

DATA

GENERAL SETTINGS:

Units system:	KN, kN/m ² , m	Accounting for 2nd order moments:	no
Water weight:	10.000 kN/m ³	Definition of the project in:	elevation
Number of iterations per phase:	50		
Calculation step:	0.500		

CHARACTERISTICS OF SOIL LAYERS:

Layer	z [m]	zw [m]	γ [kN/m ³]	γd [kN/m ³]	φ [°]	c [kN/m ²]	dc [kN/m ²]	k0	kay	kpy	kd	kr	kac	kpc	kh [kN/m ³]	dkh [kN/m ³]
3AGP1	754.000	733.000	15.500	6.500	27.00	20.000	0.000	0.546	0.322	3.418	0.546	0.546	1.330	4.530	23000	0
3AR1	751.700	733.000	19.000	9.000	30.00	0.000	0.000	0.500	0.282	3.940	0.500	0.500	1.240	4.990	27142	0
3AG1	744.700	733.000	18.000	9.000	24.00	35.000	0.000	0.593	0.366	2.932	0.593	0.593	1.420	4.140	26998	0
4AG1	732.700	733.000	21.000	12.000	20.00	100.000	0.000	0.658	0.430	2.384	0.658	0.658	1.550	3.700	42000	0

WALL PROPERTIES:

Section	z0 [m]	EI [kNm ²]	L [m]	B _D
1. HZM 880 A - 12 / AZ 13-770 - D	754.000	451668	1.000	1.00

zf = 727.700 m

OPTIONS:

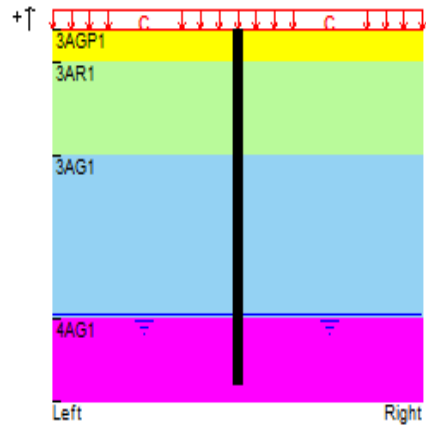
Caquot surcharge on the ground surface: 20.00 kN/m².

DATA

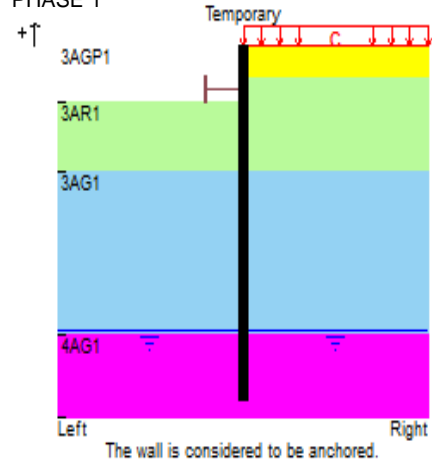
STRUT	Phase	za [m]	K [kN/m]
1	1	750.850	1.20E+04
2	2	746.850	1.20E+04
3	3	742.850	1.20E+04
4	4	738.850	1.20E+04
5	5	734.850	1.20E+04

STAGED CONSTRUCTION SYNTHESIS

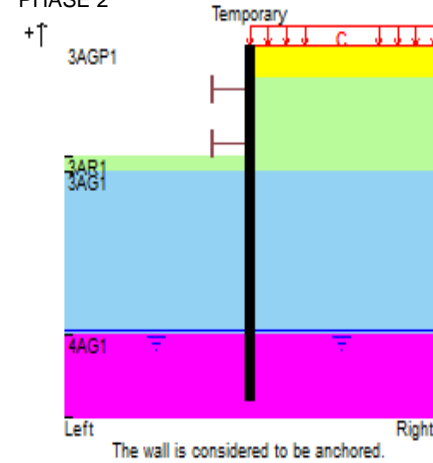
INITIAL PHASE



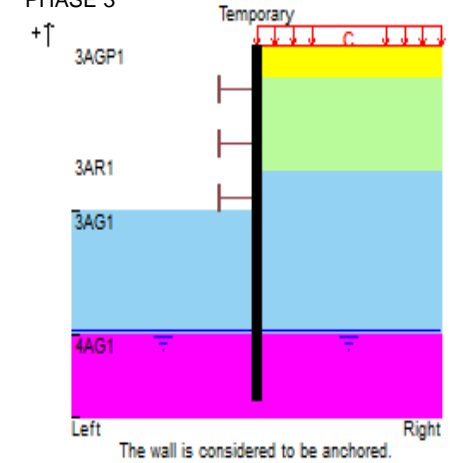
PHASE 1



PHASE 2



PHASE 3



- Caquot surcharge: q [kN/m²] = 20.00

- excavation (left): z_h [m] = 749.850
 z_w [m] = 733.000
 - installation of strut: n° 1
 z_a [m] = 750.850
 K [kN/m] = 12000

- excavation (left): z_h [m] = 745.850
 z_w [m] = 733.000
 - installation of strut: n° 2
 z_a [m] = 746.850
 K [kN/m] = 12000

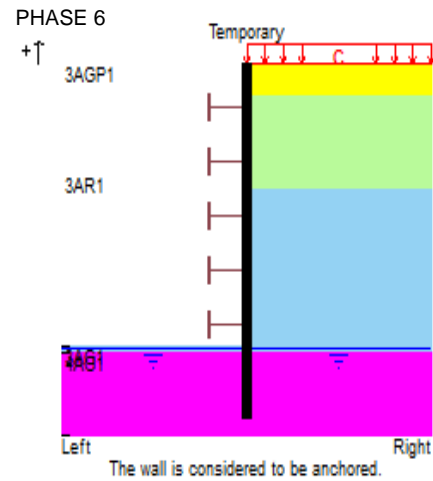
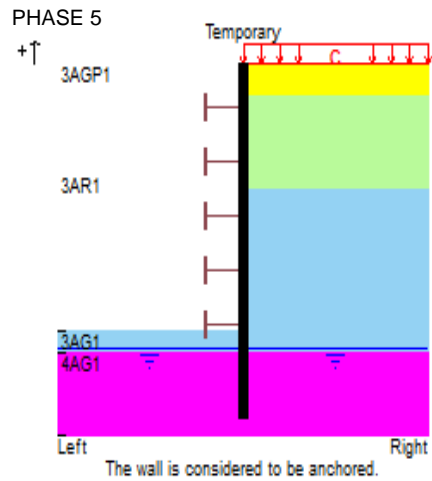
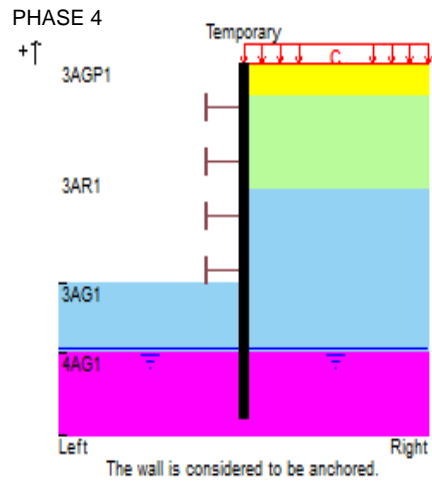
- excavation (left): z_h [m] = 741.850
 z_w [m] = 733.000
 - installation of strut: n° 3
 z_a [m] = 742.850
 K [kN/m] = 12000



Calculated by: **AMRetain**



STAGED CONSTRUCTION SYNTHESIS



- excavation (left): zh [m] = 737.850
 zw [m] = 733.000
 - installation of strut: n° 4
 za [m] = 738.850
 K [kN/m] = 12000

- excavation (left): zh [m] = 734.350
 zw [m] = 733.000
 - installation of strut: n° 5
 za [m] = 734.850
 K [kN/m] = 12000

- excavation (left): zh [m] = 733.150
 zw [m] = 733.000



Calculated by: **AMRetain**



RESULTS

PHASE 1

- excavation (left): zh [m] = 749.850 zw [m] = 733.000
 - installation of strut : n° 1 za[m] = 750.850 K [kN/m] = 12000

Calculation converged after 4 iterations.

Level [m]	Rotation [rad]	Displ. [mm]	Moment		Shear force		Soil status		Earth pressure		Water pressure		Vertical pressure		Limiting active pressure		Limiting passive		Diff. pressures	
			M.k [kNm]	M.d [kNm]	V.k [kN]	V.d [kN]	left	right	left [kN/m²]	right [kN/m²]	left [kN/m²]	right [kN/m²]	left [kN/m²]	right [kN/m²]	left [kN/m²]	right [kN/m²]	left [kN/m²]	right [kN/m²]	P.k [kN/m²]	P.d [kN/m²]
754.00	0.00031	-2.83	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00	158.96	0.00	-
753.54	0.00031	-2.69	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	27.13	0.00	0.00	0.00	183.33	0.00	-
753.08	0.00031	-2.55	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	34.26	0.00	0.00	0.00	207.70	0.00	-
752.62	0.00031	-2.40	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	41.39	0.00	0.00	0.00	232.07	0.00	-
752.16	0.00031	-2.26	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	48.52	0.00	0.00	0.00	256.44	0.00	-
751.70	0.00031	-2.12	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	55.65	0.00	0.00	0.00	280.81	0.00	-
751.70	0.00031	-2.12	0.00	-	0.00	-	excavation	active press.	0.00	15.69	0.00	0.00	0.00	55.65	0.00	15.69	0.00	219.26	15.69	-
751.28	0.00031	-1.99	-1.49	-	-7.15	-	excavation	active press.	0.00	17.97	0.00	0.00	0.00	63.73	0.00	17.97	0.00	251.08	17.97	-
750.85	0.00031	-1.86	-6.22	-	-15.27	-	excavation	active press.	0.00	20.25	0.00	0.00	0.00	71.80	0.00	20.25	0.00	282.89	20.25	-
750.85	0.00031	-1.86	-6.22	-	7.00	-	excavation	active press.	0.00	20.25	0.00	0.00	0.00	71.80	0.00	20.25	0.00	282.89	20.25	-
750.35	0.00030	-1.70	-5.36	-	-3.80	-	excavation	active press.	0.00	22.93	0.00	0.00	0.00	81.30	0.00	22.93	0.00	320.32	22.93	-
749.85	0.00029	-1.56	-10.24	-	-15.93	-	passive press.	active press.	0.00	25.61	0.00	0.00	0.00	90.80	0.00	25.61	0.00	357.75	25.61	-
749.35	0.00027	-1.41	-19.96	-	-20.04	-	passive press.	active press.	37.43	28.28	0.00	0.00	9.50	100.30	2.68	28.29	37.43	395.18	-9.15	-
748.85	0.00025	-1.28	-28.66	-	-14.41	-	elastic	active press.	44.34	30.96	0.00	0.00	19.00	109.80	5.36	30.96	74.86	432.61	-13.38	-
748.35	0.00021	-1.17	-34.24	-	-7.99	-	elastic	active press.	45.96	33.64	0.00	0.00	28.50	119.30	8.04	33.64	112.29	470.04	-12.32	-
747.85	0.00017	-1.07	-36.72	-	-1.97	-	elastic	active press.	48.08	36.32	0.00	0.00	38.00	128.80	10.72	36.32	149.72	507.47	-11.76	-
747.35	0.00013	-0.99	-36.36	-	3.12	-	elastic	elastic	50.75	42.15	0.00	0.00	47.50	138.30	13.40	39.00	187.15	544.90	-8.60	-
746.85	0.00009	-0.94	-33.86	-	6.65	-	elastic	elastic	53.96	48.44	0.00	0.00	57.00	147.80	16.07	41.68	224.58	582.33	-5.53	-
746.35	0.00006	-0.90	-29.93	-	8.90	-	elastic	elastic	57.68	54.22	0.00	0.00	66.50	157.30	18.75	44.36	262.01	619.76	-3.46	-
745.85	0.00003	-0.88	-25.10	-	10.33	-	elastic	elastic	61.84	59.56	0.00	0.00	76.00	166.80	21.43	47.04	299.44	657.19	-2.28	-
745.47	0.00001	-0.87	-20.98	-	11.13	-	elastic	elastic	65.29	63.39	0.00	0.00	83.28	174.08	23.49	49.09	328.14	685.89	-1.90	-
745.08	-0.00001	-0.87	-16.57	-	11.86	-	elastic	elastic	68.93	67.04	0.00	0.00	90.57	181.37	25.54	51.15	356.83	714.59	-1.89	-
744.70	-0.00002	-0.88	-11.88	-	12.64	-	elastic	elastic	72.71	70.54	0.00	0.00	97.85	188.65	27.59	53.20	385.53	743.28	-2.16	-
744.70	-0.00002	-0.88	-11.88	-	12.64	-	elastic	elastic	81.68	88.21	0.00	0.00	97.85	188.65	0.00	19.35	431.80	698.02	6.53	-
744.24	-0.00003	-0.89	-6.71	-	9.75	-	elastic	elastic	86.92	92.85	0.00	0.00	106.18	196.98	0.00	22.39	456.21	722.43	5.93	-
743.78	-0.00003	-0.90	-2.81	-	7.19	-	elastic	elastic	92.25	97.39	0.00	0.00	114.50	205.30	0.00	25.44	480.61	746.84	5.14	-
743.31	-0.00003	-0.92	0.00	-	5.01	-	elastic	elastic	97.62	101.90	0.00	0.00	122.83	213.63	0.00	28.49	505.02	771.25	4.28	-
742.85	-0.00003	-0.93	1.89	-	3.23	-	elastic	elastic	102.98	106.40	0.00	0.00	131.15	221.95	0.00	31.53	529.43	795.66	3.42	-
742.35	-0.00003	-0.95	3.12	-	1.74	-	elastic	elastic	108.76	111.30	0.00	0.00	140.15	230.95	1.60	34.83	555.82	822.05	2.54	-
741.85	-0.00003	-0.96	3.71	-	0.67	-	elastic	elastic	114.50	116.24	0.00	0.00	149.15	239.95	4.89	38.12	582.21	848.43	1.75	-
741.35	-0.00002	-0.98	3.85	-	-0.03	-	elastic	elastic	120.17	121.24	0.00	0.00	158.15	248.95	8.18	41.42	608.60	874.82	1.06	-
740.85	-0.00002	-0.99	3.73	-	-0.42	-	elastic	elastic	125.80	126.29	0.00	0.00	167.15	257.95	11.48	44.71	634.98	901.21	0.49	-
740.35	-0.00002	-1.00	3.48	-	-0.55	-	elastic	elastic	131.36	131.40	0.00	0.00	176.15	266.95	14.77	48.00	661.37	927.60	0.03	-
739.85	-0.00001	-1.00	3.21	-	-0.48	-	elastic	elastic	136.88	136.56	0.00	0.00	185.15	275.95	18.07	51.30	687.76	953.99	-0.32	-
739.35	-0.00001	-1.01	3.03	-	-0.25	-	elastic	elastic	142.34	141.76	0.00	0.00	194.15	284.95	21.36	54.59	714.15	980.37	-0.58	-

