COMMITTENTE:

RFI RETE FERROVIARIA ITALIANA
GRUPPO FERROVIE DELLO STATO ITALIANE

DIREZIONE LAVORI:

ITALFERR
GRUPPO FERROVIE DELLO STATO ITALIANE

APPALTATORE:

PIZZAROTTI FONDATA NEL 1910 | Ghella 5 Generations of Tunnelers | ITINERA | SALCEF GROUP SALCEF CONSTRUCTION | EdS INFRASTRUTTURE Engineering & Construction

PROGETTAZIONE:	PROGETTISTA:	DIRETTORE DELLA PROGETTAZIONE
RAGGRUPPAMENTO TEMPORANEO PROGETTISTI GEODATA ENGINEERING – INTEGRA – RINA	Ing. Fabio RIZZO	Ing. Piergiorgio GRASSO Responsabile integrazione fra le varie prestazioni specialistiche

PROGETTO ESECUTIVO

ITINERARIO NAPOLI – BARI
RADDOPPIO TRATTA CANCELLO-BENEVENTO
II LOTTO FUNZIONALE FRASSO TELESINO – VITULANO
1° LOTTO FUNZIONALE FRASSO TELESINO- TELESE

FA05 - AREA DI SOCCORSO AL KM 25+135

Relazione di calcolo paratia del piazzale FA05 – Allegati

APPALTATORE		SCALA:
IMPRESA PIZZAROTTI & C. S.p.A. Dott. Ing. Sabino Del Balzo IL DIRETTORE TECNICO Ing. Sabino DEL BALZO IL DIRETTORE TECNICO Ing. S. Del Balzo 23/06/2020		-

COMMESSA	LOTTO	FASE	ENTE	TIPO DOC.	OPERA/DISCIPLINA	PROGR.	REV.
I F 2 6	1 2	E	Z Z	C L	F A 0 5 0 0	0 0 3	A

Rev.	Descrizione	Redatto	Data	Verificato	Data	Approvato	Data	Autorizzato Data
A	Emissione	G. Brino	18/06/2020	A. Fernandez	19/06/2020	P. Grasso	23/06/2020	Ing. Fabio RIZZO 23/06/2020

File:IF26.1.2.E.ZZ.CL.FA.05.0.0.003.A		n. Elab.:

Indice

1 GENERALITA'

La presente relazione riporta gli allegati di calcolo alla relazione IF2612EZZCLGA0200010A dell'analisi geotecnica e strutturale delle opere all'Imbocco Sud lato Cancello e della Sezione Tipo F, nell'ambito della redazione degli elaborati tecnici del Progetto Esecutivo (PE) per il Raddoppio dell'Itinerario Ferroviario Napoli-Bari nella Tratta Cancello–Benevento / 2° Lotto Funzionale Frasso Telesino – Vitulano.

2 DOCUMENTI DI RIFERIMENTO

I documenti di Progetto Esecutivo citati nel report sono di seguito elencati:

Rif. [I] IF26.1.2.E.ZZ.CL.FA.05.0.0.002: FA05 - AREA DI SOCCORSO AL KM 25+135 - Relazione di calcolo paratia del piazzale FA05

PLAXIS Report

Click here and press F9 key for TOC

1.1.1.1.1.1 Materials - Soil and interfaces - Hardening soil (1/3)

Identification		**MDL1**	**MDL1_interf**	**MDL2**	**MDL2_interf**	**MDL3**
Identification number		1	2	3	4	5
Drainage type		Drained	Drained	Drained	Drained	Drained
Colour						
Comments		GHIAIA SABBIOSA	GHIAIA SABBIOSA	SABBIA, SABBIA LIMOSA	SABBIA, SABBIA LIMOSA	ARGILLA LIMOSA
γ_{unsat}	kN/m³	20.00	20.00	20.00	20.00	20.00
γ_{sat}	kN/m³	20.00	20.00	20.00	20.00	20.00
Dilatancy cut-off		No	No	No	No	No
e_{init}		0.5000	0.5000	0.5000	0.5000	0.9800
e_{min}		0.000	0.000	0.000	0.000	0.000
e_{max}		999.0	999.0	999.0	999.0	999.0
Rayleigh α		0.000	0.000	0.000	0.000	0.000
Rayleigh β		0.000	0.000	0.000	0.000	0.000
E_{50}^{ref}	kN/m²	120.0E3	120.0E3	60.00E3	60.00E3	50.00E3
E_{oed}^{ref}	kN/m²	110.7E3	110.7E3	60.00E3	60.00E3	50.00E3
E_{ur}^{ref}	kN/m²	240.0E3	240.0E3	120.0E3	120.0E3	150.0E3
power (m)		0.5000	0.5000	0.5000	0.5000	0.5000
Use alternatives		No	No	No	No	No
C_c		3.115E-3	3.115E-3	5.750E-3	5.750E-3	9.108E-3
C_s		1.294E-3	1.294E-3	2.587E-3	2.587E-3	2.732E-3
e_{init}		0.5000	0.5000	0.5000	0.5000	0.9800
c_{ref}	kN/m²	0.000	0.000	0.1000	0.1000	10.00
φ (phi)	°	38.00	38.00	32.00	32.00	24.00
ψ (psi)	°	0.000	0.000	0.000	0.000	0.000
Set to default values		No	No	Yes	Yes	Yes
v_{ur}		0.2000	0.2000	0.2000	0.2000	0.2000
p_{ref}	kN/m²	100.0	100.0	100.0	100.0	100.0
K_0^{nc}		0.4087	0.4087	0.4701	0.4701	0.5933
c_{inc}	kN/m²/m	0.000	0.000	0.000	0.000	0.000
y_{ref}	m	0.000	0.000	0.000	0.000	0.000
R_f		0.9000	0.9000	0.9000	0.9000	0.9000
Tension cut-off		Yes	Yes	Yes	Yes	Yes
Tensile strength	kN/m²	0.000	0.000	0.000	0.000	0.000
Undrained behaviour		Standard	Standard	Standard	Standard	Standard

Identification		**MDL1**	**MDL1_interf**	**MDL2**	**MDL2_interf**	**MDL3**
Skempton-B		0.9866	0.9866	0.9866	0.9866	0.9866
v_u		0.4950	0.4950	0.4950	0.4950	0.4950
$K_{w,ref}$ / n	kN/m²	9.833E6	9.833E6	4.917E6	4.917E6	6.146E6
Strength		Manual	Manual	Manual	Manual	Manual
R_{inter}		0.6000	0.01000	0.6000	0.01000	0.6000
Consider gap closure		Yes	Yes	Yes	Yes	Yes
δ_{inter}		0.000	0.000	0.000	0.000	0.000
Cross permeability		Impermeable	Impermeable	Impermeable	Impermeable	Impermeable
Drainage conductivity, dk	m³/s/m	0.000	0.000	0.000	0.000	0.000
K_0 determination		Automatic	Automatic	Automatic	Automatic	Automatic
$K_{0,x} = K_{0,z}$		Yes	Yes	Yes	Yes	Yes
$K_{0,x}$		0.4087	0.4087	0.4701	0.4701	0.5933
$K_{0,z}$		0.4087	0.4087	0.4701	0.4701	0.5933
OCR		1.000	1.000	1.000	1.000	1.000
POP	kN/m²	0.000	0.000	0.000	0.000	0.000
Data set		Standard	Standard	Standard	Standard	Standard
Type		Coarse	Coarse	Coarse	Coarse	Coarse
< 2 µm	%	10.00	10.00	10.00	10.00	10.00
2 µm - 50 µm	%	13.00	13.00	13.00	13.00	13.00
50 µm - 2 mm	%	77.00	77.00	77.00	77.00	77.00
Use defaults		None	None	None	None	None
k_x	m/s	0.01000E-3	0.000	0.1000E-3	0.000	0.08000E-6
k_y	m/s	0.01000E-3	0.000	0.1000E-3	0.000	0.08000E-6
$-\psi_{unsat}$	m	10.00E3	10.00E3	10.00E3	10.00E3	10.00E3
e_{init}		0.5000	0.5000	0.5000	0.5000	0.9800
S_s	1/m	0.000	0.000	0.000	0.000	0.000
c_k		1000E12	1000E12	1000E12	1000E12	1000E12

1.1.1.1.1.2 Materials - Soil and interfaces - Hardening soil (2/3)

Identification		**MDL3_interf**	**MDL4**	**MDL4_interf**	**Rv**	**TGC2**
Identification number		6	7	8	9	10
Drainage type		Drained	Drained	Drained	Drained	Drained
Colour						
Comments		ARGILLA LIMOSA	TRAVERTINO	TRAVERTINO		
γ_{unsat}	kN/m³	20.00	20.00	20.00	20.00	18.50
γ_{sat}	kN/m³	20.00	20.00	20.00	20.00	18.50
Dilatancy cut-off		No	No	No	No	No
e_{init}		0.5000	0.5000	0.5000	0.5000	0.5000
e_{min}		0.000	0.000	0.000	0.000	0.000
e_{max}		999.0	999.0	999.0	999.0	999.0
Rayleigh α		0.000	0.000	0.000	0.000	0.000
Rayleigh β		0.000	0.000	0.000	0.000	0.000
E_{50}^{ref}	kN/m²	50.00E3	200.0E3	200.0E3	20.00E3	35.00E3
E_{oed}^{ref}	kN/m²	50.00E3	200.0E3	200.0E3	19.19E3	34.46E3
E_{ur}^{ref}	kN/m²	150.0E3	600.0E3	600.0E3	40.00E3	70.00E3
power (m)		0.5000	0.5000	0.5000	0.5000	0.5000
Use alternatives		No	No	No	No	No
C_c		6.900E-3	1.725E-3	1.725E-3	0.01798	0.01001
C_s		2.070E-3	0.5175E-3	0.5175E-3	7.762E-3	4.436E-3
e_{init}		0.5000	0.5000	0.5000	0.5000	0.5000
c_{ref}	kN/m²	10.00	30.00	30.00	0.1000	0.1000
φ (phi)	°	24.00	34.00	34.00	35.00	33.00
ψ (psi)	°	0.000	0.000	0.000	0.000	0.000
Set to default values		Yes	Yes	Yes	No	No
v_{ur}		0.2000	0.2000	0.2000	0.2000	0.2000
p_{ref}	kN/m²	100.0	100.0	100.0	100.0	100.0
K_0^{nc}		0.5933	0.4408	0.4408	0.4393	0.4603
c_{inc}	kN/m²/m	0.000	0.000	0.000	0.000	0.000
y_{ref}	m	0.000	0.000	0.000	0.000	0.000
R_f		0.9000	0.9000	0.9000	0.9000	0.9000
Tension cut-off		Yes	Yes	Yes	Yes	Yes
Tensile strength	kN/m²	0.000	0.000	0.000	0.000	0.000
Undrained behaviour		Standard	Standard	Standard	Standard	Standard

Identification		MDL3_interf	MDL4	MDL4_interf	Rv	TGC2
Skempton-B		0.9866	0.9866	0.9866	0.9866	0.9866
v_u		0.4950	0.4950	0.4950	0.4950	0.4950
$K_{w,ref}$ / n	kN/m²	6.146E6	24.58E6	24.58E6	1.639E6	2.868E6
Strength		Manual	Manual	Manual	Manual	Manual
R_{inter}		0.01000	0.6000	0.01000	0.6000	0.6000
Consider gap closure		Yes	Yes	Yes	Yes	Yes
δ_{inter}		0.000	0.000	0.000	0.000	0.000
Cross permeability		Impermeable	Impermeable	Impermeable	Impermeable	Impermeable
Drainage conductivity, dk	m³/s/m	0.000	0.000	0.000	0.000	0.000
K_0 determination		Automatic	Automatic	Automatic	Automatic	Automatic
$K_{0,x} = K_{0,z}$		Yes	Yes	Yes	Yes	Yes
$K_{0,x}$		0.5933	0.4408	0.4408	0.4393	0.4603
$K_{0,z}$		0.5933	0.4408	0.4408	0.4393	0.4603
OCR		1.000	1.000	1.000	1.000	1.000
POP	kN/m²	0.000	0.000	0.000	0.000	0.000
Data set		Standard	Standard	Standard	Standard	Standard
Type		Coarse	Coarse	Coarse	Coarse	Coarse
< 2 µm	%	10.00	10.00	10.00	10.00	10.00
2 µm - 50 µm	%	13.00	13.00	13.00	13.00	13.00
50 µm - 2 mm	%	77.00	77.00	77.00	77.00	77.00
Use defaults		None	None	None	None	None
k_x	m/s	0.000	5.000E-3	0.000	0.1000E-3	0.01000E-3
k_y	m/s	0.000	5.000E-3	0.000	0.1000E-3	0.01000E-3
$-\psi_{unsat}$	m	10.00E3	10.00E3	10.00E3	10.00E3	10.00E3
e_{init}		0.5000	0.5000	0.5000	0.5000	0.5000
S_s	1/m	0.000	0.000	0.000	0.000	0.000
c_k		1000E12	1000E12	1000E12	1000E12	1000E12

1.1.1.1.1.3 Materials - Soil and interfaces - Hardening soil (3/3)

Identification		**TGC2_interf**
Identification number		11
Drainage type		Drained
Colour		
Comments		
γ_{unsat}	kN/m³	18.50
γ_{sat}	kN/m³	18.50
Dilatancy cut-off		No
e_{init}		0.5000
e_{min}		0.000
e_{max}		999.0
Rayleigh α		0.000
Rayleigh β		0.000
E_{50}^{ref}	kN/m²	35.00E3
E_{oed}^{ref}	kN/m²	34.46E3
E_{ur}^{ref}	kN/m²	70.00E3
power (m)		0.5000
Use alternatives		No
C_c		0.01001
C_s		4.436E-3
e_{init}		0.5000
c_{ref}	kN/m²	0.1000
φ (phi)	°	33.00
ψ (psi)	°	0.000
Set to default values		No
v_{ur}		0.2000
p_{ref}	kN/m²	100.0
K_0^{nc}		0.4603
c_{inc}	kN/m²/m	0.000
y_{ref}	m	0.000

Identification		**TGC2_interf**
R_f		0.9000
Tension cut-off		Yes
Tensile strength	kN/m²	0.000
Undrained behaviour		Standard
Skempton-B		0.9866
v_u		0.4950
$K_{w,ref}$ / n	kN/m²	2.868E6
Strength		Manual
R_{inter}		0.01000
Consider gap closure		Yes
δ_{inter}		0.000
Cross permeability		Impermeable
Drainage conductivity, dk	m³/s/m	0.000
K_0 determination		Automatic
$K_{0,x} = K_{0,z}$		Yes
$K_{0,x}$		0.4603
$K_{0,z}$		0.4603
OCR		1.000
POP	kN/m²	0.000
Data set		Standard
Type		Coarse
< 2 µm	%	10.00
2 µm - 50 µm	%	13.00
50 µm - 2 mm	%	77.00
Use defaults		None
k_x	m/s	0.000
k_y	m/s	0.000
$-\psi_{unsat}$	m	10.00E3
e_{init}		0.5000
S_s	1/m	0.000
c_k		1000E12

1.1.1.1.2 Materials - Soil and interfaces - Linear elastic

Identification		**Concrete**
Identification number		12
Drainage type		Non-porous
Colour		
Comments		
γ_{unsat}	kN/m³	25.00
γ_{sat}	kN/m³	25.00
Dilatancy cut-off		No
e_{init}		0.5000
e_{min}		0.000
e_{max}		999.0
Rayleigh α		0.000
Rayleigh β		0.000
E	kN/m²	30.00E6
v (nu)		0.2000
G	kN/m²	12.50E6
E_{oed}	kN/m²	33.33E6
V_s	m/s	2215
V_p	m/s	3617
Set to default values		Yes
E_{inc}	kN/m²/m	0.000
y_{ref}	m	0.000
Strength		Rigid
R_{inter}		1.000
Consider gap closure		Yes
δ_{inter}		0.000
Cross permeability		Impermeable
Drainage conductivity, dk	m³/s/m	0.000
K_0 determination		Automatic
$K_{0,x} = K_{0,z}$		Yes

Identification		**Concrete**
$K_{0,x}$		0.5000
$K_{0,z}$		0.5000
OCR		1.000
POP	kN/m²	0.000
k_x	m/s	0.000
k_y	m/s	0.000
$-\psi_{unsat}$	m	10.00E3
e_{init}		0.5000
c_k		1000E12

1.1.1.2.1 Materials - Plates - (1/2)

Identification		**Palo 1200 s1.5m**	**pali1500_passo1.8m**	**Soletta**	**pali1500_passo3.4m**	**SolettaTesta**
Identification number		1	2	3	4	5
Comments			d1500; interasse 1.8m	Soletta_1.0mx1.0m; C30/37	d1500; interasse 3.4m	Soletta_1.45mx1.0m; C30/37
Colour						
Material type		Elastic	Elastic	Elastic	Elastic	Elastic
Isotropic		Yes	Yes	Yes	Yes	Yes
EA_1	kN/m	23.40E6	30.40E6	33.00E6	16.10E6	47.90E6
EA_2	kN/m	23.40E6	30.40E6	33.00E6	16.10E6	47.90E6
EI	kN m²/m	2.100E6	4.280E6	2.750E6	2.270E6	8.380E6
d	m	1.038	1.300	1.000	1.301	1.449
w	kN/m/m	18.85	24.54	25.00	13.00	36.25
v (nu)		0.2000	0.2000	0.2000	0.2000	0.2000
Rayleigh α		0.000	0.000	0.000	0.000	0.000
Rayleigh β		0.000	0.000	0.000	0.000	0.000
Prevent punching		No	No	No	No	No
Identification number		1	2	3	4	5

1.1.1.2.2 Materials - Plates - (2/2)

Identification		**TraveFondazione**	**SC_20cm**
Identification number		6	7
Comments		Trave_1.5mx1.0m; C30/37	
Colour			
Material type		Elastic	Elastic
Isotropic		Yes	Yes
EA_1	kN/m	49.50E6	3.000E6
EA_2	kN/m	49.50E6	3.000E6
EI	kN m²/m	9.280E6	10.00E3
d	m	1.500	0.2000
w	kN/m/m	37.50	5.000
v (nu)		0.2000	0.2000
Rayleigh α		0.000	0.000
Rayleigh β		0.000	0.000
Prevent punching		No	No
Identification number		6	7

1.1.1.3 Materials - Anchors -

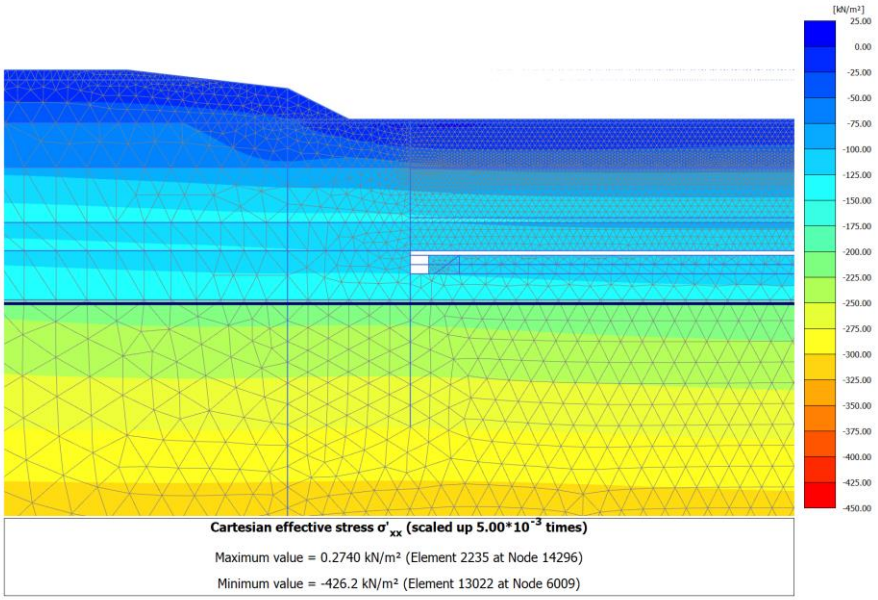
Identification		**Vincolo rigido_Soletta**
Identification number		1
Comments		Rigidezza della soletta w=1.75m, E=33Gpa
Colour		■
Material type		Elastic
EA	kN	57.75E6
$L_{spacing}$	m	1.000
Identification number		1
Identification number		1
Identification number		1

