i_u, "pasisukimas leistinas", "pasisukimas neleistinas") = "pasisukimas leistinas"$

Gylis kuriame veikia didžiausias lenkimo momentas

Grunto prie pamato šoninio paviršiaus vidutinis stipris:

$$R_f := \frac{F_f}{\pi \cdot d \cdot d_d} = 39.826 \quad kN$$

Gylis, kuriame veikia didžiausias lenkimo momentas:

$$z_m := z_0 - \sqrt{z_0^{\,2} - \frac{\left(1 - \frac{d^2 \cdot R_f}{2 \cdot Q_d}\right) \cdot d_d^{\,2} \cdot z_0}{2 \cdot (1.5 \cdot h_d + d_d)}} = 0.967 \quad m$$

Didžiausias polių veikiantis lenkimo momentas:

$$M := Q_d \cdot (h_d + z_m) - \frac{2 \cdot Q_d}{3 \cdot d_d^{\,2} \cdot z_0} \cdot (1.5 \cdot h_d + d_d)(3 \cdot z_0 - z_m) \cdot z_m^{\,2} - \frac{d^2}{2} \cdot R_f \cdot z_m = 43.619 \; kNm$$

IŠVADA: sąlyga tenkinama

1.17.4. Pamatų nuosėdžių skaičiavimas

Pamatų nuosėdžiai grafiškai pavaizduoti pamatų plane.

Skaičiuojami nuosėdžiai po išorinėmis sienomis ašyse 1 ir 5:

Įvesties duomenys:

Ned	240	kN
B	0.3	m
L	1.88	m
A	0.564	m2
L1	0.94	m
B1	0.15	m

Polių eilių skaičius B kryptimi mB	1	vnt
Polių eilių skaičius L kryptimi mL	2	vnt
Atstumas tarp polių ašių B kryptimi aB	0	m
Atstumas tarp polių ašių L kryptimi aL	1.58	m
Polio skersmuo	0.3	m
Poliaus ilgis	3.75	m
Rostverko aukštis	0	m
Poliaus viršaus altittudė	4.22	m

Nuosėdis skaičiuojamas sumavimo metodu:

Eil. Nr.	d,m	γ, kN/m^3	$\sigma_{zg,}$ kPa	$0{,}2\sigma_{zg,}$ kPa	z,m	ξ=2z/b	η=l/b	K	$\sigma_{zp,}$ kPa	$\sigma_{zp,vid,}$ kPa	H_i, m	E, Mpa	S_i, m
1	7.97	22	175.3	35.07	0	0	6.267	1	425.53		0.06	79	
2	8.15	22	179.3	35.86	0.18	1.2	6.267	0.755	321.28	373.4	0.18	79	0.0009
3	8.33	22	183.3	36.65	0.36	2.4	6.267	0.477	202.98	262.1	0.18	79	0.0006
4	8.51	22	187.2	37.44	0.54	3.6	6.267	0.337	143.40	173.2	0.18	79	0.0004
5	8.69	22	191.2	38.24	0.72	4.8	6.267	0.258	109.79	126.6	0.18	79	0.0003
6	8.87	22	195.1	39.03	0.9	6	6.267	0.208	88.51	99.15	0.18	79	0.0002
7	9.05	22	199.1	39.82	1.08	7.2	6.267	0.175	74.47	81.49	0.18	79	0.0002
8	9.23	22	203.1	40.61	1.26	8.4	6.267	0.15	63.83	69.15	0.18	79	0.0002
9	9.41	22	207	41.4	1.44	9.6	6.267	0.132	56.17	60	0.18	79	0.0001
10	9.59	22	211	42.2	1.62	10.8	6.267	0.126	53.62	54.89	0.18	79	0.0001
11	9.77	22	214.9	42.99	1.8	12	6.267	0.104	44.26	48.94	0.18	79	0.0001
12	9.95	23	219.1	43.82	1.98	13.2	6.267	0.092	39.15	41.7	0.18	79	1E-04
												Σs_i=	0.0032

0,2 σzg>σzp

Didžiausias leistinas nuosėdis $0{,}03 \cdot b = 0{,}03 \cdot 0{,}3 = 0{,}9cm < 2{,}5cm$

Didžiausias nuosėdis $0{,}3cm < 0{,}9cm$

Išvada: sąlyga tenkinama

Skaičiuojami nuosėdžiai po vidinėmis sienomis ašyse 3 ir 4:

Įvesties duomenys:

Ned	216	kN
B	0.3	m
L	1.18	m
A	0.354	m2
L1	0.59	m
B1	0.15	m

Polių eilių skaičius B kryptimi mB	1	vnt
Polių eilių skaičius L kryptimi mL	2	vnt
Atstumas tarp polių ašių B kryptimi aB	0	m
Atstumas tarp polių ašių L kryptimi aL	0.88	m
Polio skersmuo	0.3	m
Poliaus ilgis	3.15	m
Rostverko aukštis	0	m
Poliaus viršaus altittudė	4.82	m

Nuosėdis skaičiuojamas sumavimo metodu:

Eil. Nr.	d,m	γ, kN/m^3	σ_{zg}, kPa	$0{,}2\sigma_{zg}$, kPa	z,m	ξ=2z/b	η=l/b	K	σ_{zp}, kPa	$\sigma_{zp,vid}$, kPa	H_i, m	E, Mpa	S_i, m
1	7.97	22	175.3	35.07	0	0	3.933	1	610.17		0.06	79	
2	8.09	22	178	35.6	0.12	0.8	3.933	0.881	537.56	573.9	0.12	79	0.0009
3	8.21	22	180.6	36.12	0.24	1.6	3.933	0.642	391.73	464.6	0.12	79	0.0007
4	8.33	22	183.3	36.65	0.36	2.4	3.933	0.477	291.05	341.4	0.12	79	0.0005
5	8.45	22	185.9	37.18	0.48	3.2	3.933	0.374	228.20	259.6	0.12	79	0.0004
6	8.57	22	188.5	37.71	0.6	4	3.933	0.306	186.71	207.5	0.12	79	0.0003
7	8.69	22	191.2	38.24	0.72	4.8	3.933	0.258	157.42	172.1	0.12	79	0.0003
8	8.81	22	193.8	38.76	0.84	5.6	3.933	0.223	136.07	146.7	0.12	79	0.0002
9	8.93	22	196.5	39.29	0.96	6.4	3.933	0.196	119.59	127.8	0.12	79	0.0002
10	9.05	22	199.1	39.82	1.08	7.2	3.933	0.175	106.78	113.2	0.12	79	0.0002
11	9.17	22	201.7	40.35	1.2	8	3.933	0.158	96.41	101.6	0.12	79	0.0002
12	9.29	23	204.5	40.9	1.32	8.8	3.933	0.144	87.86	92.14	0.12	79	0.0001
13	9.41	24	207.4	41.48	1.44	9.6	3.933	0.132	80.54	84.2	0.12	79	0.0001
14	9.53	25	210.4	42.08	1.56	10.4	3.933	0.126	76.88	78.71	0.12	79	0.0001
15	9.65	26	213.5	42.7	1.68	11.2	3.933	0.114	69.56	73.22	0.12	79	0.0001
16	9.77	27	216.7	43.35	1.8	12	3.933	0.104	63.46	66.51	0.12	79	0.0001
17	9.89	28	220.1	44.02	1.92	12.8	3.933	0.092	56.14	59.8	0.12	79	9E-05
18	10.01	29	223.6	44.72	2.04	13.6	3.933	0.082	50.03	53.08	0.12	79	8E-05
19	10.13	30	227.2	45.44	2.16	14.4	3.933	0.07	42.71	46.37	0.12	79	7E-05
												Σs_i=	0.0047

0,2 σzg>σzp

Didžiausias leistinas nuosėdis $0{,}03 \cdot b = 0{,}03 \cdot 0{,}3 = 0{,}9cm < 2{,}5cm$

Didžiausias nuosėdis $0{,}5cm < 0{,}9cm$

Išvada: sąlyga tenkinama

Skaičiuojami nuosėdžiai po vidinėmis sienomis ašyje 2:

Įvesties duomenys:

Ned	252	kN
B	0.3	m
L	1.28	m
A	0.384	m2
L1	0.64	m
B1	0.15	m

Polių eilių skaičius B kryptimi mB	1	vnt
Polių eilių skaičius L kryptimi mL	2	vnt
Atstumas tarp polių ašių B kryptimi aB	0	m
Atstumas tarp polių ašių L kryptimi aL	0.98	m
Polio skersmuo	0.3	m
Poliaus ilgis	3.15	m
Rostverko aukštis	0	m
Poliaus viršaus altittudė	4.82	m

Nuosėdis skaičiuojamas sumavimo metodu:

Eil. Nr.	d,m	γ, kN/m^3	σ_{zg}, kPa	$0{,}2\sigma_{zg}$, kPa	z,m	ξ=2z/b	η=l/b	K	σ_{zp}, kPa	$\sigma_{zp,vid}$, kPa	H_i, m	E, Mpa	S_i, m
1	7.97	22	175.3	35.07	0	0	4.267	1	656.25		0.06	79	
2	8.09	22	178	35.6	0.12	0.8	4.267	0.881	578.16	617.2	0.12	79	0.0009
3	8.21	22	180.6	36.12	0.24	1.6	4.267	0.642	421.31	499.7	0.12	79	0.0008
4	8.33	22	183.3	36.65	0.36	2.4	4.267	0.477	313.03	367.2	0.12	79	0.0006
5	8.45	22	185.9	37.18	0.48	3.2	4.267	0.374	245.44	279.2	0.12	79	0.0004
6	8.57	22	188.5	37.71	0.6	4	4.267	0.306	200.81	223.1	0.12	79	0.0003
7	8.69	22	191.2	38.24	0.72	4.8	4.267	0.258	169.31	185.1	0.12	79	0.0003
8	8.81	22	193.8	38.76	0.84	5.6	4.267	0.223	146.34	157.8	0.12	79	0.0002
9	8.93	22	196.5	39.29	0.96	6.4	4.267	0.196	128.63	137.5	0.12	79	0.0002
10	9.05	22	199.1	39.82	1.08	7.2	4.267	0.175	114.84	121.7	0.12	79	0.0002
11	9.17	22	201.7	40.35	1.2	8	4.267	0.158	103.69	109.3	0.12	79	0.0002
12	9.29	23	204.5	40.9	1.32	8.8	4.267	0.144	94.50	99.09	0.12	79	0.0002
13	9.41	24	207.4	41.48	1.44	9.6	4.267	0.132	86.63	90.56	0.12	79	0.0001
14	9.53	25	210.4	42.08	1.56	10.4	4.267	0.126	82.69	84.66	0.12	79	0.0001
15	9.65	26	213.5	42.7	1.68	11.2	4.267	0.114	74.81	78.75	0.12	79	0.0001
16	9.77	27	216.7	43.35	1.8	12	4.267	0.104	68.25	71.53	0.12	79	0.0001
17	9.89	28	220.1	44.02	1.92	12.8	4.267	0.092	60.38	64.31	0.12	79	1E-04
18	10.01	29	223.6	44.72	2.04	13.6	4.267	0.082	53.81	57.09	0.12	79	9E-05
19	10.13	30	227.2	45.44	2.16	14.4	4.267	0.07	45.94	49.88	0.12	79	8E-05
20	10.25	31	230.9	46.18	2.28	15.2	4.267	0.06	39.38	42.66	0.12	79	6E-05
												Σs_i=	0.0051

0,2 σzg>σzp

Didžiausias leistinas nuosėdis $0{,}03 \cdot b = 0{,}03 \cdot 0{,}3 = 0{,}9cm < 2{,}5cm$

Didžiausias nuosėdis $0{,}5cm < 0{,}9cm$

Išvada: sąlyga tenkinama

Skaičiuojami nuosėdžiai po išorinėmis sienomis ašyse A ir I:

Įvesties duomenys:

Ned	190	kN
B	0.3	m
L	1.4	m
A	0.42	m2
L1	0.7	m
B1	0.15	m

Polių eilių skaičius B kryptimi mB	1	vnt
Polių eilių skaičius L kryptimi mL	2	vnt
Atstumas tarp polių ašių B kryptimi aB	0	m
Atstumas tarp polių ašių L kryptimi aL	1.1	m
Polio skersmuo	0.3	m
Poliaus ilgis	3.75	m
Rostverko aukštis	0	m
Poliaus viršaus altittudė	4.22	m

Nuosėdis skaičiuojamas sumavimo metodu:

Eil. Nr.	d,m	γ, kN/m^3	σ_{zg}, kPa	$0{,}2\sigma_{zg}$, kPa	z,m	ξ=2z/b	η=l/b	K	σ_{zp}, kPa	$\sigma_{zp,vid}$, kPa	H_i, m	E, Mpa	S_i, m
1	7.97	22	175.3	35.07	0	0	4.667	1	452.38		0.06	79	
2	8.15	22	179.3	35.86	0.18	1.2	4.667	0.755	341.55	397	0.18	79	0.0009
3	8.33	22	183.3	36.65	0.36	2.4	4.667	0.477	215.79	278.7	0.18	79	0.0006
4	8.51	22	187.2	37.44	0.54	3.6	4.667	0.337	152.45	184.1	0.18	79	0.0004
5	8.69	22	191.2	38.24	0.72	4.8	4.667	0.258	116.71	134.6	0.18	79	0.0003
6	8.87	22	195.1	39.03	0.9	6	4.667	0.208	94.10	105.4	0.18	79	0.0002
7	9.05	22	199.1	39.82	1.08	7.2	4.667	0.175	79.17	86.63	0.18	79	0.0002
8	9.23	22	203.1	40.61	1.26	8.4	4.667	0.15	67.86	73.51	0.18	79	0.0002
9	9.41	22	207	41.4	1.44	9.6	4.667	0.132	59.71	63.79	0.18	79	0.0001
10	9.59	22	211	42.2	1.62	10.8	4.667	0.126	57.00	58.36	0.18	79	0.0001
11	9.77	22	214.9	42.99	1.8	12	4.667	0.104	47.05	52.02	0.18	79	0.0001
12	9.95	23	219.1	43.82	1.98	13.2	4.667	0.092	41.62	44.33	0.18	79	0.0001
												Σs_i=	0.0034

0,2 σzg>σzp

Didžiausias leistinas nuosėdis $0{,}03 \cdot b = 0{,}03 \cdot 0{,}3 = 0{,}9cm < 2{,}5cm$

Didžiausias nuosėdis $0{,}3cm < 0{,}9cm$

Išvada: sąlyga tenkinama

Skaičiuojami nuosėdžiai po vidinėmis sienomis tarp ašių D ir H:

Įvesties duomenys:

Ned	184	kN
B	0.3	m
L	1.28	m
A	0.384	m2
L1	0.64	m
B1	0.15	m

Polių eilių skaičius B kryptimi mB	1	vnt
Polių eilių skaičius L kryptimi mL	2	vnt
Atstumas tarp polių ašių B kryptimi aB	0	m
Atstumas tarp polių ašių L kryptimi aL	0.98	m
Polio skersmuo	0.3	m
Poliaus ilgis	3.15	m
Rostverko aukštis	0	m
Poliaus viršaus altittudė	4.82	m

Nuosėdis skaičiuojamas sumavimo metodu:

Eil. Nr.	d,m	γ, kN/m^3	σ_{zg}, kPa	$0{,}2\sigma_{zg}$, kPa	z,m	ξ=2z/b	η=l/b	K	σ_{zp}, kPa	$\sigma_{zp,vid}$, kPa	H_i, m	E, Mpa	S_i, m
1	7.97	22	175.3	35.07	0	0	4.267	1	479.17		0.06	79	
2	8.09	22	178	35.6	0.12	0.8	4.267	0.881	422.15	450.7	0.12	79	0.0007
3	8.21	22	180.6	36.12	0.24	1.6	4.267	0.642	307.63	364.9	0.12	79	0.0006
4	8.33	22	183.3	36.65	0.36	2.4	4.267	0.477	228.56	268.1	0.12	79	0.0004
5	8.45	22	185.9	37.18	0.48	3.2	4.267	0.374	179.21	203.9	0.12	79	0.0003
6	8.57	22	188.5	37.71	0.6	4	4.267	0.306	146.63	162.9	0.12	79	0.0002
7	8.69	22	191.2	38.24	0.72	4.8	4.267	0.258	123.63	135.1	0.12	79	0.0002
8	8.81	22	193.8	38.76	0.84	5.6	4.267	0.223	106.85	115.2	0.12	79	0.0002
9	8.93	22	196.5	39.29	0.96	6.4	4.267	0.196	93.92	100.4	0.12	79	0.0002
10	9.05	22	199.1	39.82	1.08	7.2	4.267	0.175	83.85	88.89	0.12	79	0.0001
11	9.17	22	201.7	40.35	1.2	8	4.267	0.158	75.71	79.78	0.12	79	0.0001
12	9.29	23	204.5	40.9	1.32	8.8	4.267	0.144	69.00	72.35	0.12	79	0.0001
13	9.41	24	207.4	41.48	1.44	9.6	4.267	0.132	63.25	66.13	0.12	79	0.0001
14	9.53	25	210.4	42.08	1.56	10.4	4.267	0.126	60.38	61.81	0.12	79	9E-05
15	9.65	26	213.5	42.7	1.68	11.2	4.267	0.114	54.63	57.5	0.12	79	9E-05
16	9.77	27	216.7	43.35	1.8	12	4.267	0.104	49.83	52.23	0.12	79	8E-05
17	9.89	28	220.1	44.02	1.92	12.8	4.267	0.092	44.08	46.96	0.12	79	7E-05
18	10.01	29	223.6	44.72	2.04	13.6	4.267	0.082	39.29	41.69	0.12	79	6E-05
												Σs_i=	0.0036

0,2 σzg>σzp

Didžiausias leistinas nuosėdis $0{,}03 \cdot b = 0{,}03 \cdot 0{,}3 = 0{,}9cm < 2{,}5cm$

Didžiausias nuosėdis $0{,}4cm < 0{,}9cm$

Išvada: sąlyga tenkinama

Skaičiuojami nuosėdžiai po vidinėmis sienomis neįrusintoje dalyje tarp ašių 4-5/C-I:

Įvesties duomenys:

Ned	223	kN
B	0.3	m
L	1.34	m
A	0.402	m2
L1	0.67	m
B1	0.15	m

Polių eilių skaičius B kryptimi mB	1	vnt
Polių eilių skaičius L kryptimi mL	2	vnt
Atstumas tarp polių ašių B kryptimi aB	0	m
Atstumas tarp polių ašių L kryptimi aL	1.04	m
Polio skersmuo	0.3	m
Poliaus ilgis	7.07	m
Rostverko aukštis	0	m
Poliaus viršaus altittudė	0.9	m

Nuosėdis skaičiuojamas sumavimo metodu:

Eil. Nr.	d,m	γ, kN/m^3	$\sigma_{zg,}$ kPa	$0{,}2\sigma_{zg,}$ kPa	z,m	ξ=2z/b	η=l/b	K	$\sigma_{zp,}$ kPa	$\sigma_{zp,vid,}$ kPa	H_i, m	E, Mpa	S_i, m
1	7.97	22	175.3	35.07	0	0	4.467	1	554.73		0.06	79	
2	8.09	22	178	35.6	0.12	0.8	4.467	0.881	488.71	521.7	0.12	79	0.0008
3	8.21	22	180.6	36.12	0.24	1.6	4.467	0.642	356.13	422.4	0.12	79	0.0006
4	8.33	22	183.3	36.65	0.36	2.4	4.467	0.477	264.60	310.4	0.12	79	0.0005
5	8.45	22	185.9	37.18	0.48	3.2	4.467	0.374	207.47	236	0.12	79	0.0004
6	8.57	22	188.5	37.71	0.6	4	4.467	0.306	169.75	188.6	0.12	79	0.0003
7	8.69	22	191.2	38.24	0.72	4.8	4.467	0.258	143.12	156.4	0.12	79	0.0002
8	8.81	22	193.8	38.76	0.84	5.6	4.467	0.223	123.70	133.4	0.12	79	0.0002
9	8.93	22	196.5	39.29	0.96	6.4	4.467	0.196	108.73	116.2	0.12	79	0.0002
10	9.05	22	199.1	39.82	1.08	7.2	4.467	0.175	97.08	102.9	0.12	79	0.0002
11	9.17	22	201.7	40.35	1.2	8	4.467	0.158	87.65	92.36	0.12	79	0.0001
12	9.29	23	204.5	40.9	1.32	8.8	4.467	0.144	79.88	83.76	0.12	79	0.0001
13	9.41	24	207.4	41.48	1.44	9.6	4.467	0.132	73.22	76.55	0.12	79	0.0001
14	9.53	25	210.4	42.08	1.56	10.4	4.467	0.126	69.90	71.56	0.12	79	0.0001
15	9.65	26	213.5	42.7	1.68	11.2	4.467	0.114	63.24	66.57	0.12	79	0.0001
16	9.77	27	216.7	43.35	1.8	12	4.467	0.104	57.69	60.47	0.12	79	9E-05
17	9.89	28	220.1	44.02	1.92	12.8	4.467	0.092	51.03	54.36	0.12	79	8E-05
18	10.01	29	223.6	44.72	2.04	13.6	4.467	0.082	45.49	48.26	0.12	79	7E-05
19	10.13	30	227.2	45.44	2.16	14.4	4.467	0.07	38.83	42.16	0.12	79	6E-05
												Σs_i=	0.0042