RESULTS

PHASE 1

Level [m]	Rotation [rad]	Displ. [mm]	Moment		Shear force		Soil status		Earth pressure		Water pressure		Vertical pressure		Limiting active pressure		limiting passive		Diff. pressures	
			M.k [kNm]	M.d [kNm]	V.k [kN]	V.d [kN]	left	right	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	P.k [kN/m ²]	P.d [kN/m ²]
738.85	0.00000	-1.01	2.98	-	0.08	-	elastic	elastic	147.76	147.02	0.00	0.00	203.15	293.95	24.65	57.89	740.54	1006.76	-0.75	-
738.35	0.00000	-1.01	3.12	-	0.47	-	elastic	elastic	153.14	152.32	0.00	0.00	212.15	302.95	27.95	61.18	766.92	1033.15	-0.82	-
737.85	0.00000	-1.01	3.45	-	0.88	-	elastic	elastic	158.47	157.66	0.00	0.00	221.15	311.95	31.24	64.47	793.31	1059.54	-0.81	-
737.35	0.00001	-1.01	3.99	-	1.25	-	elastic	elastic	163.74	163.06	0.00	0.00	230.15	320.95	34.54	67.77	819.70	1085.93	-0.68	-
736.85	0.00001	-1.01	4.69	-	1.53	-	elastic	elastic	168.96	168.52	0.00	0.00	239.15	329.95	37.83	71.06	846.09	1112.31	-0.44	-
736.35	0.00002	-1.00	5.49	-	1.66	-	elastic	elastic	174.11	174.04	0.00	0.00	248.15	338.95	41.12	74.36	872.48	1138.70	-0.06	-
735.85	0.00002	-0.99	6.31	-	1.55	-	elastic	elastic	179.17	179.65	0.00	0.00	257.15	347.95	44.42	77.65	898.86	1165.09	0.48	-
735.35	0.00003	-0.97	7.00	-	1.13	-	elastic	elastic	184.14	185.36	0.00	0.00	266.15	356.95	47.71	80.94	925.25	1191.48	1.22	-
734.85	0.00004	-0.96	7.37	-	0.28	-	elastic	elastic	189.01	191.17	0.00	0.00	275.15	365.95	51.01	84.24	951.64	1217.87	2.16	-
734.35	0.00005	-0.94	7.19	-	-1.09	-	elastic	elastic	193.76	197.08	0.00	0.00	284.15	374.95	54.30	87.53	978.03	1244.25	3.32	-
733.95	0.00005	-0.92	6.46	-	-2.63	-	elastic	elastic	197.49	201.89	0.00	0.00	291.35	382.15	56.93	90.17	999.14	1265.36	4.40	-
733.55	0.00006	-0.89	5.03	-	-4.63	-	elastic	elastic	201.16	206.76	0.00	0.00	298.55	389.35	59.57	92.80	1020.25	1286.47	5.60	-
733.15	0.00006	-0.87	2.69	-	-7.13	-	elastic	elastic	204.78	211.68	0.00	0.00	305.75	396.55	62.21	95.44	1041.36	1307.59	6.90	-
732.70	0.00006	-0.84	-1.26	-	-10.57	-	elastic	elastic	207.23	215.64	3.00	3.00	311.15	401.95	64.18	97.41	1057.19	1323.42	8.41	-
732.70	0.00006	-0.84	-1.26	-	-10.57	-	elastic	elastic	240.08	229.14	3.00	3.00	311.15	401.95	0.00	17.84	1111.78	1328.25	-10.94	-
732.20	0.00006	-0.81	-5.29	-	-5.74	-	elastic	elastic	242.75	234.36	8.00	8.00	317.15	407.95	0.00	20.42	1126.09	1342.55	-8.39	-
731.70	0.00005	-0.78	-7.21	-	-2.13	-	elastic	elastic	245.54	239.47	13.00	13.00	323.15	413.95	0.00	23.00	1140.39	1356.86	-6.07	-
731.20	0.00004	-0.76	-7.60	-	0.41	-	elastic	elastic	248.49	244.42	18.00	18.00	329.15	419.95	0.00	25.58	1154.69	1371.16	-4.07	-
730.70	0.00004	-0.74	-6.95	-	2.03	-	elastic	elastic	251.61	249.20	23.00	23.00	335.15	425.95	0.00	28.16	1169.00	1385.47	-2.41	-
730.20	0.00003	-0.72	-5.70	-	2.90	-	elastic	elastic	254.89	253.81	28.00	28.00	341.15	431.95	0.00	30.74	1183.30	1399.77	-1.08	-
729.70	0.00002	-0.71	-4.16	-	3.17	-	elastic	elastic	258.30	258.30	33.00	33.00	347.15	437.95	0.00	33.32	1197.61	1414.07	0.00	-
729.20	0.00002	-0.70	-2.61	-	2.95	-	elastic	elastic	261.81	262.68	38.00	38.00	353.15	443.95	0.00	35.90	1211.91	1428.38	0.88	-
728.70	0.00002	-0.69	-1.28	-	2.32	-	elastic	elastic	265.38	267.01	43.00	43.00	359.15	449.95	0.00	38.48	1226.21	1442.68	1.63	-
728.20	0.00002	-0.68	-0.35	-	1.33	-	elastic	elastic	268.98	271.31	48.00	48.00	365.15	455.95	2.01	41.06	1240.52	1456.99	2.33	-
727.70	0.00002	-0.68	0.00	-	0.00	-	elastic	elastic	272.59	275.59	53.00	53.00	371.15	461.95	4.59	43.64	1254.82	1471.29	3.00	-

Strut n° 1 elevation 750.85 axial force 22.27 kN

limiting earth resistance [kN] = 15889 mobilised earth resistance [kN] = 3315 ratio (1) = 4.793

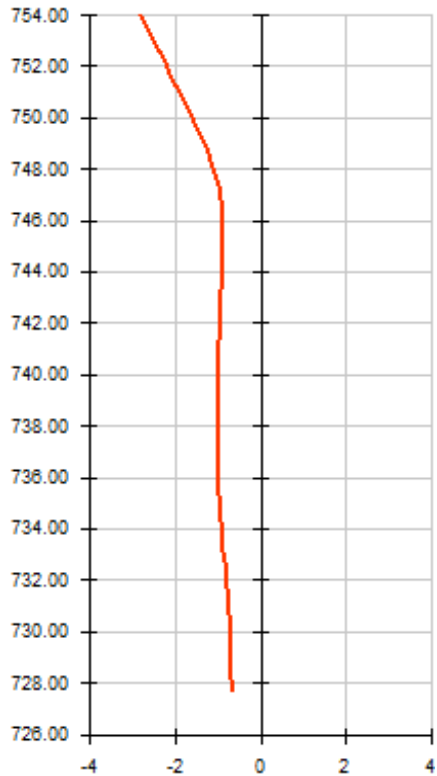


Calculated by: **AMRetain**



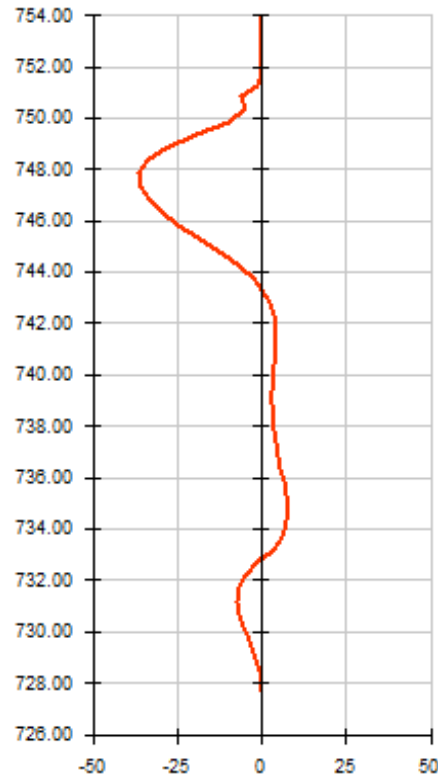
RESULTS (Phase 1)

Displacements [mm]



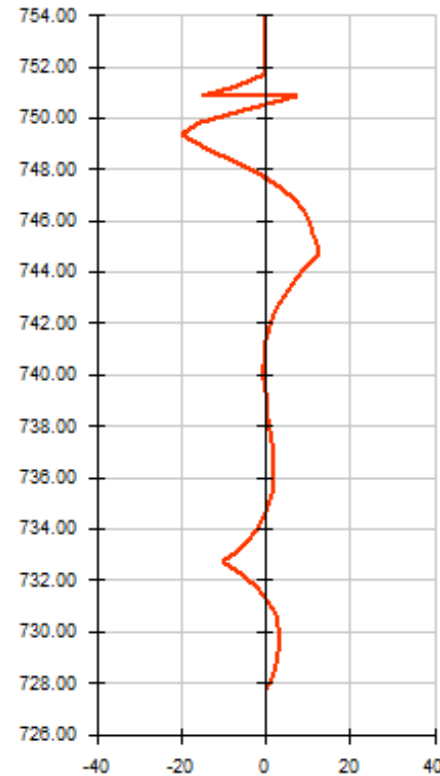
Dmax = -0.676
Dmin = -2.833

Moments [kNm]



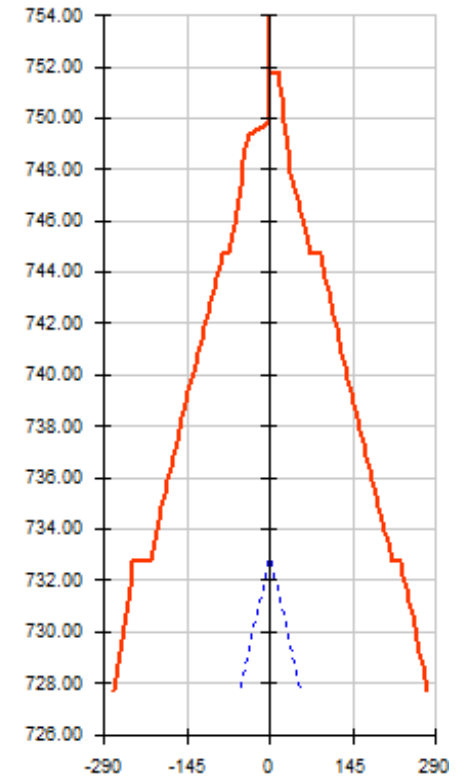
M.k max = 7.368
M.k min = -36.717

Shear forces [kN]



V.k max = 12.635
V.k min = -20.045

Earth/Water pressures [kN/m²]



P max = 275.590
P min = -272.589
Pw max = 53.000
Pw min = -53.000



Calculated by: **AMRetain**



RESULTS

PHASE 2

- excavation (left): zh [m] = 745.850 zw [m] = 733.000
 - installation of strut : n° 2 za[m] = 746.850 K [kN/m] = 12000

Calculation converged after 3 iterations.

Level [m]	Rotation [rad]	Displ. [mm]	Moment		Shear force		Soil status		Earth pressure		Water pressure		Vertical pressure		Limiting active pressure		Limiting passive		Diff. pressures	
			M.k [kNm]	M.d [kNm]	V.k [kN]	V.d [kN]	left	right	left [kN/m²]	right [kN/m²]	left [kN/m²]	right [kN/m²]	left [kN/m²]	right [kN/m²]	left [kN/m²]	right [kN/m²]	left [kN/m²]	right [kN/m²]	P.k [kN/m²]	P.d [kN/m²]
754.00	0.00026	-7.61	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00	158.96	0.00	-
753.54	0.00026	-7.49	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	27.13	0.00	0.00	0.00	183.33	0.00	-
753.08	0.00026	-7.37	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	34.26	0.00	0.00	0.00	207.70	0.00	-
752.62	0.00026	-7.25	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	41.39	0.00	0.00	0.00	232.07	0.00	-
752.16	0.00026	-7.13	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	48.52	0.00	0.00	0.00	256.44	0.00	-
751.70	0.00026	-7.02	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	55.65	0.00	0.00	0.00	280.81	0.00	-
751.70	0.00026	-7.02	0.00	-	0.00	-	excavation	active press.	0.00	15.69	0.00	0.00	0.00	55.65	0.00	15.69	0.00	219.26	15.69	-
751.28	0.00026	-6.91	-1.49	-	-7.15	-	excavation	active press.	0.00	17.97	0.00	0.00	0.00	63.73	0.00	17.97	0.00	251.08	17.97	-
750.85	0.00025	-6.80	-6.22	-	-15.27	-	excavation	active press.	0.00	20.25	0.00	0.00	0.00	71.80	0.00	20.25	0.00	282.89	20.25	-
750.85	0.00025	-6.80	-6.22	-	66.33	-	excavation	active press.	0.00	20.25	0.00	0.00	0.00	71.80	0.00	20.25	0.00	282.89	20.25	-
750.35	0.00026	-6.67	24.30	-	55.54	-	excavation	active press.	0.00	22.93	0.00	0.00	0.00	81.30	0.00	22.93	0.00	320.32	22.93	-
749.85	0.00030	-6.53	49.10	-	43.40	-	excavation	active press.	0.00	25.61	0.00	0.00	0.00	90.80	0.00	25.61	0.00	357.75	25.61	-
749.35	0.00037	-6.37	67.48	-	29.93	-	excavation	active press.	0.00	28.28	0.00	0.00	0.00	100.30	0.00	28.29	0.00	395.18	28.28	-
748.85	0.00045	-6.16	78.80	-	15.12	-	excavation	active press.	0.00	30.96	0.00	0.00	0.00	109.80	0.00	30.96	0.00	432.61	30.96	-
748.35	0.00054	-5.92	82.38	-	-1.03	-	excavation	active press.	0.00	33.64	0.00	0.00	0.00	119.30	0.00	33.64	0.00	470.04	33.64	-
747.85	0.00063	-5.63	77.55	-	-18.52	-	excavation	active press.	0.00	36.32	0.00	0.00	0.00	128.80	0.00	36.32	0.00	507.47	36.32	-
747.35	0.00070	-5.29	63.63	-	-37.35	-	excavation	active press.	0.00	39.00	0.00	0.00	0.00	138.30	0.00	39.00	0.00	544.90	39.00	-
746.85	0.00076	-4.93	39.97	-	-57.52	-	excavation	active press.	0.00	41.68	0.00	0.00	0.00	147.80	0.00	41.68	0.00	582.33	41.68	-
746.85	0.00076	-4.93	39.97	-	-9.67	-	excavation	active press.	0.00	41.68	0.00	0.00	0.00	147.80	0.00	41.68	0.00	582.33	41.68	-
746.35	0.00080	-4.54	29.81	-	-31.18	-	excavation	active press.	0.00	44.36	0.00	0.00	0.00	157.30	0.00	44.36	0.00	619.76	44.36	-
745.85	0.00082	-4.13	8.57	-	-54.03	-	passive press.	active press.	0.00	47.04	0.00	0.00	0.00	166.80	0.00	47.04	0.00	657.19	47.04	-
745.47	0.00082	-3.81	-14.95	-	-66.95	-	passive press.	active press.	28.70	49.09	0.00	0.00	7.28	174.08	2.05	49.09	28.70	685.89	20.40	-
745.08	0.00079	-3.50	-41.46	-	-69.66	-	passive press.	active press.	57.39	51.15	0.00	0.00	14.57	181.37	4.11	51.15	57.39	714.59	-6.25	-
744.70	0.00075	-3.21	-67.05	-	-62.16	-	passive press.	active press.	86.09	53.20	0.00	0.00	21.85	188.65	6.16	53.20	86.09	743.28	-32.89	-
744.70	0.00075	-3.21	-67.05	-	-62.16	-	elastic	elastic	99.57	25.26	0.00	0.00	21.85	188.65	0.00	19.35	208.96	698.02	-74.31	-
744.24	0.00067	-2.88	-88.49	-	-31.90	-	elastic	elastic	95.63	39.07	0.00	0.00	30.18	196.98	0.00	22.39	233.37	722.43	-56.57	-
743.78	0.00057	-2.59	-97.74	-	-9.33	-	elastic	elastic	92.81	51.77	0.00	0.00	38.50	205.30	0.00	25.44	257.78	746.84	-41.04	-
743.31	0.00047	-2.35	-98.13	-	6.63	-	elastic	elastic	91.21	63.24	0.00	0.00	46.83	213.63	0.00	28.49	282.19	771.25	-27.97	-
742.85	0.00038	-2.15	-92.45	-	17.12	-	elastic	elastic	90.85	73.47	0.00	0.00	55.15	221.95	0.00	31.53	306.60	795.66	-17.38	-
742.35	0.00028	-1.99	-82.09	-	23.61	-	elastic	elastic	91.78	83.21	0.00	0.00	64.15	230.95	0.00	34.83	332.99	822.05	-8.58	-
741.85	0.00020	-1.87	-69.47	-	26.31	-	elastic	elastic	93.94	91.73	0.00	0.00	73.15	239.95	0.00	38.12	359.38	848.43	-2.21	-
741.35	0.00013	-1.79	-56.22	-	26.34	-	elastic	elastic	97.13	99.21	0.00	0.00	82.15	248.95	0.00	41.42	385.76	874.82	2.09	-
740.85	0.00007	-1.74	-43.42	-	24.64	-	elastic	elastic	101.16	105.86	0.00	0.00	91.15	257.95	0.00	44.71	412.15	901.21	4.70	-
740.35	0.00003	-1.72	-31.75	-	21.97	-	elastic	elastic	105.84	111.85	0.00	0.00	100.15	266.95	0.00	48.00	438.54	927.60	6.00	-
739.85	0.00000	-1.71	-21.53	-	18.88	-	elastic	elastic	111.00	117.36	0.00	0.00	109.15	275.95	0.00	51.30	464.93	953.99	6.36	-

