

## Analysis of Redi Rock wall

### Input data

Task : Redi-Rock Wall Design  
 Part : Blue Hills Estate Farm  
 Customer : Countryside Partnerships  
 Author : SW  
 Date : 25/05/2023  
 Project number : 0121-265

### Settings

United Kingdom - EN 1997

### Wall analysis

Verification methodology : according to EN 1997  
 Active earth pressure calculation : Coulomb  
 Passive earth pressure calculation : Caquot-Kerisel  
 Earthquake analysis : Mononobe-Okabe  
 Shape of earth wedge : Calculate as skew  
 Allowable eccentricity : 0.333  
 Internal stability : Standard - straight slip surface  
 Reduction coeff. of contact first block - base : 1.00  
 Design approach : 1 - reduction of actions and soil parameters

Partial factors on actions (A)					
Permanent design situation					
		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 load :	$\gamma_w =$	1.35 [-]		1.00 [-]	

Partial factors for soil parameters (M)					
Permanent design situation					
		Combination 1		Combination 2	
Partial factor on internal friction :	$\gamma_\phi =$	1.00 [-]		1.25 [-]	
Partial factor on effective cohesion :	$\gamma_c =$	1.00 [-]		1.25 [-]	
Partial factor on undrained shear strength :	$\gamma_{cu} =$	1.00 [-]		1.40 [-]	
Partial factor on Poisson's ratio :	$\gamma_v =$	1.00 [-]		1.00 [-]	

Partial factors for variable actions		
Permanent design situation		
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 [-]

### Blocks

No.	Description	Height h [mm]	Width w [mm]	Unit weight $\gamma$ [kN/m <sup>3</sup> ]
1	Block 28	457.2	711.2	18.85
2	Block 41	457.2	1028.7	18.85
3	Block 60	457.2	1524.0	20.42
4	Top block 24 straight	457.2	609.6	16.97

No.	Description	Height h [mm]	Width w [mm]	Unit weight $\gamma$ [kN/m <sup>3</sup> ]
5	Planter 41	457.2	1028.7	18.85
6	Planter 60	457.2	1524.0	17.59
7	Top block 28	457.2	711.2	18.85
8	Top block 41	457.2	1028.7	18.85
9	Top block 24 straight garden	457.2	609.6	12.57
10	Block R-5236 HC	914.4	1320.8	17.28
11	Block R-7236 HC	914.4	1828.8	17.28
12	Block R-9636 HC	914.4	2438.4	17.28
13	Block R-41 HC	457.2	1028.7	17.28

No.	Description	Min. shear strength $F_{min}$ [kN/m]	Max. shear strength $F_{max}$ [kN/m]	Friction f [°]
1	Block 28	88.45	164.56	44.00
2	Block 41	88.45	164.56	44.00
3	Block 60	88.45	164.56	44.00
4	Top block 24 straight	88.45	164.56	44.00
5	Planter 41	88.45	164.56	44.00
6	Planter 60	88.45	164.56	44.00
7	Top block 28	88.45	164.56	44.00
8	Top block 41	88.45	164.56	44.00
9	Top block 24 straight garden	88.45	164.56	44.00
10	Block R-5236 HC	66.40	175.13	44.00
11	Block R-7236 HC	66.40	175.13	44.00
12	Block R-9636 HC	66.40	175.13	44.00
13	Block R-41 HC	78.19	188.35	37.00

### Setbacks

No.	Setback s [mm]
1	0.254
2	9.525
3	41.275
4	238.125
5	422.275

### Geometry

No. group	Description	Count	Setback s [mm]
1	Block 60	2	41.3
2	Block 41	4	41.3
3	Block 28	1	41.3
4	Top block 28	1	-