0,2 σzg>σzp

Didžiausias leistinas nuosėdis $0{,}03 \cdot b = 0{,}03 \cdot 0{,}3 = 0{,}9cm < 2{,}5cm$

Didžiausias nuosėdis $0{,}4cm < 0{,}9cm$

Išvada: sąlyga tenkinama

Skaičiuojami nuosėdžiai po išorinėmis sienomis neįrusintoje dalyje ašyje 5:

Įvesties duomenys:

Ned	193	kN
B	0.3	m
L	2	m
A	0.6	m2
L1	1	m
B1	0.15	m

Polių eilių skaičius B kryptimi mB	1	vnt
Polių eilių skaičius L kryptimi mL	2	vnt
Atstumas tarp polių ašių B kryptimi aB	0	m
Atstumas tarp polių ašių L kryptimi aL	1.7	m
Polio skersmuo	0.3	m
Poliaus ilgis	7.07	m
Rostverko aukštis	0	m
Poliaus viršaus altittudė	0.9	m

Nuosėdis skaičiuojamas sumavimo metodu:

Eil. Nr.	d,m	γ, kN/m^3	σ_{zg}, kPa	$0{,}2\sigma_{zg}$, kPa	z,m	ξ=2z/b	η=l/b	K	σ_{zp}, kPa	$\sigma_{zp,vid}$, kPa	H_i, m	E, Mpa	S_i, m
1	7.97	22	175.3	35.07	0	0	6.667	1	321.67		0.06	79	
2	8.09	22	178	35.6	0.12	0.8	6.667	0.881	283.39	302.5	0.12	79	0.0005
3	8.21	22	180.6	36.12	0.24	1.6	6.667	0.642	206.51	244.9	0.12	79	0.0004
4	8.33	22	183.3	36.65	0.36	2.4	6.667	0.477	153.44	180	0.12	79	0.0003
5	8.45	22	185.9	37.18	0.48	3.2	6.667	0.374	120.30	136.9	0.12	79	0.0002
6	8.57	22	188.5	37.71	0.6	4	6.667	0.306	98.43	109.4	0.12	79	0.0002
7	8.69	22	191.2	38.24	0.72	4.8	6.667	0.258	82.99	90.71	0.12	79	0.0001
8	8.81	22	193.8	38.76	0.84	5.6	6.667	0.223	71.73	77.36	0.12	79	0.0001
9	8.93	22	196.5	39.29	0.96	6.4	6.667	0.196	63.05	67.39	0.12	79	0.0001
10	9.05	22	199.1	39.82	1.08	7.2	6.667	0.175	56.29	59.67	0.12	79	9E-05
11	9.17	22	201.7	40.35	1.2	8	6.667	0.158	50.82	53.56	0.12	79	8E-05
12	9.29	23	204.5	40.9	1.32	8.8	6.667	0.144	46.32	48.57	0.12	79	7E-05
13	9.41	24	207.4	41.48	1.44	9.6	6.667	0.132	42.46	44.39	0.12	79	7E-05
14	9.53	25	210.4	42.08	1.56	10.4	6.667	0.126	40.53	41.5	0.12	79	6E-05
												Σs_i=	0.0022

0,2 σzg>σzp

Didžiausias leistinas nuosėdis $0{,}03 \cdot b = 0{,}03 \cdot 0{,}3 = 0{,}9cm < 2{,}5cm$

Didžiausias nuosėdis $0{,}2cm < 0{,}9cm$

Išvada: sąlyga tenkinama

Skaičiuojami nuosėdžiai po lifto šachtos prieduobe tarp ašių A-D/1-2:

Įvesties duomenys:

Ned	422	kN
B	0.4	m
L	2.02	m
A	0.808	m2
L1	1.01	m
B1	0.2	m

Polių eilių skaičius B kryptimi mB	1	vnt
Polių eilių skaičius L kryptimi mL	2	vnt
Atstumas tarp polių ašių B kryptimi aB	0	m
Atstumas tarp polių ašių L kryptimi aL	1.62	m
Polio skersmuo	0.4	m
Poliaus ilgis	3.15	m
Rostverko aukštis	0	m
Poliaus viršaus altittudė	5.6	m

Nuosėdis skaičiuojamas sumavimo metodu:

Eil. Nr.	d,m	γ, kN/m^3	$\sigma_{zg,}$ kPa	$0{,}2\sigma_{zg,}$ kPa	z,m	ξ=2z/b	η=l/b	K	$\sigma_{zp,}$ kPa	$\sigma_{zp,vid,}$ kPa	$H_{i,}$ m	E, Mpa	$S_{i,}$ m
1	8.75	22	192.5	38.5	0	0	5.05	1	522.28		0.08	79	
2	8.87	22	195.1	39.03	0.12	0.6	5.05	0.881	460.13	491.2	0.12	79	0.0007
3	8.99	22	197.8	39.56	0.24	1.2	5.05	0.642	335.30	397.7	0.12	79	0.0006
4	9.11	22	200.4	40.08	0.36	1.8	5.05	0.477	249.13	292.2	0.12	79	0.0004
5	9.23	22	203.1	40.61	0.48	2.4	5.05	0.374	195.33	222.2	0.12	79	0.0003
6	9.35	22	205.7	41.14	0.6	3	5.05	0.306	159.82	177.6	0.12	79	0.0003
7	9.47	22	208.3	41.67	0.72	3.6	5.05	0.258	134.75	147.3	0.12	79	0.0002
8	9.59	22	211	42.2	0.84	4.2	5.05	0.223	116.47	125.6	0.12	79	0.0002
9	9.71	22	213.6	42.72	0.96	4.8	5.05	0.196	102.37	109.4	0.12	79	0.0002
10	9.83	22	216.3	43.25	1.08	5.4	5.05	0.175	91.40	96.88	0.12	79	0.0001
11	9.95	22	218.9	43.78	1.2	6	5.05	0.158	82.52	86.96	0.12	79	0.0001
12	10.07	23	221.7	44.33	1.32	6.6	5.05	0.144	75.21	78.86	0.12	79	0.0001
13	10.19	24	224.5	44.91	1.44	7.2	5.05	0.132	68.94	72.07	0.12	79	0.0001
14	10.31	25	227.5	45.51	1.56	7.8	5.05	0.126	65.81	67.37	0.12	79	0.0001
15	10.43	26	230.7	46.13	1.68	8.4	5.05	0.114	59.54	62.67	0.12	79	1E-04
16	10.55	27	233.9	46.78	1.8	9	5.05	0.104	54.32	56.93	0.12	79	9E-05
17	10.67	28	237.3	47.45	1.92	9.6	5.05	0.092	48.05	51.18	0.12	79	8E-05
18	10.79	29	240.7	48.15	2.04	10.2	5.05	0.082	42.83	45.44	0.12	79	7E-05
												Σs_i=	0.0039

0,2 σzg>σzp

Didžiausias leistinas nuosėdis $0{,}03 \cdot b = 0{,}03 \cdot 0{,}4 = 1{,}2cm < 2{,}5cm$

Didžiausias nuosėdis $0{,}4cm < 1{,}2cm$

Išvada: sąlyga tenkinama

Skaičiuojami nuosėdžiai po polių siena ašyje 4:

Įvesties duomenys:

Ned	148	kN
B	0.4	m
L	0.9	m
A	0.36	m2
L1	0.45	m
B1	0.2	m

Polių eilių skaičius B kryptimi mB	1	vnt
Polių eilių skaičius L kryptimi mL	2	vnt
Atstumas tarp polių ašių B kryptimi aB	0	m
Atstumas tarp polių ašių L kryptimi aL	0.5	m
Polio skersmuo	0.4	m
Poliaus ilgis	7.63	m
Rostverko aukštis	0	m
Poliaus viršaus altittudė	1	m

Nuosėdis skaičiuojamas sumavimo metodu:

Eil. Nr.	d,m	γ, kN/m^3	$\sigma_{zg,}$ kPa	$0{,}2\sigma_{zg,}$ kPa	z,m	ξ=2z/b	η=l/b	K	$\sigma_{zp,}$ kPa	$\sigma_{zp,vid,}$ kPa	$H_{i,}$ m	E, Mpa	$S_{i,}$ m
1	8.63	22	189.9	37.97	0	0	2.25	1	437.00		0.08	79	
2	8.75	22	192.5	38.5	0.12	0.6	2.25	0.881	385.00	411	0.12	79	0.0006
3	8.87	22	195.1	39.03	0.24	1.2	2.25	0.642	280.55	332.8	0.12	79	0.0005
4	8.99	22	197.8	39.56	0.36	1.8	2.25	0.477	208.45	244.5	0.12	79	0.0004
5	9.11	22	200.4	40.08	0.48	2.4	2.25	0.374	163.44	185.9	0.12	79	0.0003
6	9.23	22	203.1	40.61	0.6	3	2.25	0.306	133.72	148.6	0.12	79	0.0002
7	9.35	22	205.7	41.14	0.72	3.6	2.25	0.258	112.75	123.2	0.12	79	0.0002
8	9.47	22	208.3	41.67	0.84	4.2	2.25	0.223	97.45	105.1	0.12	79	0.0002
9	9.59	22	211	42.2	0.96	4.8	2.25	0.196	85.65	91.55	0.12	79	0.0001
10	9.71	22	213.6	42.72	1.08	5.4	2.25	0.175	76.48	81.06	0.12	79	0.0001
11	9.83	22	216.3	43.25	1.2	6	2.25	0.158	69.05	72.76	0.12	79	0.0001
12	9.95	23	219	43.8	1.32	6.6	2.25	0.144	62.93	65.99	0.12	79	0.0001
13	10.07	24	221.9	44.38	1.44	7.2	2.25	0.132	57.68	60.31	0.12	79	9E-05
14	10.19	25	224.9	44.98	1.56	7.8	2.25	0.126	55.06	56.37	0.12	79	9E-05
15	10.31	26	228	45.6	1.68	8.4	2.25	0.114	49.82	52.44	0.12	79	8E-05
16	10.43	27	231.3	46.25	1.8	9	2.25	0.104	45.45	47.63	0.12	79	7E-05
												Σs_i=	0.0032

0,2 σzg>σzp

Didžiausias leistinas nuosėdis $0{,}03 \cdot b = 0{,}03 \cdot 0{,}4 = 1{,}2cm < 2{,}5cm$

Didžiausias nuosėdis $0{,}3cm < 1{,}2cm$

Išvada: sąlyga tenkinama

Skaičiuojami nuosėdžiai po kolonomis tarp H ir I:

Įvesties duomenys:

Ned	373	kN
B	0.4	m
L	0.4	m
A	0.16	m2
L1	0.2	m
B1	0.2	m

Polių eilių skaičius B kryptimi mB	1	vnt
Polių eilių skaičius L kryptimi mL	1	vnt
Atstumas tarp polių ašių B kryptimi aB	0	m
Atstumas tarp polių ašių L kryptimi aL	0	m
Polio skersmuo	0.4	m
Poliaus ilgis	3.2	m
Rostverko aukštis	0	m
Poliaus viršaus altitudė	4.77	m

Nuosėdis skaičiuojamas sumavimo metodu:

Eil. Nr.	d,m	γ, kN/m^3	σ_{zg}, kPa	$0{,}2\sigma_{zg}$, kPa	z,m	ξ=2z/b	η=l/b	K	σ_{zp}, kPa	$\sigma_{zp,vid}$, kPa	H_i, m	E, Mpa	S_i, m
1	7.97	22	175.3	35.07	0	0	1	1	2331.25		0.08	79	
2	8.13	22	178.9	35.77	0.16	0.8	1	0.756	1762.43	2047	0.16	79	0.0041
3	8.29	22	182.4	36.48	0.32	1.6	1	0.39	909.19	1336	0.16	79	0.0027
4	8.45	22	185.9	37.18	0.48	2.4	1	0.214	498.89	704	0.16	79	0.0014
5	8.61	22	189.4	37.88	0.64	3.2	1	0.13	303.06	401	0.16	79	0.0008
6	8.77	22	192.9	38.59	0.8	4	1	0.087	202.82	252.9	0.16	79	0.0005
7	8.93	22	196.5	39.29	0.96	4.8	1	0.067	156.19	179.5	0.16	79	0.0004
8	9.09	22	200	40	1.12	5.6	1	0.046	107.24	131.7	0.16	79	0.0003
9	9.25	22	203.5	40.7	1.28	6.4	1	0.036	83.93	95.58	0.16	79	0.0002
10	9.41	22	207	41.4	1.44	7.2	1	0.028	65.28	74.6	0.16	79	0.0002
11	9.57	22	210.5	42.11	1.6	8	1	0.022	51.29	58.28	0.16	79	0.0001
12	9.73	23	214.2	42.84	1.76	8.8	1	0.019	44.29	47.79	0.16	79	1E-04
13	9.89	24	218.1	43.61	1.92	9.6	1	0.016	37.30	40.8	0.16	79	8E-05
												Σs_i=	0.0109

0,2 σzg>σzp

Didžiausias leistinas nuosėdis $0{,}03 \cdot b = 0{,}03 \cdot 0{,}4 = 1{,}2cm < 2{,}5cm$

Didžiausias nuosėdis $1{,}1cm < 1{,}2cm$

Išvada: sąlyga tenkinama

Skaičiuojami nuosėdžiai po kolonomis ant I ašies ir tarp D ir H:

Įvesties duomenys:

Ned	142	kN
B	0.4	m
L	0.4	m
A	0.16	m2
L1	0.2	m
B1	0.2	m

Polių eilių skaičius B kryptimi mB	1	vnt
Polių eilių skaičius L kryptimi mL	1	vnt
Atstumas tarp polių ašių B kryptimi aB	0	m
Atstumas tarp polių ašių L kryptimi aL	0	m
Polio skersmuo	0.4	m
Poliaus ilgis	3.2	m
Rostverko aukštis	0	m
Poliaus viršaus altitudė	4.77	m

Nuosėdis skaičiuojamas sumavimo metodu:

Eil. Nr.	d,m	γ, kN/m^3	$\sigma_{zg,}$ kPa	$0{,}2\sigma_{zg,}$ kPa	z,m	ξ=2z/b	η=l/b	K	$\sigma_{zp,}$ kPa	$\sigma_{zp,vid,}$ kPa	$H_{i,}$ m	E, Mpa	$S_{i,}$ m
1	7.97	22	175.3	35.07	0	0	1	1	887.50		0.08	79	
2	8.13	22	178.9	35.77	0.16	0.8	1	0.756	670.95	779.2	0.16	79	0.0016
3	8.29	22	182.4	36.48	0.32	1.6	1	0.39	346.13	508.5	0.16	79	0.001
4	8.45	22	185.9	37.18	0.48	2.4	1	0.214	189.93	268	0.16	79	0.0005
5	8.61	22	189.4	37.88	0.64	3.2	1	0.13	115.38	152.7	0.16	79	0.0003
6	8.77	22	192.9	38.59	0.8	4	1	0.087	77.21	96.29	0.16	79	0.0002
7	8.93	22	196.5	39.29	0.96	4.8	1	0.067	59.46	68.34	0.16	79	0.0001
8	9.09	22	200	40	1.12	5.6	1	0.046	40.83	50.14	0.16	79	0.0001
9	9.25	22	203.5	40.7	1.28	6.4	1	0.036	31.95	36.39	0.16	79	7E-05
												Σs_i=	0.004

0,2 σzg>σzp

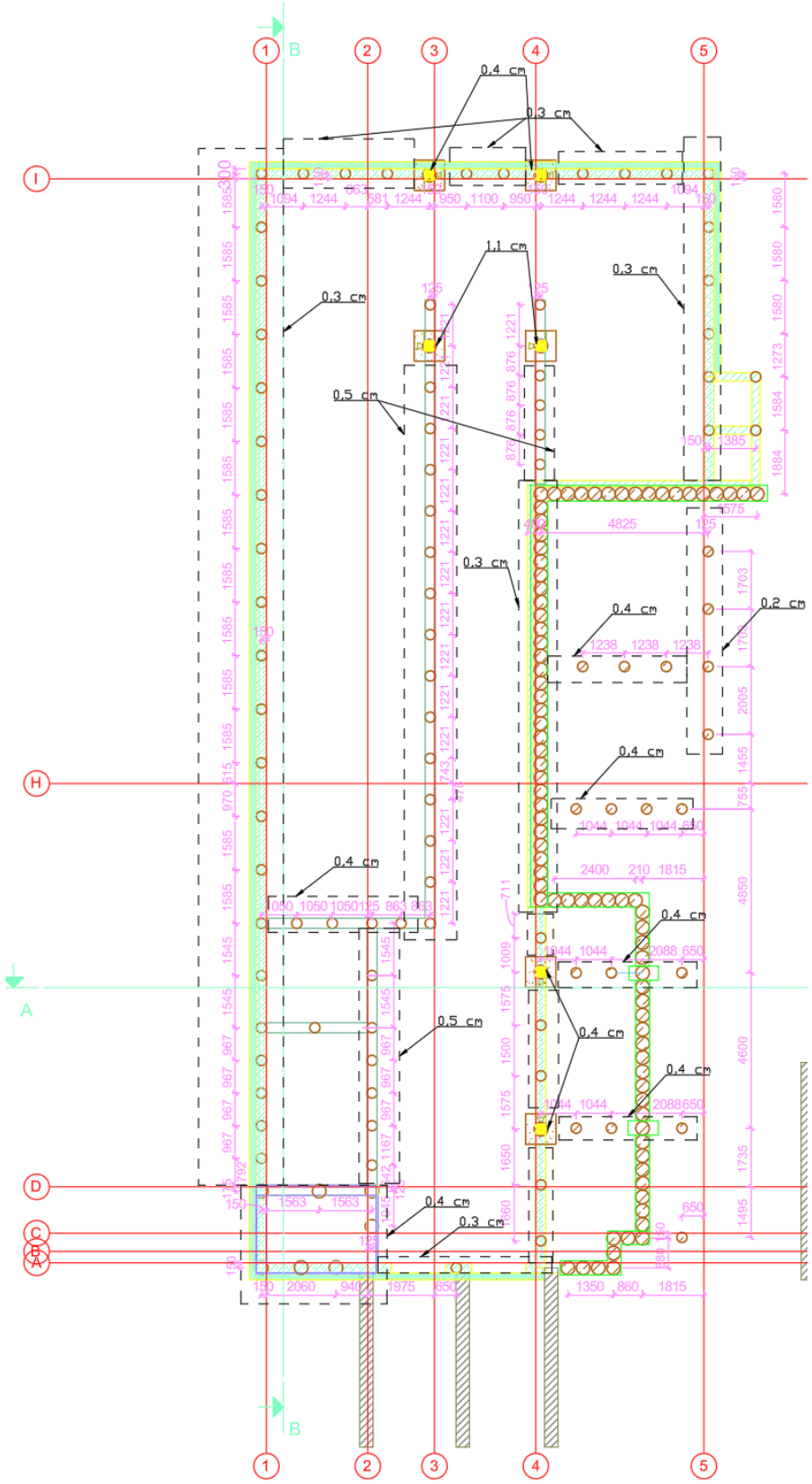
Didžiausias leistinas nuosėdis $0{,}03 \cdot b = 0{,}03 \cdot 0{,}4 = 1{,}2cm < 2{,}5cm$

Didžiausias nuosėdis $0{,}4cm < 1{,}2cm$

Išvada: sąlyga tenkinama

1.17.5. Pamatų santykinių nuosėdžių tikrinimas

Pamatų nuosėdžiai grafiškai pavaizduoti pamatų plane:



