Správa železniční dopravní cesty

STÁTNÍ FOND DOPRAVNÍ INFRASTRUKTURY

Ing. RASTISLAV SCHREIBER
Autorizovaný inženýr pro mosty a inženýr. konstrukce
ČKAIT - 3000059

			ČÍSLO SOUPRAVY:
REVIZE Č.	DATUM	ZMĚNA	

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OBJEDNATEL:	Správa železniční dopravní cesty Stavební správa východ, Nerudova 1, 772 58 Olomouc		
HLAVNÍ INŽENÝR PROJEKTU Ing. Ondřej Čech	ODPOVĚDNÝ PROJ. PS, SO Ing. Ondřej Čech	VYPRACOVAL ZA ABM Ing. Štefan Chrastina	ODPOVĚDNÝ PROJ. ZA ABM Ing. Rastislav Schreiber
KRAJ: Královéhradecký	POVĚŘENÝ MÚ: Nové Město nad Metují / k.ú. Krčín		STUPEŇ: DÚR + DSP

Rekonstrukce podjezdu v Novém Městě nad Metují na silnice III/30821
SO 01 Most v km 49,202

Statický výpočet NK

ZAK. ČÍSLO	
029-2018	
MĚŘÍTKO -	POČET FORMÁTŮ x A4
DATUM:	03/2018
ČÁST DOKUM. D.E.1.4.1	PŘÍLOHA **6**

STATICKÝ VÝPOČET

Názov projektu: 18305 - Nove Mesto nad Metuji
Objekt: 49.202_CM4 52x225
Čislo projektu: 18305
RevíziaA0:
Dátum: 5/3/2018
Vypracoval: Ing. Štefan Chrastina

Obsah

Kapitola 1

Predpoklady statického výpočtu

- Svetlá výška: 7.97 m
- Svetlý rozpon: 17.32 m
- Hrúbka horného dielca: 350 mm
- Hrúbka stenového dielca: 350 mm
- Dĺžka monolitickej pätky: 1500 mm

Materiály:

- Betón prefabrikát: C50/60
- Betón monolit: C35/45

Hodnota nominálneho krytia výstuže pre stupeň vplyvu prostredia XD3, XF4 je 50mm.

Statická Analýza:

Konštrukcia bola analyzovaná pomocou programu ROBOT MILLENNIUM. Statický model konštrukcie zodpovedá tvaru strednicovej roviny prenesenej do rámu o šírke jeden meter. V bodoch spojov medzi horným a stenovým dielcom konštrukcie (tzv. Ball Socket Joint) sú namodelované kĺby.

Základy:

Základy sú modelované pomocou Winklerových pružin, vložených do bodov základových pätiek (dosiek). Výpočet tuhostí pružín je založený na Menardovej teórii.

Použitím tejto teórie bola stanovená hodnota súčiniteľa poddajnosti Kz =40Mpa/m.

Bočný zásyp:

Dôležitým statickým prvkom konštrukcie je priliehajúci zásyp. Pasívnu tuhosť bočného zásypu vo výpočte reprezentujú jednosmerné vodorovné Winklerové pružiny, ktoré sú aplikované do bodov stenových prvkov konštrukcie. Predpísaná hodnota Edef2 pre zásypovú zeminu po zhutnění je 70MPa. Táto hodnota musí byť kontrolovaná po dobu výstavby napríklad statickou zaťažovacou skúškou. Súčiniteľ vodorovnej poddajnosti zásypového materiálu a teda tuhosť vodorovných Winklerových pružín bola stanovená pomocou Menardovej teorie na Kx=20MPa/m.

Zásyp, jeho hutnenie a výber materiálu musí byť v súlade s technologickým predpisom zasýpania schválený statikom.

Zaťaženie:

Súčiniteľe zemného tlaku:

Vodorovné účinky zemného tlaku sú uvažované v súlade s

EN 1997-1. Hodnota uhlu vnútrného trenia zásypového materiálu nesmie klesnúť pod 30°.

- K_0 max = 0.60
- K_0 min = 0.15
- K a = 0.33

Stále a dlhodobé náhodilé zaťaženia:

- Vlastná tiaž konštrukcie
- Objemová hmotnosť betónu = 25kN/m^3
- Zvislé zaťaženie zásypovou zeminou
- Objemová hmotnosť zeminy = 20 kN/m3
- Výška nadnásypu:
  DOCmin=4.85 m, DOCmax=5.21 m, DOCcons=0.9 m
- Zaťaženie koľajovým lôžkom
- Objemová hmotnosť koľajového lôžka = 22 kN/m3

Nahodilé krátkodobé zaťaženie:

Zaťaženie koľajovou dopravou

Zvislé zaťaženia:

- Súčiniteľ zaťaženia koľajovej dopravy α = 1.21
- Model zaťaženia LM71
- Model zaťaženia SW/0
- Model zaťaženia SW/2

Vodorovné zaťaženia:

- Rozjazdové a brzdné sily
- Odstredivé sily
- Bočné rázy
- Zvýšenie zemného tlaku vyvolané pohyblivým zaťažením

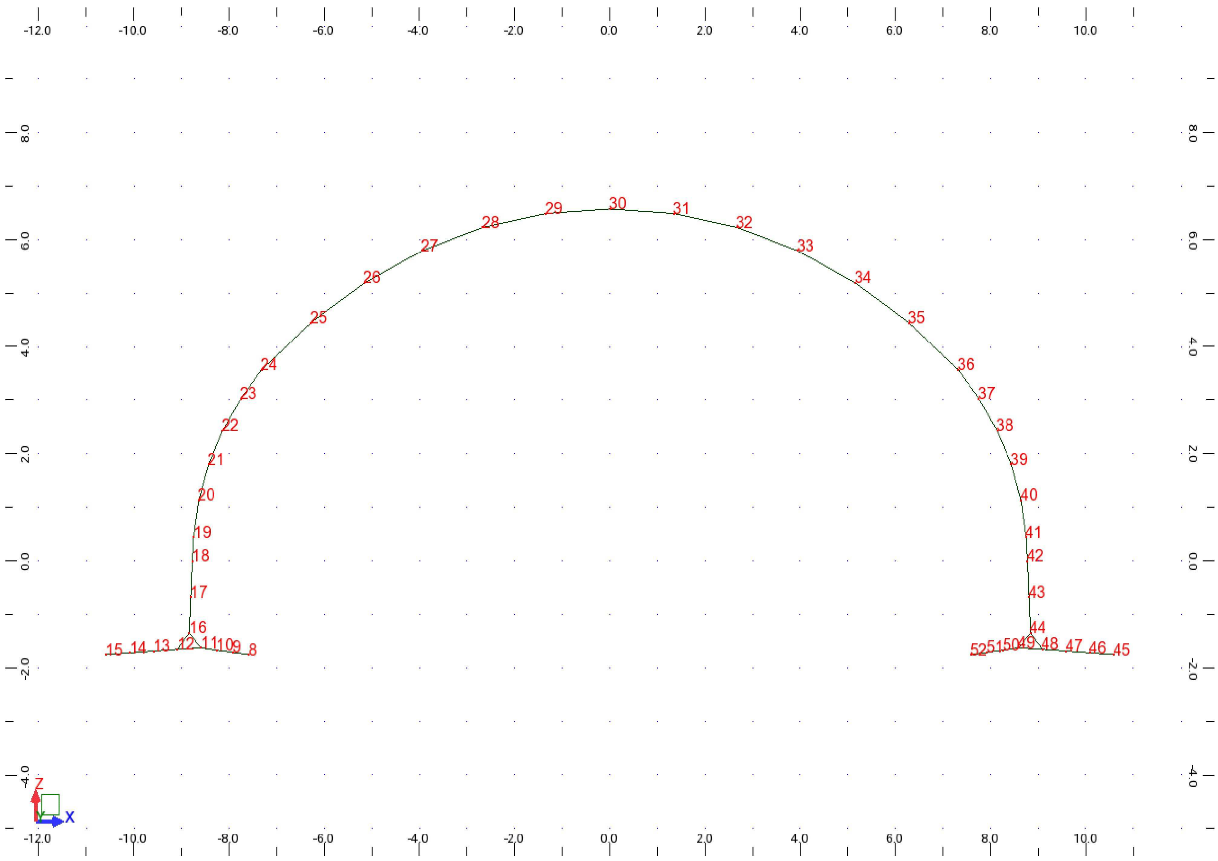
Použité normy:

- EN 1990: Zásady navrhovania konštrukcií
- EN 1991–1: Zaťaženie konštrukcií – Všeobecné zaťaženia
- EN 1991–2: Zaťaženie konštrukcií – Zaťaženie mostov
- EN 1992–1-1: Navrhovanie betónových konštrukcií – Všeobecné pravidlá
- EN 1992–2: Navrhovanie betónových konštrukcií – Betónové mosty
- EN 1997–1: Navrhovánie geotechnických konštrukcií
- ČSN EN 206–1: Betón – Špecifikácia, vlastnosti, výroba a

Kapitola 2

Statický model, číslovanie prútov a bodov, podpory, vlastnosti prierezov

Diagram of nodes

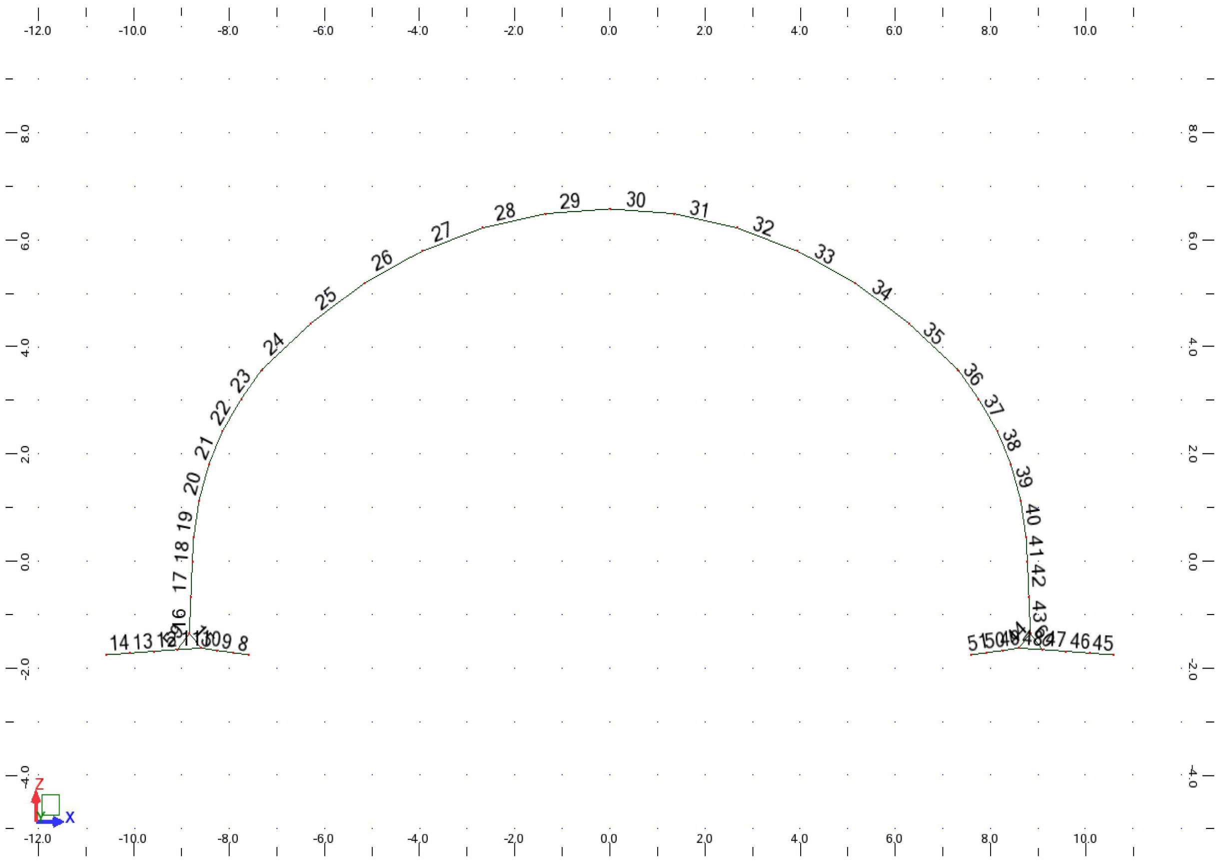


Nodes properties

Node	X (m)	Z (m)	Support
8	-7.59	-1.75	ADD_Spring_52
9	-7.92	-1.71	ADD_Spring_51
10	-8.26	-1.67	ADD_Spring_50
11	-8.59	-1.63	ADD_Spring_49
12	-9.08	-1.65	ADD_Spring_12
13	-9.58	-1.68	ADD_Spring_13
14	-10.08	-1.72	ADD_Spring_14
15	-10.58	-1.75	ADD_Spring_15
16	-8.83	-1.35	ADD_Spring_16+
17	-8.80	-0.68	ADD_Spring_17+
18	-8.77	0.0	ADD_Spring_18+
19	-8.74	0.44	ADD_Spring_19+
20	-8.63	1.13	ADD_Spring_20+
21	-8.43	1.80	ADD_Spring_21+
22	-8.13	2.44	ADD_Spring_22+
23	-7.75	3.02	ADD_Spring_23+
24	-7.31	3.57	ADD_Spring_24+
25	-6.28	4.44	
26	-5.16	5.19	
27	-3.95	5.79	
28	-2.67	6.22	
29	-1.35	6.49	
30	0.0	6.57	
31	1.35	6.49	
32	2.67	6.22	
33	3.95	5.79	
34	5.16	5.19	
35	6.28	4.44	
36	7.31	3.57	ADD_Spring_36-
37	7.75	3.02	ADD_Spring_37-
38	8.13	2.44	ADD_Spring_38-
39	8.43	1.80	ADD_Spring_39-
40	8.63	1.13	ADD_Spring_40-
41	8.74	0.44	ADD_Spring_41-
42	8.77	0.0	ADD_Spring_42-
43	8.80	-0.68	ADD_Spring_43-
44	8.83	-1.35	ADD_Spring_44-
45	10.58	-1.75	ADD_Spring_15
46	10.08	-1.72	ADD_Spring_14
47	9.58	-1.68	ADD_Spring_13
48	9.08	-1.65	ADD_Spring_12
49	8.59	-1.63	ADD_Spring_49
50	8.26	-1.67	ADD_Spring_50
51	7.92	-1.71	ADD_Spring_51
52	7.59	-1.75	ADD_Spring_52

ABM Mosty			
Navrhol:	SC	Súbor:	ServiceMax_ULS.rtd
		Projekt:	18305

Diagram of Bars



Bars properties

Bar/Node		Node 1	Node 2	Section	Material	Length (m)	RECT_BF (mm)	RECT_HT (mm)	RECT_TH (mm)
8/	**8**	8	9	RE 7	*C50/60*	0.34	1000	300	0.0
8/	**9**	8	9	RE 7	*C50/60*	0.34	1000	383	0.0
9/	**9**	9	10	RE 8	*C50/60*	0.34	1000	383	0.0
9/	**10**	9	10	RE 8	*C50/60*	0.34	1000	467	0.0
10/	**10**	10	11	RE 9	*C50/60*	0.34	1000	467	0.0
10/	**11**	10	11	RE 9	*C50/60*	0.34	1000	550	0.0
11/	**11**	11	12	RE 10	*C50/60*	0.49	1000	550	0.0
11/	**12**	11	12	RE 10	*C50/60*	0.49	1000	500	0.0
12/	**12**	12	13	ADD 0.6x0.533	*C35/45*	0.50	1000	600	0.0
12/	**13**	12	13	ADD 0.6x0.533	*C35/45*	0.50	1000	533	0.0
13/	**13**	13	14	ADD 0.533x0.467	*C35/45*	0.50	1000	533	0.0
13/	**14**	13	14	ADD 0.533x0.467	*C35/45*	0.50	1000	467	0.0
14/	**14**	14	15	ADD 0.467x0.4	*C35/45*	0.50	1000	467	0.0
14/	**15**	14	15	ADD 0.467x0.4	*C35/45*	0.50	1000	400	0.0
15/	**11**	11	16	RE 36	*C50/60*	0.37	1000	550	0.0
15/	**16**	11	16	RE 36	*C50/60*	0.37	1000	550	0.0
16/	**16**	16	17	RE 14	*C50/60*	0.68	1000	492	0.0
16/	**17**	16	17	RE 14	*C50/60*	0.68	1000	431	0.0
17/	**17**	17	18	RE 15	*C50/60*	0.68	1000	431	0.0
17/	**18**	17	18	RE 15	*C50/60*	0.68	1000	370	0.0
18/	**18**	18	19	RE 16	*C50/60*	0.44	1000	370	0.0
18/	**19**	18	19	RE 16	*C50/60*	0.44	1000	350	0.0
19/	**19**	19	20	RE 32	*C50/60*	0.70	1000	350	0.0
19/	**20**	19	20	RE 32	*C50/60*	0.70	1000	350	0.0
20/	**20**	20	21	RE 32	*C50/60*	0.70	1000	350	0.0
20/	**21**	20	21	RE 32	*C50/60*	0.70	1000	350	0.0
21/	**21**	21	22	RE 32	*C50/60*	0.70	1000	350	0.0
21/	**22**	21	22	RE 32	*C50/60*	0.70	1000	350	0.0
22/	**22**	22	23	RE 32	*C50/60*	0.70	1000	350	0.0
22/	**23**	22	23	RE 32	*C50/60*	0.70	1000	350	0.0
23/	**23**	23	24	RE 32	*C50/60*	0.70	1000	350	0.0
23/	**24**	23	24	RE 32	*C50/60*	0.70	1000	350	0.0
24/	**24**	24	25	RE 32	*C50/60*	1.35	1000	350	0.0
24/	**25**	24	25	RE 32	*C50/60*	1.35	1000	350	0.0
25/	**25**	25	26	RE 32	*C50/60*	1.35	1000	350	0.0
25/	**26**	25	26	RE 32	*C50/60*	1.35	1000	350	0.0
26/	**26**	26	27	RE 32	*C50/60*	1.35	1000	350	0.0
26/	**27**	26	27	RE 32	*C50/60*	1.35	1000	350	0.0
27/	**27**	27	28	RE 32	*C50/60*	1.35	1000	350	0.0
27/	**28**	27	28	RE 32	*C50/60*	1.35	1000	350	0.0
28/	**28**	28	29	RE 32	*C50/60*	1.35	1000	350	0.0
28/	**29**	28	29	RE 32	*C50/60*	1.35	1000	350	0.0
29/	**29**	29	30	RE 32	*C50/60*	1.35	1000	350	0.0
29/	**30**	29	30	RE 32	*C50/60*	1.35	1000	350	0.0
30/	**30**	30	31	RE 32	*C50/60*	1.35	1000	350	0.0
30/	**31**	30	31	RE 32	*C50/60*	1.35	1000	350	0.0
31/	**31**	31	32	RE 32	*C50/60*	1.35	1000	350	0.0
31/	**32**	31	32	RE 32	*C50/60*	1.35	1000	350	0.0
32/	**32**	32	33	RE 32	*C50/60*	1.35	1000	350	0.0
32/	**33**	32	33	RE 32	*C50/60*	1.35	1000	350	0.0
33/	**33**	33	34	RE 32	*C50/60*	1.35	1000	350	0.0
33/	**34**	33	34	RE 32	*C50/60*	1.35	1000	350	0.0
34/	**34**	34	35	RE 32	*C50/60*	1.35	1000	350	0.0

34/ 35	34	35	RE 32	*C50/60*	1.35	1000	350	0.0
35/ 35	35	36	RE 32	*C50/60*	1.35	1000	350	0.0
35/ 36	35	36	RE 32	*C50/60*	1.35	1000	350	0.0
36/ 36	36	37	RE 32	*C50/60*	0.70	1000	350	0.0
36/ 37	36	37	RE 32	*C50/60*	0.70	1000	350	0.0
37/ 37	37	38	RE 32	*C50/60*	0.70	1000	350	0.0
37/ 38	37	38	RE 32	*C50/60*	0.70	1000	350	0.0
38/ 38	38	39	RE 32	*C50/60*	0.70	1000	350	0.0
38/ 39	38	39	RE 32	*C50/60*	0.70	1000	350	0.0
39/ 39	39	40	RE 32	*C50/60*	0.70	1000	350	0.0
39/ 40	39	40	RE 32	*C50/60*	0.70	1000	350	0.0
40/ 40	40	41	RE 32	*C50/60*	0.70	1000	350	0.0
40/ 41	40	41	RE 32	*C50/60*	0.70	1000	350	0.0
41/ 41	41	42	RE 17	*C50/60*	0.44	1000	350	0.0
41/ 42	41	42	RE 17	*C50/60*	0.44	1000	370	0.0
42/ 42	42	43	RE 18	*C50/60*	0.68	1000	370	0.0
42/ 43	42	43	RE 18	*C50/60*	0.68	1000	431	0.0
43/ 43	43	44	RE 19	*C50/60*	0.68	1000	431	0.0
43/ 44	43	44	RE 19	*C50/60*	0.68	1000	492	0.0
44/ 44	44	49	RE 36	*C50/60*	0.37	1000	550	0.0
44/ 49	44	49	RE 36	*C50/60*	0.37	1000	550	0.0
45/ 45	45	46	ADD 0.4x0.467	*C35/45*	0.50	1000	400	0.0
45/ 46	45	46	ADD 0.4x0.467	*C35/45*	0.50	1000	467	0.0
46/ 46	46	47	ADD 0.467x0.533	*C35/45*	0.50	1000	467	0.0
46/ 47	46	47	ADD 0.467x0.533	*C35/45*	0.50	1000	533	0.0
47/ 47	47	48	ADD 0.533x0.6	*C35/45*	0.50	1000	533	0.0
47/ 48	47	48	ADD 0.533x0.6	*C35/45*	0.50	1000	600	0.0
48/ 48	48	49	RE 23	*C50/60*	0.49	1000	500	0.0
48/ 49	48	49	RE 23	*C50/60*	0.49	1000	550	0.0
49/ 49	49	50	RE 24	*C50/60*	0.34	1000	550	0.0
49/ 50	49	50	RE 24	*C50/60*	0.34	1000	467	0.0
50/ 50	50	51	RE 25	*C50/60*	0.34	1000	467	0.0
50/ 51	50	51	RE 25	*C50/60*	0.34	1000	383	0.0
51/ 51	51	52	RE 26	*C50/60*	0.34	1000	383	0.0
51/ 52	51	52	RE 26	*C50/60*	0.34	1000	300	0.0
59/ 12	12	16	RE 34	*C50/60*	0.39	1000	500	0.0
59/ 16	12	16	RE 34	*C50/60*	0.39	1000	500	0.0
60/ 48	48	44	RE 34	*C50/60*	0.39	1000	500	0.0
60/ 44	48	44	RE 34	*C50/60*	0.39	1000	500	0.0