### Base

#### Geometry

Upper setback  $a_1 = 0.20$  m

Lower setback  $a_2 = 0.20$  m

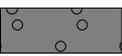
Height  $h = 0.20$  m

Width  $b = 1.90$  m

### Material

Soil creating foundation - Granular Fill

#### Basic soil parameters

No.	Name	Pattern	$\phi_{ef}$ [°]	$c_{ef}$ [kPa]	$\gamma$ [kN/m <sup>3</sup> ]	$\gamma_{su}$ [kN/m <sup>3</sup> ]	$\delta$ [°]
1	Granular Fill		38.50	0.00	21.00	11.00	10.00
2	Clay with high or very high plasticity (CH, CV, CE), firm consistency		15.00	5.00	20.50	10.50	10.00
3	Clay with high or very high plasticity (CH, CV, CE), very stiff consistency, $S_r > 0.8$		15.00	18.00	20.50	10.50	10.00

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

#### Soil parameters

##### Granular Fill

Unit weight :  $\gamma = 21.00$  kN/m<sup>3</sup>  
 Stress-state : effective  
 Angle of internal friction :  $\phi_{ef} = 38.50$  °  
 Cohesion of soil :  $c_{ef} = 0.00$  kPa  
 Angle of friction struc.-soil :  $\delta = 10.00$  °  
 Saturated unit weight :  $\gamma_{sat} = 21.00$  kN/m<sup>3</sup>

##### Clay with high or very high plasticity (CH, CV, CE), firm consistency

Unit weight :  $\gamma = 20.50$  kN/m<sup>3</sup>  
 Stress-state : effective  
 Angle of internal friction :  $\phi_{ef} = 15.00$  °  
 Cohesion of soil :  $c_{ef} = 5.00$  kPa  
 Angle of friction struc.-soil :  $\delta = 10.00$  °  
 Saturated unit weight :  $\gamma_{sat} = 20.50$  kN/m<sup>3</sup>

##### Clay with high or very high plasticity (CH, CV, CE), very stiff consistency, $S_r > 0.8$

Unit weight :  $\gamma = 20.50$  kN/m<sup>3</sup>  
 Stress-state : effective  
 Angle of internal friction :  $\phi_{ef} = 15.00$  °  
 Cohesion of soil :  $c_{ef} = 18.00$  kPa  
 Angle of friction struc.-soil :  $\delta = 10.00$  °  
 Saturated unit weight :  $\gamma_{sat} = 20.50$  kN/m<sup>3</sup>

#### Backfill

Assigned soil : Granular Fill

Slope = 45.00 °

#### Geological profile and assigned soils

No.	Thickness of layer $t$ [m]	Depth $z$ [m]	Assigned soil	Pattern
1	3.66	0.00 .. 3.66	Clay with high or very high plasticity (CH, CV, CE), firm consistency	
2	-	3.66 .. ∞	Clay with high or very high plasticity (CH, CV, CE), very stiff consistency, $S_r > 0.8$	

### Terrain profile

Terrain behind the structure is flat.

### Water influence

Ground water table is located below the structure.

### Input surface surcharges

No.	Surcharge		Action	Mag.1 [kN/m <sup>2</sup> ]	Mag.2 [kN/m <sup>2</sup> ]	Ord.x x [m]	Length l [m]	Depth z [m]
	new	change						
1	Yes		variable	2.50				on terrain

No.	Name
1	Surcharge

### Resistance on front face of the structure

Resistance on front face of the structure: at rest

Soil on front face of the structure - Granular Fill

Soil thickness in front of structure h = 0.50 m

Terrain in front of structure is flat.

### Settings of the stage of construction

Design situation : permanent

Reduction of soil/soil friction angle : do not reduce

### Verification No. 1

#### Pressure at rest on front face of the structure - partial results

Layer No.	Thickness [m]	$\alpha$ [°]	$\Phi_d$ [°]	$c_d$ [kPa]	$\gamma$ [kN/m <sup>3</sup> ]	$K_r$	Comment
1	0.30	0.00	38.50	0.00	21.00	0.377	
2	0.00	89.61(80.00)	38.50	0.00	21.00	0.377	MODIFIED
3	0.20	0.00	38.50	0.00	21.00	0.377	

