

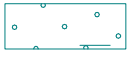

Sheeting structure design

Input data

Project

Date : 11/2/2005

Basic soil parameters

No.	Name	Pattern	φ_{ef} [°]	c_{ef} [kPa]	γ [kN/m ³]	γ_{su} [kN/m ³]	δ [°]
1	Soil No. 1		29.00	5.00	18.00	10.00	0.00
2	Soil No. 2		15.00	5.00	20.50	10.50	0.00

Soil parameters


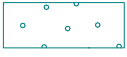
Soil No. 1

Unit weight : $\gamma = 18.00$ kN/m³
 Stress-state : effective
 Angle of internal friction : $\varphi_{ef} = 29.00$ °
 Cohesion of soil : $c_{ef} = 5.00$ kPa
 Active friction angle : $\delta_{act} = 20.00$ °
 Passive friction angle : $\delta_{pas} = 15.00$ °
 Saturated unit weight : $\gamma_{sat} = 20.00$ kN/m³

Soil No. 2

Unit weight : $\gamma = 20.50$ kN/m³
 Stress-state : effective
 Angle of internal friction : $\varphi_{ef} = 15.00$ °
 Cohesion of soil : $c_{ef} = 5.00$ kPa
 Active friction angle : $\delta_{act} = 15.00$ °
 Passive friction angle : $\delta_{pas} = 15.00$ °
 Saturated unit weight : $\gamma_{sat} = 20.50$ kN/m³

Geological profile and assigned soils

No.	Layer [m]	Assigned soil	Pattern
1	1.50	Soil No. 2	
2	-	Soil No. 1	

Geometry of structure

Soil in front of wall is excavated to a depth of 4.00 m.