Diagram of Sections

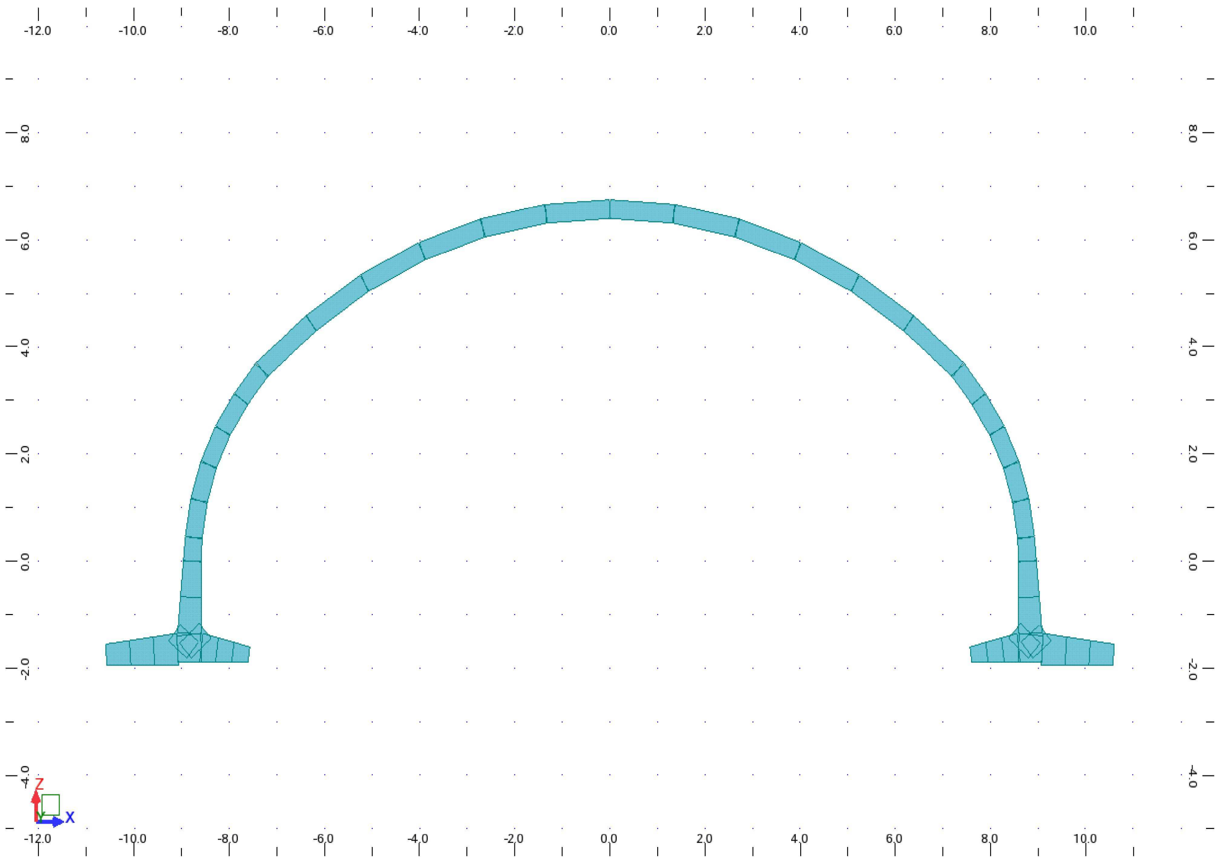
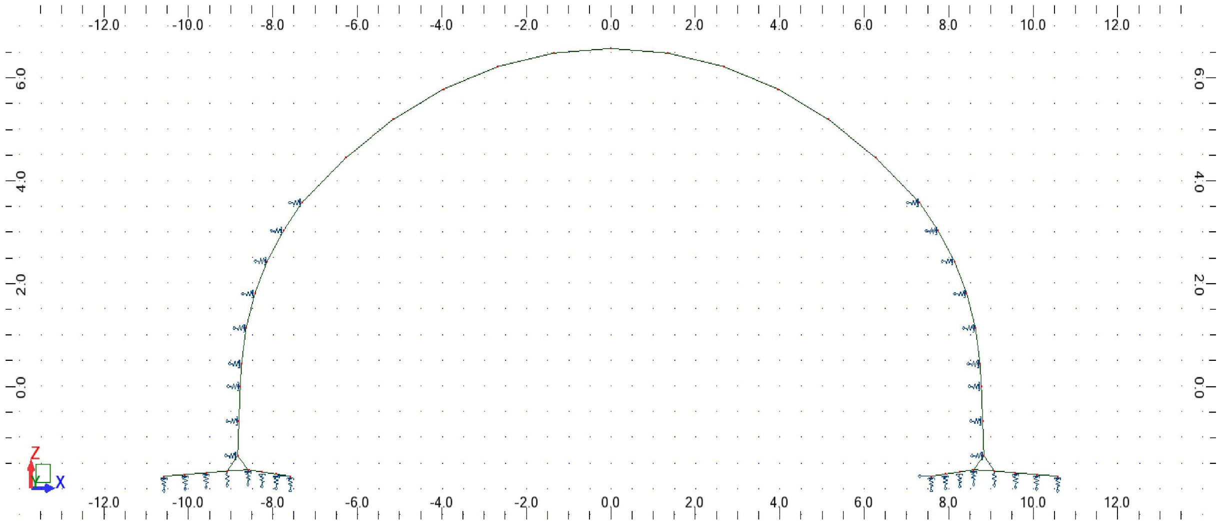


Diagram of Supports



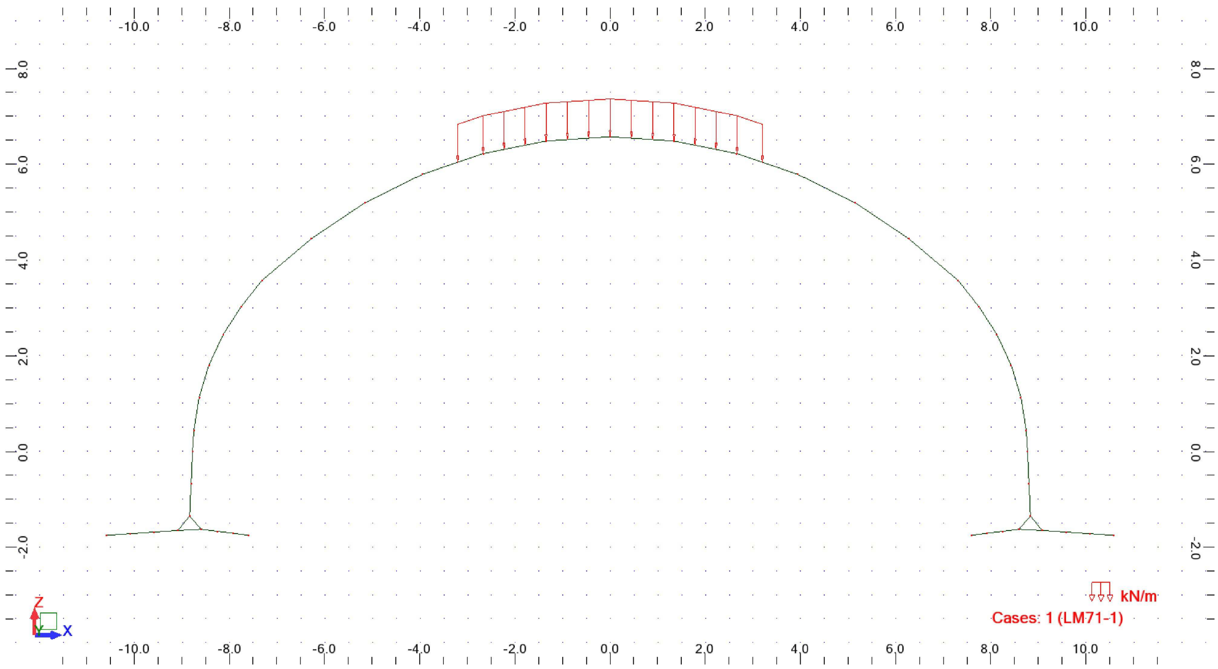
Supports properties

Support name	List of nodes	Support conditions
ADD_Spring_12	12 48	KZ=29842.30 (kN/m)
ADD_Spring_13	13 47	KZ=26102.48 (kN/m) +
ADD_Spring_14	14 46	KZ=31339.18 (kN/m) +
ADD_Spring_15	15 45	KZ=15033.30 (kN/m) +
ADD_Spring_49	11 49	KZ=24878.15 (kN/m) +
ADD_Spring_50	10 50	KZ=20134.58 (kN/m) +
ADD_Spring_51	9 51	KZ=20134.58 (kN/m) +
ADD_Spring_52	8 52	UX KZ=10098.91 (kN/m) +
ADD_Spring_16+	16	KX=11706.92 (kN/m) +
ADD_Spring_44-	44	KX=11706.92 (kN/m) -
ADD_Spring_17+	17	KX=14865.16 (kN/m) +
ADD_Spring_43-	43	KX=14865.16 (kN/m) -
ADD_Spring_18+	18	KX=12261.38 (kN/m) +
ADD_Spring_42-	42	KX=12261.38 (kN/m) -
ADD_Spring_19+	19	KX=12536.12 (kN/m) +
ADD_Spring_41-	41	KX=12536.12 (kN/m) -
ADD_Spring_20+	20	KX=15422.15 (kN/m) +
ADD_Spring_40-	40	KX=15422.15 (kN/m) -
ADD_Spring_21+	21	KX=15425.84 (kN/m) +
ADD_Spring_39-	39	KX=15425.84 (kN/m) -
ADD_Spring_22+	22	KX=15424.35 (kN/m) +
ADD_Spring_38-	38	KX=15424.35 (kN/m) -
ADD_Spring_23+	23	KX=15447.15 (kN/m) +
ADD_Spring_37-	37	KX=15447.15 (kN/m) -
ADD_Spring_24+	24	KX=22592.81 (kN/m) +
ADD_Spring_36-	36	KX=22592.81 (kN/m) -

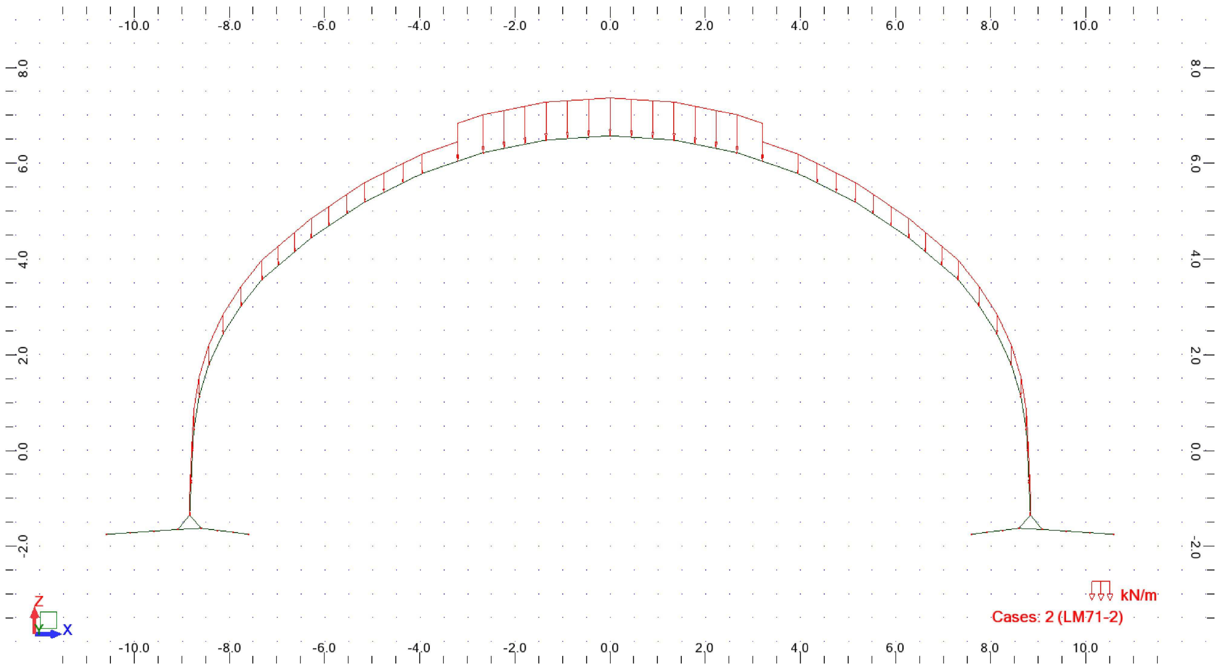
Kapitola 3

Zaťažovacie stavy - Schémy

View - Cases: 1 (LM71-1)

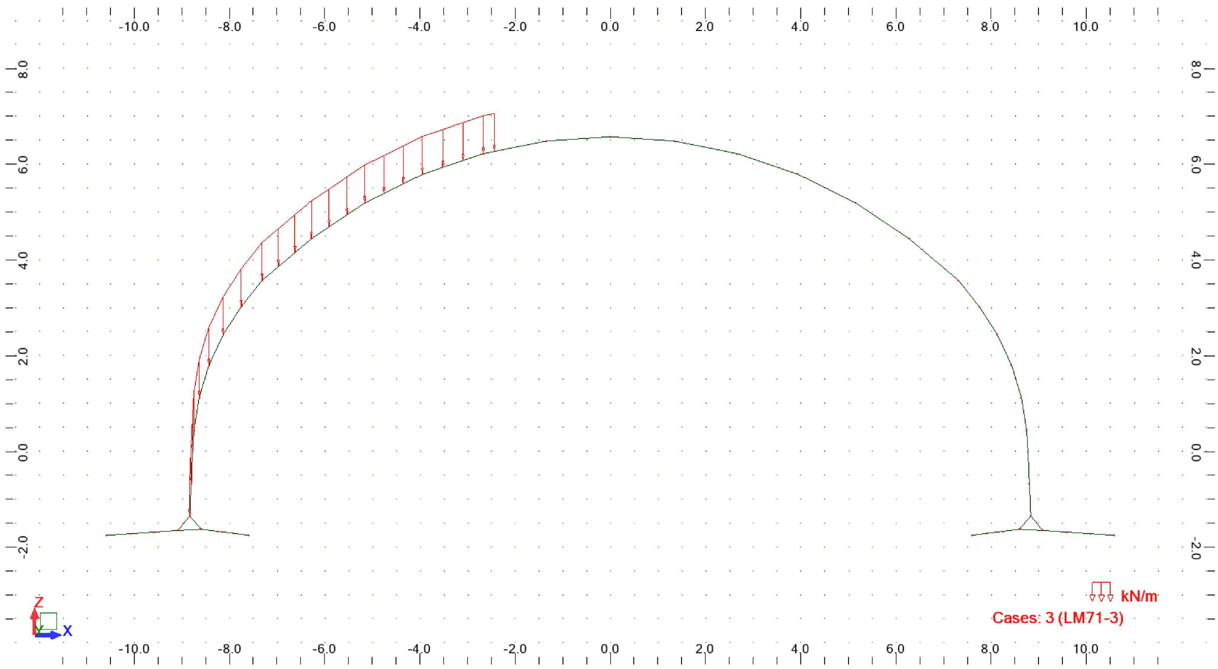


View - Cases: 2 (LM71-2)

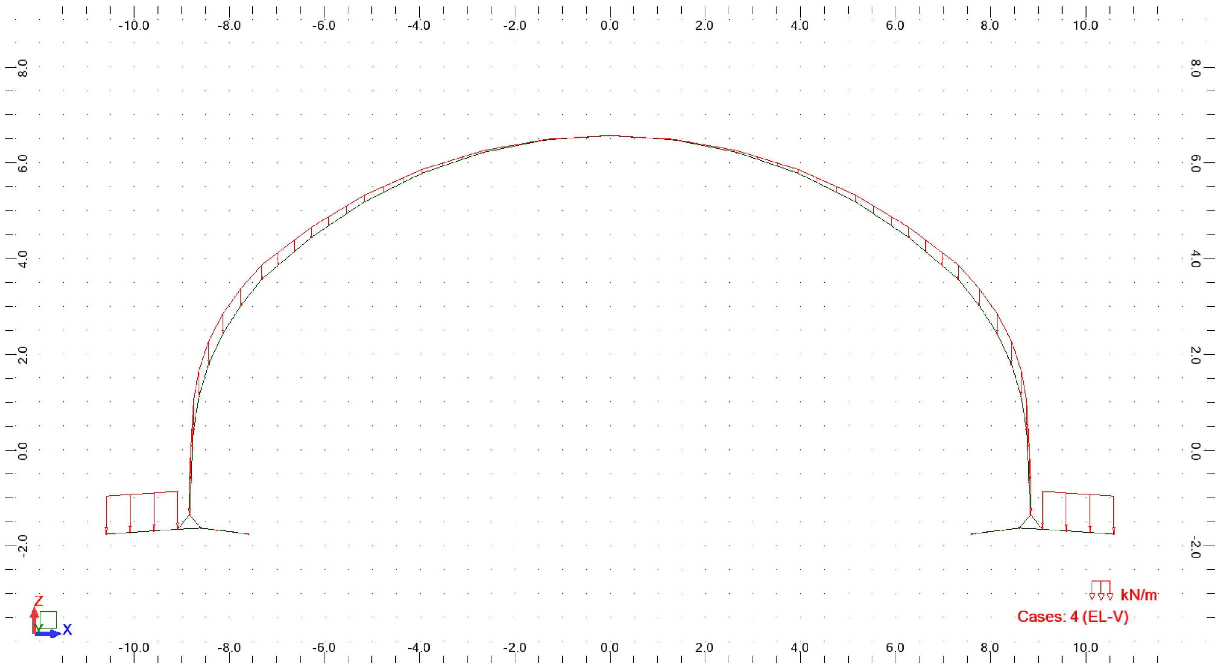


ABM Mosty			
Navrhol:	SC	Súbor:	ServiceMax_ULS.rtd
		Projekt:	18305

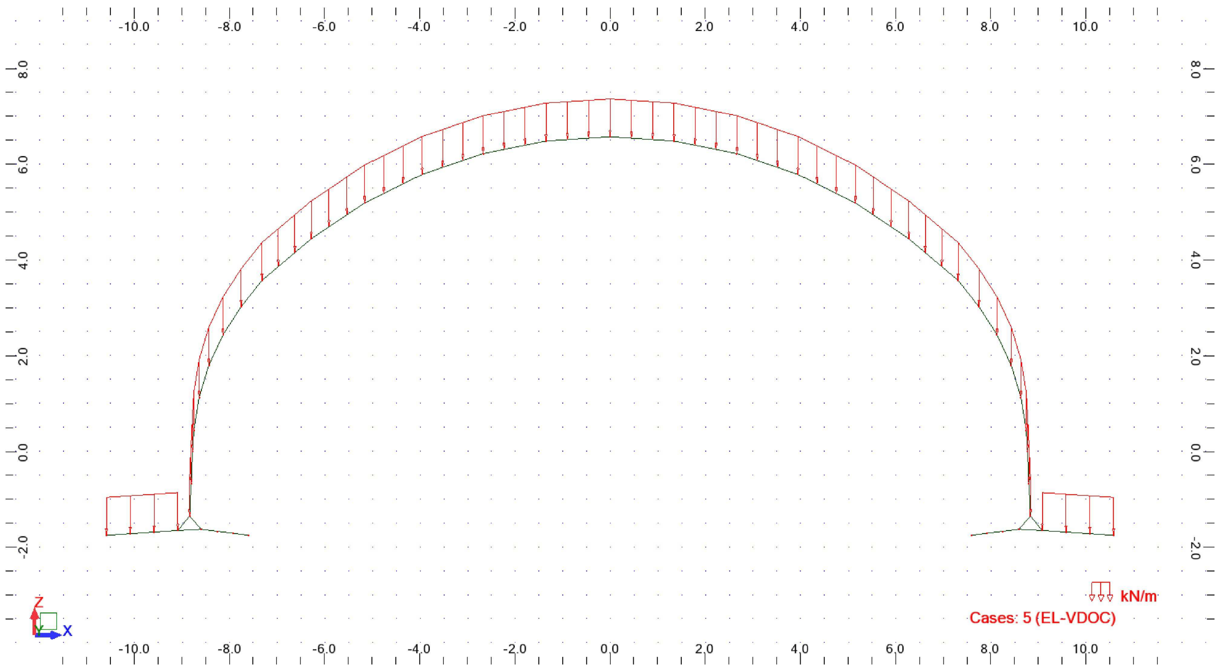
View - Cases: 3 (LM71-3)



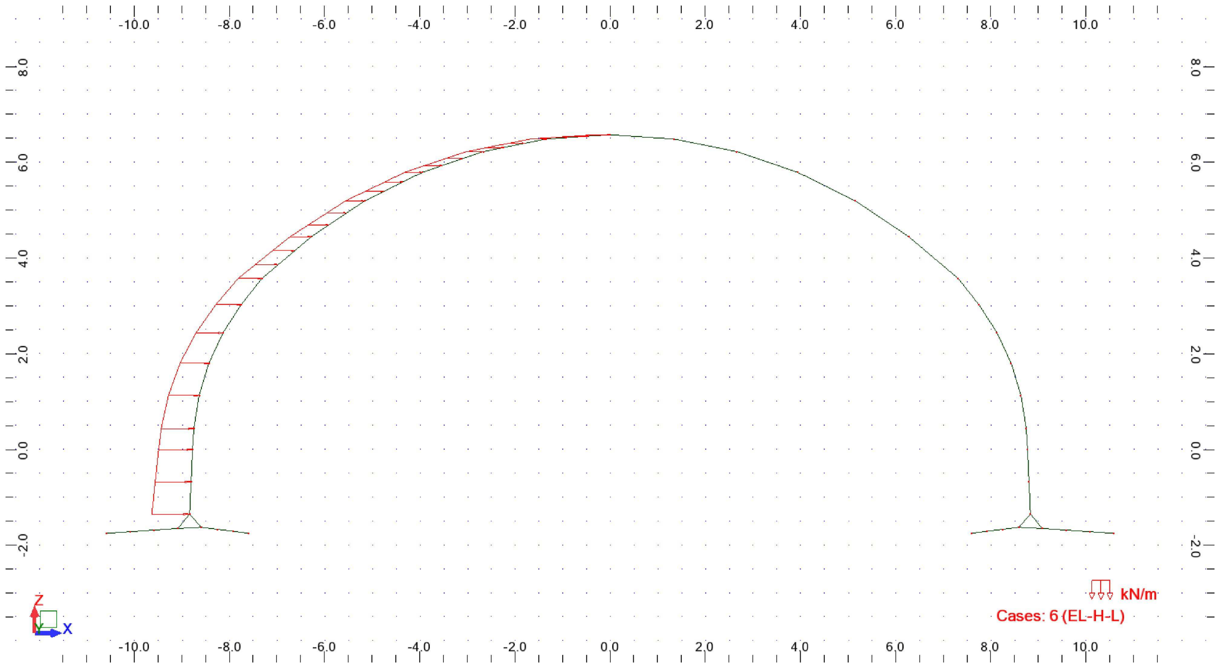
View - Cases: 4 (EL-V)



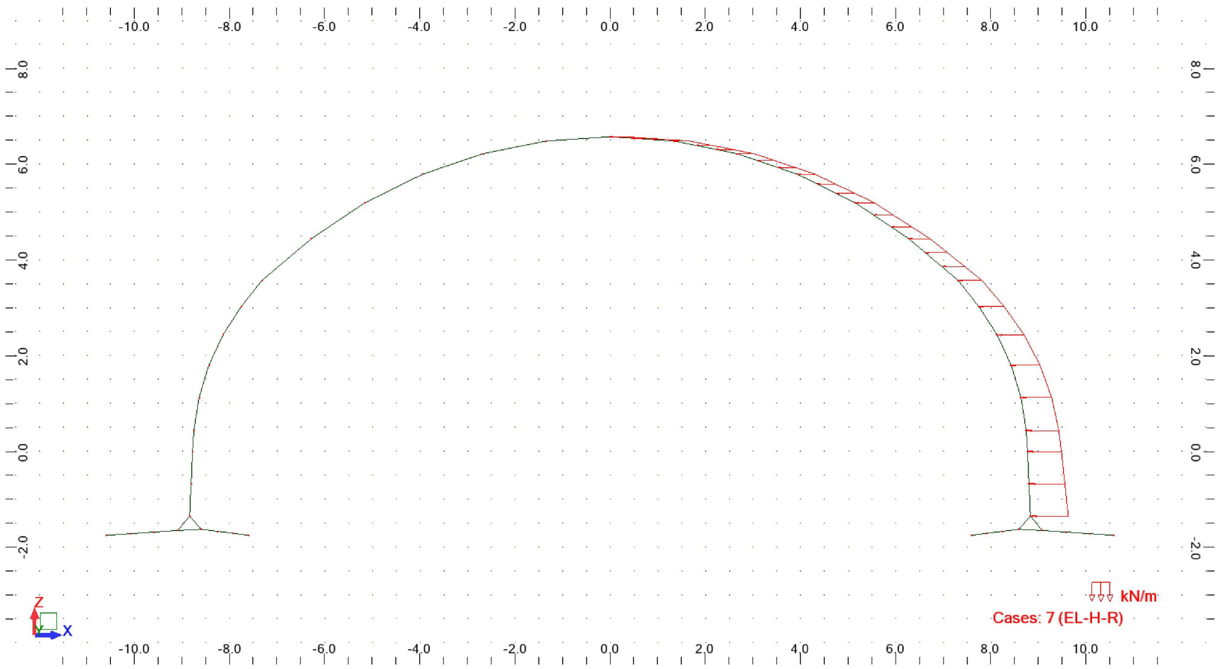
View - Cases: 5 (EL-VDOC)