#### Pressure at rest distribution on front face of the structure

Layer No.	Start [m] End [m]	$\sigma_z$ [kPa]	$\sigma_w$ [kPa]	Pressure [kPa]	Hor. comp. [kPa]	Vert. comp. [kPa]
1	0.00	0.00	0.00	0.00	0.00	0.00
	0.30	6.30	0.00	2.38	2.38	0.00
2	0.30	6.30	0.00	6.22	0.41	6.20
	0.30	6.33	0.00	6.25	0.41	6.23
3	0.30	6.33	0.00	2.39	2.39	0.00
	0.50	10.50	0.00	3.96	3.96	0.00

#### Active pressure behind the structure - partial results

Layer No.	Thickness [m]	$\alpha$ [°]	$\Phi_d$ [°]	$c_d$ [kPa]	$\gamma$ [kN/m <sup>3</sup> ]	$\delta_d$ [°]	$K_a$	Comment
1	0.13	25.75	38.50	0.00	21.00	38.50	0.535	
2	0.30	0.00	38.50	0.00	21.00	10.00	0.218	
3	0.03	25.75	38.50	0.00	21.00	38.50	0.535	
4	0.46	25.75	38.50	0.00	21.00	38.50	0.535	
5	1.00	-3.87	38.50	0.00	21.00	10.00	0.194	
6	0.83	25.75	38.50	0.00	21.00	38.50	0.535	
7	0.58	-2.58	38.50	0.00	21.00	10.00	0.202	
8	0.33	25.75	38.50	0.00	21.00	38.50	0.535	
9	0.00	0.00	15.00	5.00	20.50	10.00	0.533	

Layer No.	Thickness [m]	$\alpha$ [°]	$\varphi_d$ [°]	$c_d$ [kPa]	$\gamma$ [kN/m <sup>3</sup> ]	$\delta_d$ [°]	$K_a$	Comment
10	0.20	0.00	15.00	18.00	20.50	10.00	0.533	

**Active pressure distribution behind the structure (without surcharge)**

Layer No.	Start [m] End [m]	$\sigma_z$ [kPa]	$\sigma_w$ [kPa]	Pressure [kPa]	Hor. comp. [kPa]	Vert. comp. [kPa]
1	0.00	0.00	0.00	0.00	0.00	0.00
	0.13	2.67	0.00	1.43	0.62	1.29
2	0.13	2.67	0.00	0.58	0.57	0.10
	0.43	8.97	0.00	1.96	1.93	0.34
3	0.43	8.97	0.00	4.80	2.09	4.33
	0.46	9.60	0.00	5.14	2.23	4.63
4	0.46	9.60	0.00	5.14	2.23	4.63
	0.91	19.20	0.00	10.28	4.47	9.26
5	0.91	19.20	0.00	3.73	3.71	0.40
	1.92	40.27	0.00	7.82	7.77	0.83
6	1.92	40.27	0.00	21.56	9.37	19.42
	2.74	57.61	0.00	30.85	13.40	27.78
7	2.74	57.61	0.00	11.63	11.54	1.50
	3.32	69.80	0.00	14.10	13.98	1.82
8	3.32	69.80	0.00	37.38	16.24	33.66
	3.66	76.81	0.00	41.13	17.87	37.04
9	3.66	76.81	0.00	34.15	33.63	5.93
	3.66	76.86	0.00	34.17	33.65	5.93
10	3.66	76.86	0.00	16.52	16.27	2.87
	3.86	80.91	0.00	18.68	18.40	3.24

**Pressure distribution from surcharge - Surcharge**

Point No.	Depth [m]	Hor. comp. [kPa]	Vert. comp. [kPa]
1	0.00	0.58	1.21
2	0.13	0.58	1.21
3	0.13	0.54	0.09
4	0.43	0.54	0.09
5	0.43	0.58	1.21
6	0.46	0.58	1.21
7	0.91	0.58	1.21
8	0.91	0.48	0.05
9	1.92	0.48	0.05
10	1.92	0.58	1.21
11	2.74	0.58	1.21
12	2.74	0.50	0.07
13	3.32	0.50	0.07
14	3.32	0.58	1.21
15	3.66	0.58	1.21
16	3.66	1.31	0.23
17	3.66	1.31	0.23
18	3.86	1.31	0.23