Tikrinami santykiniai nuosėdžiai tarp ašių 1 ir 3 ir tarp ašių 4 ir 5:

$$\frac{s_1 - s_2}{L} = \frac{0{,}5 - 0{,}3}{500} = 0{,}0004 \leq 0{,}002.$$

Tikrinami santykiniai nuosėdžiai tarp ašių 3 ir 4:

$$\frac{s_1 - s_3}{L} = \frac{0{,}5 - 0{,}3}{328} = 0{,}0006 \leq 0{,}002.$$

Tikrinami santykiniai nuosėdžiai tarp ašių 4 ir 5:

$$\frac{s_3 - s_4}{L} = \frac{0{,}3 - 0{,}2}{500} = 0{,}0002 \leq 0{,}002.$$

Tikrinami santykiniai nuosėdžiai kolonų tarp ašių I ir H:

$$\frac{s_5 - s_6}{L} = \frac{1{,}1 - 0{,}4}{500} = 0{,}0014 \leq 0{,}002.$$

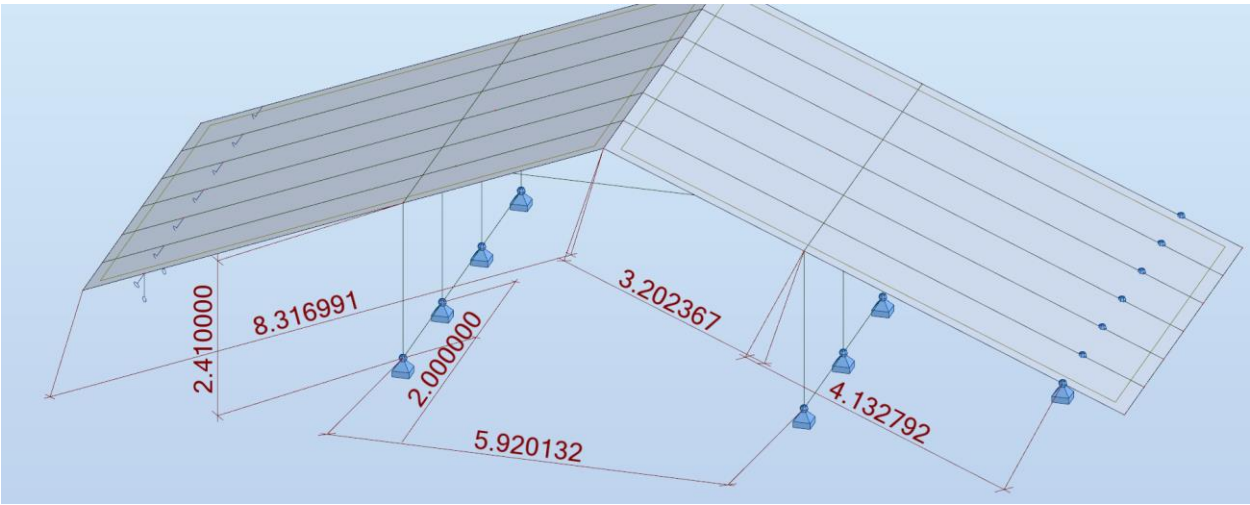
Išvada: visos sąlygos yra tenkinamos

1.18. Esamo pastato naujai projektuojamų konstrukcijų skaičiavimas

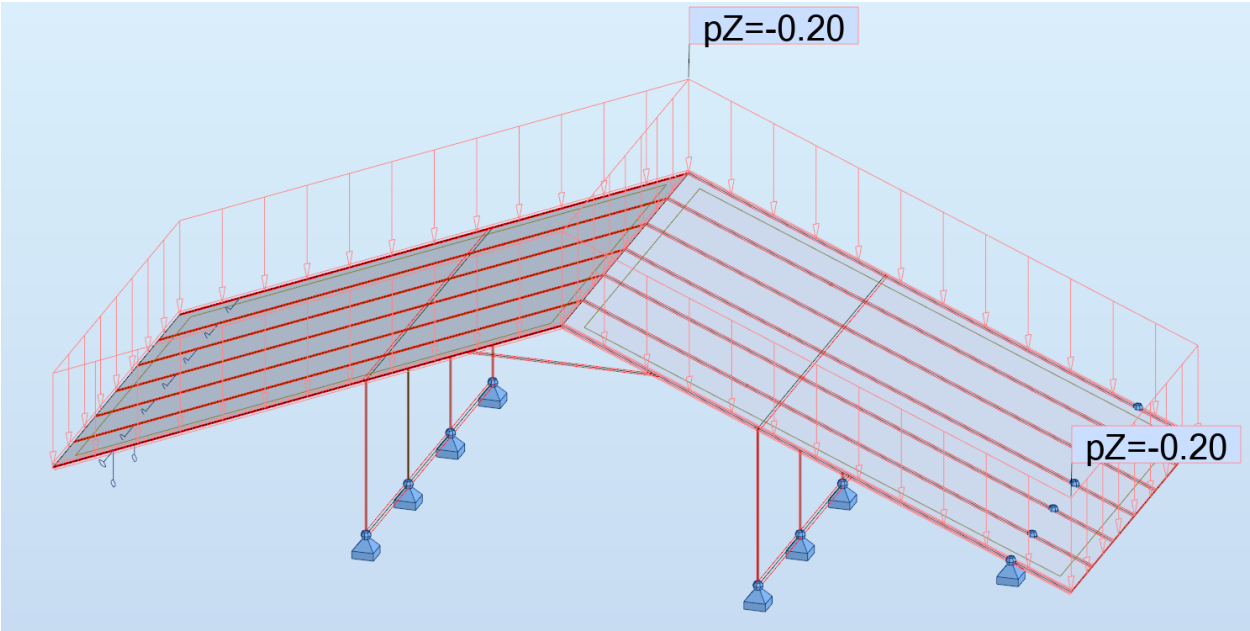
1.18.1. Esamų medinių stogo konstrukcijų atnaujinimas

Dėl blogos esamos medienos būklės atnaujinamos esamo stogo medinės konstrukcijos pilnai išlaikant esamą skaičiuojamąją schemą. Skaičiuojamas pagrindinis stogo rėmas su esamais skerspjūviais. Naudojama medienos klasė C18.

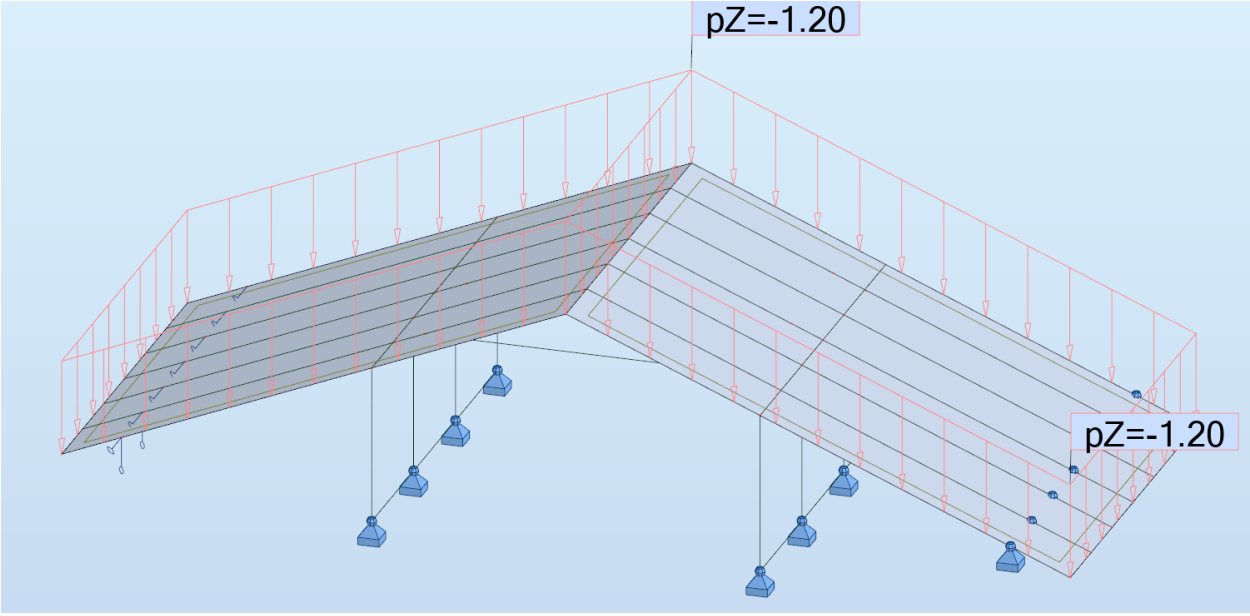
Skaičiuojamoji schema:



Veikiančios apkrovos. Nuolatinės apkrovos:



Sniego apkrovos:



Gegnės projektavimas

CODE: *EN 1995-1:2004/A2:2014*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 62 **POINT:** 3 **COORDINATE:** x = 0.39 L = 3.202542 m

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LOADS:
Governing Load Case: 4 ULS/2=1*1.35 1*1.35

MATERIAL C18

gM = 1.30	f m,0,k = 18.00 MPa	f t,0,k = 11.00 MPa	f c,0,k = 18.00 MPa
f v,k = 3.40 MPa	f t,90,k = 0.40 MPa	f c,90,k = 2.20 MPa	E 0,moyen = 9000.00 MPa
E 0,05 = 6000.00 MPa	G moyen = 560.00 MPa	Service class: 2	Beta c = 0.20



SECTION PARAMETERS: Gegnė

ht=15.0 cm

bf=10.0 cm	Ay=100.00 cm2	Az=100.00 cm2	Ax=150.00 cm2
	Iy=2812.50 cm4	Iz=1250.00 cm4	Ix=2936.5 cm4
	Wy=375.00 cm3	Wz=250.00 cm3	

STRESSES
Sig_t,0,d = N/Ax = -0.42/150.00 = -0.03 MPa
Sig_m,y,d = MY/Wy= -0.65/375.00 = -1.73 MPa
Sig_m,z,d = MZ/Wz= -0.01/250.00 = -0.06 MPa
Tau y,d = 1.5*-0.00/150.00 = -0.00 MPa
Tau z,d = 1.5*-1.52/150.00 = -0.15 MPa
Tau tory,d = 0.00 MPa, Tau torz,d = 0.00 MPa

ALLOWABLE STRESSES
f t,0,d = 5.51 MPa
f m,y,d = 8.31 MPa
f m,z,d = 9.01 MPa
f v,d = 1.57 MPa

Factors and additional parameters
km = 0.70 kh = 1.08 kmod = 0.60 Ksys = 1.00 kcr = 0.67

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

About Y axis: About Z axis:

VERIFICATION FORMULAS:

Sig_t,0,d/f t,0,d + Sig_m,y,d/f m,y,d + km*Sig_m,z,d/f m,z,d = 0.22 < 1.00 (6.17)

(Tau y,d/kcr+Tau tory,d/kshape)/f v,d = 0.00 < 1.00 (Tau z,d/kcr+Tau torz,d/kshape)/f v,d = 0.14 < 1.00 (6.13-4)

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM):

Displacements (GLOBAL SYSTEM):

v x = 0.1 cm < v max,x = L/150.00 = 5.5 cm Verified

Governing load case: SLS:QPR/4=1*1.00 1*1.00

v y = 0.0 cm < v max,y = L/150.00 = 5.5 cm Verified

Governing load case: SLS:QPR/4=1*1.00 1*1.00

Section OK !!!

Išvada: laikomoji galia pakankama

Stygos projektavimas

CODE: *EN 1995-1:2004/A2:2014*

ANALYSIS TYPE: Member Verification

CODE GROUP:

MEMBER: 84 Styga_84 **POINT:** 2 **COORDINATE:** x = 0.50 L = 2.482135 m

---

LOADS:

Governing Load Case: 4 ULS/2=1*1.35 1*1.35

MATERIAL C18

gM = 1.30	f m,0,k = 18.00 MPa	f t,0,k = 11.00 MPa	f c,0,k = 18.00 MPa
f v,k = 3.40 MPa	f t,90,k = 0.40 MPa	f c,90,k = 2.20 MPa	E 0,moyen = 9000.00 MPa
E 0,05 = 6000.00 MPa	G moyen = 560.00 MPa	Service class: 2	Beta c = 0.20

SECTION PARAMETERS: Styga

ht=15.0 cm

bf=10.0 cm	Ay=100.00 cm2	Az=100.00 cm2	Ax=150.00 cm2
	Iy=2812.50 cm4	Iz=1250.00 cm4	Ix=2936.5 cm4
	Wy=375.00 cm3	Wz=250.00 cm3	

STRESSES

Sig_t,0,d = N/Ax = -2.39/150.00 = -0.16 MPa

Sig_m,y,d = MY/Wy= -0.20/375.00 = -0.52 MPa

Tau tory,d = 0.00 MPa, Tau torz,d = 0.00 MPa

ALLOWABLE STRESSES

f t,0,d = 5.51 MPa

f m,y,d = 8.31 MPa

Factors and additional parameters

kh = 1.08 kh_y = 1.00 kmod = 0.60 Ksys = 1.00

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

About Y axis: About Z axis:

VERIFICATION FORMULAS:

Sig_t,0,d/f t,0,d + Sig_m,y,d/f m,y,d = 0.16/5.51 + 0.52/8.31 = 0.09 < 1.00 (6.17)

(Tau y,d+Tau tory,d/kshape)/f v,d = 0.00 < 1.00 (Tau z,d+Tau torz,d/kshape)/f v,d = 0.00 < 1.00 (6.13-4)

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM):

Displacements (GLOBAL SYSTEM):

v x = 0.0 cm < v max,x = L/150.00 = 3.3 cm Verified

Governing load case: SLS:QPR/4=1*1.00 1*1.00

v y = 0.0 cm < v max,y = L/150.00 = 3.3 cm Verified

Governing load case: SLS:QPR/4=1*1.00 1*1.00

Section OK !!!

Išvada: laikomoji galia pakankama

Medinės kolonos projektavimas

CODE: *EN 1995-1:2004/A2:2014*

ANALYSIS TYPE: Member Verification

CODE GROUP:

MEMBER: 78 Medine kolona_78 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.000000 m

---

LOADS:

Governing Load Case: 4 ULS/2=1*1.35 1*1.35

MATERIAL C18

gM = 1.30	f m,0,k = 18.00 MPa	f t,0,k = 11.00 MPa	f c,0,k = 18.00 MPa
f v,k = 3.40 MPa	f t,90,k = 0.40 MPa	f c,90,k = 2.20 MPa	E 0,moyen = 9000.00 MPa
E 0,05 = 6000.00 MPa	G moyen = 560.00 MPa	Service class: 1	Beta c = 0.20

SECTION PARAMETERS: 150x150

ht=15.0 cm

bf=15.0 cm	Ay=150.00 cm2	Az=150.00 cm2	Ax=225.00 cm2
	Iy=4218.75 cm4	Iz=4218.75 cm4	Ix=7117.0 cm4
	Wy=562.50 cm3	Wz=562.50 cm3	

STRESSES

Sig_c,0,d = N/Ax = 4.65/225.00 = 0.21 MPa

Sig_m,y,d = MY/Wy= 0.00/562.50 = 0.01 MPa

Sig_m,z,d = MZ/Wz= 0.00/562.50 = 0.00 MPa

ALLOWABLE STRESSES

f c,0,d = 8.31 MPa

f m,y,d = 8.31 MPa

f m,z,d = 8.31 MPa

Tau y,d = 1.5*0.00/225.00 = 0.00 MPa f v,d = 1.57 MPa
Tau z,d = 1.5*0.00/225.00 = 0.00 MPa
Tau tory,d = 0.00 MPa, Tau torz,d = 0.00 MPa

Factors and additional parameters
km = 0.70 kh = 1.00 kmod = 0.60 Ksys = 1.00 kcr = 0.67

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

About Y axis:

		About Z axis:	
LY = 2.410002 m	Lambda Y = 111.31	LZ = 2.410002 m	Lambda Z = 111.31
Lambda_rel Y = 1.94	ky = 2.55	Lambda_rel Z = 1.94	kz = 2.55
LFY = 4.820005 m	kcy = 0.24	LFZ = 4.820005 m	kcz = 0.24

VERIFICATION FORMULAS:
(Sig_c,0,d/kc,y*f c,0,d) + Sig_m,y,d/f m,y,d + km*Sig_m,z,d/f m,z,d = 0.11 < 1.00 (6.23)

(Tau y,d/kcr+Tau tory,d/kshape)/f v,d = 0.00 < 1.00 (Tau z,d/kcr+Tau torz,d/kshape)/f v,d = 0.00 < 1.00 (6.13-4)

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM):

Displacements (GLOBAL SYSTEM):
v x = 0.0 cm < v max,x = L/150.00 = 1.6 cm Verified
Governing load case: SLS:QPR/4=1*1.00 1*1.00
v y = 0.0 cm < v max,y = L/150.00 = 1.6 cm Verified
Governing load case: SLS:QPR/4=1*1.00 1*1.00

Section OK !!!

Išvada: laikomoji galia pakankama

Išilginės medinės sijos projektavimas

CODE: *EN 1995-1:2004/A2:2014*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 108 Timber Beam_108 **POINT:** 1 **COORDINATE:** x = 0.83 L = 5.000000 m

---

LOADS:
Governing Load Case: 4 ULS/2=1*1.35 1*1.35

MATERIAL C18

gM = 1.30	f m,0,k = 18.00 MPa	f t,0,k = 11.00 MPa	f c,0,k = 18.00 MPa
f v,k = 3.40 MPa	f t,90,k = 0.40 MPa	f c,90,k = 2.20 MPa	E 0,moyen = 9000.00 MPa
E 0,05 = 6000.00 MPa	G moyen = 560.00 MPa	Service class: 1	Beta c = 0.20



SECTION PARAMETERS: 180x120

ht=18.0 cm
bf=12.0 cm

	Ay=144.00 cm2	Az=144.00 cm2	Ax=216.00 cm2
	Iy=5832.00 cm4	Iz=2592.00 cm4	Ix=6013.4 cm4
	Wy=648.00 cm3	Wz=432.00 cm3	

STRESSES

Sig_t,0,d = N/Ax = -0.00/216.00 = -0.00 MPa
Sig_m,y,d = MY/Wy= -0.75/648.00 = -1.15 MPa
Sig_m,z,d = MZ/Wz= -0.34/432.00 = -0.79 MPa
Tau y,d = 1.5*-0.41/216.00 = -0.03 MPa
Tau z,d = 1.5*-0.67/216.00 = -0.05 MPa
Tau tory,d = 0.01 MPa, Tau torz,d = 0.01 MPa

ALLOWABLE STRESSES

f t,0,d = 5.31 MPa
f m,y,d = 8.31 MPa
f m,z,d = 8.69 MPa
f v,d = 1.57 MPa

Factors and additional parameters

km = 0.70 kh = 1.05 kmod = 0.60 Ksys = 1.00 kcr = 0.67



LATERAL BUCKLING PARAMETERS:

lef = 5.400000 m Lambda_rel m = 0.58
Sig_cr = 53.05 MPa k crit = 1.00

BUCKLING PARAMETERS:

 About Y axis:

 About Z axis:

VERIFICATION FORMULAS:

Sig_t,0,d/f t,0,d + Sig_m,y,d/f m,y,d + km*Sig_m,z,d/f m,z,d = 0.20 < 1.00 (6.17)
Sig_m,y,d/(kcrit*f m,y,d) = 1.15/(1.00*8.31) = 0.14 < 1.00 (6.33)
(Tau y,d/kcr+Tau tory,d/kshape)/f v,d = 0.03 < 1.00 (Tau z,d/kcr+Tau torz,d/kshape)/f v,d = 0.05 < 1.00 (6.13-4)

LIMIT DISPLACEMENTS



Deflections (LOCAL SYSTEM):

u fin,y = 0.1 cm < u fin,max,y = L/200.00 = 3.0 cm Verified
Governing load case: (1+0.6)*1
u fin,z = 0.0 cm < u fin,max,z = L/200.00 = 3.0 cm Verified
Governing load case: (1+0.6)*1



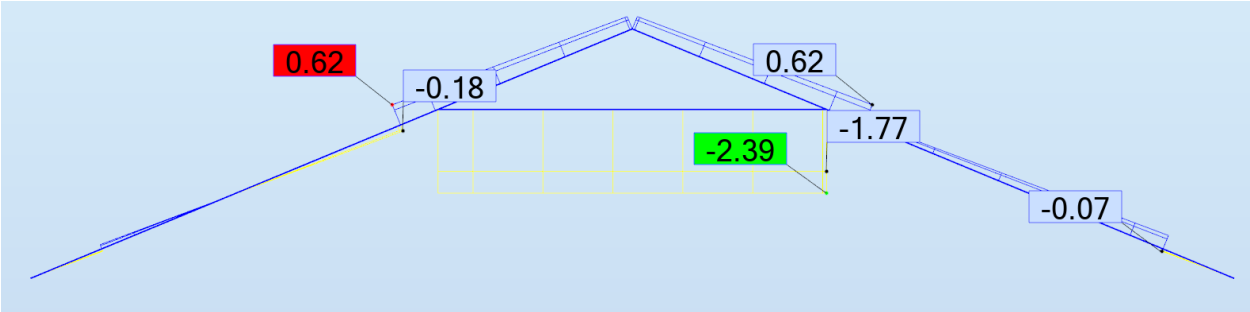
Displacements (GLOBAL SYSTEM):

Section OK !!!

Išvada: laikomoji galia pakankama

1.18.2. Medinių elementų jungimo mazgų skaičiavimas

Skaičiuojamas stygos ir gegnės mazgas. Numatomas mazgas su 5mm skersmens 4vnt. medsraigčiais. Stygoje veikianti didžiausia ašinė jėga 2,4 kN.



