

Committente: **INTERPROGETTI**

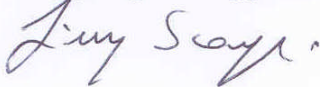
**PIATTAFORMA INTERMODALE DI TREMESTIERI IN
PROVINCIA DI MESSINA**

CONSULENZA GEOTECNICA

Relazione n. 28 del 14.05.2010

ALLEGATO 2

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REPORT

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1. General Information

Table [1] units

Type	Unit
Length	m
Force	kN
Time	s

Table [2] Model dimensions

	min.	max.
X	-40,000	41,000
Y	-40,000	6,500

Table [3] Model

Model	Plane Strain
Element	6-Noded

2. Structures

Table [4] Beams

Plate no.	Data set	Length [m]	Nodes
1	HZ1080MA-12/AZ13-770	29,800	1842, 1929, 1926, 1923, 1796, 1761, 1691, 1630, 1391, 1211, 853.
2	pali1016/6.2m	12,000	1014, 1060, 1395.
3	HZ1080MA-12/AZ13-770	29,800	2223, 2220, 2156, 2126, 2079, 1985, 1754, 1698, 1513, 1398, 1157.

Table [5] Node-to-node anchors

Anchor no.	Data set	Length [m]	First node	Last node
1	pali1219/6.2m	2,500	1816	1874
2	pali1219/6.2m	9,500	1395	1822
3	ø40/2,07m	9,500	1842	2223

3. Material data

Table [6] Soil data sets parameters

<i>Linear Elastic</i>		4
		Calcestruzzo
Type		Drained
γ_{unsat}	[kN/m ³]	25,00
γ_{sat}	[kN/m ³]	25,00
k_x	[m/s]	0,000
k_y	[m/s]	0,000
e_{init}	[-]	0,500
c_k	[-]	1E15
E_{ref}	[kN/m ²]	35000000,00
ν	[-]	0,200
G_{ref}	[kN/m ²]	14583333,333
E_{oed}	[kN/m ²]	38888888,889
E_{incr}	[kN/m ² /m]	0,00
y_{ref}	[m]	0,000
R_{inter}	[-]	1,000
Interface permeability		Neutral

<i>Mohr-Coulomb</i>		1	2	3	5
		Strato 1 - S+G	Strato 2 - G+Ciot	Riempimento	Strato 1 rid
Type		Drained	Drained	Drained	Drained
γ_{unsat}	[kN/m ³]	19,50	19,50	19,50	19,50
γ_{sat}	[kN/m ³]	19,50	19,50	19,50	19,50
k_x	[m/s]	0,000	0,000	0,000	0,000
k_y	[m/s]	0,000	0,000	0,000	0,000
e_{init}	[-]	0,500	0,500	0,500	0,500
c_k	[-]	1E15	1E15	1E15	1E15
E_{ref}	[kN/m ²]	35000,000	35000,000	35000,000	35000,000
ν	[-]	0,300	0,270	0,300	0,300
G_{ref}	[kN/m ²]	13461,538	13779,528	13461,538	13461,538
E_{oed}	[kN/m ²]	47115,385	43735,022	47115,385	47115,385
c_{ref}	[kN/m ²]	0,00	0,00	0,00	0,00
ϕ	[°]	34,00	38,00	34,00	28,30
ψ	[°]	10,00	5,00	0,00	10,00
E_{inc}	[kN/m ² /m]	0,00	0,00	0,00	0,00
y_{ref}	[m]	0,000	0,000	0,000	0,000
$c_{increment}$	[kN/m ² /m]	0,00	0,00	0,00	0,00
T_{str}	[kN/m ²]	0,00	0,00	0,00	0,00
R_{inter}	[-]	0,70	0,70	0,50	0,70
Interface permeability		Neutral	Neutral	Neutral	Neutral

<i>Mohr-Coulomb</i>		6	7	8
		Strato 2 rid	jet grouting	Massi
Type		Drained	Drained	Drained
γ_{unsat}	[kN/m ³]	19,50	20,00	19,00
γ_{sat}	[kN/m ³]	19,50	20,00	19,00
k_x	[m/s]	0,000	0,000	0,000
k_y	[m/s]	0,000	0,000	0,000
e_{init}	[-]	0,500	0,500	0,500
c_k	[-]	1E15	1E15	1E15
E_{ref}	[kN/m ²]	35000,000	70000,000	50000,000
ν	[-]	0,270	0,200	0,300



Mohr-Coulomb		6	7	8
		Strato 2 rid	jet grouting	Massi
G_{ref}	[kN/m ²]	13779,528	29166,667	19230,769
E_{oed}	[kN/m ²]	43735,022	77777,778	67307,692
c_{ref}	[kN/m ²]	0,00	1000,00	0,00
φ	[°]	32,00	0,00	45,00
ψ	[°]	5,00	0,00	0,00
E_{inc}	[kN/m ² /m]	0,00	0,00	0,00
y_{ref}	[m]	0,000	0,000	0,000
c_{increment}	[kN/m ² /m]	0,00	0,00	0,00
T_{str.}	[kN/m ²]	0,00	0,00	0,00
R_{inter.}	[-]	0,70	0,50	0,50
Interface permeability		Neutral	Neutral	Neutral

Table [7] Beam data sets parameters

no.	Identification	EA [kN/m]	EI [kNm ² /m]	w [kN/m/m]	v [-]	Mp [kNm/m]	Np [kN/m]
1	HZ1080MA-12/AZ13-770	6,174E6	8,485E5	0,00	0,15	1E15	1E15
2	pali1016/6.2m	1,788E6	3,26E5	0,00	0,15	1E15	1E15

Table [8] Anchor data sets parameters

no.	Identification	EA [kN]	Fmax,comp [kN]	Fmax,tens [kN]	L spacing [m]
1	φ40/2,07m	127500,00	1E15	1E15	1,00
2	pali1219/6.2m	1788000,00	1E15	1E15	1,00

4. Calculation phases

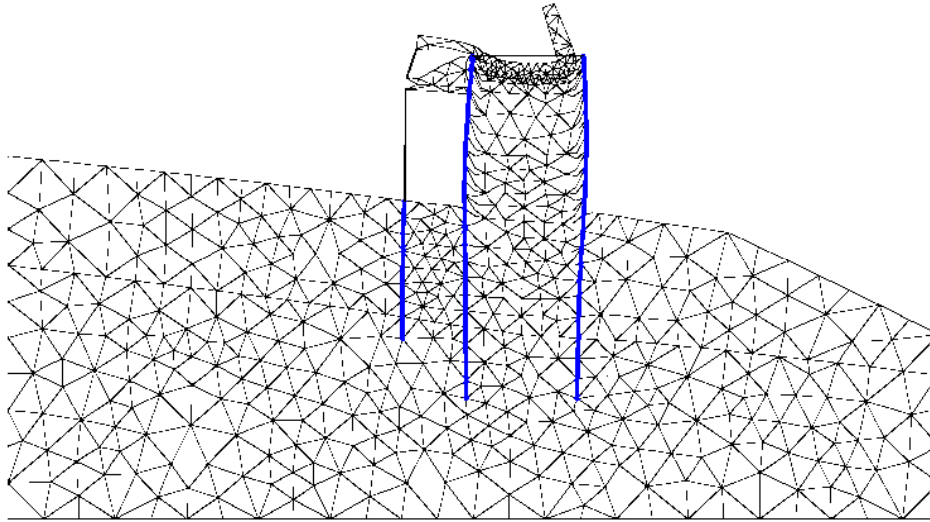
Table [9] List of phases

Phase	Ph-No.	Start phase	Calculation type	Load input	First step	Last step
Initial phase	0	0		-	0	0
litostatiche	1	0	Plastic analysis	Total multipliers	1	7
palancole	2	1	Plastic analysis	Staged construction	8	9
1+2	3	2	Plastic analysis	Staged construction	10	33
3+4	4	3	Plastic analysis	Staged construction	34	65
sol+jet-grouting	5	4	Plastic analysis	Staged construction	66	70
pali cella	6	5	Plastic analysis	Staged construction	71	74
SLE qp	7	6	Plastic analysis	Staged construction	75	80
SLE rara cresta	8	6	Plastic analysis	Staged construction	81	180
SLE rara cavo	9	6	Plastic analysis	Staged construction	181	237
SLE freq cresta	10	6	Plastic analysis	Staged construction	238	263
SLE freq cavo	11	6	Plastic analysis	Staged construction	264	275
west (SLV)+10 kPa	12	6	Plastic analysis	Staged construction	276	297
SLV	13	12	Plastic analysis	Total multipliers	298	351
SLV par rid	14	13	Plastic analysis	Staged construction	352	370
west (SLD)+ 10 kPa	15	6	Plastic analysis	Staged construction	371	377
SLD	16	15	Plastic analysis	Total multipliers	378	392
SLU 1.2 cresta	17	6	Plastic analysis	Staged construction	393	450
SLU 1.2 cavo	18	6	Plastic analysis	Staged construction	451	490
SLU 1.1 cresta	19	6	Plastic analysis	Staged construction	491	616
varx1.15 (da moltiplicare x1.3)						
SLU 1.1 cavo	20	6	Plastic analysis	Staged construction	617	681

Phase	Ph-No.	Start phase	Calculation type	Load input	First step	Last step
varx1.15 (da moltiplicare x1.3)						

5. Results for phase 6

5.1. Deformations



**Fig. 1 Plot of deformed mesh
- Step no: 74 - (Phase: 6)**

5.1.1. Plot of horizontal displacements

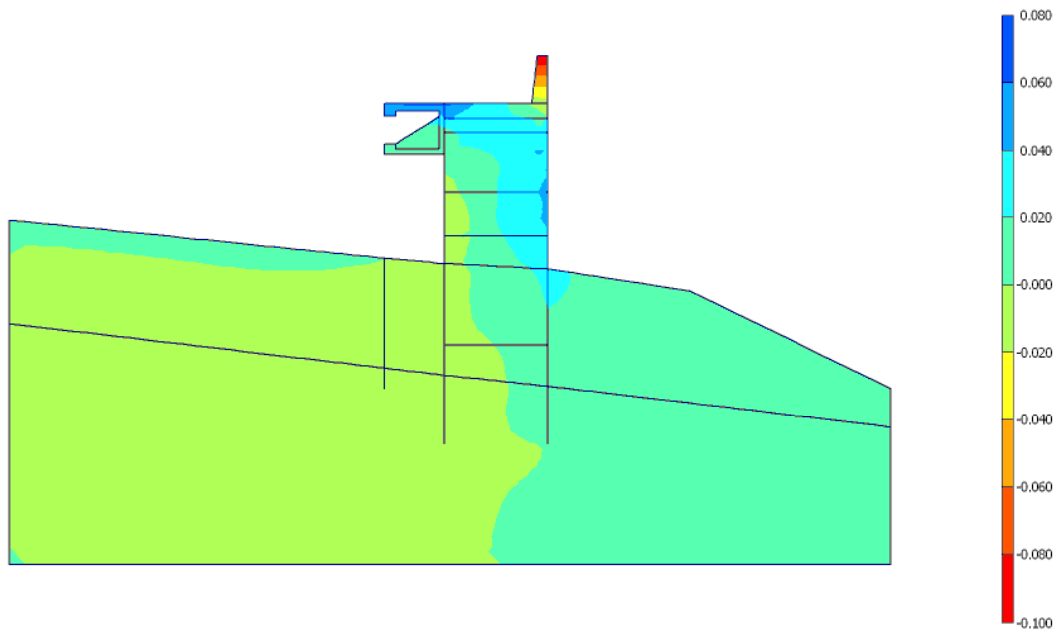


Fig. 2 Plot of horizontal displacements (shadings)
- Step no: 74 - (Phase: 6)

5.2. Structures

5.2.2. Beams

5.2.2.1. Beams

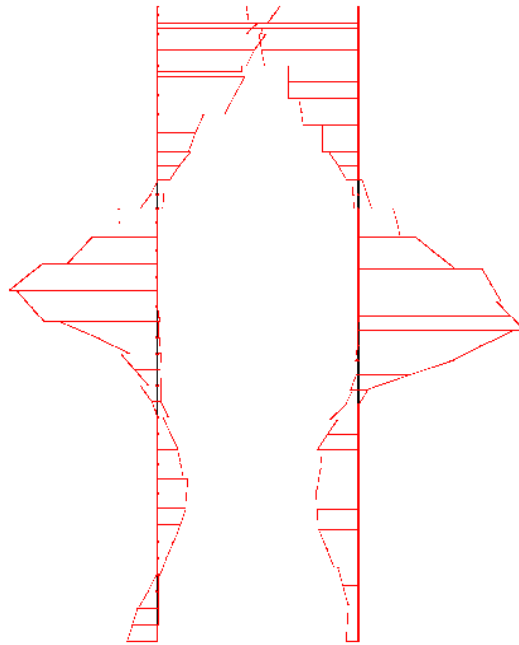


Fig. 3 Shear forces envelop in beam
 Extreme value -155,75 kN/m (Phase: 6)

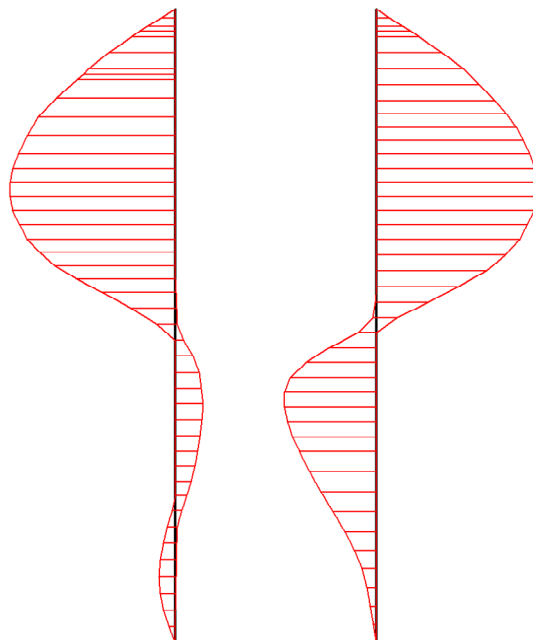


Fig. 4 Bending moment envelop in beam

Extreme value 515,06 kN/m/m (Phase: 6)

5.2.3. Anchors

Table [10] Anchors phase no: 6

Anchor no.	Node	x-coord. [m]	y-coord. [m]	F [kN]	Fmax,comp [kN]	Fmax,te ns [kN]	EA [kN]	Rotation [°]	Le [m]
1	1816 1874	-5,500 -5,500	-1,500 1,000	-67,312	1E15	1E15	1788000,00	N/A	2,500
2	1395 1822	-5,500 -5,500	-12,000 -2,500	-116,852	1E15	1E15	1788000,00	N/A	9,500
3	1842 2223	0,000 9,500	0,800 0,800	105,096	1E15	1E15	127500,00	N/A	9,500

