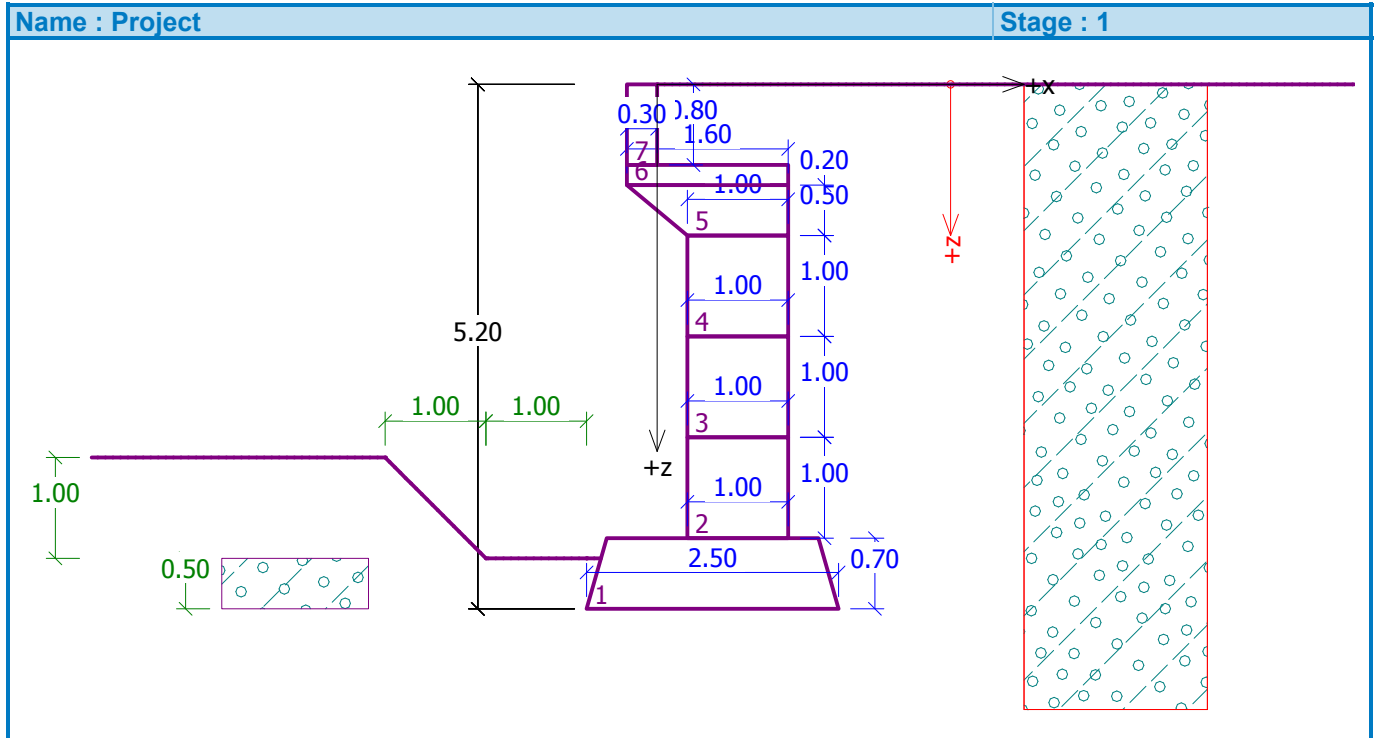


## Prefab wall analysis

### Input data

#### Project

Date : 3/28/2009



### Geometry of structure

Slope of wall = 0.00 °

No.	Width b [m]	Height h [m]	Offset k [m]	Offs.(L) o <sub>1</sub> [m]	Offs.(R) o <sub>2</sub> [m]	Self w. [kN/m <sup>3</sup> ]	Friction [-]	Cohesion [kPa]
7	0.30	0.80	0.00	0.00	0.00	20.00	0.53	0.00
6	1.60	0.20	0.00	0.00	0.00	20.00	0.53	0.00
5	1.00	0.50	0.00	0.60	0.00	20.00	0.53	0.00
4	1.00	1.00	0.00	0.00	0.00	20.00	0.53	0.00
3	1.00	1.00	0.00	0.00	0.00	20.00	0.36	1.20
2	1.00	1.00	0.80	0.00	0.00	20.00	0.53	1.10
1	2.50	0.70	0.00	-0.20	-0.20	20.00	-	-

Note: Blocks are ordered from bottom to the top

### Basic soil parameters

No.	Name	Pattern	φ <sub>ef</sub> [°]	c <sub>ef</sub> [kPa]	γ [kN/m <sup>3</sup> ]	γ <sub>su</sub> [kN/m <sup>3</sup> ]	δ [°]
1	Soil No.1		30.00	5.00	20.00	10.00	15.00

All soils are considered as cohesionless for at rest pressure analysis.

