

## **Bijlage 1 Berekeningsrapporten deelgebied A**

### **B1.1 STBI**

- **Aansluiting tussen huidige kering en N207**
- **Maatgevend profiel N207 (profiel 10)**

Program : D-Geo Stability  
 Version : 10.1.4.3  
 License : Unknown  
 Company : Royal HaskoningDHV  
 Date : 6-11-2015  
 Time : 11:43:55

Output file : C:\Users\nl85691\Desktop\Box Sync\Box Sync\BE1234 PUF VIJG\BE1234 PUF  
 Input file : C:\Users\nl85691\Desktop\Box Sync\Box Sync\BE1234 PUF VIJG\BE1234 PUF  
 ===== BEGINNING OF DATA =====

ECHO OF THE INPUT  
 =====

Problem identification : Dijkversterking VIJG  
 : DG A aansluiting STBI

Calculation model : Bishop  
 Default shear strength : C phi

LAYER BOUNDARIES  
 =====

Boundary no.		Co-ordinates [m]					
8	- X -	-10.00	50.00	53.30	55.80	59.10	110.00
8	- Y -	3.00	3.00	4.10	4.10	3.00	3.00
7	- X -	-10.00	50.00	59.10	110.00		
7	- Y -	3.00	3.00	3.00	3.00		
6	- X -	-10.00	110.00				
6	- Y -	0.00	0.00				
5	- X -	-10.00	110.00				
5	- Y -	-1.00	-1.00				
4	- X -	-10.00	110.00				
4	- Y -	-4.00	-4.00				
3	- X -	-10.00	110.00				
3	- Y -	-5.00	-5.00				
2	- X -	-10.00	110.00				
2	- Y -	-9.00	-9.00				
1	- X -	-10.00	110.00				
1	- Y -	-13.00	-13.00				
0	- X -	-10.00	110.00				
0	- Y -	-25.00	-25.00				

PL LINES  
 =====

PL line no.		Co-ordinates [m]				
1	- X -	-10.00	0.00	50.00	57.50	110.00
1	- Y -	-0.60	3.00	3.00	3.53	3.53
2	- X -	-10.00	110.00			
2	- Y -	-3.07	-3.07			

Unit weight of water used for calculation: 9.81 [kN/m3]  
 The groundwater level is determined by PL-line number 1

## FORBIDDEN LINES

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No forbidden lines were input.

## SOIL PROPERTIES

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Layer no.	Material name
8	Ophoogmateriaal klei
7	Zand, siltig
6	Klei, siltig
5	Zand, siltig
4	Klei, humeus
3	Hollandveen
2	Klei, humeus
1	Pleistoceen zand los/mati

Layer number	Gam usat [kN/m3]	Gam sat [kN/m3]	PL-line top	PL-line bottom
8	17.00	17.00	1	1
7	17.00	19.00	1	1
6	16.20	16.20	1	1
5	17.00	19.00	1	1
4	12.90	12.90	1	99
3	11.00	11.00	99	99
2	12.90	12.90	99	2
1	18.00	20.00	2	-

Layer number	Cohesion [kN/m2]	Phi [degrees]	Cu/Pc [-]	POP [kN/m2]	Cu top [kN/m2]	Cu bot. [kN/m2]	Cu grad. [kN/m2/m]
8	1.50	17.60	-	-	-	-	-
7	0.00	25.70	-	-	-	-	-
6	0.00	27.70	-	-	-	-	-
5	0.00	25.70	-	-	-	-	-
4	0.00	27.20	-	-	-	-	-
3	0.00	21.80	-	-	-	-	-
2	0.00	27.20	-	-	-	-	-
1	0.00	28.00	-	-	-	-	-

No degree of consolidation &lt;&gt; 100% input.

## CENTER POINT GRID AND TANGENT LINES

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X co-ordinate grid left	:	38.56 [m]
X co-ordinate grid right	:	52.96 [m]
Number of grid points in X - direction	:	15
Y co-ordinate grid bottom	:	8.26 [m]
Y co-ordinate grid top	:	14.18 [m]
Number of grid points in Y - direction	:	15
Y co-ordinate tangent smallest circle	:	2.24 [m]
Y co-ordinate tangent biggest circle	:	-8.76 [m]
Number of circles per grid point	:	10

No fixed points input.

Total number of center points in the grid: 225  
 Total number of slip circles in the grid : 2250

## LINE LOADS

=====

No line loads input.

UNIFORM LOAD  
=====

Uniform load number	Magnitude [kN/m]	X start [m]	X end [m]	Distrib. degrees	Load Type
1	5.00	53.55	55.55	30.00	Temporary

TREE ON SLOPE  
=====

No tree on slope was input.

DEGREE OF CONSOLIDATION : TEMPORARY LOADS  
=====

Layer number	Degree of consolidation
8	100
7	100
6	0
5	100
4	0
3	0
2	0
1	100

EARTHQUAKE  
=====

No earth quake factors were input.

\*\*\*\*\*  
 \*\*\*\*\* The input has been tested, and is correct. \*\*\*\*\*  
 \*\*\*\*\*  
 □

RESULTS OF THE SLOPE STABILITY ANALYSIS  
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The center point of the critical circle lies on the edge of the grid.

New grid with : X minimum = 38.56 [m]  
 X maximum = 52.96 [m]  
 Y minimum = 7.84 [m]  
 Y maximum = 13.76 [m]

The center point of the critical circle lies on the edge of the grid.

New grid with : X minimum = 38.56 [m]  
 X maximum = 52.96 [m]  
 Y minimum = 7.42 [m]  
 Y maximum = 13.33 [m]

The center point of the critical circle lies on the edge of the grid.