**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	-1.55	82.82	0.91	1.000	1.000	1.350
FF resistance	-0.99	-0.17	0.01	-0.10	1.000	1.000	1.350
Weight - earth wedge	0.00	-0.31	0.62	1.79	1.000	1.000	1.350
Weight - earth wedge	0.00	-1.39	3.94	1.48	1.000	1.000	1.350
Weight - earth wedge	0.00	-3.10	1.40	1.27	1.000	1.000	1.350
Weight - earth wedge	0.00	-3.79	1.48	0.89	1.000	1.000	1.350
Active pressure	33.77	-1.27	36.94	1.64	1.350	1.350	1.350
Surcharge	2.23	-1.80	2.30	1.52	1.500	1.500	1.500
Surcharge	0.00	-3.86	1.31	0.88	0.000	1.500	1.500

**Verification of complete wall****Check for overturning stability**Resisting moment  $M_{res} = 171.97$  kNm/mOverturning moment  $M_{ovr} = 63.66$  kNm/m**Wall for overturning is SATISFACTORY****Check for slip**Resisting horizontal force  $H_{res} = 66.21$  kN/mActive horizontal force  $H_{act} = 47.95$  kN/m**Wall for slip is SATISFACTORY****Overall check - WALL is SATISFACTORY****Pressure at rest on front face of the structure - partial results**

Layer No.	Thickness [m]	$\alpha$ [°]	$\Phi_d$ [°]	$c_d$ [kPa]	$\gamma$ [kN/m <sup>3</sup> ]	$K_r$	Comment
1	0.30	0.00	32.47	0.00	21.00	0.463	
2	0.00	89.61(80.00)	32.47	0.00	21.00	0.463	MODIFIED
3	0.20	0.00	32.47	0.00	21.00	0.463	

**Pressure at rest distribution on front face of the structure**

Layer No.	Start [m] End [m]	$\sigma_z$ [kPa]	$\sigma_w$ [kPa]	Pressure [kPa]	Hor. comp. [kPa]	Vert. comp. [kPa]
1	0.00	0.00	0.00	0.00	0.00	0.00
	0.30	6.30	0.00	2.92	2.92	0.00
2	0.30	6.30	0.00	6.22	0.51	6.20
	0.30	6.33	0.00	6.25	0.51	6.23
3	0.30	6.33	0.00	2.93	2.93	0.00
	0.50	10.50	0.00	4.86	4.86	0.00

**Active pressure behind the structure - partial results**

Layer No.	Thickness [m]	$\alpha$ [°]	$\Phi_d$ [°]	$c_d$ [kPa]	$\gamma$ [kN/m <sup>3</sup> ]	$\delta_d$ [°]	$K_a$	Comment
1	0.13	25.75	32.47	0.00	21.00	32.47	0.570	
2	0.30	0.00	32.47	0.00	21.00	8.43	0.282	
3	0.03	25.75	32.47	0.00	21.00	32.47	0.570	
4	0.46	25.75	32.47	0.00	21.00	32.47	0.570	
5	1.00	-3.87	32.47	0.00	21.00	8.43	0.257	

Layer No.	Thickness [m]	$\alpha$ [°]	$\varphi_d$ [°]	$c_d$ [kPa]	$\gamma$ [kN/m <sup>3</sup> ]	$\delta_d$ [°]	$K_a$	Comment
6	0.83	25.75	32.47	0.00	21.00	32.47	0.570	
7	0.58	-2.58	32.47	0.00	21.00	8.43	0.265	
8	0.33	25.75	32.47	0.00	21.00	32.47	0.570	
9	0.00	0.00	12.10	4.00	20.50	8.07	0.599	
10	0.20	0.00	12.10	14.40	20.50	8.07	0.599	