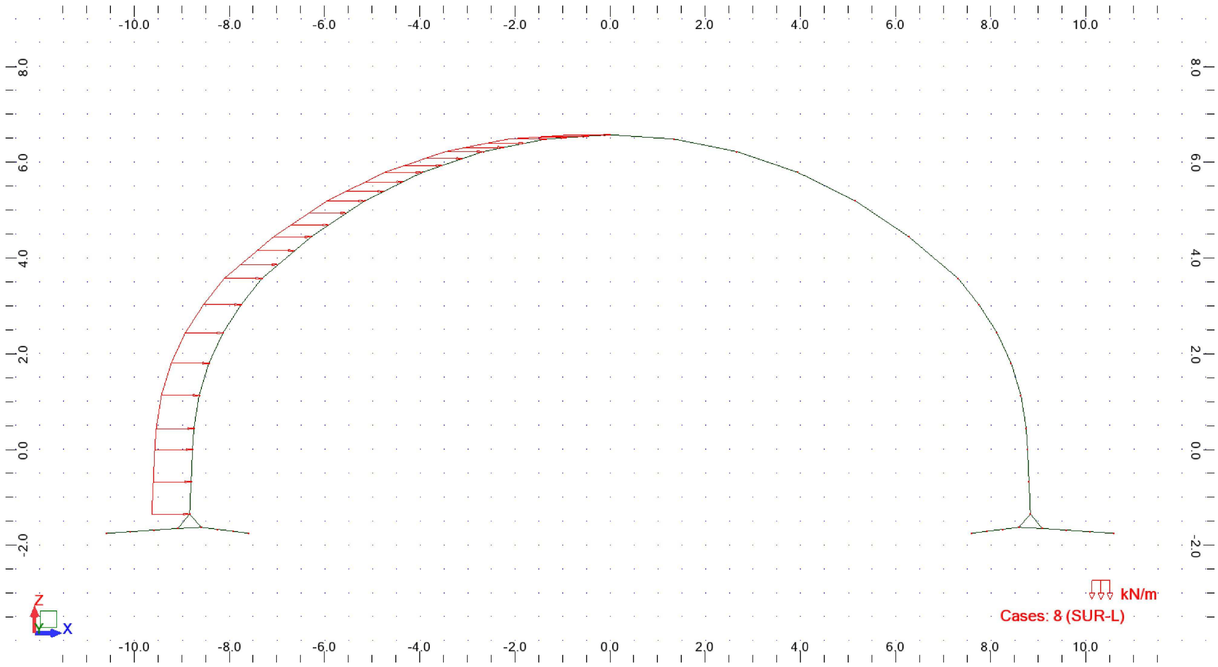
View - Cases: 6 (EL-H-L)



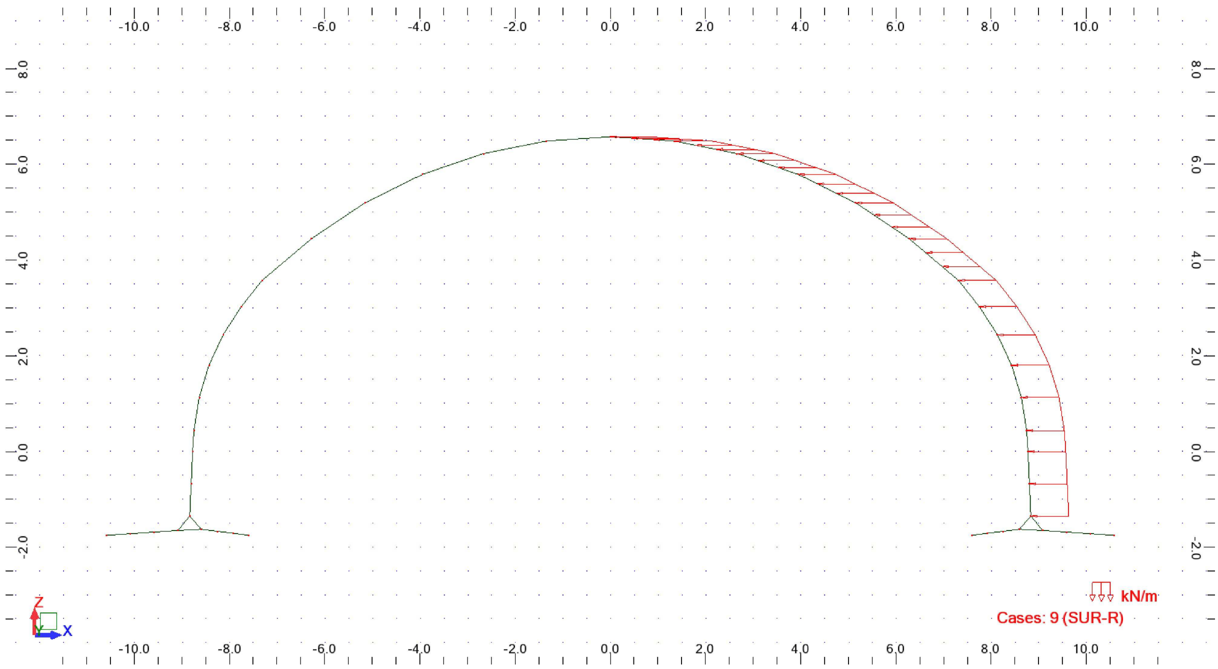
View - Cases: 7 (EL-H-R)



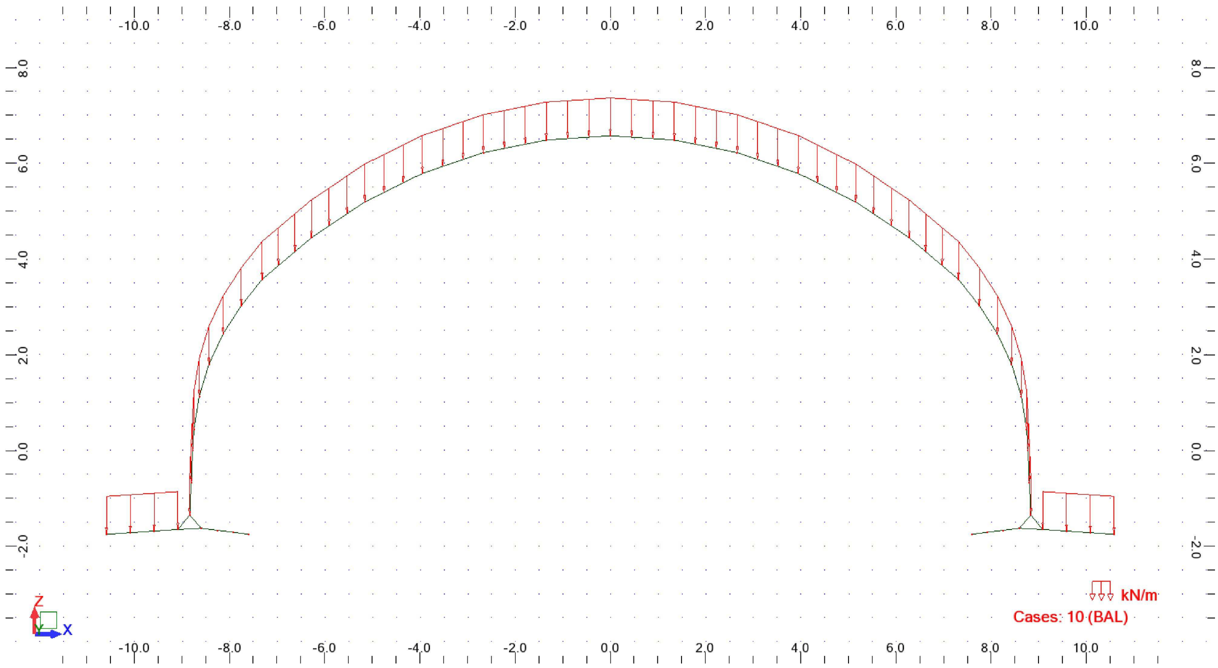
View - Cases: 8 (SUR-L)



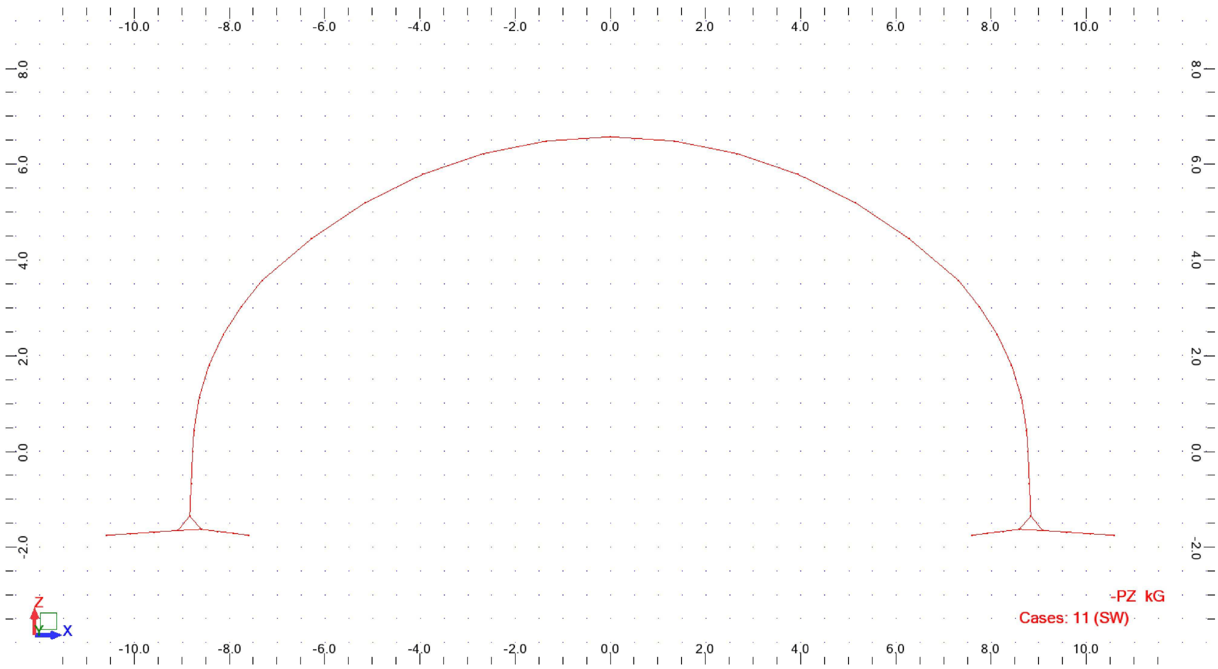
View - Cases: 9 (SUR-R)



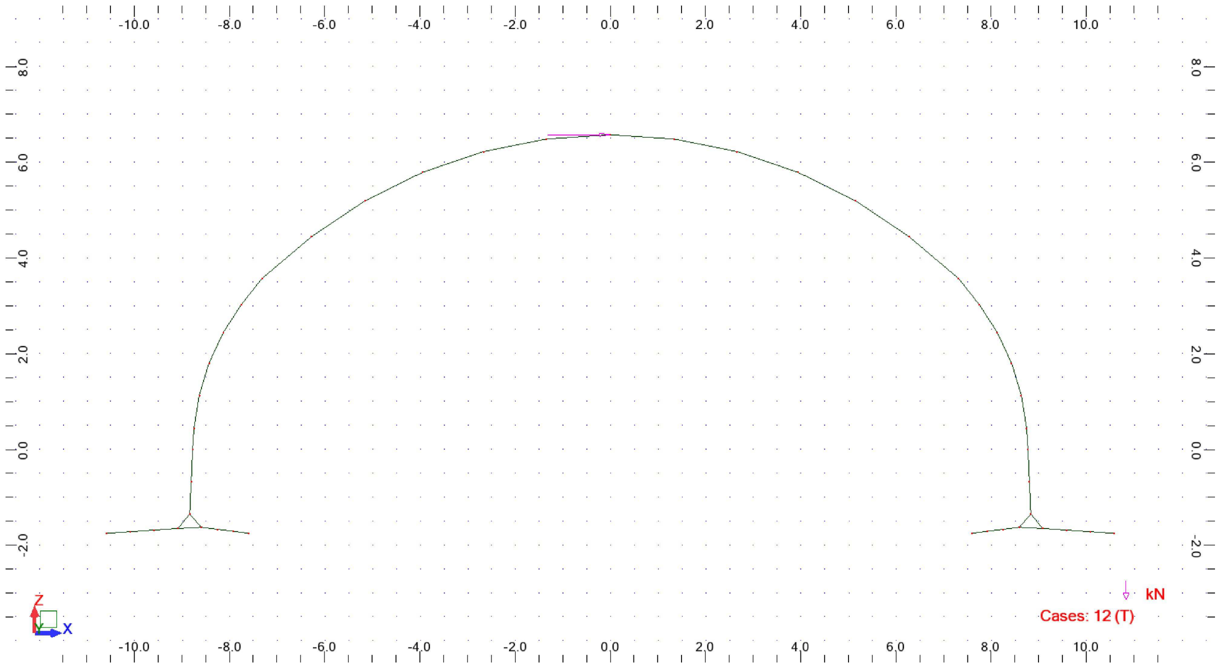
View - Cases: 10 (BAL)



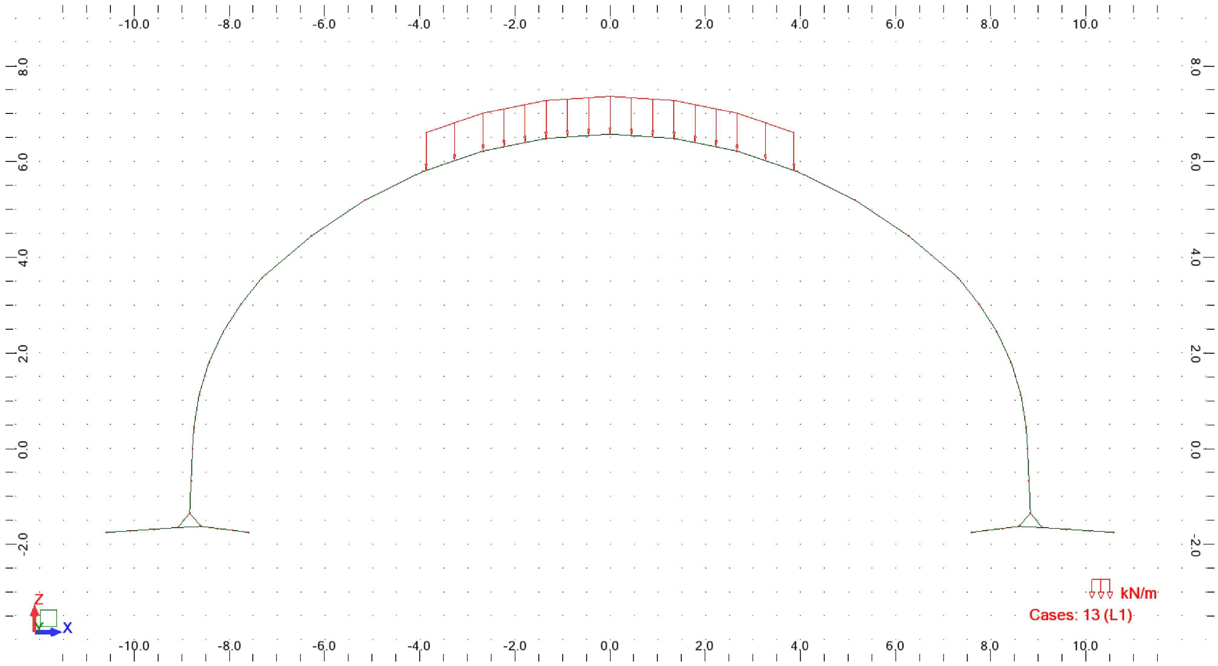
View - Cases: 11 (SW)



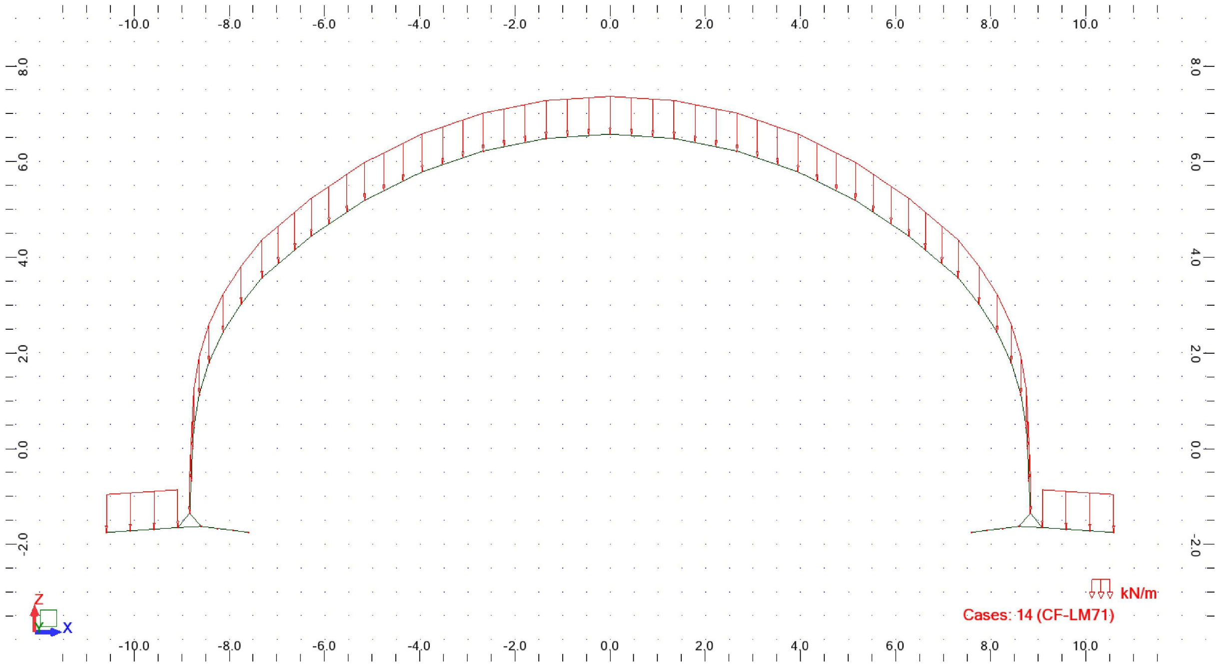
View - Cases: 12 (T)



View - Cases: 13 (L1)

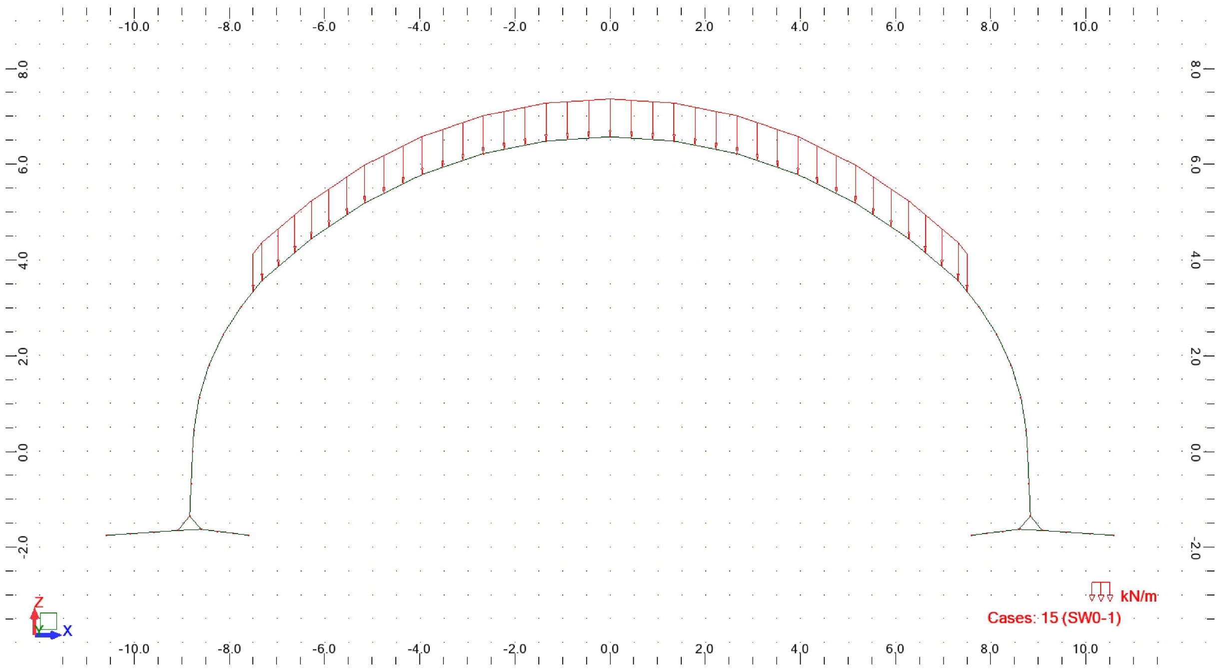


View - Cases: 14 (CF-LM71)