New grid with : X minimum = 38.56 [m]  
 X maximum = 52.96 [m]  
 Y minimum = 6.99 [m]  
 Y maximum = 12.91 [m]

The center point of the critical circle lies on the edge of the grid.

New grid with : X minimum = 38.56 [m]  
 X maximum = 52.96 [m]  
 Y minimum = 6.57 [m]  
 Y maximum = 12.49 [m]

The center point of the critical circle lies on the edge of the grid.

New grid with : X minimum = 38.56 [m]  
 X maximum = 52.96 [m]  
 Y minimum = 6.15 [m]  
 Y maximum = 12.07 [m]

The center point of the critical circle lies on the edge of the grid.

New grid with : X minimum = 38.56 [m]  
 X maximum = 52.96 [m]  
 Y minimum = 6.15 [m]  
 Y maximum = 12.07 [m]  
 tangent minimum = 1.01 [m]  
 tangent maximum = 12.01 [m]

Information on the critical circle : Fmin = 1.612  
 Calculation method used : Bishop - C phi

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X co-ordinate center point : 50.91 [m]  
 Y co-ordinate center point : 6.57 [m]  
 Radius of critical circle : 4.33 [m]

The center point of the critical circle is enclosed

Total driving moment : -89.77 [kNm/m]  
 Driving moment free water : 0.00 [kNm/m]  
 Driving moment external loads : -14.21 [kNm/m]  
 Iterated resisting moment : 89.77 [kNm/m]  
 Non-iterated resisting moment : 139.24 [kNm/m]

END OF D-Geo Stability OUTPUT

=====

Program : D-Geo Stability  
 Version : 10.1.4.3  
 License : Unknown  
 Company : Royal HaskoningDHV  
 Date : 7-10-2015  
 Time : 15:43:30

Output file : C:\Users\nl85691\Desktop\Box Sync\Box Sync\BE1234 PUF VIJG\BE1234 PUF  
 Input file : C:\Users\nl85691\Desktop\Box Sync\Box Sync\BE1234 PUF VIJG\BE1234 PUF  
 ===== BEGINNING OF DATA =====

ECHO OF THE INPUT  
 =====

Problem identification : Dijkversterking VIJG  
 : DG A dp 10 STBI

Calculation model : Bishop  
 Default shear strength : C phi

LAYER BOUNDARIES  
 =====

Boundary no.		Co-ordinates [m]					
11	- X -	-10.00	1.77	3.52	4.41	6.82	8.03
11	- Y -	0.27	0.32	0.90	1.04	1.15	1.14
11	- X -	9.90	15.97	19.58	20.84	21.10	24.60
11	- Y -	0.41	0.53	0.59	0.61	0.65	1.76
11	- X -	29.19	33.36	35.63	36.57	40.04	40.49
11	- Y -	3.21	4.57	5.16	5.26	5.33	5.35
11	- X -	42.22	43.68	46.69	49.38	55.23	59.04
11	- Y -	5.49	5.58	5.68	5.72	5.59	5.22
11	- X -	62.52	65.97	73.10	80.58	84.25	85.64
11	- Y -	4.87	2.98	2.98	3.06	3.24	3.50
11	- X -	86.47	87.04	89.18	90.08	92.25	93.41
11	- Y -	4.08	4.21	4.16	4.00	3.12	2.71
11	- X -	98.06	103.35	110.00			
11	- Y -	2.52	2.42	2.50			
10	- X -	-10.00	1.77	3.52	4.41	6.82	8.03
10	- Y -	0.27	0.32	0.90	1.04	1.15	1.14
10	- X -	9.90	15.97	19.58	20.84	21.10	24.60
10	- Y -	0.41	0.53	0.59	0.61	0.65	1.76
10	- X -	29.19	33.36	35.63	36.57	40.04	40.49
10	- Y -	3.21	4.57	5.16	5.26	5.33	5.35
10	- X -	42.22	43.68	46.69	49.38	55.23	59.04
10	- Y -	5.49	5.58	5.68	5.72	5.59	5.22
10	- X -	62.52	65.97	73.10	80.58	84.25	86.28
10	- Y -	4.87	2.98	2.98	3.06	3.24	1.05
10	- X -	90.63	92.25	93.41	98.06	103.35	110.00
10	- Y -	1.08	3.12	2.71	2.52	2.42	2.50
9	- X -	-10.00	1.77	3.52	4.41	6.82	8.03
9	- Y -	0.27	0.32	0.90	1.04	1.15	1.14
9	- X -	9.90	15.97	19.58	20.84	21.10	24.60
9	- Y -	0.41	0.53	0.59	0.61	0.65	1.76
9	- X -	29.19	33.36	35.63	36.57	40.04	40.49
9	- Y -	3.21	4.57	5.16	5.26	5.33	5.35
9	- X -	42.22	43.68	46.69	49.38	55.23	59.04