**Active pressure distribution behind the structure (without surcharge)**

Layer No.	Start [m] End [m]	$\sigma_z$ [kPa]	$\sigma_w$ [kPa]	Pressure [kPa]	Hor. comp. [kPa]	Vert. comp. [kPa]
1	0.00	0.00	0.00	0.00	0.00	0.00
	0.13	2.67	0.00	1.52	0.80	1.29
2	0.13	2.67	0.00	0.75	0.75	0.11
	0.43	8.97	0.00	2.53	2.51	0.37
3	0.43	8.97	0.00	5.11	2.69	4.35
	0.46	9.60	0.00	5.47	2.88	4.65
4	0.46	9.60	0.00	5.47	2.88	4.65
	0.91	19.20	0.00	10.94	5.76	9.30
5	0.91	19.20	0.00	4.94	4.92	0.39
	1.92	40.27	0.00	10.36	10.32	0.82
6	1.92	40.27	0.00	22.95	12.09	19.51
	2.74	57.61	0.00	32.83	17.29	27.91
7	2.74	57.61	0.00	15.29	15.21	1.56
	3.32	69.80	0.00	18.53	18.43	1.89
8	3.32	69.80	0.00	39.78	20.95	33.82
	3.66	76.81	0.00	43.77	23.05	37.21
9	3.66	76.81	0.00	40.16	39.76	5.63
	3.66	76.86	0.00	40.19	39.79	5.64
10	3.66	76.86	0.00	25.06	24.82	3.52
	3.86	80.91	0.00	27.49	27.22	3.86

**Pressure distribution from surcharge - Surcharge**

Point No.	Depth [m]	Hor. comp. [kPa]	Vert. comp. [kPa]
1	0.00	0.75	1.21
2	0.13	0.75	1.21
3	0.13	0.70	0.10
4	0.43	0.70	0.10
5	0.43	0.75	1.21
6	0.46	0.75	1.21
7	0.91	0.75	1.21
8	0.91	0.64	0.05
9	1.92	0.64	0.05
10	1.92	0.75	1.21
11	2.74	0.75	1.21
12	2.74	0.66	0.07
13	3.32	0.66	0.07
14	3.32	0.75	1.21

Point No.	Depth [m]	Hor. comp. [kPa]	Vert. comp. [kPa]
15	3.66	0.75	1.21
16	3.66	1.48	0.21
17	3.66	1.48	0.21
18	3.86	1.48	0.21

#### 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. overturn.	Coeff. sliding	Coeff. stress
Weight - wall	0.00	-1.55	82.82	0.91	1.000	1.000	1.000
FF resistance	-1.21	-0.17	0.01	-0.10	1.000	1.000	1.000
Weight - earth wedge	0.00	-0.31	0.62	1.79	1.000	1.000	1.000
Weight - earth wedge	0.00	-1.39	3.94	1.48	1.000	1.000	1.000
Weight - earth wedge	0.00	-3.10	1.40	1.27	1.000	1.000	1.000
Weight - earth wedge	0.00	-3.79	1.48	0.89	1.000	1.000	1.000
Active pressure	44.72	-1.25	37.25	1.64	1.000	1.000	1.000
Surcharge	2.86	-1.83	2.31	1.52	1.300	1.300	1.300
Surcharge	0.00	-3.86	1.31	0.88	0.000	1.300	1.300

#### Verification of complete wall

##### Check for overturning stability

Resisting moment  $M_{res} = 150.65$  kNm/m

Overturning moment  $M_{ovr} = 62.62$  kNm/m

**Wall for overturning is SATISFACTORY**

##### Check for slip

Resisting horizontal force  $H_{res} = 47.84$  kN/m

Active horizontal force  $H_{act} = 47.23$  kN/m

**Wall for slip is SATISFACTORY**

**Overall check - WALL is SATISFACTORY**

#### Dimensioning No. 1

##### Active pressure behind the structure - partial results

Layer No.	Thickness [m]	$\alpha$ [°]	$\varphi_d$ [°]	$c_d$ [kPa]	$\gamma$ [kN/m <sup>3</sup> ]	$\delta_d$ [°]	$K_a$	Comment
1	0.13	25.75	38.50	0.00	21.00	38.50	0.535	
2	0.30	0.00	38.50	0.00	21.00	10.00	0.218	
3	0.03	25.75	38.50	0.00	21.00	38.50	0.535	
4	0.46	25.75	38.50	0.00	21.00	38.50	0.535	
5	1.83	-3.87	38.50	0.00	21.00	10.00	0.194	