### Soil parameters

#### Soil No.1


Unit weight :  $\gamma = 20.00 \text{ kN/m}^3$

Stress-state : effective

Angle of internal friction :  $\phi_{ef} = 30.00^\circ$

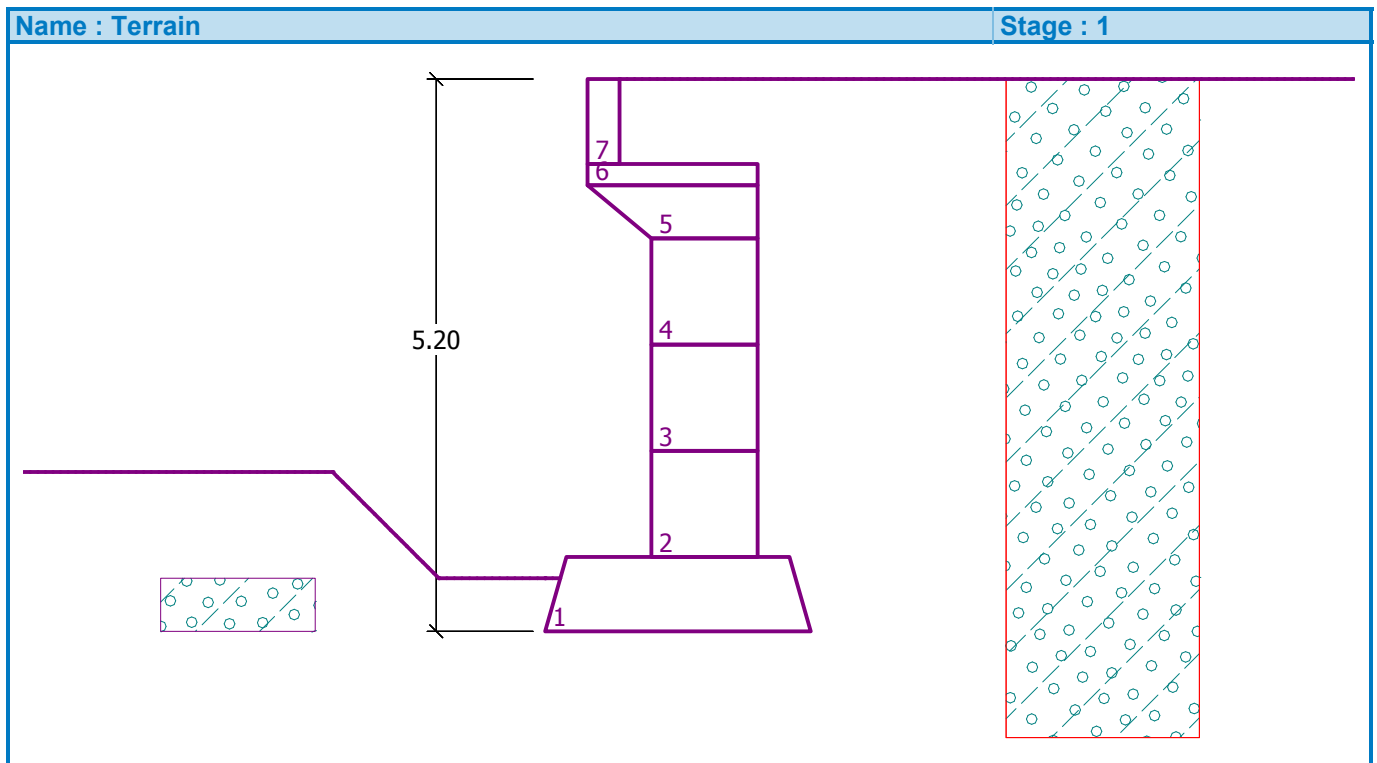
Cohesion of soil :  $c_{ef} = 5.00 \text{ kPa}$   
 Angle of friction struc.-soil :  $\delta = 15.00^\circ$   
 Soil : cohesionless  
 Saturated unit weight :  $\gamma_{sat} = 20.00 \text{ kN/m}^3$

### Geological profile and assigned soils

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

### Terrain profile

Terrain behind the structure is flat.