6. Results for phase 7

6.3. Deformations

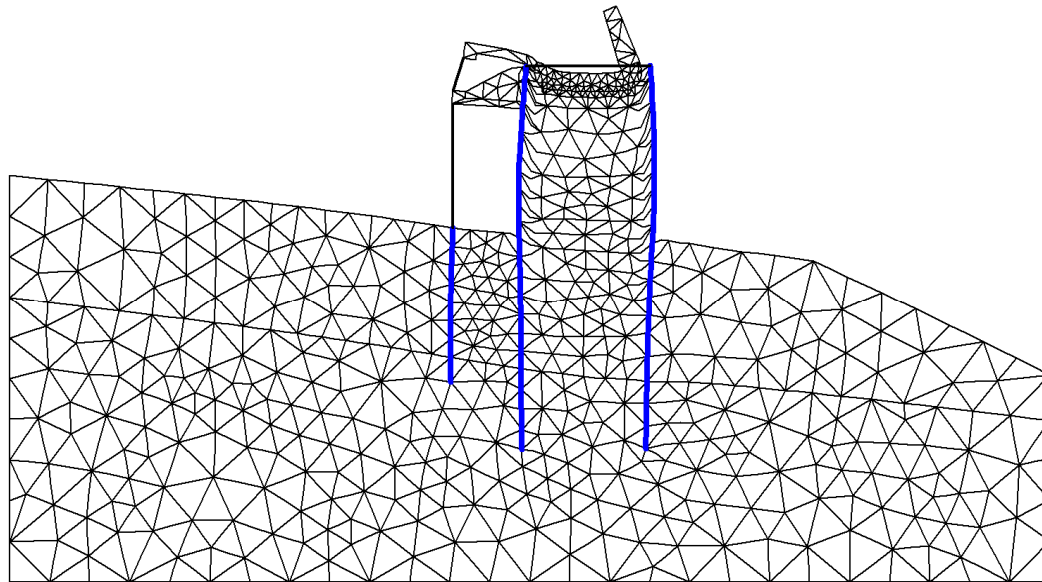


Fig. 5 Plot of deformed mesh
- Step no: 80 - (Phase: 7)

6.3.4. Plot of horizontal displacements

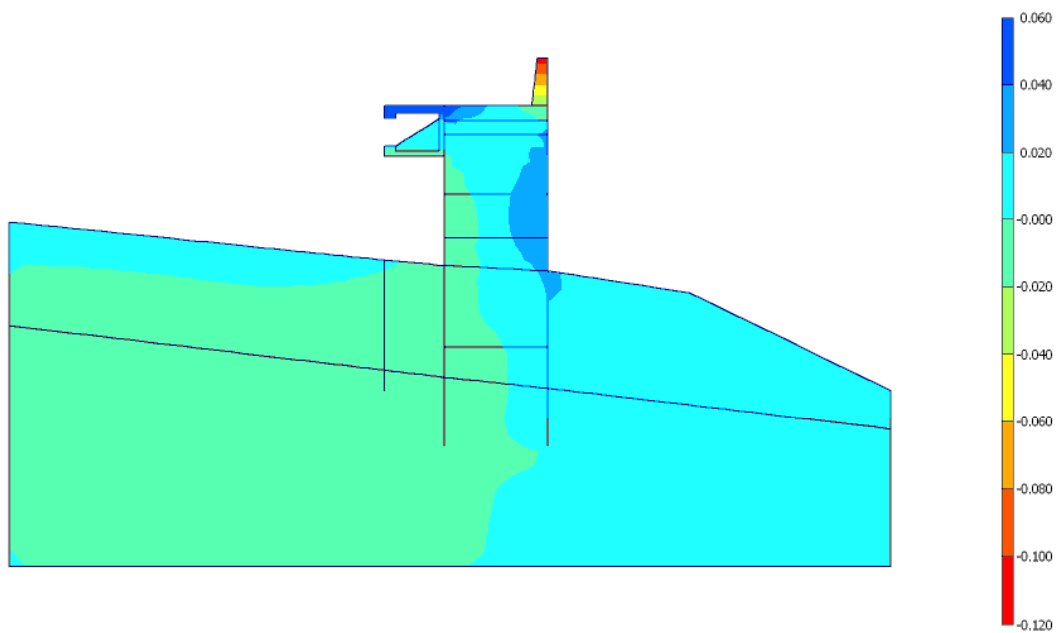


Fig. 6 Plot of horizontal displacements (shadings)
- Step no: 80 - (Phase: 7)

6.4. Structures

6.4.5. Beams

6.4.5.2. Beams

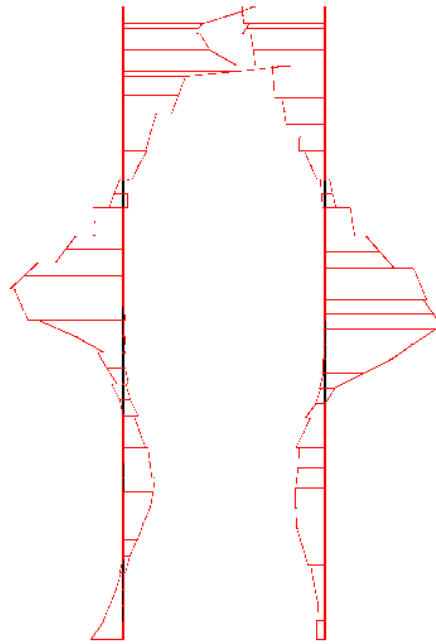


Fig. 7 Shear forces envelop in beam
Extreme value -219,71 kN/m (Phase: 7)

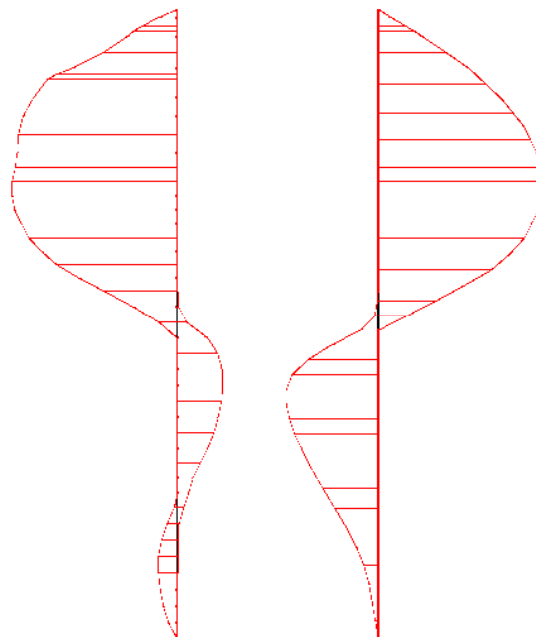


Fig. 8 Bending moment envelop in beam
Extreme value 515,06 kN/m/m (Phase: 7)

6.4.6. Anchors

Table [11] Anchors phase no: 7

Anchor no.	Node	x-coord. [m]	y-coord. [m]	F [kN]	Fmax,comp [kN]	Fmax,tens [kN]	EA [kN]	Rotation [°]	Le [m]
1	1816 1874	-5,500 -5,500	-1,500 1,000	-201,101	1E15	1E15	1788000,00	N/A	2,500
2	1395 1822	-5,500 -5,500	-12,000 -2,500	-284,499	1E15	1E15	1788000,00	N/A	9,500
3	1842 2223	0,000 9,500	0,800 0,800	108,445	1E15	1E15	127500,00	N/A	9,500

7. Results for phase 8

7.5. Deformations

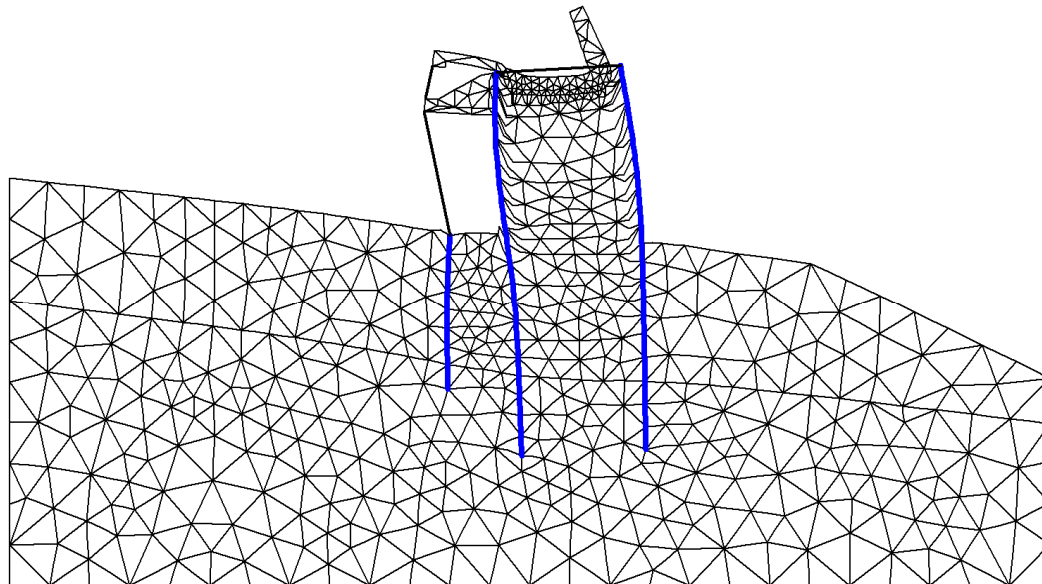


Fig. 9 Plot of deformed mesh
- Step no: 180 - (Phase: 8)

7.5.7. Plot of horizontal displacements

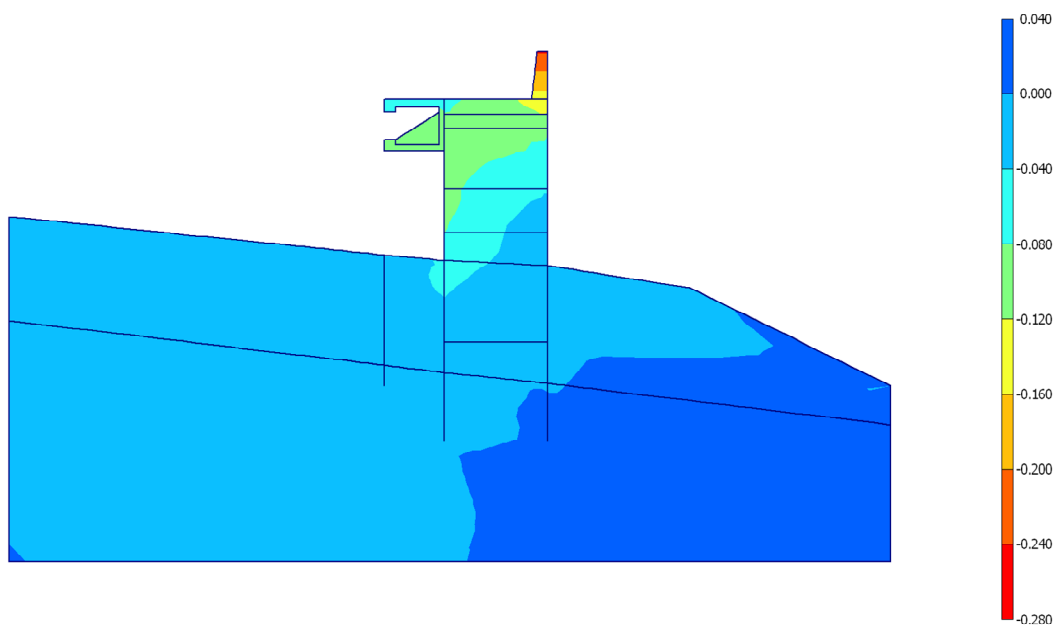


Fig. 10 Plot of horizontal displacements (shadings)

- Step no: 180 - (Phase: 8)

7.6. Structures

7.6.8. Beams

7.6.8.3. Beams



Fig. 11 Shear forces envelop in beam
Extreme value $-1,04 \cdot 10^3$ kN/m (Phase: 8)

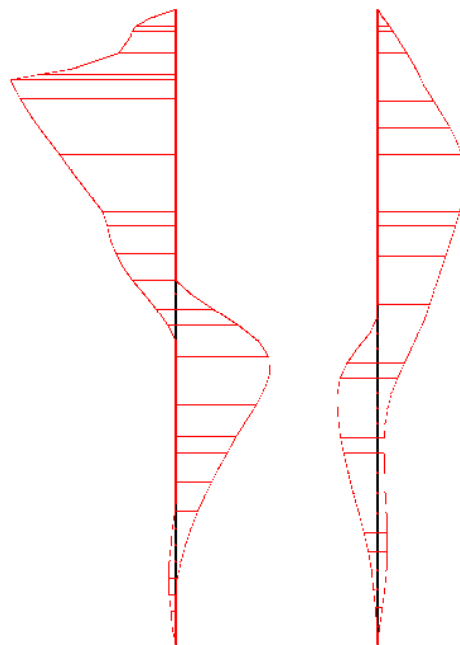


Fig. 12 Bending moment envelop in beam
 Extreme value $1,17 \cdot 10^3$ kN/m/m (Phase: 8)

7.6.9. Anchors

Table [12] Anchors phase no: 8

Anchor no.	Node	x-coord. [m]	y-coord. [m]	F [kN]	Fmax,comp [kN]	Fmax,tens [kN]	EA [kN]	Rotation [°]	Le [m]
1	1816 1874	-5,500 -5,500	-1,500 1,000	-372,595	1E15	1E15	1788000,00	N/A	2,500
2	1395 1822	-5,500 -5,500	-12,000 -2,500	-583,807	1E15	1E15	1788000,00	N/A	9,500
3	1842 2223	0,000 9,500	0,800 0,800	110,193	1E15	1E15	127500,00	N/A	9,500