RESULTS

PHASE 2

Level [m]	Rotation [rad]	Displ. [mm]	Moment		Shear force		Soil status		Earth pressure		Water pressure		Vertical pressure		Limiting active pressure		limiting passive		Diff. pressures	
			M.k [kNm]	M.d [kNm]	V.k [kN]	V.d [kN]	left	right	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	P.k [kN/m ²]	P.d [kN/m ²]
739.35	-0.00002	-1.72	-12.87	-	15.77	-	elastic	elastic	116.49	122.55	0.00	0.00	118.15	284.95	0.00	54.59	491.32	980.37	6.06	-
738.85	-0.00003	-1.73	-5.71	-	12.92	-	elastic	elastic	122.17	127.54	0.00	0.00	127.15	293.95	0.00	57.89	517.70	1006.76	5.36	-
738.35	-0.00003	-1.75	0.11	-	10.45	-	elastic	elastic	127.95	132.44	0.00	0.00	136.15	302.95	0.13	61.18	544.09	1033.15	4.50	-
737.85	-0.00003	-1.76	4.82	-	8.42	-	elastic	elastic	133.72	137.34	0.00	0.00	145.15	311.95	3.43	64.47	570.48	1059.54	3.62	-
737.35	-0.00002	-1.78	8.61	-	6.80	-	elastic	elastic	139.42	142.31	0.00	0.00	154.15	320.95	6.72	67.77	596.87	1085.93	2.89	-
736.85	-0.00001	-1.79	11.66	-	5.47	-	elastic	elastic	145.00	147.41	0.00	0.00	163.15	329.95	10.01	71.06	623.26	1112.31	2.41	-
736.35	0.00000	-1.79	14.10	-	4.30	-	elastic	elastic	150.40	152.68	0.00	0.00	172.15	338.95	13.31	74.36	649.64	1138.70	2.28	-
735.85	0.00002	-1.78	15.95	-	3.08	-	elastic	elastic	155.59	158.16	0.00	0.00	181.15	347.95	16.60	77.65	676.03	1165.09	2.57	-
735.35	0.00004	-1.77	17.14	-	1.61	-	elastic	elastic	160.55	163.88	0.00	0.00	190.15	356.95	19.90	80.94	702.42	1191.48	3.33	-
734.85	0.00006	-1.75	17.48	-	-0.37	-	elastic	elastic	165.26	169.85	0.00	0.00	199.15	365.95	23.19	84.24	728.81	1217.87	4.59	-
734.35	0.00008	-1.71	16.64	-	-3.11	-	elastic	elastic	169.70	176.08	0.00	0.00	208.15	374.95	26.48	87.53	755.20	1244.25	6.38	-
733.95	0.00009	-1.68	14.84	-	-6.02	-	elastic	elastic	173.08	181.24	0.00	0.00	215.35	382.15	29.12	90.17	776.31	1265.36	8.16	-
733.55	0.00010	-1.64	11.72	-	-9.70	-	elastic	elastic	176.32	186.54	0.00	0.00	222.55	389.35	31.75	92.80	797.42	1286.47	10.22	-
733.15	0.00011	-1.60	6.97	-	-14.24	-	elastic	elastic	179.45	191.95	0.00	0.00	229.75	396.55	34.39	95.44	818.53	1307.59	12.50	-
732.70	0.00011	-1.55	-0.80	-	-20.48	-	elastic	elastic	181.29	196.51	3.00	3.00	235.15	401.95	36.37	97.41	834.36	1323.42	15.21	-
732.70	0.00011	-1.55	-0.80	-	-20.48	-	elastic	elastic	219.83	199.38	3.00	3.00	235.15	401.95	0.00	17.84	930.60	1328.25	-20.45	-
732.20	0.00011	-1.49	-8.67	-	-11.41	-	elastic	elastic	221.46	205.65	8.00	8.00	241.15	407.95	0.00	20.42	944.90	1342.55	-15.81	-
731.70	0.00010	-1.44	-12.58	-	-4.57	-	elastic	elastic	223.27	211.73	13.00	13.00	247.15	413.95	0.00	23.00	959.21	1356.86	-11.54	-
731.20	0.00008	-1.40	-13.58	-	0.27	-	elastic	elastic	225.36	217.54	18.00	18.00	253.15	419.95	0.00	25.58	973.51	1371.16	-7.83	-
730.70	0.00007	-1.36	-12.60	-	3.41	-	elastic	elastic	227.76	223.03	23.00	23.00	259.15	425.95	0.00	28.16	987.81	1385.47	-4.73	-
730.20	0.00005	-1.33	-10.41	-	5.14	-	elastic	elastic	230.45	228.24	28.00	28.00	265.15	431.95	0.00	30.74	1002.12	1399.77	-2.22	-
729.70	0.00004	-1.31	-7.64	-	5.74	-	elastic	elastic	233.38	233.21	33.00	33.00	271.15	437.95	0.00	33.32	1016.42	1414.07	-0.18	-
729.20	0.00004	-1.29	-4.82	-	5.41	-	elastic	elastic	236.49	237.99	38.00	38.00	277.15	443.95	0.00	35.90	1030.73	1428.38	1.51	-
728.70	0.00003	-1.27	-2.37	-	4.29	-	elastic	elastic	239.71	242.67	43.00	43.00	283.15	449.95	0.00	38.48	1045.03	1442.68	2.96	-
728.20	0.00003	-1.26	-0.65	-	2.48	-	elastic	elastic	242.99	247.29	48.00	48.00	289.15	455.95	0.00	41.06	1059.33	1456.99	4.30	-
727.70	0.00003	-1.24	0.00	-	0.00	-	elastic	elastic	246.28	251.89	53.00	53.00	295.15	461.95	0.00	43.64	1073.64	1471.29	5.60	-

Strut n° 1 elevation 750.85 axial force 81.60 kN

Strut n° 2 elevation 746.85 axial force 47.86 kN

limiting earth resistance [kN] = 11366 mobilised earth resistance [kN] = 2744 ratio (1) = 4.141

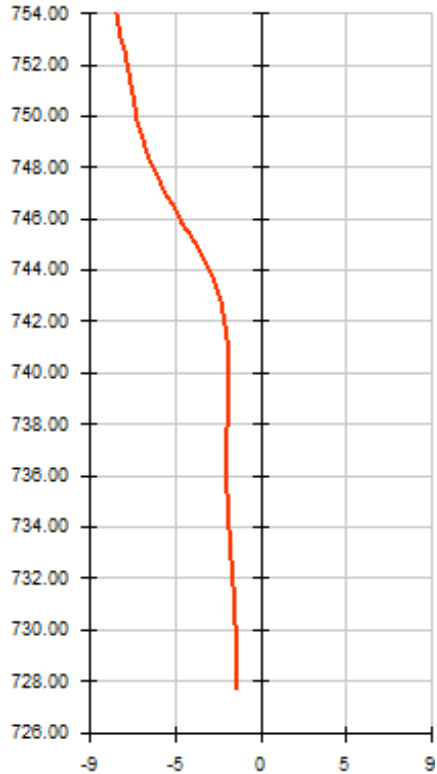


Calculated by: **AMRetain**



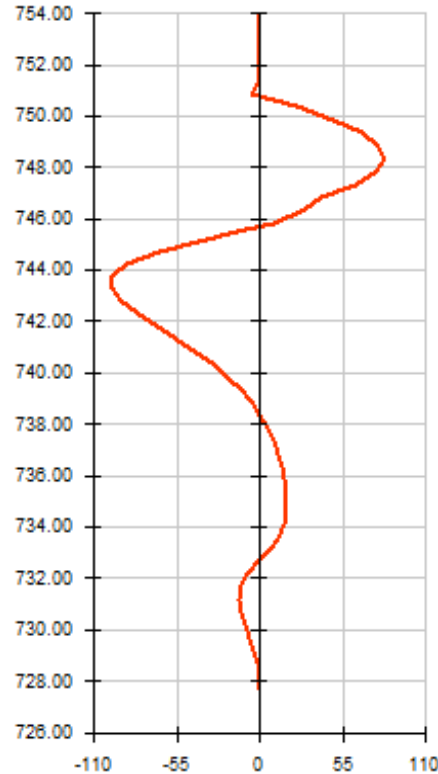
RESULTS (Phase 2)

Displacements [mm]



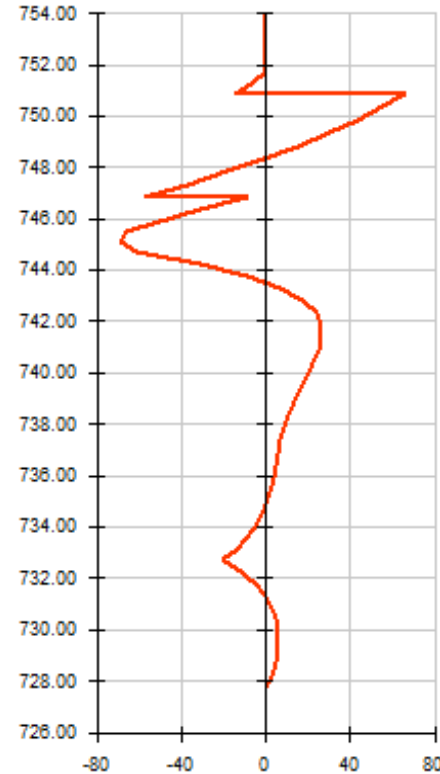
Dmax = -1.240
Dmin = -7.606

Moments [kNm]



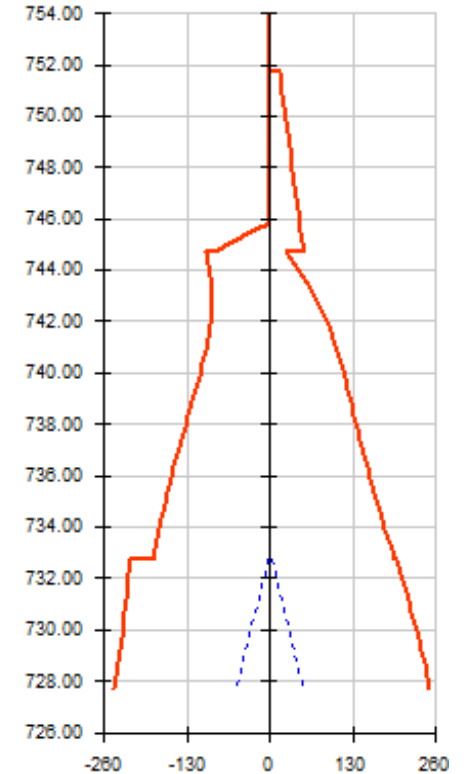
M.k max = 82.379
M.k min = -98.134

Shear forces [kN]



V.k max = 66.330
V.k min = -69.664

Earth/Water pressures [kN/m²]



P max = 251.888
P min = -246.284
Pw max = 53.000
Pw min = -53.000



Calculated by: **AMRetain**



RESULTS

PHASE 3

- excavation (left): zh [m] = 741.850 zw [m] = 733.000
 - installation of strut : n° 3 za[m] = 742.850 K [kN/m] = 12000

Calculation converged after 5 iterations.

Level [m]	Rotation [rad]	Displ. [mm]	Moment		Shear force		Soil status		Earth pressure		Water pressure		Vertical pressure		Limiting active pressure		Limiting passive		Diff. pressures	
			M.k [kNm]	M.d [kNm]	V.k [kN]	V.d [kN]	left	right	left [kN/m²]	right [kN/m²]	left [kN/m²]	right [kN/m²]	left [kN/m²]	right [kN/m²]	left [kN/m²]	right [kN/m²]	left [kN/m²]	right [kN/m²]	P.k [kN/m²]	P.d [kN/m²]
754.00	-0.00050	-6.56	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00	158.96	0.00	-
753.54	-0.00050	-6.79	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	27.13	0.00	0.00	0.00	183.33	0.00	-
753.08	-0.00050	-7.02	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	34.26	0.00	0.00	0.00	207.70	0.00	-
752.62	-0.00050	-7.25	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	41.39	0.00	0.00	0.00	232.07	0.00	-
752.16	-0.00050	-7.48	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	48.52	0.00	0.00	0.00	256.44	0.00	-
751.70	-0.00050	-7.71	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	55.65	0.00	0.00	0.00	280.81	0.00	-
751.70	-0.00050	-7.71	0.00	-	0.00	-	excavation	active press.	0.00	15.69	0.00	0.00	0.00	55.65	0.00	15.69	0.00	219.26	15.69	-
751.28	-0.00050	-7.92	-1.49	-	-7.15	-	excavation	active press.	0.00	17.97	0.00	0.00	0.00	63.73	0.00	17.97	0.00	251.08	17.97	-
750.85	-0.00050	-8.13	-6.22	-	-15.27	-	excavation	active press.	0.00	20.25	0.00	0.00	0.00	71.80	0.00	20.25	0.00	282.89	20.25	-
750.85	-0.00050	-8.13	-6.22	-	82.31	-	excavation	active press.	0.00	20.25	0.00	0.00	0.00	71.80	0.00	20.25	0.00	282.89	20.25	-
750.35	-0.00049	-8.38	32.30	-	71.52	-	excavation	active press.	0.00	22.93	0.00	0.00	0.00	81.30	0.00	22.93	0.00	320.32	22.93	-
749.85	-0.00044	-8.62	65.08	-	59.39	-	excavation	active press.	0.00	25.61	0.00	0.00	0.00	90.80	0.00	25.61	0.00	357.75	25.61	-
749.35	-0.00035	-8.81	91.46	-	45.91	-	excavation	active press.	0.00	28.28	0.00	0.00	0.00	100.30	0.00	28.29	0.00	395.18	28.28	-
748.85	-0.00024	-8.96	110.77	-	31.10	-	excavation	active press.	0.00	30.96	0.00	0.00	0.00	109.80	0.00	30.96	0.00	432.61	30.96	-
748.35	-0.00011	-9.05	122.34	-	14.95	-	excavation	active press.	0.00	33.64	0.00	0.00	0.00	119.30	0.00	33.64	0.00	470.04	33.64	-
747.85	0.00003	-9.07	125.50	-	-2.54	-	excavation	active press.	0.00	36.32	0.00	0.00	0.00	128.80	0.00	36.32	0.00	507.47	36.32	-
747.35	0.00016	-9.02	119.57	-	-21.37	-	excavation	active press.	0.00	39.00	0.00	0.00	0.00	138.30	0.00	39.00	0.00	544.90	39.00	-
746.85	0.00029	-8.91	103.90	-	-41.54	-	excavation	active press.	0.00	41.68	0.00	0.00	0.00	147.80	0.00	41.68	0.00	582.33	41.68	-
746.85	0.00029	-8.91	103.90	-	54.08	-	excavation	active press.	0.00	41.68	0.00	0.00	0.00	147.80	0.00	41.68	0.00	582.33	41.68	-
746.35	0.00041	-8.73	125.62	-	32.57	-	excavation	active press.	0.00	44.36	0.00	0.00	0.00	157.30	0.00	44.36	0.00	619.76	44.36	-
745.85	0.00056	-8.49	136.25	-	9.72	-	excavation	active press.	0.00	47.04	0.00	0.00	0.00	166.80	0.00	47.04	0.00	657.19	47.04	-
745.47	0.00068	-8.25	136.46	-	-8.71	-	excavation	active press.	0.00	49.09	0.00	0.00	0.00	174.08	0.00	49.09	0.00	685.89	49.09	-
745.08	0.00079	-7.97	129.47	-	-27.92	-	excavation	active press.	0.00	51.15	0.00	0.00	0.00	181.37	0.00	51.15	0.00	714.59	51.15	-
744.70	0.00089	-7.65	114.96	-	-47.92	-	excavation	active press.	0.00	53.20	0.00	0.00	0.00	188.65	0.00	53.20	0.00	743.28	53.20	-
744.70	0.00089	-7.65	114.96	-	-47.92	-	excavation	active press.	0.00	19.35	0.00	0.00	0.00	188.65	0.00	19.35	0.00	698.02	19.35	-
744.24	0.00100	-7.21	90.62	-	-57.57	-	excavation	active press.	0.00	22.39	0.00	0.00	0.00	196.98	0.00	22.39	0.00	722.43	22.39	-
743.78	0.00108	-6.73	61.49	-	-68.63	-	excavation	active press.	0.00	25.44	0.00	0.00	0.00	205.30	0.00	25.44	0.00	746.84	25.44	-
743.31	0.00112	-6.22	26.92	-	-81.10	-	excavation	active press.	0.00	28.49	0.00	0.00	0.00	213.63	0.00	28.49	0.00	771.25	28.49	-
742.85	0.00113	-5.70	-13.75	-	-94.98	-	excavation	active press.	0.00	31.53	0.00	0.00	0.00	221.95	0.00	31.53	0.00	795.66	31.53	-
742.85	0.00113	-5.70	-13.75	-	-52.44	-	excavation	active press.	0.00	31.53	0.00	0.00	0.00	221.95	0.00	31.53	0.00	795.66	31.53	-
742.35	0.00110	-5.14	-44.05	-	-69.03	-	excavation	active press.	0.00	34.83	0.00	0.00	0.00	230.95	0.00	34.83	0.00	822.05	34.83	-
741.85	0.00102	-4.61	-83.05	-	-87.27	-	elastic	active press.	124.47	38.12	0.00	0.00	0.00	239.95	0.00	38.12	144.90	848.43	-86.35	-
741.35	0.00091	-4.12	-116.35	-	-46.86	-	elastic	active press.	116.67	41.42	0.00	0.00	9.00	248.95	0.00	41.42	171.29	874.82	-75.26	-
740.85	0.00078	-3.70	-131.12	-	-13.68	-	elastic	elastic	110.57	53.07	0.00	0.00	18.00	257.95	0.00	44.71	197.68	901.21	-57.50	-
740.35	0.00063	-3.35	-131.56	-	10.32	-	elastic	elastic	106.39	67.92	0.00	0.00	27.00	266.95	0.00	48.00	224.06	927.60	-38.47	-