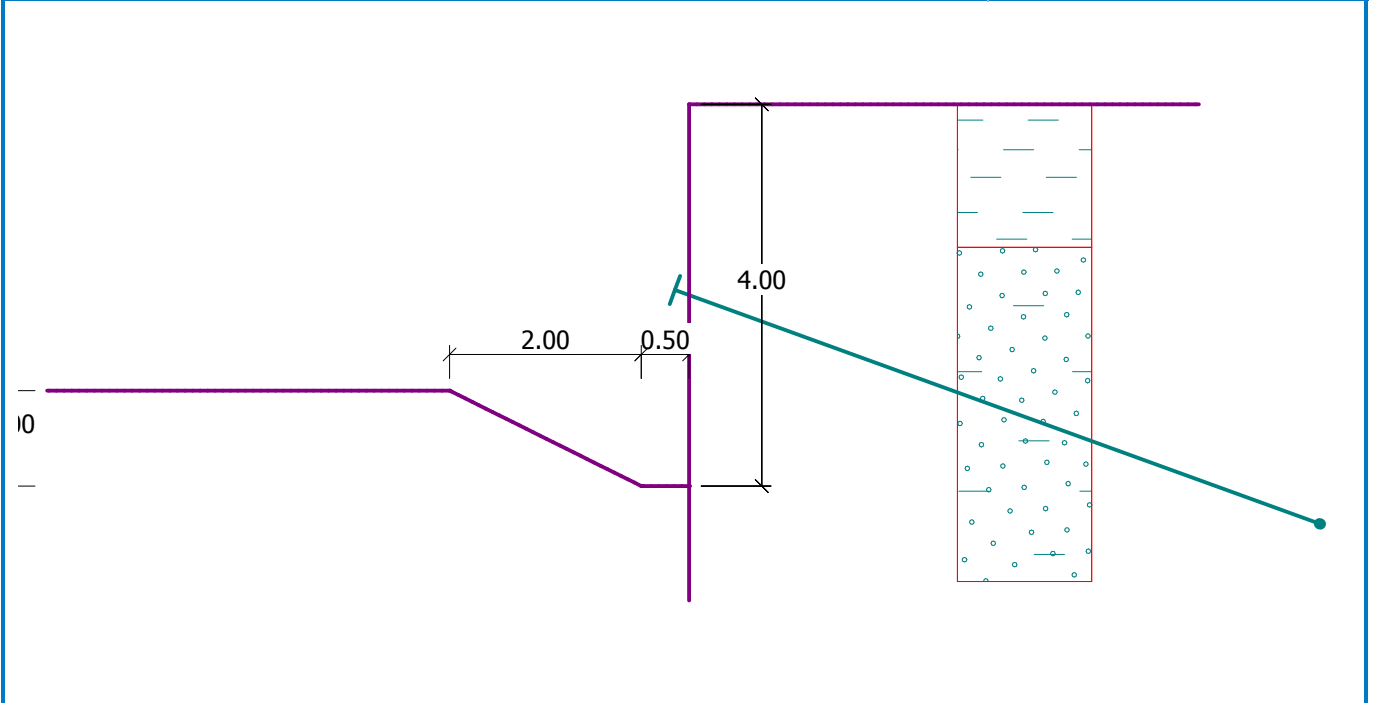
Ditch bottom shape

No.	Coordinate X [m]	Depth Z [m]
1	0.00	0.00
2	-0.50	0.00
3	-2.50	-1.00
4	-3.50	-1.00

Origin [0,0] is located at the ditch bottom.
 Positive coordinate +z has downward direction.

Name : Excavation

Stage : 1

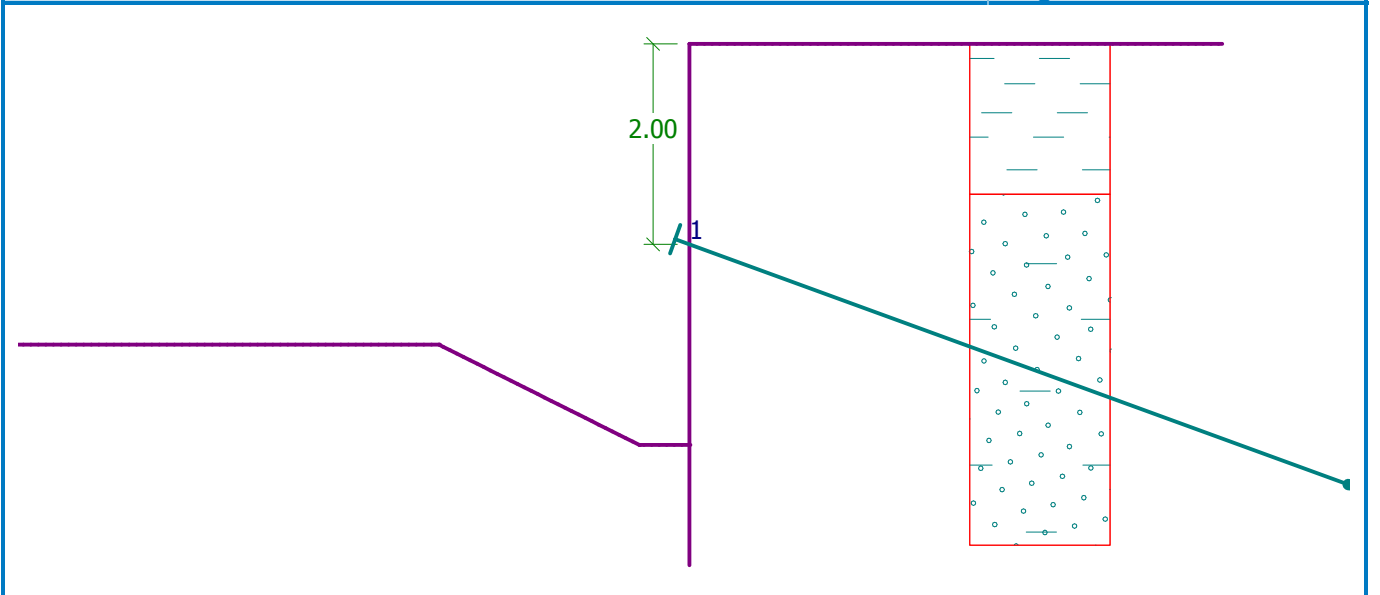


Input anchors

No.	New anchor	Depth z [m]	Length l [m]	Root l_k [m]	Slope α [°]	Spacing b [m]	Force F [kN]
1	YES	2.00	7.00	0.01	20.00	1.00	31.24

Name : Anchors

Stage : 1



Terrain profile

Terrain behind the structure is flat.