8. Results for phase 9

8.7. Deformations

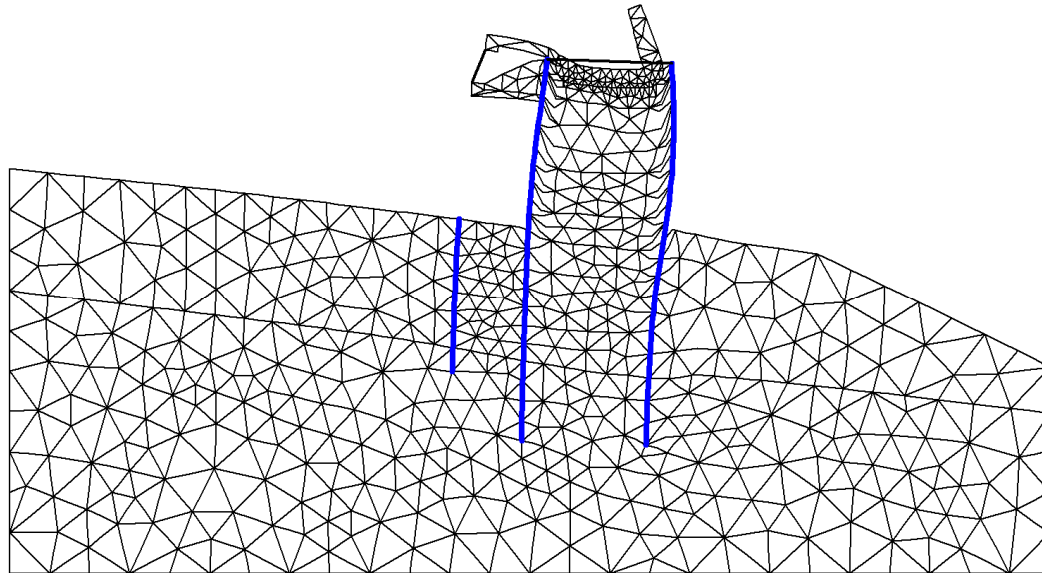


Fig. 13 Plot of deformed mesh
- Step no: 237 - (Phase: 9)

8.7.10. Plot of horizontal displacements

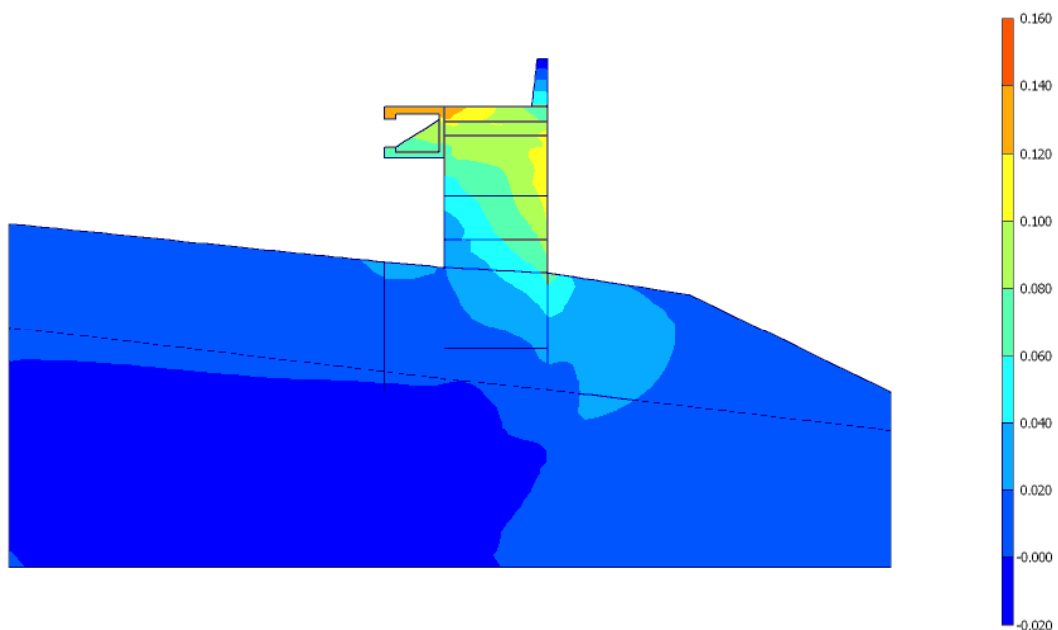


Fig. 14 Plot of horizontal displacements (shadings)
- Step no: 237 - (Phase: 9)

8.8. Structures

8.8.11. Beams

8.8.11.4. Beams

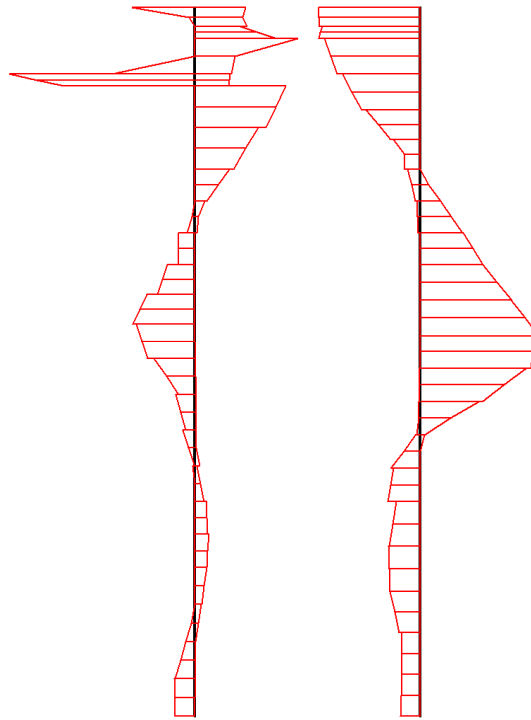


Fig. 15 Shear forces envelop in beam
Extreme value 420,37 kN/m (Phase: 9)

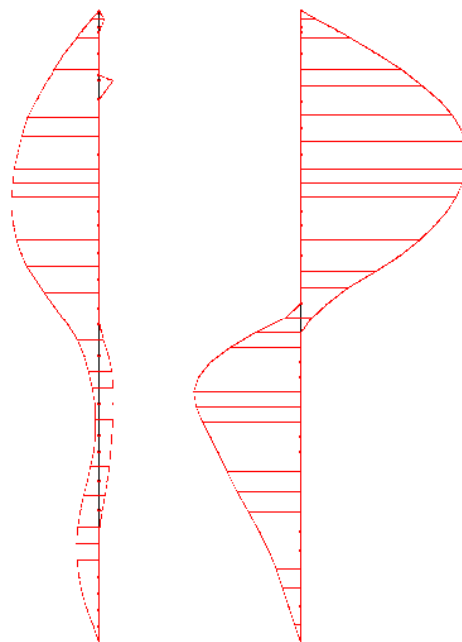


Fig. 16 Bending moment envelop in beam
Extreme value 987,29 kN/m/m (Phase: 9)

8.8.12. Anchors

Table [13] Anchors phase no: 9

Anchor no.	Node	x-coord. [m]	y-coord. [m]	F [kN]	Fmax,comp [kN]	Fmax,tens [kN]	EA [kN]	Rotation [°]	Le [m]
1	1816 1874	-5,500 -5,500	-1,500 1,000	-27,703	1E15	1E15	1788000,00	N/A	2,500
2	1395 1822	-5,500 -5,500	-12,000 -2,500	0,000	1E15	1E15	1788000,00	N/A	9,500
3	1842 2223	0,000 9,500	0,800 0,800	108,631	1E15	1E15	127500,00	N/A	9,500

9. Results for phase 10

9.9. Deformations

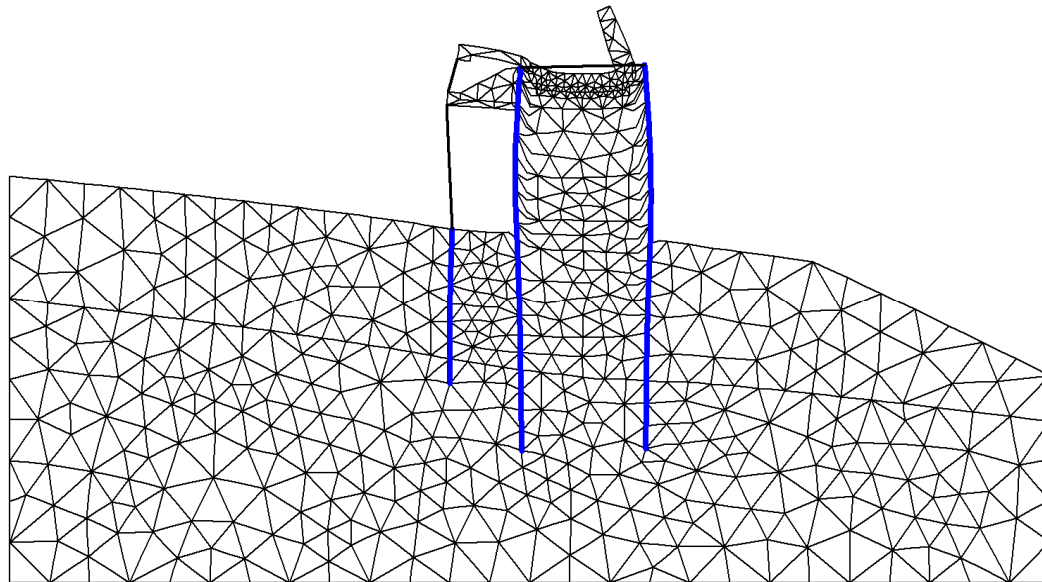


Fig. 17 Plot of deformed mesh
- Step no: 263 - (Phase: 10)

9.9.13. Plot of horizontal displacements

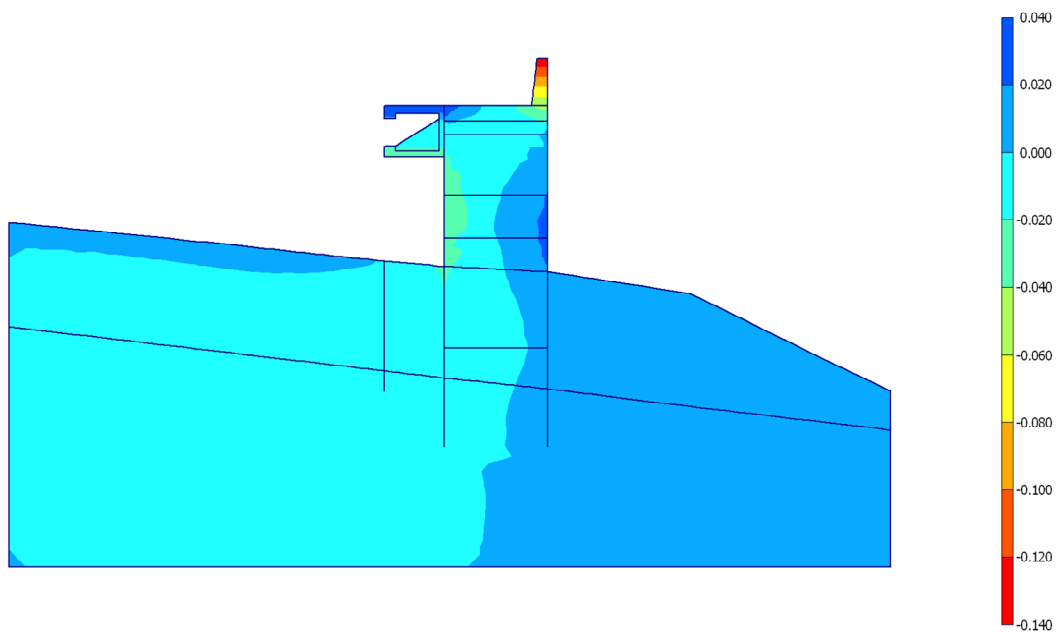


Fig. 18 Plot of horizontal displacements (shadings)
- Step no: 263 - (Phase: 10)

9.10. Structures

9.10.14. Beams

9.10.14.5. Beams

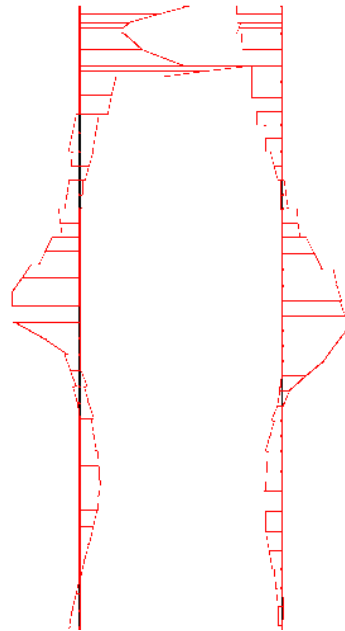


Fig. 19 Shear forces envelop in beam
 Extreme value -381,22 kN/m (Phase: 10)

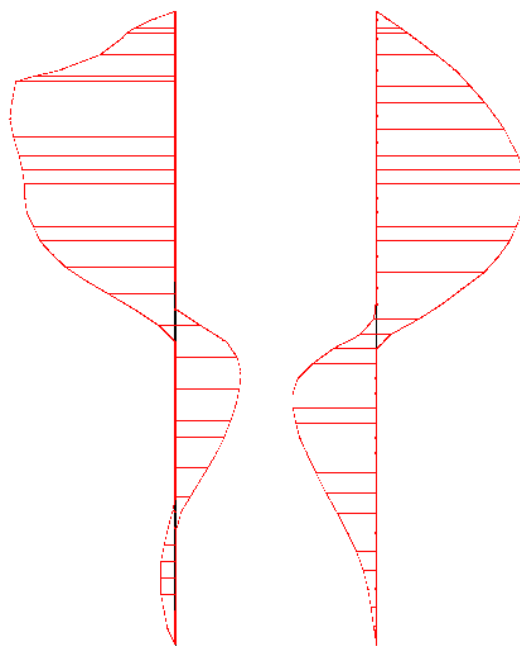


Fig. 20 Bending moment envelop in beam
 Extreme value 564,18 kN/m/m (Phase: 10)

9.10.15. Anchors

Table [14] Anchors phase no: 10

Anchor no.	Node	x-coord. [m]	y-coord. [m]	F [kN]	Fmax,comp [kN]	Fmax,tens [kN]	EA [kN]	Rotation [°]	Le [m]
1	1816 1874	-5,500 -5,500	-1,500 1,000	-240,472	1E15	1E15	1788000,00	N/A	2,500
2	1395 1822	-5,500 -5,500	-12,000 -2,500	-352,113	1E15	1E15	1788000,00	N/A	9,500
3	1842 2223	0,000 9,500	0,800 0,800	109,057	1E15	1E15	127500,00	N/A	9,500