9	- Y -	5.49	5.58	5.68	5.72	5.59	5.22
9	- X -	62.52	65.97	68.07	86.28	90.63	92.25
9	- Y -	4.87	2.98	0.94	1.05	1.08	3.12
9	- X -	93.41	98.06	103.35	110.00		
9	- Y -	2.71	2.52	2.42	2.50		
8	- X -	-10.00	1.77	3.52	4.41	6.82	8.03
8	- Y -	0.27	0.32	0.90	1.04	1.15	1.14
8	- X -	9.90	15.97	19.58	20.59	24.05	65.35
8	- Y -	0.41	0.53	0.59	0.00	-2.00	-2.00
8	- X -	67.20	68.07	86.28	90.63	92.25	93.41
8	- Y -	0.00	0.94	1.05	1.08	3.12	2.71
8	- X -	98.06	103.35	110.00			
8	- Y -	2.52	2.42	2.50			
7	- X -	-10.00	20.59	24.05	65.35	67.20	68.07
7	- Y -	0.00	0.00	-2.00	-2.00	0.00	0.94
7	- X -	86.28	90.63	92.25	93.41	98.06	103.35
7	- Y -	1.05	1.08	3.12	2.71	2.52	2.42
7	- X -	110.00					
7	- Y -	2.50					
6	- X -	-10.00	24.05	65.35	67.20	68.07	86.28
6	- Y -	-2.00	-2.00	-2.00	0.00	0.94	1.05
6	- X -	90.63	92.25	93.41	98.06	103.35	110.00
6	- Y -	1.08	3.12	2.71	2.52	2.42	2.50
5	- X -	-10.00	24.05	65.35	67.20	68.07	86.28
5	- Y -	-2.00	-2.00	-2.00	0.00	0.94	1.05
5	- X -	90.63	110.00				
5	- Y -	1.08	1.20				
4	- X -	-10.00	24.05	65.35	67.20	110.00	
4	- Y -	-2.00	-2.00	-2.00	0.00	0.00	
3	- X -	-10.00	24.05	65.35	110.00		
3	- Y -	-2.00	-2.00	-2.00	-2.00		
2	- X -	-10.00	110.00				
2	- Y -	-10.00	-10.00				
1	- X -	-10.00	110.00				
1	- Y -	-13.00	-13.00				
0	- X -	-10.00	110.00				
0	- Y -	-25.00	-25.00				

## PL LINES

=====

PL line no.	Co-ordinates [m]					
1	- X -	-10.00	20.00	22.00	63.30	110.00
1	- Y -	-0.60	0.30	0.90	3.00	3.53
2	- X -	-10.00	110.00			
2	- Y -	-3.07	-3.07			
3	- X -	-10.00	110.00			
3	- Y -	-0.60	-0.60			

Unit weight of water used for calculation: 9.81 [kN/m3]

The groundwater level is determined by PL-line number 1

FORBIDDEN LINES

=====

No forbidden lines were input.

SOIL PROPERTIES

=====

Layer no. | Material name

Layer no.	Material name
11	Klei, dijksmateriaal
10	Zand, siltig (toplaag)
9	Ophoogmateriaal zand
8	Zand, siltig (toplaag)
7	Klei, siltig
6	Zand, siltig (toplaag)
5	Zand, siltig (toplaag)
4	Klei, siltig
3	Hollandveen
2	Klei, humeus
1	Pleistoceen zand los/mati

Layer number	Gam usat [kN/m3]	Gam sat [kN/m3]	PL-line top	PL-line bottom
11	16.80	16.80	1	1
10	17.00	19.00	1	1
9	18.00	20.00	1	1
8	17.00	19.00	1	1
7	16.20	16.20	1	99
6	17.00	19.00	1	1
5	17.00	19.00	1	1
4	16.20	16.20	1	99
3	11.00	11.00	99	99
2	12.90	12.90	99	2
1	18.00	20.00	2	-

Layer number	Cohesion [kN/m2]	Phi [degrees]	Cu/Pc [-]	POP [kN/m2]	Cu top [kN/m2]	Cu bot. [kN/m2]	Cu grad. [kN/m2/m]
11	2.40	28.40	-	-	-	-	-
10	0.00	25.70	-	-	-	-	-
9	0.00	28.00	-	-	-	-	-
8	0.00	25.70	-	-	-	-	-
7	0.00	27.70	-	-	-	-	-
6	0.00	25.70	-	-	-	-	-
5	0.00	25.70	-	-	-	-	-
4	0.00	27.70	-	-	-	-	-
3	0.00	21.80	-	-	-	-	-
2	0.00	27.20	-	-	-	-	-
1	0.00	28.00	-	-	-	-	-

No degree of consolidation <> 100% input.

CENTER POINT GRID AND TANGENT LINES

=====

X co-ordinate grid left	:	20.74 [m]
X co-ordinate grid right	:	36.58 [m]
Number of grid points in X - direction	:	15
Y co-ordinate grid bottom	:	8.14 [m]
Y co-ordinate grid top	:	20.04 [m]
Number of grid points in Y - direction	:	15
Y co-ordinate tangent smallest circle	:	0.32 [m]
Y co-ordinate tangent biggest circle	:	-10.68 [m]



Number of circles per grid point : 10

No fixed points input.

Total number of center points in the grid: 225
Total number of slip circles in the grid : 2250

LINE LOADS
=====

No line loads input.

UNIFORM LOAD
=====

Table with 6 columns: Uniform load number, Magnitude [kN/m], X start [m], X end [m], Distrib. degrees, Load Type. Contains 2 rows of data.

TREE ON SLOPE
=====

No tree on slope was input.

DEGREE OF CONSOLIDATION : TEMPORARY LOADS
=====

Table with 2 columns: Layer number, Degree of consolidation. Lists values for layers 1 through 11.

EARTHQUAKE
=====

No earth quake factors were input.