### Water influence

Ground water table is located below the structure.

### Resistance on front face of the structure

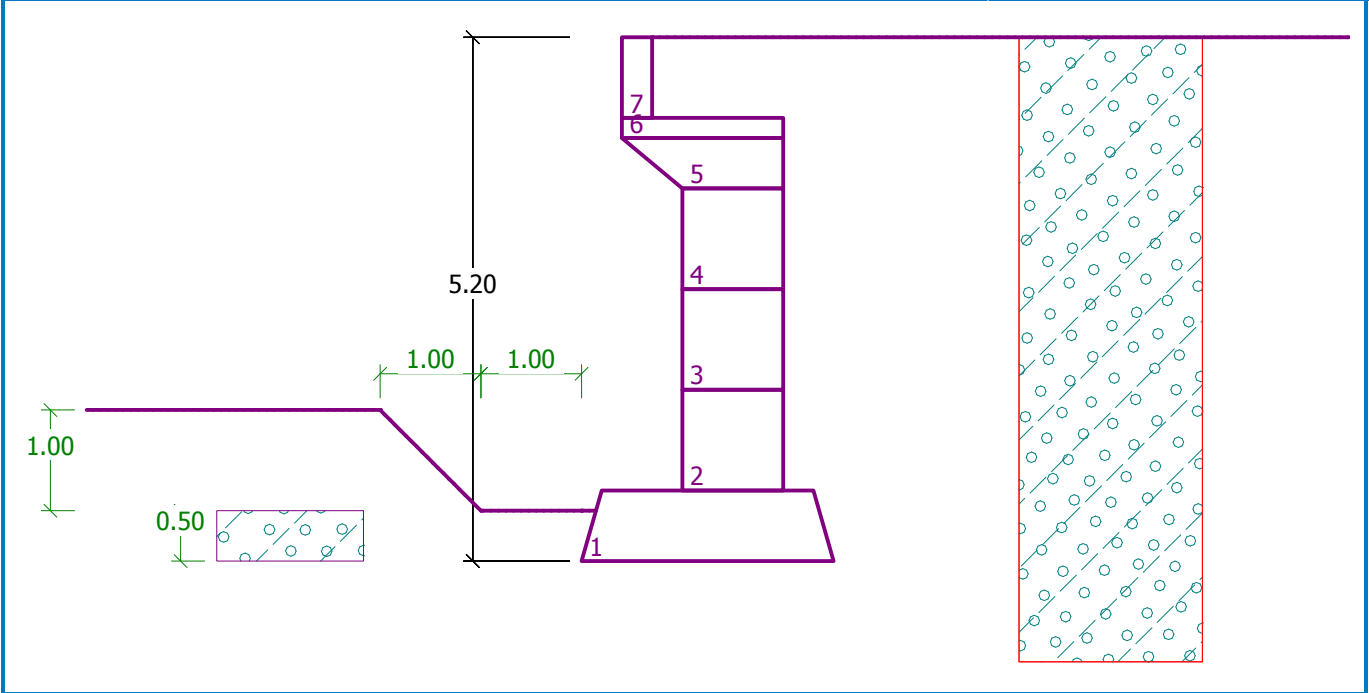
Resistance on front face of the structure: at rest  
 Soil on front face of the structure - Soil No.1  
 Soil thickness in front of structure  $h = 0.50 \text{ m}$

### Terrain shape in front of structure

No.	Coordinate X [m]	Depth Z [m]
1	0.00	0.00
2	0.00	-0.50
3	-1.00	-0.50
4	-2.00	-1.50
5	-3.00	-1.50

Origin [0,0] is located in bottom left edge of construction.  
 Positive coordinate +z has downward direction.

**Name : FF resistance** **Stage : 1**



**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	$\gamma_G$	1.35	1.00	1.00	1.00
Variable actions	$\gamma_Q$	1.50	0.00	1.30	0.00
Water actions	$\gamma_w$	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	$\gamma_{mc}$	1.00	1.25
Partial factor for undrained shear strength	$\gamma_{m_{cu}}$	1.00	1.40
Partial factor for Poisson's ratio	$\gamma_{mv}$	1.00	1.00

Partial factors for variable actions	Fact.	[-]
Factor for combination value	$\psi_0$	0.70
Factor for frequent value	$\psi_1$	0.50
Factor for quasi-permanent value	$\psi_2$	0.30

Active earth pressure calculation - Coulomb  
Passive earth pressure calculation - Caquot-Kerisel