10. Results for phase 11

10.11. Deformations

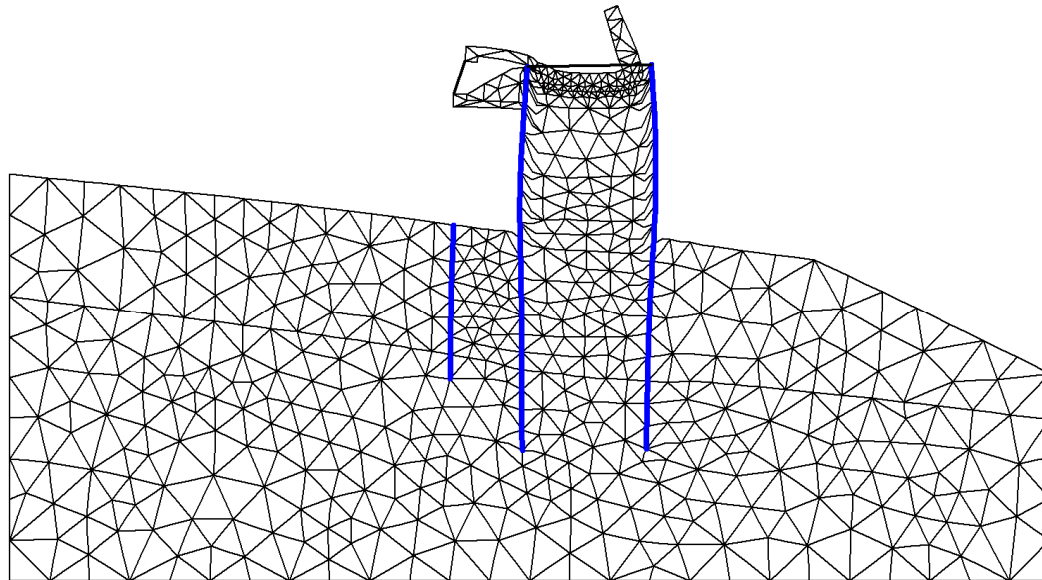


Fig. 21 Plot of deformed mesh
- Step no: 275 - (Phase: 11)

10.11.16. Plot of horizontal displacements

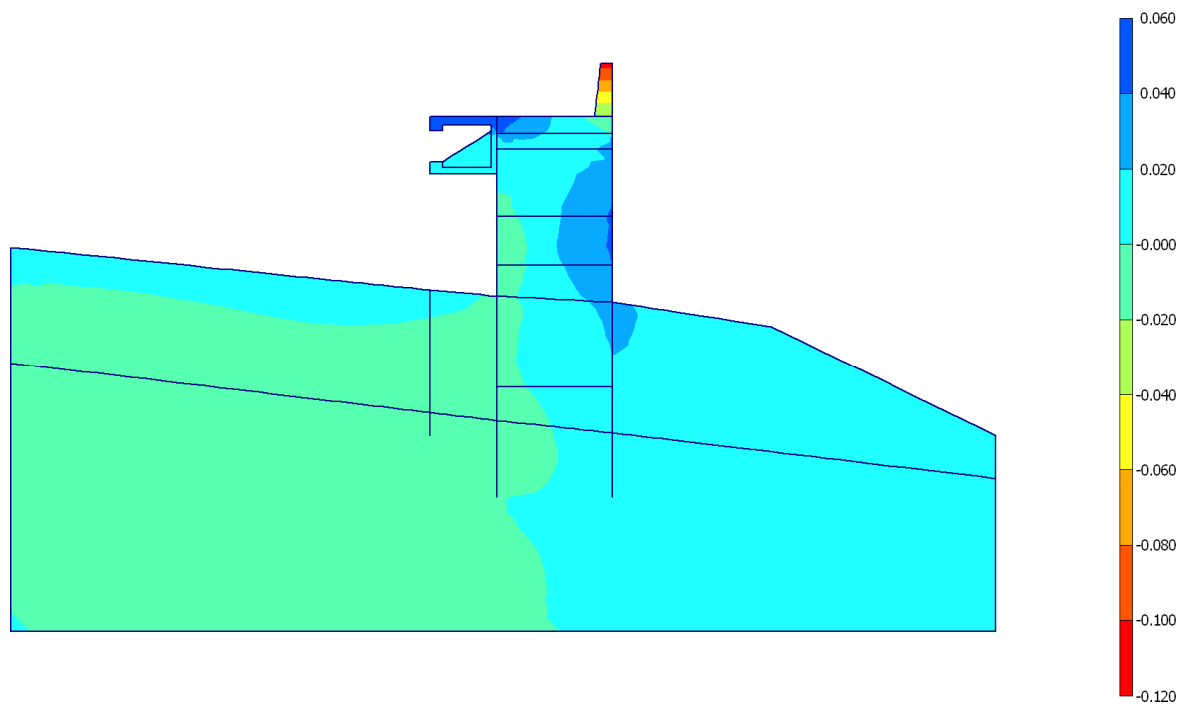


Fig. 22 Plot of horizontal displacements (shadings)

- Step no: 275 - (Phase: 11)

10.12. Structures

10.12.17. Beams

10.12.17.6. Beams

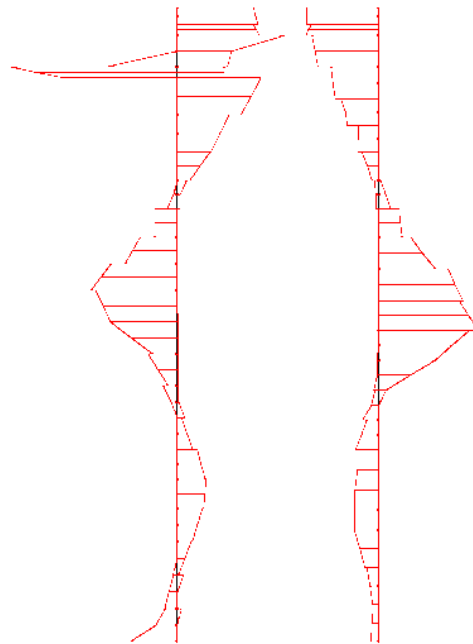


Fig. 23 Shear forces envelop in beam
 Extreme value 276,86 kN/m (Phase: 11)

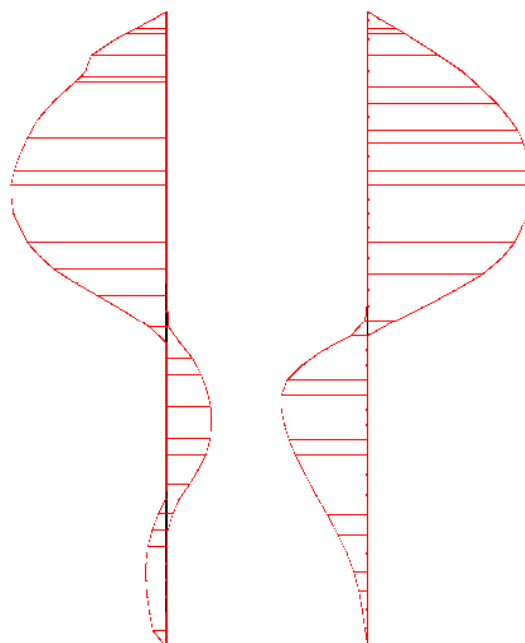


Fig. 24 Bending moment envelop in beam
 Extreme value 548,51 kN/m/m (Phase: 11)

10.12.18. Anchors

Table [15] Anchors phase no: 11

Anchor no.	Node	x-coord. [m]	y-coord. [m]	F [kN]	Fmax,comp [kN]	Fmax,tens [kN]	EA [kN]	Rotation [°]	Le [m]
1	1816 1874	-5,500 -5,500	-1,500 1,000	-2,805	1E15	1E15	1788000,00	N/A	2,500
2	1395 1822	-5,500 -5,500	-12,000 -2,500	0,000	1E15	1E15	1788000,00	N/A	9,500
3	1842 2223	0,000 9,500	0,800 0,800	104,460	1E15	1E15	127500,00	N/A	9,500

11. Results for phase 13

11.13. Deformations

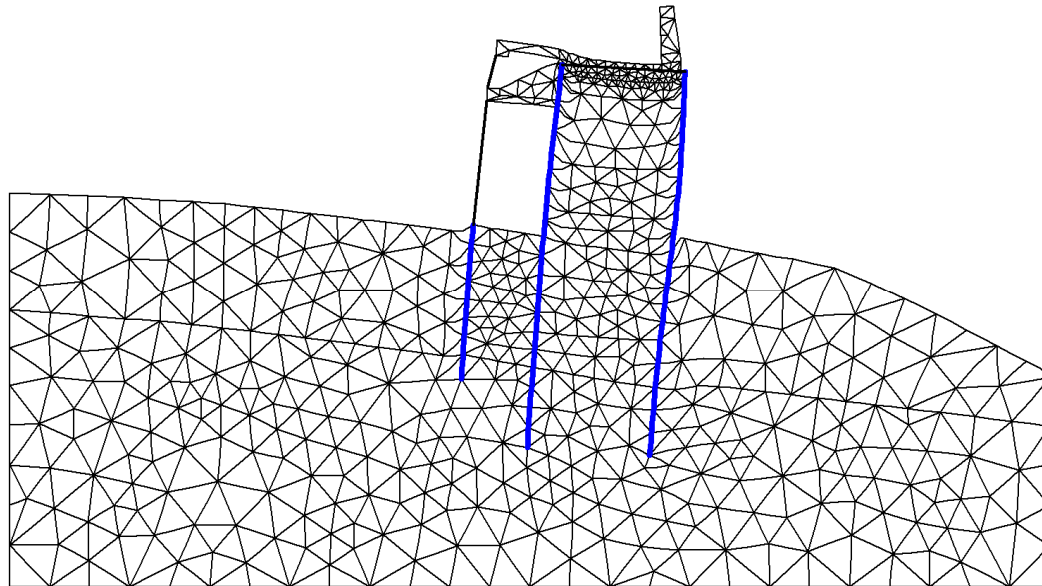


Fig. 25 Plot of deformed mesh
- Step no: 351 - (Phase: 13)

11.13.19. Plot of horizontal displacements

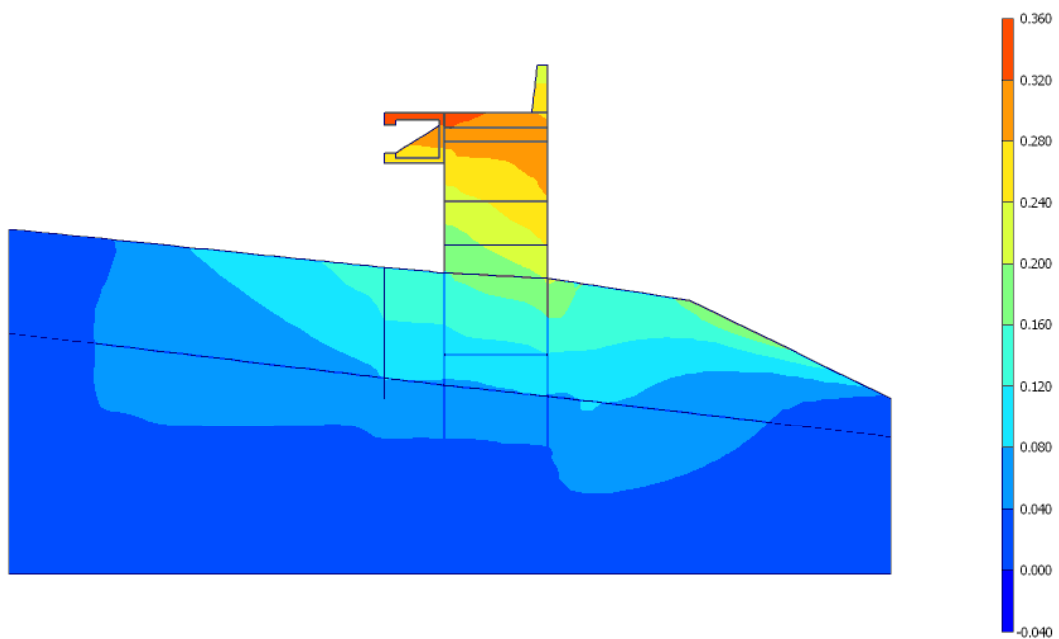


Fig. 26 Plot of horizontal displacements (shadings)
- Step no: 351 - (Phase: 13)

11.14. Structures

11.14.20. Beams

11.14.20.7. Beams

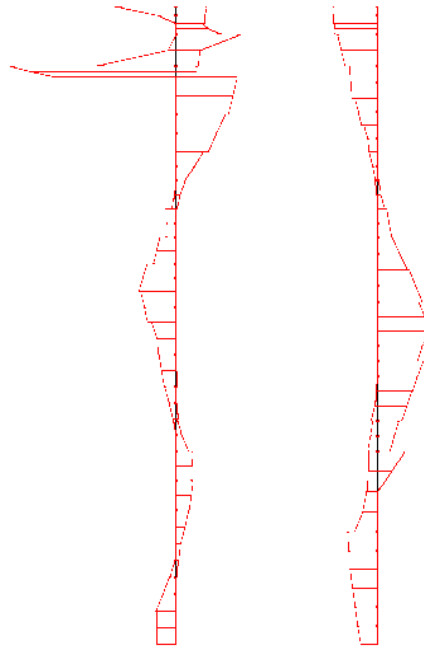


Fig. 27 Shear forces envelop in beam
Extreme value 625,02 kN/m (Phase: 13)

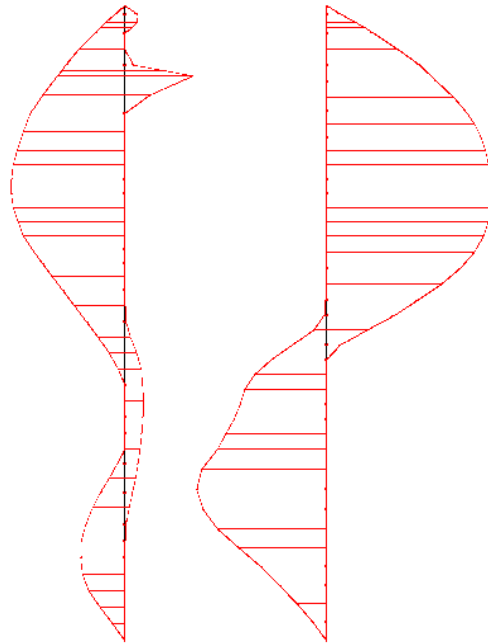


Fig. 28 Bending moment envelop in beam
 Extreme value 752,33 kN/m/m (Phase: 13)

11.14.21. Anchors

Table [16] Anchors phase no: 13

Anchor no.	Node	x-coord. [m]	y-coord. [m]	F [kN]	Fmax,comp [kN]	Fmax,tens [kN]	EA [kN]	Rotation [°]	Le [m]
1	1816 1874	-5,500 -5,500	-1,500 1,000	68,329	1E15	1E15	1788000,00	N/A	2,500
2	1395 1822	-5,500 -5,500	-12,000 -2,500	127,480	1E15	1E15	1788000,00	N/A	9,500
3	1842 2223	0,000 9,500	0,800 0,800	105,376	1E15	1E15	127500,00	N/A	9,500