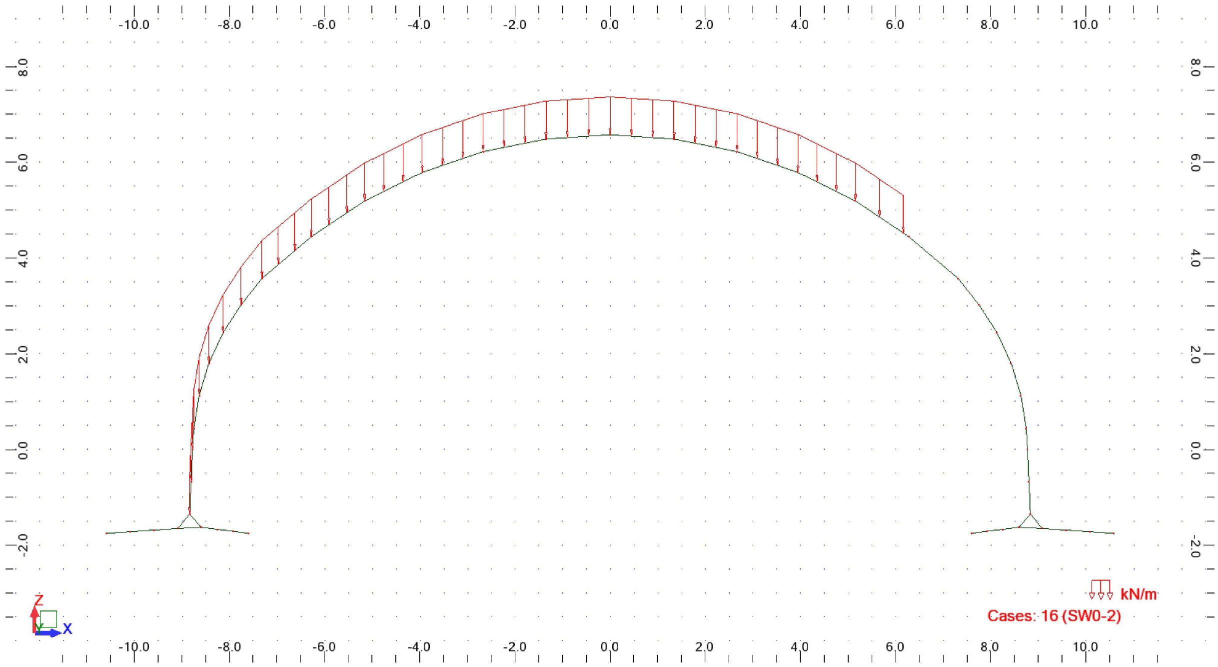


ABM Mosty			
Navrhol:	SC	Súbor:	ServiceMax_ULS.rtd
		Projekt:	18305

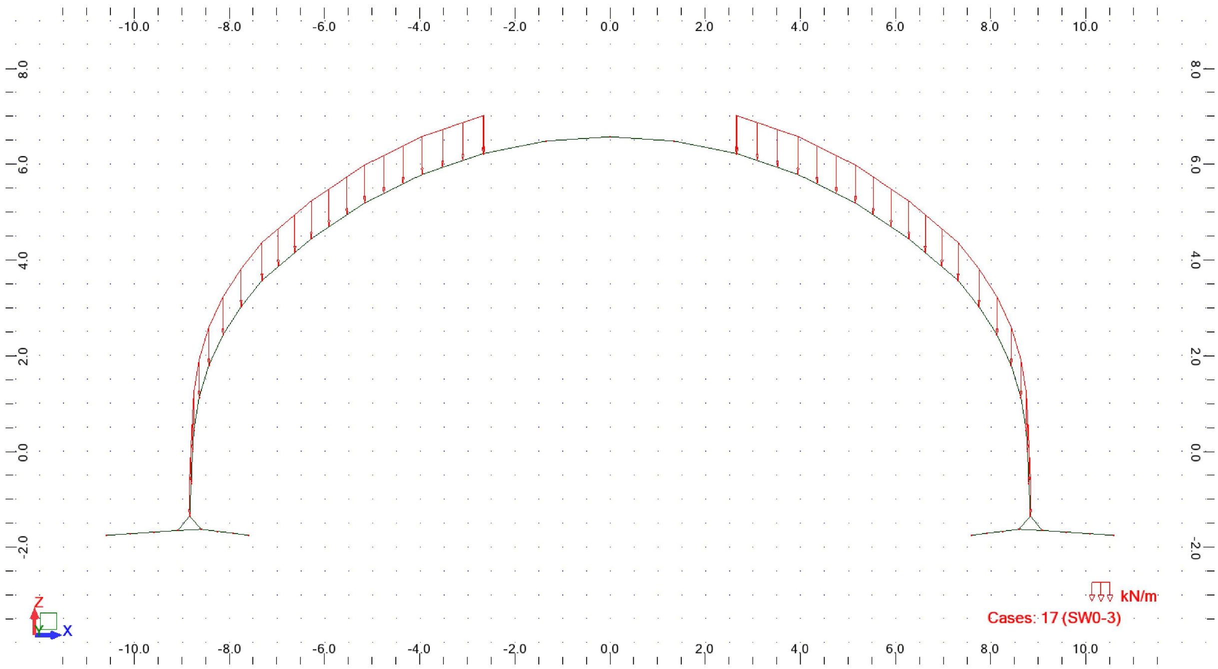
View - Cases: 15 (SW0-1)



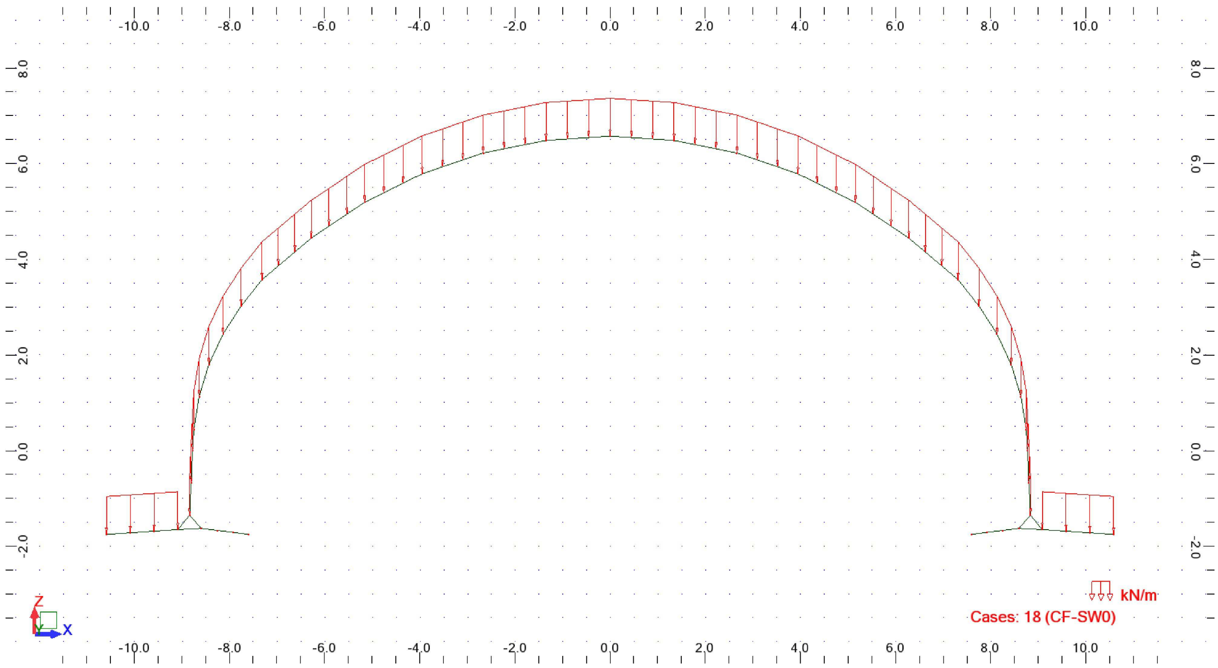
View - Cases: 16 (SW0-2)



View - Cases: 17 (SW0-3)

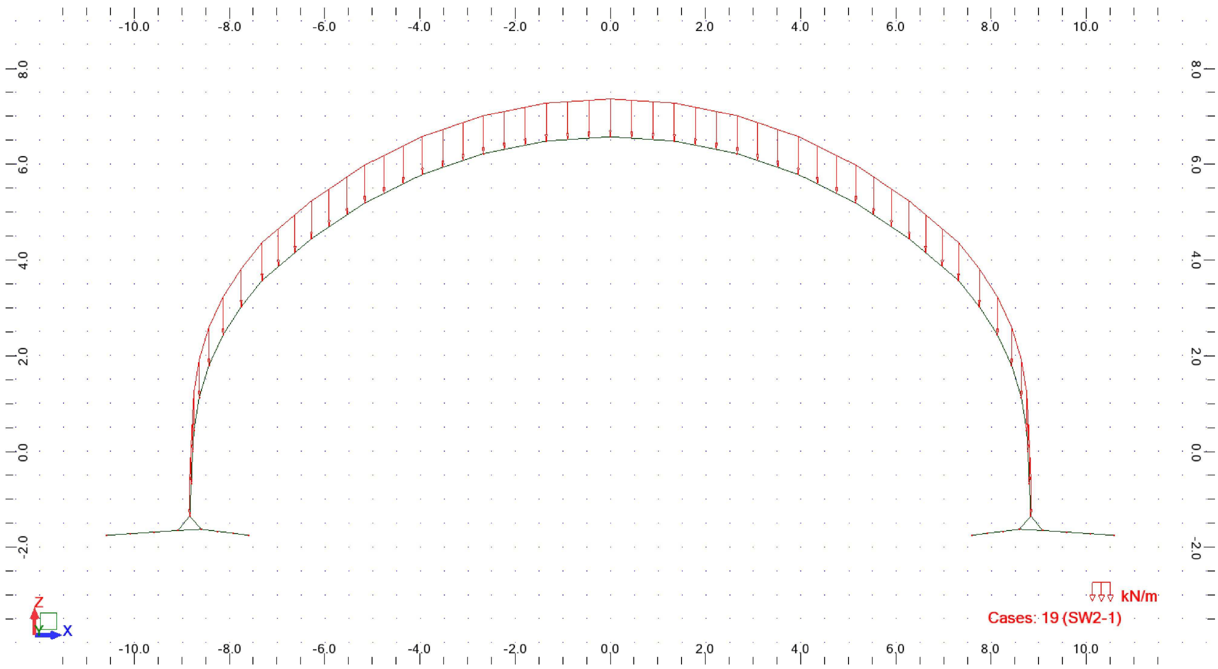


View - Cases: 18 (CF-SW0)

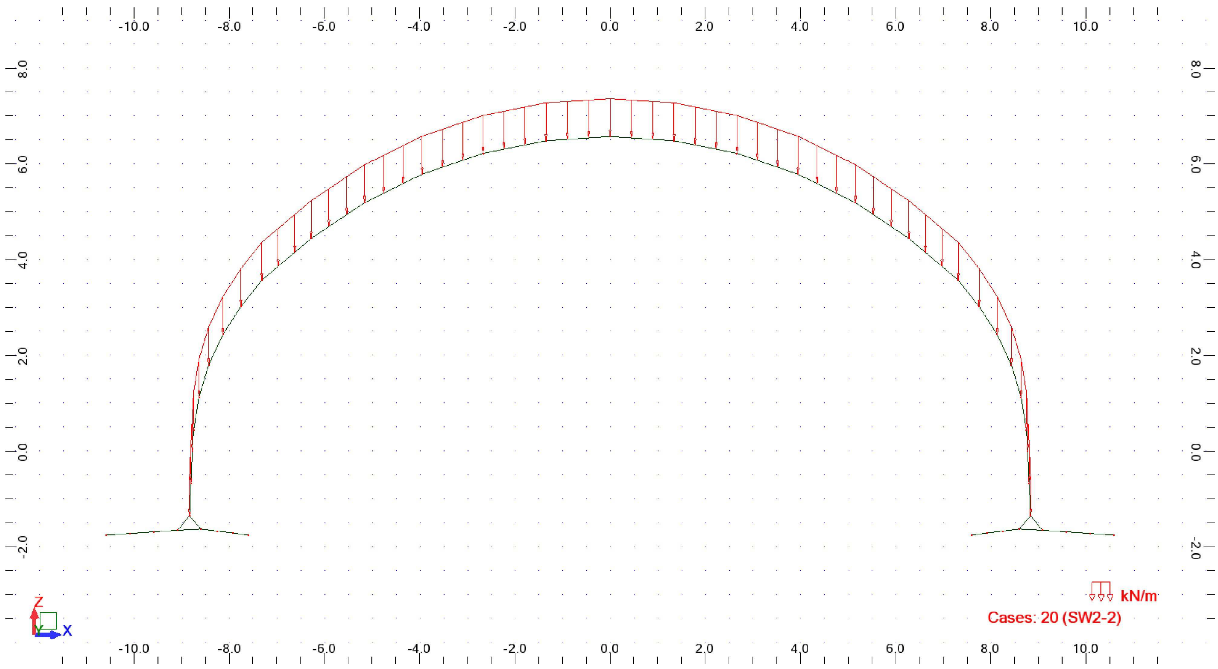


ABM Mosty			
Navrhol:	SC	Súbor:	ServiceMax_ULS.rtd
		Projekt:	18305

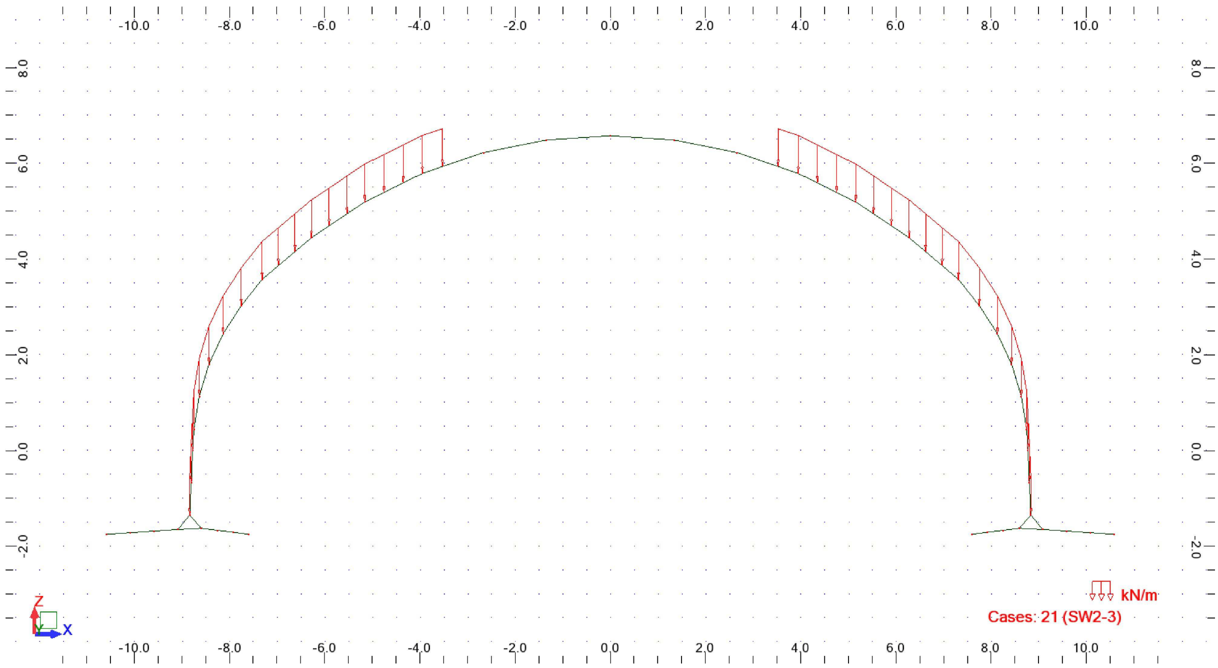
View - Cases: 19 (SW2-1)



View - Cases: 20 (SW2-2)

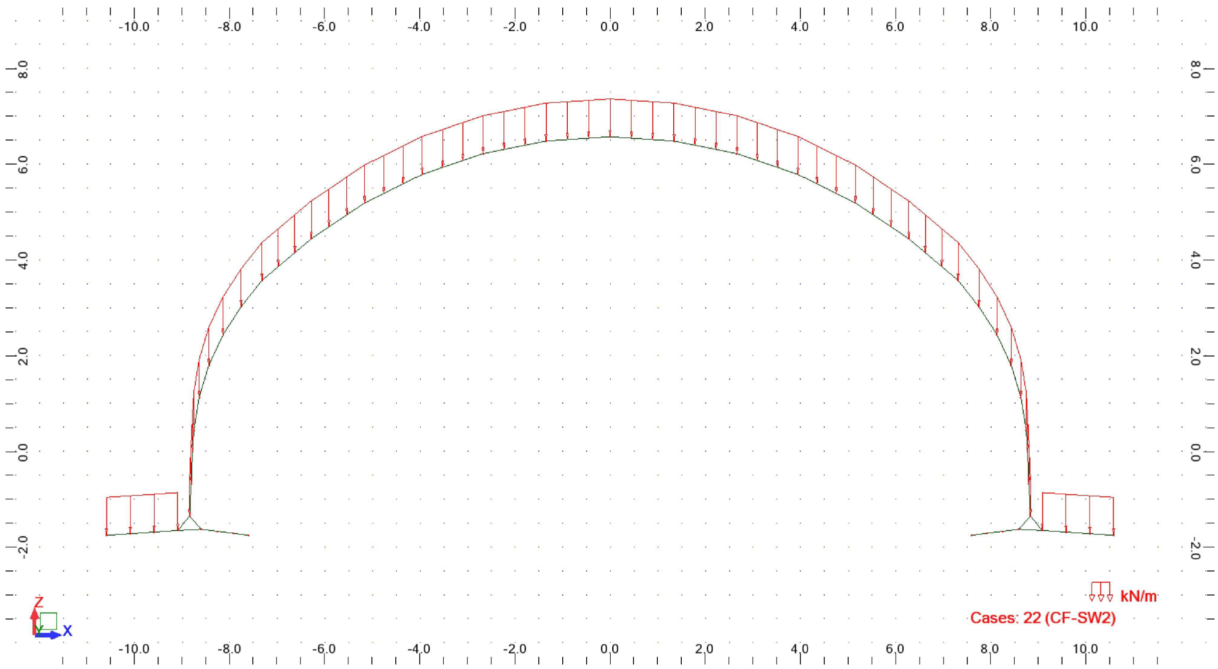


View - Cases: 21 (SW2-3)



ABM Mosty			
Navrhol:	SC	Súbor:	ServiceMax_ULS.rtd
		Projekt:	18305

View - Cases: 22 (CF-SW2)



Service Max - SLS - Load Case Values

- Cases: 1to22

Case	Case name	Nature	Load type	List	Load values
1	LM71-1	live	uniform load	28 29	PZ=-22.00(kN/m) projected
1	LM71-1	live	trapezoidal load (2p)	27	PZ2=-22.00(kN/m) PZ1=-22.00(kN/m) X2=1.35(m) X1=0.79(m) global projected absolute
1	LM71-1	live	uniform load	30 31	PZ=-22.00(kN/m) projected
1	LM71-1	live	trapezoidal load (2p)	32	PZ2=-22.00(kN/m) PZ1=-22.00(kN/m) X2=0.56(m) X1=0.0(m) global projected absolute
2	LM71-2	live	uniform load	33to43	PZ=-11.28(kN/m) projected
2	LM71-2	live	trapezoidal load (2p)	32	PZ2=-11.28(kN/m) PZ1=-11.28(kN/m) X2=1.35(m) X1=0.56(m) global projected absolute
2	LM71-2	live	uniform load	28 29	PZ=-22.00(kN/m) projected
2	LM71-2	live	trapezoidal load (2p)	27	PZ2=-22.00(kN/m) PZ1=-22.00(kN/m) X2=1.35(m) X1=0.79(m) global projected absolute
2	LM71-2	live	uniform load	16to26	PZ=-11.28(kN/m) projected
2	LM71-2	live	trapezoidal load (2p)	27	PZ2=-11.28(kN/m) PZ1=-11.28(kN/m) X2=0.79(m) X1=0.0(m) global projected absolute
2	LM71-2	live	uniform load	30 31	PZ=-22.00(kN/m) projected
2	LM71-2	live	trapezoidal load (2p)	32	PZ2=-22.00(kN/m) PZ1=-22.00(kN/m) X2=0.56(m) X1=0.0(m) global projected absolute
3	LM71-3	live	uniform load	16to27	PZ=-22.00(kN/m) projected
3	LM71-3	live	trapezoidal load (2p)	28	PZ2=-22.00(kN/m) PZ1=-22.00(kN/m) X2=0.24(m) X1=0.0(m) global projected absolute
4	EL-V	dead	trapezoidal load (2p)	27	PZ2=-7.02(kN/m) PZ1=-15.70(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	33	PZ2=-27.62(kN/m) PZ1=-15.70(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	32	PZ2=-15.70(kN/m) PZ1=-7.02(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	26	PZ2=-15.70(kN/m) PZ1=-27.62(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	34	PZ2=-42.62(kN/m) PZ1=-27.62(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	25	PZ2=-27.62(kN/m) PZ1=-42.62(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	35	PZ2=-59.98(kN/m) PZ1=-42.62(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	24	PZ2=-42.62(kN/m) PZ1=-59.98(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	36	PZ2=-70.98(kN/m) PZ1=-59.98(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	23	PZ2=-59.98(kN/m) PZ1=-70.98(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	37	PZ2=-82.74(kN/m) PZ1=-70.98(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	22	PZ2=-70.98(kN/m) PZ1=-82.74(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	38	PZ2=-95.44(kN/m) PZ1=-82.74(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	21	PZ2=-82.74(kN/m) PZ1=-95.44(kN/m)

					X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	39	PZ2=-108.86(kN/m) PZ1=-95.44(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	20	PZ2=-95.44(kN/m) PZ1=-108.86(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	40	PZ2=-122.70(kN/m) PZ1=-108.86(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	19	PZ2=-108.86(kN/m) PZ1=-122.70(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	41	PZ2=-131.46(kN/m) PZ1=-122.70(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	18	PZ2=-122.70(kN/m) PZ1=-131.46(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	42	PZ2=-144.96(kN/m) PZ1=-131.46(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	17	PZ2=-131.46(kN/m) PZ1=-144.96(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	43	PZ2=-158.46(kN/m) PZ1=-144.96(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	16	PZ2=-144.96(kN/m) PZ1=-158.46(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	28	PZ2=-1.76(kN/m) PZ1=-7.02(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	31	PZ2=-7.02(kN/m) PZ1=-1.76(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	29	PZ2=0.0(kN/m) PZ1=-1.76(kN/m) X2=0.0(m) X1=0.0(m) global not project. absolute
4	EL-V	dead	trapezoidal load (2p)	30	PZ2=-1.76(kN/m) PZ1=0.0(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	uniform load	12to14 45to47	PZ=-158.46(kN/m) projected
5	EL-VDOC	dead	uniform load	12to14 45to47	PZ=-104.20(kN/m) projected
5	EL-VDOC	dead	uniform load	16to43	PZ=-104.20(kN/m) projected
6	EL-H-L	dead	trapezoidal load (2p)	19	PX2=217.46(kN/m) PX1=231.30(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	21	PX2=191.34(kN/m) PX1=204.04(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	22	PX2=179.58(kN/m) PX1=191.34(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	23	PX2=168.58(kN/m) PX1=179.58(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	24	PX2=151.22(kN/m) PX1=168.58(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	25	PX2=136.22(kN/m) PX1=151.22(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	26	PX2=124.30(kN/m) PX1=136.22(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	20	PX2=204.04(kN/m) PX1=217.46(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	29	PX2=108.60(kN/m) PX1=110.36(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	28	PX2=110.36(kN/m) PX1=115.62(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	16	PX2=253.56(kN/m) PX1=267.06(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	17	PX2=240.06(kN/m) PX1=253.56(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	18	PX2=231.30(kN/m) PX1=240.06(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	27	PX2=115.62(kN/m) PX1=124.30(kN/m)