**Settings of the stage of construction**

Combination : basic

**Verification No. 1**

**Forces acting on construction - combination 1**

Name	F <sub>hor</sub> [kN/m]	App.Pt. Z [m]	F <sub>vert</sub> [kN/m]	App.Pt. X [m]	Coeff. overtur.	Coeff. sliding	Coeff. stress
Weight - wall	0.00	-2.11	116.40	1.36	1.000	1.000	1.350
FF resistance	-1.20	-0.17	0.69	0.05	1.000	1.000	1.350
Weight - earth wedge	0.00	-5.20	0.00	0.70	1.000	1.000	1.000
Weight - earth wedge	0.00	-0.87	1.56	2.10	1.000	1.000	1.350
Weight - earth wedge	0.00	-4.77	17.10	1.24	1.000	1.000	1.350
Active pressure	65.46	-1.36	45.95	2.19	1.000	1.350	1.350

#### Verification of complete wall

##### Check for overturning stability

Resisting moment  $M_{res} = 283.34$  kNm/m

Overturning moment  $M_{ovr} = 88.82$  kNm/m

**Wall for overturning is SATISFACTORY**

##### Check for slip

Resisting horizontal force  $H_{res} = 124.23$  kN/m

Active horizontal force  $H_{act} = 87.17$  kN/m

**Wall for slip is SATISFACTORY**

**Overall check - WALL is SATISFACTORY**

Maximum stress in footing bottom :114.56kPa

#### Forces acting on construction - combination 2

Name	F <sub>hor</sub> [kN/m]	App.Pt. Z [m]	F <sub>vert</sub> [kN/m]	App.Pt. X [m]	Coeff. overtur.	Coeff. sliding	Coeff. stress
Weight - wall	0.00	-2.11	116.40	1.36	1.000	1.000	1.000
FF resistance	-1.40	-0.17	0.69	0.05	1.000	1.000	1.000
Weight - earth wedge	0.00	-5.20	0.00	0.70	1.000	1.000	1.000
Weight - earth wedge	0.00	-0.87	1.56	2.10	1.000	1.000	1.000
Weight - earth wedge	0.00	-4.77	17.10	1.24	1.000	1.000	1.000
Active pressure	86.50	-1.46	49.45	2.19	1.000	1.000	1.000