12. Results for phase 14

12.15. Deformations

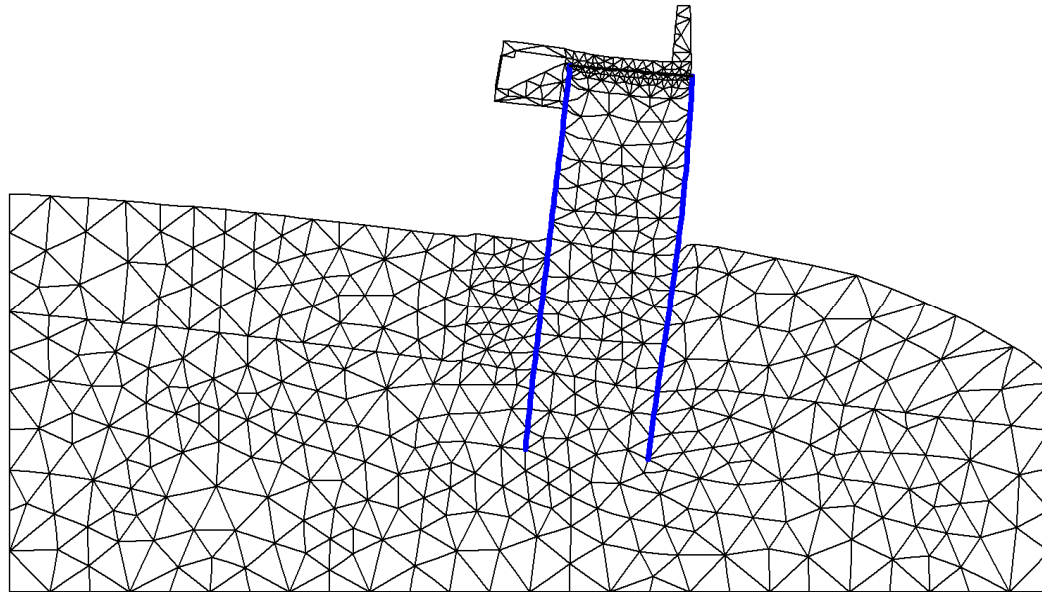


Fig. 29 Plot of deformed mesh
- Step no: 370 - (Phase: 14)

12.15.22. Plot of horizontal displacements

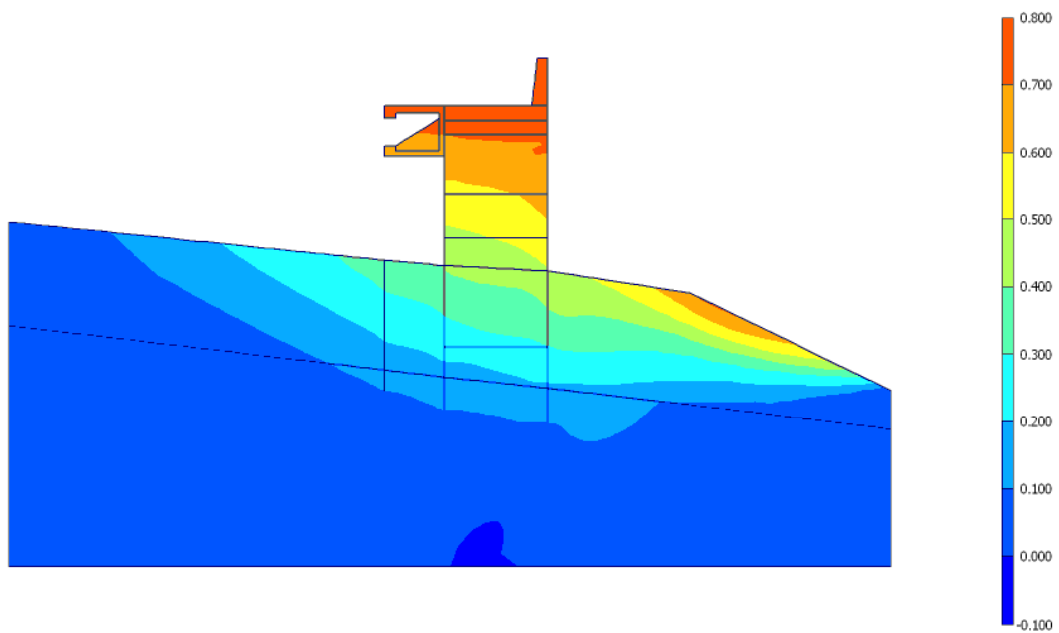


Fig. 30 Plot of horizontal displacements (shadings)
- Step no: 370 - (Phase: 14)

12.16. Structures

12.16.23. Beams

12.16.23.8. Beams

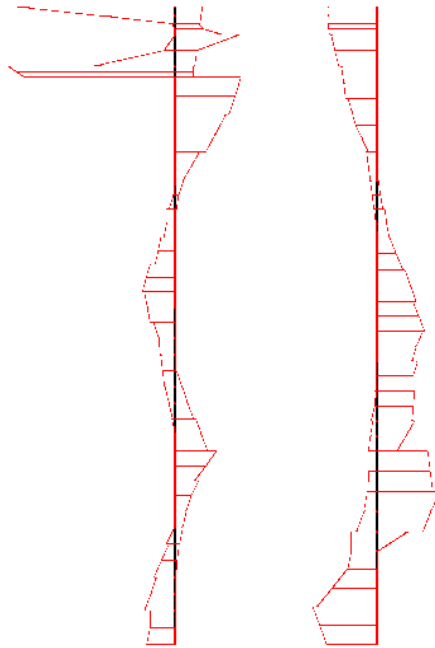


Fig. 31 Shear forces envelop in beam
Extreme value 711,17 kN/m (Phase: 14)

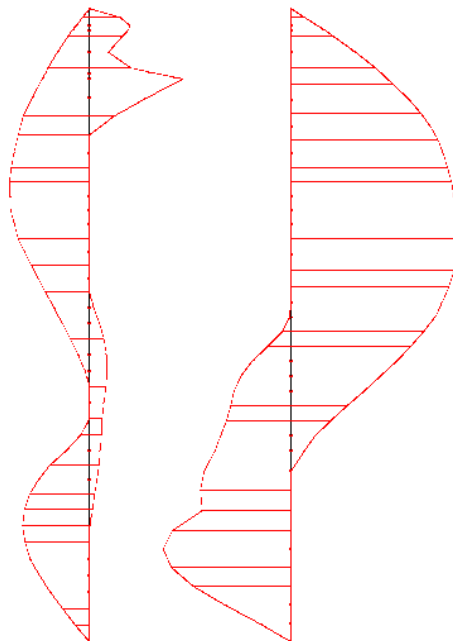


Fig. 32 Bending moment envelop in beam
 Extreme value $1,07 \cdot 10^3$ kN/m/m (Phase: 14)

12.16.24. Anchors

Table [17] Anchors phase no: 14

Anchor no.	Node	x-coord. [m]	y-coord. [m]	F [kN]	Fmax,comp [kN]	Fmax,tens [kN]	EA [kN]	Rotation [°]	Le [m]
1	1816	-5,500	-1,500	-63,651	1E15	1E15	1788000,00	N/A	2,500
	1874	-5,500	1,000						
2	1395	-5,500	-12,000	0,000	1E15	1E15	1788000,00	N/A	9,500
	1822	-5,500	-2,500						
3	1842	0,000	0,800	112,123	1E15	1E15	127500,00	N/A	9,500
	2223	9,500	0,800						

Beams

Table of beam force envelops phase no: 14 -- Sea side beam

Node no.	x-coord. [m]	y-coord. [m]	N _{min} [kN/m]	N _{max} [kN/m]	Q _{min} [kN/m]	Q _{max} [kN/m]	M _{min} [kNm/m]	M _{max} [kNm/m]
1842	0,000	0,800	-188,883	768,732	-115,241	676,573	0,000	0,000
1843	0,000	0,400	-195,987	759,353	-109,339	323,437	-44,916	200,002
1929	0,000	0,000	-203,757	749,974	-105,911	0,013	-87,471	258,749
1929	0,000	0,000	-211,176	631,250	-99,767	13,310	-87,471	258,749
1928	0,000	-0,250	-217,996	506,917	-121,380	0,043	-112,166	248,465
1926	0,000	-0,500	-227,663	382,584	-204,478	0,043	-136,643	210,957
1926	0,000	-0,500	-243,435	206,661	-271,873	0,043	-136,643	210,957
1925	0,000	-1,250	-310,241	33,498	-90,920	48,388	-208,245	123,101
1923	0,000	-2,000	-424,429	0,000	-83,830	355,000	-270,151	267,340
1923	0,000	-2,000	-347,940	0,000	-79,200	711,172	-270,151	267,340
1792	0,000	-2,250	-304,849	0,000	-78,598	675,659	-286,373	440,419
1796	0,000	-2,500	-297,244	8,575	-77,996	642,346	-305,947	605,170
1796	0,000	-2,500	-697,711	0,000	-281,464	0,043	-305,947	605,170
1789	0,000	-3,375	-694,622	0,000	-255,095	0,043	-371,090	370,426
1788	0,000	-4,250	-691,533	0,000	-228,726	0,043	-428,540	158,754
1788	0,000	-4,250	-710,751	0,000	-215,698	0,043	-428,540	158,754
1763	0,000	-5,125	-696,582	0,000	-173,122	0,043	-461,575	0,230
1761	0,000	-6,000	-682,413	0,000	-130,545	0,043	-488,537	0,268
1761	0,000	-6,000	-677,788	0,499	-102,523	0,043	-488,537	0,268
1753	0,000	-6,667	-654,645	0,000	-67,932	0,043	-505,319	0,296
1751	0,000	-7,333	-631,502	0,000	-33,340	0,043	-515,057	0,325
1751	0,000	-7,333	-631,303	0,000	-34,560	0,043	-515,057	0,325
1724	0,000	-8,000	-610,764	0,000	-14,641	8,684	-514,364	0,353
1722	0,000	-8,667	-594,287	0,000	-4,668	27,433	-507,079	0,382
1722	0,000	-8,667	-603,892	0,000	0,000	36,786	-507,079	0,382
1693	0,000	-9,333	-578,768	0,000	0,000	37,874	-483,873	0,411
1691	0,000	-10,000	-553,644	0,000	0,000	49,613	-461,277	0,439
1691	0,000	-10,000	-569,852	0,000	0,000	61,961	-461,277	0,439
1682	0,000	-10,625	-560,193	0,000	0,000	73,543	-421,103	0,466
1681	0,000	-11,250	-558,648	0,000	0,000	85,245	-374,407	0,493
1681	0,000	-11,250	-581,949	0,000	0,000	108,614	-374,407	0,493
1632	0,000	-11,875	-579,898	0,000	0,000	124,412	-329,410	0,520
1630	0,000	-12,500	-577,846	0,000	0,000	140,211	-283,920	1,698
1630	0,000	-12,500	-547,793	0,000	-0,026	132,120	-283,920	1,698
1620	0,000	-13,250	-569,523	0,000	-0,252	119,272	-229,397	30,432
1619	0,000	-14,000	-591,253	0,000	-2,153	106,538	-174,192	65,503
1619	0,000	-14,000	-579,015	0,000	-1,868	92,739	-174,192	65,503
1561	0,000	-14,750	-564,288	0,000	-1,817	70,277	-121,536	91,956
1559	0,000	-15,500	-549,560	0,000	-2,958	65,317	-71,796	109,707
1559	0,000	-15,500	-551,708	0,000	-3,295	62,994	-71,796	109,707
1557	0,000	-16,250	-554,802	0,000	-6,390	54,402	-28,249	113,759
1556	0,000	-17,000	-557,896	0,000	-29,974	46,021	-0,308	105,570
1556	0,000	-17,000	-554,168	0,523	-29,905	41,955	-0,308	105,570
1453	0,000	-17,750	-544,348	12,842	-53,767	26,447	-0,382	92,890
1451	0,000	-18,500	-534,528	25,161	-77,628	11,080	-0,382	81,547
1451	0,000	-18,500	-542,324	1,803	-89,889	12,869	-0,382	81,547
1393	0,000	-19,250	-531,783	13,557	-114,021	0,226	-56,994	76,563
1391	0,000	-20,000	-521,243	25,310	-138,153	0,356	-151,559	68,731
1391	0,000	-20,000	-526,682	0,000	-176,045	0,356	-151,559	68,731
1333	0,000	-20,688	-519,560	30,727	-128,659	0,420	-256,301	59,984
1332	0,000	-21,375	-512,438	78,707	-81,274	0,532	-328,466	49,097
1332	0,000	-21,375	-516,941	32,956	-100,928	0,553	-328,466	49,097
1213	0,000	-22,063	-511,213	53,409	-67,401	0,452	-385,560	34,465
1211	0,000	-22,750	-505,485	73,861	-49,086	0,362	-418,066	19,984



Node no.	x-coord. [m]	y-coord. [m]	N _{min} [kN/m]	N _{max} [kN/m]	Q _{min} [kN/m]	Q _{max} [kN/m]	M _{min} [kNm/m]	M _{max} [kNm/m]
1211	0,000	-22,750	-507,119	59,307	-48,446	0,290	-418,066	19,984
1090	0,000	-23,531	-489,184	77,284	-32,991	2,117	-430,240	5,176
1088	0,000	-24,313	-471,250	95,262	-17,573	37,517	-414,757	3,312
1088	0,000	-24,313	-470,164	95,845	-17,288	27,141	-414,757	3,312
1027	0,000	-25,094	-438,706	108,034	-8,567	59,003	-381,107	3,017
1026	0,000	-25,875	-407,247	120,223	-2,093	90,866	-322,564	2,389
1026	0,000	-25,875	-403,204	121,378	-1,954	80,798	-322,564	2,389
958	0,000	-26,656	-358,753	113,703	-1,178	105,813	-253,856	1,550
957	0,000	-27,438	-314,303	106,028	-1,388	130,828	-170,353	0,548
957	0,000	-27,438	-310,603	71,798	-1,904	104,215	-170,353	0,548
852	0,000	-28,219	-269,793	77,373	-0,351	109,026	-89,362	0,000
853	0,000	-29,000	-228,983	82,949	0,000	120,165	0,000	0,000
Max:			-188,883	768,732	0,000	711,172	0,000	605,170
Min:			-710,751	0,000	-281,464	0,000	-515,057	0,000