\*\*\*\*\* The input has been tested, and is correct. \*\*\*\*\*

□

RESULTS OF THE SLOPE STABILITY ANALYSIS
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Information on the critical circle : Fmin = 1.519
Calculation method used : Bishop - C phi

X co-ordinate center point : 24.14 [m]
Y co-ordinate center point : 11.54 [m]
Radius of critical circle : 16.11 [m]

The center point of the critical circle is enclosed

Total driving moment	:	-6965.01	[kNm/m]
Driving moment free water	:	0.00	[kNm/m]
Driving moment external loads	:	-105.12	[kNm/m]
Iterated resisting moment	:	6965.01	[kNm/m]
Non-iterated resisting moment	:	10156.01	[kNm/m]

END OF D-Geo Stability OUTPUT

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## **Bijlage 1 Berekeningsrapporten deelgebied A**

### **B1.2 STBU maatgevend profiel N207 (profiel 13)**

Program : D-Geo Stability  
 Version : 10.1.4.3  
 License : Unknown  
 Company : Royal HaskoningDHV  
 Date : 7-10-2015  
 Time : 16:15:35

Output file : C:\Users\nl85691\Desktop\Box Sync\Box Sync\BE1234 PUF VIJG\BE1234 PUF  
 Input file : C:\Users\nl85691\Desktop\Box Sync\Box Sync\BE1234 PUF VIJG\BE1234 PUF  
 ===== BEGINNING OF DATA =====

ECHO OF THE INPUT  
 =====

Problem identification : Dijkversterking VIJG  
 : DG A dp 13 STBU zonder dijkbekleding

Calculation model : Bishop  
 Default shear strength : C phi

LAYER BOUNDARIES  
 =====

Boundary no.		Co-ordinates [m]					
10	- X -	-10.00	3.87	11.20	19.90	25.49	30.70
10	- Y -	3.80	3.98	4.00	4.27	3.92	3.44
10	- X -	33.40	35.80	37.50	42.40	43.60	47.90
10	- Y -	2.40	2.60	2.86	4.70	4.80	5.20
10	- X -	50.00	50.70	51.70	55.29	57.20	58.60
10	- Y -	6.19	6.27	6.31	6.50	6.60	6.60
10	- X -	60.50	64.20	68.20	70.10	73.80	77.10
10	- Y -	6.60	6.78	6.60	6.50	6.46	5.80
10	- X -	79.90	82.70	85.10	87.10	95.00	95.26
10	- Y -	4.65	3.50	2.50	2.20	2.20	2.01
10	- X -	96.40	97.60	98.08	98.10	104.75	110.00
10	- Y -	1.00	1.20	1.96	2.00	2.15	2.10
9	- X -	-10.00	3.87	11.20	19.90	25.49	30.70
9	- Y -	3.80	3.98	4.00	4.27	3.92	3.44
9	- X -	33.40	35.80	37.50	42.40	43.60	47.90
9	- Y -	2.40	2.60	2.86	4.70	4.80	5.20
9	- X -	50.00	50.70	51.70	55.29	57.20	58.60
9	- Y -	6.19	6.27	6.31	6.50	6.60	6.60
9	- X -	60.50	64.20	68.20	70.10	73.80	77.10
9	- Y -	6.60	6.78	6.60	6.50	6.46	5.80
9	- X -	79.90	80.61	84.48	85.10	86.10	86.90
9	- Y -	4.65	3.07	1.46	1.20	1.21	2.00
9	- X -	87.10	95.00	95.26	96.40	97.60	98.08
9	- Y -	2.20	2.20	2.01	1.00	1.20	1.96
9	- X -	98.10	104.75	110.00			
9	- Y -	2.00	2.15	2.10			
8	- X -	-10.00	38.70	39.93	83.41	84.48	85.10
8	- Y -	2.00	2.00	1.00	1.00	1.46	1.20
8	- X -	86.10	86.90	87.10	95.00	95.26	96.40
8	- Y -	1.21	2.00	2.20	2.20	2.01	1.00
8	- X -	97.60	98.08	98.10	104.75	110.00	
8	- Y -	1.20	1.96	2.00	2.15	2.10	
7	- X -	-10.00	38.70	39.93	83.41	84.48	85.10

7	- Y -	2.00	2.00	1.00	1.00	1.46	1.20
7	- X -	86.10	86.90	95.26	96.40	97.60	98.08
7	- Y -	1.21	2.00	2.01	1.00	1.20	1.96
7	- X -	98.10	104.75	110.00			
7	- Y -	2.00	2.15	2.10			
6	- X -	-10.00	38.70	39.93	83.41	84.48	85.10
6	- Y -	2.00	2.00	1.00	1.00	1.46	1.20
6	- X -	86.10	86.90	95.26	96.40	97.60	98.08
6	- Y -	1.21	2.00	2.01	1.00	1.20	1.96
6	- X -	110.00					
6	- Y -	2.00					
5	- X -	-10.00	41.26	83.45	110.00		
5	- Y -	0.02	-0.50	-0.50	0.00		
4	- X -	-10.00	110.00				
4	- Y -	-1.00	-1.00				
3	- X -	-10.00	24.05	43.34	84.00	110.00	
3	- Y -	-2.00	-2.00	-2.00	-2.00	-2.00	
2	- X -	-10.00	110.00				
2	- Y -	-4.00	-4.00				
1	- X -	-10.00	110.00				
1	- Y -	-7.50	-7.50				
0	- X -	-10.00	110.00				
0	- Y -	-25.00	-25.00				

## PL LINES

=====

PL line no.		Co-ordinates [m]					
1	- X -	-10.00	33.40	39.10	80.60	81.90	85.10
1	- Y -	-0.60	2.00	2.89	3.00	3.53	2.20
1	- X -	89.00	95.00	110.00			
1	- Y -	2.20	2.10	2.10			
2	- X -	-10.00	110.00				
2	- Y -	-3.07	-3.07				
3	- X -	-10.00	110.00				
3	- Y -	-0.60	-0.60				

Unit weight of water used for calculation: 9.81 [kN/m<sup>3</sup>]  
 The groundwater level is determined by PL-line number 1

## FORBIDDEN LINES

=====

No forbidden lines were input.