1.1.1.4 Materials - Embedded beam row -

Identification		**Palo1200**
Identification number		1
Comments		NB portata laterale per lunghezza palo
Colour		
Material type		Elastic
E	kN/m²	31.00E3
γ	kN/m³	25.00
Beam type		Predefined
Predefined beam type		Massive circular beam
Diameter	m	1.200
A	m²	1.131
I_2	m⁴	0.1018
I_3	m⁴	0.1018
Rayleigh α		0.000
Rayleigh β		0.000
Axial skin resistance		Linear
$T_{skin, start, max}$	kN/m	100.0
$T_{skin, end, max}$	kN/m	100.0
F_{max}	kN	900.0
Identification number		1
Comments		NB portata laterale per lunghezza palo
Colour		
Material type		Elastic
E	kN/m²	31.00E3
γ	kN/m³	25.00
Beam type		Predefined
Predefined beam type		Massive circular beam
Diameter	m	1.200
A	m²	1.131
I	m⁴	0.1018

Identification		**Palo1200**
$L_{spacing}$	m	3.600
Rayleigh α		0.000
Rayleigh β		0.000
Axial skin resistance		Linear
$T_{skin, start, max}$	kN/m	100.0
$T_{skin, end, max}$	kN/m	100.0
Lateral skin resistance		Unlimited
F_{max}	kN	900.0
Default values		Yes
Axial stiffness factor		1.097
Lateral stiffness factor		1.097
Base stiffness factor		10.97
Identification number		1

4.1.1 Calculation results, Slope modelling [Phase_1] (1/6), Cartesian effective stress σ'_{xx}

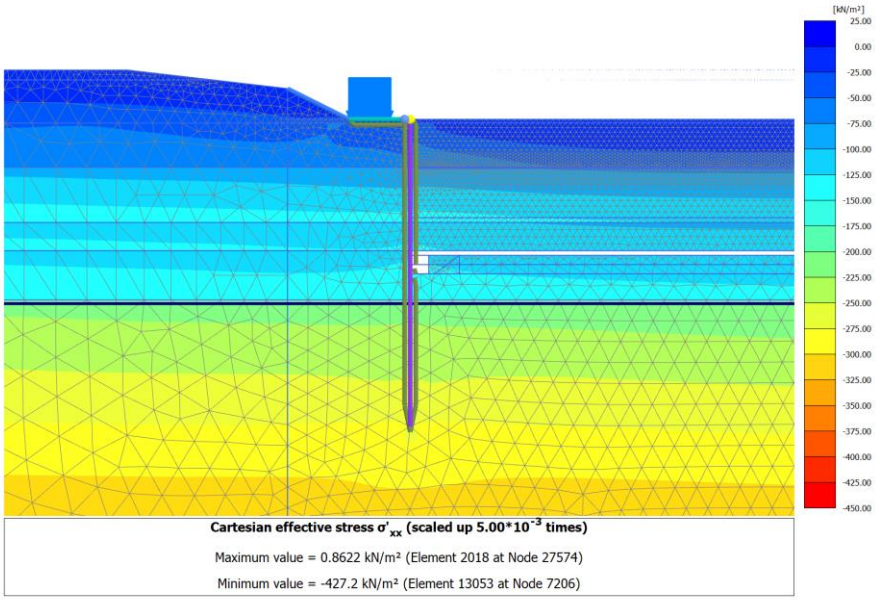


Cartesian effective stress σ'_{xx} (scaled up $5.00*10^{-3}$ times)

Maximum value = 0.2740 kN/m² (Element 2235 at Node 14296)

Minimum value = -426.2 kN/m² (Element 13022 at Node 6009)

4.1.2 Calculation results, Pile Installation [Phase_2] (2/8), Cartesian effective stress σ'_{xx}

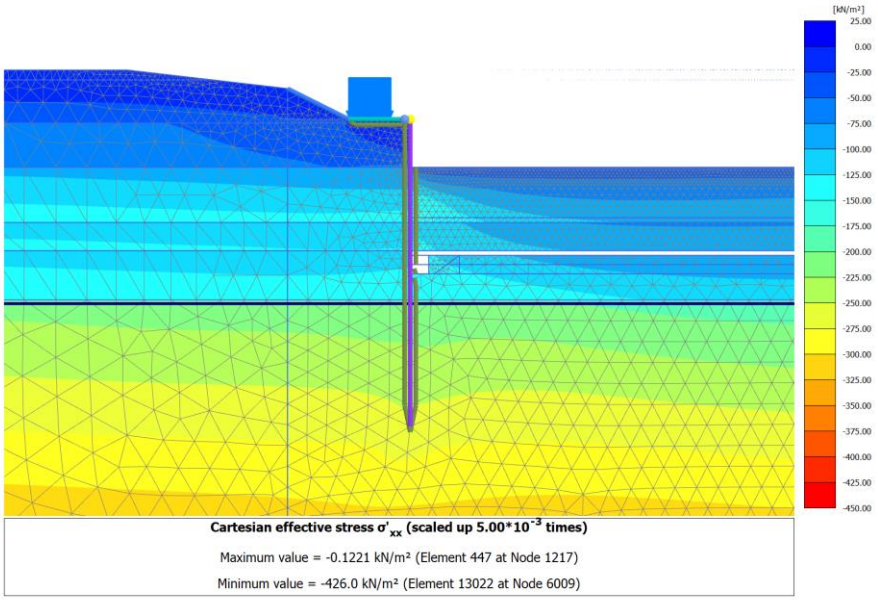


Cartesian effective stress σ'_{xx} (scaled up $5.00*10^{-3}$ times)

Maximum value = 0.8622 kN/m² (Element 2018 at Node 27574)

Minimum value = -427.2 kN/m² (Element 13053 at Node 7206)

4.1.3 Calculation results, Exc1 [Phase_3] (3/13), Cartesian effective stress σ'_{xx}

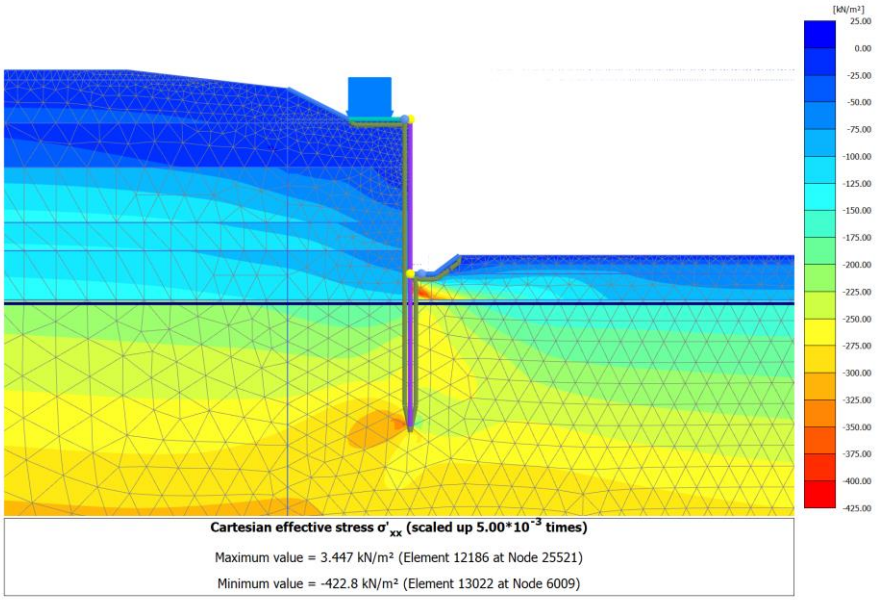


Cartesian effective stress σ'_{xx} (scaled up $5.00*10^{-3}$ times)

Maximum value = -0.1221 kN/m² (Element 447 at Node 1217)

Minimum value = -426.0 kN/m² (Element 13022 at Node 6009)

4.1.4 Calculation results, ExcFinal [Phase_5] (5/293), Cartesian effective stress σ'_{xx}

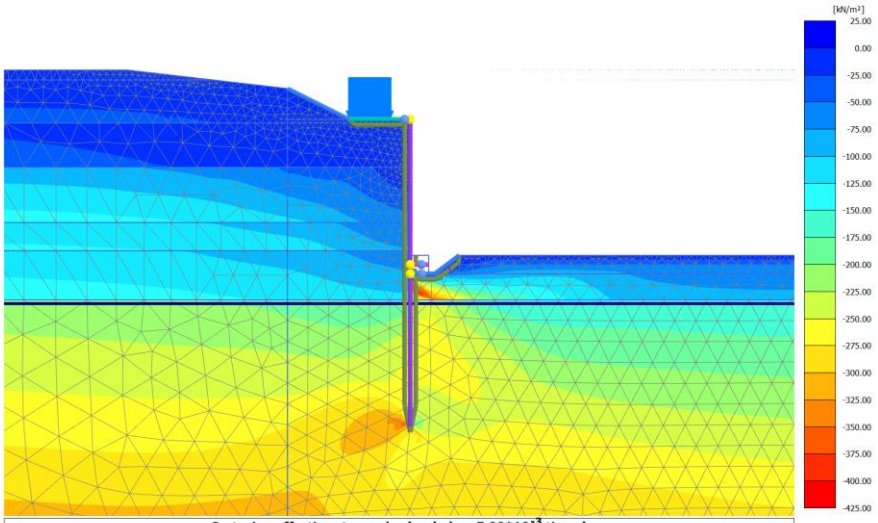


Cartesian effective stress σ'_{xx} (scaled up $5.00*10^{-3}$ times)

Maximum value = 3.447 kN/m² (Element 12186 at Node 25521)

Minimum value = -422.8 kN/m² (Element 13022 at Node 6009)

4.1.5 Calculation results, ShortTerm [Phase_6] (6/308), Cartesian effective stress σ'_{xx}

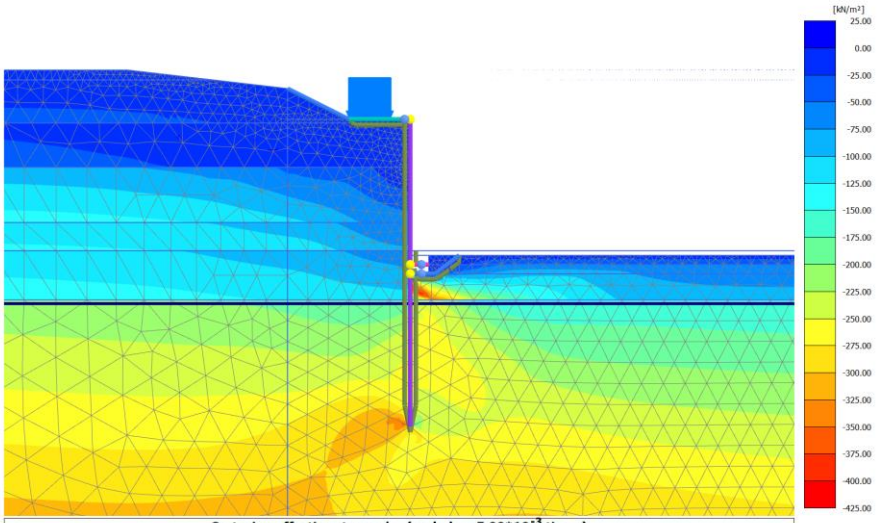


Cartesian effective stress σ'_{xx} (scaled up $5.00*10^{-3}$ times)

Maximum value = 4.452 kN/m² (Element 12186 at Node 25521)

Minimum value = -422.9 kN/m² (Element 13022 at Node 6009)

4.1.6 Calculation results, LongTerm [Phase_7] (7/462), Cartesian effective stress σ'_{xx}

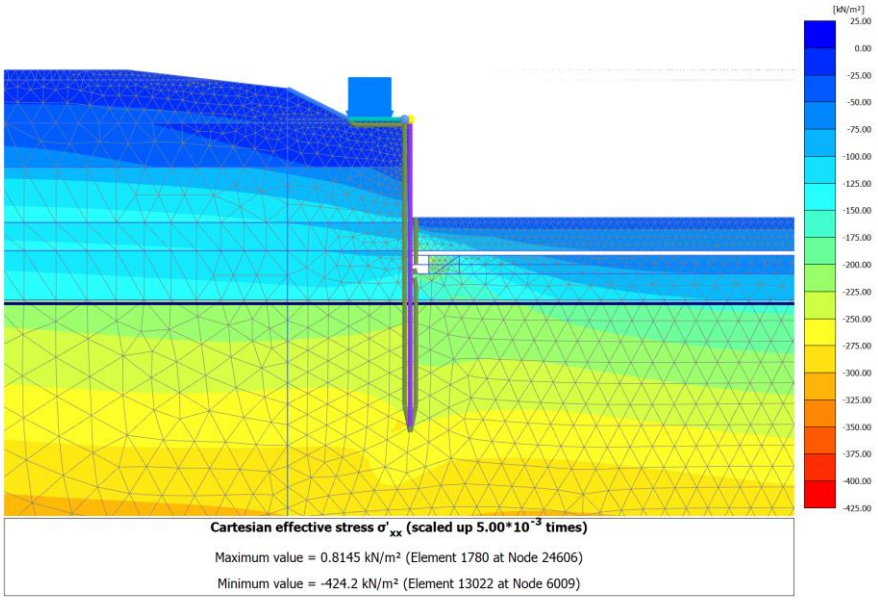


Cartesian effective stress σ'_{xx} (scaled up $5.00*10^{-3}$ times)

Maximum value = 1.649 kN/m² (Element 2059 at Node 4715)

Minimum value = -422.9 kN/m² (Element 13022 at Node 6009)

4.1.7 Calculation results, Exc2 [Phase_4] (4/482), Cartesian effective stress σ'_{xx}

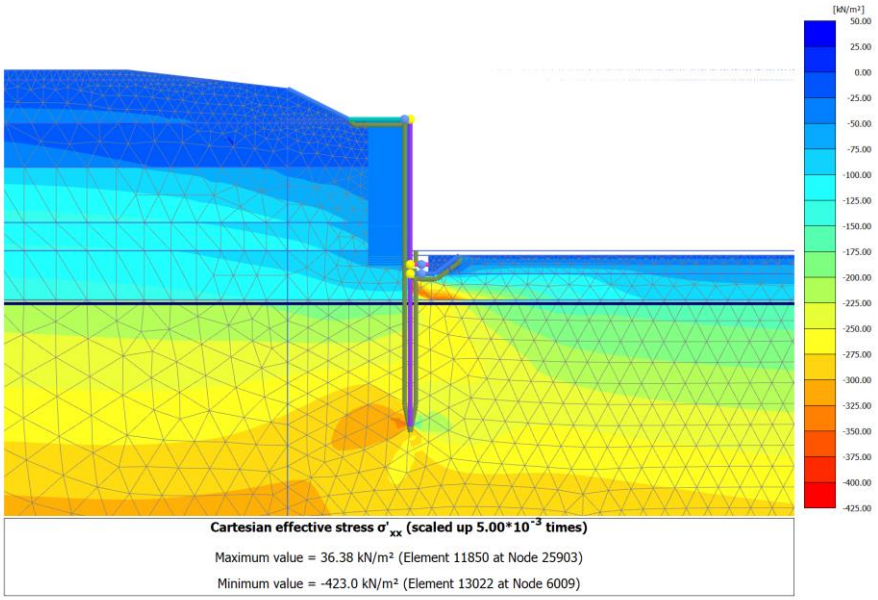


Cartesian effective stress σ'_{xx} (scaled up $5.00*10^{-3}$ times)

Maximum value = 0.8145 kN/m² (Element 1780 at Node 24606)

Minimum value = -424.2 kN/m² (Element 13022 at Node 6009)

4.1.8 Calculation results, EQK [Phase_8] (8/992), Cartesian effective stress σ'_{xx}

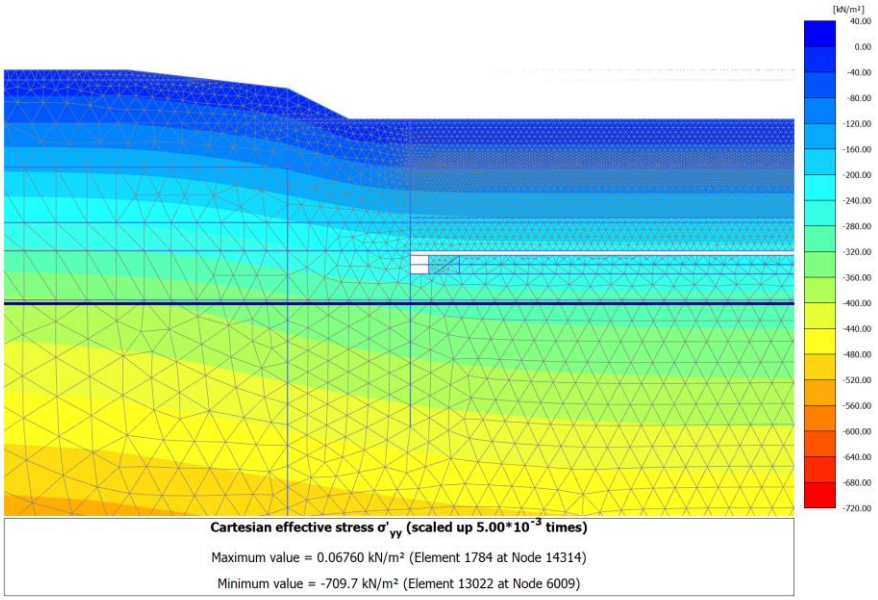


Cartesian effective stress σ'_{xx} (scaled up $5.00*10^{-3}$ times)

Maximum value = 36.38 kN/m² (Element 11850 at Node 25903)

Minimum value = -423.0 kN/m² (Element 13022 at Node 6009)

4.2.1 Calculation results, Slope modelling [Phase_1] (1/6), Cartesian effective stress σ'_{yy}

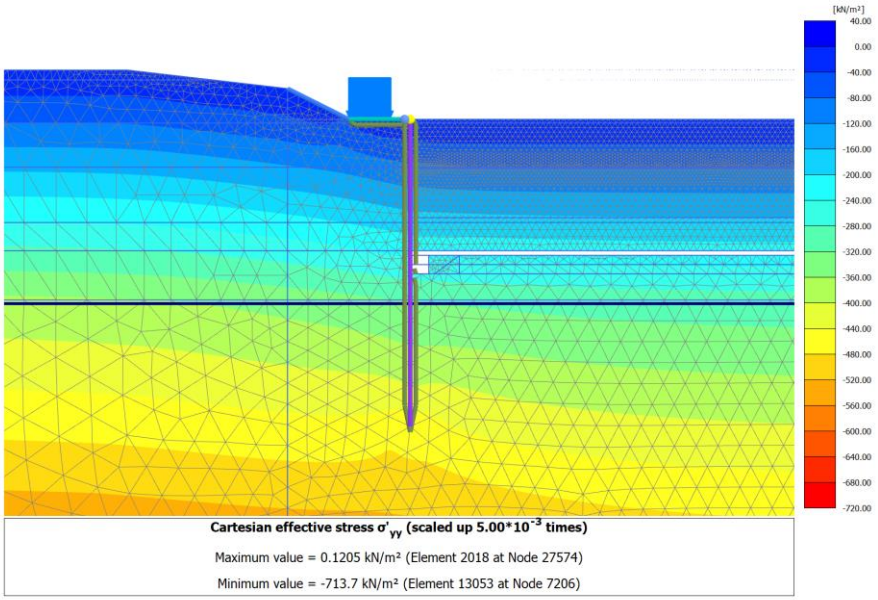


Cartesian effective stress σ'_{yy} (scaled up $5.00*10^{-3}$ times)

Maximum value = 0.06760 kN/m² (Element 1784 at Node 14314)

Minimum value = -709.7 kN/m² (Element 13022 at Node 6009)

4.2.2 Calculation results, Pile Installation [Phase_2] (2/8), Cartesian effective stress σ'_{yy}

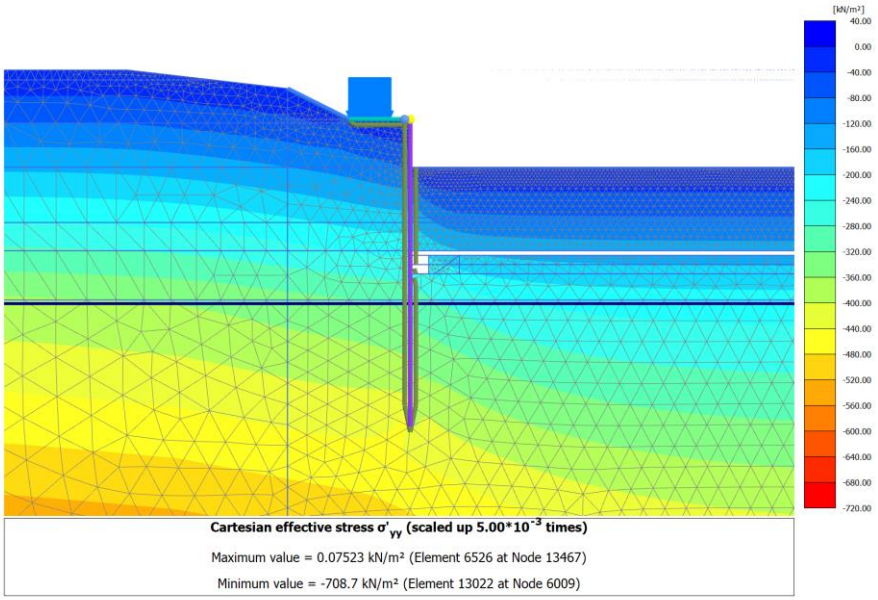


Cartesian effective stress σ'_{yy} (scaled up $5.00*10^{-3}$ times)