RESULTS

PHASE 3

Level [m]	Rotation [rad]	Displ. [mm]	Moment		Shear force		Soil status		Earth pressure		Water pressure		Vertical pressure		Limiting active pressure		limiting passive		Diff. pressures	
			M.k [kNm]	M.d [kNm]	V.k [kN]	V.d [kN]	left	right	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	P.k [kN/m ²]	P.d [kN/m ²]
739.85	0.00049	-3.07	-122.23	-	25.76	-	elastic	elastic	104.15	80.83	0.00	0.00	36.00	275.95	0.00	51.30	250.45	953.99	-23.32	-
739.35	0.00036	-2.85	-106.91	-	34.54	-	elastic	elastic	103.73	91.94	0.00	0.00	45.00	284.95	0.00	54.59	276.84	980.37	-11.79	-
738.85	0.00026	-2.70	-88.52	-	38.35	-	elastic	elastic	104.89	101.45	0.00	0.00	54.00	293.95	0.00	57.89	303.23	1006.76	-3.44	-
738.35	0.00017	-2.59	-69.15	-	38.64	-	elastic	elastic	107.37	109.64	0.00	0.00	63.00	302.95	0.00	61.18	329.62	1033.15	2.26	-
737.85	0.00010	-2.53	-50.26	-	36.60	-	elastic	elastic	110.89	116.79	0.00	0.00	72.00	311.95	0.00	64.47	356.00	1059.54	5.90	-
737.35	0.00006	-2.49	-32.79	-	33.12	-	elastic	elastic	115.16	123.19	0.00	0.00	81.00	320.95	0.00	67.77	382.39	1085.93	8.03	-
736.85	0.00003	-2.47	-17.28	-	28.82	-	elastic	elastic	119.93	129.10	0.00	0.00	90.00	329.95	0.00	71.06	408.78	1112.31	9.17	-
736.35	0.00002	-2.45	-4.04	-	24.08	-	elastic	elastic	124.96	134.74	0.00	0.00	99.00	338.95	0.00	74.36	435.17	1138.70	9.78	-
735.85	0.00002	-2.45	6.76	-	19.08	-	elastic	elastic	130.06	140.32	0.00	0.00	108.00	347.95	0.00	77.65	461.56	1165.09	10.25	-
735.35	0.00003	-2.43	14.99	-	13.78	-	elastic	elastic	135.07	145.99	0.00	0.00	117.00	356.95	0.00	80.94	487.94	1191.48	10.92	-
734.85	0.00005	-2.41	20.47	-	8.05	-	elastic	elastic	139.85	151.87	0.00	0.00	126.00	365.95	0.00	84.24	514.33	1217.87	12.02	-
734.35	0.00008	-2.38	22.92	-	1.61	-	elastic	elastic	144.34	158.06	0.00	0.00	135.00	374.95	0.00	87.53	540.72	1244.25	13.72	-
733.95	0.00010	-2.35	22.42	-	-4.24	-	elastic	elastic	147.69	163.25	0.00	0.00	142.20	382.15	2.35	90.17	561.83	1265.36	15.56	-
733.55	0.00011	-2.31	19.41	-	-10.92	-	elastic	elastic	150.83	168.65	0.00	0.00	149.40	389.35	4.98	92.80	582.94	1286.47	17.82	-
733.15	0.00013	-2.26	13.55	-	-18.57	-	elastic	elastic	153.79	174.23	0.00	0.00	156.60	396.55	7.62	95.44	604.05	1307.59	20.44	-
732.70	0.00014	-2.20	3.02	-	-28.50	-	elastic	elastic	155.37	179.05	3.00	3.00	162.00	401.95	9.59	97.41	619.88	1323.42	23.68	-
732.70	0.00014	-2.20	3.02	-	-28.50	-	elastic	elastic	198.85	172.23	3.00	3.00	162.00	401.95	0.00	17.84	756.21	1328.25	-26.63	-
732.20	0.00013	-2.13	-8.14	-	-16.61	-	elastic	elastic	199.94	179.03	8.00	8.00	168.00	407.95	0.00	20.42	770.51	1342.55	-20.91	-
731.70	0.00012	-2.06	-14.06	-	-7.51	-	elastic	elastic	201.20	185.67	13.00	13.00	174.00	413.95	0.00	23.00	784.82	1356.86	-15.53	-
731.20	0.00010	-2.01	-16.07	-	-0.93	-	elastic	elastic	202.77	192.00	18.00	18.00	180.00	419.95	0.00	25.58	799.12	1371.16	-10.77	-
730.70	0.00009	-1.96	-15.36	-	3.45	-	elastic	elastic	204.70	197.96	23.00	23.00	186.00	425.95	0.00	28.16	813.42	1385.47	-6.74	-
730.20	0.00007	-1.92	-12.93	-	5.99	-	elastic	elastic	206.98	203.57	28.00	28.00	192.00	431.95	0.00	30.74	827.73	1399.77	-3.41	-
729.70	0.00006	-1.89	-9.63	-	7.01	-	elastic	elastic	209.56	208.89	33.00	33.00	198.00	437.95	0.00	33.32	842.03	1414.07	-0.67	-
729.20	0.00005	-1.86	-6.13	-	6.77	-	elastic	elastic	212.37	213.98	38.00	38.00	204.00	443.95	0.00	35.90	856.34	1428.38	1.62	-
728.70	0.00005	-1.84	-3.04	-	5.46	-	elastic	elastic	215.31	218.93	43.00	43.00	210.00	449.95	0.00	38.48	870.64	1442.68	3.62	-
728.20	0.00004	-1.81	-0.83	-	3.19	-	elastic	elastic	218.34	223.81	48.00	48.00	216.00	455.95	0.00	41.06	884.94	1456.99	5.47	-
727.70	0.00004	-1.79	0.00	-	0.00	-	elastic	elastic	221.38	228.66	53.00	53.00	222.00	461.95	0.00	43.64	899.25	1471.29	7.28	-

Strut n° 1 elevation 750.85 axial force 97.59 kN
 Strut n° 2 elevation 746.85 axial force 95.62 kN
 Strut n° 3 elevation 742.85 axial force 42.55 kN

limiting earth resistance [kN] = 7672 mobilised earth resistance [kN] = 2171 ratio (1) = 3.533

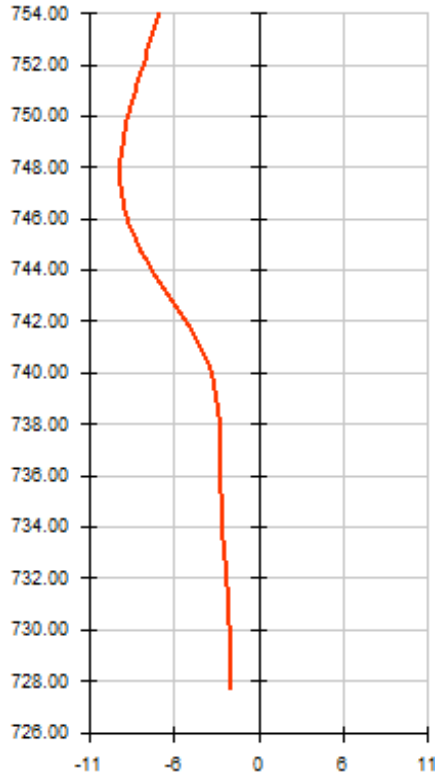


Calculated by: **AMRetain**



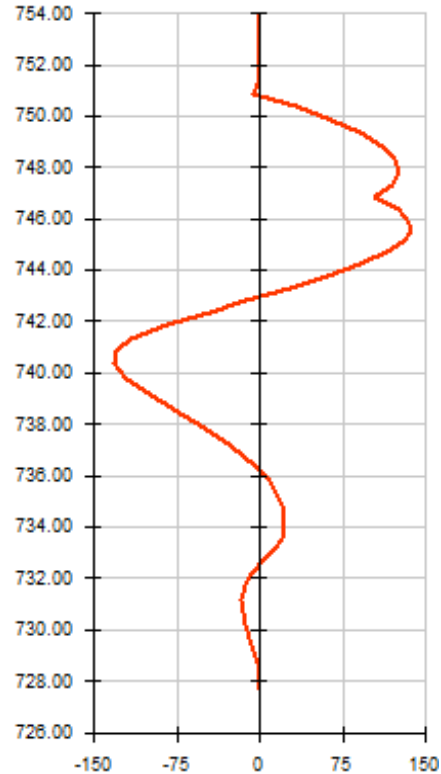
RESULTS (Phase 3)

Displacements [mm]



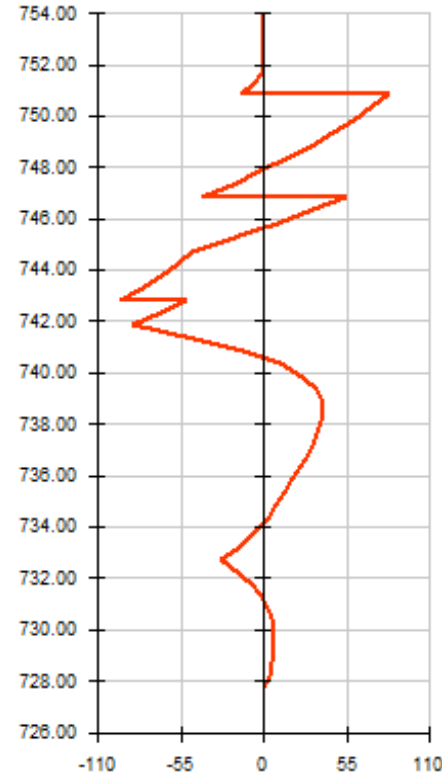
Dmax = -1.793
Dmin = -9.068

Moments [kNm]



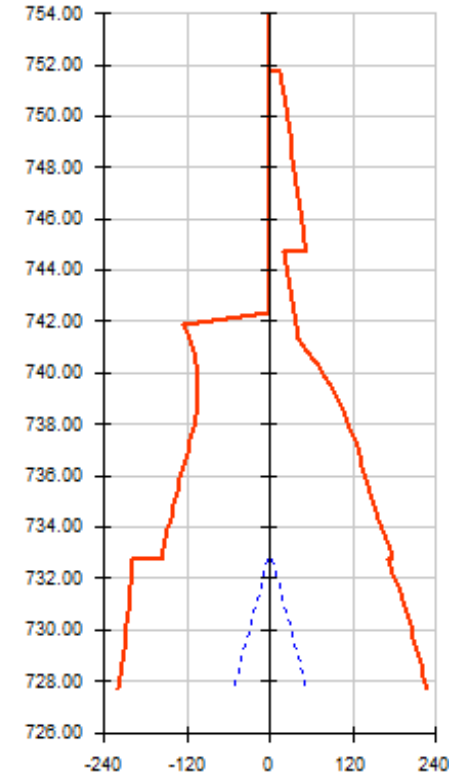
M.k max = 136.464
M.k min = -131.561

Shear forces [kN]



V.k max = 82.313
V.k min = -94.982

Earth/Water pressures [kN/m²]



P max = 228.658
P min = -221.381
Pw max = 53.000
Pw min = -53.000



Calculated by: **AMRetain**



RESULTS

PHASE 4

- excavation (left): zh [m] = 737.850 zw [m] = 733.000
 - installation of strut : n° 4 za[m] = 738.850 K [kN/m] = 12000

Calculation converged after 5 iterations.