## SOIL PROPERTIES

=====

Layer no.	Material name
10	Ophoogmateriaal zand
9	Ophoogmateriaal zand

8 | Ophoogmateriaal zand  
 7 | Zand, siltig (toplaag)  
 6 | Klei, siltig  
 5 | Hollandveen  
 4 | Zand, siltig (toplaag)  
 3 | Zand, siltig (toplaag)  
 2 | Hollandveen  
 1 | Pleistoceen zand los/mati

Layer number	Gam usat [kN/m3]	Gam sat [kN/m3]	PL-line top	PL-line bottom
10	18.00	20.00	1	1
9	18.00	20.00	1	1
8	18.00	20.00	1	1
7	17.00	19.00	1	1
6	16.20	16.20	1	1
5	11.00	11.00	1	1
4	17.00	19.00	1	99
3	17.00	19.00	99	99
2	11.00	11.00	99	2
1	18.00	20.00	2	-

Layer number	Cohesion [kN/m2]	Phi [degrees]	Cu/Pc [-]	POP [kN/m2]	Cu top [kN/m2]	Cu bot. [kN/m2]	Cu grad. [kN/m2/m]
10	0.00	28.00	-	-	-	-	-
9	0.00	28.00	-	-	-	-	-
8	0.00	28.00	-	-	-	-	-
7	0.00	25.70	-	-	-	-	-
6	0.00	27.70	-	-	-	-	-
5	0.00	21.80	-	-	-	-	-
4	0.00	25.70	-	-	-	-	-
3	0.00	25.70	-	-	-	-	-
2	0.00	21.80	-	-	-	-	-
1	0.00	28.00	-	-	-	-	-

No degree of consolidation <> 100% input.

CENTER POINT GRID AND TANGENT LINES  
 =====

X co-ordinate grid left : 73.26 [m]  
 X co-ordinate grid right : 89.09 [m]  
 Number of grid points in X - direction : 15  
  
 Y co-ordinate grid bottom : 7.02 [m]  
 Y co-ordinate grid top : 18.92 [m]  
 Number of grid points in Y - direction : 15  
  
 Y co-ordinate tangent smallest circle : 0.32 [m]  
 Y co-ordinate tangent biggest circle : -10.68 [m]  
 Number of circles per grid point : 10

No fixed points input.

Total number of center points in the grid: 225  
 Total number of slip circles in the grid : 2250

LINE LOADS  
 =====

No line loads input.

UNIFORM LOAD  
 =====

Uniform load number	Magnitude [kN/m]	X start [m]	X end [m]	Distrib. degrees	Load Type
---------------------	------------------	-------------	-----------	------------------	-----------

1	13.30	59.60	69.10	30.00	Temporary
2	5.00	52.70	54.30	30.00	Temporary

TREE ON SLOPE  
=====

No tree on slope was input.

DEGREE OF CONSOLIDATION : TEMPORARY LOADS  
=====

Layer number	Degree of consolidation
10	100
9	100
8	100
7	0
6	0
5	0
4	0
3	0
2	0
1	100

EARTHQUAKE  
=====

No earth quake factors were input.

\*\*\*\*\*  
\*\*\*\*\* The input has been tested, and is correct. \*\*\*\*\*  
\*\*\*\*\*

□

RESULTS OF THE SLOPE STABILITY ANALYSIS  
=====

Information on the critical circle : Fmin = 1.360  
Calculation method used : Bishop - C phi  
=====

X co-ordinate center point : 84.57 [m]  
Y co-ordinate center point : 9.57 [m]  
Radius of critical circle : 10.47 [m]

The center point of the critical circle is enclosed

Total driving moment : 2210.02 [kNm/m]  
Driving moment free water : 0.00 [kNm/m]  
Driving moment external loads : 0.00 [kNm/m]  
Iterated resisting moment : 2210.02 [kNm/m]  
Non-iterated resisting moment : 2885.00 [kNm/m]

END OF D-Geo Stability OUTPUT  
=====

## **Bijlage 1 Berekeningsrapporten deelgebied A**

### **B1.3 Zetting ter plaatse van aansluiting huidige kering en N207**



## Report for D-Settlement 14.1

Settlement Calculations  
Developed by Deltares



Company: Royal HaskoningDHV

Date of report: 6-11-2015  
Time of report: 11:52:33

Date of calculation: 6-11-2015  
Time of calculation: 11:50:20

Filename: C:\..\8. Berekeningen\DG-A\RHDHV VKV A2\DGA-aansluiting\_zetting\_MP

Project identification: Dijkversterking VIJG  
DG A - Aansluiting dijk op N207  
Sondering 09 Geomet 2008 - indicatieve zetting

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## 2 Echo of the Input

### 2.1 Layer Boundaries

Boundary number	Co-ordinates [m]				
7 - X -	-60,000	-5,800	3,300	70,000	
7 - Y -	3,000	3,000	3,000	3,000	
6 - X -	-60,000	70,000			
6 - Y -	0,000	0,000			
5 - X -	-60,000	70,000			
5 - Y -	-1,000	-1,000			
4 - X -	-60,000	70,000			
4 - Y -	-4,000	-4,000			
3 - X -	-60,000	70,000			
3 - Y -	-5,000	-5,000			
2 - X -	-60,000	70,000			
2 - Y -	-9,000	-9,000			
1 - X -	-60,000	70,000			
1 - Y -	-13,000	-13,000			
0 - X -	-60,000	70,000			
0 - Y -	-15,000	-15,000			