Maximum value = 0.1205 kN/m² (Element 2018 at Node 27574)

Minimum value = -713.7 kN/m² (Element 13053 at Node 7206)

4.2.3 Calculation results, Exc1 [Phase_3] (3/13), Cartesian effective stress σ'_{yy}

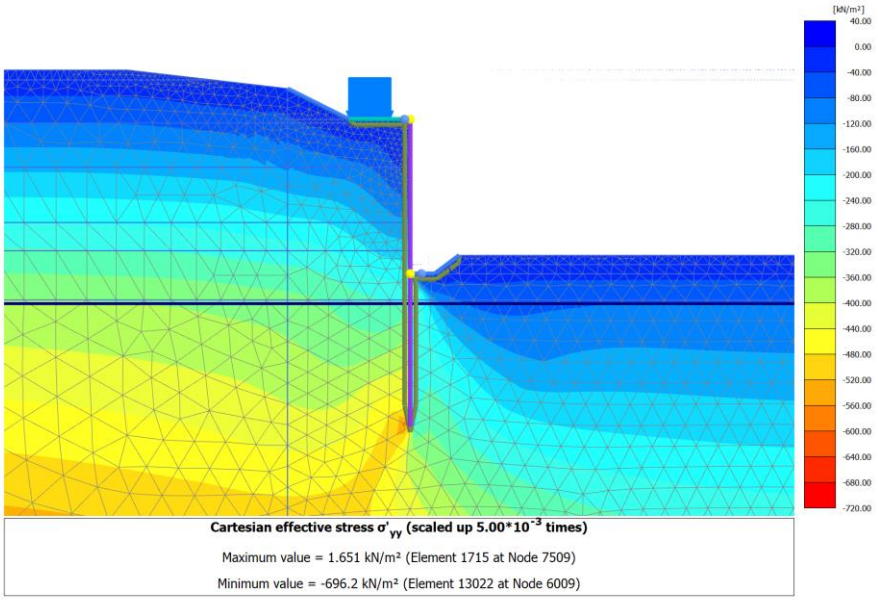


Cartesian effective stress σ'_{yy} (scaled up $5.00*10^{-3}$ times)

Maximum value = 0.07523 kN/m² (Element 6526 at Node 13467)

Minimum value = -708.7 kN/m² (Element 13022 at Node 6009)

4.2.4 Calculation results, ExcFinal [Phase_5] (5/293), Cartesian effective stress σ'_{yy}

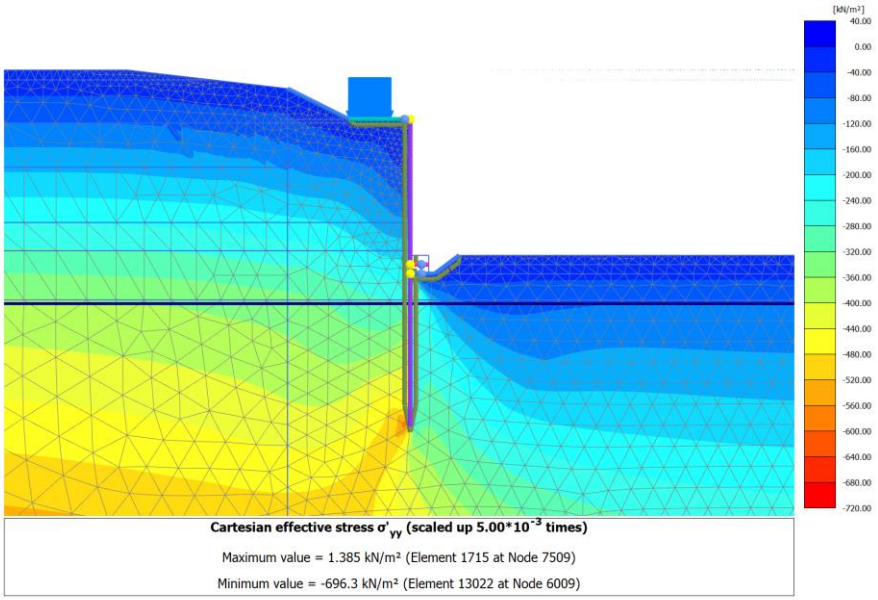


Cartesian effective stress σ'_{yy} (scaled up $5.00*10^{-3}$ times)

Maximum value = 1.651 kN/m² (Element 1715 at Node 7509)

Minimum value = -696.2 kN/m² (Element 13022 at Node 6009)

4.2.5 Calculation results, ShortTerm [Phase_6] (6/308), Cartesian effective stress σ'$_{yy}$

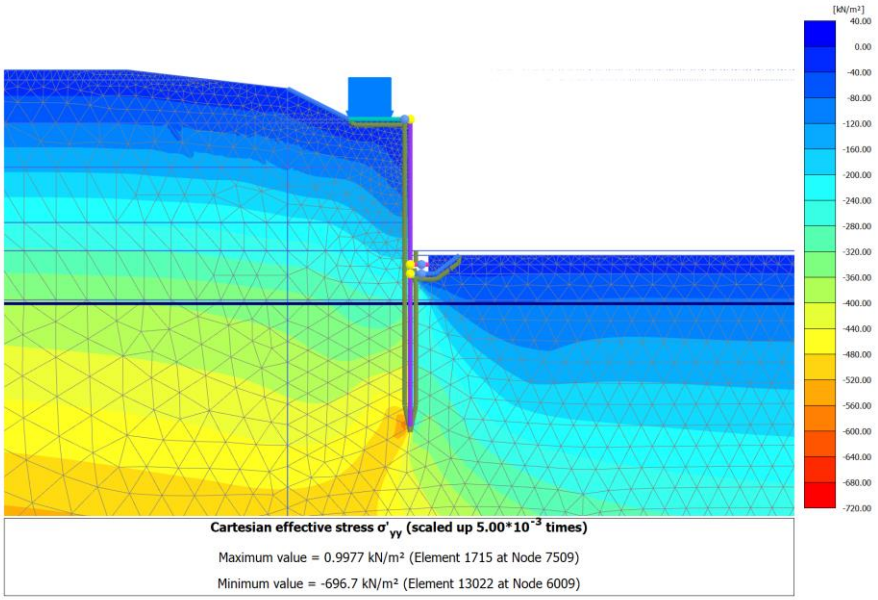


Cartesian effective stress σ'$_{yy}$ (scaled up 5.00*10^{-3} times)

Maximum value = 1.385 kN/m² (Element 1715 at Node 7509)

Minimum value = -696.3 kN/m² (Element 13022 at Node 6009)

4.2.6 Calculation results, LongTerm [Phase_7] (7/462), Cartesian effective stress σ'_{yy}

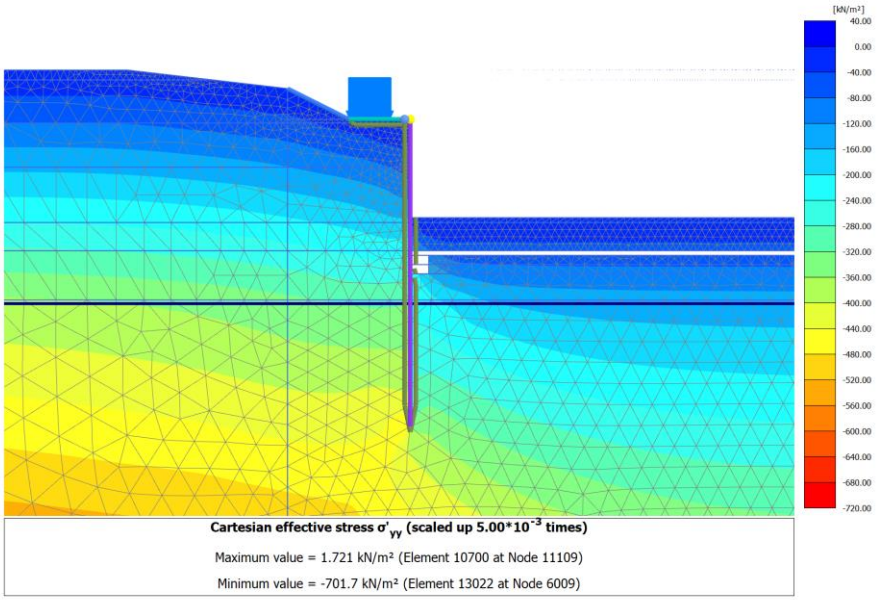


Cartesian effective stress σ'_{yy} (scaled up $5.00*10^{-3}$ times)

Maximum value = 0.9977 kN/m² (Element 1715 at Node 7509)

Minimum value = -696.7 kN/m² (Element 13022 at Node 6009)

4.2.7 Calculation results, Exc2 [Phase_4] (4/482), Cartesian effective stress σ'_{yy}

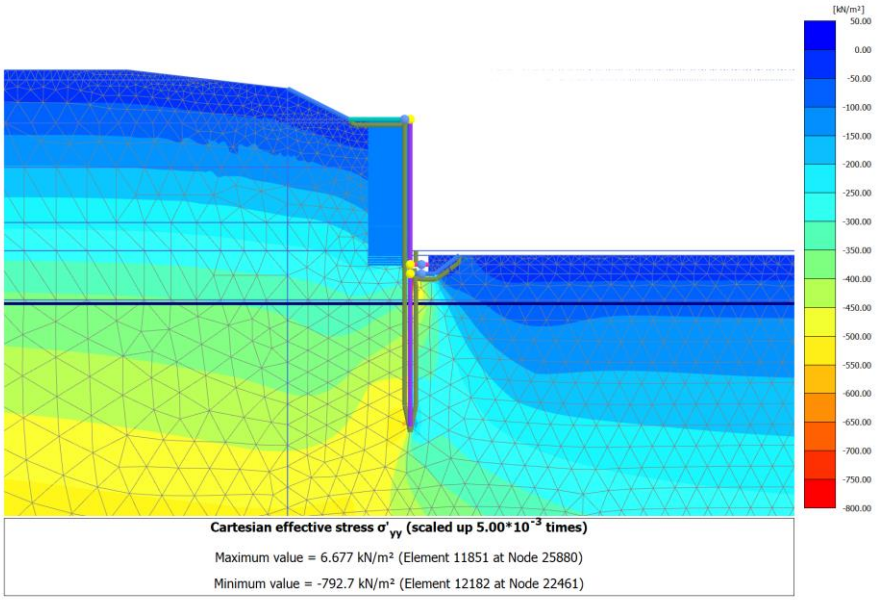


Cartesian effective stress σ'_{yy} (scaled up $5.00*10^{-3}$ times)

Maximum value = 1.721 kN/m² (Element 10700 at Node 11109)

Minimum value = -701.7 kN/m² (Element 13022 at Node 6009)

4.2.8 Calculation results, EQK [Phase_8] (8/992), Cartesian effective stress σ'_{yy}

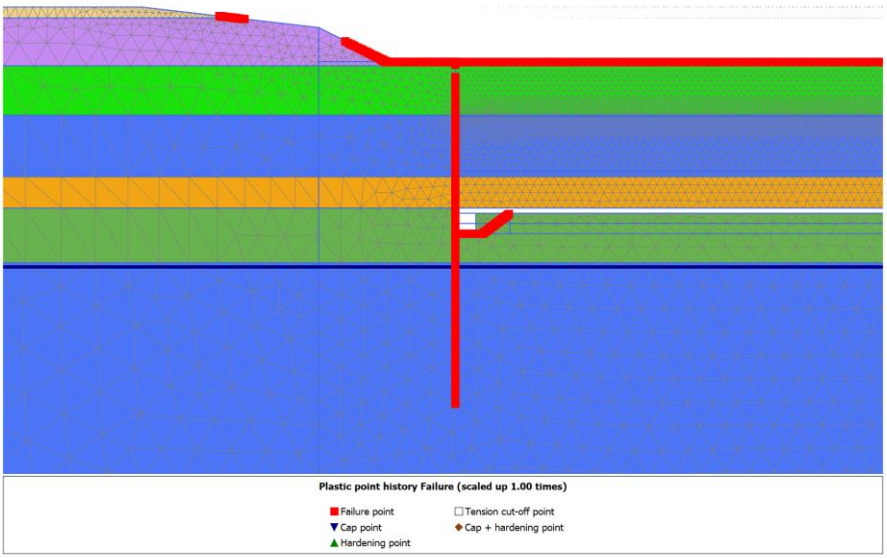


Cartesian effective stress σ'_{yy} (scaled up $5.00*10^{-3}$ times)

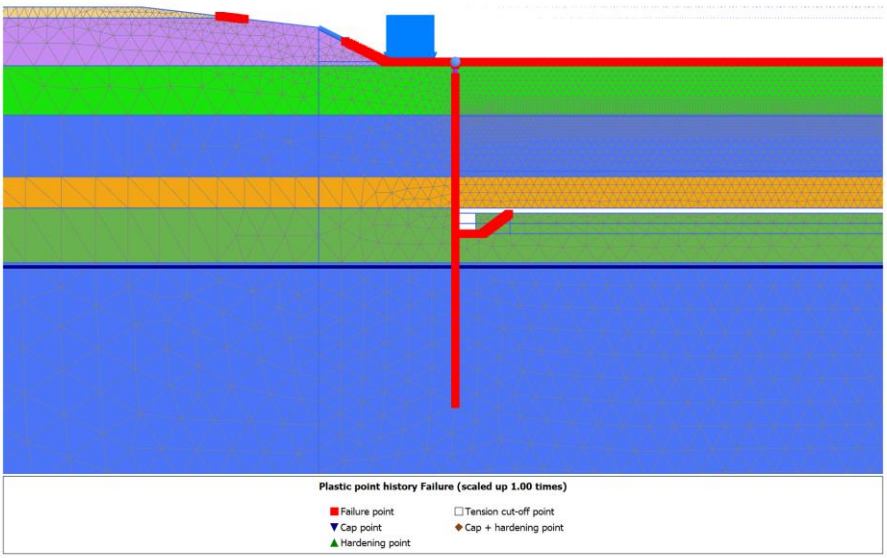
Maximum value = 6.677 kN/m² (Element 11851 at Node 25880)

Minimum value = -792.7 kN/m² (Element 12182 at Node 22461)

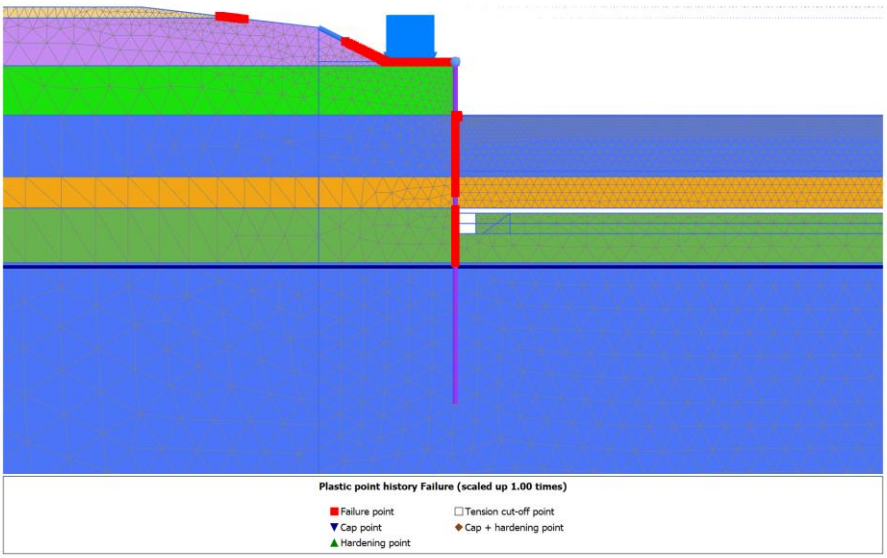
4.3.1 Calculation results, Slope modelling [Phase_1] (1/6), Plastic point history Failure



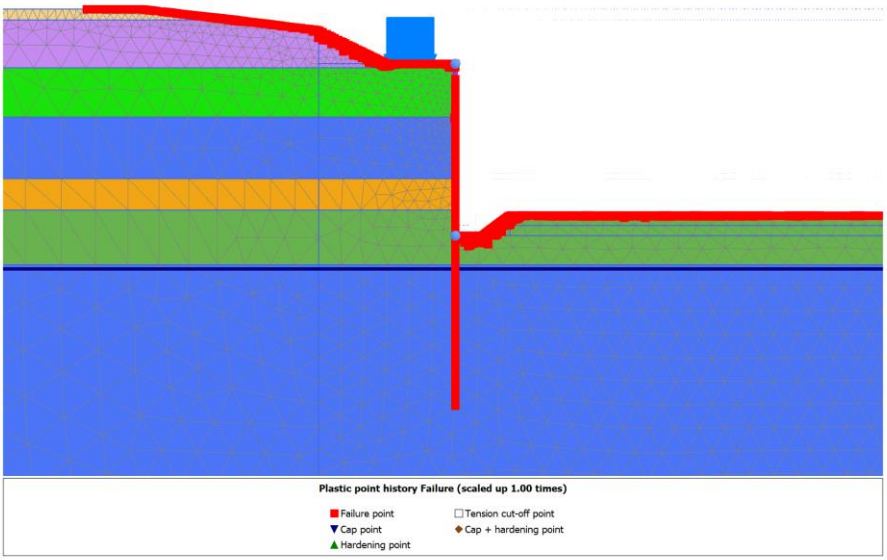
4.3.2 Calculation results, Pile Installation [Phase_2] (2/8), Plastic point history Failure



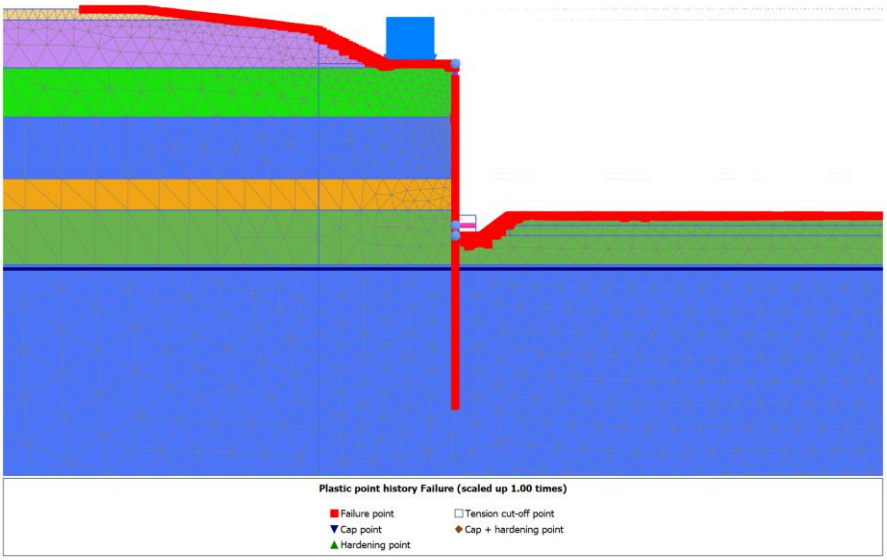
4.3.3 Calculation results, Exc1 [Phase_3] (3/13), Plastic point history Failure



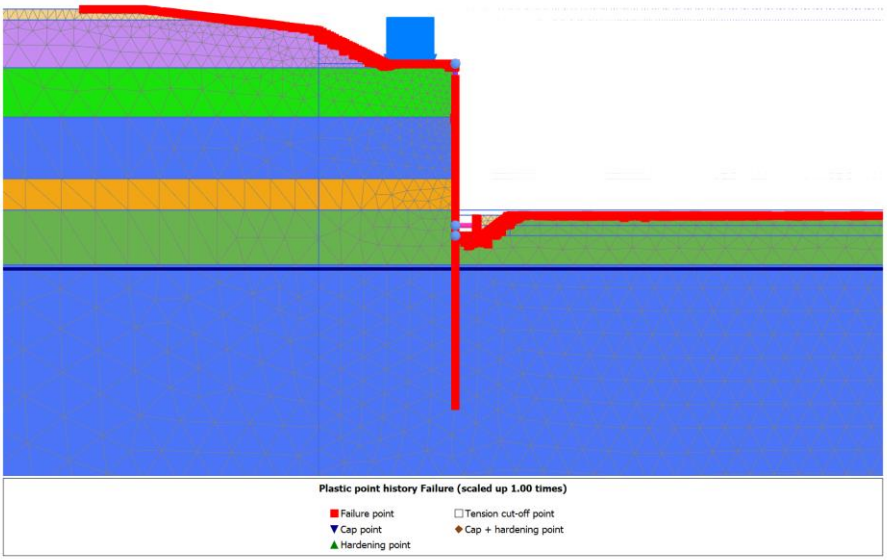
4.3.4 Calculation results, ExcFinal [Phase_5] (5/293), Plastic point history Failure