Table of beam force envelops phase no: 14 – port side beam

Node no.	x-coord. [m]	y-coord. [m]	N _{min} [kN/m]	N _{max} [kN/m]	Q _{min} [kN/m]	Q _{max} [kN/m]	M _{min} [kNm/m]	M _{max} [kNm/m]
2223	9,500	0,800	-423,664	0,199	-0,013	212,397	0,000	0,000
2222	9,500	0,400	-424,495	0,000	-0,013	211,697	-0,005	84,819
2220	9,500	0,000	-425,325	0,000	-0,013	210,997	-0,010	169,358
2220	9,500	0,000	-427,100	0,000	0,000	210,009	-0,010	169,358
2158	9,500	-0,250	-420,923	0,000	0,000	208,299	-0,001	221,646
2156	9,500	-0,500	-414,745	4,668	0,000	206,588	0,000	273,507
2156	9,500	-0,500	-431,861	0,000	0,000	197,737	0,000	273,507
2128	9,500	-1,250	-440,555	0,000	0,000	181,598	0,000	415,757
2126	9,500	-2,000	-449,248	0,000	0,000	165,458	0,000	545,903
2126	9,500	-2,000	-463,467	0,000	0,000	153,908	0,000	545,903
2081	9,500	-2,750	-460,919	0,000	0,000	144,716	0,000	657,887
2079	9,500	-3,500	-458,370	0,000	0,000	135,524	0,000	762,977
2079	9,500	-3,500	-469,305	0,000	0,000	125,169	0,000	762,977
2052	9,500	-4,125	-476,939	0,000	0,000	109,206	0,000	836,219
2050	9,500	-4,750	-484,573	0,000	0,000	93,244	0,000	899,485
2050	9,500	-4,750	-470,990	0,000	0,000	92,289	0,000	899,485
1987	9,500	-5,375	-493,823	0,000	0,000	65,410	0,000	948,765
1985	9,500	-6,000	-516,655	0,000	0,000	38,530	0,000	981,247
1985	9,500	-6,000	-497,055	0,454	0,000	45,765	0,000	981,247
1970	9,500	-6,667	-503,561	0,000	0,000	38,715	0,000	1009,407
1968	9,500	-7,333	-510,068	0,000	0,000	31,666	0,000	1032,867
1968	9,500	-7,333	-504,522	0,000	-3,232	30,361	0,000	1032,867
1782	9,500	-8,000	-505,500	0,000	-11,272	22,663	0,000	1050,542
1780	9,500	-8,667	-506,479	0,000	-23,791	14,965	0,000	1063,084
1780	9,500	-8,667	-512,857	0,000	-32,619	13,279	0,000	1063,084
1756	9,500	-9,333	-506,970	0,000	-40,476	6,785	0,000	1069,772
1754	9,500	-10,000	-501,083	0,000	-51,086	0,290	0,000	1072,131
1754	9,500	-10,000	-502,026	0,000	-53,713	0,813	0,000	1072,131
1734	9,500	-10,750	-538,786	0,000	-81,221	0,039	0,000	1066,538
1733	9,500	-11,500	-575,546	0,000	-110,278	0,039	0,000	1048,541
1733	9,500	-11,500	-571,188	0,000	-117,907	0,039	0,000	1048,541
1700	9,500	-12,250	-606,283	0,000	-141,919	0,039	0,000	1017,751
1698	9,500	-13,000	-642,743	0,000	-165,998	0,039	-4,520	973,420
1698	9,500	-13,000	-602,698	0,000	-151,781	0,000	-4,520	973,420
1671	9,500	-13,700	-665,140	0,000	-175,864	0,000	-10,944	925,409
1670	9,500	-14,400	-729,872	0,000	-200,014	1,503	-56,970	855,878
1670	9,500	-14,400	-723,876	0,000	-194,197	1,199	-56,970	855,878
1657	9,500	-15,100	-756,921	0,000	-167,564	1,259	-154,307	770,467



Node no.	x-coord. [m]	y-coord. [m]	N _{min} [kN/m]	N _{max} [kN/m]	Q _{min} [kN/m]	Q _{max} [kN/m]	M _{min} [kNm/m]	M _{max} [kNm/m]
1656	9,500	-15,800	-789,965	0,000	-148,071	2,774	-251,127	677,610
1656	9,500	-15,800	-816,084	0,000	-170,665	2,699	-251,127	677,610
1606	9,500	-16,500	-856,532	0,000	-151,468	2,594	-326,313	572,621
1604	9,500	-17,200	-896,979	0,000	-154,433	7,859	-371,836	465,556
1604	9,500	-17,200	-900,050	0,000	-157,405	6,064	-371,836	465,556
1584	9,500	-17,900	-961,940	0,000	-152,437	12,695	-389,412	357,111
1583	9,500	-18,600	-1023,830	0,000	-147,470	27,151	-418,326	252,143
1583	9,500	-18,600	-1031,734	0,000	-158,952	19,991	-418,326	252,143
1515	9,500	-19,300	-1091,113	0,000	-120,579	29,415	-456,568	154,308
1513	9,500	-20,000	-1150,492	0,000	-82,206	39,123	-492,906	83,333
1513	9,500	-20,000	-1282,407	0,000	-215,787	34,348	-492,906	83,333
1471	9,500	-20,940	-1291,118	0,000	-225,744	36,054	-563,948	0,062
1469	9,500	-21,880	-1299,829	0,000	-235,701	40,346	-587,341	0,042
1469	9,500	-21,880	-1322,448	0,000	-264,964	42,831	-587,341	0,042
1399	9,500	-22,820	-1296,622	0,000	-228,735	58,053	-572,995	0,028
1398	9,500	-23,759	-1270,795	0,000	-192,505	89,893	-770,945	0,018
1398	9,500	-23,759	-1237,236	0,000	-128,137	114,681	-770,945	0,018
1329	9,500	-24,633	-1170,129	0,000	-0,984	111,247	-827,334	0,012
1328	9,500	-25,506	-1103,022	0,000	-0,004	126,873	-772,663	0,007
1328	9,500	-25,506	-1100,012	0,000	-0,004	131,040	-772,663	0,007
1223	9,500	-26,380	-977,478	0,000	-0,003	195,722	-629,960	0,004
1221	9,500	-27,253	-854,944	0,000	-0,002	260,405	-430,760	0,002
1221	9,500	-27,253	-819,745	0,000	-0,002	275,557	-430,760	0,002
1158	9,500	-28,127	-741,132	0,000	-0,001	246,589	-202,730	0,001
1157	9,500	-29,000	-662,518	0,000	0,000	217,622	0,000	0,000
Max:			-414,745	4,668	0,000	275,557	0,000	1072,131
Min:			-1322,448	0,000	-264,964	0,000	-827,334	0,000

13. Results for phase 16

13.17. Deformations

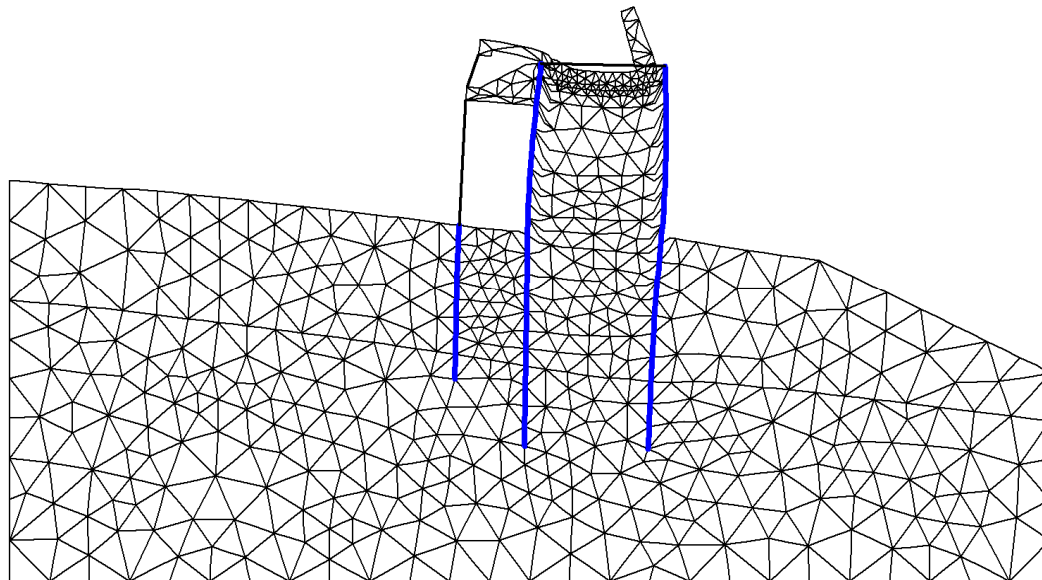


Fig. 33 Plot of deformed mesh
- Step no: 392 - (Phase: 16)

13.17.25. Plot of horizontal displacements

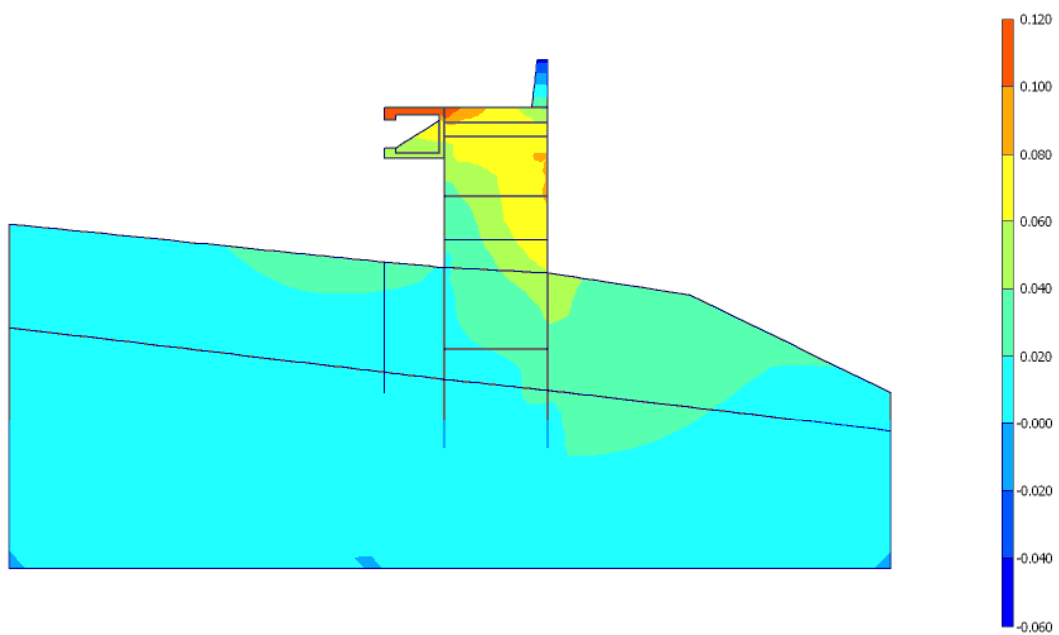


Fig. 34 Plot of horizontal displacements (shadings)

- Step no: 392 - (Phase: 16)

13.18. Structures

13.18.26. Beams

13.18.26.9. Beams

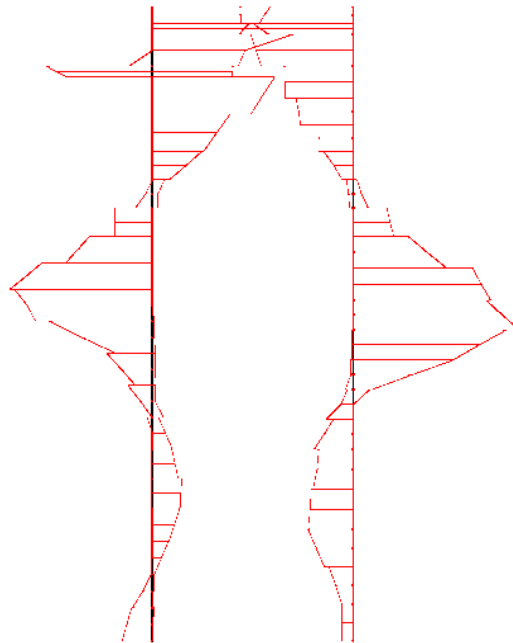


Fig. 35 Shear forces envelop in beam
 Extreme value -162,31 kN/m (Phase: 16)

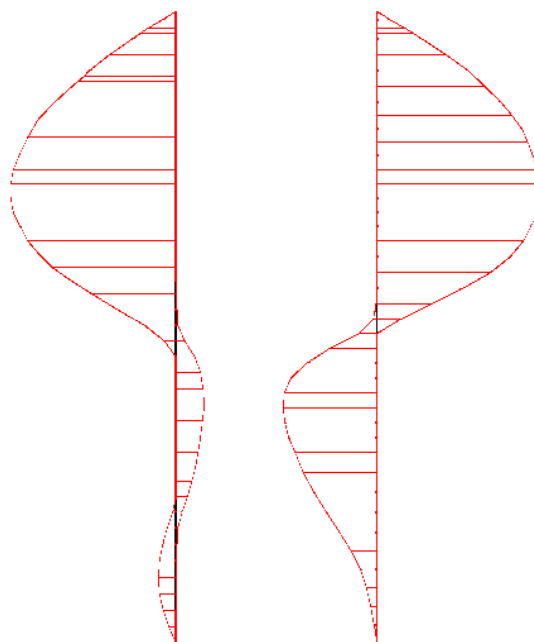


Fig. 36 Bending moment envelop in beam
 Extreme value 515,06 kN/m/m (Phase: 16)

13.18.27. Anchors

Table [18] Anchors phase no: 16

Anchor no.	Node	x-coord. [m]	y-coord. [m]	F [kN]	Fmax,comp [kN]	Fmax,tens [kN]	EA [kN]	Rotation [°]	Le [m]
1	1816	-5,500	-1,500	-19,593	1E15	1E15	1788000,00	N/A	2,500
	1874	-5,500	1,000						
2	1395	-5,500	-12,000	-39,381	1E15	1E15	1788000,00	N/A	9,500
	1822	-5,500	-2,500						
3	1842	0,000	0,800	104,522	1E15	1E15	127500,00	N/A	9,500
	2223	9,500	0,800						