### 2.2 PL Lines

PL line number	Co-ordinates [m]				
1 - X -	-60,000	70,000			
1 - Y -	-0,360	-0,360			
2 - X -	-60,000	70,000			
2 - Y -	-3,070	-3,070			

### 2.3 General Data

Soil model:	Koppejan
Consolidation model:	Terzaghi
Strain model:	Natural
Groundwater level:	Initial determined by PL-line number 1
Unit weight of water:	9,81 [kN/m <sup>3</sup> ]
Dispersion conditions layer boundaries	
- Top:	drained
- Bottom:	drained
Stress distribution	
- Soil:	Buisman
- Loads:	None
End of consolidation:	10000,00 [days]
With maintain profile (only for non uniform loads)	
- Material:	Superelevation
- Time:	2,00 [days]
- Unit weight above phreatic.:	18,00 [kN/m <sup>3</sup> ]
- Unit weight below phreatic:	20,00 [kN/m <sup>3</sup> ]
- Iteration stop criterium:	0,10 [m]
Pc (initial):	Variable parallel to the initial effective stress
Pc (per step):	Automatic increased to the final effective stresses
No imaginary surface	
With submerging (only for non uniform loads)	
- Iteration stop criterium :	0,10 [m]
Load column width	
- Non-Uniform Loads :	1,00 [m]
- Trapezoidal Loads :	1,00 [m]

## 2.4 Soil Profiles

Layer number	Material name	PL-line top	PL-line bottom
7	Zand, siltig	1	1
6	Klei, siltig	1	1
5	Zand, siltig	1	1
4	Klei, humeus	1	99
3	Hollandveen	99	99
2	Klei, humeus	99	2
1	Pleistoecen zand m...	2	2

## 2.5 Soil Properties

Layer number	Drained	Unit weight	
		Unsaturated [kN/m <sup>3</sup> ]	Saturated [kN/m <sup>3</sup> ]
7	Yes	17,00	19,00
6	No	16,20	16,20
5	Yes	17,00	19,00
4	No	12,90	12,90
3	No	12,00	12,00
2	No	12,90	12,90
1	Yes	18,00	20,00

Layer number	Vert. consolid. coefficient Cv [m <sup>2</sup> /s]
7	-
6	2,70E-07
5	-
4	1,00E-07
3	5,30E-07
2	1,00E-07
1	-

Layer number	Precons. pressure [kN/m <sup>2</sup> ]	POP [kN/m <sup>2</sup> ]	OCR [-]
7	-	0,00	-
6	-	0,00	-
5	-	0,00	-
4	-	0,00	-
3	-	0,00	-
2	-	0,00	-
1	-	0,00	-

Layer number	Primary compr. coeff.		Secular compr. coef.		Swell constants	
	Cp [-]	Cp' [-]	Cs [-]	Cs' [-]	Ap [-]	As [-]
7	6,00E+02	2,00E+02	1,00E+09	1,00E+09	6,00E+02	1,00E+09
6	5,90E+01	1,20E+01	2,40E+02	1,10E+02	5,90E+01	1,10E+02
5	6,00E+02	2,00E+02	1,00E+09	1,00E+09	6,00E+02	1,00E+09
4	3,00E+01	7,50E+00	1,20E+02	3,00E+01	3,00E+01	3,00E+01
3	5,90E+01	5,00E+00	1,60E+02	6,00E+01	5,90E+01	6,00E+01
2	3,00E+01	7,50E+00	1,20E+02	3,00E+01	3,00E+01	3,00E+01
1	1,80E+03	6,00E+02	1,00E+09	1,00E+09	1,80E+03	1,00E+09

## 2.6 Non-Uniform Loads

Load number	Time [days]	Unit weight	
		Unsaturated [kN/m <sup>3</sup> ]	Saturated [kN/m <sup>3</sup> ]
1	1	17,00	17,00

Load number	Co-ordinates [m]					
1 - X -	-5,80	-2,50	-1,25	0,00	3,30	
1 - Y -	3,00	4,10	4,10	4,10	3,00	

## 2.7 Verticals

Vertical number	X co-ordinates [m]				
1 - 5	-60,000	-5,800	-2,500	-1,250	0,000
6 - 7	3,300	70,000			