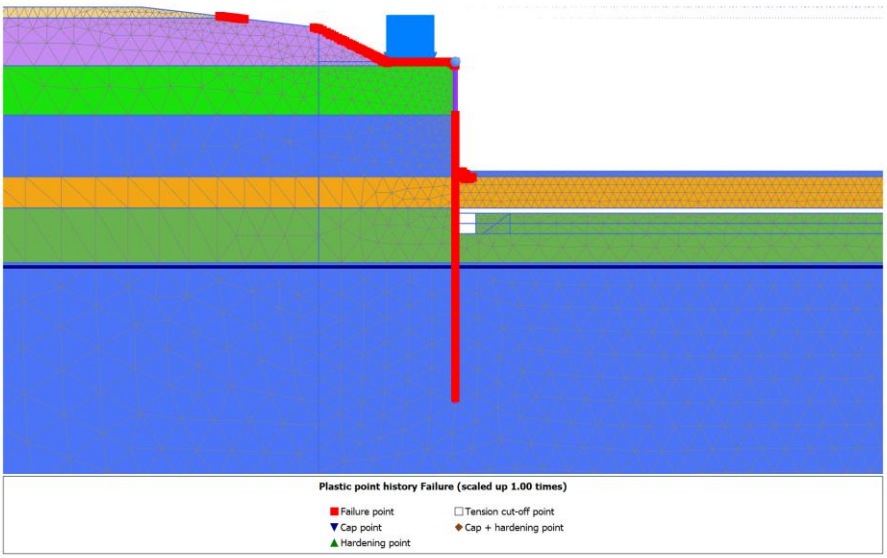
4.3.5 Calculation results, ShortTerm [Phase_6] (6/308), Plastic point history Failure



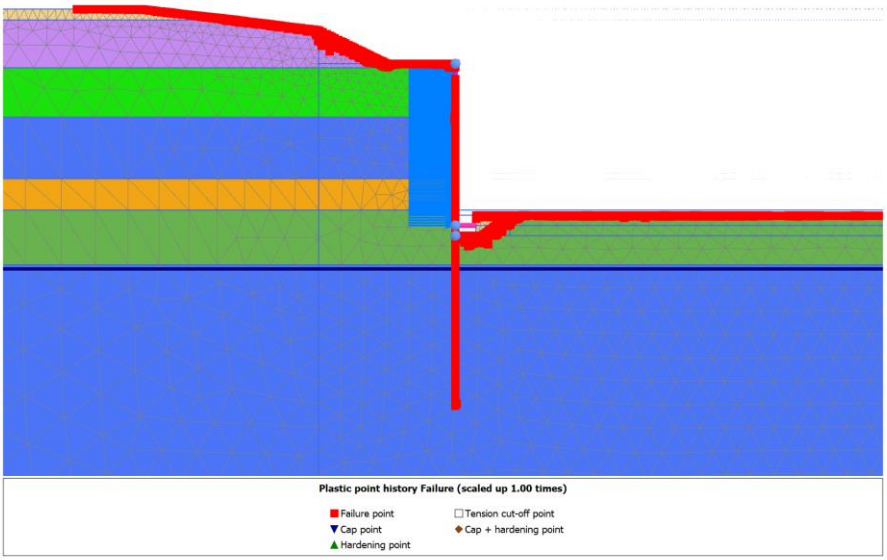
4.3.6 Calculation results, LongTerm [Phase_7] (7/462), Plastic point history Failure



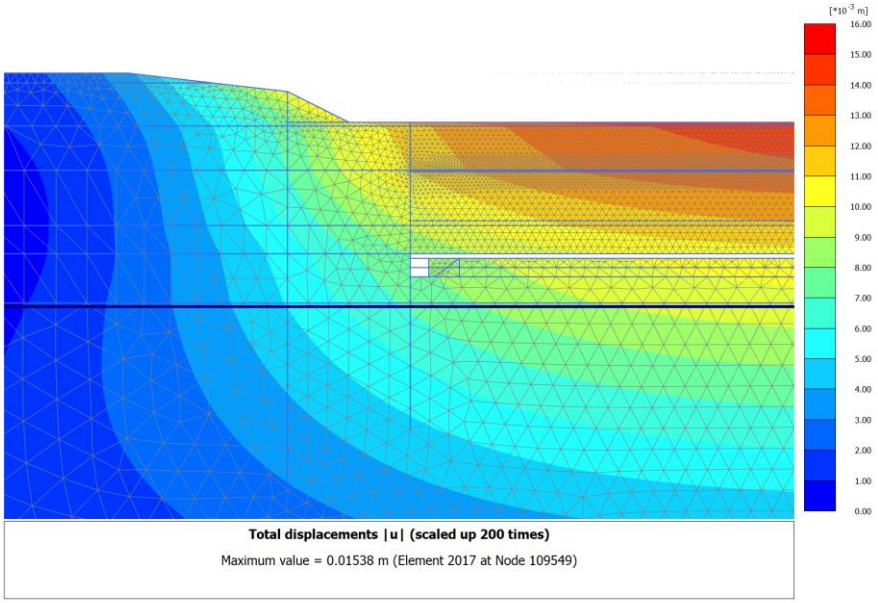
4.3.7 Calculation results, Exc2 [Phase_4] (4/482), Plastic point history Failure



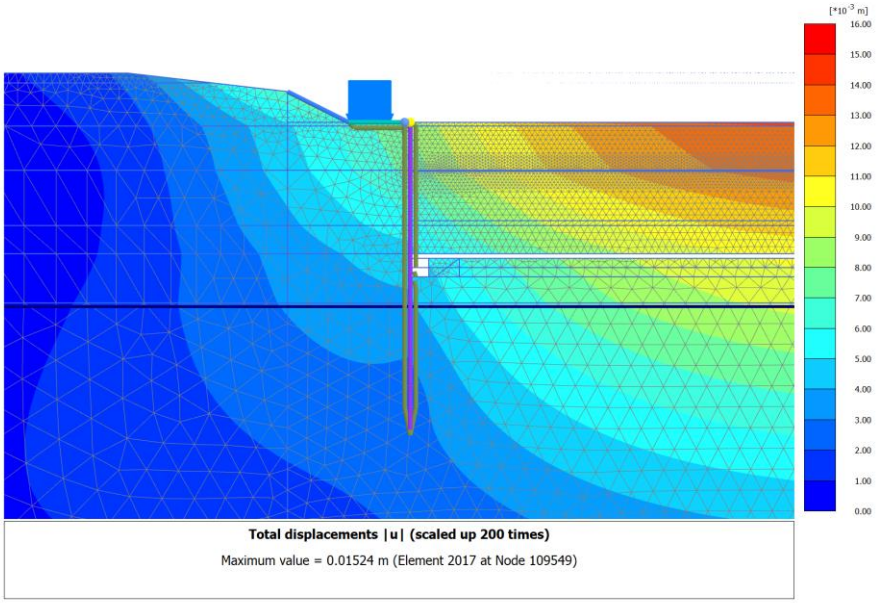
4.3.8 Calculation results, EQK [Phase_8] (8/992), Plastic point history Failure



4.4.1 Calculation results, Slope modelling [Phase_1] (1/6), Total displacements |u|



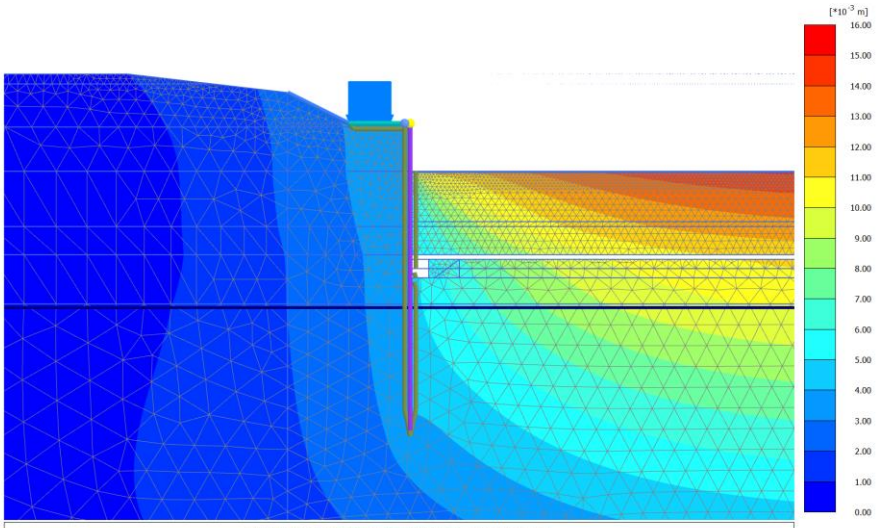
4.4.2 Calculation results, Pile Installation [Phase_2] (2/8), Total displacements |u|



Total displacements |u| (scaled up 200 times)

Maximum value = 0.01524 m (Element 2017 at Node 109549)

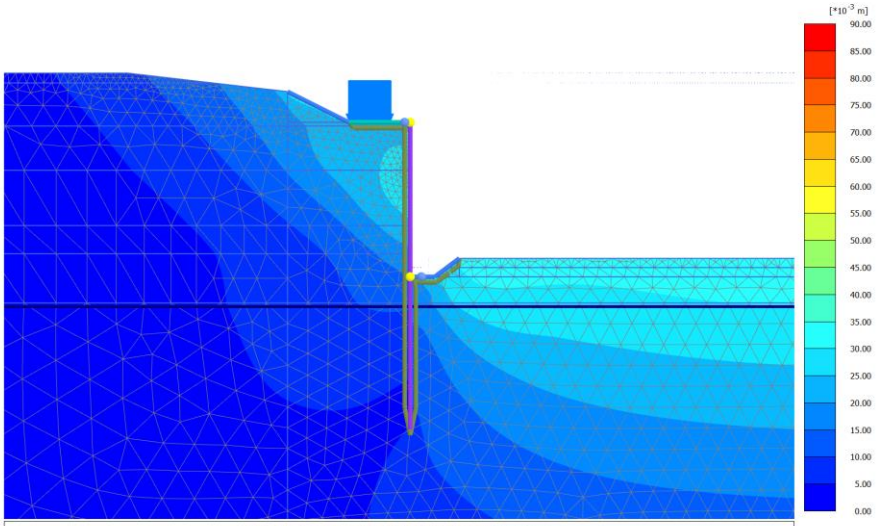
4.4.3 Calculation results, Exc1 [Phase_3] (3/13), Total displacements |u|



Total displacements |u| (scaled up 200 times)

Maximum value = 0.01555 m (Element 7109 at Node 100776)

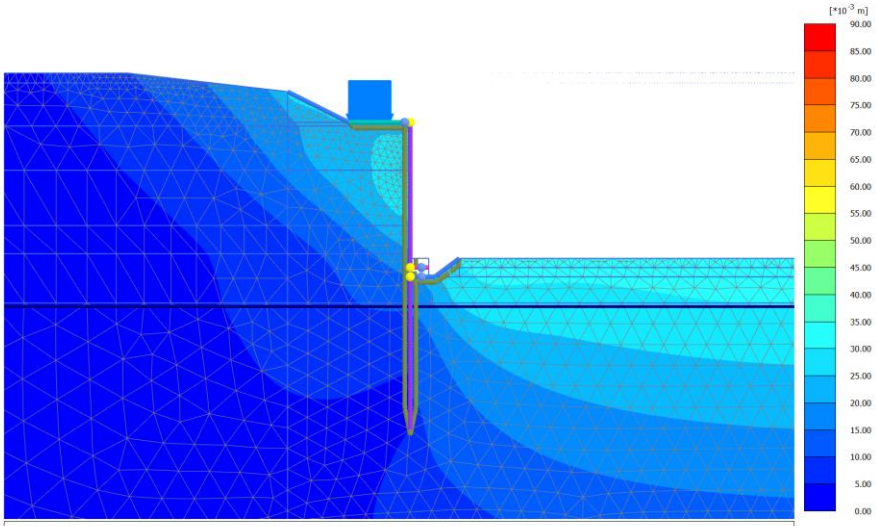
4.4.4 Calculation results, ExcFinal [Phase_5] (5/293), Total displacements |u|



Total displacements |u| (scaled up 50.0 times)

Maximum value = 0.08622 m (Element 11850 at Node 25904)

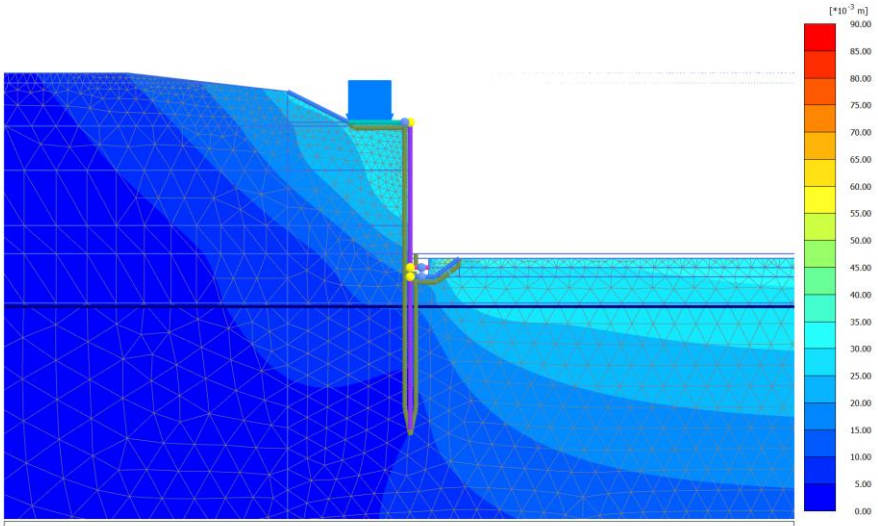
4.4.5 Calculation results, ShortTerm [Phase_6] (6/308), Total displacements |u|



Total displacements |u| (scaled up 50.0 times)

Maximum value = 0.08654 m (Element 11850 at Node 25904)

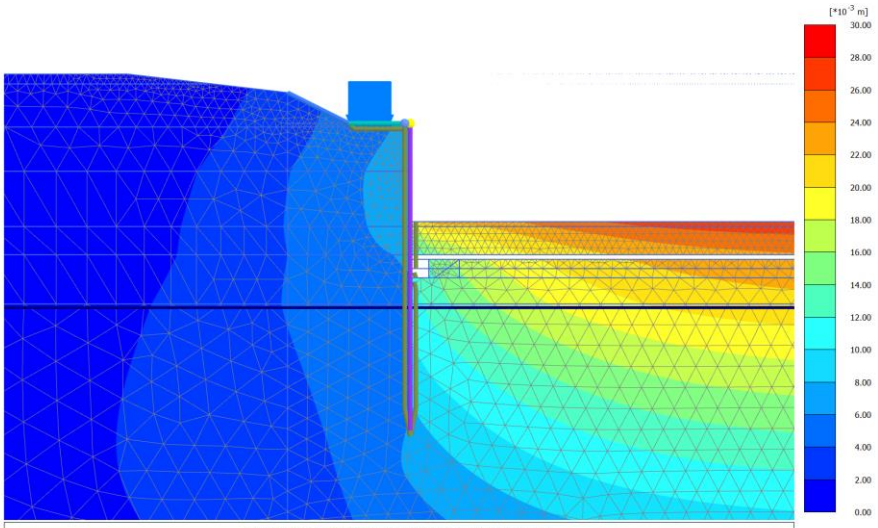
4.4.6 Calculation results, LongTerm [Phase_7] (7/462), Total displacements |u|



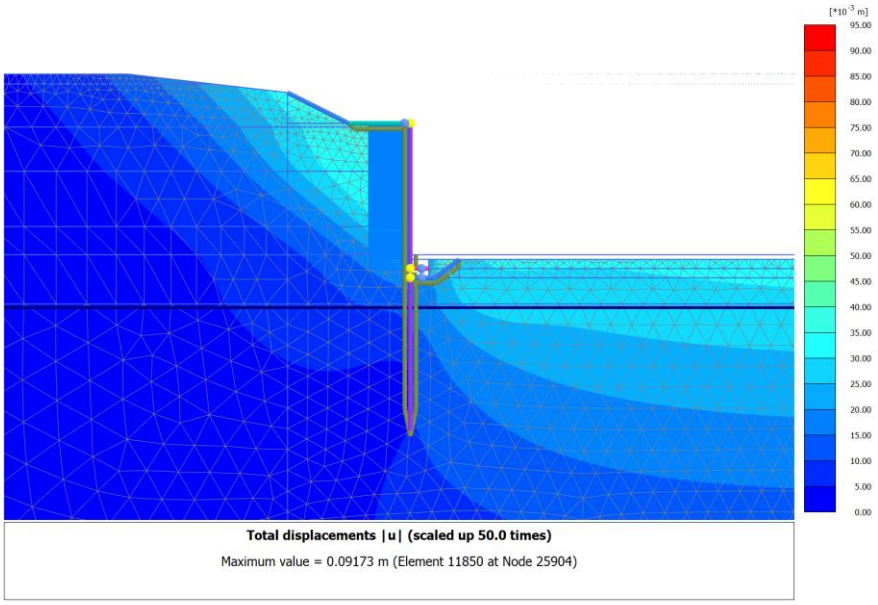
Total displacements |u| (scaled up 50.0 times)

Maximum value = 0.08696 m (Element 11850 at Node 25904)

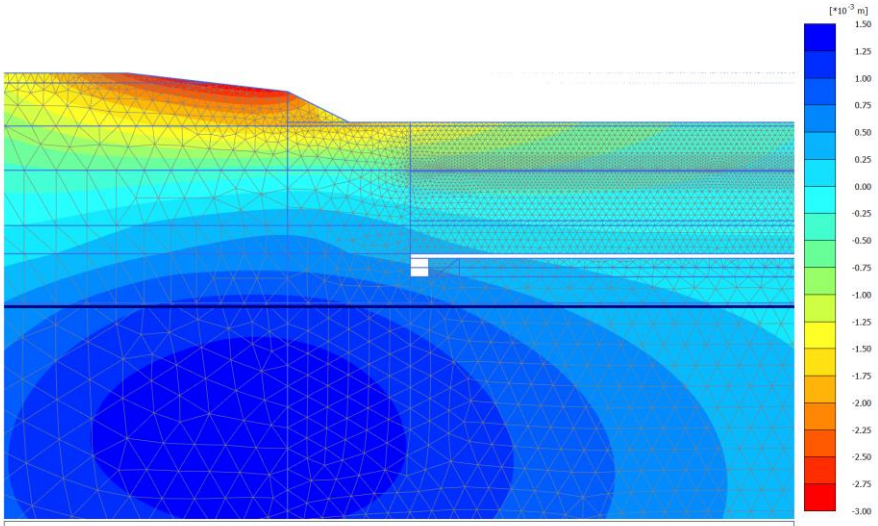
4.4.7 Calculation results, Exc2 [Phase_4] (4/482), Total displacements |u|



4.4.8 Calculation results, EQK [Phase_8] (8/992), Total displacements |u|



4.5.1 Calculation results, Slope modelling [Phase_1] (1/6), Total displacements u_x

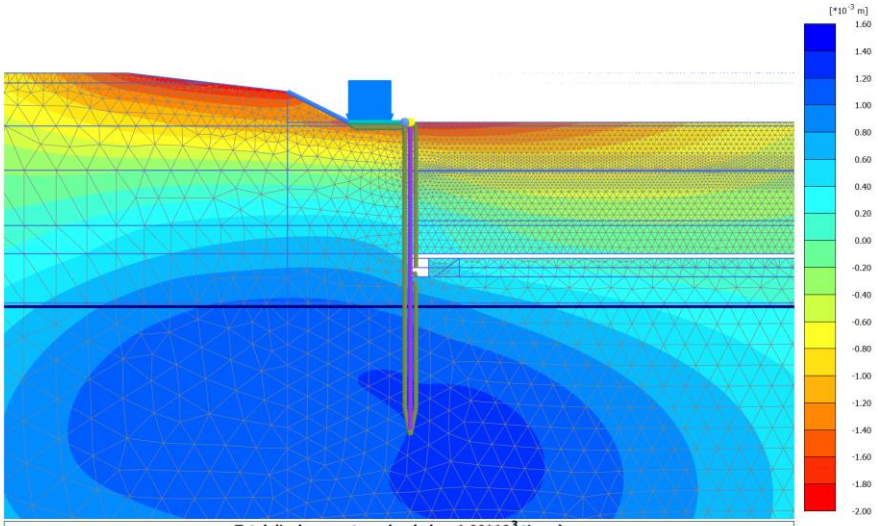


Total displacements u_x (scaled up 500 times)