Level [m]	Rotation [rad]	Displ. [mm]	Moment		Shear force		Soil status		Earth pressure		Water pressure		Vertical pressure		Limiting active pressure		Limiting passive		Diff. pressures	
			M.k [kNm]	M.d [kNm]	V.k [kN]	V.d [kN]	left	right	left [kN/m²]	right [kN/m²]	left [kN/m²]	right [kN/m²]	left [kN/m²]	right [kN/m²]	left [kN/m²]	right [kN/m²]	left [kN/m²]	right [kN/m²]	P.k [kN/m²]	P.d [kN/m²]
754.00	-0.00125	-4.22	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00	158.96	0.00	-
753.54	-0.00125	-4.80	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	27.13	0.00	0.00	0.00	183.33	0.00	-
753.08	-0.00125	-5.38	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	34.26	0.00	0.00	0.00	207.70	0.00	-
752.62	-0.00125	-5.95	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	41.39	0.00	0.00	0.00	232.07	0.00	-
752.16	-0.00125	-6.53	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	48.52	0.00	0.00	0.00	256.44	0.00	-
751.70	-0.00125	-7.11	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	55.65	0.00	0.00	0.00	280.81	0.00	-
751.70	-0.00125	-7.11	0.00	-	0.00	-	excavation	elastic	0.00	32.00	0.00	0.00	0.00	55.65	0.00	15.69	0.00	219.26	32.00	-
751.28	-0.00125	-7.64	-2.70	-	-12.24	-	excavation	elastic	0.00	25.59	0.00	0.00	0.00	63.73	0.00	17.97	0.00	251.08	25.59	-
750.85	-0.00126	-8.17	-10.05	-	-21.98	-	excavation	active press.	0.00	20.25	0.00	0.00	0.00	71.80	0.00	20.25	0.00	282.89	20.25	-
750.85	-0.00126	-8.17	-10.05	-	76.09	-	excavation	active press.	0.00	20.25	0.00	0.00	0.00	71.80	0.00	20.25	0.00	282.89	20.25	-
750.35	-0.00125	-8.80	25.36	-	65.30	-	excavation	active press.	0.00	22.93	0.00	0.00	0.00	81.30	0.00	22.93	0.00	320.32	22.93	-
749.85	-0.00121	-9.42	55.03	-	53.17	-	excavation	active press.	0.00	25.61	0.00	0.00	0.00	90.80	0.00	25.61	0.00	357.75	25.61	-
749.35	-0.00113	-10.01	78.30	-	39.70	-	excavation	active press.	0.00	28.28	0.00	0.00	0.00	100.30	0.00	28.29	0.00	395.18	28.28	-
748.85	-0.00104	-10.55	94.50	-	24.88	-	excavation	active press.	0.00	30.96	0.00	0.00	0.00	109.80	0.00	30.96	0.00	432.61	30.96	-
748.35	-0.00093	-11.04	102.96	-	8.73	-	excavation	active press.	0.00	33.64	0.00	0.00	0.00	119.30	0.00	33.64	0.00	470.04	33.64	-
747.85	-0.00082	-11.48	103.01	-	-8.76	-	excavation	active press.	0.00	36.32	0.00	0.00	0.00	128.80	0.00	36.32	0.00	507.47	36.32	-
747.35	-0.00071	-11.86	93.98	-	-27.59	-	excavation	active press.	0.00	39.00	0.00	0.00	0.00	138.30	0.00	39.00	0.00	544.90	39.00	-
746.85	-0.00061	-12.19	75.20	-	-47.76	-	excavation	active press.	0.00	41.68	0.00	0.00	0.00	147.80	0.00	41.68	0.00	582.33	41.68	-
746.85	-0.00061	-12.19	75.20	-	87.22	-	excavation	active press.	0.00	41.68	0.00	0.00	0.00	147.80	0.00	41.68	0.00	582.33	41.68	-
746.35	-0.00051	-12.47	113.49	-	65.71	-	excavation	active press.	0.00	44.36	0.00	0.00	0.00	157.30	0.00	44.36	0.00	619.76	44.36	-
745.85	-0.00037	-12.69	140.68	-	42.86	-	excavation	active press.	0.00	47.04	0.00	0.00	0.00	166.80	0.00	47.04	0.00	657.19	47.04	-
745.47	-0.00024	-12.81	153.61	-	24.43	-	excavation	active press.	0.00	49.09	0.00	0.00	0.00	174.08	0.00	49.09	0.00	685.89	49.09	-
745.08	-0.00011	-12.87	159.32	-	5.22	-	excavation	active press.	0.00	51.15	0.00	0.00	0.00	181.37	0.00	51.15	0.00	714.59	51.15	-
744.70	0.00002	-12.89	157.51	-	-14.78	-	excavation	active press.	0.00	53.20	0.00	0.00	0.00	188.65	0.00	53.20	0.00	743.28	53.20	-
744.70	0.00002	-12.89	157.51	-	-14.78	-	excavation	active press.	0.00	19.35	0.00	0.00	0.00	188.65	0.00	19.35	0.00	698.02	19.35	-
744.24	0.00018	-12.84	148.50	-	-24.43	-	excavation	active press.	0.00	22.39	0.00	0.00	0.00	196.98	0.00	22.39	0.00	722.43	22.39	-
743.78	0.00033	-12.72	134.70	-	-35.49	-	excavation	active press.	0.00	25.44	0.00	0.00	0.00	205.30	0.00	25.44	0.00	746.84	25.44	-
743.31	0.00045	-12.54	115.45	-	-47.96	-	excavation	active press.	0.00	28.49	0.00	0.00	0.00	213.63	0.00	28.49	0.00	771.25	28.49	-
742.85	0.00056	-12.31	90.12	-	-61.84	-	excavation	active press.	0.00	31.53	0.00	0.00	0.00	221.95	0.00	31.53	0.00	795.66	31.53	-
742.85	0.00056	-12.31	90.12	-	59.99	-	excavation	active press.	0.00	31.53	0.00	0.00	0.00	221.95	0.00	31.53	0.00	795.66	31.53	-
742.35	0.00067	-12.00	116.03	-	43.40	-	excavation	active press.	0.00	34.83	0.00	0.00	0.00	230.95	0.00	34.83	0.00	822.05	34.83	-
741.85	0.00081	-11.63	133.24	-	25.16	-	excavation	active press.	0.00	38.12	0.00	0.00	0.00	239.95	0.00	38.12	0.00	848.43	38.12	-
741.35	0.00096	-11.18	140.92	-	5.28	-	excavation	active press.	0.00	41.42	0.00	0.00	0.00	248.95	0.00	41.42	0.00	874.82	41.42	-
740.85	0.00112	-10.66	138.24	-	-16.26	-	excavation	active press.	0.00	44.71	0.00	0.00	0.00	257.95	0.00	44.71	0.00	901.21	44.71	-
740.35	0.00126	-10.07	124.39	-	-39.43	-	excavation	active press.	0.00	48.00	0.00	0.00	0.00	266.95	0.00	48.00	0.00	927.60	48.00	-



Calculated by: **AMRetain**



RESULTS

PHASE 4

Level [m]	Rotation [rad]	Displ. [mm]	Moment		Shear force		Soil status		Earth pressure		Water pressure		Vertical pressure		Limiting active pressure		limiting passive		Diff. pressures	
			M.k [kNm]	M.d [kNm]	V.k [kN]	V.d [kN]	left	right	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	P.k [kN/m ²]	P.d [kN/m ²]
739.85	0.00139	-9.40	98.53	-	-64.26	-	excavation	active press.	0.00	51.30	0.00	0.00	0.00	275.95	0.00	51.30	0.00	953.99	51.30	-
739.35	0.00147	-8.69	59.85	-	-90.73	-	excavation	active press.	0.00	54.59	0.00	0.00	0.00	284.95	0.00	54.59	0.00	980.37	54.59	-
738.85	0.00151	-7.94	7.53	-	-118.85	-	excavation	active press.	0.00	57.89	0.00	0.00	0.00	293.95	0.00	57.89	0.00	1006.76	57.89	-
738.85	0.00151	-7.94	7.53	-	-55.98	-	excavation	active press.	0.00	57.89	0.00	0.00	0.00	293.95	0.00	57.89	0.00	1006.76	57.89	-
738.35	0.00150	-7.18	-27.84	-	-85.75	-	excavation	active press.	0.00	61.18	0.00	0.00	0.00	302.95	0.00	61.18	0.00	1033.15	61.18	-
737.85	0.00144	-6.45	-78.50	-	-117.16	-	passive press.	active press.	144.90	64.47	0.00	0.00	0.00	311.95	0.00	64.47	144.90	1059.54	-80.43	-
737.35	0.00133	-5.75	-126.51	-	-73.85	-	elastic	active press.	160.59	67.77	0.00	0.00	9.00	320.95	0.00	67.77	171.29	1085.93	-92.83	-
736.85	0.00117	-5.12	-152.45	-	-31.15	-	elastic	active press.	149.01	71.06	0.00	0.00	18.00	329.95	0.00	71.06	197.68	1112.31	-77.95	-
736.35	0.00100	-4.58	-158.93	-	3.91	-	elastic	elastic	139.65	77.35	0.00	0.00	27.00	338.95	0.00	74.36	224.06	1138.70	-62.30	-
735.85	0.00083	-4.12	-150.22	-	28.88	-	elastic	elastic	132.64	95.04	0.00	0.00	36.00	347.95	0.00	77.65	250.45	1165.09	-37.59	-
735.35	0.00067	-3.75	-131.93	-	42.61	-	elastic	elastic	127.84	110.51	0.00	0.00	45.00	356.95	0.00	80.94	276.84	1191.48	-17.33	-
734.85	0.00054	-3.44	-109.14	-	47.19	-	elastic	elastic	125.01	124.02	0.00	0.00	54.00	365.95	0.00	84.24	303.23	1217.87	-0.98	-
734.35	0.00043	-3.20	-85.97	-	44.41	-	elastic	elastic	123.80	135.90	0.00	0.00	63.00	374.95	0.00	87.53	329.62	1244.25	12.11	-
733.95	0.00036	-3.04	-69.40	-	37.85	-	elastic	elastic	123.78	144.46	0.00	0.00	70.20	382.15	0.00	90.17	350.73	1265.36	20.69	-
733.55	0.00031	-2.91	-56.11	-	28.13	-	elastic	elastic	124.43	152.35	0.00	0.00	77.40	389.35	0.00	92.80	371.84	1286.47	27.93	-
733.15	0.00026	-2.79	-47.26	-	15.72	-	elastic	elastic	125.62	159.70	0.00	0.00	84.60	396.55	0.00	95.44	392.95	1307.59	34.08	-
732.70	0.00022	-2.69	-43.83	-	-0.92	-	elastic	elastic	125.91	165.82	3.00	3.00	90.00	401.95	0.00	97.41	408.78	1323.42	39.91	-
732.70	0.00022	-2.69	-43.83	-	-0.92	-	elastic	elastic	172.07	151.63	3.00	3.00	90.00	401.95	0.00	17.84	584.56	1328.25	-20.43	-
732.20	0.00017	-2.59	-42.07	-	7.26	-	elastic	elastic	171.96	159.64	8.00	8.00	96.00	407.95	0.00	20.42	598.86	1342.55	-12.31	-
731.70	0.00013	-2.52	-37.16	-	11.87	-	elastic	elastic	172.81	166.69	13.00	13.00	102.00	413.95	0.00	23.00	613.17	1356.86	-6.12	-
731.20	0.00009	-2.46	-30.65	-	13.81	-	elastic	elastic	174.52	172.87	18.00	18.00	108.00	419.95	0.00	25.58	627.47	1371.16	-1.65	-
730.70	0.00006	-2.43	-23.66	-	13.87	-	elastic	elastic	176.94	178.35	23.00	23.00	114.00	425.95	0.00	28.16	641.78	1385.47	1.41	-
730.20	0.00004	-2.40	-16.98	-	12.68	-	elastic	elastic	179.91	183.27	28.00	28.00	120.00	431.95	0.00	30.74	656.08	1399.77	3.36	-
729.70	0.00002	-2.39	-11.11	-	10.71	-	elastic	elastic	183.28	187.80	33.00	33.00	126.00	437.95	0.00	33.32	670.38	1414.07	4.52	-
729.20	0.00001	-2.38	-6.34	-	8.30	-	elastic	elastic	186.91	192.06	38.00	38.00	132.00	443.95	0.00	35.90	684.69	1428.38	5.15	-
728.70	0.00001	-2.38	-2.85	-	5.64	-	elastic	elastic	190.70	196.17	43.00	43.00	138.00	449.95	0.00	38.48	698.99	1442.68	5.47	-
728.20	0.00000	-2.38	-0.72	-	2.86	-	elastic	elastic	194.56	200.21	48.00	48.00	144.00	455.95	0.00	41.06	713.30	1456.99	5.66	-
727.70	0.00000	-2.37	0.00	-	0.00	-	elastic	elastic	198.43	204.23	53.00	53.00	150.00	461.95	0.00	43.64	727.60	1471.29	5.79	-

Strut n° 1 elevation 750.85 axial force 98.07 kN
 Strut n° 2 elevation 746.85 axial force 134.98 kN
 Strut n° 3 elevation 742.85 axial force 121.82 kN
 Strut n° 4 elevation 738.85 axial force 62.87 kN

limiting earth resistance [kN] = 4725 mobilised earth resistance [kN] = 1599 ratio (1) = 2.955

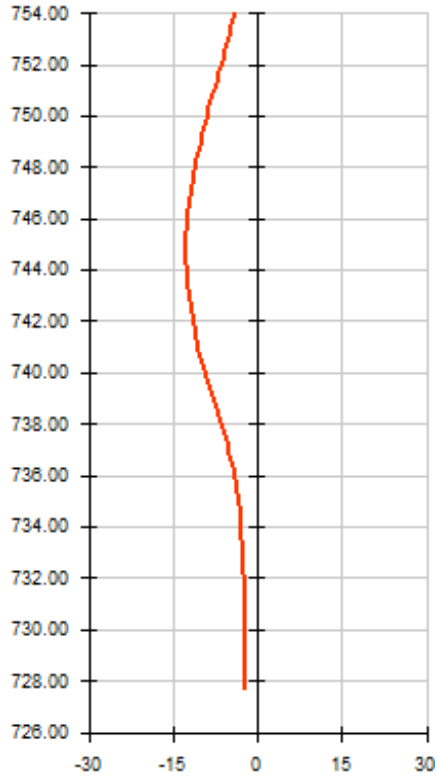


Calculated by: **AMRetain**



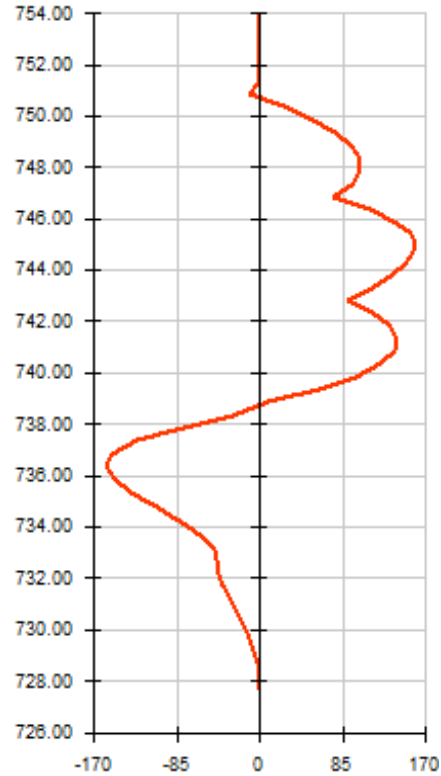
RESULTS (Phase 4)

Displacements [mm]



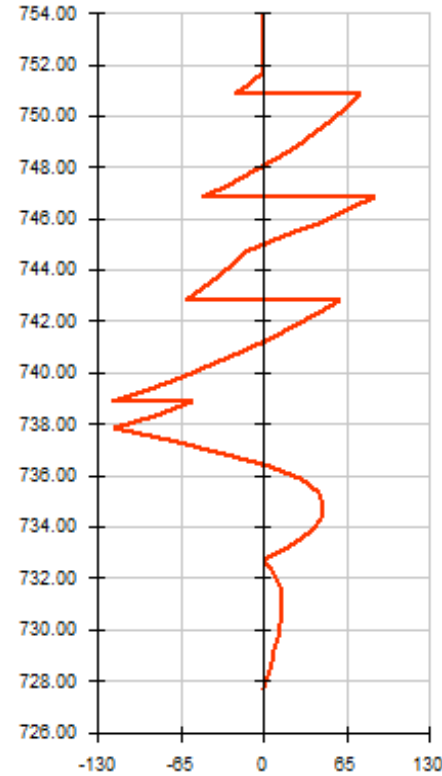
Dmax = -2.375
Dmin = -12.889

Moments [kNm]



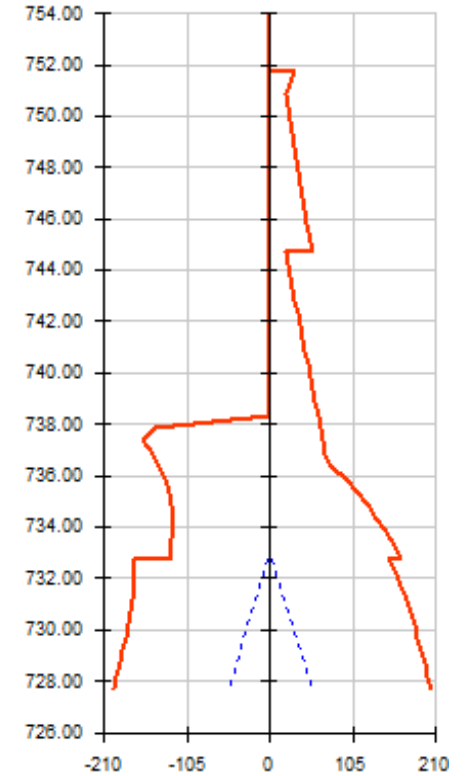
M.k max = 159.317
M.k min = -158.934

Shear forces [kN]



V.k max = 87.218
V.k min = -118.851

Earth/Water pressures [kN/m²]



P max = 204.229
P min = -198.435
Pw max = 53.000
Pw min = -53.000



Calculated by: **AMRetain**



RESULTS

PHASE 5

- excavation (left): zh [m] = 734.350 zw [m] = 733.000
 - installation of strut : n° 5 za[m] = 734.850 K [kN/m] = 12000

Calculation converged after 5 iterations.