### 3 Results per Vertical

#### 3.1 Results for Vertical 1 (X = -60,00 m; Z = 0,00 m)

Depth [m]	Initial stress			Final stress		
	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]
Layer 7						
3,00	0,001	0,000	0,001	0,001	0,000	0,001
2,90	1,700	0,000	1,700	1,700	0,000	1,700
2,80	3,400	0,000	3,400	3,400	0,000	3,400
2,70	5,100	0,000	5,100	5,100	0,000	5,100
2,60	6,800	0,000	6,800	6,800	0,000	6,800
2,50	8,500	0,000	8,500	8,500	0,000	8,500
2,40	10,200	0,000	10,200	10,200	0,000	10,200
2,30	11,900	0,000	11,900	11,900	0,000	11,900
2,20	13,600	0,000	13,600	13,600	0,000	13,600
2,10	15,300	0,000	15,300	15,300	0,000	15,300
2,00	17,000	0,000	17,000	17,000	0,000	17,000
1,50	25,500	0,000	25,500	25,500	0,000	25,500
0,80	37,400	0,000	37,400	37,400	0,000	37,400
0,00	51,000	0,000	51,000	51,000	0,000	51,000
Layer 6						
0,00	51,000	0,000	51,000	51,000	0,000	51,000
-0,36	56,832	0,000	56,832	56,833	0,001	56,832
-0,50	59,100	1,373	57,727	59,101	1,374	57,727
-1,00	67,200	6,278	60,922	67,201	6,279	60,922
Layer 5						
-1,00	67,200	6,278	60,922	67,201	6,279	60,922
-1,80	82,400	14,126	68,274	82,401	14,127	68,274
-2,50	95,700	20,993	74,707	95,701	20,994	74,707
-3,07	106,530	26,585	79,945	106,531	26,586	79,945
-4,00	124,200	35,708	88,492	124,201	35,709	88,492
Layer 4						
-4,00	124,200	35,708	88,492	124,201	35,709	88,492
-4,50	130,650	39,136	91,514	130,651	39,137	91,514
-5,00	137,100	42,565	94,535	137,101	42,565	94,536
Layer 3						
-5,00	137,100	42,565	94,536	137,101	42,565	94,536
-6,00	149,100	49,421	99,679	149,102	49,421	99,680
-7,00	161,100	56,277	104,823	161,102	56,277	104,825
-8,00	173,100	63,133	109,967	173,103	63,133	109,969
-9,00	185,100	69,989	115,111	185,103	69,989	115,114
Layer 2						
-9,00	185,100	69,989	115,111	185,104	69,989	115,114
-10,00	198,000	76,845	121,155	198,004	76,845	121,159
-11,00	210,900	83,701	127,199	210,906	83,701	127,204
-12,00	223,800	90,557	133,243	223,807	90,557	133,250
-13,00	236,700	97,413	139,287	236,709	97,413	139,295
Layer 1						
-13,00	236,700	97,413	139,287	236,709	97,413	139,296
-14,00	256,700	107,223	149,477	256,711	107,223	149,488
-15,00	276,700	117,033	159,667	276,713	117,033	159,680

Layer number	Swelling		Settlement b. Sp.		Settlement a. Sp.	
	Primary	Secondary	Primary	Secondary 10 [days]	Primary	Secondary 10 [days]
	[m]	[m]	[m]	[m]	[m]	[m]
7	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
6	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
5	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
4	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000

Layer number	Swelling		Settlement b. Sp.		Settlement a. Sp.	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
	[m]	[m]	[m]	10 [days] [m]	[m]	10 [days] [m]
3	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
2	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
1	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Total	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000

Depth		Layer number	Total settlement (100% cons.)			Percentage of original layer height [%]
From [m]	To [m]		Primary [m]	Secondary 10 [days] [m]	After 10000 [days] [m]	
3,00	0,00	7	0,0000	0,0000	0,0000	0,00
0,00	-1,00	6	0,0000	0,0000	0,0000	0,00
-1,00	-4,00	5	0,0000	0,0000	0,0000	0,00
-4,00	-5,00	4	0,0000	0,0000	0,0000	0,00
-5,00	-9,00	3	0,0000	0,0000	0,0000	0,00
-9,00	-13,00	2	0,0000	0,0000	0,0000	0,00
-13,00	-15,00	1	0,0000	0,0000	0,0000	0,00
Total			0,0000	0,0000	0,0001	

### 3.2 Results for Vertical 2 (X = -5,80 m; Z = 0,00 m)

Depth [m]	Initial stress			Final stress		
	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]
Layer 7						
3,00	0,001	0,000	0,001	2,882	0,000	2,882
2,90	1,700	0,000	1,700	4,607	0,000	4,607
2,80	3,400	0,000	3,400	6,339	0,000	6,339
2,70	5,100	0,000	5,100	8,077	0,000	8,077
2,60	6,800	0,000	6,800	9,824	0,000	9,824
2,50	8,500	0,000	8,500	11,580	0,000	11,580
2,40	10,200	0,000	10,200	13,347	0,000	13,347
2,30	11,900	0,000	11,900	15,124	0,000	15,124
2,20	13,600	0,000	13,600	16,911	0,000	16,911
2,10	15,300	0,000	15,300	18,706	0,000	18,706
2,00	17,000	0,000	17,000	20,508	0,000	20,508
1,50	25,500	0,000	25,500	29,570	0,000	29,570
0,80	37,400	0,000	37,400	42,248	0,000	42,248
0,00	51,000	0,000	51,000	56,600	0,000	56,600
Layer 6						
0,00	51,000	0,000	51,000	56,601	0,000	56,601
-0,36	56,832	0,000	56,832	64,080	1,368	62,711
-0,50	59,100	1,373	57,727	66,430	2,726	63,704
-1,00	67,200	6,278	60,922	74,778	7,573	67,205
Layer 5						
-1,00	67,200	6,278	60,922	74,778	7,573	67,205
-1,80	82,400	14,126	68,274	90,328	15,418	74,910
-2,50	95,700	20,993	74,707	103,816	22,281	81,534
-3,07	106,530	26,585	79,945	114,731	27,871	86,861
-4,00	124,200	35,708	88,492	132,439	36,991	95,448
Layer 4						
-4,00	124,200	35,708	88,492	132,439	36,991	95,449
-4,50	130,650	39,136	91,514	138,774	40,322	98,451
-5,00	137,100	42,565	94,535	145,089	43,657	101,432
Layer 3						
-5,00	137,100	42,565	94,536	145,089	43,657	101,432
-6,00	149,100	49,421	99,679	156,779	50,337	106,441
-7,00	161,100	56,277	104,823	168,434	57,029	111,405
-8,00	173,100	63,133	109,967	180,075	63,733	116,342
-9,00	185,100	69,989	115,111	191,714	70,449	121,265
Layer 2						