Maximum value = $1.420*10^{-3}$ m (Element 13533 at Node 12394)

Minimum value = $-2.931*10^{-3}$ m (Element 1687 at Node 1737)

4.5.2 Calculation results, Pile Installation [Phase_2] (2/8), Total displacements u_x

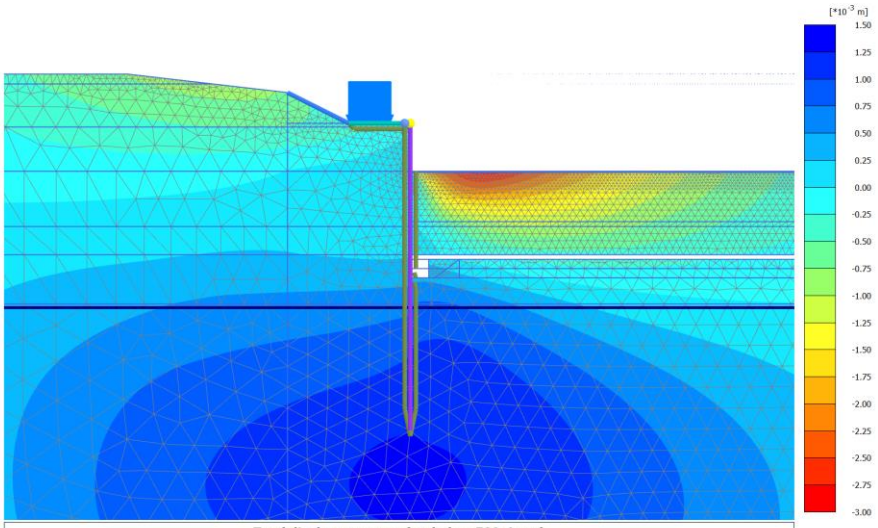


Total displacements u_x (scaled up $1.00*10^3$ times)

Maximum value = $1.397*10^{-3}$ m (Element 12471 at Node 23435)

Minimum value = $-1.974*10^{-3}$ m (Element 436 at Node 1044)

4.5.3 Calculation results, Exc1 [Phase_3] (3/13), Total displacements u_x

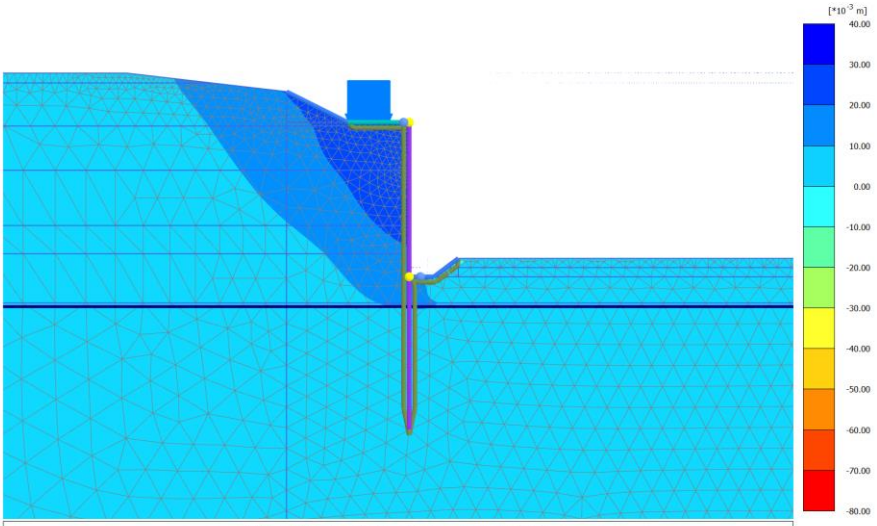


Total displacements u_x (scaled up 500 times)

Maximum value = $1.307*10^{-3}$ m (Element 12809 at Node 20281)

Minimum value = $-2.872*10^{-3}$ m (Element 6594 at Node 26582)

4.5.4 Calculation results, ExcFinal [Phase_5] (5/293), Total displacements u_x

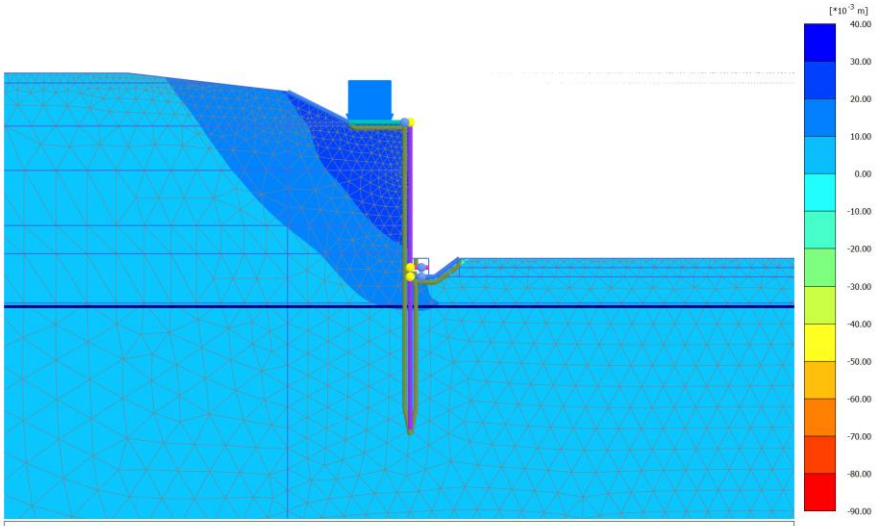


Total displacements u_x (scaled up 20.0 times)

Maximum value = 0.03567 m (Element 1747 at Node 14233)

Minimum value = -0.07987 m (Element 11850 at Node 25904)

4.5.5 Calculation results, ShortTerm [Phase_6] (6/308), Total displacements u_x

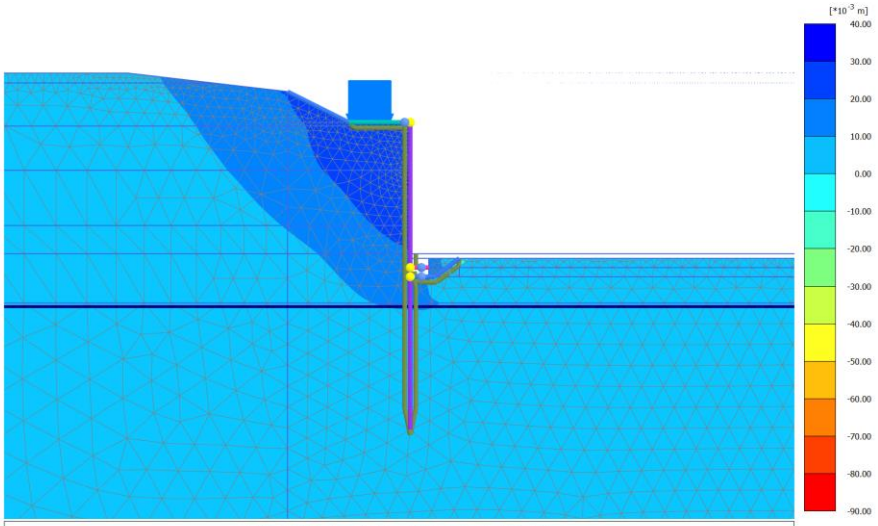


Total displacements u_x (scaled up 20.0 times)

Maximum value = 0.03672 m (Element 1747 at Node 14233)

Minimum value = -0.07998 m (Element 11850 at Node 25904)

4.5.6 Calculation results, LongTerm [Phase_7] (7/462), Total displacements u_x

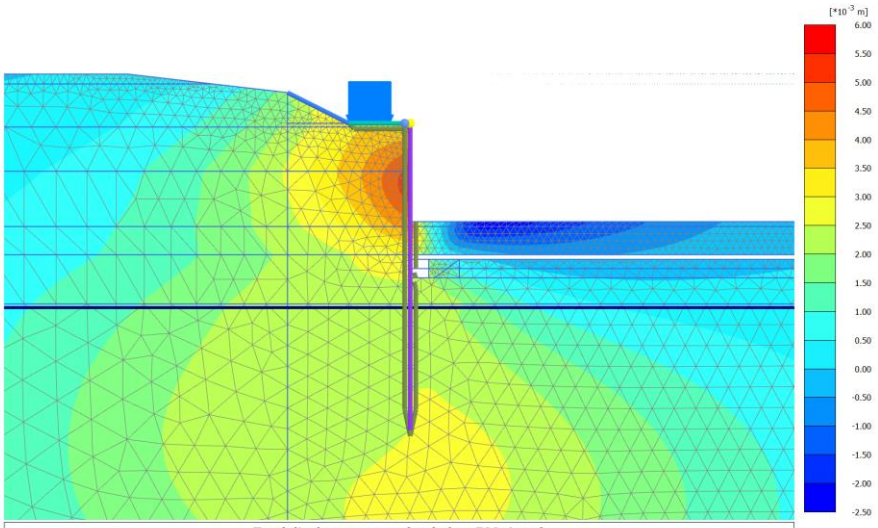


Total displacements u_x (scaled up 20.0 times)

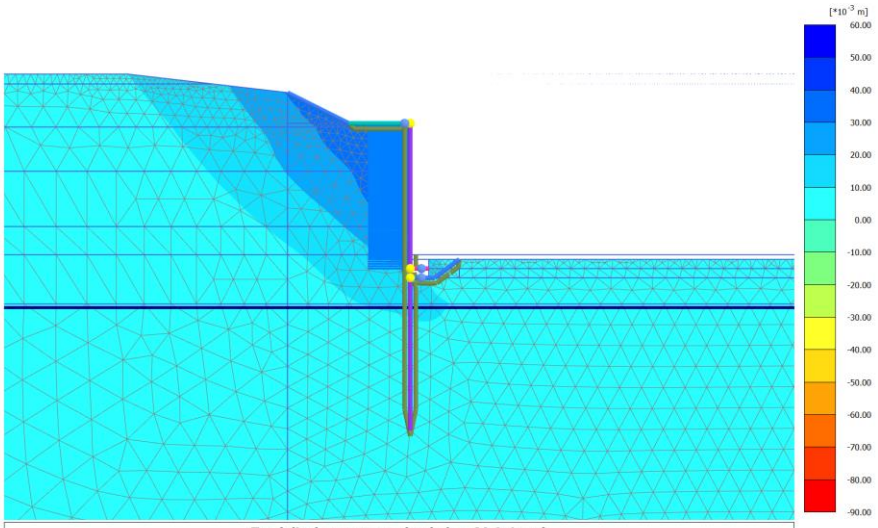
Maximum value = 0.03746 m (Element 1747 at Node 14233)

Minimum value = -0.07990 m (Element 11850 at Node 25904)

4.5.7 Calculation results, Exc2 [Phase_4] (4/482), Total displacements u_x



4.5.8 Calculation results, EQK [Phase_8] (8/992), Total displacements u_x

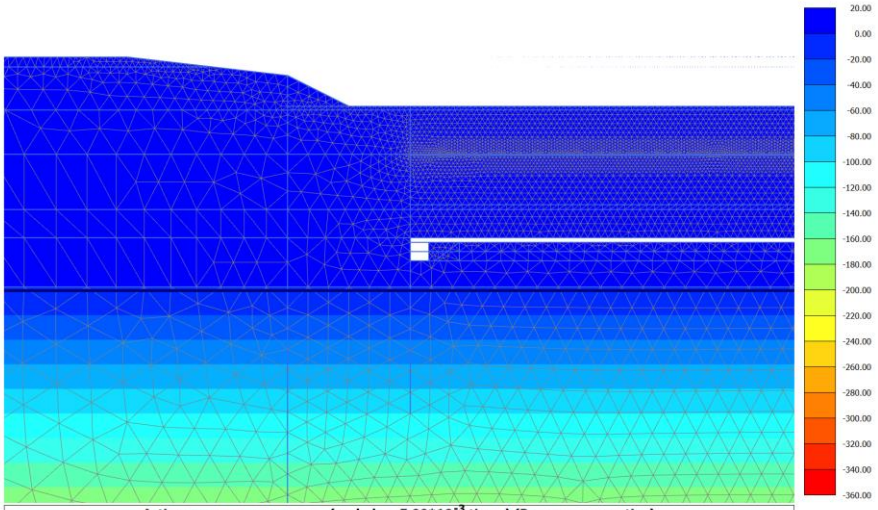


Total displacements u_x (scaled up 20.0 times)

Maximum value = 0.05172 m (Element 1747 at Node 14234)

Minimum value = -0.08855 m (Element 11850 at Node 25904)

4.6.1 Calculation results, Slope modelling [Phase_1] (1/6), Active pore pressures p_{active}

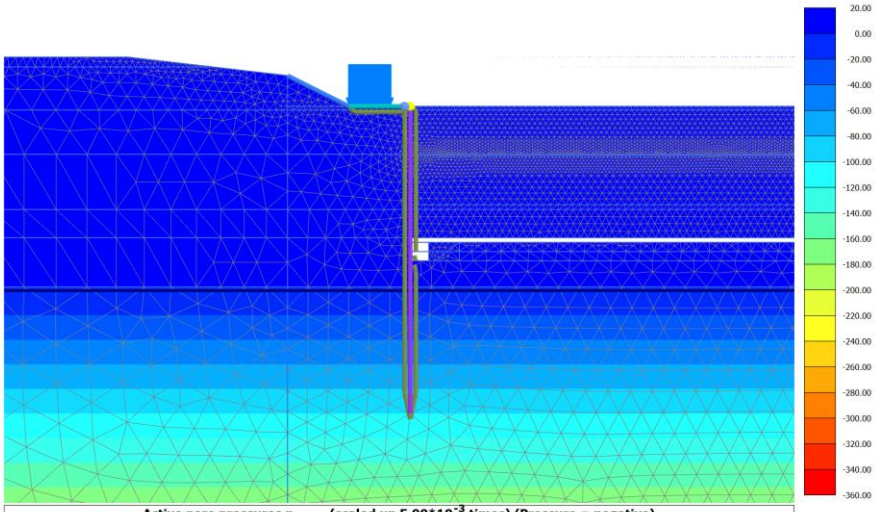


Active pore pressures p_{active} (scaled up $5.00*10^{-3}$ times) (Pressure = negative)

Maximum value = 0.000 kN/m² (Element 313 at Node 2711)

Minimum value = -350.0 kN/m² (Element 13032 at Node 9389)

4.6.2 Calculation results, Pile Installation [Phase_2] (2/8), Active pore pressures p_{active}

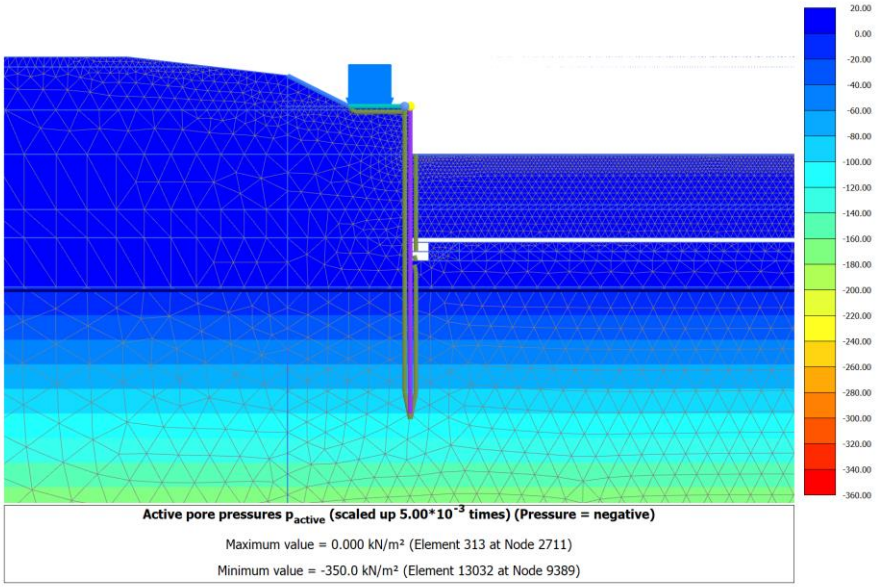


Active pore pressures p_{active} (scaled up $5.00*10^{-3}$ times) (Pressure = negative)

Maximum value = 0.000 kN/m² (Element 313 at Node 2711)

Minimum value = -350.0 kN/m² (Element 13032 at Node 9389)

4.6.3 Calculation results, Exc1 [Phase_3] (3/13), Active pore pressures p_{active}

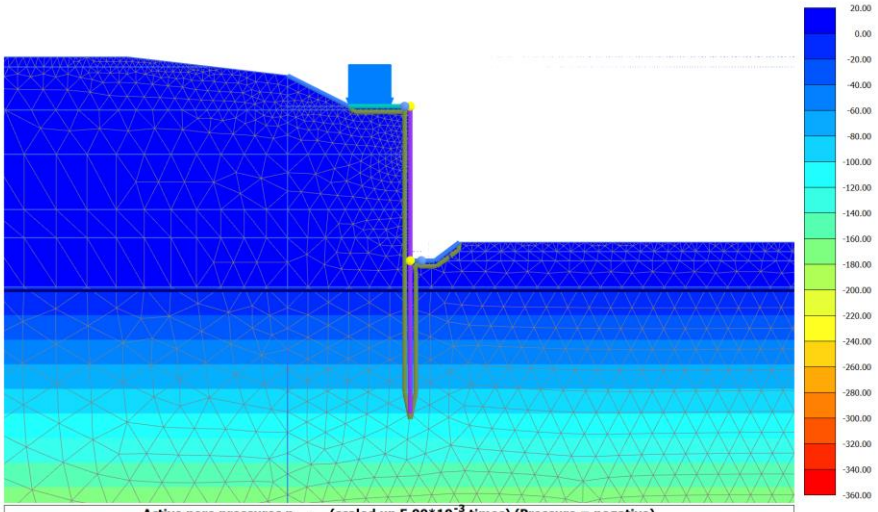


Active pore pressures p_{active} (scaled up $5.00*10^{-3}$ times) (Pressure = negative)

Maximum value = 0.000 kN/m² (Element 313 at Node 2711)

Minimum value = -350.0 kN/m² (Element 13032 at Node 9389)

4.6.4 Calculation results, ExcFinal [Phase_5] (5/293), Active pore pressures p_{active}

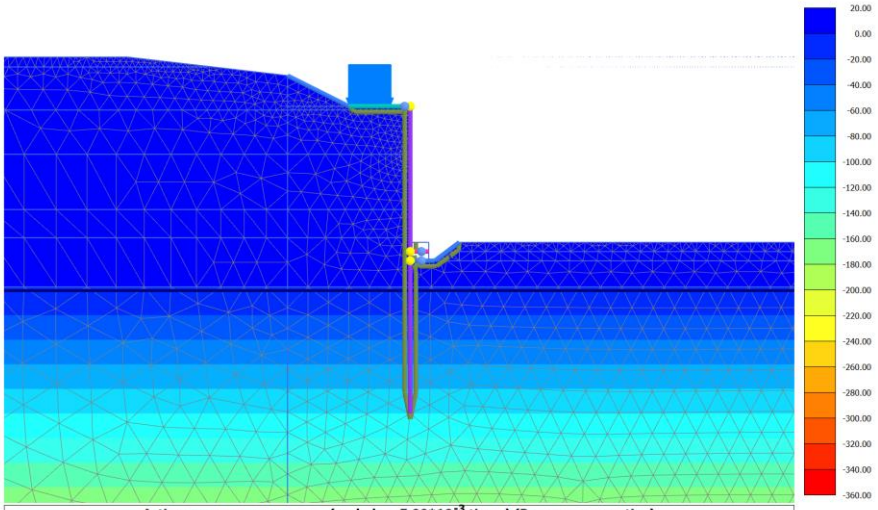


Active pore pressures p_{active} (scaled up $5.00*10^{-3}$ times) (Pressure = negative)

Maximum value = 0.000 kN/m² (Element 313 at Node 2711)

Minimum value = -350.0 kN/m² (Element 13032 at Node 9389)