					X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	37	PX2=-191.34(kN/m) PX1=-179.58(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	36	PX2=-179.58(kN/m) PX1=-168.58(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	35	PX2=-168.58(kN/m) PX1=-151.22(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	34	PX2=-151.22(kN/m) PX1=-136.22(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	33	PX2=-136.22(kN/m) PX1=-124.30(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	31	PX2=-115.62(kN/m) PX1=-110.36(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	30	PX2=-110.36(kN/m) PX1=-108.60(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	32	PX2=-124.30(kN/m) PX1=-115.62(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	43	PX2=-267.06(kN/m) PX1=-253.56(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	42	PX2=-253.56(kN/m) PX1=-240.06(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	41	PX2=-240.06(kN/m) PX1=-231.30(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	40	PX2=-231.30(kN/m) PX1=-217.46(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	39	PX2=-217.46(kN/m) PX1=-204.04(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	38	PX2=-204.04(kN/m) PX1=-191.34(kN/m) X2=1.00 X1=0.0 global projected relative
8	SUR-L	live	uniform load	16to29	PX=12.52(kN/m) projected
9	SUR-R	live	uniform load	30to43	PX=-12.52(kN/m) projected
10	BAL	dead	uniform load	12to14 16to43 45to47	PZ=-4.40(kN/m) projected
11	SW	dead	self-weight	8to51 59 60	PZ Negative Factor=1.00
12	T	live	nodal force	30	FX=291.52(kN)
13	L1	live	trapezoidal load (2p)	32	PZ2=-10.65(kN/m) PZ1=-10.65(kN/m) X2=1.26(m) X1=0.0(m) global projected absolute
13	L1	live	uniform load	30 31	PZ=-10.65(kN/m) projected
13	L1	live	trapezoidal load (2p)	27	PZ2=-10.65(kN/m) PZ1=-10.65(kN/m) X2=1.35(m) X1=0.09(m) global projected absolute
13	L1	live	uniform load	28 29	PZ=-10.65(kN/m) projected
14	CF-LM71	dead	uniform load	16to43	PZ=-40.79(kN/m) projected
14	CF-LM71	dead	uniform load	12to14 45to47	PZ=-40.79(kN/m) projected
15	SW0-1	live	trapezoidal load (2p)	36	PZ2=-20.82(kN/m) PZ1=-20.82(kN/m) X2=0.30(m) X1=0.0(m) global projected absolute
15	SW0-1	live	uniform load	30to35	PZ=-20.82(kN/m) projected
15	SW0-1	live	trapezoidal load (2p)	23	PZ2=-20.82(kN/m) PZ1=-20.82(kN/m) X2=0.70(m) X1=0.40(m) global projected absolute
15	SW0-1	live	uniform load	24to29	PZ=-20.82(kN/m) projected
16	SW0-2	live	trapezoidal load (2p)	34	PZ2=-20.82(kN/m) PZ1=-20.82(kN/m) X2=1.21(m) X1=0.0(m) global projected absolute
16	SW0-2	live	uniform load	16to33	PZ=-20.82(kN/m) projected
17	SW0-3	live	trapezoidal load (2p)	31	PZ2=-20.82(kN/m) PZ1=-20.82(kN/m) X2=1.35(m) X1=1.33(m) global projected

					absolute
17	SW0-3	live	uniform load	32to43	PZ=-20.82(kN/m) projected
17	SW0-3	live	trapezoidal load (2p)	28	PZ2=-20.82(kN/m) PZ1=-20.82(kN/m) X2=0.02(m) X1=0.0(m) global projected absolute
17	SW0-3	live	uniform load	16to27	PZ=-20.82(kN/m) projected
18	CF-SW0	dead	uniform load	16to43	PZ=-34.72(kN/m) projected
18	CF-SW0	dead	uniform load	12to14 45to47	PZ=-34.72(kN/m) projected
19	SW2-1	live	uniform load	30to43	PZ=-19.41(kN/m) projected
19	SW2-1	live	uniform load	16to29	PZ=-19.41(kN/m) projected
20	SW2-2	live	uniform load	16to43	PZ=-19.41(kN/m) projected
21	SW2-3	live	uniform load	33to43	PZ=-19.41(kN/m) projected
21	SW2-3	live	trapezoidal load (2p)	27	PZ2=-19.41(kN/m) PZ1=-19.41(kN/m) X2=0.45(m) X1=0.0(m) global projected absolute
21	SW2-3	live	uniform load	16to26	PZ=-19.41(kN/m) projected
21	SW2-3	live	trapezoidal load (2p)	32	PZ2=-19.41(kN/m) PZ1=-19.41(kN/m) X2=1.35(m) X1=0.90(m) global projected absolute
22	CF-SW2	dead	uniform load	16to43	PZ=-25.57(kN/m) projected
22	CF-SW2	dead	uniform load	12to14 45to47	PZ=-25.57(kN/m) projected

Service Min - SLS - Load Case Values

- Cases: 1to22

Case	Case name	Nature	Load type	List	Load values
1	LM71-1	live	uniform load	28 29	PZ=-24.11(kN/m) projected
1	LM71-1	live	trapezoidal load (2p)	27	PZ2=-24.11(kN/m) PZ1=-24.11(kN/m) X2=1.35(m) X1=0.79(m) global projected absolute
1	LM71-1	live	uniform load	30 31	PZ=-24.11(kN/m) projected
1	LM71-1	live	trapezoidal load (2p)	32	PZ2=-24.11(kN/m) PZ1=-24.11(kN/m) X2=0.56(m) X1=0.0(m) global projected absolute
2	LM71-2	live	uniform load	33to43	PZ=-12.36(kN/m) projected
2	LM71-2	live	trapezoidal load (2p)	32	PZ2=-12.36(kN/m) PZ1=-12.36(kN/m) X2=1.35(m) X1=0.56(m) global projected absolute
2	LM71-2	live	uniform load	28 29	PZ=-24.11(kN/m) projected
2	LM71-2	live	trapezoidal load (2p)	27	PZ2=-24.11(kN/m) PZ1=-24.11(kN/m) X2=1.35(m) X1=0.79(m) global projected absolute
2	LM71-2	live	uniform load	16to26	PZ=-12.36(kN/m) projected
2	LM71-2	live	trapezoidal load (2p)	27	PZ2=-12.36(kN/m) PZ1=-12.36(kN/m) X2=0.79(m) X1=0.0(m) global projected absolute
2	LM71-2	live	uniform load	30 31	PZ=-24.11(kN/m) projected
2	LM71-2	live	trapezoidal load (2p)	32	PZ2=-24.11(kN/m) PZ1=-24.11(kN/m) X2=0.56(m) X1=0.0(m) global projected absolute
3	LM71-3	live	uniform load	16to27	PZ=-24.11(kN/m) projected
3	LM71-3	live	trapezoidal load (2p)	28	PZ2=-24.11(kN/m) PZ1=-24.11(kN/m) X2=0.24(m) X1=0.0(m) global projected absolute
4	EL-V	dead	trapezoidal load (2p)	27	PZ2=-7.02(kN/m) PZ1=-15.70(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	33	PZ2=-27.62(kN/m) PZ1=-15.70(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	32	PZ2=-15.70(kN/m) PZ1=-7.02(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	26	PZ2=-15.70(kN/m) PZ1=-27.62(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	34	PZ2=-42.62(kN/m) PZ1=-27.62(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	25	PZ2=-27.62(kN/m) PZ1=-42.62(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	35	PZ2=-59.98(kN/m) PZ1=-42.62(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	24	PZ2=-42.62(kN/m) PZ1=-59.98(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	36	PZ2=-70.98(kN/m) PZ1=-59.98(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	23	PZ2=-59.98(kN/m) PZ1=-70.98(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	37	PZ2=-82.74(kN/m) PZ1=-70.98(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	22	PZ2=-70.98(kN/m) PZ1=-82.74(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	38	PZ2=-95.44(kN/m) PZ1=-82.74(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	21	PZ2=-82.74(kN/m) PZ1=-95.44(kN/m)

					X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	39	PZ2=-108.86(kN/m) PZ1=-95.44(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	20	PZ2=-95.44(kN/m) PZ1=-108.86(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	40	PZ2=-122.70(kN/m) PZ1=-108.86(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	19	PZ2=-108.86(kN/m) PZ1=-122.70(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	41	PZ2=-131.46(kN/m) PZ1=-122.70(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	18	PZ2=-122.70(kN/m) PZ1=-131.46(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	42	PZ2=-144.96(kN/m) PZ1=-131.46(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	17	PZ2=-131.46(kN/m) PZ1=-144.96(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	43	PZ2=-158.46(kN/m) PZ1=-144.96(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	16	PZ2=-144.96(kN/m) PZ1=-158.46(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	28	PZ2=-1.76(kN/m) PZ1=-7.02(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	31	PZ2=-7.02(kN/m) PZ1=-1.76(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	trapezoidal load (2p)	29	PZ2=0.0(kN/m) PZ1=-1.76(kN/m) X2=0.0(m) X1=0.0(m) global not project. absolute
4	EL-V	dead	trapezoidal load (2p)	30	PZ2=-1.76(kN/m) PZ1=0.0(kN/m) X2=1.00 X1=0.0 global projected relative
4	EL-V	dead	uniform load	12to14 45to47	PZ=-158.46(kN/m) projected
5	EL-VDOC	dead	uniform load	12to14 45to47	PZ=-97.00(kN/m) projected
5	EL-VDOC	dead	uniform load	16to43	PZ=-97.00(kN/m) projected
6	EL-H-L	dead	trapezoidal load (2p)	19	PX2=210.26(kN/m) PX1=224.10(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	21	PX2=184.14(kN/m) PX1=196.84(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	22	PX2=172.38(kN/m) PX1=184.14(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	23	PX2=161.38(kN/m) PX1=172.38(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	24	PX2=144.02(kN/m) PX1=161.38(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	25	PX2=129.02(kN/m) PX1=144.02(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	26	PX2=117.10(kN/m) PX1=129.02(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	20	PX2=196.84(kN/m) PX1=210.26(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	29	PX2=101.40(kN/m) PX1=103.16(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	28	PX2=103.16(kN/m) PX1=108.42(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	16	PX2=246.36(kN/m) PX1=259.86(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	17	PX2=232.86(kN/m) PX1=246.36(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	18	PX2=224.10(kN/m) PX1=232.86(kN/m) X2=1.00 X1=0.0 global projected relative
6	EL-H-L	dead	trapezoidal load (2p)	27	PX2=108.42(kN/m) PX1=117.10(kN/m)

					X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	37	PX2=-184.14(kN/m) PX1=-172.38(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	36	PX2=-172.38(kN/m) PX1=-161.38(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	35	PX2=-161.38(kN/m) PX1=-144.02(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	34	PX2=-144.02(kN/m) PX1=-129.02(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	33	PX2=-129.02(kN/m) PX1=-117.10(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	31	PX2=-108.42(kN/m) PX1=-103.16(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	30	PX2=-103.16(kN/m) PX1=-101.40(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	32	PX2=-117.10(kN/m) PX1=-108.42(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	43	PX2=-259.86(kN/m) PX1=-246.36(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	42	PX2=-246.36(kN/m) PX1=-232.86(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	41	PX2=-232.86(kN/m) PX1=-224.10(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	40	PX2=-224.10(kN/m) PX1=-210.26(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	39	PX2=-210.26(kN/m) PX1=-196.84(kN/m) X2=1.00 X1=0.0 global projected relative
7	EL-H-R	dead	trapezoidal load (2p)	38	PX2=-196.84(kN/m) PX1=-184.14(kN/m) X2=1.00 X1=0.0 global projected relative
8	SUR-L	live	uniform load	16to29	PX=13.13(kN/m) projected
9	SUR-R	live	uniform load	30to43	PX=-13.13(kN/m) projected
10	BAL	dead	uniform load	12to14 16to43 45to47	PZ=-4.40(kN/m) projected
11	SW	dead	self-weight	8to51 59 60	PZ Negative Factor=1.00
12	T	live	nodal force	30	FX=291.52(kN)
13	L1	live	trapezoidal load (2p)	32	PZ2=-10.96(kN/m) PZ1=-10.96(kN/m) X2=1.07(m) X1=0.0(m) global projected absolute
13	L1	live	uniform load	30 31	PZ=-10.96(kN/m) projected
13	L1	live	trapezoidal load (2p)	27	PZ2=-10.96(kN/m) PZ1=-10.96(kN/m) X2=1.35(m) X1=0.28(m) global projected absolute
13	L1	live	uniform load	28 29	PZ=-10.96(kN/m) projected
14	CF-LM71	dead	uniform load	16to43	PZ=-42.74(kN/m) projected
14	CF-LM71	dead	uniform load	12to14 45to47	PZ=-42.74(kN/m) projected
15	SW0-1	live	trapezoidal load (2p)	36	PZ2=-21.84(kN/m) PZ1=-21.84(kN/m) X2=0.30(m) X1=0.0(m) global projected absolute
15	SW0-1	live	uniform load	30to35	PZ=-21.84(kN/m) projected
15	SW0-1	live	trapezoidal load (2p)	23	PZ2=-21.84(kN/m) PZ1=-21.84(kN/m) X2=0.70(m) X1=0.40(m) global projected absolute
15	SW0-1	live	uniform load	24to29	PZ=-21.84(kN/m) projected
16	SW0-2	live	trapezoidal load (2p)	34	PZ2=-21.84(kN/m) PZ1=-21.84(kN/m) X2=1.21(m) X1=0.0(m) global projected absolute
16	SW0-2	live	uniform load	16to33	PZ=-21.84(kN/m) projected
17	SW0-3	live	trapezoidal load (2p)	31	PZ2=-21.84(kN/m) PZ1=-21.84(kN/m) X2=1.35(m) X1=1.33(m) global projected

					absolute
17	SW0-3	live	uniform load	32to43	PZ=-21.84(kN/m) projected
17	SW0-3	live	trapezoidal load (2p)	28	PZ2=-21.84(kN/m) PZ1=-21.84(kN/m) X2=0.02(m) X1=0.0(m) global projected absolute
17	SW0-3	live	uniform load	16to27	PZ=-21.84(kN/m) projected
18	CF-SW0	dead	uniform load	16to43	PZ=-36.38(kN/m) projected
18	CF-SW0	dead	uniform load	12to14 45to47	PZ=-36.38(kN/m) projected
19	SW2-1	live	uniform load	30to43	PZ=-20.35(kN/m) projected
19	SW2-1	live	uniform load	16to29	PZ=-20.35(kN/m) projected
20	SW2-2	live	uniform load	16to43	PZ=-20.35(kN/m) projected
21	SW2-3	live	uniform load	33to43	PZ=-20.35(kN/m) projected
21	SW2-3	live	trapezoidal load (2p)	27	PZ2=-20.35(kN/m) PZ1=-20.35(kN/m) X2=0.45(m) X1=0.0(m) global projected absolute
21	SW2-3	live	uniform load	16to26	PZ=-20.35(kN/m) projected
21	SW2-3	live	trapezoidal load (2p)	32	PZ2=-20.35(kN/m) PZ1=-20.35(kN/m) X2=1.35(m) X1=0.90(m) global projected absolute
22	CF-SW2	dead	uniform load	16to43	PZ=-26.79(kN/m) projected
22	CF-SW2	dead	uniform load	12to14 45to47	PZ=-26.79(kN/m) projected

Storage - SLS - Load Case Values

- Case: 11 (SW)

Case	Case name	Nature	Load type	List	Load values
11	SW	dead	self-weight	24to35	PZ Negative Factor=1.00
11	SW	dead	self-weight	8to11 15to23 59	PX Factor=1.00
11	SW	dead	self-weight	36to44 48to51 60	PX Negative Factor=1.00

Kapitola 4

Kombinácie zaťažovacích stavov

Storage - Load Combination SLS

Combinations	Name	Definition
12 (C)	Storage-U	11*1.35
13 (C)	Storage-F	11*0.95

ABM Mosty			
Navrhol:	SC	Súbor:	ServiceMin_SLS.rtd
		Projekt:	5202250 350

Service Min - Load Combination SLS

Combinations	Name	Definition
23	LM71-1_VH_SLS-CH	(1+4+5+10+11+13+14)*1.00+(6+7)*0.55+(8+9)*0.33
24	LM71-2_VH_SLS-CH	(2+4+5+10+11+13+14)*1.00+(6+7)*0.55+(8+9)*0.33
25	LM71-3_VH_SLS-CH	(3+4+5+10+11+13+14)*1.00+(6+7)*0.55+(8+9)*0.33
26	LM71-1_Vh_SLS-CH	(1+4+5+10+11+13+14)*1.00
27	LM71-2_Vh_SLS-CH	(2+4+5+10+11+13+14)*1.00
28	LM71-3_Vh_SLS-CH	(3+4+5+10+11+13+14)*1.00
29	LM71-1_VH_T_SLS-CH	(1+4+5+10+11+13+14+12)*1.00+6*0.55+(7+8)*0.33
30	LM71-2_VH_T_SLS-CH	(2+4+5+10+11+13+14+12)*1.00+6*0.55+(7+8)*0.33
31	LM71-3_VH_T_SLS-CH	(3+4+5+10+11+13+14+12)*1.00+6*0.55+(7+8)*0.33
32	LM71-1_vH_T_SLS-CH	(1+4+5+10+11+12)*1.00+6*0.55+(7+8)*0.33
33	LM71-2_vH_T_SLS-CH	(2+4+5+10+11+12)*1.00+6*0.55+(7+8)*0.33
34	LM71-3_vH_T_SLS-CH	(3+4+5+10+11+12)*1.00+6*0.55+(7+8)*0.33
35	vH1-ULS	(4+5+10+11)*1.00+(6+7)*0.55+(8+9)*0.33
36	vh2-ULS	(4+5+10+11)*1.00+6*0.55+(7+8)*0.33
37	SW/0-1_VH_SLS-CH	(15+4+5+10+11+13+18)*1.00+(6+7)*0.55+(8+9)*0.45
38	SW/0-2_VH_SLS-CH	(16+4+5+10+11+13+18)*1.00+(6+7)*0.55+(8+9)*0.45
39	SW/0-3_VH_SLS-CH	(17+4+5+10+11+13+18)*1.00+(6+7)*0.55+(8+9)*0.45
40	SW/0-1_Vh_SLS-CH	(15+4+5+10+11+13+18)*1.00
41	SW/0-2_Vh_SLS-CH	(16+4+5+10+11+13+18)*1.00
42	SW/0-3_Vh_SLS-CH	(17+4+5+10+11+13+18)*1.00
43	SW/0-1_VH_T_SLS-CH	(15+4+5+10+11+13+18+12)*1.00+6*0.55+7*0.33+8*0.45
44	SW/0-2_VH_T_SLS-CH	(16+4+5+10+11+13+18+12)*1.00+6*0.55+7*0.33+8*0.45
45	SW/0-3_VH_T_SLS-CH	(17+4+5+10+11+13+18+12)*1.00+6*0.55+7*0.33+8*0.45
46	SW/0-1_vH_T_SLS-CH	(15+4+5+10+11+12)*1.00+6*0.55+7*0.33+8*0.45
47	SW/0-2_vH_T_SLS-CH	(16+4+5+10+11+12)*1.00+6*0.55+7*0.33+8*0.45
48	SW/0-3_vH_T_SLS-CH	(17+4+5+10+11+12)*1.00+6*0.55+7*0.33+8*0.45
49	SW/2-1_VH_SLS-CH	(19+4+5+10+11+13+22)*1.00+(6+7)*0.55+(8+9)*0.51
50	SW/2-2_VH_SLS-CH	(20+4+5+10+11+13+22)*1.00+(6+7)*0.55+(8+9)*0.51
51	SW/2-3_VH_SLS-CH	(21+4+5+10+11+13+22)*1.00+(6+7)*0.55+(8+9)*0.51
52	SW/2-1_Vh_SLS-CH	(19+4+5+10+11+13+22)*1.00
53	SW/2-2_Vh_SLS-CH	(20+4+5+10+11+13+22)*1.00
54	SW/2-3_Vh_SLS-CH	(21+4+5+10+11+13+22)*1.00
55	SW/2-1_VH_T_SLS-CH	(19+4+5+10+11+13+22+12)*1.00+6*0.55+7*0.33+8*0.51
56	SW/2-2_VH_T_SLS-CH	(20+4+5+10+11+13+22+12)*1.00+6*0.55+7*0.33+8*0.51
57	SW/2-3_VH_T_SLS-CH	(21+4+5+10+11+13+22+12)*1.00+6*0.55+7*0.33+8*0.51
58	SW/2-1_vH_T_SLS-CH	(19+4+5+10+11+12)*1.00+6*0.55+7*0.33+8*0.51
59	SW/2-2_vH_T_SLS-CH	(20+4+5+10+11+12)*1.00+6*0.55+7*0.33+8*0.51
60	SW/2-3_vH_T_SLS-CH	(21+4+5+10+11+12)*1.00+6*0.55+7*0.33+8*0.51

Service Min - Load Combination SLS - QUASI PERMANENT - CRACK WIDTH CHECK

Combinations	Name	Definition
23	VH1_SLS-QP	(4+5+10+11)*1.00+(6+7)*0.55
24	VH2_SLS-QP	(4+5+10+11)*1.00+6*0.55
25	Vh3_SLS-QP	(4+5+10+11)*1.00
26	vH4_SLS-QP	(4+5+10+11)*1.00+(6+7)*0.60
27	vH5_SLS-QP	(4+5+10+11)*1.00+6*0.60

ABM Mosty			
Navrhol:	SC	Súbor:	ServiceMax_SLS.rtd
		Projekt:	5202250 350

Service Max - Load Combination SLS

Combinations	Name	Definition
23	LM71-1_VH_SLS-CH	(1+4+5+10+11+13+14)*1.00+(6+7)*0.55+(8+9)*0.33
24	LM71-2_VH_SLS-CH	(2+4+5+10+11+13+14)*1.00+(6+7)*0.55+(8+9)*0.33
25	LM71-3_VH_SLS-CH	(3+4+5+10+11+13+14)*1.00+(6+7)*0.55+(8+9)*0.33
26	LM71-1_Vh_SLS-CH	(1+4+5+10+11+13+14)*1.00
27	LM71-2_Vh_SLS-CH	(2+4+5+10+11+13+14)*1.00
28	LM71-3_Vh_SLS-CH	(3+4+5+10+11+13+14)*1.00
29	LM71-1_VH_T_SLS-CH	(1+4+5+10+11+13+14+12)*1.00+6*0.55+(7+8)*0.33
30	LM71-2_VH_T_SLS-CH	(2+4+5+10+11+13+14+12)*1.00+6*0.55+(7+8)*0.33
31	LM71-3_VH_T_SLS-CH	(3+4+5+10+11+13+14+12)*1.00+6*0.55+(7+8)*0.33
32	LM71-1_vH_T_SLS-CH	(1+4+5+10+11+12)*1.00+6*0.55+(7+8)*0.33
33	LM71-2_vH_T_SLS-CH	(2+4+5+10+11+12)*1.00+6*0.55+(7+8)*0.33
34	LM71-3_vH_T_SLS-CH	(3+4+5+10+11+12)*1.00+6*0.55+(7+8)*0.33
35	vH1-ULS	(4+5+10+11)*1.00+(6+7)*0.55+(8+9)*0.33
36	vh2-ULS	(4+5+10+11)*1.00+6*0.55+(7+8)*0.33
37	SW/0-1_VH_SLS-CH	(15+4+5+10+11+13+18)*1.00+(6+7)*0.55+(8+9)*0.45
38	SW/0-2_VH_SLS-CH	(16+4+5+10+11+13+18)*1.00+(6+7)*0.55+(8+9)*0.45
39	SW/0-3_VH_SLS-CH	(17+4+5+10+11+13+18)*1.00+(6+7)*0.55+(8+9)*0.45
40	SW/0-1_Vh_SLS-CH	(15+4+5+10+11+13+18)*1.00
41	SW/0-2_Vh_SLS-CH	(16+4+5+10+11+13+18)*1.00
42	SW/0-3_Vh_SLS-CH	(17+4+5+10+11+13+18)*1.00
43	SW/0-1_VH_T_SLS-CH	(15+4+5+10+11+13+18+12)*1.00+6*0.55+7*0.33+8*0.45
44	SW/0-2_VH_T_SLS-CH	(16+4+5+10+11+13+18+12)*1.00+6*0.55+7*0.33+8*0.45
45	SW/0-3_VH_T_SLS-CH	(17+4+5+10+11+13+18+12)*1.00+6*0.55+7*0.33+8*0.45
46	SW/0-1_vH_T_SLS-CH	(15+4+5+10+11+12)*1.00+6*0.55+7*0.33+8*0.45
47	SW/0-2_vH_T_SLS-CH	(16+4+5+10+11+12)*1.00+6*0.55+7*0.33+8*0.45
48	SW/0-3_vH_T_SLS-CH	(17+4+5+10+11+12)*1.00+6*0.55+7*0.33+8*0.45
49	SW/2-1_VH_SLS-CH	(19+4+5+10+11+13+22)*1.00+(6+7)*0.55+(8+9)*0.51
50	SW/2-2_VH_SLS-CH	(20+4+5+10+11+13+22)*1.00+(6+7)*0.55+(8+9)*0.51
51	SW/2-3_VH_SLS-CH	(21+4+5+10+11+13+22)*1.00+(6+7)*0.55+(8+9)*0.51
52	SW/2-1_Vh_SLS-CH	(19+4+5+10+11+13+22)*1.00
53	SW/2-2_Vh_SLS-CH	(20+4+5+10+11+13+22)*1.00
54	SW/2-3_Vh_SLS-CH	(21+4+5+10+11+13+22)*1.00
55	SW/2-1_VH_T_SLS-CH	(19+4+5+10+11+13+22+12)*1.00+6*0.55+7*0.33+8*0.51
56	SW/2-2_VH_T_SLS-CH	(20+4+5+10+11+13+22+12)*1.00+6*0.55+7*0.33+8*0.51
57	SW/2-3_VH_T_SLS-CH	(21+4+5+10+11+13+22+12)*1.00+6*0.55+7*0.33+8*0.51
58	SW/2-1_vH_T_SLS-CH	(19+4+5+10+11+12)*1.00+6*0.55+7*0.33+8*0.51
59	SW/2-2_vH_T_SLS-CH	(20+4+5+10+11+12)*1.00+6*0.55+7*0.33+8*0.51
60	SW/2-3_vH_T_SLS-CH	(21+4+5+10+11+12)*1.00+6*0.55+7*0.33+8*0.51