Level [m]	Rotation [rad]	Displ. [mm]	Moment		Shear force		Soil status		Earth pressure		Water pressure		Vertical pressure		Limiting active pressure		Limiting passive		Diff. pressures	
			M.k [kNm]	M.d [kNm]	V.k [kN]	V.d [kN]	left	right	left [kN/m²]	right [kN/m²]	left [kN/m²]	right [kN/m²]	left [kN/m²]	right [kN/m²]	left [kN/m²]	right [kN/m²]	left [kN/m²]	right [kN/m²]	P.k [kN/m²]	P.d [kN/m²]
754.00	-0.00150	-3.22	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00	158.96	0.00	-
753.54	-0.00150	-3.91	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	27.13	0.00	0.00	0.00	183.33	0.00	-
753.08	-0.00150	-4.60	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	34.26	0.00	0.00	0.00	207.70	0.00	-
752.62	-0.00150	-5.29	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	41.39	0.00	0.00	0.00	232.07	0.00	-
752.16	-0.00150	-5.97	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	48.52	0.00	0.00	0.00	256.44	0.00	-
751.70	-0.00150	-6.66	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	55.65	0.00	0.00	0.00	280.81	0.00	-
751.70	-0.00150	-6.66	0.00	-	0.00	-	excavation	elastic	0.00	43.99	0.00	0.00	0.00	55.65	0.00	15.69	0.00	219.26	43.99	-
751.28	-0.00150	-7.30	-3.69	-	-16.73	-	excavation	elastic	0.00	34.75	0.00	0.00	0.00	63.73	0.00	17.97	0.00	251.08	34.75	-
750.85	-0.00151	-7.94	-13.70	-	-29.76	-	excavation	elastic	0.00	26.57	0.00	0.00	0.00	71.80	0.00	20.25	0.00	282.89	26.57	-
750.85	-0.00151	-7.94	-13.70	-	65.51	-	excavation	elastic	0.00	26.57	0.00	0.00	0.00	71.80	0.00	20.25	0.00	282.89	26.57	-
750.35	-0.00151	-8.69	15.77	-	52.41	-	excavation	elastic	0.00	25.85	0.00	0.00	0.00	81.30	0.00	22.93	0.00	320.32	25.85	-
749.85	-0.00148	-9.44	38.75	-	39.54	-	excavation	active press.	0.00	25.61	0.00	0.00	0.00	90.80	0.00	25.61	0.00	357.75	25.61	-
749.35	-0.00142	-10.17	55.21	-	26.07	-	excavation	active press.	0.00	28.28	0.00	0.00	0.00	100.30	0.00	28.29	0.00	395.18	28.28	-
748.85	-0.00136	-10.86	64.60	-	11.26	-	excavation	active press.	0.00	30.96	0.00	0.00	0.00	109.80	0.00	30.96	0.00	432.61	30.96	-
748.35	-0.00129	-11.53	66.25	-	-4.89	-	excavation	active press.	0.00	33.64	0.00	0.00	0.00	119.30	0.00	33.64	0.00	470.04	33.64	-
747.85	-0.00122	-12.15	59.49	-	-22.38	-	excavation	active press.	0.00	36.32	0.00	0.00	0.00	128.80	0.00	36.32	0.00	507.47	36.32	-
747.35	-0.00116	-12.74	43.64	-	-41.21	-	excavation	active press.	0.00	39.00	0.00	0.00	0.00	138.30	0.00	39.00	0.00	544.90	39.00	-
746.85	-0.00113	-13.31	18.05	-	-61.38	-	excavation	active press.	0.00	41.68	0.00	0.00	0.00	147.80	0.00	41.68	0.00	582.33	41.68	-
746.85	-0.00113	-13.31	18.05	-	87.13	-	excavation	active press.	0.00	41.68	0.00	0.00	0.00	147.80	0.00	41.68	0.00	582.33	41.68	-
746.35	-0.00108	-13.87	56.29	-	65.62	-	excavation	active press.	0.00	44.36	0.00	0.00	0.00	157.30	0.00	44.36	0.00	619.76	44.36	-
745.85	-0.00101	-14.39	83.44	-	42.77	-	excavation	active press.	0.00	47.04	0.00	0.00	0.00	166.80	0.00	47.04	0.00	657.19	47.04	-
745.47	-0.00093	-14.76	96.33	-	24.34	-	excavation	active press.	0.00	49.09	0.00	0.00	0.00	174.08	0.00	49.09	0.00	685.89	49.09	-
745.08	-0.00085	-15.10	102.00	-	5.13	-	excavation	active press.	0.00	51.15	0.00	0.00	0.00	181.37	0.00	51.15	0.00	714.59	51.15	-
744.70	-0.00076	-15.41	100.16	-	-14.87	-	excavation	active press.	0.00	53.20	0.00	0.00	0.00	188.65	0.00	53.20	0.00	743.28	53.20	-
744.70	-0.00076	-15.41	100.16	-	-14.87	-	excavation	active press.	0.00	19.35	0.00	0.00	0.00	188.65	0.00	19.35	0.00	698.02	19.35	-
744.24	-0.00066	-15.74	91.11	-	-24.52	-	excavation	active press.	0.00	22.39	0.00	0.00	0.00	196.98	0.00	22.39	0.00	722.43	22.39	-
743.78	-0.00058	-16.03	77.26	-	-35.58	-	excavation	active press.	0.00	25.44	0.00	0.00	0.00	205.30	0.00	25.44	0.00	746.84	25.44	-
743.31	-0.00051	-16.28	57.98	-	-48.05	-	excavation	active press.	0.00	28.49	0.00	0.00	0.00	213.63	0.00	28.49	0.00	771.25	28.49	-
742.85	-0.00046	-16.50	32.60	-	-61.93	-	excavation	active press.	0.00	31.53	0.00	0.00	0.00	221.95	0.00	31.53	0.00	795.66	31.53	-
742.85	-0.00046	-16.50	32.60	-	110.21	-	excavation	active press.	0.00	31.53	0.00	0.00	0.00	221.95	0.00	31.53	0.00	795.66	31.53	-
742.35	-0.00040	-16.72	83.62	-	93.62	-	excavation	active press.	0.00	34.83	0.00	0.00	0.00	230.95	0.00	34.83	0.00	822.05	34.83	-
741.85	-0.00028	-16.89	125.95	-	75.39	-	excavation	active press.	0.00	38.12	0.00	0.00	0.00	239.95	0.00	38.12	0.00	848.43	38.12	-
741.35	-0.00012	-16.99	158.74	-	55.50	-	excavation	active press.	0.00	41.42	0.00	0.00	0.00	248.95	0.00	41.42	0.00	874.82	41.42	-
740.85	-0.00007	-17.01	181.17	-	33.97	-	excavation	active press.	0.00	44.71	0.00	0.00	0.00	257.95	0.00	44.71	0.00	901.21	44.71	-
740.35	0.00027	-16.92	192.43	-	10.79	-	excavation	active press.	0.00	48.00	0.00	0.00	0.00	266.95	0.00	48.00	0.00	927.60	48.00	-



Calculated by: **AMRetain**



RESULTS

PHASE 5

Level [m]	Rotation [rad]	Displ. [mm]	Moment		Shear force		Soil status		Earth pressure		Water pressure		Vertical pressure		Limiting active pressure		limiting passive		Diff. pressures	
			M.k [kNm]	M.d [kNm]	V.k [kN]	V.d [kN]	left	right	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	P.k [kN/m ²]	P.d [kN/m ²]
739.85	0.00048	-16.73	191.69	-	-14.03	-	excavation	active press.	0.00	51.30	0.00	0.00	0.00	275.95	0.00	51.30	0.00	953.99	51.30	-
739.35	0.00069	-16.44	178.13	-	-40.50	-	excavation	active press.	0.00	54.59	0.00	0.00	0.00	284.95	0.00	54.59	0.00	980.37	54.59	-
738.85	0.00087	-16.05	150.91	-	-68.62	-	excavation	active press.	0.00	57.89	0.00	0.00	0.00	293.95	0.00	57.89	0.00	1006.76	57.89	-
738.85	0.00087	-16.05	150.91	-	91.54	-	excavation	active press.	0.00	57.89	0.00	0.00	0.00	293.95	0.00	57.89	0.00	1006.76	57.89	-
738.35	0.00106	-15.57	189.31	-	61.78	-	excavation	active press.	0.00	61.18	0.00	0.00	0.00	302.95	0.00	61.18	0.00	1033.15	61.18	-
737.85	0.00128	-14.98	212.42	-	30.36	-	excavation	active press.	0.00	64.47	0.00	0.00	0.00	311.95	0.00	64.47	0.00	1059.54	64.47	-
737.35	0.00152	-14.28	219.40	-	-2.70	-	excavation	active press.	0.00	67.77	0.00	0.00	0.00	320.95	0.00	67.77	0.00	1085.93	67.77	-
736.85	0.00176	-13.46	209.45	-	-37.40	-	excavation	active press.	0.00	71.06	0.00	0.00	0.00	329.95	0.00	71.06	0.00	1112.31	71.06	-
736.35	0.00198	-12.53	181.72	-	-73.76	-	excavation	active press.	0.00	74.36	0.00	0.00	0.00	338.95	0.00	74.36	0.00	1138.70	74.36	-
735.85	0.00215	-11.49	135.41	-	-111.76	-	excavation	active press.	0.00	77.65	0.00	0.00	0.00	347.95	0.00	77.65	0.00	1165.09	77.65	-
735.35	0.00226	-10.38	69.69	-	-151.41	-	excavation	active press.	0.00	80.94	0.00	0.00	0.00	356.95	0.00	80.94	0.00	1191.48	80.94	-
734.85	0.00229	-9.24	-16.27	-	-192.70	-	excavation	active press.	0.00	84.24	0.00	0.00	0.00	365.95	0.00	84.24	0.00	1217.87	84.24	-
734.85	0.00229	-9.24	-16.27	-	-123.13	-	excavation	active press.	0.00	84.24	0.00	0.00	0.00	365.95	0.00	84.24	0.00	1217.87	84.24	-
734.35	0.00224	-8.11	-88.50	-	-166.08	-	passive press.	active press.	144.90	87.53	0.00	0.00	0.00	374.95	0.00	87.53	144.90	1244.25	-57.37	-
733.95	0.00213	-7.23	-149.85	-	-139.43	-	passive press.	active press.	166.01	90.17	0.00	0.00	7.20	382.15	0.00	90.17	166.01	1265.36	-75.84	-
733.55	0.00198	-6.41	-199.21	-	-106.52	-	elastic	active press.	181.55	92.80	0.00	0.00	14.40	389.35	0.00	92.80	187.12	1286.47	-88.75	-
733.15	0.00178	-5.66	-235.22	-	-74.75	-	elastic	active press.	165.49	95.44	0.00	0.00	21.60	396.55	0.00	95.44	208.23	1307.59	-70.06	-
732.70	0.00154	-4.91	-262.69	-	-49.40	-	elastic	elastic	148.51	105.86	3.00	3.00	27.00	401.95	0.00	97.41	224.06	1323.42	-42.65	-
732.70	0.00154	-4.91	-262.69	-	-49.40	-	elastic	elastic	223.89	58.36	3.00	3.00	27.00	401.95	0.00	17.84	434.37	1328.25	-165.53	-
732.20	0.00124	-4.21	-269.12	-	18.79	-	elastic	elastic	198.68	91.47	8.00	8.00	33.00	407.95	0.00	20.42	448.67	1342.55	-107.21	-
731.70	0.00095	-3.67	-248.25	-	60.89	-	elastic	elastic	179.61	118.43	13.00	13.00	39.00	413.95	0.00	23.00	462.98	1356.86	-61.19	-
731.20	0.00070	-3.25	-211.60	-	82.83	-	elastic	elastic	166.26	139.68	18.00	18.00	45.00	419.95	0.00	25.58	477.28	1371.16	-26.58	-
730.70	0.00049	-2.96	-167.89	-	89.92	-	elastic	elastic	157.80	156.03	23.00	23.00	51.00	425.95	0.00	28.16	491.58	1385.47	-1.77	-
730.20	0.00033	-2.76	-123.43	-	86.54	-	elastic	elastic	153.24	168.49	28.00	28.00	57.00	431.95	0.00	30.74	505.89	1399.77	15.25	-
729.70	0.00021	-2.62	-82.53	-	76.10	-	elastic	elastic	151.56	178.06	33.00	33.00	63.00	437.95	0.00	33.32	520.19	1414.07	26.50	-
729.20	0.00014	-2.53	-48.10	-	61.01	-	elastic	elastic	151.83	185.70	38.00	38.00	69.00	443.95	0.00	35.90	534.50	1428.38	33.87	-
728.70	0.00010	-2.47	-22.04	-	42.81	-	elastic	elastic	153.24	192.17	43.00	43.00	75.00	449.95	0.00	38.48	548.80	1442.68	38.93	-
728.20	0.00009	-2.43	-5.66	-	22.35	-	elastic	elastic	155.21	198.10	48.00	48.00	81.00	455.95	0.00	41.06	563.10	1456.99	42.90	-
727.70	0.00009	-2.38	0.00	-	0.00	-	elastic	elastic	157.35	203.86	53.00	53.00	87.00	461.95	0.00	43.64	577.41	1471.29	46.51	-

Strut n° 1 elevation 750.85 axial force 95.28 kN
 Strut n° 2 elevation 746.85 axial force 148.51 kN
 Strut n° 3 elevation 742.85 axial force 172.15 kN
 Strut n° 4 elevation 738.85 axial force 160.17 kN
 Strut n° 5 elevation 734.85 axial force 69.57 kN

limiting earth resistance [kN] = 2839 mobilised earth resistance [kN] = 1101 ratio (1) = 2.579

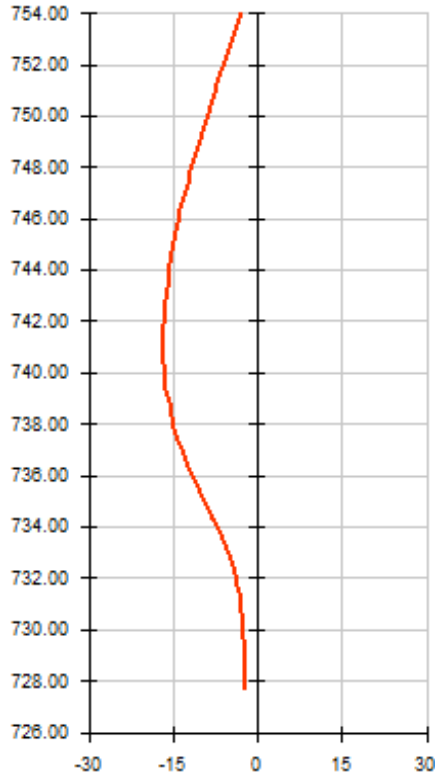


Calculated by: **AMRetain**



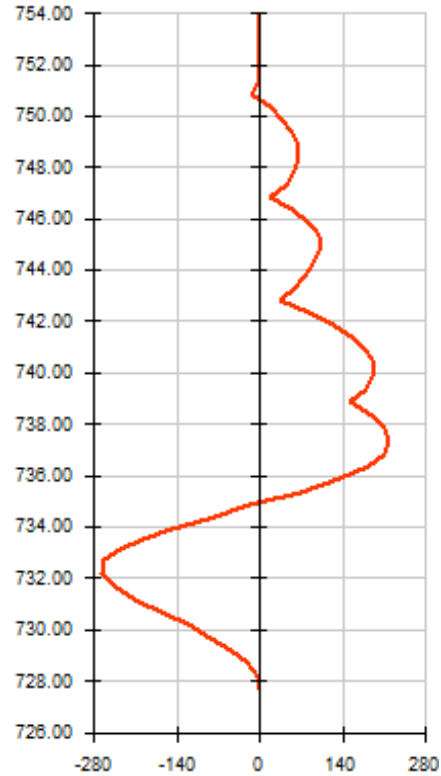
RESULTS (Phase 5)