##### Active pressure distribution behind the structure (without surcharge)

Layer No.	Start [m] End [m]	$\sigma_z$ [kPa]	$\sigma_w$ [kPa]	Pressure [kPa]	Hor. comp. [kPa]	Vert. comp. [kPa]
1	0.00	0.00	0.00	0.00	0.00	0.00
	0.13	2.67	0.00	1.43	0.62	1.29
2	0.13	2.67	0.00	0.58	0.57	0.10
	0.43	8.97	0.00	1.96	1.93	0.34

Layer No.	Start [m] End [m]	$\sigma_z$ [kPa]	$\sigma_w$ [kPa]	Pressure [kPa]	Hor. comp. [kPa]	Vert. comp. [kPa]
3	0.43	8.97	0.00	4.80	2.09	4.33
	0.46	9.60	0.00	5.14	2.23	4.63
4	0.46	9.60	0.00	5.14	2.23	4.63
	0.91	19.20	0.00	10.28	4.47	9.26
5	0.91	19.20	0.00	3.73	3.71	0.40
	2.74	57.61	0.00	11.18	11.12	1.19

#### Pressure distribution from surcharge - Surcharge

Point No.	Depth [m]	Hor. comp. [kPa]	Vert. comp. [kPa]
1	0.00	0.58	1.21
2	0.13	0.58	1.21
3	0.13	0.54	0.09
4	0.43	0.54	0.09
5	0.43	0.58	1.21
6	0.46	0.58	1.21
7	0.91	0.58	1.21
8	0.91	0.48	0.05
9	2.74	0.48	0.05

#### Forces acting on construction - combination 1

Name	$F_{hor}$ [kN/m]	App.Pt. z [m]	$F_{vert}$ [kN/m]	App.Pt. x [m]	Coeff. overtur.	Coeff. sliding	Coeff. stress
Weight - wall	0.00	-1.23	46.38	0.57	1.000	1.000	1.350
Weight - earth wedge	0.00	-1.99	1.40	0.98	1.000	1.000	1.350
Weight - earth wedge	0.00	-2.68	1.48	0.61	1.000	1.000	1.350
Active pressure	15.57	-0.94	4.91	1.05	1.350	1.350	1.350
Surcharge	1.40	-1.42	0.86	1.01	1.500	1.500	1.500
Surcharge	0.00	-2.74	1.31	0.59	0.000	0.000	1.500

#### Verification of most stressed block No. 3

##### Check for overturning stability

Resisting moment  $M_{res} = 36.90$  kNm/m

Overturning moment  $M_{ovr} = 22.71$  kNm/m

**Joint for overturning stability is SATISFACTORY**

##### Check for slip

Resisting horizontal force  $H_{res} = 143.68$  kN/m

Active horizontal force  $H_{act} = 23.11$  kN/m

**Joint for verification is SATISFACTORY**

#### Active pressure behind the structure - partial results

Layer No.	Thickness [m]	$\alpha$ [°]	$\Phi_d$ [°]	$c_d$ [kPa]	$\gamma$ [kN/m <sup>3</sup> ]	$\delta_d$ [°]	$K_a$	Comment
1	0.13	25.75	32.47	0.00	21.00	32.47	0.570	
2	0.30	0.00	32.47	0.00	21.00	8.43	0.282	
3	0.03	25.75	32.47	0.00	21.00	32.47	0.570	
4	0.46	25.75	32.47	0.00	21.00	32.47	0.570	