4.6.5 Calculation results, ShortTerm [Phase_6] (6/308), Active pore pressures p_{active}

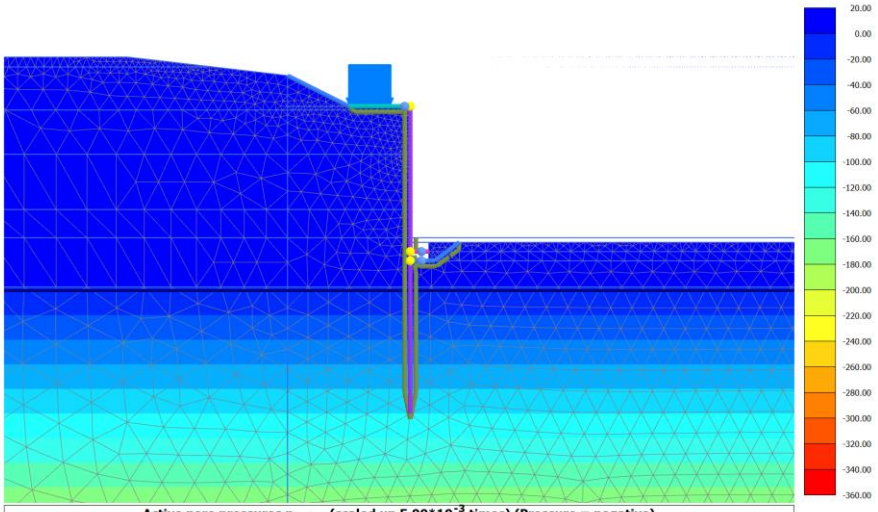


Active pore pressures p_{active} (scaled up $5.00*10^{-3}$ times) (Pressure = negative)

Maximum value = 0.000 kN/m² (Element 313 at Node 2711)

Minimum value = -350.0 kN/m² (Element 13032 at Node 9389)

4.6.6 Calculation results, LongTerm [Phase_7] (7/462), Active pore pressures p_{active}

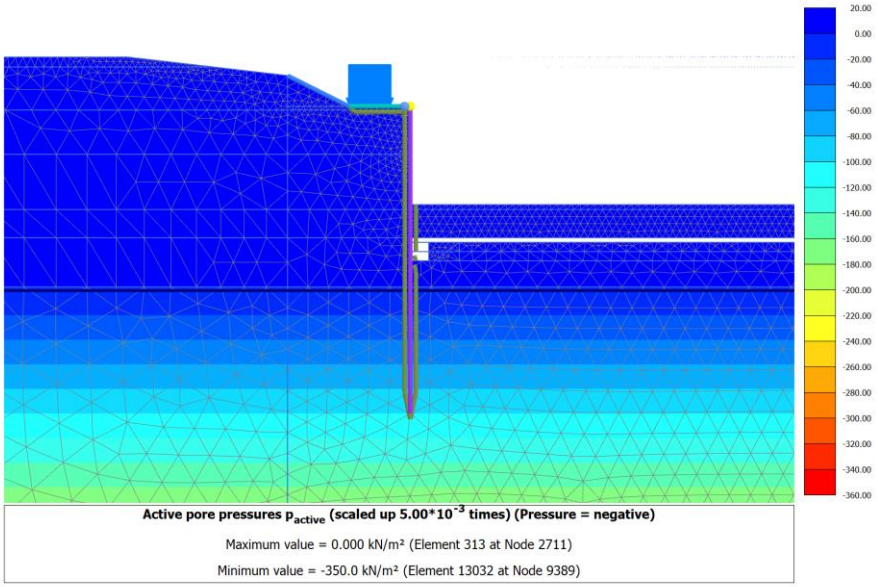


Active pore pressures p_{active} (scaled up $5.00*10^{-3}$ times) (Pressure = negative)

Maximum value = 0.000 kN/m² (Element 313 at Node 2711)

Minimum value = -350.0 kN/m² (Element 13032 at Node 9389)

4.6.7 Calculation results, Exc2 [Phase_4] (4/482), Active pore pressures p_{active}

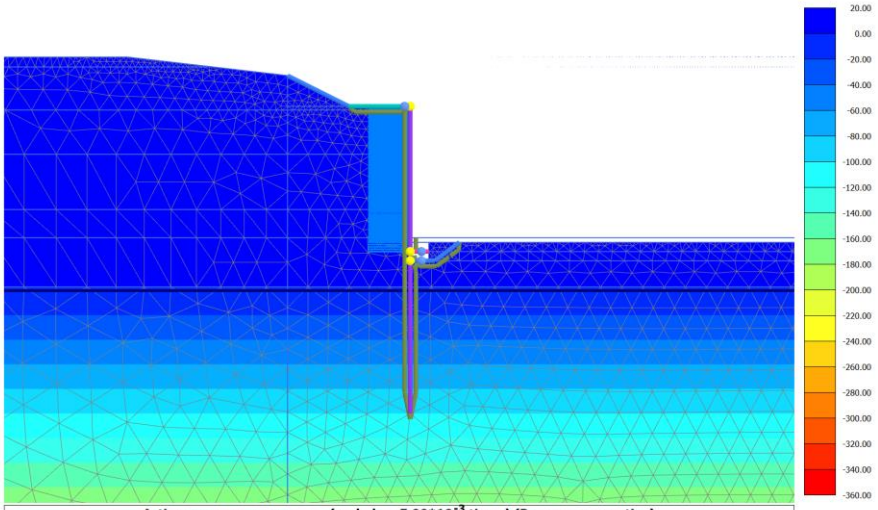


Active pore pressures p_{active} (scaled up $5.00*10^{-3}$ times) (Pressure = negative)

Maximum value = 0.000 kN/m² (Element 313 at Node 2711)

Minimum value = -350.0 kN/m² (Element 13032 at Node 9389)

4.6.8 Calculation results, EQK [Phase_8] (8/992), Active pore pressures p_{active}

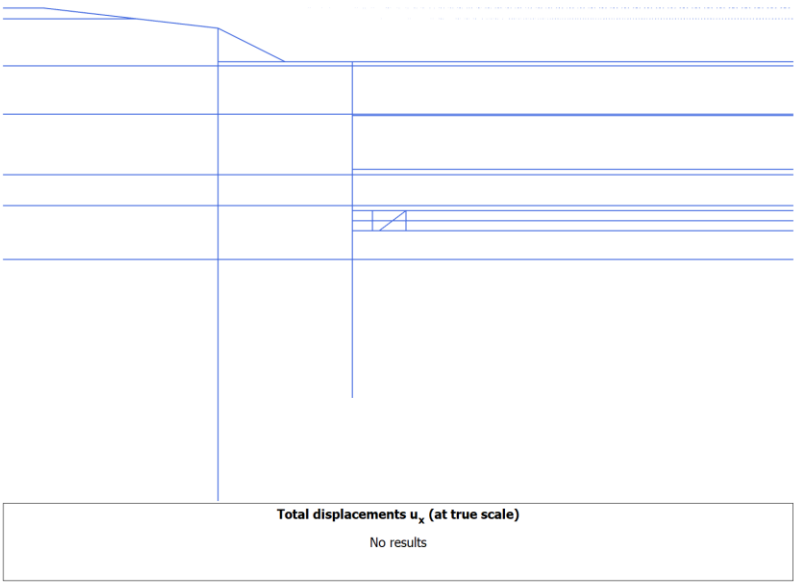


Active pore pressures p_{active} (scaled up $5.00*10^{-3}$ times) (Pressure = negative)

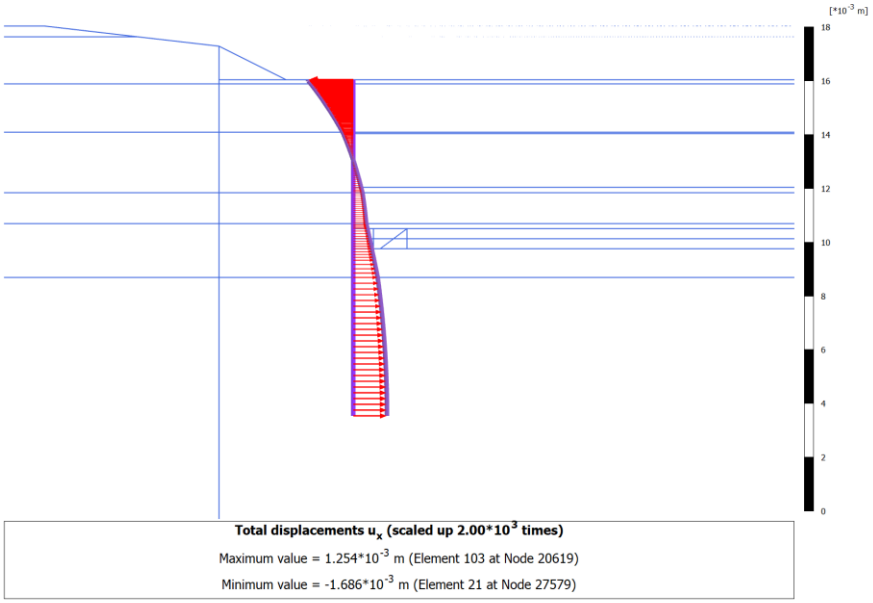
Maximum value = 0.000 kN/m² (Element 313 at Node 2711)

Minimum value = -350.0 kN/m² (Element 13032 at Node 9389)

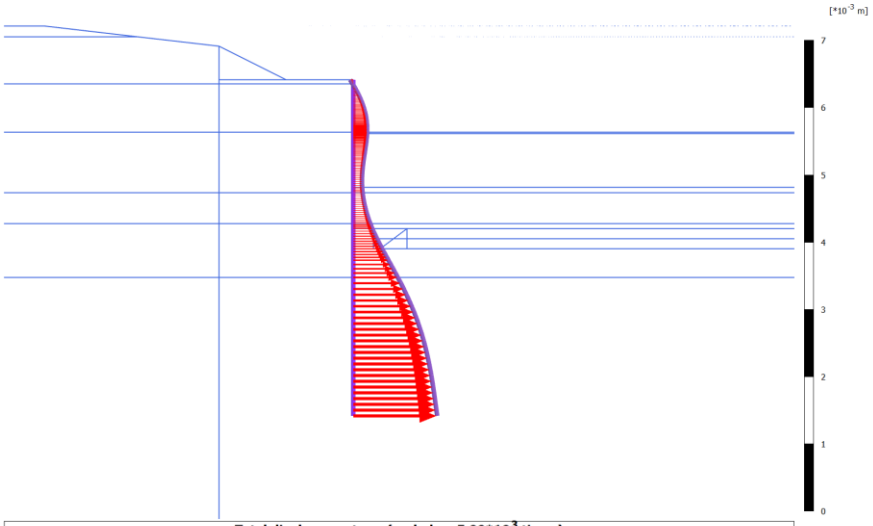
4.7.1 Calculation results, Plate, Slope modelling [Phase_1] (1/6), Total displacements u_x



4.7.2 Calculation results, Plate, Pile Installation [Phase_2] (2/8), Total displacements u_x



4.7.3 Calculation results, Plate, Exc1 [Phase_3] (3/13), Total displacements u_x

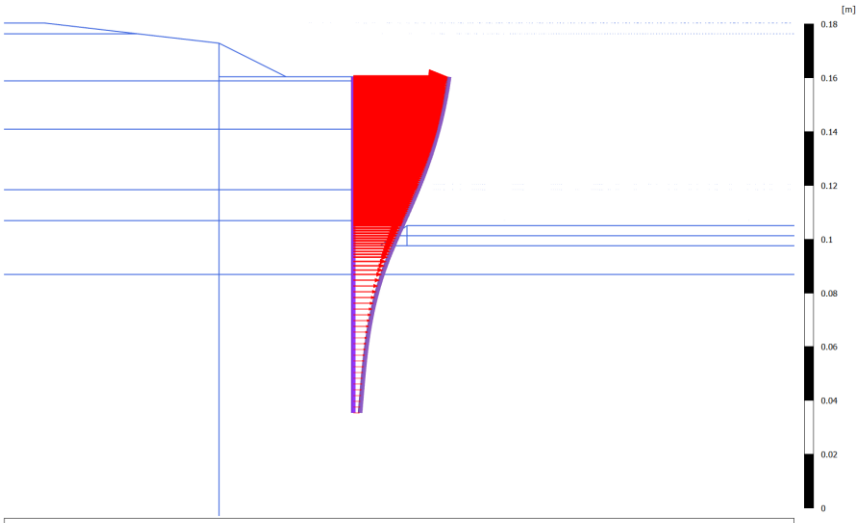


Total displacements u_x (scaled up $5.00*10^{-3}$ times)

Maximum value = $1.250*10^{-3}$ m (Element 103 at Node 20619)

Minimum value = $-0.04777*10^{-3}$ m (Element 21 at Node 27579)

4.7.4 Calculation results, Plate, ExcFinal [Phase_5] (5/293), Total displacements u_x

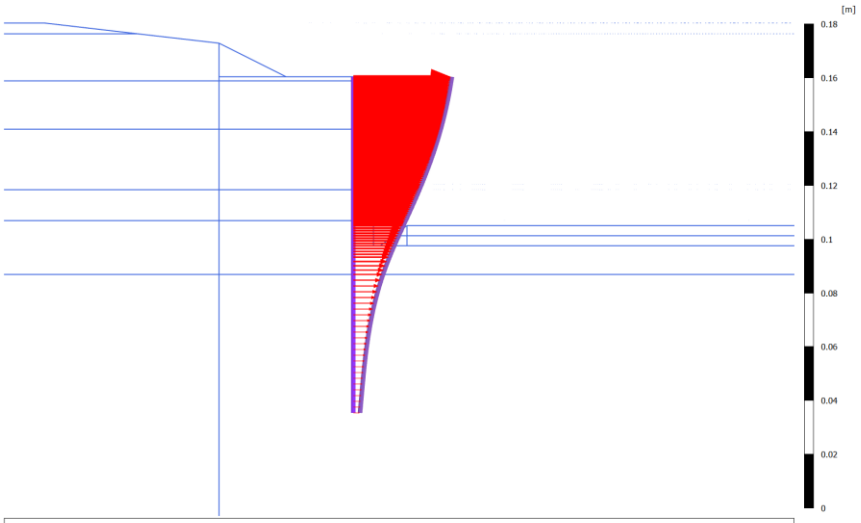


Total displacements u_x (scaled up 200 times)

Maximum value = 0.03567 m (Element 21 at Node 27579)

Minimum value = $2.519*10^{-3}$ m (Element 103 at Node 20619)

4.7.5 Calculation results, Plate, ShortTerm [Phase_6] (6/308), Total displacements u_x

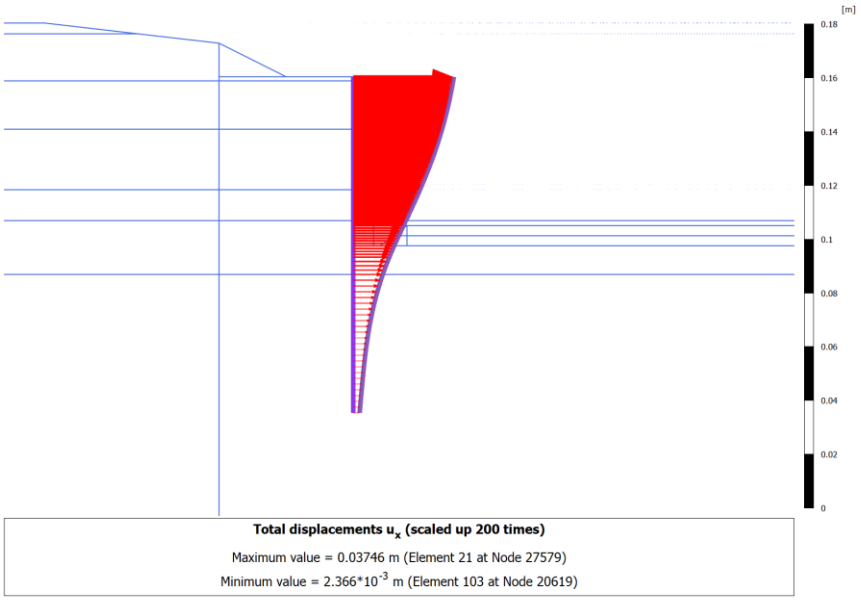


Total displacements u_x (scaled up 200 times)

Maximum value = 0.03672 m (Element 21 at Node 27579)

Minimum value = $2.504*10^{-3}$ m (Element 103 at Node 20619)

4.7.6 Calculation results, Plate, LongTerm [Phase_7] (7/462), Total displacements u_x

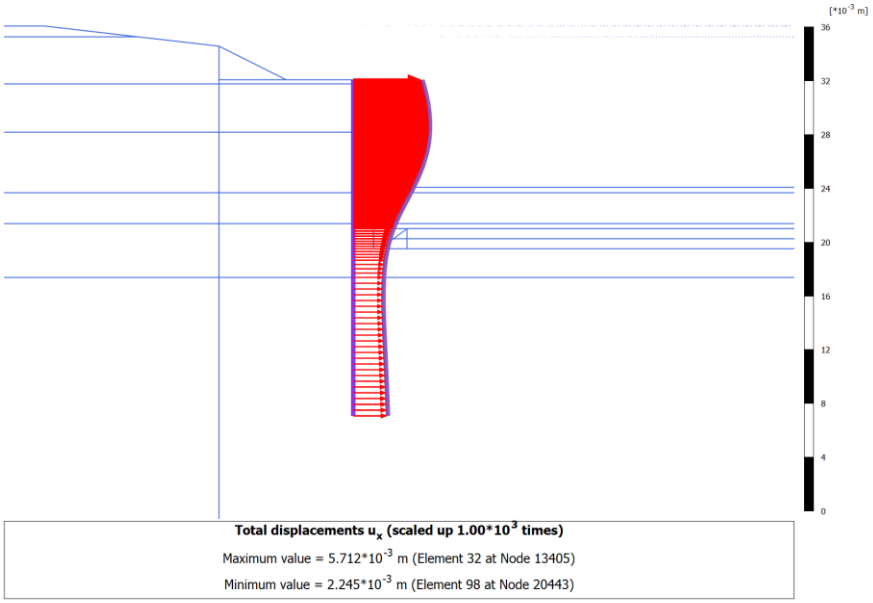


Total displacements u_x (scaled up 200 times)

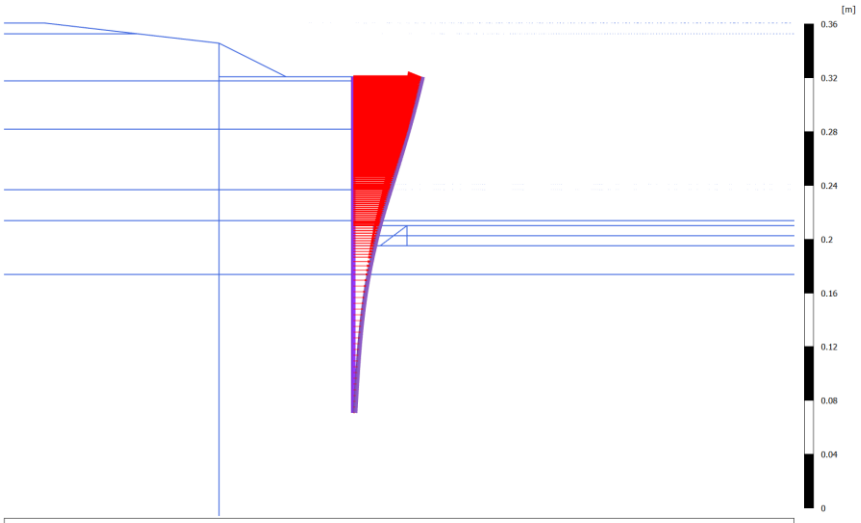
Maximum value = 0.03746 m (Element 21 at Node 27579)

Minimum value = $2.366*10^{-3}$ m (Element 103 at Node 20619)

4.7.7 Calculation results, Plate, Exc2 [Phase_4] (4/482), Total displacements u_x



4.7.8 Calculation results, Plate, EQK [Phase_8] (8/992), Total displacements u_x

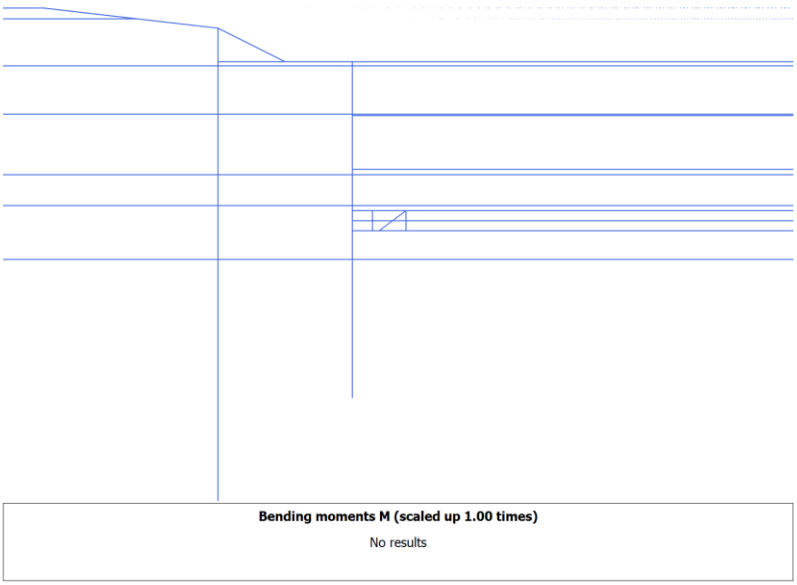


Total displacements u_x (scaled up 100 times)