Service Max - Load Combination SLS - QUASI PERMANENT - CRACK WIDTH CHECK

Combinations	Name	Definition
23	VH1_SLS-QP	(4+5+10+11)*1.00+(6+7)*0.55
24	VH2_SLS-QP	(4+5+10+11)*1.00+6*0.55
25	Vh3_SLS-QP	(4+5+10+11)*1.00
26	vH4_SLS-QP	(4+5+10+11)*1.00+(6+7)*0.60
27	vH5_SLS-QP	(4+5+10+11)*1.00+6*0.60

Service Max - Load Combination ULS

- Cases: 23to87

Combinations	Name	Definition
23	LM71-1_VH_ULS_a	(1+13+14)*1.16+(4+5+10+11)*1.35+(6+7)*0.80+(8+9)*0.68
24	LM71-1_VH_ULS_b	(1+13+14)*1.45+(4+5+10+11)*1.15+(6+7)*0.68+(8+9)*0.80
25	LM71-2_VH_ULS_a	(2+13+14)*1.16+(4+5+10+11)*1.35+(6+7)*0.80+(8+9)*0.68
26	LM71-2_VH_ULS_b	(2+13+14)*1.45+(4+5+10+11)*1.15+(6+7)*0.68+(8+9)*0.80
27	LM71-3_VH_ULS_a	(3+13+14)*1.16+(4+5+10+11)*1.35+(6+7)*0.80+(8+9)*0.68
28	LM71-3_VH_ULS_b	(3+13+14)*1.45+(4+5+10+11)*1.15+(6+7)*0.68+(8+9)*0.80
29	LM71-1_Vh_ULS_a	(1+13+14)*1.16+(4+5+10+11)*1.35+(6+7)*0.20
30	LM71-1_Vh_ULS_b	(1+13+14)*1.45+(4+5+10+11)*1.15+(6+7)*0.20
31	LM71-2_Vh_ULS_a	(2+13+14)*1.16+(4+5+10+11)*1.35+(6+7)*0.20
32	LM71-2_Vh_ULS_b	(2+13+14)*1.45+(4+5+10+11)*1.15+(6+7)*0.20
33	LM71-3_Vh_ULS_a	(3+13+14)*1.16+(4+5+10+11)*1.35+(6+7)*0.20
34	LM71-3_Vh_ULS_b	(3+13+14)*1.45+(4+5+10+11)*1.15+(6+7)*0.20
35	LM71-1_VH_T_ULS_a	(1+13+14+12)*1.16+(4+5+10+11)*1.35+6*0.80+7*0.33+8*0.68
36	LM71-1_VH_T_ULS_b	(1+13+14+12)*1.45+(4+5+10+11)*1.15+6*0.68+7*0.33+8*0.80
37	LM71-2_VH_T_ULS_a	(2+13+14+12)*1.16+(4+5+10+11)*1.35+6*0.80+7*0.33+8*0.68
38	LM71-2_VH_T_ULS_b	(2+13+14+12)*1.45+(4+5+10+11)*1.15+6*0.68+7*0.33+8*0.80
39	LM71-3_VH_T_ULS_a	(3+13+14+12)*1.16+(4+5+10+11)*1.35+6*0.80+7*0.33+8*0.68
40	LM71-3_VH_T_ULS_b	(3+13+14+12)*1.45+(4+5+10+11)*1.15+(6+8)*0.68+7*0.33
41	LM71-1_vH_T_ULS	1*0.50+(4+5+10+11)*1.00+6*0.80+7*0.33+8*0.68+12*1.45
42	LM71-2_vH_T_ULS	2*0.50+(4+5+10+11)*1.00+6*0.80+7*0.33+8*0.68+12*1.45
43	LM71-2_vH_T_ULS	3*0.50+(4+5+10+11)*1.00+6*0.80+7*0.33+8*0.68+12*1.45
44	vH1-ULS	(4+5+10+11)*1.00+(6+7+8+9)*0.80
45	vh2-ULS	(4+5+10+11)*1.00+(6+8)*0.80+7*0.33
46	SW/0-1_VH_ULS_a	(15+13+18)*1.16+(4+5+10+11)*1.35+(6+7)*0.80+(8+9)*0.67
47	SW/0-1_VH_ULS_b	(15+13+18)*1.45+(4+5+10+11)*1.15+(6+7)*0.68+(8+9)*0.80
48	SW/0-2_VH_ULS_a	(16+13+18)*1.16+(4+5+10+11)*1.35+(6+7)*0.80+(8+9)*0.67
49	SW/0-2_VH_ULS_b	(16+13+18)*1.45+(4+5+10+11)*1.15+(6+7)*0.68+(8+9)*0.80
50	SW/0-2_VH_ULS_a	(17+13+18)*1.16+(4+5+10+11)*1.35+(6+7)*0.80+(8+9)*0.67
51	SW/0-2_VH_ULS_b	(17+13+18)*1.45+(4+5+10+11)*1.15+(6+7)*0.68+(8+9)*0.80
52	SW/0-1_Vh_ULS_a	(15+13+14)*1.16+(4+5+10+11)*1.35+(6+7)*0.20
53	SW/0-1_Vh_ULS_b	(15+13+14)*1.45+(4+5+10+11)*1.15+(6+7)*0.20
54	SW/0-1_Vh_ULS_a	(16+13+14)*1.16+(4+5+10+11)*1.35+(6+7)*0.20
55	SW/0-1_Vh_ULS_b	(16+13+14)*1.45+(4+5+10+11)*1.15+(6+7)*0.20
56	SW/0-1_Vh_ULS_a	(17+13+14)*1.16+(4+5+10+11)*1.35+(6+7)*0.20
57	SW/0-1_Vh_ULS_b	(17+13+14)*1.45+(4+5+10+11)*1.15+(6+7)*0.20
58	SW/0-1_VH_T_ULS_a	(15+13+18+12)*1.16+(4+5+10+11)*1.35+6*0.80+7*0.33+8*0.67
59	SW/0-1_VH_T_ULS_b	(15+13+18+12)*1.45+(4+5+10+11)*1.15+6*0.68+7*0.33+8*0.80
60	SW/0-2_VH_T_ULS_a	(16+13+18+12)*1.16+(4+5+10+11)*1.35+6*0.80+7*0.33+8*0.67
61	SW/0-2_VH_T_ULS_b	(16+13+18+12)*1.45+(4+5+10+11)*1.15+6*0.68+7*0.33+8*0.80
62	SW/0-3_VH_T_ULS_a	(17+13+18+12)*1.16+(4+5+10+11)*1.35+6*0.80+7*0.33+8*0.67
63	SW/0-3_VH_T_ULS_b	(17+13+18+12)*1.45+(4+5+10+11)*1.15+6*0.68+7*0.33+8*0.80
64	SW/0-1_vH_T_ULS	15*0.50+(4+5+10+11)*1.00+6*0.80+7*0.33+8*0.67+12*1.45
65	SW/0-2_vH_T_ULS	16*0.50+(4+5+10+11)*1.00+6*0.80+7*0.33+8*0.67+12*1.45
66	SW/0-3_vH_T_ULS	17*0.50+(4+5+10+11)*1.00+6*0.80+7*0.33+8*0.67+12*1.45
67	SW/2-1_VH_ULS_a	(19+13+22)*1.00+(4+5+10+11)*1.35+(6+7)*0.80+(8+9)*0.67
68	SW/2-1_VH_ULS_b	(19+13+22)*1.20+(4+5+10+11)*1.15+(6+7)*0.68+(8+9)*0.80
69	SW/2-2_VH_ULS_a	(20+13+22)*1.00+(4+5+10+11)*1.35+(6+7)*0.80+(8+9)*0.67
70	SW/2-2_VH_ULS_b	(20+13+22)*1.20+(4+5+10+11)*1.15+(6+7)*0.68+(8+9)*0.80
71	SW/2-3_VH_ULS_a	(21+13+22)*1.00+(4+5+10+11)*1.35+(6+7)*0.80+(8+9)*0.67
72	SW/2-3_VH_ULS_b	(21+13+22)*1.20+(4+5+10+11)*1.15+(6+7)*0.68+(8+9)*0.80
73	SW/2-1_Vh_ULS_a	(19+13+22)*1.00+(4+5+10+11)*1.35+(6+7)*0.20
74	SW/2-1_Vh_ULS_b	(19+13+22)*1.20+(4+5+10+11)*1.15+(6+7)*0.20
75	SW/2-2_Vh_ULS_a	(20+13+22)*1.00+(4+5+10+11)*1.35+(6+7)*0.20

76	SW/2-2_Vh_ULS_b	(20+13+22)*1.20+(4+5+10+11)*1.15+(6+7)*0.20
77	SW/2-3_Vh_ULS_a	(21+13+22)*1.00+(4+5+10+11)*1.35+(6+7)*0.20
78	SW/2-3_Vh_ULS_b	(21+13+22)*1.20+(4+5+10+11)*1.15+(6+7)*0.20
79	SW/2-1_VH_T_ULS_a	(19+13+22)*1.00+(4+5)*1.15+6*0.80+7*0.33+8*0.67+(10+11)*1.35+ 12*1.10
80	SW/2-1_VH_T_ULS_b	(19+13+22)*1.20+(4+5)*1.35+6*0.68+7*0.33+8*0.80+(10+11)*1.15+ 12*1.30
81	SW/2-2_VH_T_ULS_a	(20+13+22)*1.00+(4+5)*1.15+6*0.80+7*0.33+8*0.67+(10+11)*1.35+ 12*1.10
82	SW/2-2_VH_T_ULS_b	(20+13+22)*1.20+(4+5)*1.35+6*0.68+7*0.33+8*0.80+(10+11)*1.15+ 12*1.30
83	SW/2-3_VH_T_ULS_a	(21+13+22)*1.00+(4+5)*1.15+6*0.80+7*0.33+8*0.67+(10+11)*1.35+ 12*1.10
84	SW/2-3_VH_T_ULS_b	(21+13+22)*1.20+(4+5)*1.35+6*0.68+7*0.33+8*0.80+(10+11)*1.15+ 12*1.30
85	SW/2-1_vH_T_ULS	19*0.50+(4+5+10+11)*1.00+6*0.80+7*0.33+8*0.67+12*1.30
86	SW/2-2_vH_T_ULS	20*0.50+(4+5+10+11)*1.00+6*0.80+7*0.33+8*0.67+12*1.30
87	SW/2-3_vH_T_ULS	21*0.50+(4+5+10+11)*1.00+6*0.80+7*0.33+8*0.67+12*1.30

Kapitola 5

Obálky vnútorných síl

Obálka ohybových momentov (MSU)

Section	MY [kNm]	Load Case-Phase	Face
10	-3,57	Storage-F	External
10	-7,34	Storage-U	External
16	33,16	Storage-U	Internal
16	11,96	Storage-F	Internal
20	46,44	Storage-U	Internal
20	29,14	Storage-F	Internal
23	17,53	Storage-U	Internal
23	0	Storage-U	Internal
24	57,8	Storage-U	Internal
24	0	Storage-U	Internal
26	154,55	Storage-U	Internal
26	77,25	Storage-F	Internal
30	217,79	Storage-U	Internal
30	148,08	Storage-F	Internal
33	154,55	Storage-U	Internal
33	77,25	Storage-F	Internal

Section	MY [kNm]	Load Case-Phase	Face
10	473,47	LM71-3_VH_ULS_a-Service Min	Internal
10	119,29	vh2-ULS-Service Min	Internal
12	850,14	SW/0-1_Vh_ULS_a-Service Min	Internal
12	59,31	LM71-2_vH_T_ULS-Service Min	Internal
16	390,57	SW/0-1_Vh_ULS_b-Service Min	Internal
16	-250,32	LM71-2_vH_T_ULS-Service Min	External
20	30,09	LM71-1_VH_ULS_b-Service Min	Internal
20	-151,46	LM71-2_vH_T_ULS-Service Min	External
23	28,49	LM71-1_VH_ULS_b-Service Min	Internal
23	-58,08	LM71-2_vH_T_ULS-Service Min	External
24	207,49	LM71-3_VH_T_ULS_b-Service Min	Internal
24	-59,74	LM71-1_Vh_ULS_b-Service Min	External
26	406,14	LM71-3_VH_T_ULS_b-Service Min	Internal
26	-58,35	LM71-1_Vh_ULS_b-Service Min	External
30	337,4	LM71-1_Vh_ULS_b-Service Min	Internal
30	-217,29	LM71-2_vH_T_ULS-Service Min	External
33	108,07	SW/0-1_Vh_ULS_a-Service Min	Internal
33	-305,35	LM71-2_vH_T_ULS-Service Min	External

Section	MY [kNm]	Load Case-Phase	Face
10	483,73	LM71-3_VH_ULS_a-Service Max	Internal
10	124,56	vh2-ULS-Service Max	Internal
12	870,24	SW/0-1_Vh_ULS_a-Service Max	Internal
12	84,28	LM71-2_vH_T_ULS-Service Max	Internal
16	396,23	SW/0-1_Vh_ULS_b-Service Max	Internal
16	-186,85	LM71-2_vH_T_ULS-Service Max	External
20	28,38	LM71-1_VH_ULS_b-Service Max	Internal
20	-141,97	LM71-2_vH_T_ULS-Service Max	External
23	27,3	LM71-1_VH_ULS_b-Service Max	Internal
23	-57,08	LM71-2_vH_T_ULS-Service Max	External
24	204,56	LM71-3_VH_T_ULS_b-Service Max	Internal
24	-56,24	LM71-1_Vh_ULS_b-Service Max	External
26	401,96	LM71-3_VH_T_ULS_b-Service Max	Internal
26	-52,83	LM71-1_Vh_ULS_b-Service Max	External
30	333,99	LM71-1_Vh_ULS_b-Service Max	Internal
30	-189,63	LM71-2_vH_T_ULS-Service Max	External
33	110,51	SW/0-1_Vh_ULS_a-Service Max	Internal
33	-287,53	LM71-2_vH_T_ULS-Service Max	External

Obálka ohybových momentov od kvázistálej kombinácie (MSP)

Section	MY [kNm]	Load Case-Phase	Face
10	-3,57	Storage-F	External
10	-7,34	Storage-U	External
16	33,16	Storage-U	Internal
16	11,96	Storage-F	Internal
20	46,44	Storage-U	Internal
20	29,14	Storage-F	Internal
23	17,53	Storage-U	Internal
23	12,34	Storage-F	Internal
24	57,8	Storage-U	Internal
24	40,68	Storage-F	Internal
26	154,55	Storage-U	Internal
26	77,25	Storage-F	Internal
30	217,79	Storage-U	Internal
30	148,08	Storage-F	Internal
33	154,55	Storage-U	Internal
33	77,25	Storage-F	Internal

Section	MY [kNm]	Load Case-Phase	Face
10	268,6	vH4_SLS-QP-Service Min	Internal
10	108,76	Vh3_SLS-QP-Service Min	Internal
12	445,23	Vh3_SLS-QP-Service Min	Internal
12	158,85	vH5_SLS-QP-Service Min	Internal
16	184,31	Vh3_SLS-QP-Service Min	Internal
16	62,49	vH5_SLS-QP-Service Min	Internal
20	-4,16	vH4_SLS-QP-Service Min	External
20	-67,48	Vh3_SLS-QP-Service Min	External
23	-1,51	vH4_SLS-QP-Service Min	External
23	-14,41	vH5_SLS-QP-Service Min	External
24	88,63	vH5_SLS-QP-Service Min	Internal
24	4,83	Vh3_SLS-QP-Service Min	Internal
26	126,5	vH5_SLS-QP-Service Min	Internal
26	18,46	Vh3_SLS-QP-Service Min	Internal
30	129,08	Vh3_SLS-QP-Service Min	Internal
30	20,82	vH4_SLS-QP-Service Min	Internal
33	54,93	Vh3_SLS-QP-Service Min	Internal
33	-50,8	vH5_SLS-QP-Service Min	External

Section	MY [kNm]	Load Case-Phase	Face
10	280,49	vH4_SLS-QP-Service Max	Internal
10	113,68	Vh3_SLS-QP-Service Max	Internal
12	469,52	Vh3_SLS-QP-Service Max	Internal
12	168,36	vH5_SLS-QP-Service Max	Internal
16	197,99	Vh3_SLS-QP-Service Max	Internal
16	71,51	vH5_SLS-QP-Service Max	Internal
20	-3,65	vH4_SLS-QP-Service Max	External
20	-68,74	Vh3_SLS-QP-Service Max	External
23	-0,97	vH4_SLS-QP-Service Max	External
23	-14,6	vH5_SLS-QP-Service Max	External
24	91,32	vH5_SLS-QP-Service Max	Internal
24	2,86	Vh3_SLS-QP-Service Max	Internal
26	133,24	vH5_SLS-QP-Service Max	Internal
26	17,22	Vh3_SLS-QP-Service Max	Internal
30	139,84	Vh3_SLS-QP-Service Max	Internal
30	26,19	vH4_SLS-QP-Service Max	Internal
33	57,22	Vh3_SLS-QP-Service Max	Internal
33	-55,87	vH5_SLS-QP-Service Max	External

Obálka šmykových síl (MSU)

Section	FZ [kNm]	Load Case-Phase	Face
10	-4,49	Storage-F	External
10	-7,08	Storage-U	External
16	29,19	Storage-U	Internal
16	13,28	Storage-F	Internal
20	-2,31	Storage-F	External
20	-11,05	Storage-U	External
23	-15,31	Storage-F	External
23	-28,13	Storage-U	External
24	48,79	Storage-U	Internal
24	25,89	Storage-F	Internal
26	40,21	Storage-U	Internal
26	18,43	Storage-F	Internal
30	2,35	Storage-U	Internal
30	-13,25	Storage-U	External

Section	FZ [kNm]	Load Case-Phase	Face
10	794,27	LM71-3_VH_ULS_a-Service Min	Internal
10	467,86	vh2-ULS-Service Min	Internal
12	-112,65	LM71-2_vH_T_ULS-Service Min	External
12	-993,85	SW/0-1_Vh_ULS_a-Service Min	External
16	250,89	LM71-2_vH_T_ULS-Service Min	Internal
16	-144,63	LM71-3_Vh_ULS_a-Service Min	External
20	61,05	LM71-2_vH_T_ULS-Service Min	Internal
20	-132,12	LM71-3_VH_T_ULS_a-Service Min	External
23	140,11	LM71-2_vH_T_ULS-Service Min	Internal
23	-103,44	LM71-1_VH_ULS_b-Service Min	External
24	306,31	LM71-3_VH_T_ULS_a-Service Min	Internal
24	-150,58	LM71-1_Vh_ULS_b-Service Min	External
26	205,95	LM71-3_VH_T_ULS_b-Service Min	Internal
26	-133,01	SW/2-3_VH_ULS_a-Service Min	External
30	148,71	LM71-2_VH_ULS_a-Service Min	Internal
30	-274,35	LM71-1_VH_T_ULS_b-Service Min	External

Section	FZ [kNm]	Load Case-Phase	Face
10	811,55	LM71-3_VH_ULS_a-Service Max	Internal
10	487,53	vh2-ULS-Service Max	Internal
12	-159,63	LM71-2_vH_T_ULS-Service Max	External
12	-1016,9	SW/0-1_Vh_ULS_a-Service Max	External
16	237,59	LM71-2_vH_T_ULS-Service Max	Internal
16	-146,63	LM71-3_Vh_ULS_a-Service Max	External
20	49,38	LM71-2_vH_T_ULS-Service Max	Internal
20	-135,46	LM71-3_VH_T_ULS_a-Service Max	External
23	140,68	LM71-2_vH_T_ULS-Service Max	Internal
23	-103,44	LM71-1_VH_ULS_b-Service Max	External
24	308,64	LM71-3_VH_T_ULS_a-Service Max	Internal
24	-150,55	LM71-1_Vh_ULS_b-Service Max	External
26	211,3	SW/0-1_Vh_ULS_a-Service Max	Internal
26	-135,98	SW/2-3_VH_ULS_a-Service Max	External
30	152,42	LM71-2_VH_ULS_a-Service Max	Internal
30	-275,16	LM71-1_VH_T_ULS_b-Service Max	External

ABM MOSTY	Projekt:	18305	Job No. 18305
	Objekt:	49.202_CM4 52x225	
	Obsah:	Bending Moment Design EN1992-1-1-04	
	Dátum:	5/3/2018	

Bar	h (mm)	b (mm)	c1 (mm)	c2 (mm)	n1 (pcs/m)	fi.1 (mm)	As1 (mm²/m)	n2 (pcs/m)	fi.2 (mm)	As2 (mm²/m)	fi.st (mm)	n
10	550	1000	40	50	10	25	4909	10	12	1131	12	14
12	600	1000	40	40	10	25	4909	10	12	1131	12	
16	492	1000	50	40	10	16	2011	10	16	2011	12	
16	492	1000	40	50	10	16	2011	10	16	2011	12	
20	350	1000	50	40	10	16	2011	10	16	2011	12	
20	350	1000	40	50	10	16	2011	10	16	2011	12	
23	350	1000	50	40	10	16	2011	10	16	2011	12	
23	350	1000	40	50	10	16	2011	10	16	2011	12	
24	350	1000	50	40	6	16	1206	6	16	1206	12	
24	350	1000	40	50	6	16	1206	6	16	1206	12	
26	350	1000	50	40	10	20	3142	10	16	2011	12	
30	350	1000	50	40	10	20	3142	10	16	2011	12	
30	350	1000	40	50	10	16	2011	10	20	3142	12	
33	350	1000	40	50	10	16	2011	10	20	3142	12	

$i := 1..n$

$$S_i := \frac{b_i}{\begin{cases} n_{1_i} & \text{if } n_{1_i} > 0 \\ 10000000 & \text{otherwise} \end{cases}}$$

$h := h \cdot mm \qquad b := b \cdot mm \qquad c_1 := c_1 \cdot mm \qquad c_2 := c_2 \cdot mm$

$A_{s1} := A_{s1} \cdot mm^2 \qquad A_{s2} := A_{s2} \cdot mm^2 \qquad A_{c_i} := h_i \cdot b_i \qquad bar_i := El_i$