Displacements [mm]



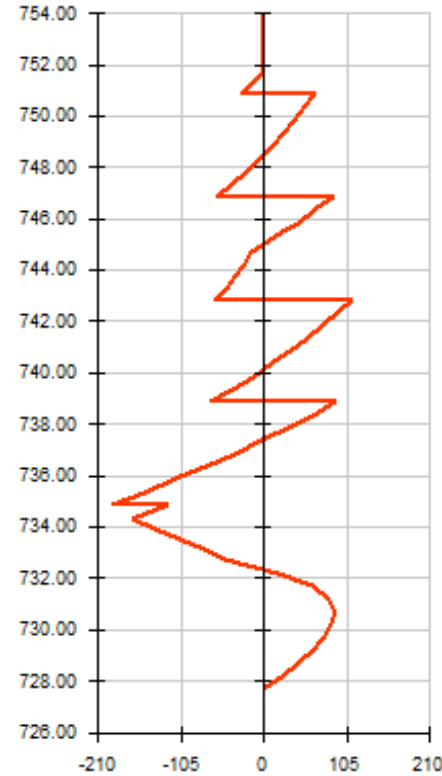
Dmax = -2.383
Dmin = -17.005

Moments [kNm]



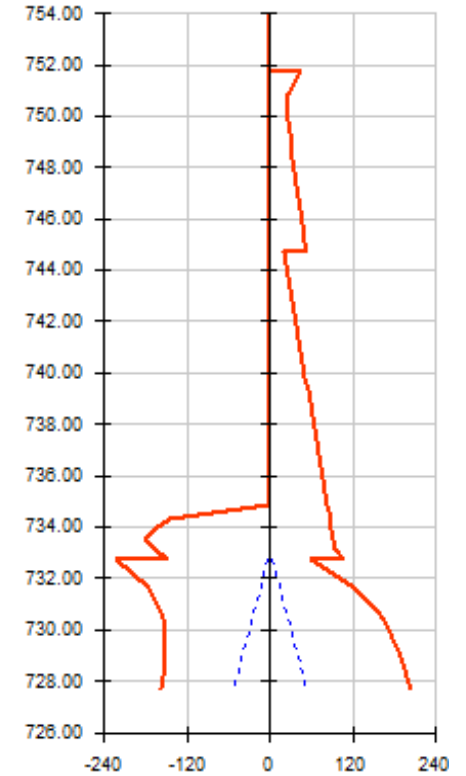
M.k max = 219.402
M.k min = -269.124

Shear forces [kN]



V.k max = 110.215
V.k min = -192.702

Earth/Water pressures [kN/m²]



P max = 203.862
P min = -223.889
Pw max = 53.000
Pw min = -53.000



Calculated by: **AMRetain**



RESULTS

PHASE 6

- excavation (left): zh [m] = 733.150 zw [m] = 733.000

Calculation converged after 4 iterations.

Level [m]	Rotation [rad]	Displ. [mm]	Moment		Shear force		Soil status		Earth pressure		Water pressure		Vertical pressure		Limiting active pressure		limiting passive		Diff. pressures	
			M.k [kNm]	M.d [kNm]	V.k [kN]	V.d [kN]	left	right	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	P.k [kN/m ²]	P.d [kN/m ²]
754.00	-0.00151	-3.13	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00	158.96	0.00	-
753.54	-0.00151	-3.83	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	27.13	0.00	0.00	0.00	183.33	0.00	-
753.08	-0.00151	-4.52	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	34.26	0.00	0.00	0.00	207.70	0.00	-
752.62	-0.00151	-5.22	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	41.39	0.00	0.00	0.00	232.07	0.00	-
752.16	-0.00151	-5.91	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	48.52	0.00	0.00	0.00	256.44	0.00	-
751.70	-0.00151	-6.61	0.00	-	0.00	-	excavation	not linked	0.00	0.00	0.00	0.00	0.00	55.65	0.00	0.00	0.00	280.81	0.00	-
751.70	-0.00151	-6.61	0.00	-	0.00	-	excavation	elastic	0.00	45.54	0.00	0.00	0.00	55.65	0.00	15.69	0.00	219.26	45.54	-
751.28	-0.00151	-7.25	-3.83	-	-17.36	-	excavation	elastic	0.00	36.16	0.00	0.00	0.00	63.73	0.00	17.97	0.00	251.08	36.16	-
750.85	-0.00152	-7.89	-14.23	-	-30.96	-	excavation	elastic	0.00	27.84	0.00	0.00	0.00	71.80	0.00	20.25	0.00	282.89	27.84	-
750.85	-0.00152	-7.89	-14.23	-	63.75	-	excavation	elastic	0.00	27.84	0.00	0.00	0.00	71.80	0.00	20.25	0.00	282.89	27.84	-
750.35	-0.00152	-8.65	14.21	-	50.06	-	excavation	elastic	0.00	26.94	0.00	0.00	0.00	81.30	0.00	22.93	0.00	320.32	26.94	-
749.85	-0.00149	-9.41	35.89	-	36.70	-	excavation	elastic	0.00	26.49	0.00	0.00	0.00	90.80	0.00	25.61	0.00	357.75	26.49	-
749.35	-0.00145	-10.14	50.82	-	22.84	-	excavation	elastic	0.00	28.92	0.00	0.00	0.00	100.30	0.00	28.29	0.00	395.18	28.92	-
748.85	-0.00138	-10.85	58.53	-	7.79	-	excavation	elastic	0.00	31.29	0.00	0.00	0.00	109.80	0.00	30.96	0.00	432.61	31.29	-
748.35	-0.00132	-11.53	58.42	-	-8.44	-	excavation	active press.	0.00	33.64	0.00	0.00	0.00	119.30	0.00	33.64	0.00	470.04	33.64	-
747.85	-0.00126	-12.17	49.88	-	-25.93	-	excavation	active press.	0.00	36.32	0.00	0.00	0.00	128.80	0.00	36.32	0.00	507.47	36.32	-
747.35	-0.00121	-12.79	32.27	-	-44.76	-	excavation	active press.	0.00	39.00	0.00	0.00	0.00	138.30	0.00	39.00	0.00	544.90	39.00	-
746.85	-0.00119	-13.39	4.90	-	-64.93	-	excavation	active press.	0.00	41.68	0.00	0.00	0.00	147.80	0.00	41.68	0.00	582.33	41.68	-
746.85	-0.00119	-13.39	4.90	-	84.51	-	excavation	active press.	0.00	41.68	0.00	0.00	0.00	147.80	0.00	41.68	0.00	582.33	41.68	-
746.35	-0.00117	-13.98	41.83	-	63.00	-	excavation	active press.	0.00	44.36	0.00	0.00	0.00	157.30	0.00	44.36	0.00	619.76	44.36	-
745.85	-0.00111	-14.55	67.68	-	40.15	-	excavation	active press.	0.00	47.04	0.00	0.00	0.00	166.80	0.00	47.04	0.00	657.19	47.04	-
745.47	-0.00105	-14.97	79.56	-	21.73	-	excavation	active press.	0.00	49.09	0.00	0.00	0.00	174.08	0.00	49.09	0.00	685.89	49.09	-
745.08	-0.00098	-15.35	84.24	-	2.52	-	excavation	active press.	0.00	51.15	0.00	0.00	0.00	181.37	0.00	51.15	0.00	714.59	51.15	-
744.70	-0.00091	-15.71	81.39	-	-17.48	-	excavation	active press.	0.00	53.20	0.00	0.00	0.00	188.65	0.00	53.20	0.00	743.28	53.20	-
744.70	-0.00091	-15.71	81.39	-	-17.48	-	excavation	active press.	0.00	19.35	0.00	0.00	0.00	188.65	0.00	19.35	0.00	698.02	19.35	-
744.24	-0.00083	-16.11	71.13	-	-27.13	-	excavation	active press.	0.00	22.39	0.00	0.00	0.00	196.98	0.00	22.39	0.00	722.43	22.39	-
743.78	-0.00076	-16.48	56.08	-	-38.20	-	excavation	active press.	0.00	25.44	0.00	0.00	0.00	205.30	0.00	25.44	0.00	746.84	25.44	-
743.31	-0.00072	-16.82	35.58	-	-50.67	-	excavation	active press.	0.00	28.49	0.00	0.00	0.00	213.63	0.00	28.49	0.00	771.25	28.49	-
742.85	-0.00069	-17.15	8.99	-	-64.55	-	excavation	active press.	0.00	31.53	0.00	0.00	0.00	221.95	0.00	31.53	0.00	795.66	31.53	-
742.85	-0.00069	-17.15	8.99	-	115.37	-	excavation	active press.	0.00	31.53	0.00	0.00	0.00	221.95	0.00	31.53	0.00	795.66	31.53	-
742.35	-0.00065	-17.49	62.60	-	98.78	-	excavation	active press.	0.00	34.83	0.00	0.00	0.00	230.95	0.00	34.83	0.00	822.05	34.83	-
741.85	-0.00056	-17.79	107.50	-	80.54	-	excavation	active press.	0.00	38.12	0.00	0.00	0.00	239.95	0.00	38.12	0.00	848.43	38.12	-
741.35	-0.00042	-18.04	142.87	-	60.66	-	excavation	active press.	0.00	41.42	0.00	0.00	0.00	248.95	0.00	41.42	0.00	874.82	41.42	-
740.85	-0.00025	-18.20	167.88	-	39.13	-	excavation	active press.	0.00	44.71	0.00	0.00	0.00	257.95	0.00	44.71	0.00	901.21	44.71	-
740.35	-0.00005	-18.28	181.72	-	15.95	-	excavation	active press.	0.00	48.00	0.00	0.00	0.00	266.95	0.00	48.00	0.00	927.60	48.00	-
739.85	0.00015	-18.26	183.56	-	-8.88	-	excavation	active press.	0.00	51.30	0.00	0.00	0.00	275.95	0.00	51.30	0.00	953.99	51.30	-



Calculated by: **AMRetain**



RESULTS

PHASE 6

Level [m]	Rotation [rad]	Displ. [mm]	Moment		Shear force		Soil status		Earth pressure		Water pressure		Vertical pressure		Limiting active pressure		limiting passive		Diff. pressures	
			M.k [kNm]	M.d [kNm]	V.k [kN]	V.d [kN]	left	right	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	left [kN/m ²]	right [kN/m ²]	P.k [kN/m ²]	P.d [kN/m ²]
739.35	0.00034	-18.13	172.57	-	-35.35	-	excavation	active press.	0.00	54.59	0.00	0.00	0.00	284.95	0.00	54.59	0.00	980.37	54.59	-
738.85	0.00052	-17.92	147.93	-	-63.47	-	excavation	active press.	0.00	57.89	0.00	0.00	0.00	293.95	0.00	57.89	0.00	1006.76	57.89	-
738.85	0.00052	-17.92	147.93	-	119.14	-	excavation	active press.	0.00	57.89	0.00	0.00	0.00	293.95	0.00	57.89	0.00	1006.76	57.89	-
738.35	0.00071	-17.61	200.13	-	89.37	-	excavation	active press.	0.00	61.18	0.00	0.00	0.00	302.95	0.00	61.18	0.00	1033.15	61.18	-
737.85	0.00096	-17.19	237.03	-	57.96	-	excavation	active press.	0.00	64.47	0.00	0.00	0.00	311.95	0.00	64.47	0.00	1059.54	64.47	-
737.35	0.00123	-16.65	257.81	-	24.90	-	excavation	active press.	0.00	67.77	0.00	0.00	0.00	320.95	0.00	67.77	0.00	1085.93	67.77	-
736.85	0.00152	-15.96	261.65	-	-9.81	-	excavation	active press.	0.00	71.06	0.00	0.00	0.00	329.95	0.00	71.06	0.00	1112.31	71.06	-
736.35	0.00180	-15.13	247.73	-	-46.16	-	excavation	active press.	0.00	74.36	0.00	0.00	0.00	338.95	0.00	74.36	0.00	1138.70	74.36	-
735.85	0.00206	-14.16	215.21	-	-84.17	-	excavation	active press.	0.00	77.65	0.00	0.00	0.00	347.95	0.00	77.65	0.00	1165.09	77.65	-
735.35	0.00227	-13.08	163.29	-	-123.81	-	excavation	active press.	0.00	80.94	0.00	0.00	0.00	356.95	0.00	80.94	0.00	1191.48	80.94	-
734.85	0.00241	-11.91	91.12	-	-165.11	-	excavation	active press.	0.00	84.24	0.00	0.00	0.00	365.95	0.00	84.24	0.00	1217.87	84.24	-
734.85	0.00241	-11.91	91.12	-	-63.53	-	excavation	active press.	0.00	84.24	0.00	0.00	0.00	365.95	0.00	84.24	0.00	1217.87	84.24	-
734.35	0.00248	-10.68	48.69	-	-106.47	-	excavation	active press.	0.00	87.53	0.00	0.00	0.00	374.95	0.00	87.53	0.00	1244.25	87.53	-
733.95	0.00251	-9.69	-0.97	-	-142.01	-	excavation	active press.	0.00	90.17	0.00	0.00	0.00	382.15	0.00	90.17	0.00	1265.36	90.17	-
733.55	0.00248	-8.69	-65.05	-	-178.60	-	excavation	active press.	0.00	92.80	0.00	0.00	0.00	389.35	0.00	92.80	0.00	1286.47	92.80	-
733.15	0.00238	-7.71	-143.99	-	-216.25	-	passive press.	active press.	144.90	95.44	0.00	0.00	0.00	396.55	0.00	95.44	144.90	1307.59	-49.46	-
732.70	0.00219	-6.68	-235.83	-	-190.88	-	passive press.	active press.	160.73	97.41	3.00	3.00	5.40	401.95	0.00	97.41	160.73	1323.42	-63.32	-
732.70	0.00219	-6.68	-235.83	-	-190.88	-	elastic	active press.	284.08	17.84	3.00	3.00	5.40	401.95	0.00	17.84	382.87	1328.25	-266.24	-
732.20	0.00190	-5.65	-300.17	-	-70.83	-	elastic	elastic	244.93	31.00	8.00	8.00	11.40	407.95	0.00	20.42	397.18	1342.55	-213.94	-
731.70	0.00156	-4.79	-311.87	-	17.98	-	elastic	elastic	212.57	71.26	13.00	13.00	17.40	413.95	0.00	23.00	411.48	1356.86	-141.30	-
731.20	0.00123	-4.09	-287.65	-	74.03	-	elastic	elastic	187.31	104.42	18.00	18.00	23.40	419.95	0.00	25.58	425.79	1371.16	-82.89	-
730.70	0.00093	-3.55	-242.16	-	104.17	-	elastic	elastic	168.65	130.97	23.00	23.00	29.40	425.95	0.00	28.16	440.09	1385.47	-37.69	-
730.20	0.00070	-3.15	-186.78	-	114.51	-	elastic	elastic	155.59	151.93	28.00	28.00	35.40	431.95	0.00	30.74	454.39	1399.77	-3.66	-
729.70	0.00052	-2.85	-130.13	-	110.00	-	elastic	elastic	146.86	168.55	33.00	33.00	41.40	437.95	0.00	33.32	468.70	1414.07	21.68	-
729.20	0.00041	-2.62	-78.64	-	94.35	-	elastic	elastic	141.18	182.12	38.00	38.00	47.40	443.95	0.00	35.90	483.00	1428.38	40.94	-
728.70	0.00034	-2.43	-37.23	-	70.00	-	elastic	elastic	137.37	193.83	43.00	43.00	53.40	449.95	0.00	38.48	497.31	1442.68	56.46	-
728.20	0.00032	-2.27	-9.86	-	38.34	-	elastic	elastic	134.48	204.62	48.00	48.00	59.40	455.95	0.00	41.06	511.61	1456.99	70.14	-
727.70	0.00031	-2.12	0.00	-	0.00	-	elastic	elastic	131.88	215.11	53.00	53.00	65.40	461.95	0.00	43.64	525.91	1471.29	83.23	-