Veikianti skersinė jėga prie atramos:

$V_{ed} := 2.4$ kN

Varžtas

$d := 5$ mm

Charakteristinis tempiamasis stipris:

$f_{uk} := 800$ MPa

Medinio elemento storis ir plotis:

$t_1 := 100$ mm

$b := 150$ mm

$t_2 := 100$ mm

Charakteristinis medienos tankis:

$\rho_k := 350$ $\frac{kg}{m3}$

Apkrovos krypties kampas medienos pluoštų krypties atžvilgiu

$\alpha_1 := 90$ laipsnių

$\alpha_2 := 90$ laipsnių

Medinio elemento charakteristinis vietinis stipris(apkrova išilgai pluošto):

$f_{h0k} := 0.082 \cdot (1 - 0.01 \cdot d) \cdot \rho_k = 27.265$ $\frac{N}{mm2}$

$k_{90} := 1.35 + 0.015 \cdot d = 1.425$ spygliuočių medienai

Medinio elemento charakteristinis vietinis stipris(apkrova kampu į pluoštą):

$$f_{hk1} := \frac{f_{h0k}}{k_{90} \cdot \sin\left(\alpha_1 \cdot \frac{\pi}{180}\right)^2 + \cos\left(\alpha_1 \cdot \frac{\pi}{180}\right)^2} = 19.133 \quad \frac{N}{mm2}$$

$$f_{hk2} := \frac{f_{h0k}}{k_{90} \cdot \sin\left(\alpha_2 \cdot \frac{\pi}{180}\right)^2 + \cos\left(\alpha_2 \cdot \frac{\pi}{180}\right)^2} = 19.133 \quad \frac{N}{mm2}$$

$$\beta := \frac{f_{hk2}}{f_{hk1}} = 1$$

Varžtų charakteristinė takumo reikšmė:

$M_{yRk} := 0.3 \cdot f_{uk} \cdot d^{2.6} = 1.576 \times 10^4$ Nmm

Jungės ašinė ištraukiamoji galia:

$F_{axRk} := 0$

$F_{vrk1} := f_{hk1} \cdot t_1 \cdot d \cdot 10^{-3} = 9.567$ kN

$F_{vrk2} := f_{hk2} \cdot t_2 \cdot d \cdot 10^{-3} = 9.567$ kN

$$F_{vrk3} := \frac{f_{hk1} \cdot t_1 \cdot d \cdot 10^{-3}}{1 + \beta} \cdot \left[\sqrt{\beta + 2 \cdot \beta^2 \cdot \left[1 + \frac{t_2}{t_1} + \left(\frac{t_2}{t_1} \right)^2 \right] + \beta^3 \cdot \left(\frac{t_2}{t_1} \right)^2} - \beta \cdot \left(1 + \frac{t_2}{t_1} \right) \right] + \frac{F_{axRk}}{4} = 3.9 \text{(kN}$$

$$F_{vrk4} := 1.05 \cdot \frac{f_{hk1} \cdot t_1 \cdot d \cdot 10^{-3}}{2 + \beta} \cdot \left[\sqrt{2 \cdot \beta \cdot (1 + \beta) + \frac{4 \cdot \beta \cdot (2 + \beta) \cdot M_{yRk}}{f_{hk1} \cdot d \cdot t_1^2}} - \beta \right] + \frac{F_{axRk}}{4} = 3.512 \quad \text{kN}$$

$$F_{vrk5} := 1.05 \cdot \frac{f_{hk2} \cdot t_2 \cdot d \cdot 10^{-3}}{1 + 2 \cdot \beta} \cdot \left[\sqrt{2 \cdot \beta^2 \cdot (1 + \beta) + \frac{4 \cdot \beta \cdot (1 + 2 \cdot \beta) \cdot M_{yRk}}{f_{hk2} \cdot d \cdot t_2^{\,2}}} - \beta \right] + \frac{F_{axRk}}{4} = 3.512 \ \text{kN}$$

$$F_{vrk6} := 10^{-3} \cdot 1.15 \cdot \sqrt{\frac{2 \cdot \beta}{1 + \beta}} \cdot \sqrt{2 \cdot M_{yRk} \cdot f_{hk1} \cdot d} + \frac{F_{axRk}}{4} = 1.997 \quad \text{kN}$$

Charakteristinė laikomoji galia, atitinkanti vienos jungės vieną šlyties plokštumą:

$$F_{vrk} := \min\left(F_{vrk1}, F_{vrk2}, F_{vrk3}, F_{vrk4}, F_{vrk5}, F_{vrk6}\right) = 1.997 \quad \text{kN}$$

$$k_{mod} := 0.8$$

$$\gamma_m := 1.3$$

Skaičiuotinė laikomoji galia, atitinkanti vienos jungės vieną šlyties plokštumą:

$$F_{vrd} := \frac{F_{vrk} \cdot k_{mod}}{\gamma_m} = 1.229 \quad \text{kN}$$

Bendra stygos mazgo skaičiuojamoji laikomoji galia:

$F_d = F_{vrd} \cdot n = 1{,}229 \cdot 4 = 4{,}916\ kN.$

Išvada: $F_d = 4,916 kN > N = 2,4\ kN$. Mazgo laikomoji galia pakankama

1.18.3. Atnaujinamų medinių konstrukcijų atsparumo ugniai skaičiavimas

Stogo konstrukcijoms keliami reikalavimai R20.

Paskaičiuoti efektyvieji elementų skerspjūviai po apanglėjimo praėjus 20min nuo gaisro pradžios (žemiau pateikti visų skerspjūvių apanglėjimo skaičiavimai):

- Gegnės 150x100mm, paskaičiavus apanglėjimą , kai ugnis veikia iš dviejų šonų ir iš apačios po 20 min lieka efektyvus skerspjūvis 127x54mm;
- Horizontali styga 150x100mm, kai ugnis veikia iš keturių pusių 20min, lieka efektyvus skerspjūvis 104x54mm;
- Sija 180x120mm, kai ugnis veikia iš keturių pusių 20min nuo gaisro pradžios lieka efektyvus skerspjūvis 134x74mm.
- Kolona 150x150mm, kai ugnis veikia iš keturių pusių 20min nuo gaisro pradžios lieka efektyvus skerspjūvis 104x104mm.
-

Gegnių apanglėjimas

Gaisro poveikio stukmė

$t := 20$ min

Skerspjūvio plotis:

$b := 100$ mm

Skerspjūvio aukštis:

$h := 150$ mm

Sąlyginė anglėjimo sparta (iš 3.1 lentelės):

$\beta_n := 0.8$

$\beta_0 := 0.65$

Sąlyginis apanglėjimo dydis:

$d_{char.n} := \beta_n \cdot t = 16$ mm

$d_{char.0} := \beta_0 \cdot t = 13$ mm

Pradinis mažiausias skerspjūvio plotas:

$b_{min} := if\left(d_{char.0} < 13, 8.15 \cdot d_{char.0}, 2 \cdot d_{char.0} + 80\right) = 106$ mm

$k_0 := if\left(t < 20, \frac{t}{20}, 1\right) = 1$

Efektyvusis apanglėjimo dydis:

$d_{ef} := d_{char.n} + k_0 \cdot 7 = 23$ mm

Efektyvusis skerspjūvio plotis (gaisras veikiamas iš dviejų pusių):

$b_{ef} := b - 2d_{ef} = 54$ mm

Efektyvusis skerpsjūvio aukštis (gaisras veikiamas iš vienos pusės):

$h_{ef} := h - d_{ef} = 127$ mm

Stygos apanglėjimas

Gaisro poveikio stukmė

$t := 20$ min

Skerspjūvio plotis:

$b := 100$ mm

Skerspjūvio aukštis:

$h := 150$ mm

Sąlyginė anglėjimo sparta (iš 3.1 lentelės):

$\beta_n := 0.8$

$\beta_0 := 0.65$

Sąlyginis apanglėjimo dydis:

$d_{char.n} := \beta_n \cdot t = 16$ mm

$d_{char.0} := \beta_0 \cdot t = 13$ mm

Pradinis mažiausias skerspjūvio plotas:

$b_{min} := if\left(d_{char.0} < 13, 8.15 \cdot d_{char.0}, 2 \cdot d_{char.0} + 80\right) = 106$ mm

$k_0 := if\left(t < 20, \frac{t}{20}, 1\right) = 1$

Efektyvusis apanglėjimo dydis:

$d_{ef} := d_{char.n} + k_0 \cdot 7 = 23$ mm

Efektyvusis skerspjūvio plotis (gaisras veikiamas iš dviejų pusių):

$b_{ef} := b - 2d_{ef} = 54$ mm

Efektyvusis skerpsjūvio aukštis (gaisras veikiamas iš dviejų pusių):

$h_{ef} := h - 2 \cdot d_{ef} = 104$ mm

Sijos apanglėjimas

Gaisro poveikio stukmė

$t := 20$ min

Skerspjūvio plotis:

$b := 120$ mm

Skerspjūvio aukštis:

$h := 180$ mm

Sąlyginė anglėjimo sparta (iš 3.1 lentelės):

$\beta_n := 0.8$

$\beta_0 := 0.65$

Sąlyginis apanglėjimo dydis:

$d_{char.n} := \beta_n \cdot t = 16$ mm

$d_{char.0} := \beta_0 \cdot t = 13$ mm

Pradinis mažiausias skerspjūvio plotas:

$b_{min} := if\left(d_{char.0} < 13, 8.15 \cdot d_{char.0}, 2 \cdot d_{char.0} + 80\right) = 106$ mm

$k_0 := if\left(t < 20, \frac{t}{20}, 1\right) = 1$

Efektyvusis apanglėjimo dydis:

$d_{ef} := d_{char.n} + k_0 \cdot 7 = 23$ mm

Efektyvusis skerspjūvio plotis (gaisras veikiamas iš dviejų pusių):

$b_{ef} := b - 2d_{ef} = 74$ mm

Efektyvusis skerpsjūvio aukštis (gaisras veikiamas iš dviejų pusių):

$h_{ef} := h - 2 \cdot d_{ef} = 134$ mm

Kolonos apanglėjimas

Gaisro poveikio stukmė

$t := 20$ min

Skerspjūvio plotis:

$b := 150$ mm

Skerspjūvio aukštis:

$h := 150$ mm

Sąlyginė anglėjimo sparta (iš 3.1 lentelės):

$\beta_n := 0.8$

$\beta_0 := 0.65$

Sąlyginis apanglėjimo dydis:

$d_{char.n} := \beta_n \cdot t = 16$ mm

$d_{char.0} := \beta_0 \cdot t = 13$ mm

Pradinis mažiausias skerspjūvio plotas:

$b_{min} := if\left(d_{char.0} < 13, 8.15 \cdot d_{char.0}, 2 \cdot d_{char.0} + 80\right) = 106$ mm

$k_0 := if\left(t < 20, \frac{t}{20}, 1\right) = 1$

Efektyvusis apanglėjimo dydis:

$d_{ef} := d_{char.n} + k_0 \cdot 7 = 23$ mm

Efektyvusis skerspjūvio plotis (gaisras veikiamas iš dviejų pusių):

$b_{ef} := b - 2d_{ef} = 104$ mm

Efektyvusis skerpsjūvio aukštis (gaisras veikiamas iš dviejų pusių):

$h_{ef} := h - 2 \cdot d_{ef} = 104$ mm

Skaičiuojamoji schema su skerspjūviai po 20 min nuo gaisro pradžios:

Gegnės projektavimas po 20 min gaisro

CODE: *EN 1995-1:2004/A2:2014*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 72 Gegnė_72 **POINT:** 3 **COORDINATE:** x = 0.39 L = 3.202542 m

---

LOADS:
Governing Load Case: 4 ULS/2=1*1.35 1*1.35

MATERIAL C18

gM = 1.30	f m,0,k = 18.00 MPa	f t,0,k = 11.00 MPa	f c,0,k = 18.00 MPa
f v,k = 3.40 MPa	f t,90,k = 0.40 MPa	f c,90,k = 2.20 MPa	E 0,moyen = 9000.00 MPa
E 0,05 = 6000.00 MPa	G moyen = 560.00 MPa	Service class: 2	Beta c = 0.20



SECTION PARAMETERS: Gegnė po 20 min

ht=12.7 cm

bf=5.4 cm	Ay=45.72 cm2	Az=45.72 cm2	Ax=68.58 cm2
	Iy=921.77 cm4	Iz=166.65 cm4	Ix=488.2 cm4
	Wy=145.16 cm3	Wz=61.72 cm3	

STRESSES
Sig_t,0,d = N/Ax = -0.37/68.58 = -0.05 MPa
Sig_m,y,d = MY/Wy= -0.56/145.16 = -3.87 MPa

Tau z,d = 1.5*-1.25/68.58 = -0.27 MPa

ALLOWABLE STRESSES
f t,0,d = 6.23 MPa
f m,y,d = 8.59 MPa
f v,d = 1.57 MPa

Factors and additional parameters
kh = 1.23 kh_y = 1.03 kmod = 0.60 Ksys = 1.00 kcr = 0.67

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:
About Y axis: About Z axis:

VERIFICATION FORMULAS:
Sig_t,0,d/f t,0,d + Sig_m,y,d/f m,y,d = 0.05/6.23 + 3.87/8.59 = 0.46 < 1.00 (6.17)

(Tau z,d/kcr)/f v,d = (0.27/0.67)/1.57 = 0.26 < 1.00 (6.13)

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM):

Displacements (GLOBAL SYSTEM):
v x = 0.1 cm < v max,x = L/150.00 = 5.5 cm Verified
Governing load case: SLS:QPR/4=1*1.00 1*1.00
v y = 0.0 cm < v max,y = L/150.00 = 5.5 cm Verified
Governing load case: SLS:QPR/4=1*1.00 1*1.00

Section OK !!!

Išvada: laikomoji galia pakankama

Išilginės sijos projektavimas po 20 min gaisro

CODE: *EN 1995-1:2004/A2:2014*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 108 Timber Beam_108 **POINT:** 1 **COORDINATE:** x = 0.83 L = 5.000000 m

---

LOADS:
Governing Load Case: 4 ULS/2=1*1.35 1*1.35

MATERIAL C18

gM = 1.30	f m,0,k = 18.00 MPa	f t,0,k = 11.00 MPa	f c,0,k = 18.00 MPa
f v,k = 3.40 MPa	f t,90,k = 0.40 MPa	f c,90,k = 2.20 MPa	E 0,moyen = 9000.00 MPa
E 0,05 = 6000.00 MPa	G moyen = 560.00 MPa	Service class: 1	Beta c = 0.20

SECTION PARAMETERS: Sija po 20 min
ht=13.4 cm

bf=7.4 cm | Ay=66.11 cm2 | Az=66.11 cm2 | Ax=99.16 cm2
Iy=1483.76 cm4 | Iz=452.50 cm4 | Ix=1180.3 cm4
Wy=221.46 cm3 | Wz=122.30 cm3

STRESSES

Sig_c,0,d = N/Ax = 0.00/99.16 = 0.00 MPa
Sig_m,y,d = MY/Wy= 0.62/221.46 = 2.82 MPa
Sig_m,z,d = MZ/Wz= 0.25/122.30 = 2.04 MPa
Tau y,d = 1.5*-0.30/99.16 = -0.04 MPa
Tau z,d = 1.5*-0.59/99.16 = -0.09 MPa
Tau tory,d = 0.00 MPa, Tau torz,d = 0.00 MPa

ALLOWABLE STRESSES

f c,0,d = 8.31 MPa
f m,y,d = 8.50 MPa
f m,z,d = 9.57 MPa
f v,d = 1.57 MPa

Factors and additional parameters

km = 0.70 kh = 1.15 kmod = 0.60 Ksys = 1.00 kcr = 0.67

LATERAL BUCKLING PARAMETERS:

lef = 5.400000 m Lambda_rel m = 0.79
Sig_cr = 28.73 MPa k crit = 0.97

BUCKLING PARAMETERS:

About Y axis: About Z axis:

VERIFICATION FORMULAS:

(Sig_c,0,d/f c,0,d)^2 + Sig_m,y,d/f m,y,d + km*Sig_m,z,d/f m,z,d = 0.48 < 1.00 (6.19)
Sig_m,y,d/(kcrit*f m,y,d) = 2.82/(0.97*8.50) = 0.34 < 1.00 (6.33)
(Tau y,d/kcr+Tau tory,d/kshape)/f v,d = 0.04 < 1.00 (Tau z,d/kcr+Tau torz,d/kshape)/f v,d = 0.09 < 1.00 (6.13-4)

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM):

u fin,y = 0.3 cm < u fin,max,y = L/200.00 = 3.0 cm Verified
Governing load case: (1+0.6)*1
u fin,z = 0.1 cm < u fin,max,z = L/200.00 = 3.0 cm Verified
Governing load case: (1+0.6)*1

Displacements (GLOBAL SYSTEM):

Section OK !!!

Išvada: laikomoji galia pakankama

Stygos projektavimas po 20 min gaisro

CODE: *EN 1995-1:2004/A2:2014*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 74 Styga_74 **POINT:** 2 **COORDINATE:** x = 0.50 L = 2.482135 m

---

LOADS:
Governing Load Case: 4 ULS/2=1*1.35 1*1.35

MATERIAL C18

gM = 1.30	f m,0,k = 18.00 MPa	f t,0,k = 11.00 MPa	f c,0,k = 18.00 MPa
f v,k = 3.40 MPa	f t,90,k = 0.40 MPa	f c,90,k = 2.20 MPa	E 0,moyen = 9000.00 MPa
E 0,05 = 6000.00 MPa	G moyen = 560.00 MPa	Service class: 2	Beta c = 0.20



SECTION PARAMETERS: Styga po 20 min

ht=10.4 cm

bf=5.4 cm	Ay=37.44 cm2	Az=37.44 cm2	Ax=56.16 cm2
	Iy=506.19 cm4	Iz=136.47 cm4	Ix=368.1 cm4
	Wy=97.34 cm3	Wz=50.54 cm3	

STRESSES

Sig_t,0,d = N/Ax = -2.10/56.16 = -0.37 MPa
Sig_m,y,d = MY/Wy= -0.07/97.34 = -0.75 MPa

ALLOWABLE STRESSES

f t,0,d = 6.23 MPa
f m,y,d = 8.94 MPa

Factors and additional parameters

kh = 1.23 kh_y = 1.08 kmod = 0.60 Ksys = 1.00

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

About Y axis: About Z axis:

VERIFICATION FORMULAS:

Sig_t,0,d/f t,0,d + Sig_m,y,d/f m,y,d = 0.37/6.23 + 0.75/8.94 = 0.14 < 1.00 (6.17)

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM):

Displacements (GLOBAL SYSTEM):

v x = 0.0 cm < v max,x = L/150.00 = 3.3 cm Verified
Governing load case: SLS:QPR/4=1*1.00 1*1.00
v y = 0.0 cm < v max,y = L/150.00 = 3.3 cm Verified
Governing load case: SLS:QPR/4=1*1.00 1*1.00

Section OK !!!

Išvada: laikomoji galia pakankama

Medinės kolonos projektavimas po 20 min gaisro

CODE: *EN 1995-1:2004/A2:2014*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 66 Medine kolona_66 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.000000 m

---

LOADS:
Governing Load Case: 4 ULS/2=1*1.35 1*1.35

MATERIAL C18

gM = 1.30	f m,0,k = 18.00 MPa	f t,0,k = 11.00 MPa	f c,0,k = 18.00 MPa
f v,k = 3.40 MPa	f t,90,k = 0.40 MPa	f c,90,k = 2.20 MPa	E 0,moyen = 9000.00 MPa
E 0,05 = 6000.00 MPa	G moyen = 560.00 MPa	Service class: 1	Beta c = 0.20



SECTION PARAMETERS: Medinė kolona po 20 min

ht=10.4 cm

bf=10.4 cm	Ay=72.11 cm2	Az=72.11 cm2	Ax=108.16 cm2
	Iy=974.88 cm4	Iz=974.88 cm4	Ix=1644.6 cm4
	Wy=187.48 cm3	Wz=187.48 cm3	

STRESSES

Sig_c,0,d = N/Ax = 3.89/108.16 = 0.36 MPa
Sig_m,y,d = MY/Wy= 0.00/187.48 = 0.00 MPa
Sig_m,z,d = MZ/Wz= 0.00/187.48 = 0.01 MPa
Tau y,d = 1.5*0.00/108.16 = 0.00 MPa
Tau z,d = 1.5*0.00/108.16 = 0.00 MPa
Tau tory,d = 0.00 MPa, Tau torz,d = 0.00 MPa

ALLOWABLE STRESSES

f c,0,d = 8.31 MPa
f m,y,d = 8.94 MPa
f m,z,d = 8.94 MPa
f v,d = 1.57 MPa

Factors and additional parameters

km = 0.70 kh = 1.08 kmod = 0.60 Ksys = 1.00 kcr = 0.67

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

About Y axis:

LY = 2.450000 m	Lambda Y = 163.21	LZ = 2.450000 m	Lambda Z = 163.21
Lambda_rel Y = 2.85	ky = 4.80	Lambda_rel Z = 2.85	kz = 4.80
LFY = 4.900000 m	kcy = 0.12	LFZ = 4.900000 m	kcz = 0.12

About Z axis:

VERIFICATION FORMULAS:

Sig_c,0,d/(kc,z*f c,0,d) + km*Sig_m,y,d/f m,y,d + Sig_m,z,d/f m,z,d = 0.38 < 1.00 (6.24)

(Tau y,d/kcr+Tau tory,d/kshape)/f v,d = 0.00 < 1.00 (Tau z,d/kcr+Tau torz,d/kshape)/f v,d = 0.00 < 1.00 (6.13-4)

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM):

Displacements (GLOBAL SYSTEM):

v x = 0.0 cm < v max,x = L/150.00 = 1.6 cm Verified
Governing load case: SLS:QPR/4=1*1.00 1*1.00
v y = 0.0 cm < v max,y = L/150.00 = 1.6 cm Verified
Governing load case: SLS:QPR/4=1*1.00 1*1.00

Section OK !!!