Water influence

Ground water table is located below the structure.

Global settings

Verification methodology : Analysis according to EN 1997

Input of partial factors : Standard

Design approach : 1 - reduction of actions and materials

Partial factors on actions (F)	Fact.	Combination 1 [-]		Combination 2 [-]	
		Unfavourable	Favourable	Unfavourable	Favourable
Permanent actions	γ_G	1.35	1.00	1.00	1.00
Variable actions	γ_Q	1.50	0.00	1.30	0.00
Water actions	γ_w	1.30		1.00	

Partial factors for soil parameters (M)	Fact.	Combination 1	Combination 2
		[-]	[-]
Partial factor for internal friction	$\gamma_{m\phi}$	1.00	1.25
Partial factor for effective cohesion	γ_{mc}	1.00	1.25
Partial factor for undrained shear strength	$\gamma_{m_{cu}}$	1.00	1.40
Partial factor for Poisson's ratio	γ_{mv}	1.00	1.00

Active earth pressure calculation - Coulomb

Passive earth pressure calculation - Caquot-Kerisel

Settings of the stage of construction

Combination : basic

Verification No. 1

Design of anchored sheeting wall fixed at heel

Combination No. 1

Coeff. of reduction of passive pressure = 0.99

A minimum dimensioning pressure was considered when computing the active pressure.

Computed depth of the zero-value point $u = 0.00$ m

Max. value of shear force = 33.07 kN/m
 Max. value of moment = 7.74 kNm/m
 Required depth of structure in soil = 1.23 m
 Overall length of structure = 5.23 m

Anchor forces

No.	Depth z [m]	Anchor force [kN]
1	2.00	31.24

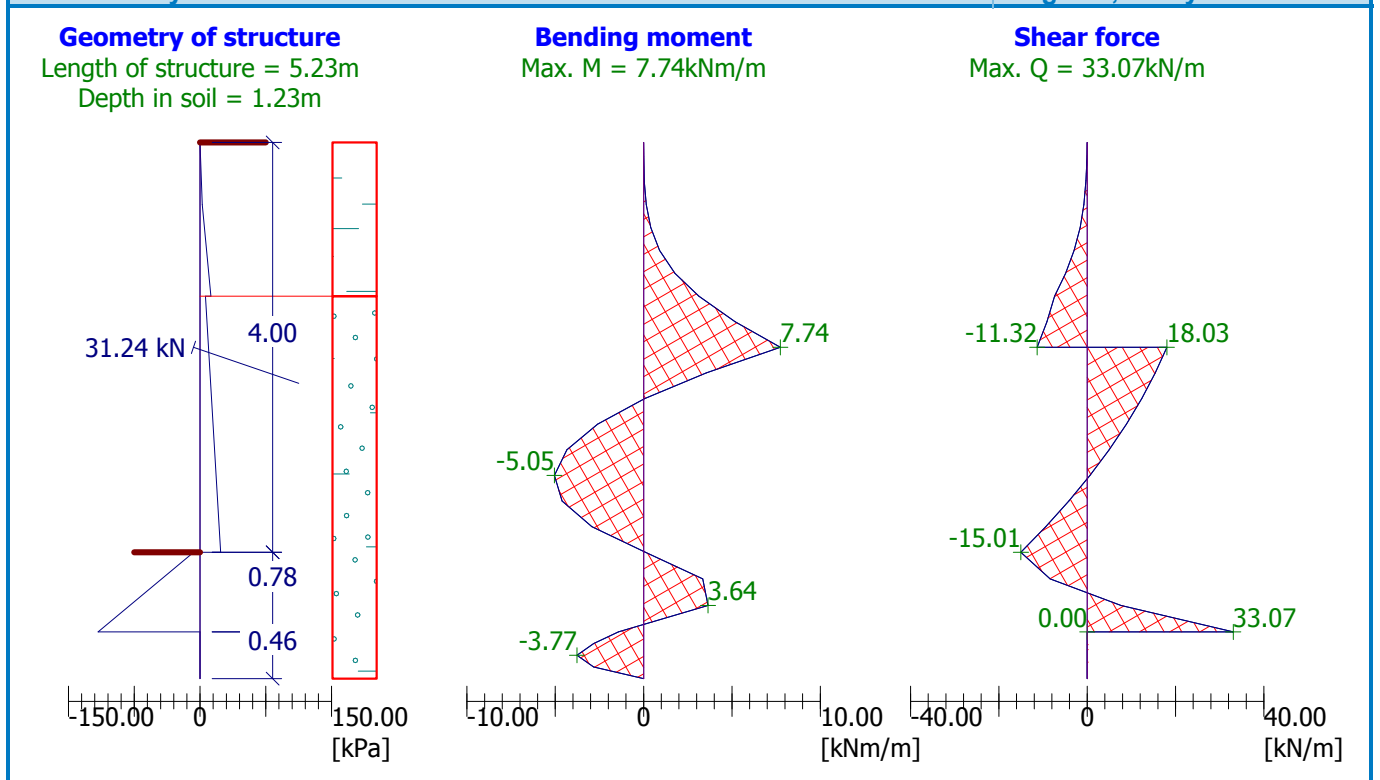
Distribution of pressure and internal forces along the structure