Strut n° 1 elevation 750.85 axial force 94.71 kN
 Strut n° 2 elevation 746.85 axial force 149.44 kN
 Strut n° 3 elevation 742.85 axial force 179.92 kN
 Strut n° 4 elevation 738.85 axial force 182.61 kN
 Strut n° 5 elevation 734.85 axial force 101.58 kN

limiting earth resistance [kN] = 2341 mobilised earth resistance [kN] = 937 ratio (1) = 2.498

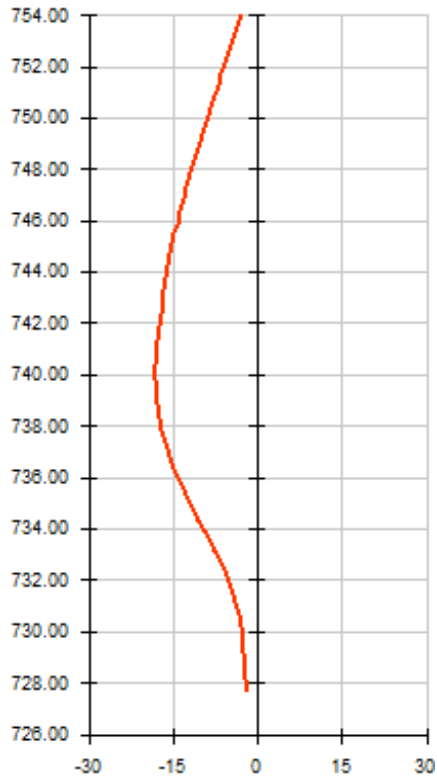


Calculated by: **AMRetain**



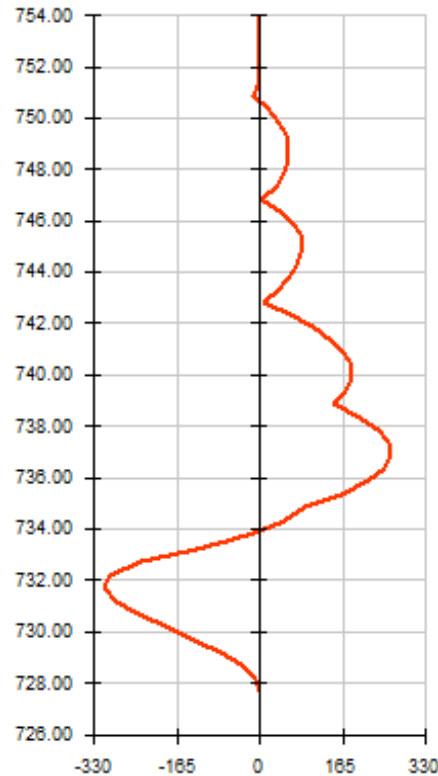
RESULTS (Phase 6)

Displacements [mm]



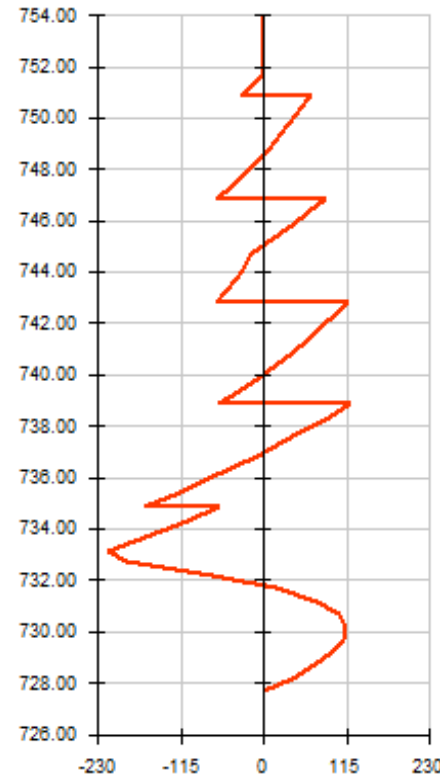
Dmax = -2.115
Dmin = -18.281

Moments [kNm]



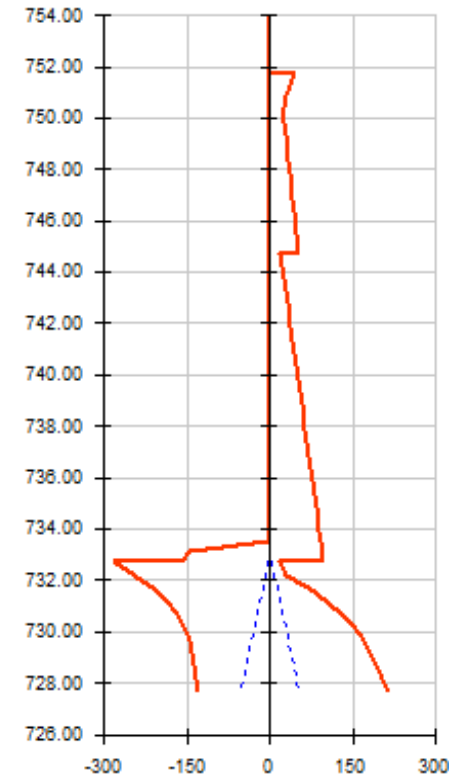
M.k max = 261.652
M.k min = -311.866

Shear forces [kN]



V.k max = 119.137
V.k min = -216.252

Earth/Water pressures [kN/m²]



P max = 215.115
P min = -284.078
Pw max = 53.000
Pw min = -53.000



Calculated by: **AMRetain**



RESULTS (Synthesis)

Phase N°	Displac. Head mm	Displac. max mm	Moment max kNm	Shear force max kN	Ratio Earth resist.	Strut 1 kN	Strut 2 kN	Strut 3 kN	Strut 4 kN	Strut 5 kN
1	-2.83	-2.83	-36.72	-20.04	4.793	22.272	-	-	-	-
2	-7.61	-7.61	-98.13	-69.66	4.141	81.604	47.856	-	-	-
3	-6.56	-9.07	136.46	-94.98	3.533	97.588	95.618	42.545	-	-
4	-4.22	-12.89	159.32	-118.85	2.955	98.071	134.980	121.820	62.869	-
5	-3.22	-17.01	-269.12	-192.70	2.579	95.275	148.510	172.150	160.170	69.569
6	-3.13	-18.28	-311.87	-216.25	2.498	94.714	149.440	179.920	182.610	101.580
Extrema	-7.61	-18.28	-311.87	-216.25	2.498	98.071	149.440	179.920	182.610	101.580

RESULTS (Envelope phases 5 to 6)

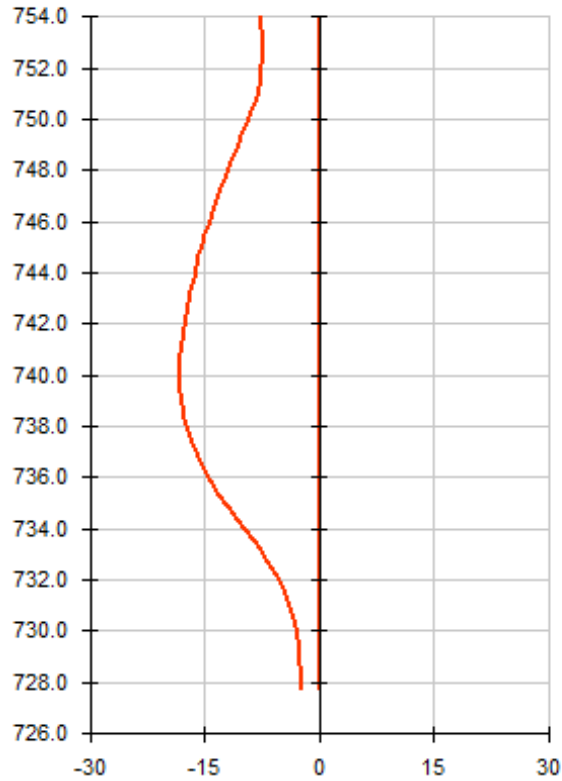
Level [m]	Moment		Shear force		Displacement	
	min [kNm]	max [kNm]	min [kN]	max [kN]	min [mm]	max [mm]
0.000	0.00	0.00	0.00	0.00	0.00	0.00
754.000	0.00	0.00	0.00	0.00	-7.61	0.00
753.540	0.00	0.00	0.00	0.00	-7.49	0.00
753.080	0.00	0.00	0.00	0.00	-7.37	0.00
752.620	0.00	0.00	0.00	0.00	-7.25	0.00
752.160	0.00	0.00	0.00	0.00	-7.48	0.00
751.700	0.00	0.00	0.00	0.00	-7.71	0.00
751.700	0.00	0.00	0.00	0.00	-7.71	0.00
751.275	-3.83	0.00	-17.36	0.00	-7.92	0.00
750.850	-14.23	0.00	-30.96	82.31	-8.17	0.00
750.350	-5.36	32.30	-3.80	71.52	-8.80	0.00
749.850	-10.24	65.08	-15.93	59.39	-9.44	0.00
749.350	-19.96	91.46	-20.04	45.91	-10.17	0.00
748.850	-28.66	110.77	-14.41	31.10	-10.86	0.00
748.350	-34.24	122.34	-8.44	14.95	-11.53	0.00
747.850	-36.72	125.50	-25.93	0.00	-12.17	0.00
747.350	-36.36	119.57	-44.76	3.12	-12.79	0.00
746.850	-33.86	103.90	-64.93	87.22	-13.39	0.00
746.350	-29.93	125.62	-31.18	65.71	-13.98	0.00
745.850	-25.10	140.68	-54.03	42.86	-14.55	0.00
745.467	-20.98	153.61	-66.95	24.43	-14.97	0.00
745.083	-41.46	159.32	-69.66	11.86	-15.35	0.00
744.700	-67.05	157.51	-62.16	12.64	-15.71	0.00
744.700	-67.05	157.51	-62.16	12.64	-15.71	0.00
744.238	-88.49	148.50	-57.57	9.75	-16.11	0.00
743.775	-97.74	134.70	-68.63	7.19	-16.48	0.00
743.313	-98.13	115.45	-81.10	6.63	-16.82	0.00
742.850	-92.45	90.12	-94.98	115.37	-17.15	0.00
742.350	-82.09	116.03	-69.03	98.78	-17.49	0.00
741.850	-83.05	133.24	-87.27	80.54	-17.79	0.00
741.350	-116.35	158.74	-46.86	60.66	-18.04	0.00
740.850	-131.12	181.17	-16.26	39.13	-18.20	0.00
740.350	-131.56	192.43	-39.43	21.97	-18.28	0.00
739.850	-122.23	191.69	-64.26	25.76	-18.26	0.00
739.350	-106.91	178.13	-90.73	34.54	-18.13	0.00
738.850	-88.52	150.91	-118.85	119.14	-17.92	0.00
738.350	-69.15	200.13	-85.75	89.37	-17.61	0.00
737.850	-78.50	237.03	-117.16	57.96	-17.19	0.00
737.350	-126.51	257.81	-73.85	33.12	-16.65	0.00

RESULTS (Envelope phases 5 to 6)

Level [m]	Moment		Shear force		Displacement	
	min [kNm]	max [kNm]	min [kN]	max [kN]	min [mm]	max [mm]
736.850	-152.45	261.65	-37.40	28.82	-15.96	0.00
736.350	-158.93	247.73	-73.76	24.08	-15.13	0.00
735.850	-150.22	215.21	-111.76	28.88	-14.16	0.00
735.350	-131.93	163.29	-151.41	42.61	-13.08	0.00
734.850	-109.14	91.12	-192.70	47.19	-11.91	0.00
734.350	-88.50	48.69	-166.08	44.41	-10.68	0.00
733.950	-149.85	22.42	-142.01	37.85	-9.69	0.00
733.550	-199.21	19.41	-178.60	28.13	-8.69	0.00
733.150	-235.22	13.55	-216.25	15.72	-7.71	0.00
732.700	-262.69	3.02	-190.88	0.00	-6.68	0.00
732.200	-300.17	0.00	-70.83	18.79	-5.65	0.00
731.700	-311.87	0.00	-7.51	60.89	-4.79	0.00
731.200	-287.65	0.00	-0.93	82.83	-4.09	0.00
730.700	-242.16	0.00	0.00	104.17	-3.55	0.00
730.200	-186.78	0.00	0.00	114.51	-3.15	0.00
729.700	-130.13	0.00	0.00	110.00	-2.85	0.00
729.200	-78.64	0.00	0.00	94.35	-2.62	0.00
728.700	-37.23	0.00	0.00	70.00	-2.47	0.00
728.200	-9.86	0.00	0.00	38.34	-2.43	0.00
727.700	0.00	0.00	0.00	0.00	-2.38	0.00

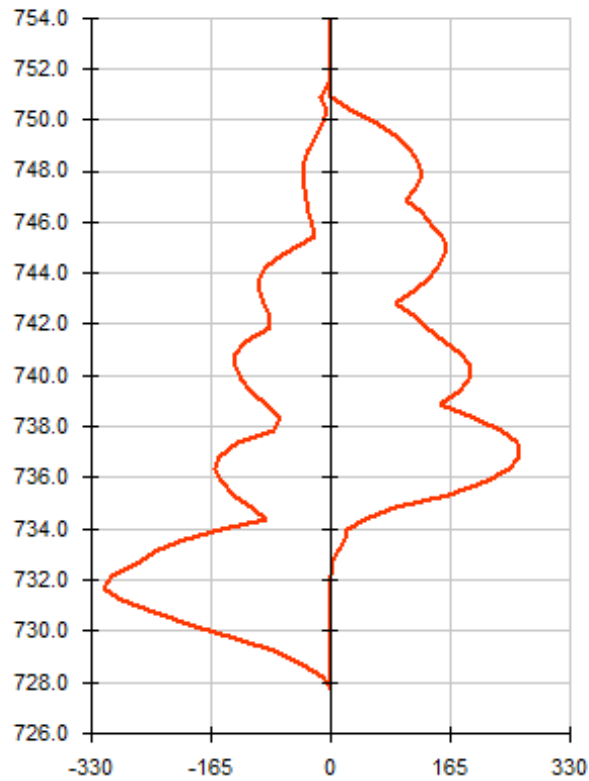
RESULTS (Envelope phases 1 to 6)

Displacements [mm]



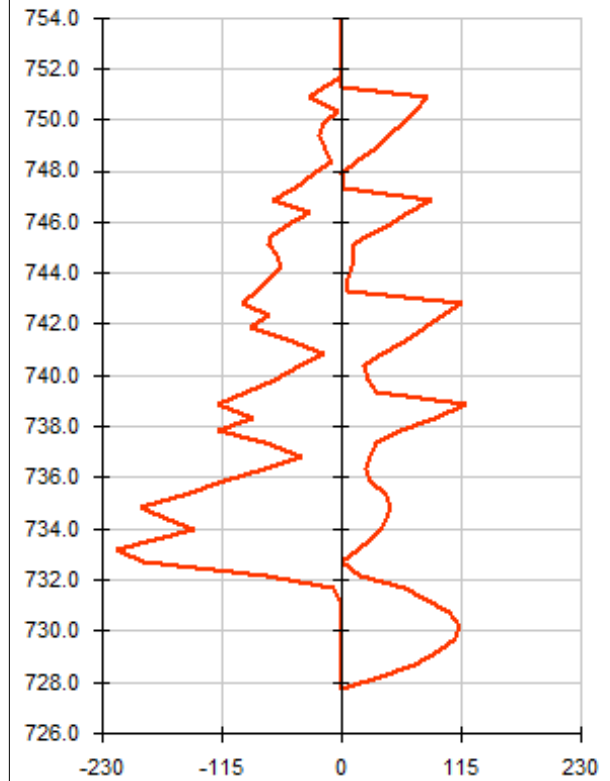
Max = 0.00
Min = -18.28

Moments [kNm]



Max = 261.65
Min = -311.87

Shear forces [kN]



Max = 119.14
Min = -216.25



Calculated by: **AMRetain**