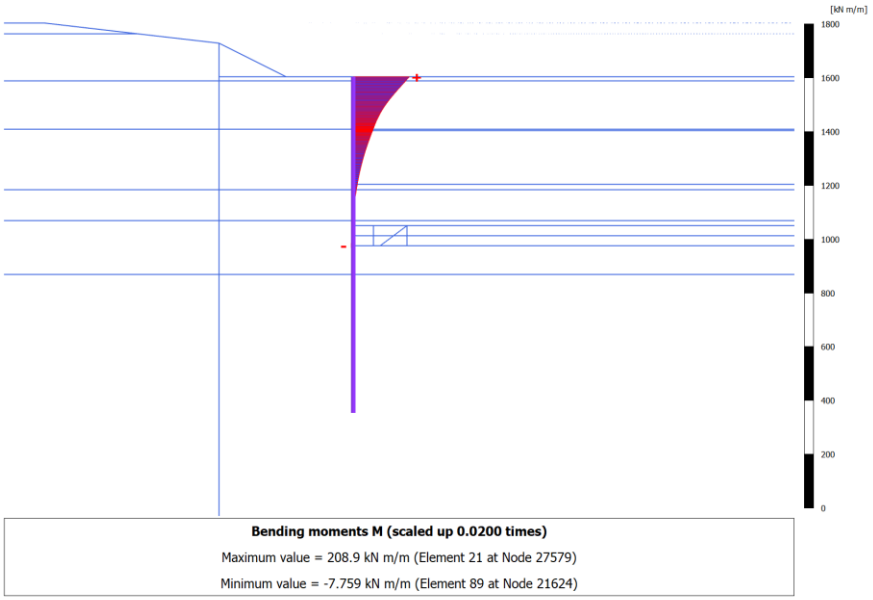
Maximum value = 0.05161 m (Element 21 at Node 27579)

Minimum value = $1.339*10^{-3}$ m (Element 103 at Node 20619)

4.8.1 Calculation results, Plate, Slope modelling [Phase_1] (1/6), Bending moments M



4.8.2 Calculation results, Plate, Pile Installation [Phase_2] (2/8), Bending moments M

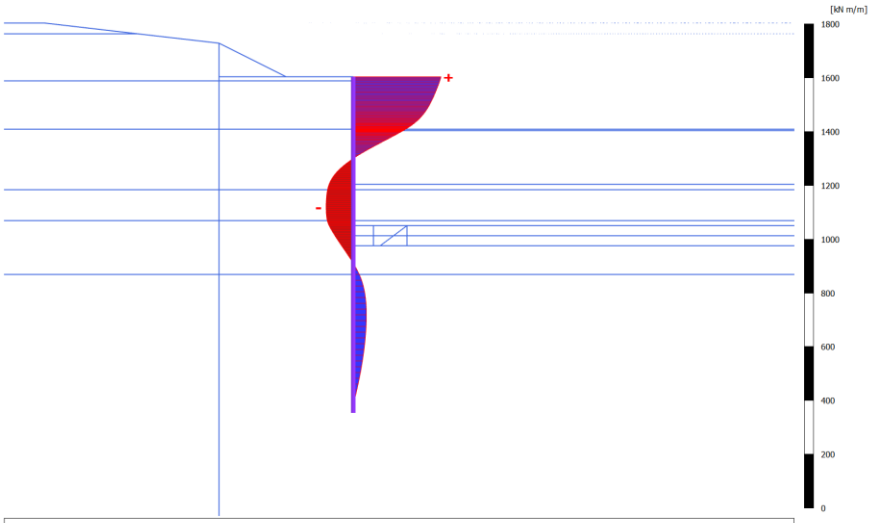


Bending moments M (scaled up 0.0200 times)

Maximum value = 208.9 kN m/m (Element 21 at Node 27579)

Minimum value = -7.759 kN m/m (Element 89 at Node 21624)

4.8.3 Calculation results, Plate, Exc1 [Phase_3] (3/13), Bending moments M

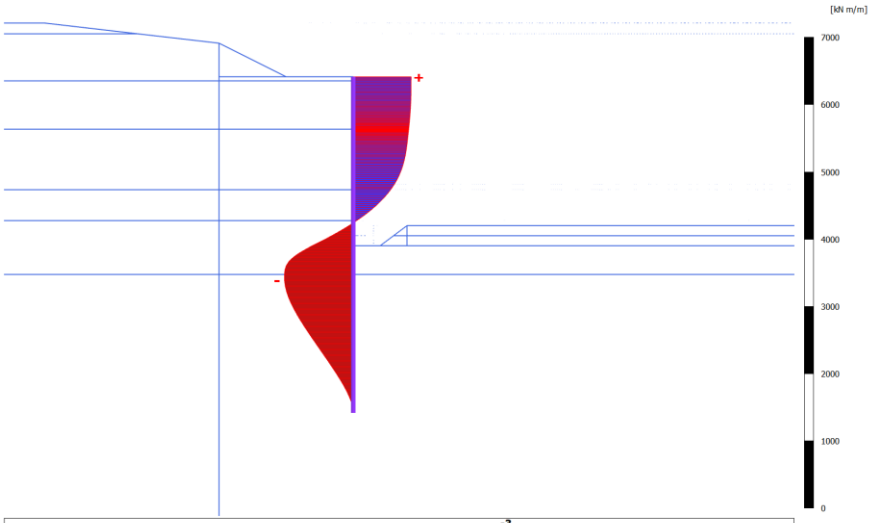


Bending moments M (scaled up 0.0200 times)

Maximum value = 326.6 kN m/m (Element 21 at Node 27579)

Minimum value = -101.3 kN m/m (Element 51 at Node 15597)

4.8.4 Calculation results, Plate, ExcFinal [Phase_5] (5/293), Bending moments M

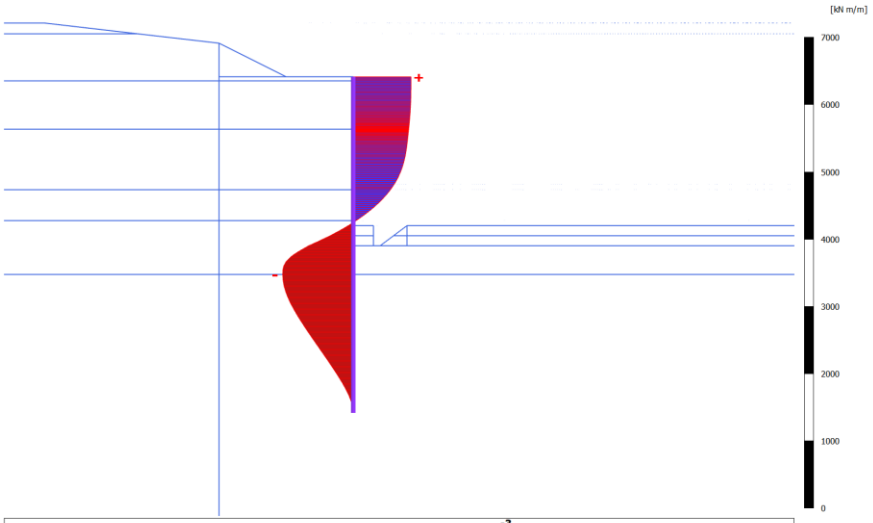


Bending moments M (scaled up $5.00*10^{-3}$ times)

Maximum value = 861.9 kN m/m (Element 21 at Node 27579)

Minimum value = -1026 kN m/m (Element 98 at Node 20441)

4.8.5 Calculation results, Plate, ShortTerm [Phase_6] (6/308), Bending moments M

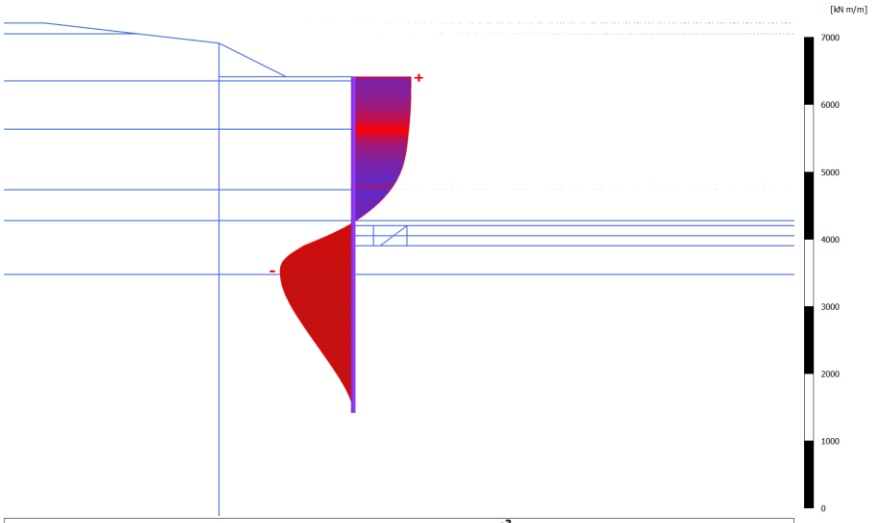


Bending moments M (scaled up $5.00*10^{-3}$ times)

Maximum value = 860.7 kN m/m (Element 21 at Node 27579)

Minimum value = -1052 kN m/m (Element 97 at Node 21608)

4.8.6 Calculation results, Plate, LongTerm [Phase_7] (7/462), Bending moments M

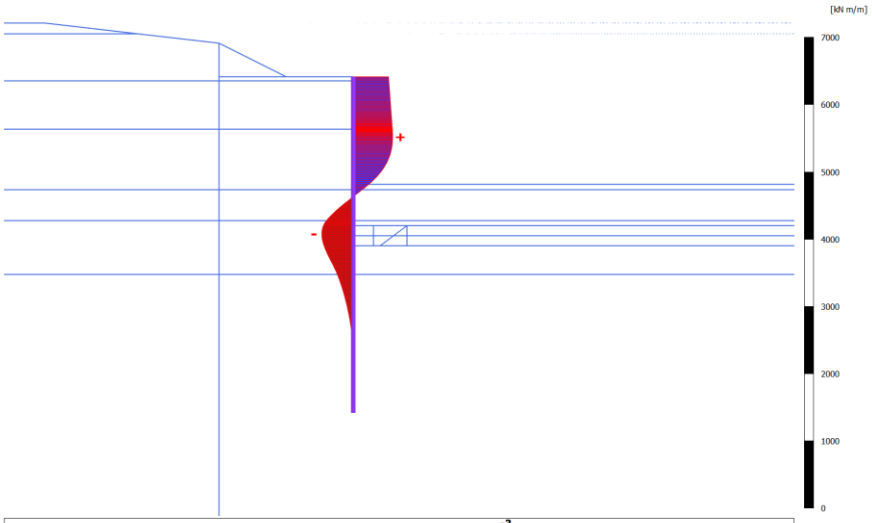


Bending moments M (scaled up $5.00*10^{-3}$ times)

Maximum value = 860.3 kN m/m (Element 21 at Node 27579)

Minimum value = -1091 kN m/m (Element 97 at Node 21607)

4.8.7 Calculation results, Plate, Exc2 [Phase_4] (4/482), Bending moments M

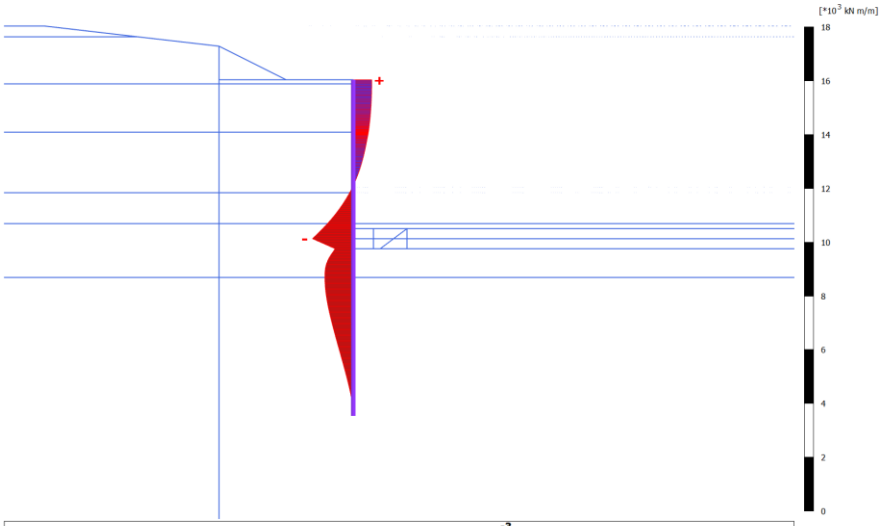


Bending moments M (scaled up $5.00*10^{-3}$ times)

Maximum value = 586.1 kN m/m (Element 38 at Node 9069)

Minimum value = -469.7 kN m/m (Element 54 at Node 19705)

4.8.8 Calculation results, Plate, EQK [Phase_8] (8/992), Bending moments M

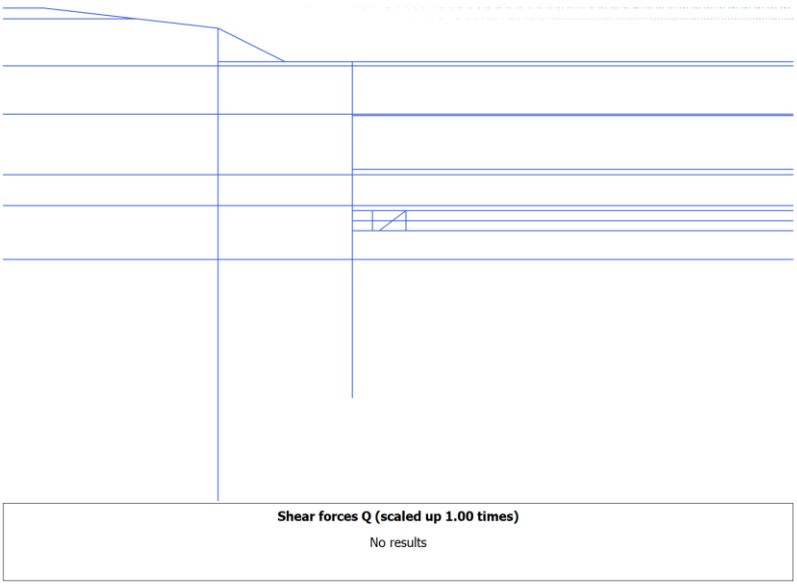


Bending moments M (scaled up $2.00*10^{-3}$ times)

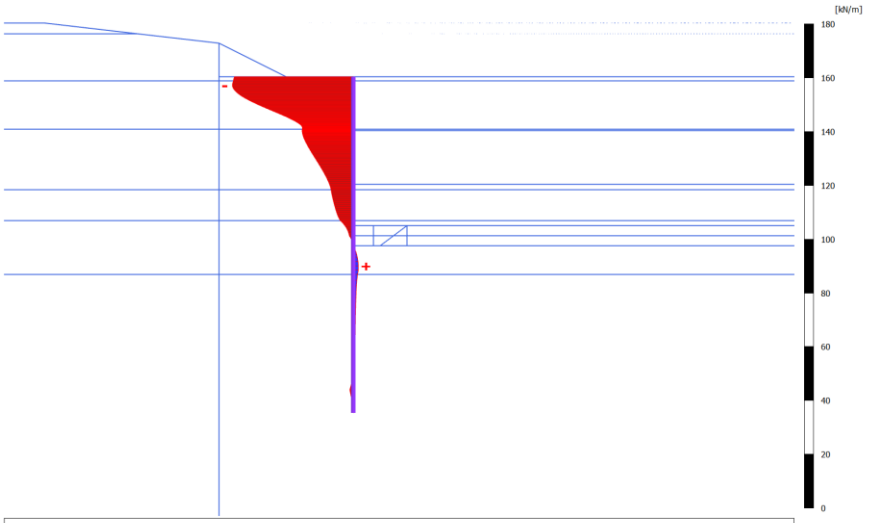
Maximum value = 688.9 kN m/m (Element 21 at Node 27579)

Minimum value = -1522 kN m/m (Element 89 at Node 20651)

4.9.1 Calculation results, Plate, Slope modelling [Phase_1] (1/6), Shear forces Q



4.9.2 Calculation results, Plate, Pile Installation [Phase_2] (2/8), Shear forces Q

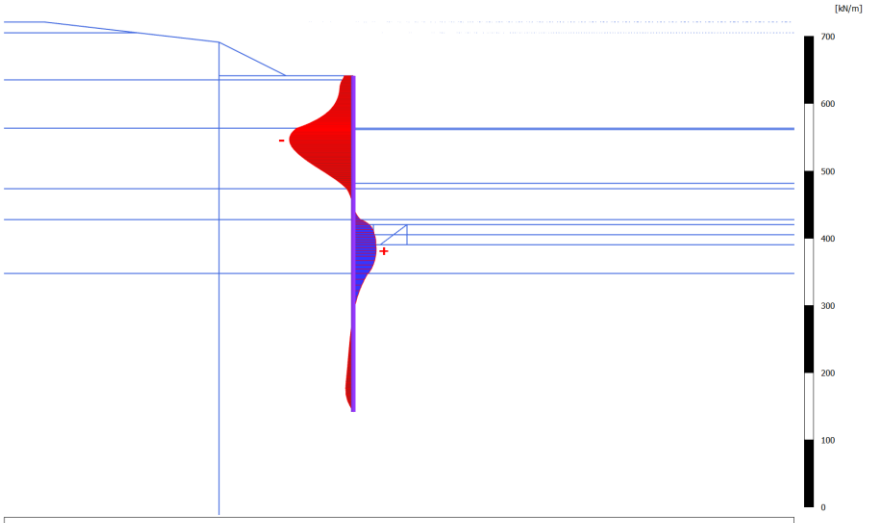


Shear forces Q (scaled up 0.200 times)

Maximum value = 1.899 kN/m (Element 97 at Node 21606)

Minimum value = -45.03 kN/m (Element 22 at Node 24243)

4.9.3 Calculation results, Plate, Exc1 [Phase_3] (3/13), Shear forces Q

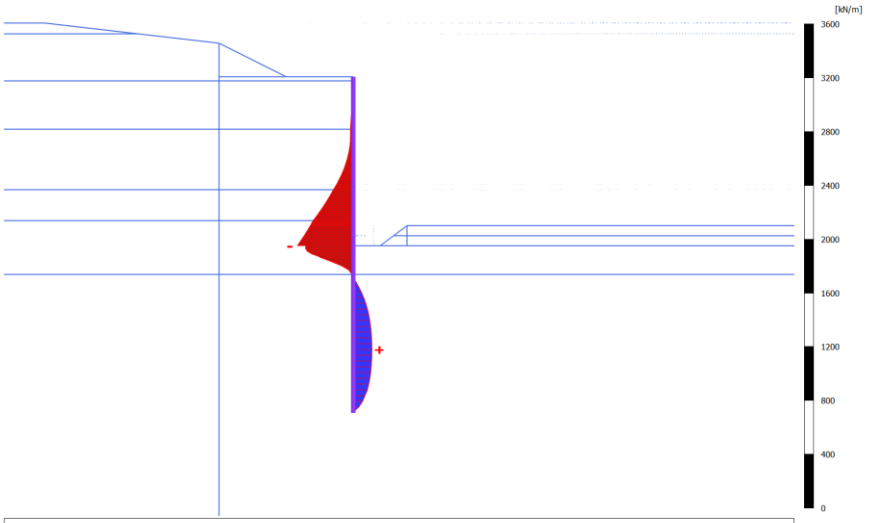


Shear forces Q (scaled up 0.0500 times)

Maximum value = 34.24 kN/m (Element 96 at Node 21626)

Minimum value = -95.16 kN/m (Element 39 at Node 8860)

4.9.4 Calculation results, Plate, ExcFinal [Phase_5] (5/293), Shear forces Q

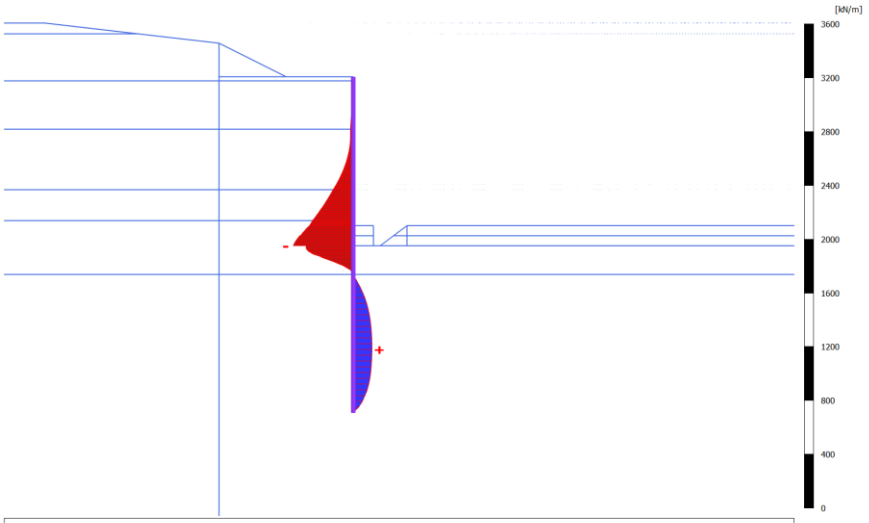


Shear forces Q (scaled up 0.0100 times)