$\phi_1 := \phi_1 \cdot mm \qquad \phi_2 := \phi_2 \cdot mm \qquad \phi_{st} := \phi_{st} \cdot mm$

$$d_{1_i} := c_{1_i} + \frac{\phi_{1_i}}{2} + \phi_{st_i} \qquad d_{2_i} := c_{2_i} + \frac{\phi_{2_i}}{2} + \phi_{st_i} \qquad d_i := h_i - d_{1_i}$$

$$z_{1_i} := 0.5 \cdot h_i - d_{2_i} \qquad z_{2_i} := -0.5 \cdot h_i + d_i$$

h -Výš ka prierezu
b -Š írka prierezu (1m)
c_1 -Nominálne krytie ť ahaný povrch
c_2 -Nominálne krytie tlač ený povrch
ϕ_1 -Priemer ť ahanej výstuž e
ϕ_2 -Priemer tlač enej výstuž e
ϕ_{st} -Priemer prieč nej výstuž e
n_1 - Poč et prútov ť ahaný povrch (na 1m)
n_2 - Poč et prútov tlač ený povrch (na 1m)
A_1 - Plocha ť ahanej výstuž e (na 1m)
A_2 - Plocha tlač enej výstuž e (na 1m)
e_0 -Excentricita normálovej sily
d -Úč inná výš ka prierezu
z_1 -Rameno ť ahanej výstuž e
z_2 -Rameno tlač enej výstuž e

Bar	MEd (kNm)	NEd (kN)	MEk (kNm)	NEk (kN)	Ved (kN)
10	483.7	112.3	280.49	124.39	811.55
12	870.2	53.63	469.52	27.73	1016.9
16	396.2	2405	197.99	1353.2	250.89
16	250.3	1235	NS	NS	250.89
20	46.44	1	46.44	0.9965	135.46
20	151.5	1193	68.74	1288.4	135.46
23	28.49	2328	NS	NS	140.68
23	58.08	1138	NS	NS	140.68
24	207.5	2088	NS	NS	308.64
24	59.74	2449	NS	NS	308.64
26	406.1	1878	154.55	52.979	211.3

M_{Ed} -Ohybový moment od zaťaženia MSU
N_{Ed} -Normálová sila od zaťaženia MSU
M_{Ek} -Ohybový moment od zaťaženia MSP
N_{Ek} -Normálová sila od zaťaženia MSP
Ved - Šmyková sila od zaťaženia MSU

Výstuž :

Charakteristická medza klzu $f_{yk} := 500MPa$

Návrhová pevnosť výstuž e $f_{yd} := \frac{f_{yk}}{\gamma_{s\_steel}}$

$\gamma_{s\_steel} \equiv 1.15$

$E_s := 200GPa$

$\varepsilon_{yd} := \frac{f_{yd}}{E_s}$

ε_{cu3} -Pomerné pretvorenie betónu
γ_c -Parciálny faktor spoľ ahlivosti betónu
α_{cc} - Súč initeľ dlhodobej pevnosti betónu v tlaku
η -Súč initeľ tlakovej pevnosti betónu
λ -Súč initeľ definujúci efektívnu výš ku tlač enej zóny betónu

f_{cd} -Návrhová pevnosť betónu v tlaku

Hodnoty zobrané z tabuľ ky 3.1 EN 1992-1-1:2006

Priemerná hodnota pevnosti betónu v tlaku po 28 dň och $f_{cm} := f_{cm} \frac{N}{mm^2}$

Charakteristická valcová pevnosť betónu v tlaku $f_{ck} := f_{ck} \frac{N}{mm^2}$

Súč initeľ veku betónu $\beta_{cc}(t) := e^{.2\left[1-\left(\frac{28}{t}\right)^{\frac{1}{2}}\right]}$ Eq3.1

Priemerná hodnota pevnosti betónu v tlaku v závislosti od veku $f_{cm\_}(t) := \beta_{cc}(t) \cdot f_{cm}$ Eq 3.1

Tieto hodnoty je potrebné zobrať z tabuľky 3.1 EN 1992-1-1page 31

$$f_{ctm}(f_{ck}, f_{cm}) := \left| \begin{array}{l} f_1 \leftarrow \dfrac{f_{ck}}{\dfrac{N}{mm^2}} \\ f_2 \leftarrow \dfrac{f_{cm}}{\dfrac{N}{mm^2}} \\ 0.3 \cdot (f_1)^{\left(\frac{2}{3}\right)} \cdot \dfrac{N}{mm^2} \quad \text{if } f_{ck} \le 50\dfrac{N}{mm^2} \\ 2.12 \cdot \ln\left[1 + \left(\dfrac{f_2}{10}\right)\right] \cdot \dfrac{N}{mm^2} \quad \text{otherwise} \end{array} \right.$$

$$f_{ctm}(f_{ck}, f_{cm}) = 4.072 \cdot \frac{N}{mm^2}$$

$$f_{ck\_}(t, f_{cm}, f_{ck}) := \left| \begin{array}{l} f_{cm\_}(t) - 8\dfrac{N}{mm^2} \quad \text{if } 3 < t < 28 \\ f_{ck} \quad \text{otherwise} \end{array} \right.$$

Charakteristická pevnosť betíonu v tlaku v závislosti od veku $f_{ck\_}(28, f_{cm}, f_{ck}) = 50.000 \cdot \text{MPa}$

Cl 3.1.2.9

$$f_{ctm\_}(f_{ck}, f_{cm}, t) := \left| \begin{array}{l} \alpha \leftarrow 1 \quad \text{if } t < 28 \\ \alpha \leftarrow \dfrac{2}{3} \quad \text{otherwise} \\ \beta_{cc}(t)^{\alpha} \cdot f_{ctm}(f_{ck}, f_{cm}) \end{array} \right.$$

$f_{ctm\_}(f_{ck}, f_{cm}, 20) = 3.925 \cdot \text{MPa}$

Modul pruž nosti betónu: $E_{cm}(f_{cm}) := 22 \cdot 1000 \cdot \left(\frac{f_{cm} \cdot \frac{mm^2}{N}}{10} \right)^{.3} \cdot \frac{N}{mm^2}$

$E_{cm}(f_{cm}) = 37658.937 \cdot MPa$

Modul pruž nosti betónu v závislosti od veku: $Ecm\_(t, f_{cm}) := \left(\frac{f_{cm\_}(t)}{f_{cm}} \right)^{.3} \cdot E_{cm}(f_{cm})$ Eq 3.5

$$\varepsilon_{cu1}(f_{ck}, f_{cm}) := \begin{cases} \frac{3.5}{1000} & \text{if } f_{ck} < 50\frac{N}{mm^2} \\ \frac{\left[2.8 + 21 \cdot \left[\frac{\left(98 - \frac{f_{cm}}{\frac{N}{mm^2}}\right)}{100}\right]^4\right]}{1000} & \text{otherwise} \end{cases}$$

$$\varepsilon_{c2}(f_{ck}) := \begin{cases} .002 & \text{if } f_{ck} < 50\frac{N}{mm^2} \\ .002 + \frac{.085 \cdot \left(\frac{f_{ck}}{\frac{N}{mm^2}} - 50 \right)^{.53}}{1000} & \text{otherwise} \end{cases}$$

$$\varepsilon_{cu2}(f_{ck}) := \begin{cases} .0035 & \text{if } f_{ck} < 50\frac{N}{mm^2} \\ .0026 + \frac{35 \cdot \left[\frac{\left(90 - \frac{f_{ck}}{\frac{N}{mm^2}}\right)}{100}\right]^4}{1000} & \text{otherwise} \end{cases}$$

$$\varepsilon_{c3}(f_{ck}) := \begin{cases} .00175 & \text{if } f_{ck} < 50\frac{N}{mm^2} \\ .00175 + \frac{.55 \cdot \left[\frac{\left(\frac{f_{ck}}{\frac{N}{mm^2}} - 50\right)}{40}\right]^4}{1000} & \text{otherwise} \end{cases}$$

$$\varepsilon_{cu3}(f_{ck}) := \begin{cases} .0035 & \text{if } f_{ck} < 50\dfrac{N}{mm^2} \\ .0026 + \dfrac{35 \cdot \left[\dfrac{\left(90 - \dfrac{f_{ck}}{\frac{N}{mm^2}}\right)}{100}\right]^4}{1000} & \text{otherwise} \end{cases}$$

Výpoč tová pevnosť betónu v tlaku $f_{cd} := \alpha_{cc} \cdot \dfrac{f_{ck}}{\gamma c}$ **Eq 3.15**

$\alpha_{cc} \equiv 0.85$ $\gamma c \equiv 1.5$

$f_{ctk\_.05}(f_{ck}, f_{cm}) := .7 \cdot f_{ctm}(f_{ck}, f_{cm})$ **Eq 3.16**

Výpoč tová pevnosť betónu v tlaku $f_{ctd}(f_{ck}, f_{cm}) := \alpha_{ct} \cdot \dfrac{f_{ctk\_.05}(f_{ck}, f_{cm})}{\gamma c}$

$\alpha_{ct} \equiv 1$

Kapitola 6

Posúdenie prierezov namáhaných tlakom za ohybu (MSU)

$h := h$ $b := b$ $c_1 := c_1$ $c_2 := c_2$

$A_{s1} := A_{s1}$ $A_{s2} := A_{s2}$ $A_{c_i} := h_i \cdot b_i$

$\phi_1 := \phi_1$ $\phi_2 := \phi_2$ $\phi_{st} := \phi_{st}$

$$d_{1_i} := c_{1_i} + \frac{\phi_{1_i}}{2} + \phi_{st_i} \qquad d_{2_i} := c_{2_i} + \frac{\phi_{2_i}}{2} + \phi_{st_i}$$

$$z_{1_i} := 0.5 \cdot h_i - d_{2_i} \quad z_{2_i} := -0.5 \cdot h_i + d_i \quad d_i := h_i - d_{1_i}$$

$$e_{0_i} := \max\left(\frac{h_i}{30}, 20mm\right)$$

$M_{Ed} := M_{Ed} \cdot kN \cdot m$ $N_{Ed} := N_{Ed} \cdot kN$

$$M_{Ed_i} := M_{Ed_i} + \left|N_{Ed_i} \cdot e_{0_i}\right|$$

n -Počet posudzovaných prútov
h -Výška prierezu
b -Šírka prierezu (1bm)
c_1 -Krytie výstuže pri ťahanom vlákne
c_2 -Krytie výstuže pri tlačenom vlákne
M_{Ed} -Návrhová hodnota momentu od zaťaženia
N_{Ed} -Návrhová hodnota normálovej sily od zaťaženia
ϕ_1 -Priemer ťahovej výstuže
ϕ_2 -Priemer tlakovej výstuže
ϕ_{st} -Priemer priečnej výstuže
n_1 - Počet prútov ťahovej výstuže na 1bm
n_2 - Počet prútov tlakovej výstuže na 1bm
A_1 - Plocha ťahovej výstuže na 1bm
A_2 - Plocha tlakovej výstuže na 1bm
e_0 -Minimálna výstrednosť tlakovej sily
d -Účinná výška prierezu
z_1 -Rameno vnútorných síl
z_2 -Rameno vnútorných síl

MATERIÁLOVÉ CHARAKTERISTIKY:

BETÓN:

$\varepsilon_{cu3}(f_{ck}) = 0.003496$ $f_{ck} = 50 \cdot MPa$

$\gamma_c = 1.5$

$\alpha_{cc} = 0.85$

$f_{cd} = 28.333 \cdot MPa$

$$\lambda(f_{ck}) := \begin{cases} .8 & \text{if } f_{ck} \le 50\dfrac{N}{mm^2} \\ \left[.8 - \dfrac{\left(f_{ck} - 50 \cdot \dfrac{N}{mm^2}\right)}{400 \cdot \dfrac{N}{mm^2}}\right] & \text{otherwise} \end{cases}$$

f_{ck} -Charakteristická valcová pevnosť betónu v tlaku
ε_{cu3} -Pomerné pretvorenie betónu v tlaku
γ_c -Súčiniteľ spoľahlivosti betónu
α_{cc} -Súčiniteľ dlhodobej spoľahlivosti betónu
η -Súčiniteľ tlakovej pevnosti betónu
λ -Súčiniteľ definujúci efektívnu výšku tlačenej zóny betónu
f_{cd} -Návrhová pevnosť betónu v tlaku

$$\eta(f_{ck}) := \begin{cases} 1 & \text{if } f_{ck} \le 50\dfrac{N}{mm^2} \\ \left[1 - \dfrac{\left(f_{ck} - 50 \cdot \dfrac{N}{mm^2}\right)}{200 \cdot \dfrac{N}{mm^2}}\right] & \text{otherwise} \end{cases}$$

VÝSTUŽ : B500B

$E_s = 2 \times 10^5 \cdot MPa$ $\gamma_s := 1.15$

$\varepsilon_{yd} = 0.002174$ $f_{yd} = 434.8 \cdot MPa$

f_{yk} -Charakteristická pevnosť výstuže v ťahu
E_s -Modul pružnosti výstuže
γ_s -Súčiniteľ spoľahlivosti výstuže
f_{yd} -Návrhová pevnosť výstuže v ťahu
ε_{yd} -Pomerné pretvorenie výstuže v ťahu

VÝPOČ ET VÝSTREDNOSTI NAMÁHANÝCH PRIEREZOV:

$$\xi_{bal1} := \frac{\varepsilon_{cu3}(f_{ck})}{\varepsilon_{cu3}(f_{ck}) + \varepsilon_{yd}} \qquad \xi_{bal2} := \frac{\varepsilon_{cu3}(f_{ck})}{\varepsilon_{cu3}(f_{ck}) - \varepsilon_{yd}}$$

$$\xi_{bal1} = 0.617 \qquad \xi_{bal2} = 2.644$$

$$N_{Rdbal_i} := \lambda(f_{ck}) \cdot \xi_{bal1} \cdot b_i \cdot d_i \cdot \eta(f_{ck}) \cdot f_{cd} + \left(A_{s2_i} - A_{s1_i}\right) \cdot f_{yd}$$

$$\text{Výstrednost}_i := \text{if}\left(N_{Rdbal_i} < \left|N_{Ed_i}\right|, \text{"ERROR"}, \text{"Velká výstrednost"}\right)$$

Ak je "Veľ ká výstrednosť ", σ s1=fyd

Ak je "ERROR" σ s1<fyd a tento výpoč et neplatí

POSÚDENIE:

$$\sigma_{s2_i} := \text{root}\left[\frac{\varepsilon_{cu3}(f_{ck}) \cdot \left(\frac{\left|N_{Ed_i}\right| - A_{s2_i} \cdot \sigma_{s2} + A_{s1_i} \cdot f_{yd}}{\lambda(f_{ck}) \cdot b_i \cdot \eta(f_{ck}) \cdot f_{cd}} - d_{2_i}\right)}{\frac{\left|N_{Ed_i}\right| - A_{s2_i} \cdot \sigma_{s2} + A_{s1_i} \cdot f_{yd}}{\lambda(f_{ck}) \cdot b_i \cdot \eta(f_{ck}) \cdot f_{cd}}} \cdot E_s - \sigma_{s2}, \sigma_{s2}\right]$$

$$\sigma_{s2_i} := \begin{cases} 0 & \text{if } \sigma_{s2_i} < 0 \\ f_{yd} & \text{if } \sigma_{s2_i} > f_{yd} \\ \sigma_{s2_i} & \text{otherwise} \end{cases}$$

σ_{s2} -Napätie v tlač enej výstuž i

x -Poloha neutrálnej osi

N_{Rdbal} -Normálová sila na medzi veľ kej a malej výstrednosti

M_{Rd} -Moment na medzi únosnosti

$$x_i := \min\left(\frac{\left|N_{Ed_i}\right| - A_{s2_i} \cdot \sigma_{s2_i} + A_{s1_i} \cdot f_{yd}}{\lambda(f_{ck}) \cdot b_i \cdot \eta(f_{ck}) \cdot f_{cd}}, \frac{700 \cdot d_i}{700 + \frac{f_{yd}}{MPa}}\right)$$

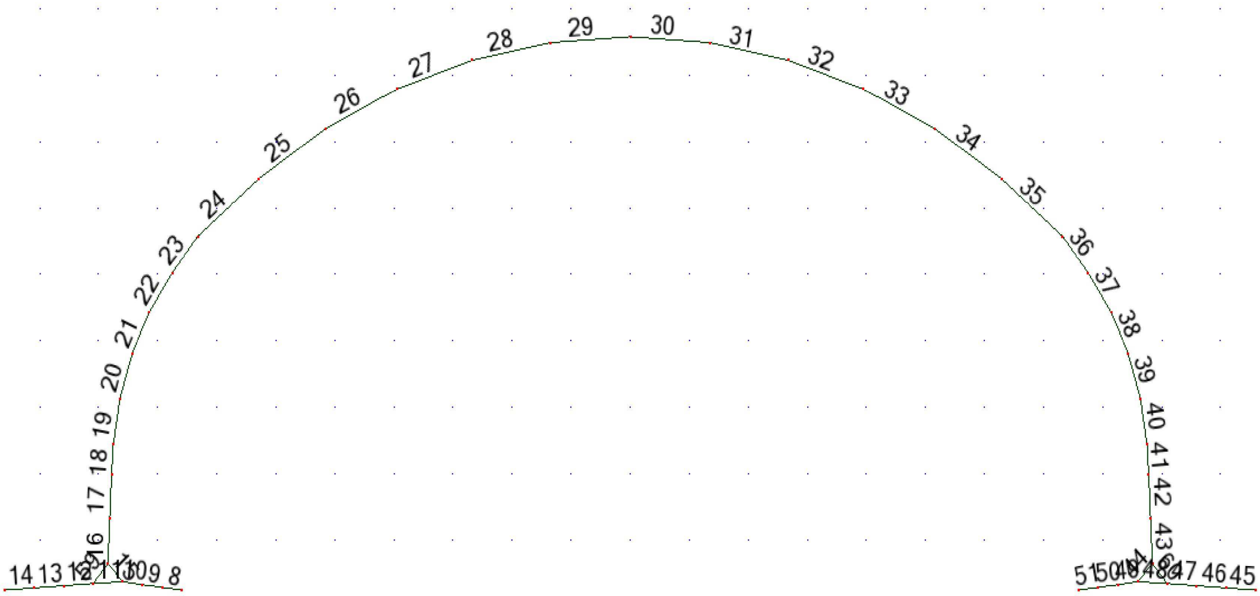
OHYBOVÝ MOMENT NA MEDZI ÚNOSNOSTI :

$$M_{Rd_i} := \lambda(f_{ck}) \cdot b_i \cdot x_i \cdot \eta(f_{ck}) \cdot f_{cd} \cdot 0.5 \cdot \left(h_i - \lambda(f_{ck}) x_i\right) + A_{s2_i} \cdot \sigma_{s2_i} \cdot z_{2_i} + A_{s1_i} \cdot f_{yd} \cdot z_{1_i}$$

Bar	x (mm)	s2 (Mpa)	M_{ED}(kN*m)	M_{RD}(kN*m)	Utilization	Result
10	0.090	173.5	486.0	972.7	50.0%	OK
12	0.085	224.0	871.3	1090.5	79.9%	OK
16	0.115	334.4	444.3	802.2	55.4%	OK
16	0.083	110.9	275.0	596.5	46.1%	OK
20	0.039	0.0	46.5	240.2	19.3%	OK
20	0.082	102.8	175.3	380.0	46.1%	OK
23	0.112	325.9	75.1	500.6	15.0%	OK
23	0.081	92.083	80.8	373.9	21.6%	OK
24	0.100	280.936	249.2	402.6	61.9%	OK
24	0.116	278.580	108.7	432.5	25.1%	OK
26	0.114	330.555	443.7	559.5	79.3%	OK
30	0.119	345.920	377.8	571.9	66.1%	OK
30	0.086	117.081	246.4	407.6	60.4%	OK
33	0.088	127.443	335.8	415.1	80.9%	OK

REKAPITULÁCIA NÁVRHU:

Bar	Tension steel /1m			položka	Compression steel / 1m			položka
	n1 (pcs/1m)	fi1 (mm)	As1 (mm2/m)		N2 (pcs/1m)	Fi2 (mm)	As2 (mm2/m)	
10	10	25	4908,74	1	10	12	1130,97	2
12	10	25	4908,74	1	10	12	1130,97	2
16	10	16	2010,62	3, 4	10	16	2010,62	5, 6
16	10	16	2010,62	5, 6	10	16	2010,62	3, 4
20	10	16	2010,62	3, 4	10	16	2010,62	5, 6
20	10	16	2010,62	5, 6	10	16	2010,62	3, 4
23	10	16	2010,62	3, 4	10	16	2010,62	5, 6
23	10	16	2010,62	5, 6	10	16	2010,62	3, 4
24	6	16	1206,37	7	6	16	1206,37	9
24	6	16	1206,37	9	6	16	1206,37	7
26	10	20	3141,59	7, 8	10	16	2010,62	9, 10
30	10	20	3141,59	7, 8	10	16	2010,62	9, 10
30	10	16	2010,62	9, 10	10	20	3141,59	7, 8
33	10	16	2010,62	9, 10	10	20	3141,59	7, 8



Kapitola 7

Posúdenie prierezov na medzný stav šírky trhlín (MSP)

ABM MOSTY	Projekt:	18305	Job No. 18305
	Objekt:	49.202_CM4 52x225	
	Obsah:	Crack Width Check in accordance with En1992-1-1 7.3.4	
	Dátum:	5/3/2018	

MATERIÁLOVÉ CHARAKTERISTIKY:

Vek betónu $t := 28$ days

Charakteristická medza klzu výstuž e $f_{yk} = 500\,MPa$

Súč initeľ dotvarovania $\Phi := 1.5$

$E_s = 200\,GPa$

$$\alpha_e := \frac{E_s}{E_{cm}(f_{cm})\cdot .9}\cdot(1+\Phi)$$

Súč initeľ normálovej sily $k_1 := 1.5$

VÝPOČ ET Š ÍRKY TRHLÍN:

Bar	kt	Doba trvania zaťaženia
10	0.4	long
12	0.4	long
16	0.4	long
16	0.4	long
20	0.4	long
20	0.4	long
23	0.4	long
23	0.4	long
24	0.4	long
24	0.4	long
26	0.4	long
30	0.4	long
30	0.4	long
33	0.4	long

$$\rho_i := \frac{A_{s_i}}{b_i\cdot d_{e_i}} \qquad \rho_{2_i} := \frac{A_{scom_i}}{b_i\cdot d_{e_i}}$$

$$As\_min\cdot\sigma_c = k_c\cdot k\cdot f_{ct\_eff}\cdot A_{ct}$$

$$\sigma_{c_i} := \frac{N_{Ed_i}}{b_i\cdot h_i}$$

$$h_1(h) := \text{if}(h < 1000, h, 1000)$$

$$\sigma_s := f_{yk}$$

$$f_{ct\_eff}(t) := f_{ctm\_}(f_{ck}, f_{cm}, t) \qquad h := \frac{h}{m}$$

Charakteristická pevnosť betónu v ť ahu v č ase $f_{ct\_eff}(t) = 4.072\,MPa$

$$k(h) := \begin{cases} 1 & \text{if } h \le 300 \\ 1 - h\cdot .0004375 & \text{if } 300 < h \le 800 \\ .65 & \text{otherwise} \end{cases}$$

$$k_c(t,i) := .4\cdot\left(1 - \frac{\sigma_{c_i}}{\frac{k_1\cdot h_i}{h_1(h)}\cdot f_{ct\_eff}(t)}\right)$$

Poloha neutrálnej osi prierezu bez trhlín $x_{uncracked}$

$$x_{uncracked_i} := \frac{b_i\cdot\frac{(h_i m)^2}{2} + b_i\cdot d_{e_i}\cdot(\alpha_e - 1)\cdot\left(\rho_i\cdot d_{e_i} + \rho_{2_i}\cdot d_{2_i}\right)}{b_i\cdot h_i m + b_i\cdot d_{e_i}\cdot(\alpha_e - 1)\cdot\left(\rho_i + \rho_{2_i}\right)}$$