Išvada: laikomoji galia pakankama

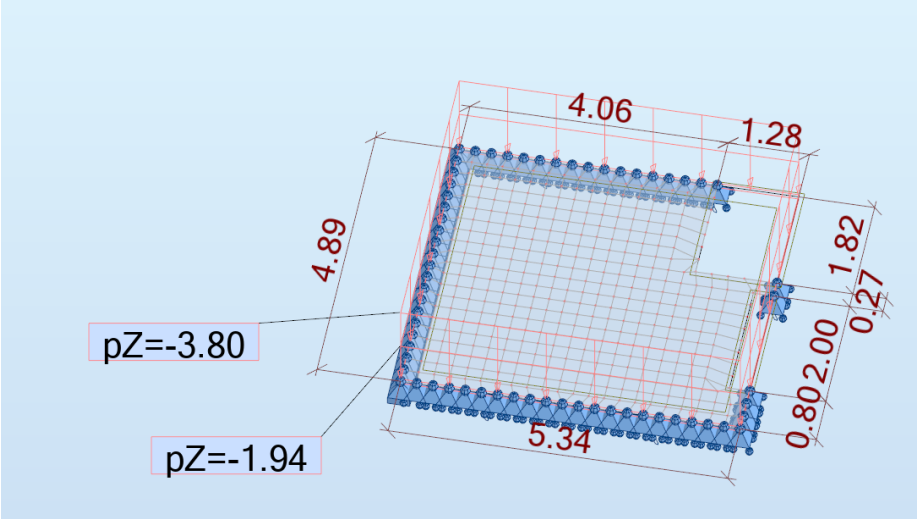
1.18.4. Naujų monolitinių ruožų projektavimas angoms formuoti

1.18.4.1. Rūsio MP-1 ruožo tarp ašių 5-6/A-E projektavimas

Projektuojama sijinė monolitinė GB perdanga.

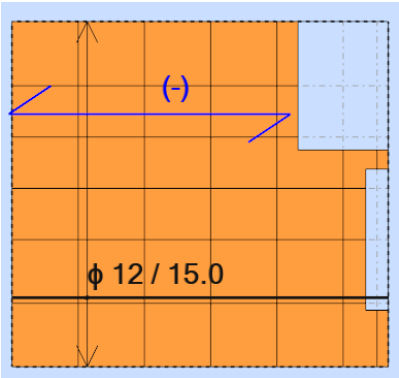
- Betonas: C30/37 XC1;
- Armatūra: S500;
- Apsauginis betono sluoksnis: ne mažiau kaip armatūros skersmuo ir ne mažiau nei 30 mm iki pagrindinės armatūros krašto.
- Ugniaatsparumas REI 45;
- Projektuojamos perdangos storis: 200 mm
- Perdanga remiasi ant mūrių sienų lanksčiai.

Skaičiuojamoji schema su veikaincčiomis charakteristinėmis apkrovomis:

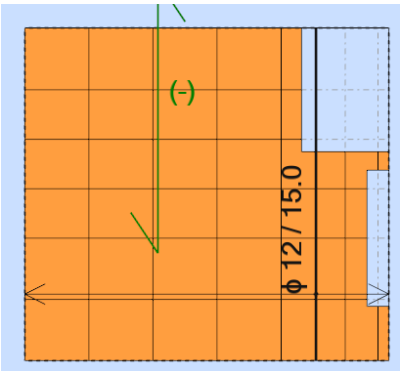


Reikalingas armavimas.

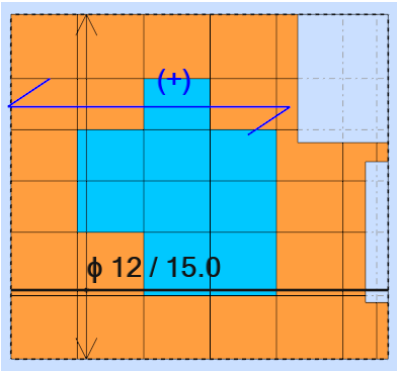
Apatinis armavimas X kryptimi:



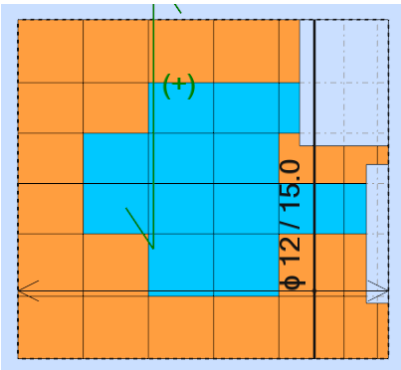
Apatinis armavimas Y kryptimi:



Viršutinis armavimas X kryptimi:



Viršutinis armavimas Y kryptimi:



1. Slab: Slab1 - Panel no. 1

1.1. Reinforcement:

- Type : perdanga
- Main reinforcement direction : 0°

Main reinforcement grade : B500B; Characteristic strength = 500.00 MPa
Horizontal branch of the stress-strain diagram

- Ductility class : B
- Bar diameters bottom d1 = 1.2 (cm) d2 = 1.2 (cm)
  top d1 = 1.2 (cm) d2 = 1.2 (cm)
- Cover bottom c1 = 3.0 (cm)
  top c2 = 3.0 (cm)
- Cover deviations Cdev = 1.0(cm), Cdur = 0.0(cm)

1.2. Concrete

Class : C30/37; Characteristic strength = 30.00 MPa
Rectangular stress distribution [3.1.7(3)]

- Density : 2501.36 (kG/m3)
- Concrete creep coefficient : 1.73
- Cement class : N

1.3. Hypothesis

- Calculations according to : EN 1992-1-1:2004/A1:2014
- Method of reinforcement area calculations : analytical
- Allowable cracking width
  - upper layer : 0.30 (mm)
  - lower layer : 0.30 (mm)
- Allowable deflection : 2.6 (cm)
- Verification of punching : no
- Exposure
  - upper layer : XC1
  - lower layer : XC1
- Calculation type : simple bending
- Structure class : S4

Modified partial coefficients:

a_{cc} = 0.9 1992-1-1 3.1.6 (1)P

1.4. Slab geometry

Thickness 0.20 (m)

Contour:

edge	beginning x1	beginning y1	end x2	end y2	length (m)
1	0.00	0.00	5.34	0.00	5.34
2	5.34	0.00	5.34	4.89	4.89
3	5.34	4.89	0.00	4.89	5.34
4	0.00	4.89	0.00	0.00	4.89

Support:

n°	Name	dimensions (m)	coordinates x	coordinates y	edge

* - head present

1.5. Calculation results:

1.5.1. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Provided reinforcement (cm2/m):	7.54	7.54	7.54	7.54
Modified required reinforcement (cm2/m):	6.63	6.67	5.69	6.33
Original required reinforcement (cm2/m):	6.63	6.67	5.69	5.05
Coordinates (m):				

	5.34;0.80	5.02;2.80	5.34;0.80	4.06;3.07

1.5.2. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Symbol: required area/provided area				
Ax(+) (cm2/m)	**6.63/7.54**	0.00/7.54	6.63/7.54	0.00/0.00
Ax(-) (cm2/m)	4.52/7.54	**6.67/7.54**	4.52/7.54	6.19/7.54
Ay(+) (cm2/m)	5.69/7.54	4.52/7.54	**5.69/7.54**	0.00/7.54
Ay(-) (cm2/m)	1.68/7.54	4.52/7.54	1.68/7.54	**6.33/7.54**
	SLS			
Mxx (kN*m/m)	14.55	-25.75	14.55	-19.78
Myy (kN*m/m)	11.47	2.16	11.47	-14.79
Mxy (kN*m/m)	-15.56	-5.30	-15.56	8.83
Nxx (kN/m)	0.00	0.00	0.00	0.00
Nyy (kN/m)	0.00	0.00	0.00	0.00
Nxy (kN/m)	0.00	0.00	0.00	0.00
	ULS			
Mxx (kN*m/m)	19.39	-34.30	19.39	-26.35
Myy (kN*m/m)	15.28	2.87	15.28	-19.71
Mxy (kN*m/m)	-20.73	-7.06	-20.73	11.76
Nxx (kN/m)	0.00	0.00	0.00	0.00
Nyy (kN/m)	0.00	0.00	0.00	0.00
Nxy (kN/m)	0.00	0.00	0.00	0.00
Coordinates (m)	5.34;0.80	5.02;2.80	5.34;0.80	4.06;3.07
Coordinates* (m)	5.34;0.80;0.00 4.06;3.07;0.00	5.02;2.80;0.00	5.34;0.80;0.00	

* - Coordinates in the structure global coordinate system

1.5.4. Deflection

|f(+)| = 0.0 (cm) <= f_{dop}(+) = 2.6 (cm)
|f(-)| = 0.0 (cm) <= f_{dop}(-) = 2.6 (cm)

1.5.5. Cracking

upper layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)
lower layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)

3. Results - detailing

List of solutions:
Reinforcement: bars

Solution no.	Reinforcement range Diameter / Weight	Total weight (kG)
1	-	548.10

Results for the solution no. 1
Reinforcement zones

Bottom reinforcement

Name	coordinates	Provided reinforcement	At Ar

	x1	y1	x2	y2	ϕ (mm) / (cm)	(cm2/m)
	(cm2/m)					
1/15- Ax Main	0.00	0.00	5.34	4.89	12.0 / 15.0	6.67 < 7.54
1/14- Ay Perpendicular	0.00	0.00	5.34	4.89	12.0 / 15.0	6.33 < 7.54

Top reinforcement

Name	coordinates				Provided reinforcement	At Ar
	x1	y1	x2	y2	ϕ (mm) / (cm)	(cm2/m)
	(cm2/m)					
1/9+* Ax Main	0.00	0.00	5.34	4.89	12.0 / 15.0	6.63 < 7.54
1/4+ Ay Perpendicular	0.00	0.00	5.34	4.89	12.0 / 15.0	5.69 < 7.54

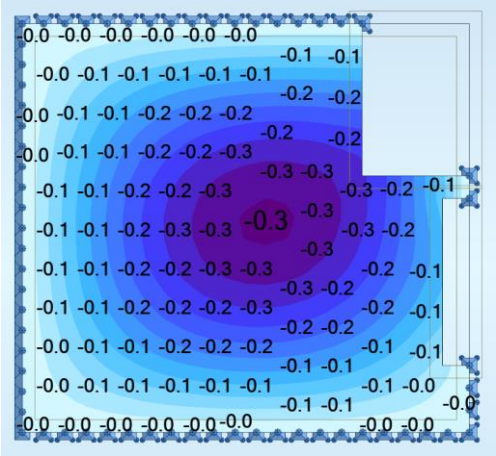
4. Material survey

- Concrete volume = 5.22 (m3)
- Formwork = 26.11 (m2)
- Slab circumference = 20.46 (m)
- Area of openings = 2.97 (m2)

- Steel B500B
- Total weight = 560.21 (kG)
- Density = 107.27 (kG/m3)
- Average diameter = 12.0 (mm)
- Survey according to diameters:

Diameter	Length (m)	Number of identical elements:
12	0.21	4
12	0.67	4
12	0.74	4
12	0.81	4
12	2.17	4
12	3.01	14
12	4.00	24
12	4.83	54
12	4.96	26
12	5.28	16

Monolitinės perdangos deformacijos:



Ribinis perdangos įlinkis:

L/200 = 5,34/200 = 2,6 cm.

Perdangos įlinkis: 0,3 cm ≤ 2,6 cm.

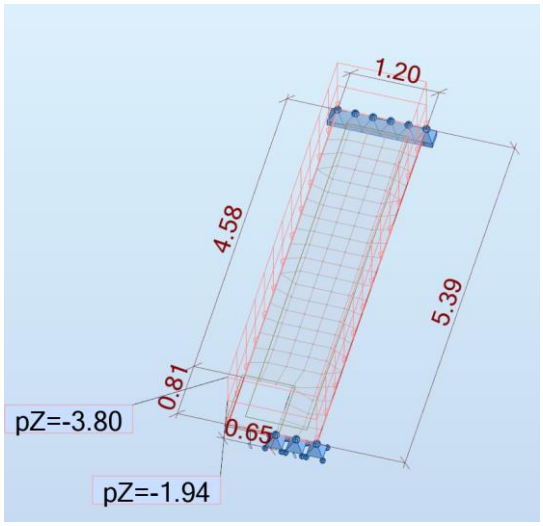
IŠVADA: perdangos laikomoji galia užtikrinta. Įlinkiai neviršija ribinių.

1.18.4.2. Rūsio MP-2 ruožo tarp ašių F-H/8-9 projektavimas

Projektuojama sijinė monolitinė GB perdanga.

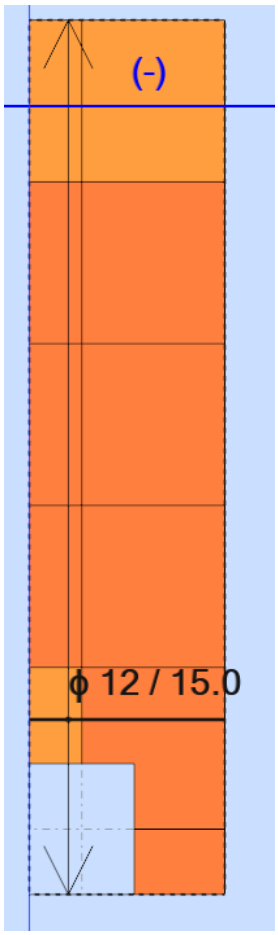
- Betonas: C35/45 XC1;
- Armatūra: S500;
- Apsauginis betono sluoksnis: ne mažiau kaip armatūros skersmuo ir ne mažiau nei 30 mm iki pagrindinės armatūros krašto.
- Ugniaatsparumas REI 45;
- Projektuojamos perdangos storis: 200 mm
- Perdanga remiasi ant mūrių sienų lanksčiai.

Skaičiuojamoji schema su veikaincčiomis charakteristinėmis apkrovomis:

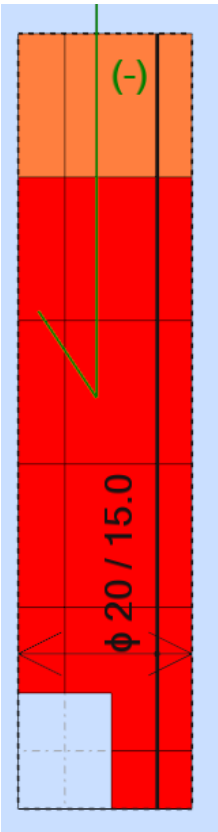


Reikalingas armavimas.

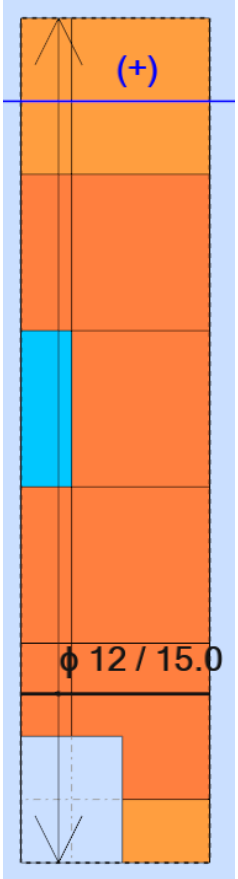
Apatinis armavimas X kryptimi:



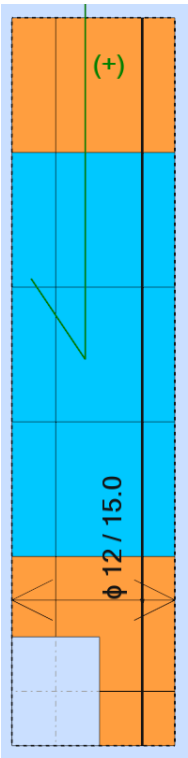
Apatinis armavimas Y kryptimi:



Viršutinis armavimas X kryptimi:



Viršutinis armavimas Y kryptimi:



1. Slab: Slab1 - Panel no. 1

1.1. Reinforcement:

- Type : perdanga
- Main reinforcement direction : 0°

Main reinforcement grade : B500B; Characteristic strength = 500.00 MPa
Horizontal branch of the stress-strain diagram

- Ductility class : B
- Bar diameters bottom d1 = 1.2 (cm) d2 = 1.2 (cm)
  top d1 = 1.2 (cm) d2 = 1.2 (cm)
- Cover bottom c1 = 3.0 (cm)
  top c2 = 3.0 (cm)
- Cover deviations Cdev = 1.0(cm), Cdur = 0.0(cm)

1.2. Concrete

Class : C35/45; Characteristic strength = 35.00 MPa
Rectangular stress distribution [3.1.7(3)]

- Density : 2501.36 (kG/m3)
- Concrete creep coefficient : 1.56
- Cement class : N

1.3. Hypothesis

- Calculations according to : EN 1992-1-1:2004/A1:2014
- Method of reinforcement area calculations : analytical
- Allowable cracking width
  - upper layer : 0.30 (mm)

- lower layer : 0.30 (mm)
- Allowable deflection : 2.5 (cm)
- Verification of punching : no
- Exposure
  - upper layer : XC1
  - lower layer : XC1
- Calculation type : simple bending
- Structure class : S4

Modified partial coefficients:

a_{cc} = 0.9 1992-1-1 3.1.6 (1)P

1.4. Slab geometry

Thickness 0.20 (m)

Contour:

edge	beginning x1	y1	end x2	y2	length (m)
1	0.00	-5.39	1.20	-5.39	1.20
2	1.20	-5.39	1.20	0.00	5.39
3	1.20	0.00	0.00	0.00	1.20
4	0.00	0.00	0.00	-5.39	5.39

Support:

n°	Name	dimensions (m)	coordinates x	y	edge

* - head present

1.5. Calculation results:

1.5.1. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Provided reinforcement (cm2/m):	7.54	7.54	7.54	20.94
Modified required reinforcement (cm2/m):	7.40	7.40	4.52	15.72
Original required reinforcement (cm2/m):	7.40	7.39	4.52	15.72
Coordinates (m):	0.24;-3.37	0.72;-2.02	1.20;0.00	0.65;-4.58

1.5.2. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Symbol: required area/provided area				
Ax(+) (cm2/m)	**7.40/7.54**	0.00/7.54	4.52/7.54	7.34/7.54
Ax(-) (cm2/m)	7.40/7.54	**7.40/7.54**	4.52/7.54	0.00/7.54
Ay(+) (cm2/m)	0.00/7.54	0.00/7.54	**4.52/7.54**	0.00/7.54
Ay(-) (cm2/m)	13.03/20.94 **15.72/20.94**	13.20/20.94	4.52/20.94	
	SLS			
Mxx (kN*m/m)	0.06	-0.52	1.01	4.81
Myy (kN*m/m)	-34.83	-35.45	0.88	-42.59

Mxy (kN*m/m)	0.82	0.76	-0.94	5.22
Nxx (kN/m)	0.00	0.00	0.00	0.00
Nyy (kN/m)	0.00	0.00	0.00	0.00
Nxy (kN/m)	0.00	0.00	0.00	0.00
	ULS			
Mxx (kN*m/m)	0.09	-0.69	1.34	6.41
Myy (kN*m/m)	-46.41	-47.22	1.17	-56.74
Mxy (kN*m/m)	1.09	1.02	-1.25	6.96
Nxx (kN/m)	0.00	0.00	0.00	0.00
Nyy (kN/m)	0.00	0.00	0.00	0.00
Nxy (kN/m)	0.00	0.00	0.00	0.00
Coordinates (m)	0.24;-3.37	0.72;-2.02	1.20;0.00	0.65;-4.58
Coordinates* (m)	0.24;2.02;0.00	0.72;3.37;0.00	1.20;5.39;0.00	0.65;0.81;0.00

* - Coordinates in the structure global coordinate system

1.5.4. Deflection

|f(+)| = 0.0 (cm) <= f_{dop}(+) = 2.5 (cm)
|f(-)| = 0.0 (cm) <= f_{dop}(-) = 2.5 (cm)

1.5.5. Cracking

upper layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)
lower layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)

3. Results - detailing

List of solutions:
Reinforcement: bars

Solution no.	**Reinforcement range Diameter / Weight**	**Total weight (kG)**
1	-	203.48

Results for the solution no. 1
Reinforcement zones

Bottom reinforcement

Name	**coordinates**				**Provided reinforcement**	**At Ar**
	x1	**y1**	**x2**	**y2**	**ϕ (mm) / (cm)**	**(cm2/m)**
1/1- Ax Main	0.00	-5.39	1.20	0.00	12.0 / 15.0	7.40 < 7.54
1/2- Ay Perpendicular	0.00	-5.39	1.20	0.00	20.0 / 15.0	15.72 < 20.94

Top reinforcement

Name	**coordinates**				**Provided reinforcement**	**At Ar**
	x1	**y1**	**x2**	**y2**	**ϕ (mm) / (cm)**	**(cm2/m)**

1/3+ Ax Main	0.00 7.54	-5.39	1.20	0.00	12.0 / 15.0	7.40	<
1/4+ Ay Perpendicular	0.00 7.54	-5.39	1.20	0.00	12.0 / 15.0	4.52	<

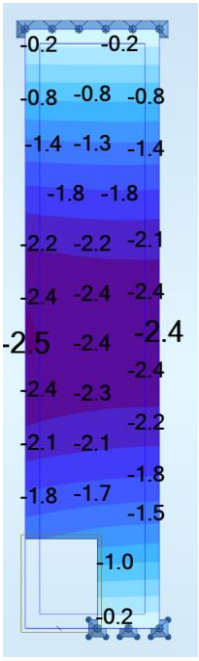
4. Material survey

- Concrete volume = 1.29 (m3)
- Formwork = 6.47 (m2)
- Slab circumference = 13.18 (m)
- Area of openings = 0.52 (m2)

- Steel B500B
- Total weight = 203.92 (kG)
- Density = 157.64 (kG/m3)
- Average diameter = 14.0 (mm)
- Survey according to diameters:

Diameter	Length (m)	Number of identical elements:
12	0.50	10
12	1.14	62
12	1.27	4
12	4.52	4
12	5.33	4
20	4.52	4
20	5.33	4

Monolitinės perdangos deformacijos:



Ribinis perdangos įlinkis:

L/200 = 5,39/200 = 2,6 cm.