Maximum value = 139.2 kN/m (Element 101 at Node 20464)

Minimum value = -417.7 kN/m (Element 89 at Node 21624)

4.9.5 Calculation results, Plate, ShortTerm [Phase_6] (6/308), Shear forces Q

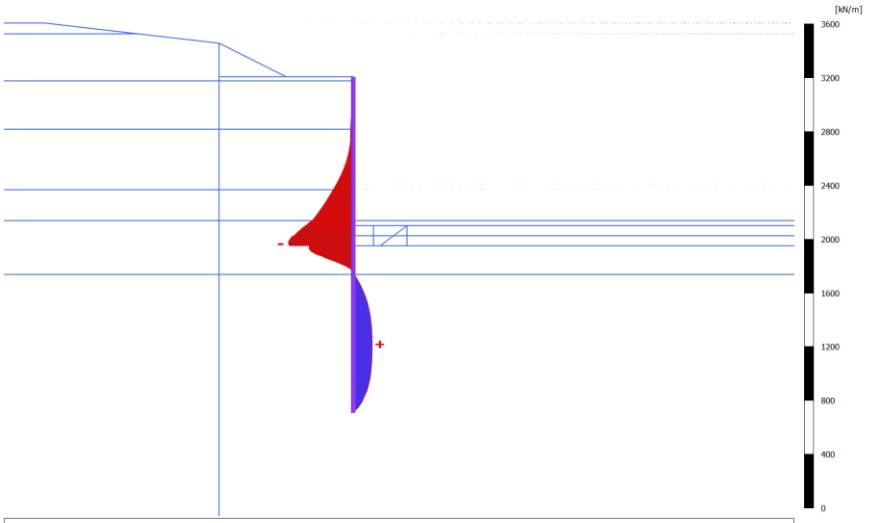


Shear forces Q (scaled up 0.0100 times)

Maximum value = 139.5 kN/m (Element 101 at Node 20464)

Minimum value = -447.5 kN/m (Element 89 at Node 21624)

4.9.6 Calculation results, Plate, LongTerm [Phase_7] (7/462), Shear forces Q

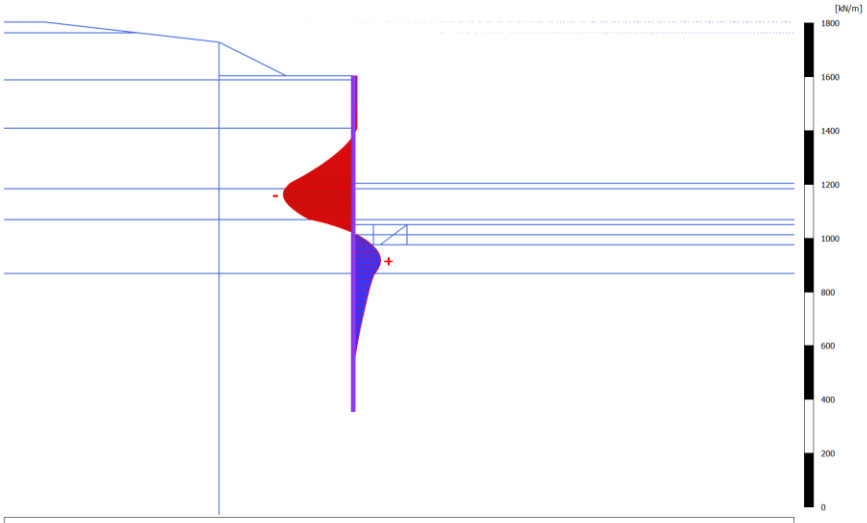


Shear forces Q (scaled up 0.0100 times)

Maximum value = 141.4 kN/m (Element 101 at Node 20507)

Minimum value = -483.4 kN/m (Element 89 at Node 20654)

4.9.7 Calculation results, Plate, Exc2 [Phase_4] (4/482), Shear forces Q

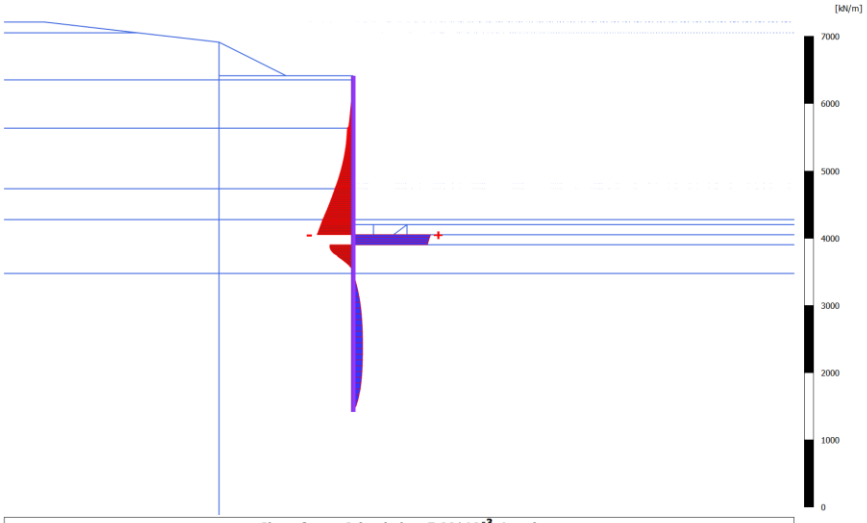


Shear forces Q (scaled up 0.0200 times)

Maximum value = 102.4 kN/m (Element 97 at Node 21605)

Minimum value = -261.2 kN/m (Element 49 at Node 12764)

4.9.8 Calculation results, Plate, EQK [Phase_8] (8/992), Shear forces Q

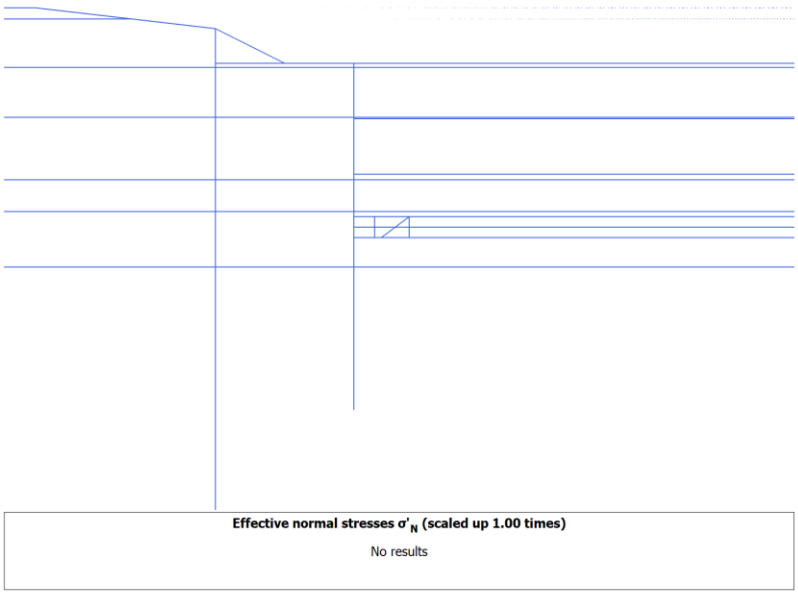


Shear forces Q (scaled up $5.00*10^{-3}$ times)

Maximum value = 1153 kN/m (Element 89 at Node 20651)

Minimum value = -540.0 kN/m (Element 54 at Node 20651)

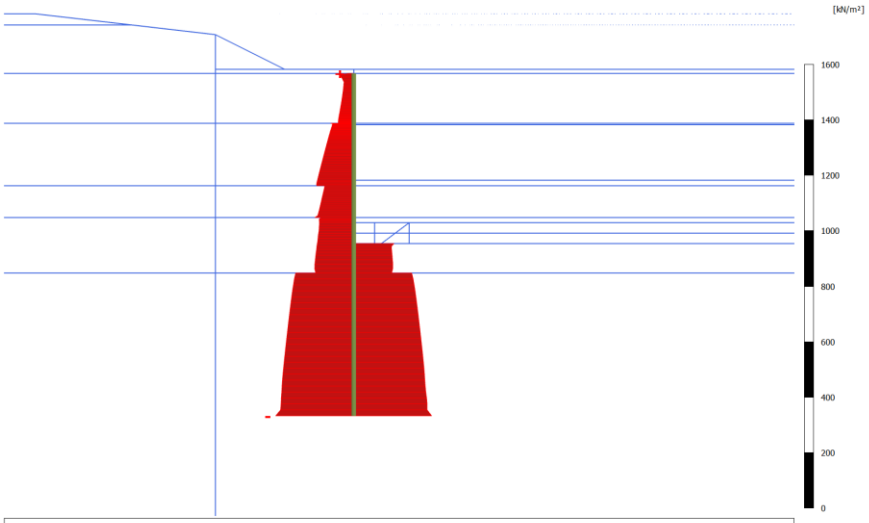
4.10.1 Calculation results, Interface, Slope modelling [Phase_1] (1/6), Effective normal stresses σ'_N



Effective normal stresses σ'_N (scaled up 1.00 times)

No results

4.10.2 Calculation results, Interface, Pile Installation [Phase_2] (2/8), Effective normal stresses σ'$_N$

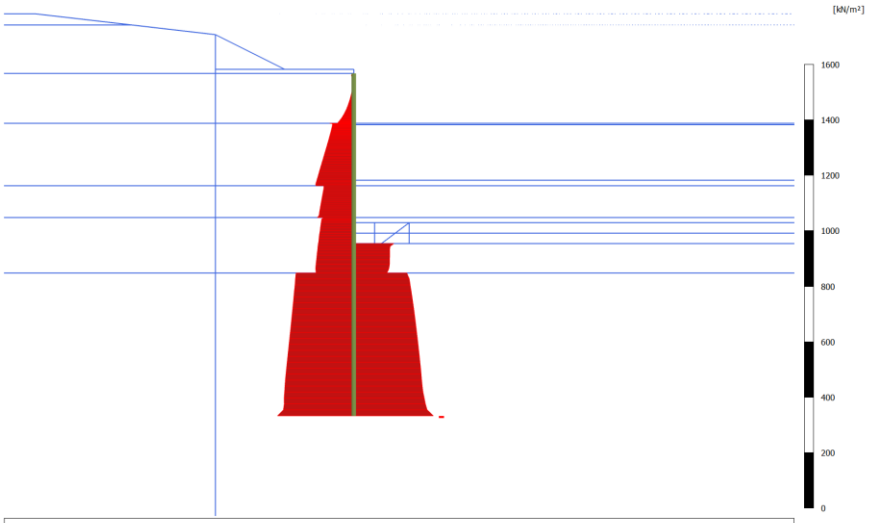


Effective normal stresses σ'$_N$ (scaled up 0.0200 times)

Maximum value = -20.71 kN/m² (Element 28 at Node 25206)

Minimum value = -282.2 kN/m² (Element 138 at Node 22755)

4.10.3 Calculation results, Interface, Exc1 [Phase_3] (3/13), Effective normal stresses σ'$_N$

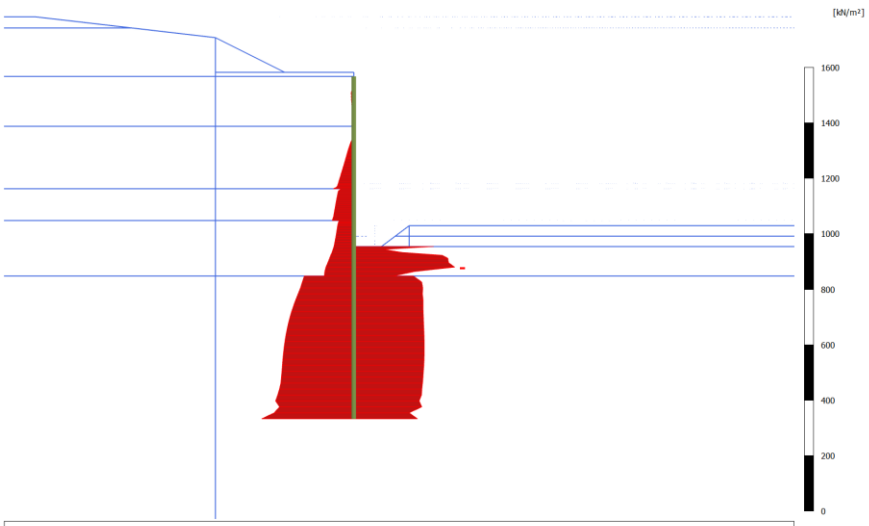


Effective normal stresses σ'$_N$ (scaled up 0.0200 times)

Maximum value = 0.000 kN/m² (Element 28 at Node 25206)

Minimum value = -287.5 kN/m² (Element 127 at Node 22755)

4.10.4 Calculation results, Interface, ExcFinal [Phase_5] (5/293), Effective normal stresses σ'$_N$

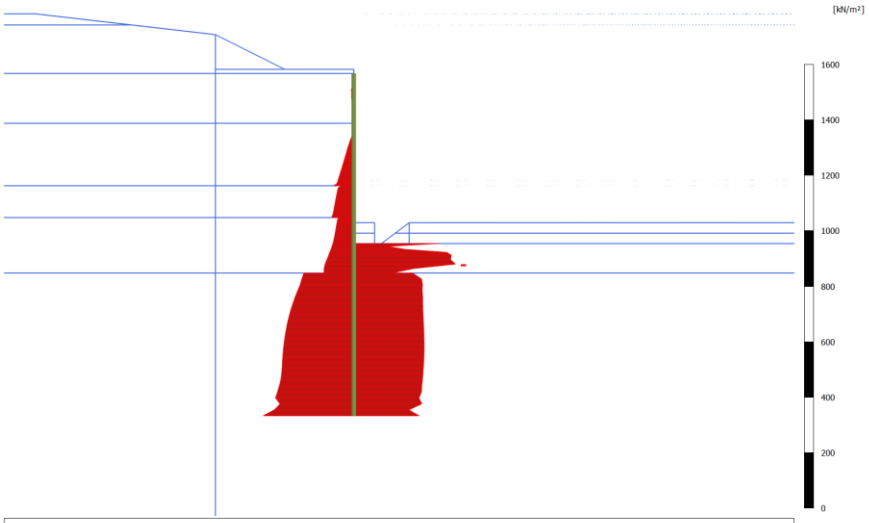


Effective normal stresses σ'$_N$ (scaled up 0.0200 times)

Maximum value = 0.000 kN/m² (Element 29 at Node 23798)

Minimum value = -364.6 kN/m² (Element 123 at Node 24029)

4.10.5 Calculation results, Interface, ShortTerm [Phase_6] (6/308), Effective normal stresses σ'$_N$

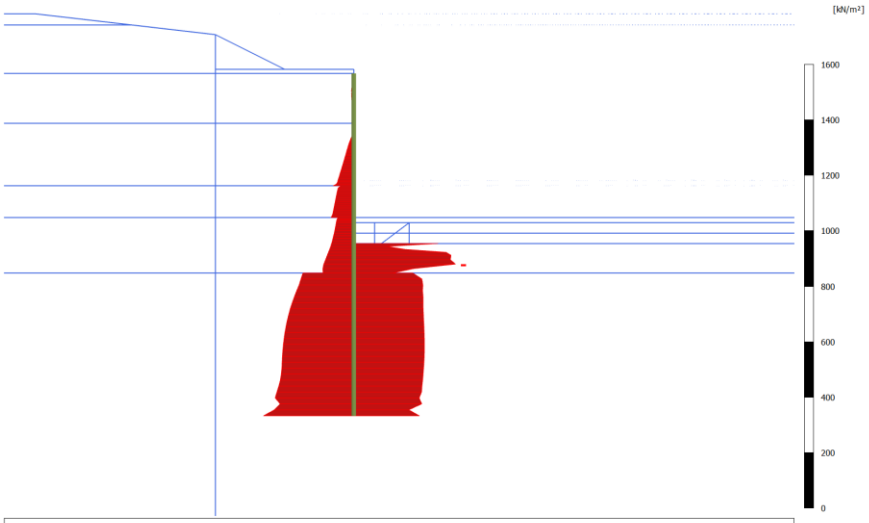


Effective normal stresses σ'$_N$ (scaled up 0.0200 times)

Maximum value = 0.000 kN/m² (Element 29 at Node 23798)

Minimum value = -367.4 kN/m² (Element 123 at Node 24029)

4.10.6 Calculation results, Interface, LongTerm [Phase_7] (7/462), Effective normal stresses σ'$_N$

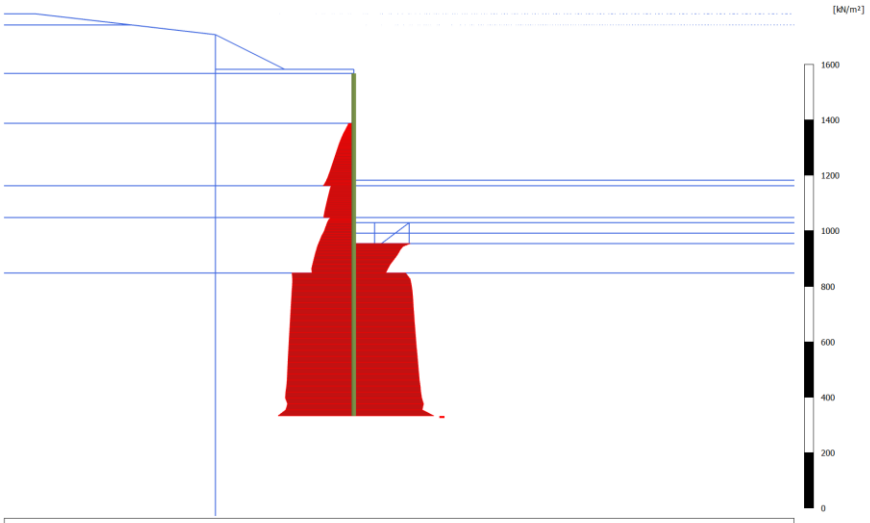


Effective normal stresses σ'$_N$ (scaled up 0.0200 times)

Maximum value = 0.000 kN/m² (Element 29 at Node 23798)

Minimum value = -367.5 kN/m² (Element 123 at Node 24029)

4.10.7 Calculation results, Interface, Exc2 [Phase_4] (4/482), Effective normal stresses σ'$_N$

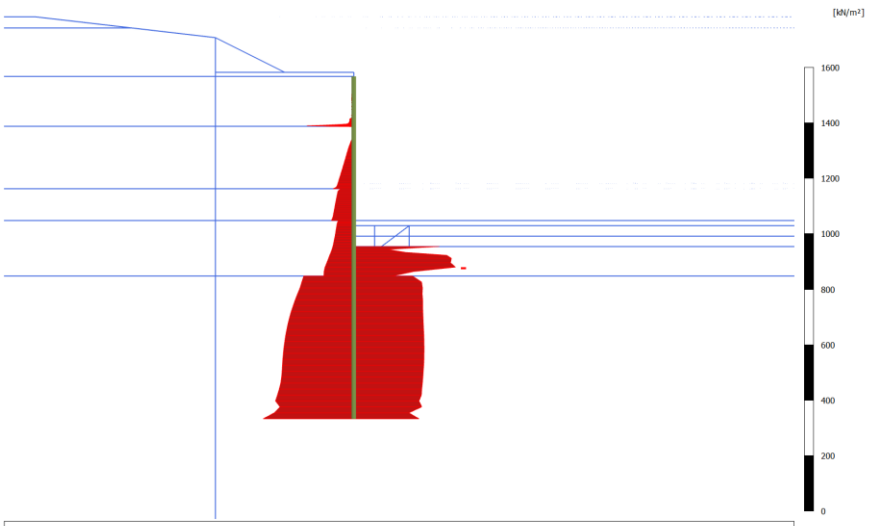


Effective normal stresses σ'$_N$ (scaled up 0.0200 times)

Maximum value = 0.000 kN/m² (Element 33 at Node 19396)

Minimum value = -289.6 kN/m² (Element 127 at Node 22755)

4.10.8 Calculation results, Interface, EQK [Phase_8] (8/992), Effective normal stresses σ'$_N$



Effective normal stresses σ'$_N$ (scaled up 0.0200 times)

Maximum value = 0.000 kN/m² (Element 29 at Node 23796)

Minimum value = -367.2 kN/m² (Element 123 at Node 24029)