14. Results for phase 17

14.19. Deformations

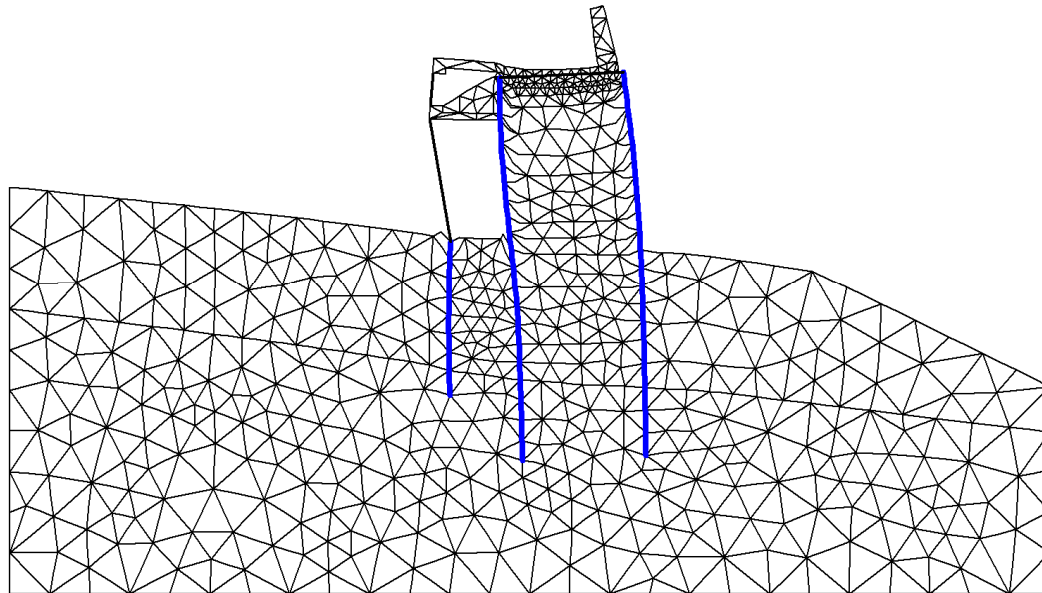


Fig. 37 Plot of deformed mesh
- Step no: 450 - (Phase: 17)

14.19.28. Plot of horizontal displacements

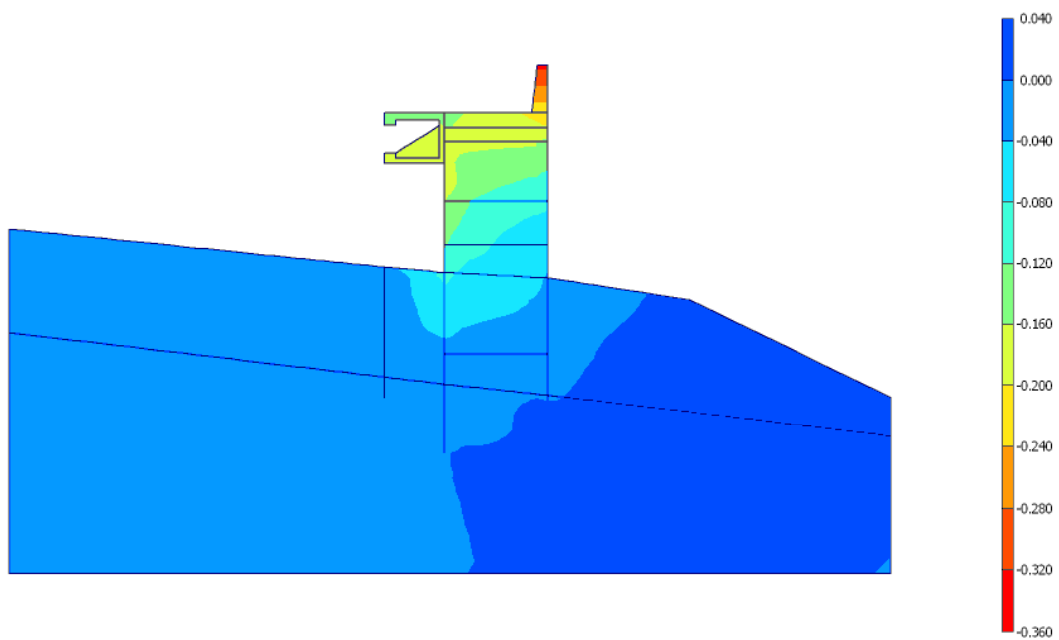


Fig. 38 Plot of horizontal displacements (shadings)
 - Step no: 450 - (Phase: 17)

14.20. Structures

14.20.29. Beams

14.20.29.10. Beams

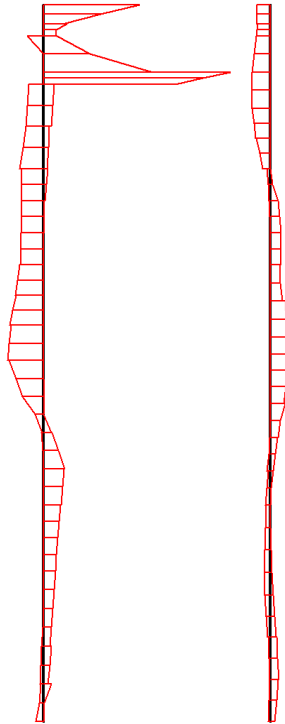


Fig. 39 Shear forces envelop in beam
 Extreme value $-1,46 \cdot 10^3$ kN/m (Phase: 17)

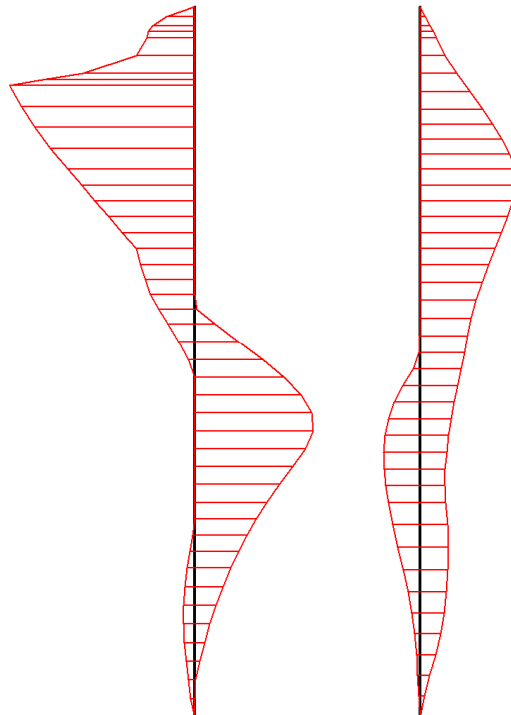


Fig. 40 Bending moment envelop in beam
 Extreme value $1,57 \cdot 10^3$ kN/m/m (Phase: 17)

14.20.30. Anchors

Table [19] Anchors phase no: 17

Anchor no.	Node	x-coord. [m]	y-coord. [m]	F [kN]	Fmax,comp [kN]	Fmax,tens [kN]	EA [kN]	Rotation [°]	Le [m]
1	1816 1874	-5,500 -5,500	-1,500 1,000	-488,931	1E15	1E15	1788000,00	N/A	2,500
2	1395 1822	-5,500 -5,500	-12,000 -2,500	-759,528	1E15	1E15	1788000,00	N/A	9,500
3	1842 2223	0,000 9,500	0,800 0,800	112,200	1E15	1E15	127500,00	N/A	9,500

15. Results for phase 18

15.21. Deformations

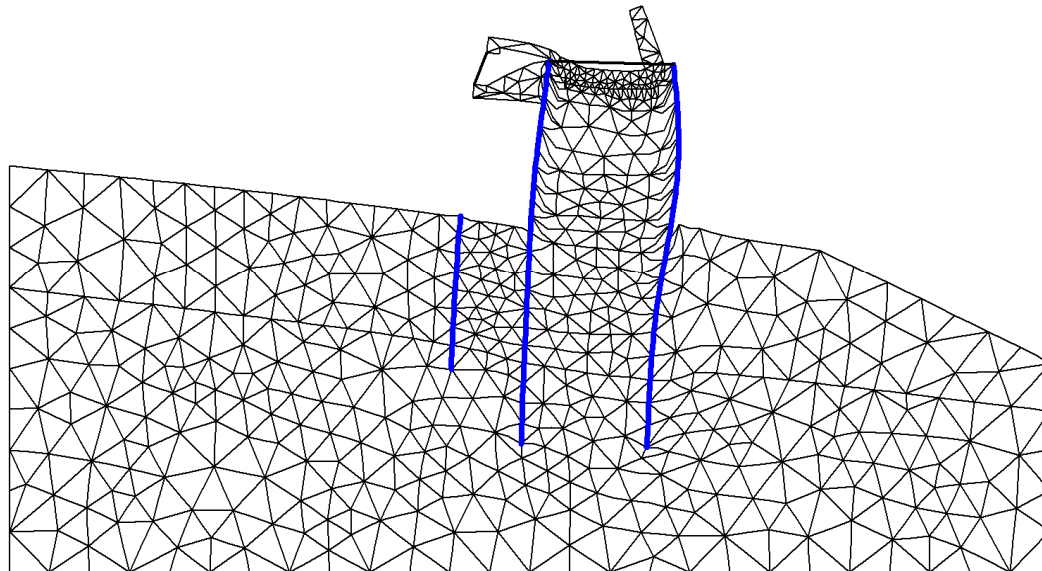


Fig. 41 Plot of deformed mesh
- Step no: 490 - (Phase: 18)

15.21.31. Plot of horizontal displacements

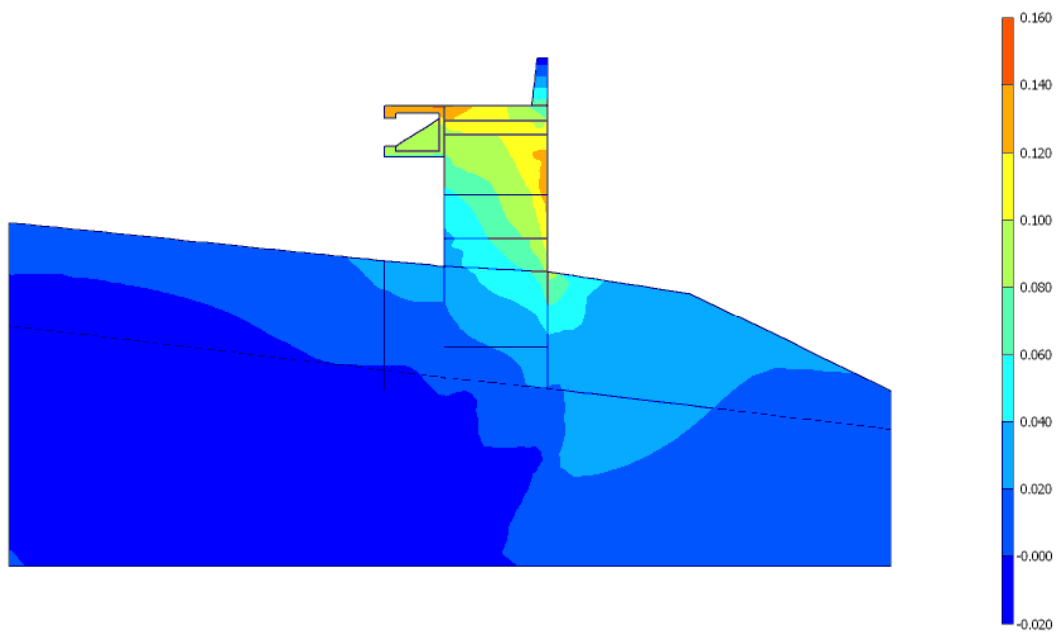


Fig. 42 Plot of horizontal displacements (shadings)

- Step no: 490 - (Phase: 18)

15.22. Structures

15.22.32. Beams

15.22.32.11. Beams

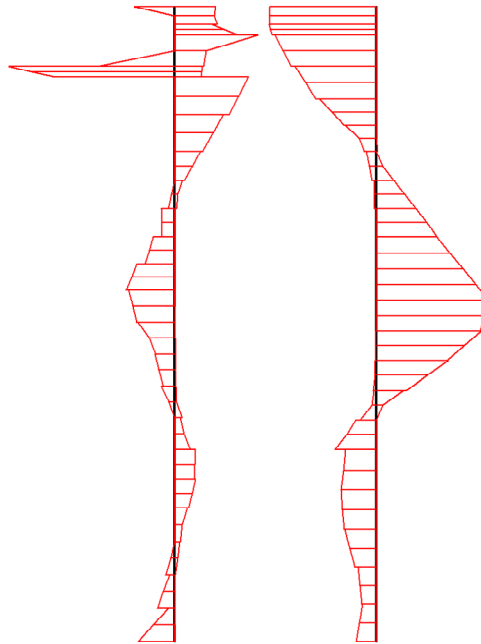


Fig. 43 Shear forces envelop in beam
Extreme value 478,78 kN/m (Phase: 18)

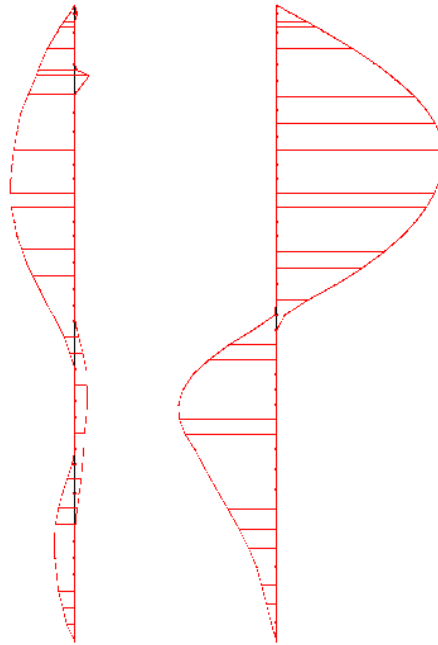


Fig. 44 Bending moment envelop in beam
 Extreme value $1,33 \cdot 10^3$ kN/m/m (Phase: 18)

15.22.33. Anchors

Table [20] Anchors phase no: 18

Anchor no.	Node	x-coord. [m]	y-coord. [m]	F [kN]	Fmax,comp [kN]	Fmax,tens [kN]	EA [kN]	Rotation [°]	Le [m]
1	1816 1874	-5,500 -5,500	-1,500 1,000	-34,311	1E15	1E15	1788000,00	N/A	2,500
2	1395 1822	-5,500 -5,500	-12,000 -2,500	0,000	1E15	1E15	1788000,00	N/A	9,500
3	1842 2223	0,000 9,500	0,800 0,800	109,020	1E15	1E15	127500,00	N/A	9,500