Perdangos įlinkis: 2,5 cm ≤ 2,6 cm.

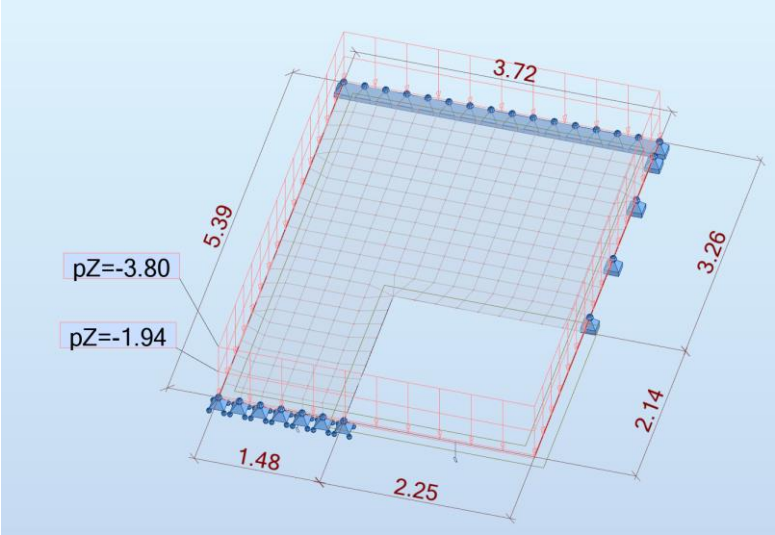
IŠVADA: perdangos laikomoji galia užtikrinta. Įlinkiai neviršija ribinių.

1.18.4.3. 1a. MP-3 ruožo tarp ašių F-H/9-10 projektavimas

Projektuojama sijinė monolitinė GB perdanga.

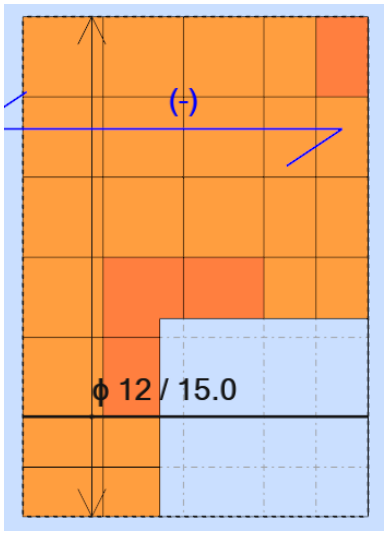
- Betonas: C30/37 XC1;
- Armatūra: S500;
- Apsauginis betono sluoksnis: ne mažiau kaip armatūros skersmuo ir ne mažiau nei 30 mm iki pagrindinės armatūros krašto.
- Ugniaatsparumas REI 45;
- Projektuojamos perdangos storis: 200 mm
- Perdanga remiasi ant mūrių sienų lanksčiai.

Skaičiuojamoji schema su veikainčiomis charakteristinėmis apkrovomis:

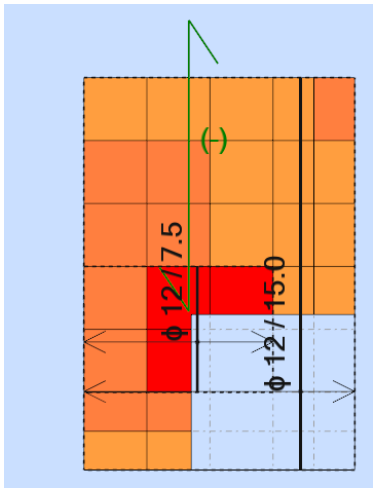


Reikalingas armavimas.

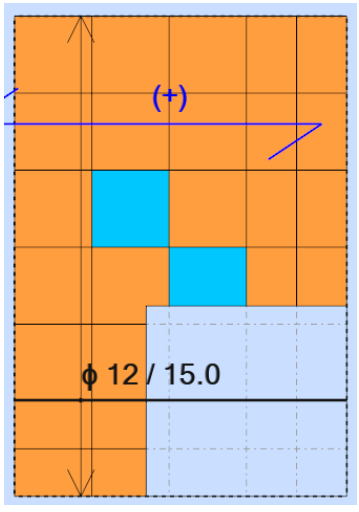
Apatinis armavimas X kryptimi:



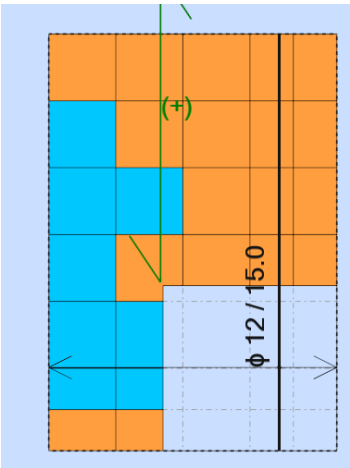
Apatinis armavimas Y kryptimi:



Viršutinis armavimas X kryptimi:



Viršutinis armavimas Y kryptimi:



1. Slab: Slab1 - Panel no. 1

1.1. Reinforcement:

- Type : perdanga
- Main reinforcement direction : 0°

Main reinforcement grade : B500B; Characteristic strength = 500.00 MPa
Horizontal branch of the stress-strain diagram

- Ductility class : B
- Bar diameters bottom d1 = 1.2 (cm) d2 = 1.2 (cm)
  top d1 = 1.2 (cm) d2 = 1.2 (cm)
- Cover bottom c1 = 3.0 (cm)
  top c2 = 3.0 (cm)
- Cover deviations Cdev = 1.0(cm), Cdur = 0.0(cm)

1.2. Concrete

Class : C30/37; Characteristic strength = 30.00 MPa
Rectangular stress distribution [3.1.7(3)]

- Density : 2501.36 (kG/m3)
- Concrete creep coefficient : 1.73
- Cement class : N

1.3. Hypothesis

- Calculations according to : EN 1992-1-1:2004/A1:2014
- Method of reinforcement area calculations : analytical
- Allowable cracking width
  - upper layer : 0.30 (mm)
  - lower layer : 0.30 (mm)
- Allowable deflection : 2.6 (cm)
- Verification of punching : no
- Exposure
  - upper layer : XC1
  - lower layer : XC1
- Calculation type : simple bending
- Structure class : S4

Modified partial coefficients:
a_{cc} = 0.9 1992-1-1 3.1.6 (1)P

1.4. Slab geometry

Thickness 0.20 (m)

Contour:

edge	beginning x1	y1	end x2	y2	length (m)
1	0.00	0.00	3.72	0.00	3.72
2	3.72	0.00	3.72	5.39	5.39
3	3.72	5.39	0.00	5.39	3.72
4	0.00	5.39	0.00	0.00	5.39

Support:

n°	Name	dimensions (m)	coordinates x	y	edge

* - head present

1.5. Calculation results:

1.5.1. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Provided reinforcement (cm2/m):	7.54	7.54	7.54	15.08
Modified required reinforcement (cm2/m):	4.52	6.87	4.52	10.46
Original required reinforcement (cm2/m):	4.52	6.87	4.52	10.46
Coordinates (m):	3.72;4.39	1.48;2.14	3.72;4.39	1.48;2.14

1.5.2. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Symbol: required area/provided area				
Ax(+) (cm2/m)	**4.52/7.54**	0.00/7.54	4.52/7.54	0.00/7.54
Ax(-) (cm2/m)	4.52/7.54	**6.87/7.54**	4.52/7.54	6.87/7.54
Ay(+) (cm2/m)	4.52/7.54	0.00/7.54	**4.52/7.54**	0.00/7.54
Ay(-) (cm2/m)	4.52/7.54 **10.46/15.08**	10.46/15.08	4.52/7.54	
	SLS			
Mxx (kN*m/m)	3.26	-16.84	3.26	-16.84
Myy (kN*m/m)	6.75	-32.15	6.75	-32.15
Mxy (kN*m/m)	12.07	-14.84	12.07	-14.84
Nxx (kN/m)	0.00	0.00	0.00	0.00
Nyy (kN/m)	0.00	0.00	0.00	0.00
Nxy (kN/m)	0.00	0.00	0.00	0.00
	ULS			
Mxx (kN*m/m)	4.34	-22.44	4.34	-22.44
Myy (kN*m/m)	8.99	-42.83	8.99	-42.83
Mxy (kN*m/m)	16.07	-19.77	16.07	-19.77
Nxx (kN/m)	0.00	0.00	0.00	0.00

Nyy (kN/m)	0.00	0.00	0.00	0.00
Nxy (kN/m)	0.00	0.00	0.00	0.00
Coordinates (m)	3.72;4.39	1.48;2.14	3.72;4.39	1.48;2.14
Coordinates* (m)	3.72;4.39;0.00 1.48;2.14;0.00	1.48;2.14;0.00	3.72;4.39;0.00	

* - Coordinates in the structure global coordinate system

1.5.4. Deflection
|f(+)| = 0.0 (cm) <= $f_{dop}(+)$ = 2.6 (cm)
|f(-)| = 0.0 (cm) <= $f_{dop}(-)$ = 2.6 (cm)

1.5.5. Cracking
upper layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)
lower layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)

3. Results - detailing

List of solutions:
Reinforcement: bars

Solution no.	**Reinforcement range Diameter / Weight**	**Total weight (kG)**
1	-	380.85

Results for the solution no. 1
Reinforcement zones

Bottom reinforcement

Name	**coordinates**				**Provided reinforcement**	**At Ar**
	x1	**y1**	**x2**	**y2**	**ϕ (mm) / (cm)**	**(cm2/m)**
1/1- Ax Main	0.00	0.00	3.72	5.39	12.0 / 15.0	6.87 < 7.54
1/2- Ay Perpendicular	0.00	0.00	3.72	5.39	12.0 / 15.0	7.08 < 7.54
1/3-(1/2-) Ay Perpendicular	0.00	1.07	2.60	2.80		12.0 / 7.5 10.46 < 15.08

Top reinforcement

Name	**coordinates**				**Provided reinforcement**	**At Ar**
	x1	**y1**	**x2**	**y2**	**ϕ (mm) / (cm)**	**(cm2/m)**
1/4+ Ax Main	0.00	0.00	3.72	5.39	12.0 / 15.0	4.52 < 7.54
1/5+ Ay Perpendicular	0.00	0.00	3.72	5.39	12.0 / 15.0	4.52 < 7.54

4. Material survey

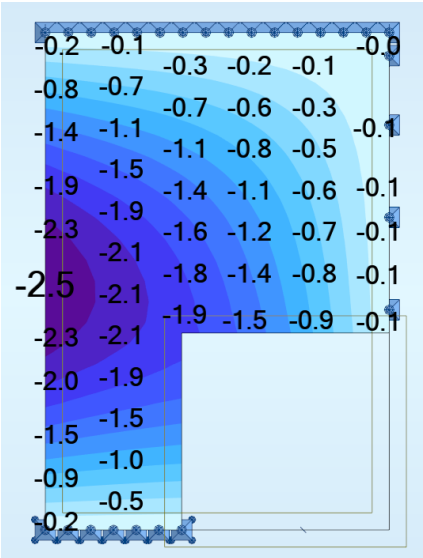
- Concrete volume = 4.01 (m3)
- Formwork = 20.05 (m2)

- Slab circumference = 18.22 (m)
- Area of openings = 4.79 (m2)

- Steel B500B
- Total weight = 395.74 (kG)
- Density = 98.68 (kG/m3)
- Average diameter = 12.0 (mm)
- Survey according to diameters:

Diameter	Length (m)	Number of identical elements:
12	0.89	8
12	1.42	28
12	2.42	9
12	3.20	30
12	3.38	4
12	3.66	44
12	5.33	20

Monolitinės perdangos deformacijos:



Ribinis perdangos įlinkis:

L/200 = 5,39/200 = 2,6 cm.

Perdangos įlinkis: 2,5 cm ≤ 2,6 cm.

IŠVADA: perdangos laikomoji galia užtikrinta. Įlinkiai neviršija ribinių.

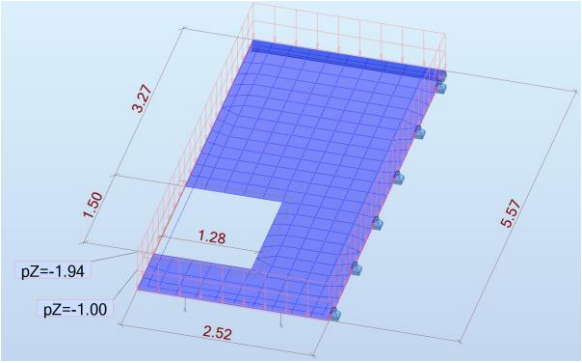
1.18.4.4. 2a. MP-4 ruožo tarp ašių F-H/9-10 projektavimas

Projektuojama sijinė monolitinė GB perdanga.

- Betonas: C30/37 XC1;
- Armatūra: S500;

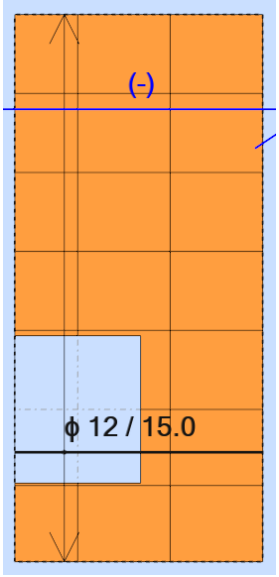
- Apsauginis betono sluoksnis: ne mažiau kaip armatūros skersmuo ir ne mažiau nei 30 mm iki pagrindinės armatūros krašto.
- Ugniaatsparumas REI 45;
- Projektuojamos perdangos storis: 200 mm
- Perdanga remiasi ant mūrių sienų lanksčiai.

Skaičiuojamoji schema su veikaincčiomis charakteristinėmis apkrovomis:

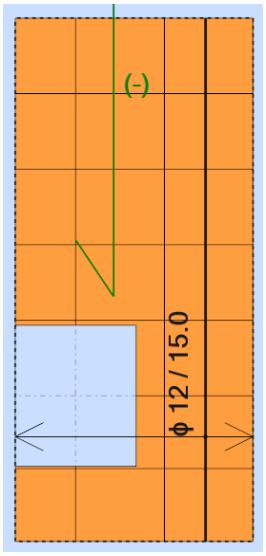


Reikalingas armavimas.

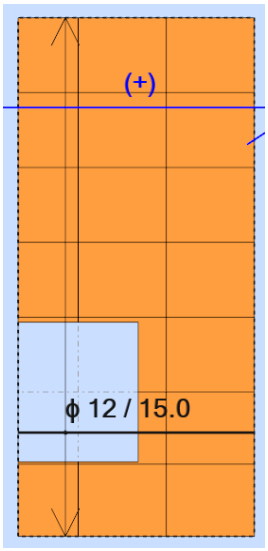
Apatinis armavimas X kryptimi:



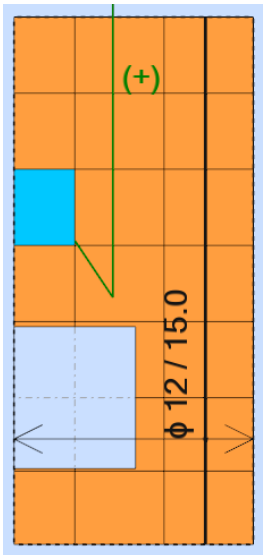
Apatinis armavimas Y kryptimi:



Viršutinis armavimas X kryptimi:



Viršutinis armavimas Y kryptimi:



1. Slab: Slab1 - Panel no. 1

1.1. Reinforcement:

- Type : perdanga
- Main reinforcement direction : 0°

Main reinforcement grade : B500B; Characteristic strength = 500.00 MPa
Horizontal branch of the stress-strain diagram

- Ductility class : B
- Bar diameters bottom d1 = 1.2 (cm) d2 = 1.2 (cm)
  top d1 = 1.2 (cm) d2 = 1.2 (cm)
- Cover bottom c1 = 3.0 (cm)
  top c2 = 3.0 (cm)
- Cover deviations Cdev = 1.0(cm), Cdur = 0.0(cm)

1.2. Concrete

Class : C30/37; Characteristic strength = 30.00 MPa
Rectangular stress distribution [3.1.7(3)]

- Density : 2501.36 (kG/m3)
- Concrete creep coefficient : 1.73
- Cement class : N

1.3. Hypothesis

- Calculations according to : EN 1992-1-1:2004/A1:2014
- Method of reinforcement area calculations : analytical
- Allowable cracking width
  - upper layer : 0.30 (mm)
  - lower layer : 0.30 (mm)
- Allowable deflection : 2.6 (cm)
- Verification of punching : no
- Exposure
  - upper layer : XC1
  - lower layer : XC1
- Calculation type : simple bending
- Structure class : S4

Modified partial coefficients:
a_{cc} = 0.9 1992-1-1 3.1.6 (1)P

1.4. Slab geometry

Thickness 0.20 (m)

Contour:

edge	beginning x1	beginning y1	end x2	end y2	length (m)
1	0.00	-0.80	2.52	-0.80	2.52
2	2.52	-0.80	2.52	4.77	5.57
3	2.52	4.77	0.00	4.77	2.52
4	0.00	4.77	0.00	-0.80	5.57

Support:

n°	Name	dimensions	coordinates	edge

	(m)	x	y

* - head present

1.5. Calculation results:

1.5.1. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Provided reinforcement (cm2/m):	7.54	7.54	7.54	7.54
Modified required reinforcement (cm2/m):	4.52	4.52	4.52	4.52
Original required reinforcement (cm2/m):	4.52	4.52	4.52	4.52
Coordinates (m):	2.52;3.50	2.27;0.83	2.52;3.50	2.27;0.83

1.5.2. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Symbol: required area/provided area				
Ax(+) (cm2/m)	**4.52/7.54**	1.05/7.54	4.52/7.54	1.05/7.54
Ax(-) (cm2/m)	4.52/7.54	**4.52/7.54**	4.52/7.54	4.52/7.54
Ay(+) (cm2/m)	4.52/7.54	1.02/7.54	**4.52/7.54**	1.02/7.54
Ay(-) (cm2/m)	4.52/7.54	4.52/7.54	4.52/7.54	**4.52/7.54**
SLS				
Mxx (kN*m/m)	2.39	-0.59	2.39	-0.59
Myy (kN*m/m)	5.04	-2.53	5.04	-2.53
Mxy (kN*m/m)	6.18	-5.02	6.18	-5.02
Nxx (kN/m)	0.00	0.00	0.00	0.00
Nyy (kN/m)	0.00	0.00	0.00	0.00
Nxy (kN/m)	0.00	0.00	0.00	0.00
ULS				
Mxx (kN*m/m)	3.21	-0.80	3.21	-0.80
Myy (kN*m/m)	6.77	-3.40	6.77	-3.40
Mxy (kN*m/m)	8.31	-6.75	8.31	-6.75
Nxx (kN/m)	0.00	0.00	0.00	0.00
Nyy (kN/m)	0.00	0.00	0.00	0.00
Nxy (kN/m)	0.00	0.00	0.00	0.00
Coordinates (m)	2.52;3.50	2.27;0.83	2.52;3.50	2.27;0.83
Coordinates* (m)	2.52;4.30;0.00 2.27;1.63;0.00	2.27;1.63;0.00	2.52;4.30;0.00	

* - Coordinates in the structure global coordinate system

1.5.4. Deflection

|f(+)| = 0.0 (cm) <= $f_{dop}(+)$ = 2.6 (cm)
|f(-)| = 0.0 (cm) <= $f_{dop}(-)$ = 2.6 (cm)

1.5.5. Cracking

upper layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)
lower layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)

ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)

3. Results - detailing

List of solutions:
Reinforcement: bars

Solution no.	**Reinforcement range Diameter / Weight**	**Total weight (kG)**
1	-	286.95

Results for the solution no. 1
Reinforcement zones

Bottom reinforcement

Name	**coordinates Ar**				**Provided reinforcement**	**At**
	x1	**y1**	**x2**	**y2**	**ϕ (mm) / (cm)**	**(cm2/m)**
1/1- Ax Main	0.00	-0.80	2.52	4.77	12.0 / 15.0	4.52 < 7.54
1/2- Ay Perpendicular	0.00	-0.80	2.52	4.77	12.0 / 15.0	4.52 < 7.54

Top reinforcement

Name	**coordinates Ar**				**Provided reinforcement**	**At**
	x1	**y1**	**x2**	**y2**	**ϕ (mm) / (cm)**	**(cm2/m)**
1/3+ Ax Main	0.00	-0.80	2.52	4.77	12.0 / 15.0	4.52 < 7.54
1/4+ Ay Perpendicular	0.00	-0.80	2.52	4.77	12.0 / 15.0	4.52 < 7.54

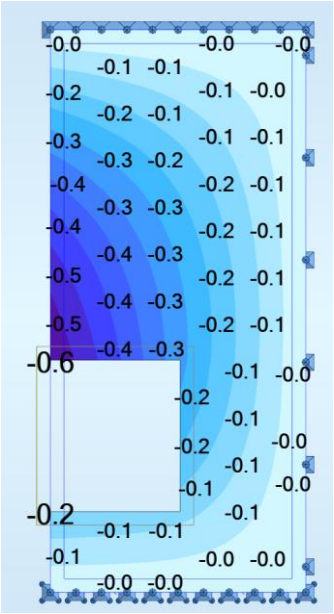
4. Material survey

- Concrete volume = 2.81 (m3)
- Formwork = 14.04 (m2)
- Slab circumference = 16.18 (m)
- Area of openings = 1.92 (m2)

- Steel B500B
- Total weight = 295.53 (kG)
- Density = 105.27 (kG/m3)
- Average diameter = 12.0 (mm)
- Survey according to diameters:

Diameter	Length (m)	Number of identical elements:
12	0.74	18
12	1.18	20
12	2.10	4
12	2.17	4
12	2.46	54
12	3.21	18
12	5.51	16

Monolitinės perdangos deformacijos:



Ribinis perdangos įlinkis:

L/200 = 5,57/200 = 2,7 cm.