#### Verification of complete wall

##### Check for overturning stability

Resisting moment  $M_{res} = 290.89$  kNm/m

Overturning moment  $M_{ovr} = 126.36$  kNm/m

**Wall for overturning is SATISFACTORY**

##### Check for slip

Resisting horizontal force  $H_{res} = 92.65$  kN/m

Active horizontal force  $H_{act} = 85.10$  kN/m

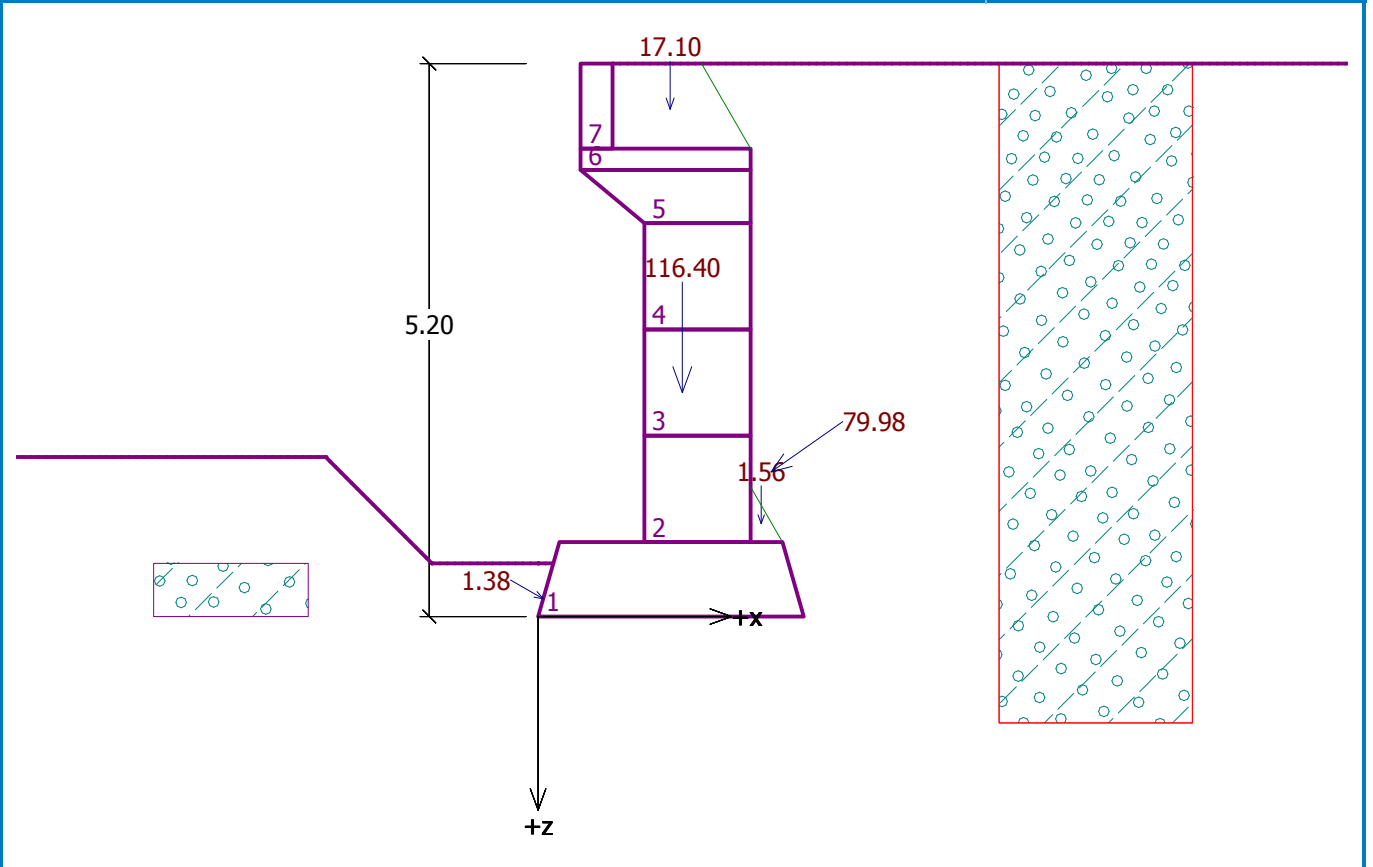
**Wall for slip is SATISFACTORY**

**Overall check - WALL is SATISFACTORY**

Maximum stress in footing bottom :104.23kPa

Name : Verification

Stage : 1; Analysis : 1



### Bearing capacity of foundation soil

Forces acting at the centre of the footing bottom

Number	Moment [kNm/m]	Norm. force [kN/m]	Shear Force [kN/m]	Eccentricity [m]	Stress [kPa]
1	44.01	245.30	86.75	0.18	114.56