16. Results for phase 19

16.23. Deformations

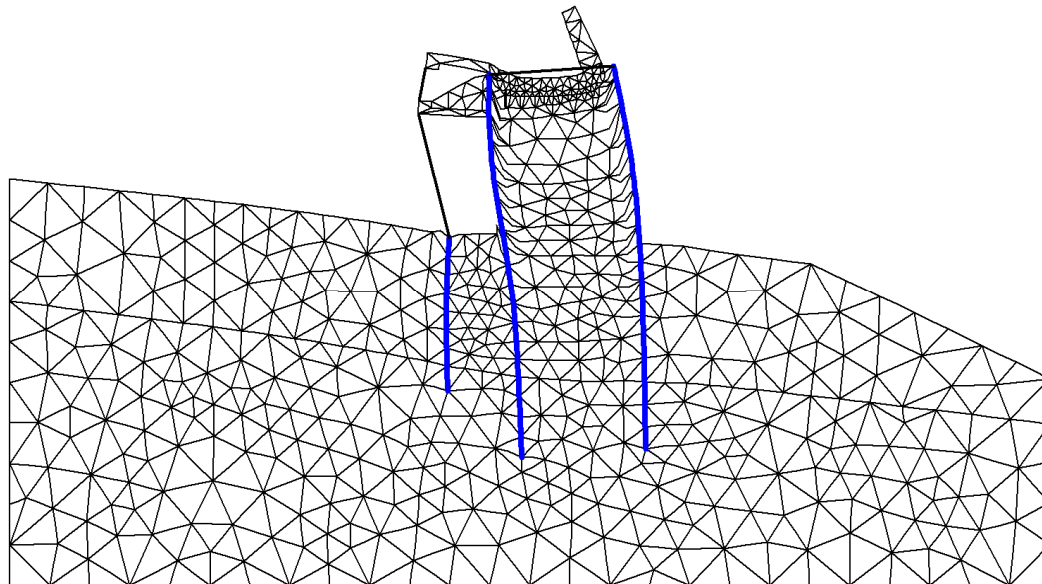


Fig. 45 Plot of deformed mesh
- Step no: 616 - (Phase: 19)

16.23.34. Plot of horizontal displacements

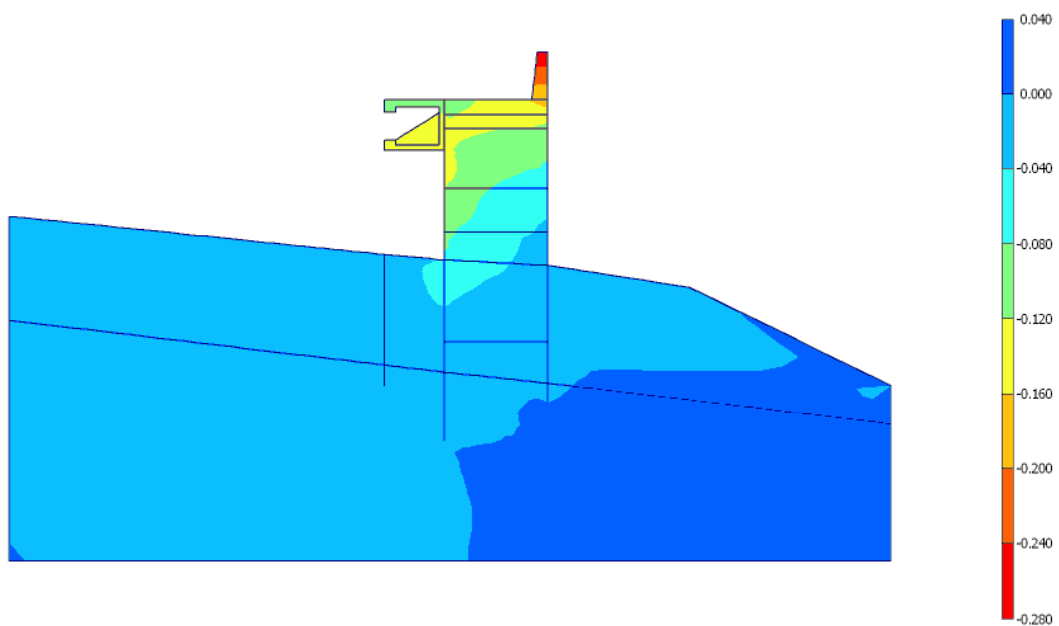


Fig. 46 Plot of horizontal displacements (shadings)
- Step no: 616 - (Phase: 19)

16.24. Structures

16.24.35. Beams

16.24.35.12. Beams

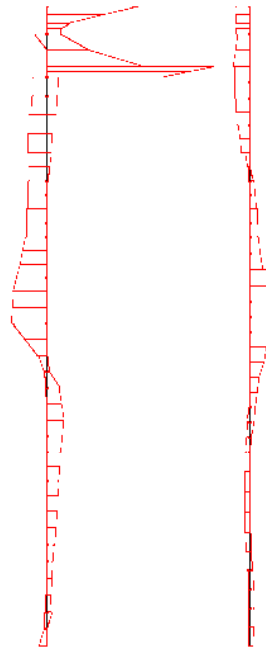


Fig. 47 Shear forces envelop in beam
Extreme value $-1,21 \cdot 10^3$ kN/m (Phase: 19)

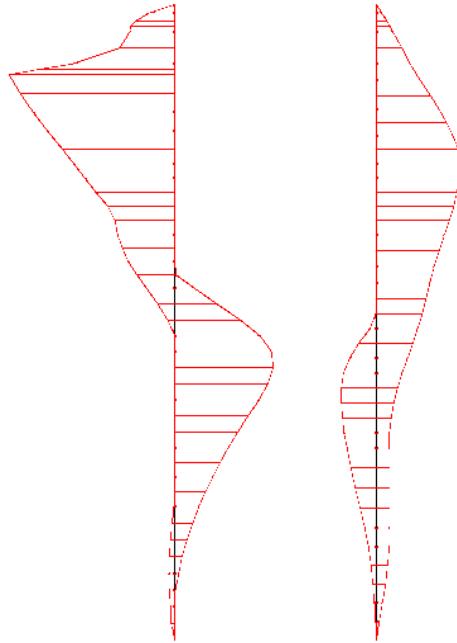


Fig. 48 Bending moment envelop in beam
 Extreme value $1,34 \cdot 10^3$ kN/m/m (Phase: 19)

16.24.36. Anchors

Table [21] Anchors phase no: 19

Anchor no.	Node	x-coord. [m]	y-coord. [m]	F [kN]	Fmax,comp [kN]	Fmax,tens [kN]	EA [kN]	Rotation [°]	Le [m]
1	1816 1874	-5,500 -5,500	-1,500 1,000	-419,964	1E15	1E15	1788000,00	N/A	2,500
2	1395 1822	-5,500 -5,500	-12,000 -2,500	-656,767	1E15	1E15	1788000,00	N/A	9,500
3	1842 2223	0,000 9,500	0,800 0,800	110,870	1E15	1E15	127500,00	N/A	9,500

17. Results for phase 20

17.25. Deformations

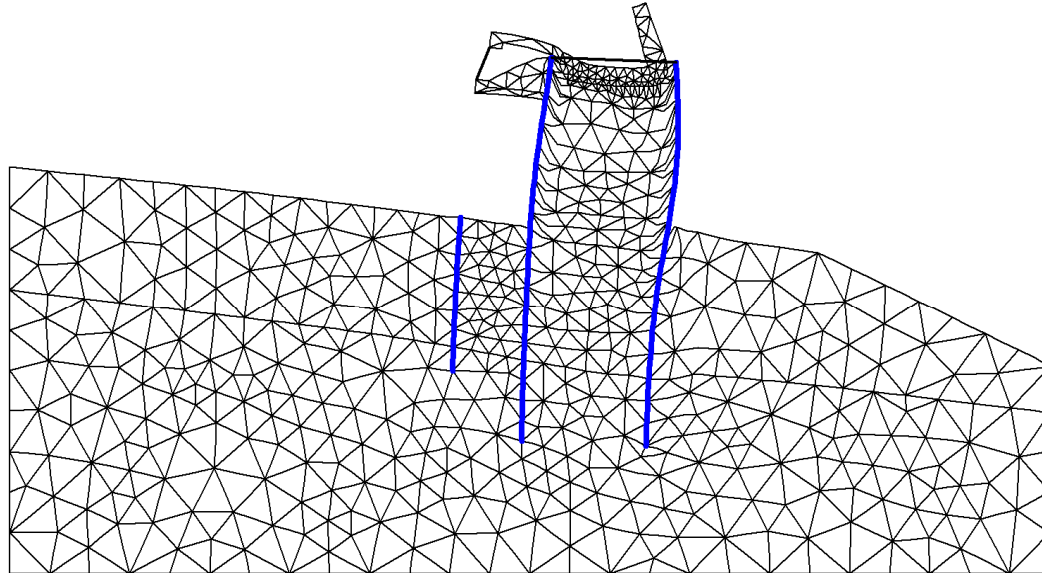


Fig. 49 Plot of deformed mesh
- Step no: 681 - (Phase: 20)

17.25.37. Plot of horizontal displacements

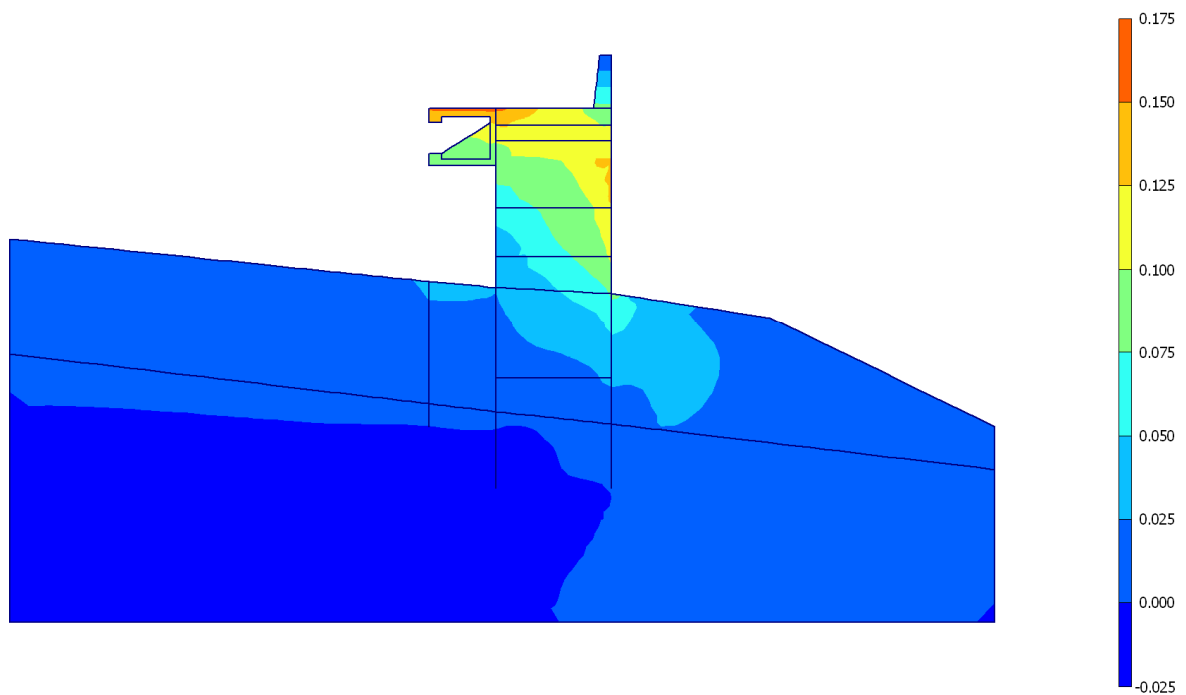


Fig. 50 Plot of horizontal displacements (shadings)
- Step no: 681 - (Phase: 20)

17.26. Structures

17.26.38. Beams

17.26.38.13. Beams

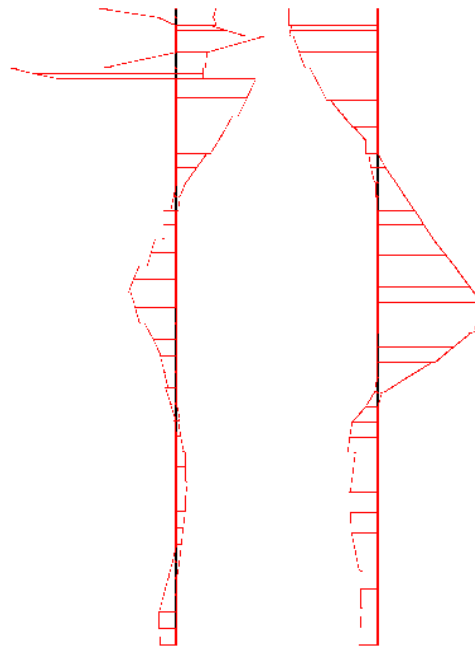


Fig. 51 Shear forces envelop in beam
 Extreme value 483,83 kN/m (Phase: 20)

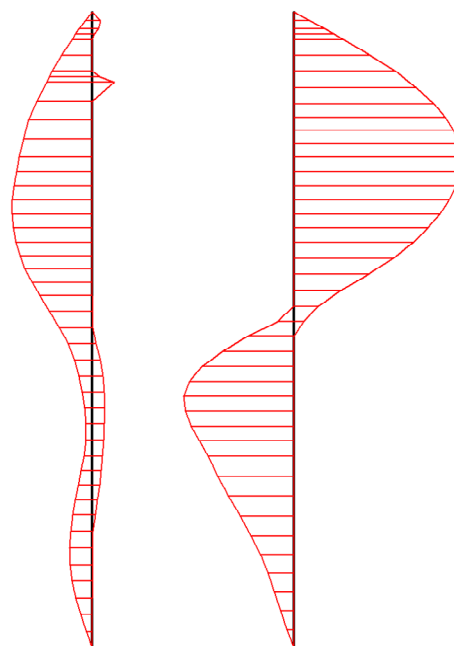


Fig. 52 Bending moment envelop in beam
 Extreme value $1,11 \cdot 10^3$ kN/m/m (Phase: 20)

17.26.39. Anchors

Table [22] Anchors phase no: 20

Anchor no.	Node	x-coord. [m]	y-coord. [m]	F [kN]	Fmax,comp [kN]	Fmax,tens [kN]	EA [kN]	Rotation [°]	Le [m]
1	1816 1874	-5,500 -5,500	-1,500 1,000	-38,110	1E15	1E15	1788000,00	N/A	2,500
2	1395 1822	-5,500 -5,500	-12,000 -2,500	0,000	1E15	1E15	1788000,00	N/A	9,500
3	1842 2223	0,000 9,500	0,800 0,800	109,944	1E15	1E15	127500,00	N/A	9,500