Perdangos įlinkis: 0,6 cm ≤ 2,7 cm.

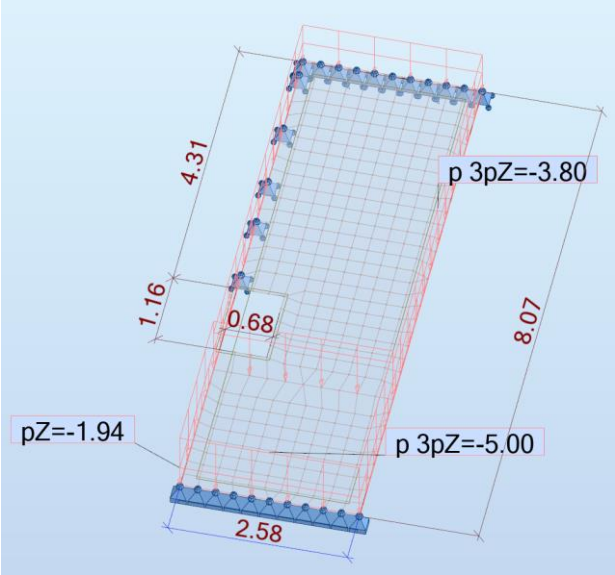
IŠVADA: perdangos laikomoji galia užtikrinta. Įlinkiai neviršija ribinių.

1.18.4.5. 1a. MP-5 ruožo tarp ašių E-H/5-6 projektavimas

Projektuojama sijinė monolitinė GB perdanga.

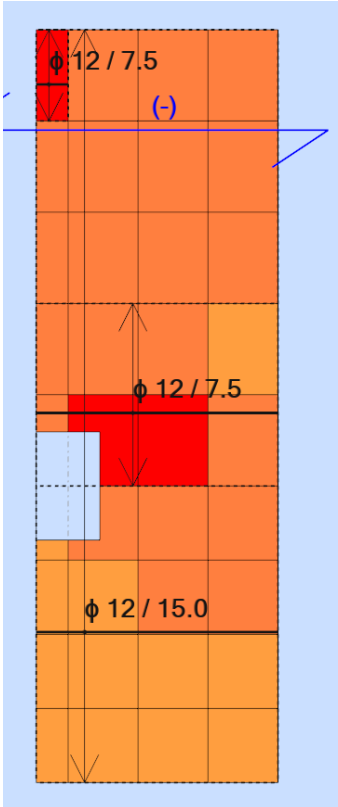
- Betonas: C30/37 XC1;
- Armatūra: S500;
- Apsauginis betono sluoksnis: ne mažiau kaip armatūros skersmuo ir ne mažiau nei 30 mm iki pagrindinės armatūros krašto.
- Ugniaatsparumas REI 45;
- Projektuojamos perdangos storis: 200 mm
- Perdanga remiasi ant mūrių sienų lanksčiai.

Skaičiuojamoji schema su veikainčiomis charakteristinėmis apkrovomis:

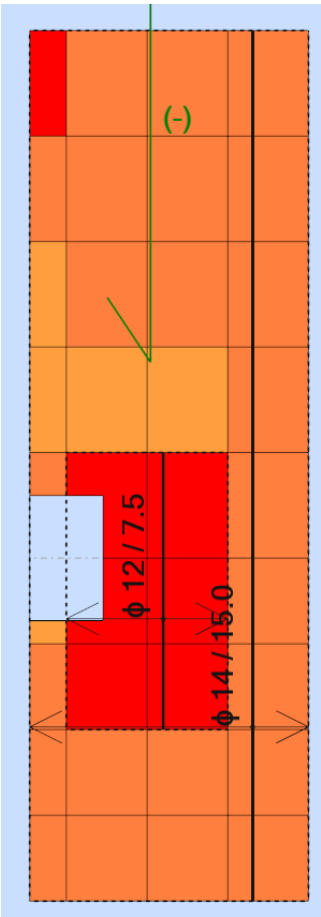


Reikalingas armavimas.

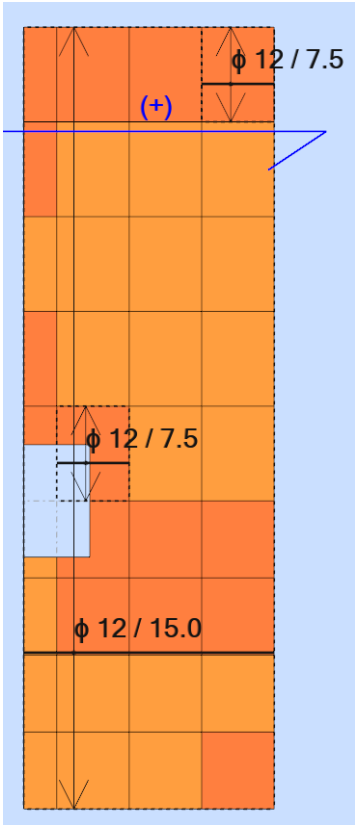
Apatinis armavimas X kryptimi:



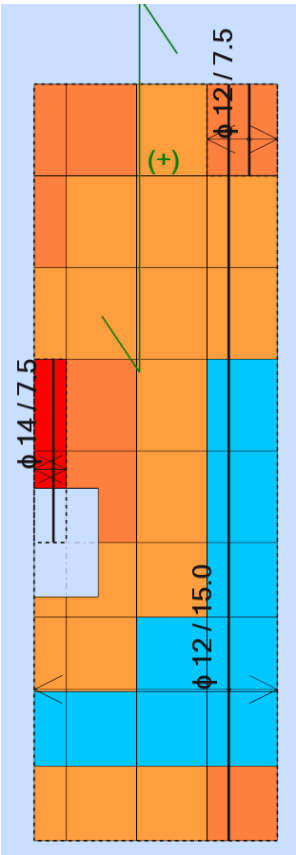
Apatinis armavimas Y kryptimi:



Viršutinis armavimas X kryptimi:



Viršutinis armavimas Y kryptimi:



1. Slab: Slab1 - Panel no. 1

1.1. Reinforcement:

- Type : perdanga
- Main reinforcement direction : 0°

Main reinforcement grade : B500B; Characteristic strength = 500.00 MPa
Horizontal branch of the stress-strain diagram

- Ductility class : B
- Bar diameters bottom d1 = 1.2 (cm) d2 = 1.2 (cm)
  top d1 = 1.2 (cm) d2 = 1.2 (cm)
- Cover bottom c1 = 3.0 (cm)
  top c2 = 3.0 (cm)
- Cover deviations Cdev = 1.0(cm), Cdur = 0.0(cm)

1.2. Concrete

Class : C30/37; Characteristic strength = 30.00 MPa
Rectangular stress distribution [3.1.7(3)]

- Density : 2501.36 (kG/m3)
- Concrete creep coefficient : 1.73
- Cement class : N

1.3. Hypothesis

- Calculations according to : EN 1992-1-1:2004/A1:2014

- Method of reinforcement area calculations : analytical
- Allowable cracking width
  - upper layer : 0.30 (mm)
  - lower layer : 0.30 (mm)
- Allowable deflection : 3.6 (cm)
- Verification of punching : no
- Exposure
  - upper layer : XC1
  - lower layer : XC1
- Calculation type : simple bending
- Structure class : S4

Modified partial coefficients:

a_{cc} = 0.9 1992-1-1 3.1.6 (1)P

1.4. Slab geometry

Thickness 0.20 (m)

Contour:

edge	beginning x1	beginning y1	end x2	end y2	length (m)
1	0.00	-2.60	2.58	-2.60	2.58
2	2.58	-2.60	2.58	5.47	8.07
3	2.58	5.47	0.00	5.47	2.58
4	0.00	5.47	0.00	-2.60	8.07

Support:

n°	Name	dimensions (m)	coordinates x	coordinates y	edge

* - head present

1.5. Calculation results:

1.5.1. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Provided reinforcement (cm2/m):	15.08	15.08	17.70	17.70
Modified required reinforcement (cm2/m):	8.72	11.51	15.19	13.86
Original required reinforcement (cm2/m):	8.72	11.51	15.19	13.86
Coordinates (m):	0.68;0.93	0.68;1.16	0.00;1.41	0.68;0.23

1.5.2. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Symbol: required area/provided area				
Ax(+) (cm2/m)	**8.72/15.08**	0.00/15.08	5.79/15.08	6.70/7.54
Ax(-) (cm2/m)	7.71/15.08	**11.51/15.08**	8.39/15.08	5.80/7.54
Ay(+) (cm2/m)	4.68/7.54	4.65/7.54	**15.19/17.70**	0.00/7.54
Ay(-) (cm2/m)	9.13/17.70 **13.86/17.70**	4.52/17.70	2.35/10.26	

	SLS			
Mxx (kN*m/m)	9.21	-40.57	13.04	-0.88
Myy (kN*m/m)	-5.03	13.78	48.11	-33.69
Mxy (kN*m/m)	28.84	12.51	-13.91	25.08
Nxx (kN/m)	0.00	0.00	0.00	0.00
Nyy (kN/m)	0.00	0.00	0.00	0.00
Nxy (kN/m)	0.00	0.00	0.00	0.00
	ULS			
Mxx (kN*m/m)	12.26	-54.01	17.35	-1.17
Myy (kN*m/m)	-6.72	18.32	64.03	-44.83
Mxy (kN*m/m)	38.40	16.66	-18.51	33.39
Nxx (kN/m)	0.00	0.00	0.00	0.00
Nyy (kN/m)	0.00	0.00	0.00	0.00
Nxy (kN/m)	0.00	0.00	0.00	0.00
Coordinates (m)	0.68;0.93	0.68;1.16	0.00;1.41	0.68;0.23
Coordinates* (m)	0.68;3.53;0.00 0.68;2.83;0.00	0.68;3.76;0.00	0.00;4.01;0.00	

* - Coordinates in the structure global coordinate system

1.5.4. Deflection

|f(+)| = 0.0 (cm) <= f_{dop}(+) = 3.6 (cm)
|f(-)| = 3.6 (cm) <= f_{dop}(-) = 3.6 (cm)

1.5.5. Cracking

upper layer
ax = 0.20 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.18 (mm) <= a_{dop} = 0.30 (mm)
lower layer
ax = 0.16 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.22 (mm) <= a_{dop} = 0.30 (mm)

3. Results - detailing

List of solutions:
Reinforcement: bars

Solution no.	**Reinforcement range Diameter / Weight**	**Total weight (kG)**
1	-	582.70

Results for the solution no. 1
Reinforcement zones

Bottom reinforcement

Name	**coordinates**				**Provided reinforcement**	**At**
	x1	**y1**	**x2**	**y2**	**ϕ (mm) / (cm)**	**Ar (cm2/m)**
1/1- Ax Main	0.00	-2.60	2.58	5.47	12.0 / 15.0	6.26 < 7.54
1/2-(1/1-) Ax Main	0.00	0.58	2.58	2.54	12.0 / 7.5	11.51 < 15.08
1/3-(1/1-) Ax Main	0.00	4.49	0.34	5.47	12.0 / 7.5	10.04 < 15.08
1/4- Ay Perpendicular	0.00	-2.60	2.58	5.47	14.0 / 15.0	9.66 < 10.26

1/5-(1/4-) Ay Perpendicular	0.34	-1.01	1.83	1.56	12.0 / 7.5	13.86 < 17.80

Top reinforcement

Name	coordinates Ar x1	y1	x2	y2	Provided reinforcement ϕ (mm) / (cm)	At (cm2/m)
1/6+ Ax Main	0.00	-2.60	2.58	5.47	12.0 / 15.0	6.70 < 7.54
1/7+(1/6+) Ax Main	0.34	0.58	1.09	1.56	12.0 / 7.5	8.72 < 15.08
1/8+(1/6+) Ax Main	1.83	4.49	2.58	5.47	12.0 / 7.5	8.41 < 15.08
1/9+ Ay Perpendicular	0.00	-2.60	2.58	5.47	12.0 / 15.0	6.02 < 7.54
1/10+(1/9+) Ay Perpendicular	1.83	4.49	2.58	5.47	12.0 / 7.5	8.12 < 15.08
1/11+(1/9+) Ay Perpendicular	0.00	0.58	0.34	2.54	14.0 / 7.5	15.19 < 17.80

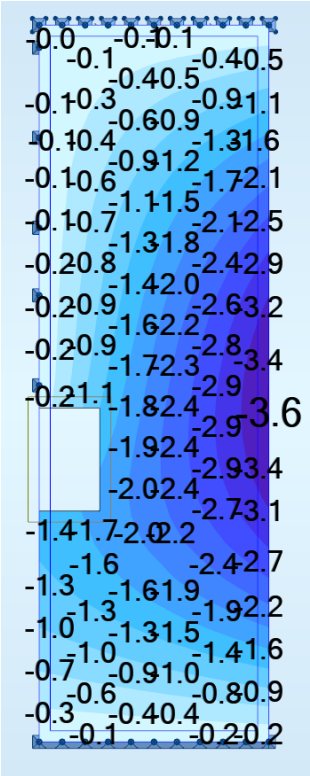
4. Material survey

- Concrete volume = 4.16 (m3)
- Formwork = 20.82 (m2)
- Slab circumference = 21.30 (m)
- Area of openings = 0.79 (m2)

- Steel B500B
- Total weight = 600.56 (kG)
- Density = 144.22 (kG/m3)
- Average diameter = 12.4 (mm)
- Survey according to diameters:

Diameter	Length (m)	Number of identical elements:
12	0.74	6
12	0.88	2
12	1.00	4
12	1.32	8
12	1.34	6
12	1.49	2
12	1.68	7
12	1.84	20
12	2.52	101
12	2.54	5
12	3.58	8
12	4.25	5
12	8.01	12
14	2.07	2
14	2.54	5
14	4.25	5
14	8.01	12

Monolitinės perdangos deformacijos:



Ribinis perdangos įlinkis:

L/200 = 8,07/218 = 3,7 cm.

Perdangos įlinkis: 3,6 cm ≤ 3,7 cm.

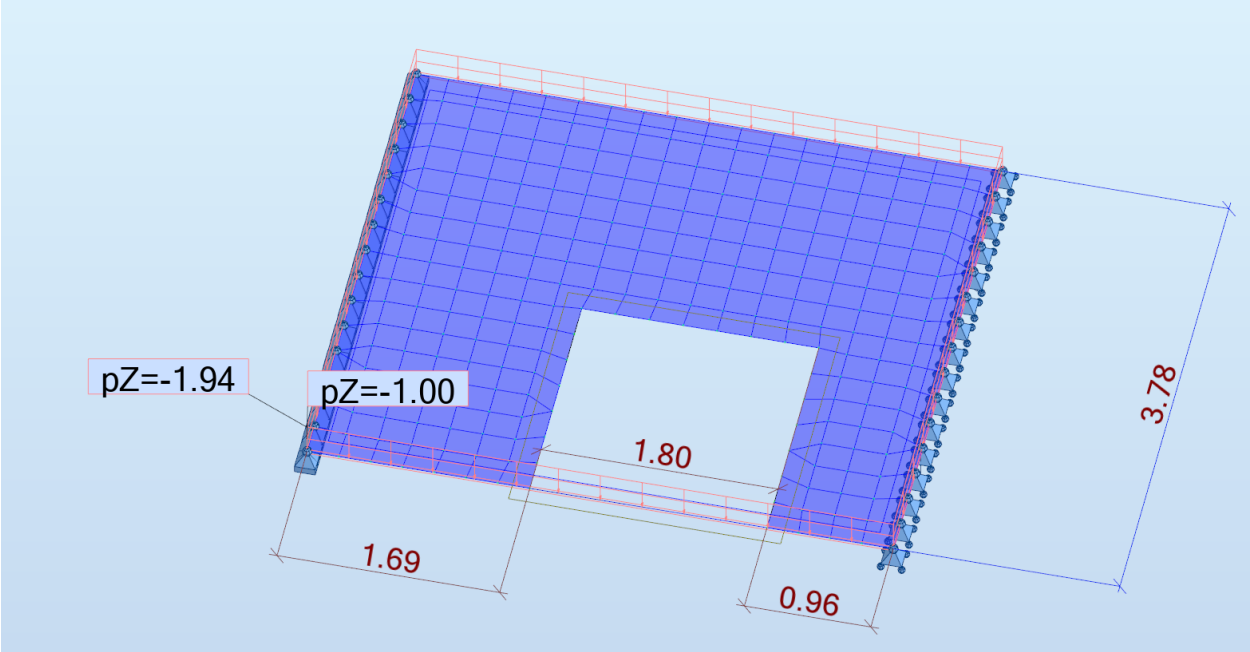
IŠVADA: perdangos laikomoji galia užtikrinta. Įlinkiai neviršija ribinių.

1.18.4.6. 2a. MP-6 ruožo tarp ašių F-H/7-8 projektavimas

Projektuojama sijinė monolitinė GB perdanga.

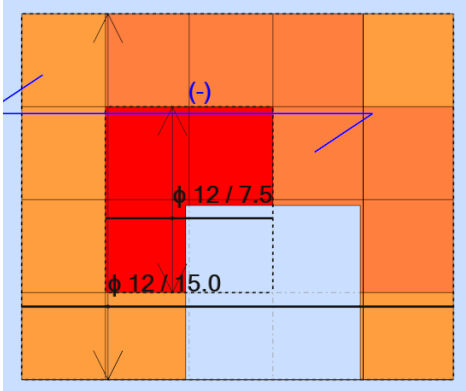
- Betonas: C30/37 XC1;
- Armatūra: S500;
- Apsauginis betono sluoksnis: ne mažiau kaip armatūros skersmuo ir ne mažiau nei 30 mm iki pagrindinės armatūros krašto.
- Ugniaatsparumas REI 45;
- Projektuojamos perdangos storis: 200 mm
- Perdanga remiasi ant mūrių sienų lanksčiai.

Skaičiuojamoji schema su veikainčiomis charakteristinėmis apkrovomis:

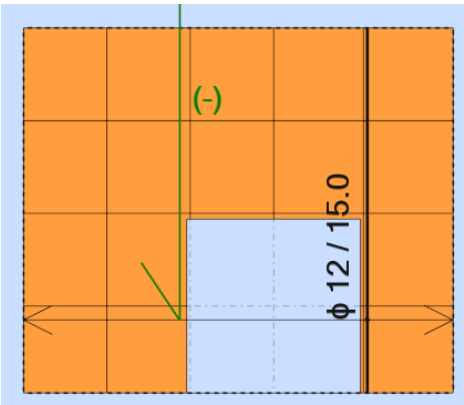


Reikalingas armavimas.