Layer No.	Thickness [m]	$\alpha$ [°]	$\varphi_d$ [°]	$c_d$ [kPa]	$\gamma$ [kN/m <sup>3</sup> ]	$\delta_d$ [°]	$K_a$	Comment
5	1.83	-3.87	32.47	0.00	21.00	8.43	0.257	

**Active pressure distribution behind the structure (without surcharge)**

Layer No.	Start [m] End [m]	$\sigma_z$ [kPa]	$\sigma_w$ [kPa]	Pressure [kPa]	Hor. comp. [kPa]	Vert. comp. [kPa]
1	0.00	0.00	0.00	0.00	0.00	0.00
	0.13	2.67	0.00	1.52	0.80	1.29
2	0.13	2.67	0.00	0.75	0.75	0.11
	0.43	8.97	0.00	2.53	2.51	0.37
3	0.43	8.97	0.00	5.11	2.69	4.35
	0.46	9.60	0.00	5.47	2.88	4.65
4	0.46	9.60	0.00	5.47	2.88	4.65
	0.91	19.20	0.00	10.94	5.76	9.30
5	0.91	19.20	0.00	4.94	4.92	0.39
	2.74	57.61	0.00	14.81	14.77	1.18

**Pressure distribution from surcharge - Surcharge**

Point No.	Depth [m]	Hor. comp. [kPa]	Vert. comp. [kPa]
1	0.00	0.75	1.21
2	0.13	0.75	1.21
3	0.13	0.70	0.10
4	0.43	0.70	0.10
5	0.43	0.75	1.21
6	0.46	0.75	1.21
7	0.91	0.75	1.21
8	0.91	0.64	0.05
9	2.74	0.64	0.05

**Forces acting on construction - combination 2**

Name	$F_{hor}$ [kN/m]	App.Pt. z [m]	$F_{vert}$ [kN/m]	App.Pt. x [m]	Coeff. overturn.	Coeff. sliding	Coeff. stress
Weight - wall	0.00	-1.23	46.38	0.57	1.000	1.000	1.000
Weight - earth wedge	0.00	-1.99	1.40	0.98	1.000	1.000	1.000
Weight - earth wedge	0.00	-2.68	1.48	0.61	1.000	1.000	1.000
Active pressure	20.60	-0.93	4.92	1.05	1.000	1.000	1.000
Surcharge	1.84	-1.41	0.87	1.01	1.300	1.300	1.300
Surcharge	0.00	-2.74	1.31	0.59	0.000	0.000	1.300

**Verification of most stressed block No. 3****Check for overturning stability**Resisting moment  $M_{res} = 34.92$  kNm/mOverturning moment  $M_{ovr} = 22.64$  kNm/m**Joint for overturning stability is SATISFACTORY****Check for slip**Resisting horizontal force  $H_{res} = 141.86$  kN/mActive horizontal force  $H_{act} = 23.00$  kN/m

**Joint for verification is SATISFACTORY**

### Bearing capacity of foundation soil

#### Design load acting at the center of footing bottom

No.	Moment [kNm/m]	Norm. force [kN/m]	Shear Force [kN/m]	Eccentricity [-]	Stress [kPa]
1	28.44	177.13	47.60	0.084	112.18
2	28.09	143.58	47.95	0.103	95.16
3	35.96	130.51	47.23	0.145	96.75
4	36.08	132.21	47.23	0.144	97.64

#### Service load acting at the center of footing bottom

No.	Moment [kNm/m]	Norm. force [kN/m]	Shear Force [kN/m]
1	20.75	130.81	35.01
2	20.66	129.50	35.01

#### Verification of foundation soil

Stress in the footing bottom : trapezoid

#### Eccentricity verification

Max. eccentricity of normal force  $e = 0.103$

Maximum allowable eccentricity  $e_{alw} = 0.333$

**Eccentricity of the normal force is SATISFACTORY**

#### Verification of bearing capacity

Max. stress at footing bottom  $\sigma = 140.49$  kPa

Bearing capacity of foundation soil  $R_d = 150.00$  kPa

**Bearing capacity of foundation soil is SATISFACTORY**

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

#### Annexes