Moment zotrvač nosti prierezu bez trhlín I_{u_i}

$$I_{u_i} := b_i \cdot \frac{(h_i m)^3}{12} + b_i \cdot h_i m \cdot \left(\frac{h_i m}{2} - x_{uncracked_i}\right)^2 + (\alpha_e - 1) \cdot \left[\left[A_{s_i} \cdot \left(d_{e_i} - x_{uncracked_i}\right)^2\right] + A_{scom_i} \cdot \left(x_{uncracked_i} - d_{2_i}\right)^2\right]$$

Ohybový moment na medzi vzniku trhlín M_{cr}

$$M_{cr_i} := f_{ct\_eff}(t) \cdot \frac{I_{u_i}}{\left(h_i \cdot m - x_{uncracked_i}\right)}$$

Poloha neutrálnej osi prierezu s ohybovou trhlinou:

$$K_i := -\alpha_e \cdot \left(\rho_i + \rho_{2_i}\right) + \sqrt{\alpha_e^2 \cdot \left(\rho_i + \rho_{2_i}\right)^2 + 2 \cdot \alpha_e \cdot \left(\rho_i + \rho_{2_i} \cdot \frac{d_{2_i}}{d_{e_i}}\right)}$$

$$x_{c_i} := K_i \cdot d_{e_i}$$

$$I_{c\_transformed_i} := \frac{b_i \cdot \left(x_{c_i}\right)^3}{3} + \alpha_e \cdot \rho_{2_i} \cdot b_i \cdot d_{e_i} \cdot \left(x_{c_i} - d_{2_i}\right)^2 + \alpha_e \cdot \rho_i \cdot b_i \cdot d_{e_i} \cdot \left(d_{e_i} - x_{c_i}\right)^2$$

Napätie v betóne pri ť ahanom vlákne:

$$M_{e_i} := M_{app_i} + N_{Ek_i} \cdot kN \cdot e_1$$

$$\sigma_{concrete_i} := \frac{M_{e_i} \cdot x_{c_i}}{I_{c\_transformed_i}} - \frac{N_{Ek_i}}{b_i \cdot h_i \cdot m} \cdot kN$$

Napätie vo výstuž i pri ť ahanom vlákne:

$$\sigma_{steel_i} := \sigma_{concrete_i} \cdot \alpha_e \cdot \frac{\left(d_{e_i} - x_{c_i}\right)}{x_{c_i}} - \frac{N_{Ek_i}}{b_i \cdot h_i \cdot m} \cdot kN$$

Efektívna ť ahaná plocha betónu:

$$A_{c\_eff_i} := \min\left[\frac{h_i m}{2}, 2.5 \cdot \left(h_i m - d_{e_i}\right), \frac{\left(h_i m - x_{c_i}\right)}{3}\right] \cdot b_i - A_{s_i}$$

$$\rho_{p\_eff_i} := \frac{A_{s_i}}{A_{c\_eff_i}}$$

Súč initeľ súdrž nosti výstuž e $K_1 := .8$ Cl 7.2

Súč initeľ rozdelenia pomerného pretvorenia $K_2 := 0.5$

$K_3 := 3.4$

$K_4 := .425$

Maximálna vzdialenosť trhlín:

$$S_{r\_max_i} := \mathrm{if}\left[S_i\,mm \le 5\cdot\left(C_{nom_i} + \frac{\phi_i}{2}\right), K_3\cdot C_{nom_i} + K_1\cdot K_2\cdot K_4\cdot\frac{\phi_i}{\rho_{p\_eff_i}}, 1.3\left(h_i\,m - x_{c_i}\right)\right]$$

$$\varepsilon_{sm} - \varepsilon_{cm} = \frac{\sigma_s - k_t\cdot\frac{f_{ct\_eff}(t)\cdot\left(1+\alpha_e\cdot\rho_{p\_eff}\right)}{\rho_{p\_eff}}}{E_s} \ge 0.6\cdot\frac{\sigma_s}{E_s}$$

Priemerná hodnota pomerného pretvorenia výstuž e $\varepsilon_{sm_i} := \frac{\sigma_{steel_i}}{E_s}$

Priemerná hodnota pomerného pretvorenia betónu medzi trhlinami $\varepsilon_{cm_i} := \frac{\left[k_{t_i}\cdot\frac{f_{ct\_eff}(t)\cdot\left(1+\alpha_e\cdot\rho_{p\_eff_i}\right)}{\rho_{p\_eff_i}}\right]}{E_s}$

Eq 7.9

$$\varepsilon_i := \max\left(\varepsilon_{sm_i} - \varepsilon_{cm_i}, .6\cdot\frac{\sigma_{steel_i}}{E_s}\right)$$

Š írka trhliny $W_{k_i} := \mathrm{if}\left[M_{e_i} \ge M_{cr_i}, S_{r\_max_i}\cdot\left(\varepsilon_i\right), 0\right]$ Eq 7.8

Bar	Mcr (kNm)	M Applied	σ concrete (MPa)	σ steel (MPa)	Crack Width (mm)
10	274	283.6	6.0	132.2	0.09
12	324	470.2	8.7	203.7	0.17
16	194	231.8	5.5	200.0	0.20
16	195	0.0	0.0	0.0	0.00
20	98	46.5	3.3	95.0	0.00
20	99	100.9	3.3	90.1	0.07
23	98	0.0	0.0	0.0	0.00
23	99	0.0	0.0	0.0	0.00
24	92	0.0	0.0	0.0	0.00
24	93	0.0	0.0	0.0	0.00
26	104	155.9	9.4	206.4	0.18
30	104	218.7	13.2	292.1	0.29
30	100	0.0	0.0	0.0	0.00
33	100	89.4	2.1	60.0	0.00

Kapitola 8

Posúdenie prierezov namáhaných šmykom za ohybu (MSU)

PRVKY BEZ POTREBY Š MYKOVÉHO VYSTUŽ ENIA:

$$C_{Rdc} := \frac{0.18}{\gamma c}$$

$$k_i := min\left(1 + \sqrt{\frac{200mm}{d_i}}, 2\right)$$

$$\sigma_{cp_i} := min\left(\frac{N_{Ed_i}}{b_i \cdot h_i}, 0.2f_{cd}\right)$$

$$\rho_{l_i} := \frac{A_{s1_i}}{b_i \cdot d_i}$$

$$v_{min_i} := 0.035 \cdot \left(k_i\right)^{\frac{3}{2}} \cdot \sqrt{\frac{f_{ck}}{MPa}} \cdot MPa$$

$$\upsilon := 0.6 \cdot \left(1 - \frac{f_{ck}}{250MPa}\right)$$

$$V_{Rdcmin_i} := \left(v_{min_i} + 0.15\sigma_{cp_i}\right) \cdot b_i \cdot d_i$$

$$V_{Rdmax_i} := 0.5 \cdot b_i \cdot d_i \cdot \upsilon \cdot f_{cd}$$

$$V_{Rdc_i} := \left[C_{Rdc} \cdot k_i \cdot \left(\frac{100 \cdot \rho_{l_i} \cdot f_{ck}}{MPa}\right)^{0.33} \cdot MPa + 0.15 \cdot \sigma_{cp_i}\right] \cdot b_i \cdot d_i$$

Š MYKOVÁ ODOLNOSŤ PRIEREZU BEZ Š MYKOVEJ VÝSTUŽ E:

$$VRdc_i := \begin{array}{|l} V_{Rdcmin_i} \ \ if \ \ V_{Rdc_i} < V_{Rdcmin_i} \\ V_{Rdmax_i} \ \ if \ \ V_{Rdc_i} > V_{Rdmax_i} \\ V_{Rdc_i} \ \ otherwise \end{array}$$

PRVKY SO Š MYKOVÝM VYSTUŽ ENÍM:

VPLYV NORMÁLOVEJ SILY

$$\alpha_{cw_i} := min\left(1 + \frac{\sigma_{cp_i}}{f_{cd}}, 1.25\right)$$

PODMIENKA PRE Ved < VRd_max_22

$$V_{Rd\_max\_22_i} := \alpha_{cw_i} \cdot 0.3125 \cdot \upsilon \cdot f_{cd} \cdot b_i \cdot d_i$$

PODMIENKA PRE **VRd_max_45 >Ved > VRd_max_22**

$$V_{Rd\_max\_45_i} := \alpha_{cw_i} \cdot 0.45 \cdot \upsilon \cdot f_{cd} \cdot b_i \cdot d_i$$

VÝPOČ ET SKLONU TLAKOVEJ DIAGONÁLY θ

$$\theta_{x_i} := min\left(\frac{\pi}{4}, \left|0.5 \cdot asin\left(\frac{Ved_i}{V_{Rd\_max\_45_i}}\right)\right|\right)$$

$$\theta_i := \begin{cases} 22\frac{\pi}{180} & if\ \ \theta_{x_i} \le 22\frac{\pi}{180} \\ \theta_{x_i} & otherwise \end{cases}$$

KONTROLA TLAKOVEJ DIAGONÁLY

$$V_{Rd\_max_i} := \begin{cases} \dfrac{\alpha_{cw_i} \cdot \upsilon \cdot f_{cd} \cdot b_i \cdot 0.9d_i}{\left(tan\left(\theta_i\right) + \dfrac{1}{tan\left(\theta_i\right)}\right)} & if\ \ \dfrac{\alpha_{cw_i} \cdot \upsilon \cdot f_{cd} \cdot b_i \cdot 0.9d_i}{\left(tan\left(\theta_i\right) + \dfrac{1}{tan\left(\theta_i\right)}\right)} \ge Ved_i \\ 0.0001kN & otherwise \end{cases}$$

NÁVRH STRMEŇ OV A SPÔN (na 1000 x 1000mm)

$$s\_links := 1000mm$$

$$A_{sw_i} := \begin{cases} \dfrac{Ved_i \cdot s\_links}{0.9 \cdot d_i \cdot f_{yd} \cdot \dfrac{1}{tan\left(\theta_i\right)}} \\ 0\ \ if\ \ VRdc_i > \left|Ved_i\right| \end{cases}$$

MINIMÁLNY STUPEŇ VYSTUŽ ENIA (na 1000 x 1000mm)

$$A_{sw\_min_i} := \frac{0.08 \cdot \sqrt{\frac{f_{ck}}{MPa}} \cdot MPa \cdot b_i \cdot s\_links}{f_{yk}}$$

$$A_{prov_i} := max\left(A_{sw\_min_i}, A_{sw_i}\right)$$

MAXIMÁLNA VZDIALENOSŤ STRMEŇ OV A SPÔN:

Pozdĺ ž ny smer:

$$\phi_i := min(\phi_{1_i}, \phi_{2_i})$$

$$s1max_i := min(15 \cdot \phi_i, 300mm)$$

Prieč ny smer:

$$s2max_i := 300mm$$

PRÍDAVNÁ HLAVNÁ VÝSTUŽ :

$$\Delta F_{sd_i} := 0.5 \cdot Ved_i \cdot \frac{1}{tan(\theta_i)}$$

$$\Delta A_{s1_i} := \left| \begin{array}{l} \dfrac{\Delta F_{sd_i}}{f_{yd}} \\ 0 \;\; if \;\; VRdc_i > |Ved_i| \end{array} \right.$$

Prút	Šmyková odolnosť prvkov bez šmyk. výstuže (kN)	Min plocha šmyk. výstuže (mm2/m2)	Potrebná plocha šmyk. výstuže (mm2/m2)	Navrhnutá plocha šmyk. výstuže (mm2/m2)	Vzdialenosť strmeňov v pozdĺžnom smere (mm)	Vzdialenosť spôn v priečnom smere (mm)	Prídavná hlavná výstuž (mm2)	Kontrola tlakovej diagonály (kN)
10	364	1131	1726	1726	180	300.0	2310	2079
12	373	1131	1961	1961	180	300.0	2894	2284
16	553	1131	0	1131	240	300.0	0	2104
16	409	1131	0	1131	240	300.0	0	1999
20	202	1131	0	1131	240	300.0	0	1190
20	353	1131	0	1131	240	300.0	0	1381
23	440	1131	0	1131	240	300.0	0	1428
23	347	1131	0	1131	240	300.0	0	1374
24	412	1131	0	1131	240	300.0	0	1428
24	424	1131	0	1131	240	300.0	0	1479
26	457	1131	0	1131	240	300.0	0	1406
30	470	1131	0	1131	240	300.0	0	1418
30	386	1131	0	1131	240	300.0	0	1414
33	394	1131	0	1131	240	300.0	0	1422

Kapitola 9

Návrh výstuže kĺbového spoja (MSU)

[redacted]

a. Reinforcement to resist spalling

For this scenario the capacity of the concrete is ignored and it is assumed that all the shear forces shall be resisted by the reinforcement. The reinforcement is determined to resist an enhanced shear force including, the shear force and 4% of the axial force. The steel stress should not exceed , nor should the steel strain exceed .001 Hence it should be design for Mild steel with $f_y := 200 \cdot \frac{N}{mm^2}$ (CIRA Guide 1 Section 3.5).

$\begin{pmatrix} P \\ V \end{pmatrix} :=$

P (kN)	Shear stress (kN)
1212.564	255.88

Axial Force at ULS $\quad P_u := P \cdot kN \quad P_u = 1.213 \times 10^3 \cdot kN$

Shearing stress of the rupture at connection: $\quad V := V \cdot kN$

Enhanced shear force $\quad V_{enhanced} := V + .04 \cdot P_u$

Required links $\quad A := \frac{V_{enhanced}}{f_y} \quad A = 1522 \cdot mm^2$

b. Bursting Resistance

The reinforcement that should resist the localised shear at the joint is calculated based on the Chapter 7 of Multi- Storey
Precast Concrete Frame Structures by K.S Elliot. The book specifies a check calculation to determine the additional
reinforcement to resist the lateral effect of bursting due to outward diffusion of force. The are of steel is calculated
based on the formula;

$f_y := 500 \cdot \frac{N}{mm^2}$, $A_{burs} := \frac{P_u \cdot \xi}{\gamma_m \cdot f_y}$

$\xi \equiv .7$ Recommended coefficient $\quad \gamma_m \equiv .87$ Partial safety factor for strength

$P_u = 1.213 \times 10^3 \cdot kN$ Axial Force at ULS

required stirrups to resist the bursting $\quad A_{burs} = 1951 \cdot mm^2$

Kapitola 10

Napätie v základovej špáre (MSU)

Projekt	18305		Job No. 18305
Objekt	49.202_CM4 52x225		
Predemet			
Navrh	SC	Datum	5/3/2018

Bar	Reaction (kN)	Case	L	n1	n2
8	137.37	SW/0-1_Vh_ULS_a-Service Max	2.99	8	16
9	296.27	SW/0-1_Vh_ULS_a-Service Max			
10	317.78	SW/0-1_Vh_ULS_a-Service Max			
11	417.37	SW/0-1_Vh_ULS_a-Service Max			
12	539.49	SW/0-1_Vh_ULS_a-Service Max			
13	498.54	SW/0-1_Vh_ULS_a-Service Max			
14	622.79	SW/0-1_Vh_ULS_a-Service Max			
15	308.63	SW/0-1_Vh_ULS_a-Service Max			
45	308.63	SW/0-1_Vh_ULS_a-Service Max			
46	622.79	SW/0-1_Vh_ULS_a-Service Max			
47	498.54	SW/0-1_Vh_ULS_a-Service Max			
48	539.49	SW/0-1_Vh_ULS_a-Service Max			
49	417.37	SW/0-1_Vh_ULS_a-Service Max			
50	317.78	SW/0-1_Vh_ULS_a-Service Max			
51	296.27	SW/0-1_Vh_ULS_a-Service Max			
52	137.37	SW/0-1_Vh_ULS_a-Service Max			

Sirka zakladu: $L := L\,m$

Priemerna dlzka elementu $L_{ave} := \frac{L}{n_1}$

Suma reakcii pod lavou castou $F_{under\_Lfooting} := \sum_{i=1}^{n_1} \left(F_i\,kN\right)$ $F_{under\_Lfooting} = 3138.240 \cdot kN$

Suma reakcii pod pravou castou $F_{under\_Rfooting} := \sum_{i=n_1+1}^{n_2} \left(F_i\,kN\right)$ $F_{under\_Rfooting} = 3138.240 \cdot kN$

Priemerne napatie v zakladovej spare $P_{ave\_L} := \frac{F_{under\_Lfooting}}{L \cdot 1m}$ $P_{ave\_L} = 1049.579 \cdot \frac{kN}{m^2}$

$P_{ave\_R} := \frac{F_{under\_Rfooting}}{L \cdot 1m}$ $P_{ave\_R} = 1049.579 \cdot \frac{kN}{m^2}$

Kapitola 11

Extrém deformácie od náhodilého zaťaženia (MSP)

Displacement

- Case: 14 (CF-LM71)

Node/Case	UZ (mm)	Case name
30/ 14	-9.85	CF-LM71

Kapitola 12

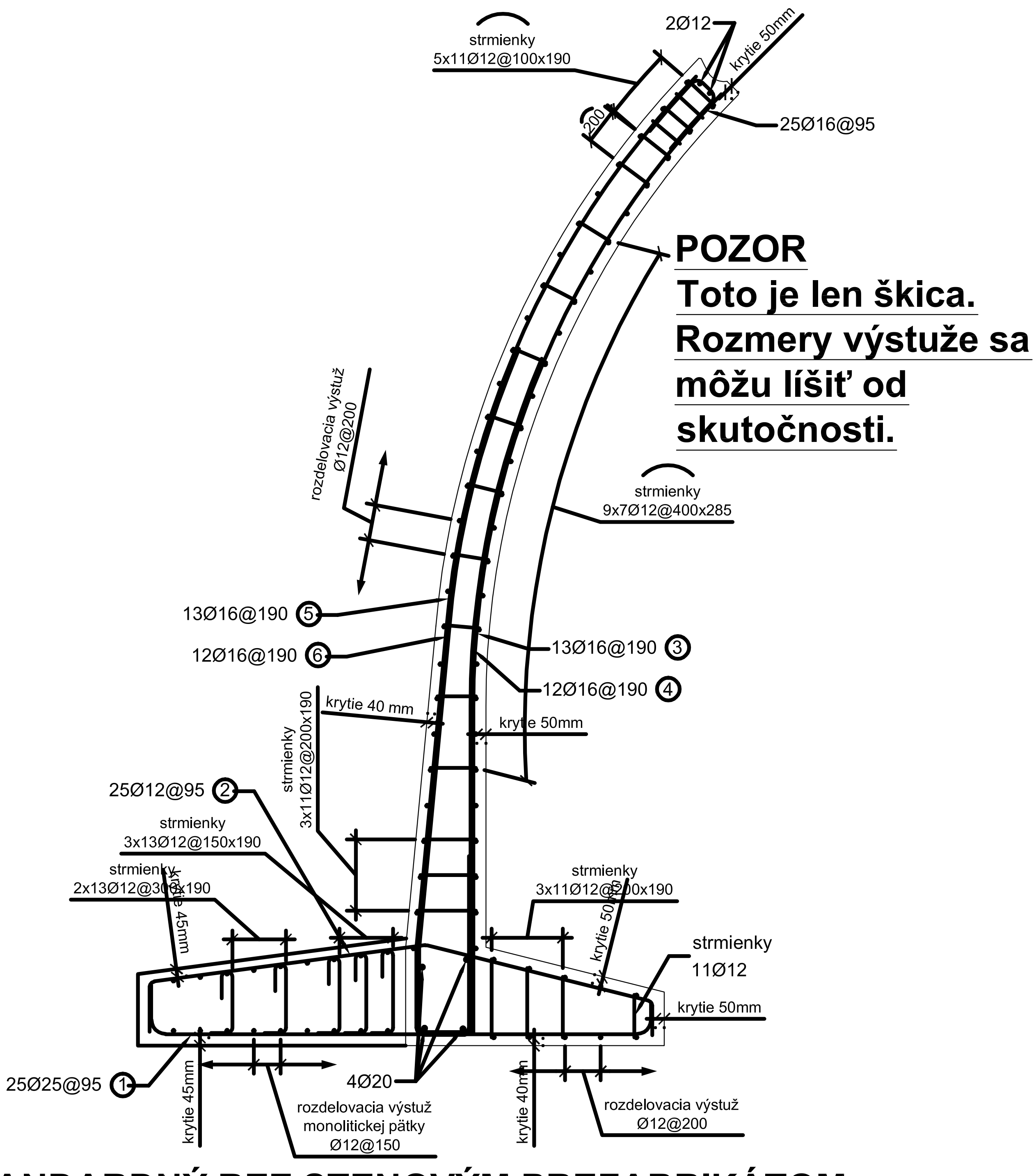
Tabuľka zaťažitelnosti

A/ identifikácia mostu
TÚ: Most v km 49,202 na trati Týniště nad Orlicí - Meziměstí
DÚ: Podjezd v Novém Městě nad Metují na silnici III/30821

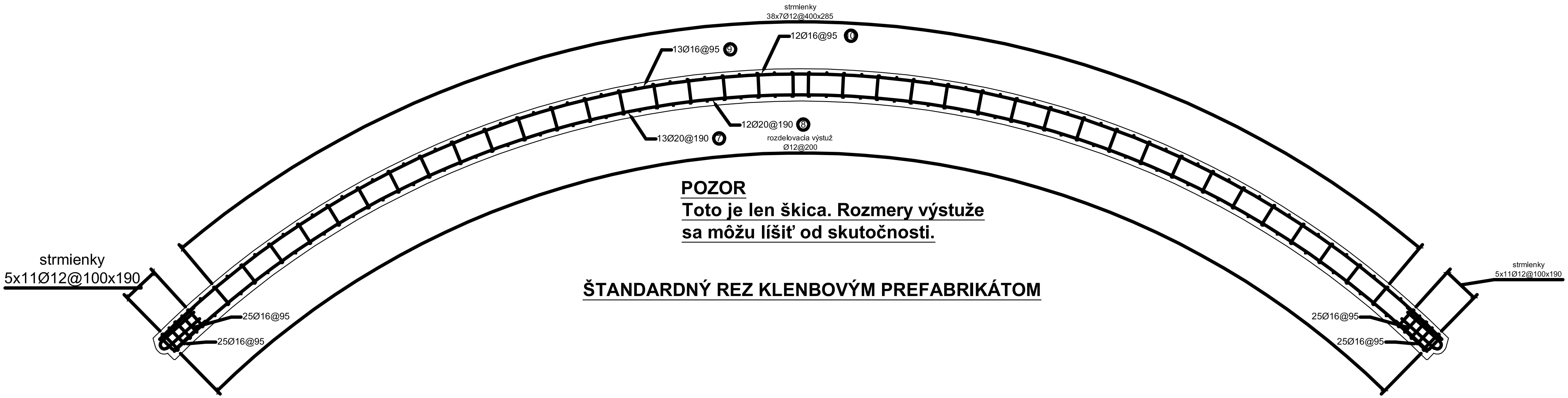
B/ Identifikácia časti mostu
Rekonstrukce podjezdu

C/ Doplňujúce dáta pre časť mostu
Kategorie zatížitelnosti : C

Normálna zaťažiteľnosť od ohybového momentu :							
Prút	Povrch	Kombinácia Service MIN	M_{ed} (kNm)	M_{Rd} (kNm)	M_{stale} (kNm)	M_{LM71} (kNm)	Z_{LM71}
10-Patka-prefa	Dole	27	473,47	972,7	362,2	111,27	6,04
12-Patka-monolit	Dole	54	850,14	1090,5	568,98	281,16	2,04
16-Stěna	Exteriér	55	390,57	802,2	174,82	215,75	3,20
16-Stěna	Interiér	43	250,32	596,5	79,62	170,7	3,33
26-Klenba	Interiér	40	406,14	559,5	97,27	308,87	1,65
33-Klenba	Exteriér	43	305,35	415,1	19,77	285,58	1,52



ŠTANDARDNÝ REZ STENOVÝM PREFABRIKÁTOM



POZOR
Toto je len škica. Rozmery výstuže sa môžu líšiť od skutočnosti.

ŠTANDARDNÝ REZ KLENBOVÝM PREFABRIKÁTOM