### Bearing capacity of foundation soil check

#### Eccentricity verification

Max. eccentricity of normal force  $e = 179.4 \text{ mm}$

Maximum allowable eccentricity  $e_{alw} = 825.0 \text{ mm}$

**Eccentricity of the normal force is SATISFACTORY**

#### Footing bottom bearing capacity verification

Max. stress at footing bottom  $\sigma = 114.56 \text{ kPa}$

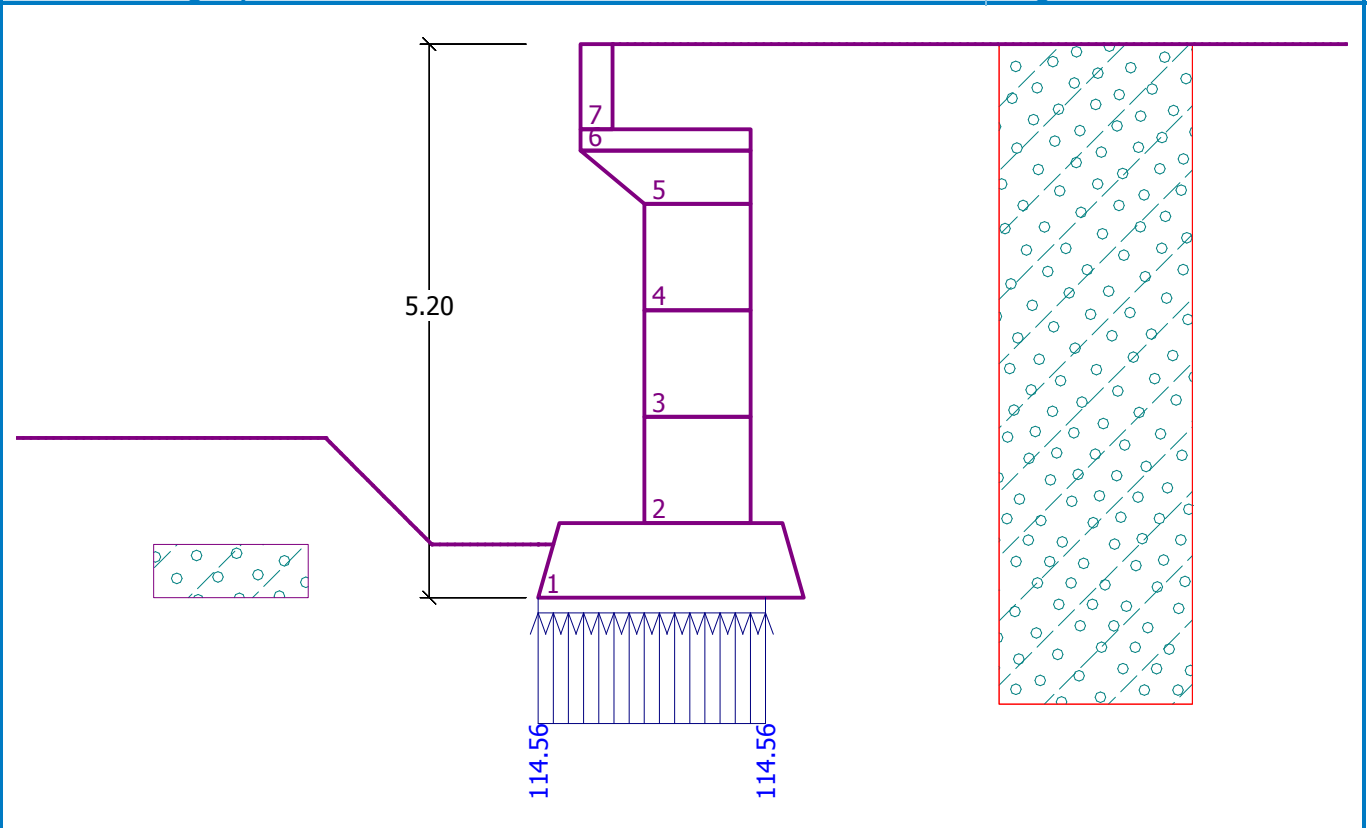
Bearing capacity of foundation soil  $R_d = 200.00 \text{ kPa}$

**Bearing capacity of foundation soil is SATISFACTORY**

**Overall verification - bearing capacity of found. soil is SATISFACTORY**

Name : Bearing cap.

Stage : 1



### Dimensioning No. 1

#### Forces acting on construction - combination 1

Name	F <sub>hor</sub> [kN/m]	App.Pt. Z [m]	F <sub>vert</sub> [kN/m]	App.Pt. X [m]	Coeff. overtur.	Coeff. sliding	Coeff. stress
Weight - wall	0.00	-1.06	44.20	0.31	1.000	1.000	1.350
Weight - earth wedge	0.00	-2.07	17.10	0.24	1.000	1.000	1.350
Active pressure	8.76	-0.67	3.45	0.97	1.350	1.350	1.350

#### Verification of construction joint above the block No.: 3

##### Check for overturning stability

Resisting moment  $M_{res} = 22.17$  kNm/m

Overturning moment  $M_{ovr} = 7.87$  kNm/m

**Joint for overturning stability is SATISFACTORY**

##### Check for slip

Resisting horizontal force  $H_{res} = 35.16$  kN/m

Active horizontal force  $H_{act} = 11.83$  kN/m

**Joint for slip is SATISFACTORY**

#### Forces acting on construction - combination 2

Name	F <sub>hor</sub> [kN/m]	App.Pt. Z [m]	F <sub>vert</sub> [kN/m]	App.Pt. X [m]	Coeff. overtur.	Coeff. sliding	Coeff. stress
Weight - wall	0.00	-1.06	44.20	0.31	1.000	1.000	1.000
Weight - earth wedge	0.00	-2.07	17.10	0.24	1.000	1.000	1.000
Active pressure	13.98	-0.73	4.51	0.96	1.000	1.000	1.000

**Verification of construction joint above the block No.: 3**

**Check for overturning stability**

Resisting moment  $M_{res} = 22.00 \text{ kNm/m}$

Overturning moment  $M_{ovr} = 10.15 \text{ kNm/m}$

**Joint for overturning stability is SATISFACTORY**

**Check for slip**

Resisting horizontal force  $H_{res} = 35.08 \text{ kN/m}$

Active horizontal force  $H_{act} = 13.98 \text{ kN/m}$

**Joint for slip is SATISFACTORY**