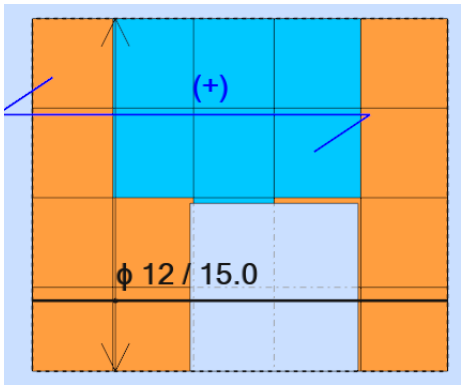
Apatinis armavimas X kryptimi:



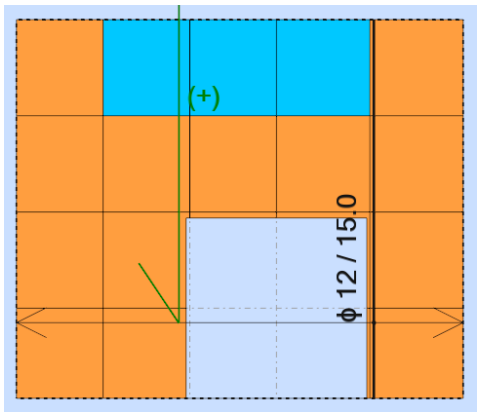
Apatinis armavimas Y kryptimi:



Viršutinis armavimas X kryptimi:



Viršutinis armavimas Y kryptimi:



1. Slab: Slab1 - Panel no. 1

1.1. Reinforcement:

- Type : perdanga
- Main reinforcement direction : 0°

Main reinforcement grade : B500B; Characteristic strength = 500.00 MPa
Horizontal branch of the stress-strain diagram

- Ductility class : B
- Bar diameters bottom d1 = 1.2 (cm) d2 = 1.2 (cm)
  top d1 = 1.2 (cm) d2 = 1.2 (cm)
- Cover bottom c1 = 3.0 (cm)
  top c2 = 3.0 (cm)
- Cover deviations Cdev = 1.0(cm), Cdur = 0.0(cm)

1.2. Concrete

Class : C30/37; Characteristic strength = 30.00 MPa
Rectangular stress distribution [3.1.7(3)]

- Density : 2501.36 (kG/m3)
- Concrete creep coefficient : 1.73
- Cement class : N

1.3. Hypothesis

- Calculations according to : EN 1992-1-1:2004/A1:2014
- Method of reinforcement area calculations : analytical
- Allowable cracking width
  - upper layer : 0.30 (mm)

- lower layer : 0.30 (mm)
- Allowable deflection : 2.2 (cm)
- Verification of punching : no
- Exposure
  - upper layer : XC1
  - lower layer : XC1
- Calculation type : simple bending
- Structure class : S4

Modified partial coefficients:

a_{cc} = 0.9 1992-1-1 3.1.6 (1)P

1.4. Slab geometry

Thickness 0.20 (m)

Contour:

edge	beginning		end		length
	x1	y1	x2	y2	(m)
1	0.00	0.00	4.45	0.00	4.45
2	4.45	0.00	4.45	3.78	3.78
3	4.45	3.78	0.00	3.78	4.45
4	0.00	3.78	0.00	0.00	3.78

Support:

n°	Name	dimensions (m)	coordinates x	y	edge

* - head present

1.5. Calculation results:

1.5.1. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Provided reinforcement (cm2/m):	7.54	15.08	7.54	7.54
Modified required reinforcement (cm2/m):	4.52	10.60	4.52	4.52
Original required reinforcement (cm2/m):	4.52	10.60	4.52	4.52
Coordinates (m):	3.49;1.54	1.69;1.80	4.45;1.01	4.20;1.11

1.5.2. Maximum moments + reinforcement for bending

	Ax(+)	Ax(-)	Ay(+)	Ay(-)
Symbol: required area/provided area				
Ax(+) (cm2/m)	**4.52/7.54**	0.00/7.54	0.14/7.54	0.14/7.54
Ax(-) (cm2/m)	5.70/7.54	**10.60/15.08**	4.52/7.54	4.52/7.54
Ay(+) (cm2/m)	0.77/7.54	4.52/7.54	**4.52/7.54**	4.52/7.54
Ay(-) (cm2/m)	4.52/7.54	4.52/7.54	4.52/7.54	**4.52/7.54**
	SLS			
Mxx (kN*m/m)	1.47	-32.74	-0.01	-1.53
Myy (kN*m/m)	-3.73	0.26	0.15	-0.48
Mxy (kN*m/m)	6.50	-11.41	1.43	1.83

Nxx (kN/m)	0.00	0.00	0.00	0.00
Nyy (kN/m)	0.00	0.00	0.00	0.00
Nxy (kN/m)	0.00	0.00	0.00	0.00
	ULS			
Mxx (kN*m/m)	1.97	-43.99	-0.02	-2.06
Myy (kN*m/m)	-5.01	0.35	0.19	-0.64
Mxy (kN*m/m)	8.74	-15.34	1.93	2.46
Nxx (kN/m)	0.00	0.00	0.00	0.00
Nyy (kN/m)	0.00	0.00	0.00	0.00
Nxy (kN/m)	0.00	0.00	0.00	0.00
Coordinates (m)	3.49;1.54	1.69;1.80	4.45;1.01	4.20;1.11
Coordinates* (m)	3.49;1.54;0.00 4.20;1.11;0.00	1.69;1.80;0.00	4.45;1.01;0.00	

* - Coordinates in the structure global coordinate system

1.5.4. Deflection

|f(+)| = 0.0 (cm) <= $f_{dop}(+)$ = 2.2 (cm)
|f(-)| = 2.1 (cm) <= $f_{dop}(-)$ = 2.2 (cm)

1.5.5. Cracking

upper layer
ax = 0.00 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)
lower layer
ax = 0.30 (mm) <= a_{dop} = 0.30 (mm)
ay = 0.00 (mm) <= a_{dop} = 0.30 (mm)

3. Results - detailing

List of solutions:
Reinforcement: bars

Solution no.	**Reinforcement range Diameter / Weight**	**Total weight (kG)**
1	-	336.47

Results for the solution no. 1
Reinforcement zones

Bottom reinforcement

Name	**coordinates**				**Provided reinforcement**	**At Ar**
	x1	**y1**	**x2**	**y2**	**ϕ (mm) / (cm)**	**(cm2/m)**
1/1- Ax Main	0.00	0.00	4.45	3.78	12.0 / 15.0	6.07 < 7.54
1/2-(1/1-) Ax Main	0.86	0.90	2.59	2.82	12.0 / 7.5	10.60 < 15.08
1/3- Ay Perpendicular	0.00	0.00	4.45	3.78	12.0 / 15.0	4.52 < 7.54

Top reinforcement

Name	**coordinates**				**Provided reinforcement**	**At Ar**
	x1	**y1**	**x2**	**y2**	**ϕ (mm) / (cm)**	**(cm2/m)**

1/4+ Ax Main	0.00 7.54	0.00	4.45	3.78	12.0 / 15.0	4.52	<
1/5+ Ay Perpendicular	0.00 7.54	0.00	4.45	3.78	12.0 / 15.0	4.52	<

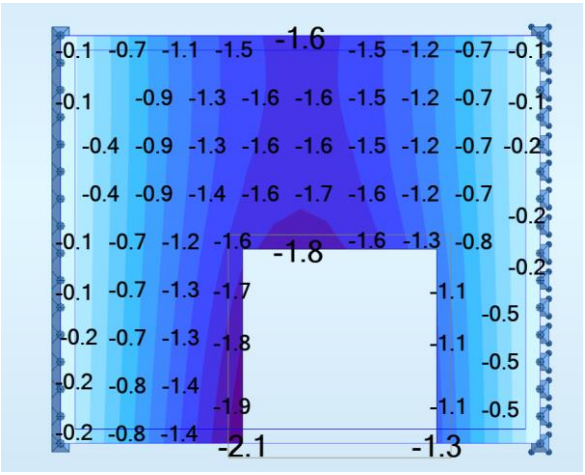
4. Material survey

- Concrete volume = 3.36 (m3)
- Formwork = 16.82 (m2)
- Slab circumference = 16.46 (m)
- Area of openings = 3.24 (m2)

- Steel B500B
- Total weight = 355.46 (kG)
- Density = 105.66 (kG/m3)
- Average diameter = 12.0 (mm)
- Survey according to diameters:

Diameter	Length (m)	Number of identical elements:
12	0.90	24
12	1.23	6
12	1.63	24
12	1.92	24
12	2.60	6
12	2.69	4
12	2.91	4
12	3.72	36
12	4.39	26

Monolitinės perdangos deformacijos:



Ribinis perdangos įlinkis:

L/200 = 4,45/200 = 2,2 cm.

Perdangos įlinkis: 2,1 cm ≤ 2,2 cm.

IŠVADA: perdangos laikomoji galia užtikrinta. Įlinkiai neviršija ribinių.

1.19. 2a. Ypatingojo poveikio tikrinimas pagal LST EN 1991-1-7

Kadangi pastatas priskirtas prie RC3 pasekmių klasės (2b pasekmių klasė pagal LST EN 1991-1-7), tikrinamas ypatingas poveikis. Surenkamų perdangų zonose tikrinami perdangos horizontalieji ryšiai, išdėstyti abiem kryptimis pagal A5.2 priedą, ir mūrinės sienos tikrinamos pagal A6 priedą, kad atlaikytų vertikalią vertikalių ryšių jėgą.

Mūrinės sienos (pagal A6 priedą)

Konstrukciniai reikalavimai:

Laikančiųjų mūro sienų storis 250mm>150mm; Mūro gniuždomasis stipris 15MPa>5MPa.

Sienos aukštis tarp perdangų paviršių 3,9m<20·t=20·0,25=5 m

Išvada: sienų konstrukciniai reikalavimai tenkinami

Sieną veikianti vertikali ryšių jėga:

$$T = \frac{34 \cdot A}{8000} \cdot \left(\frac{H}{t}\right)^2 = \frac{34 \cdot 250 \cdot 1000}{8000} \cdot \left(\frac{3,9}{0,25}\right)^2 = 259\ kN > 100kN/1m.$$

Skaičiuojamas centriškai gniuždomas mūras.

Nearmuoto mūro gniuždomojo stiprio nustatymas:

$f_{bw} := 15$ MPa

$f_{mw} := 10$ MPa

$K := 0.55$

$f_{kw} := K \cdot f_b^{0.85} = 5.496$ MPa

$f_{dw} := \frac{f_k}{\gamma_M} = 1.832$ MPa

Mūro laikomoji galia:

Sienos aukštis

$l := 3.9$ m

Sienos storis

$h := 0.25$ m

$y := \frac{h}{2} = 0.125$ m

Veikianti ašinė jėga

$N_{ed} := 259$ kN

Skaičiuojamasis elemento aukštis

$l_0 := 1 = 3.9$ m

Santykis

$\lambda_h := \frac{l_0}{h} = 15.6$

Mūro tamprumo charakteristika iš 16 lentelės

$\alpha := 1000$

Klupumo koeficientas iš 19 lentelės

$\varphi := 0.77$

Elemento skerspjūvio plotas

$A := h \cdot 1 = 0.25$ m2

$e_{0lt} := 0$ m

$N_{Edlt} := 272$ kN

$\eta := 0.14$ iš 21 lentelės

$m_{lt} := if\left[h \geq 0.3, 1, 1 - \eta \cdot \frac{N_{Edlt}}{N_{ed}} \cdot \left(1 + \frac{1.2 \cdot e_{0lt}}{h}\right)\right] = 0.853$

Skaičiuojamasis mūro gniuždomasis stipris

$f_d := 1.832 \cdot 10^3 = 1.832 \times 10^3$ kPa

$N_{Rd} := m_{lt} \cdot \varphi \cdot f_d \cdot A = 300.809$ kN

$\frac{N_{ed}}{N_{Rd}} = 0.861$

Išvada: mūro laikomoji galia pakankama

Surenkamų perdangų horizontalieji ryšiai (pagal A5.2 priedą)

Vidinių ryšių skaičiuotinė tempiamoji ryšių apkrova:

$F_t = 20 + 4 \cdot n_s = 20 + 4 \cdot 2 = 28$ *kN/m<60kN/m,*

Kur n_s – aukštų skaičius.

$\frac{F_t \cdot (g_k + \psi \cdot q_k)}{7{,}5} \cdot \frac{z}{5} = \frac{28 \cdot (1{,}94 + 0{,}6 \cdot 5{,}0)}{7{,}5} \cdot \frac{13{,}25}{5} = 49$ *kN/m>*F_t *=28 kN/m,*

Kur z – mažesnioji iš reikšmių: 5·H, kur H – aukšto aukštis, arba didžiausias atstumas metrais ryšio kryptimi tarp sienų.

$T_1 = 49$ kN/m didesnioji iš reikšmių

Perimetrinių ryšių skaičiuotinė tempiamoji ryšių apkrova:

$T_p = F_t = 28\ kN/m$

Vidinių ryšių (tarp perdangų) 1x⌀14 armatūros strypų laikomoji galia:

$N_{rd1} = \frac{\sigma_d \cdot A}{1{,}15} = \frac{500 \cdot 1 \cdot 1{,}539 \cdot 10^{-4}}{1{,}15} = 0{,}0669\ MN = 67\ kN;$

$N_{rd1} = 67kN > T_p = 49\ kN/m.$ **Sąlyga tenkinama**

Perimetrinių ryšių (ant sienų) 2x⌀12 armatūros strypų laikomoji galia:

$N_{rd2} = \frac{\sigma_d \cdot A}{1{,}15} = \frac{500 \cdot 2 \cdot 1{,}131 \cdot 10^{-4}}{1{,}15} = 0{,}0983\ MN = 98\ kN;$

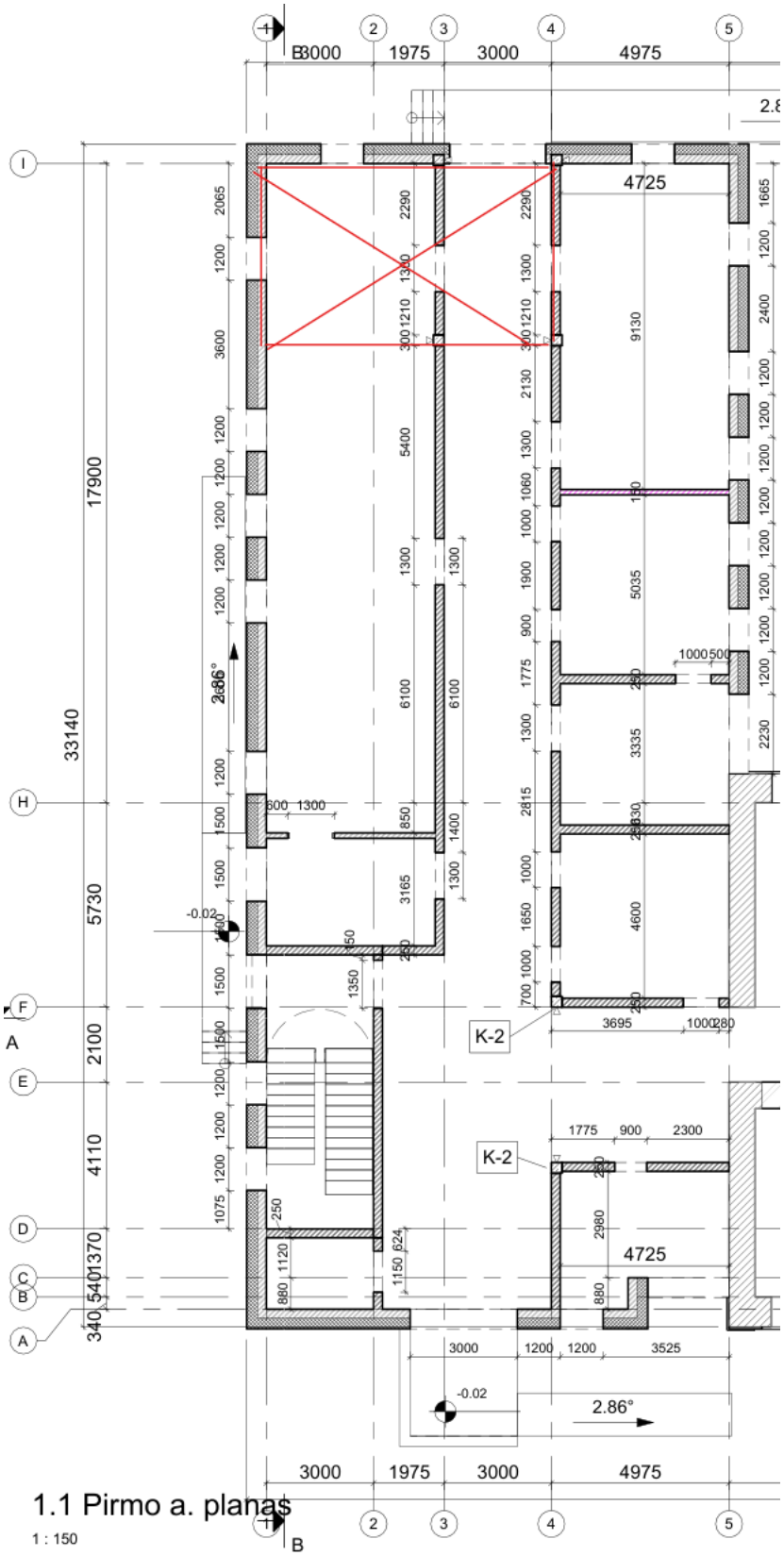
$N_{rd2} = 98kN > T_p = 28\ kN/m.$ **Sąlyga tenkinama**

Išvada: perdangų horizontalių ryšių laikomoji galia pakankama

Karkasinėse pastato dalyse tikrinama sąlyga, kai pašalinus atraminę g/b koloną vietinė pažaida neviršys nustatytos ribos. Pagal LST EN 1991-1-7 A priedas, leidžiama vietinės irties riba yra 15% perdangos ploto arba 100m2 (imama mažiausia reikšmė).

Projektuojamo priestato vieno aukšto plotas 405,49 m^2. Leidžiama vieno aukšto irties riba 405,49m^2*0,15=60,8m^2<100m^2. Priimama leidžiama vieno aukšto irties riba 60,8m^2.

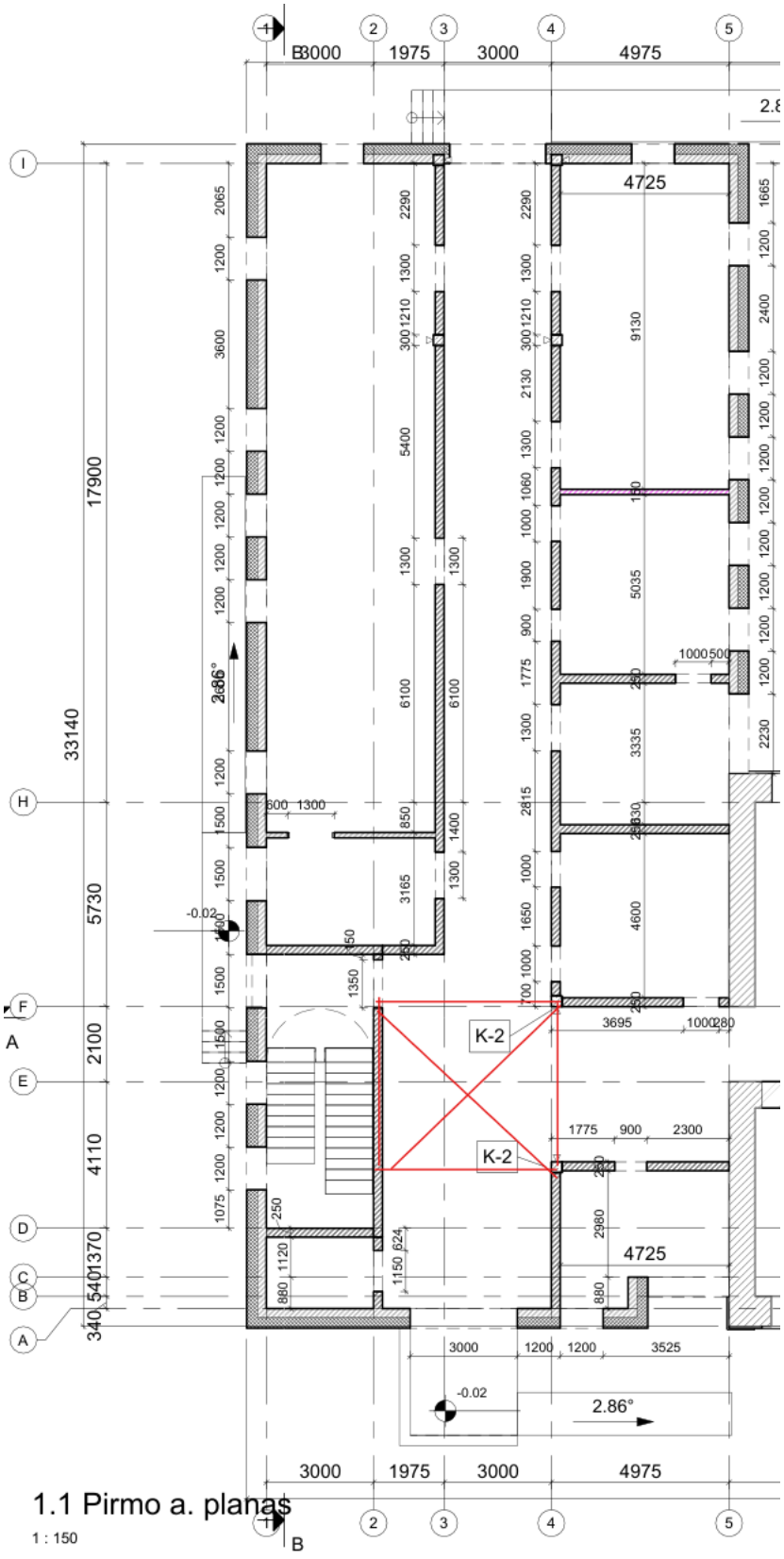
Pašalinus koloną tarp ašių I-H/1-4, vieno aukšto pažaidos plotas:



Išvada: 41,4m2<60,8m2 sąlygą tenkinama. Nėra poreikio skaičiuoti koloną kaip pagrindinį elementą.

	Lapas	Lapų	Laida
IN2413-01-TDP-SK-S	276	277	0

Pašalinus koloną tarp ašių D-F/2-4, vieno aukšto pažaidos plotas:



Išvada: 24m2<60,8m2 sąlygą tenkinama. Nėra poreikio skaičiuoti koloną kaip pagrindinį elementą.