Depth [m]	Total Pressure [kPa]	Shear Force [kN/m]	Moment [kNm/m]
0.00	0.00	-0.00	-0.00
0.13	0.55	-0.04	0.00
0.37	1.52	-0.28	0.03
0.61	2.49	-0.75	0.15
0.83	4.96	-1.59	0.40
1.05	7.42	-2.97	0.90
1.28	9.89	-4.90	1.77
1.50	12.36	-7.39	3.13
1.50	6.15	-7.39	3.13
1.75	7.88	-9.14	5.19
2.00	9.61	-11.32	7.74
2.00	9.61	18.03	7.74
2.25	11.34	15.42	3.55

Depth [m]	Total Pressure [kPa]	Shear Force [kN/m]	Moment [kNm/m]
2.50	13.07	12.37	0.07
2.75	14.80	8.88	-2.60
3.00	16.52	4.97	-4.34
3.25	18.25	0.62	-5.05
3.50	19.98	-4.16	-4.61
3.75	21.71	-9.37	-2.93
4.00	23.44	-15.01	0.11
4.00	-7.42	-15.01	0.11
4.26	-43.70	-8.39	3.34
4.52	-79.97	7.64	3.64
4.78	-116.25	33.07	-1.43

Name : Analysis

Stage : 1; Analysis : 1



Verification No. 2

Design of anchored sheeting wall hinged at heel

Combination No. 1

Coeff. of reduction of passive pressure = 1.00

A minimum dimensioning pressure was considered when computing the active pressure.

Computed depth of the zero-value point $u = 0.00$ m

Max. value of shear force = 19.81 kN/m
 Max. value of moment = 7.74 kNm/m
 Required depth of structure in soil = 0.42 m
 Overall length of structure = 4.42 m

Anchor forces

No.	Depth z [m]	Anchor force [kN]
1	2.00	33.13

Distribution of pressure and internal forces along the structure

Depth [m]	Total Pressure [kPa]	Shear Force [kN/m]	Moment [kNm/m]
0.00	0.00	0.00	0.00
0.13	0.55	-0.04	0.00
0.37	1.52	-0.28	0.03
0.61	2.49	-0.75	0.15
0.83	4.96	-1.59	0.40
1.05	7.42	-2.97	0.90
1.28	9.89	-4.90	1.77
1.50	12.36	-7.39	3.13
1.50	6.15	-7.39	3.13
1.75	7.87	-9.14	5.19
2.00	9.60	-11.32	7.74
2.00	9.60	19.81	7.74
2.22	11.13	17.50	3.58
2.44	12.67	14.86	-0.02
2.67	14.20	11.87	-2.99
2.89	15.73	8.55	-5.27
3.11	17.27	4.88	-6.77
3.33	18.80	0.87	-7.41
3.56	20.33	-3.47	-7.13
3.78	21.87	-8.16	-5.84
4.00	23.40	-13.19	-3.48
4.00	-7.46	-13.19	-3.48
4.21	-31.26	-9.14	-1.05
4.42	-55.07	0.00	0.00