Depth [m]	Initial stress			Final stress		
	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]
-9,00	185,100	69,989	115,111	191,714	70,449	121,265
-10,00	198,000	76,845	121,155	204,259	77,175	127,084
-11,00	210,900	83,701	127,199	216,817	83,912	132,904
-12,00	223,800	90,557	133,243	229,389	90,659	138,730
-13,00	236,700	97,413	139,287	241,978	97,414	144,564
Layer 1						
-13,00	236,700	97,413	139,287	241,979	97,414	144,564
-14,00	256,700	107,223	149,477	261,777	107,224	154,553
-15,00	276,700	117,033	159,667	281,585	117,033	164,552

Layer number	Swelling		Settlement b. Sp.		Settlement a. Sp.	
	Primary [m]	Secondary [m]	Primary [m]	Secondary 10 [days] [m]	Primary [m]	Secondary 10 [days] [m]
7	0,0000	0,0000	0,0000	0,0000	0,0037	0,0000
6	0,0000	0,0000	0,0000	0,0000	0,0083	0,0009
5	0,0000	0,0000	0,0000	0,0000	0,0013	0,0000
4	0,0000	0,0000	0,0000	0,0000	0,0097	0,0024
3	0,0000	0,0000	0,0000	0,0000	0,0488	0,0041
2	0,0000	0,0000	0,0000	0,0000	0,0235	0,0059
1	0,0000	0,0000	0,0000	0,0000	0,0001	0,0000
Total	0,0000	0,0000	0,0000	0,0000	0,0954	0,0133

Depth		Layer number	Total settlement (100% cons.)			Percentage of original layer height [%]
From [m]	To [m]		Primary [m]	Secondary 10 [days] [m]	After 10000 [days] [m]	
3,00	0,00	7	0,0037	0,0000	0,0037	0,12
0,00	-1,00	6	0,0083	0,0009	0,0118	1,18
-1,00	-4,00	5	0,0013	0,0000	0,0013	0,04
-4,00	-5,00	4	0,0097	0,0024	0,0193	1,93
-5,00	-9,00	3	0,0488	0,0041	0,0645	1,61
-9,00	-13,00	2	0,0235	0,0059	0,0468	1,17
-13,00	-15,00	1	0,0001	0,0000	0,0001	0,01
Total			0,0954	0,0133	0,1475	

### 3.3 Results for Vertical 3 (X = -2,50 m; Z = 0,00 m)

Depth [m]	Initial stress			Final stress		
	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]
Layer 7						
3,00	0,001	0,000	0,001	21,938	0,000	21,938
2,90	1,700	0,000	1,700	23,629	0,000	23,629
2,80	3,400	0,000	3,400	25,256	0,000	25,256
2,70	5,100	0,000	5,100	26,803	0,000	26,803
2,60	6,800	0,000	6,800	28,316	0,000	28,316
2,50	8,500	0,000	8,500	29,828	0,000	29,828
2,40	10,200	0,000	10,200	31,352	0,000	31,352
2,30	11,900	0,000	11,900	32,887	0,000	32,887
2,20	13,600	0,000	13,600	34,431	0,000	34,431
2,10	15,300	0,000	15,300	35,981	0,000	35,981
2,00	17,000	0,000	17,000	37,534	0,000	37,534
1,50	25,500	0,000	25,500	45,290	0,000	45,290
0,80	37,400	0,000	37,400	56,075	0,000	56,075
0,00	51,000	0,000	51,000	68,349	0,000	68,349
Layer 6						
0,00	51,000	0,000	51,000	68,349	0,000	68,349
-0,36	56,832	0,000	56,832	75,530	1,942	73,588
-0,50	59,100	1,373	57,727	77,529	3,274	74,255
-1,00	67,200	6,278	60,922	84,694	8,040	76,654



Depth [m]	Initial stress			Final stress		
	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]
Layer 5						
-1,00	67,200	6,278	60,922	84,694	8,040	76,654
-1,80	82,400	14,126	68,274	98,686	15,880	82,806
-2,50	95,700	20,993	74,707	111,015	22,741	88,275
-3,07	106,530	26,585	79,945	121,117	28,328	92,789
-4,00	124,200	35,708	88,492	137,714	37,445	100,269
Layer 4						
-4,00	124,200	35,708	88,492	137,714	37,445	100,269
-4,50	130,650	39,136	91,514	143,490	40,718	102,772
-5,00	137,100	42,565	94,535	149,312	44,002	105,311
Layer 3						
-5,00	137,100	42,565	94,536	149,313	44,002	105,311
-6,00	149,100	49,421	99,679	160,181	50,597	109,585
-7,00	161,100	56,277	104,823	171,194	57,222	113,971
-8,00	173,100	63,133	109,967	182,328	63,874	118,454
-9,00	185,100	69,989	115,111	193,566	70,548	123,017
Layer 2						
-9,00	185,100	69,989	115,111	193,566	70,548	123,017
-10,00	198,000	76,845	121,155	205,791	77,242	128,549
-11,00	210,900	83,701	127,199	218,091	83,952	134,139
-12,00	223,800	90,557	133,243	230,455	90,677	139,778
-13,00	236,700	97,413	139,287	242,874	97,415	145,459
Layer 1						
-13,00	236,700	97,413	139,287	242,874	97,415	145,459
-14,00	256,700	107,223	149,477	262,547	107,224	155,323
-15,00	276,700	117,033	159,667	282,251	117,033	165,218

Layer number	Swelling		Settlement b. Sp.		Settlement a. Sp.	
	Primary	Secondary	Primary	Secondary 10 [days]	Primary	Secondary 10 [days]
	[m]	[m]	[m]	[m]	[m]	[m]
7	0,0000	0,0000	0,0000	0,0000	0,0123	0,0000
6	0,0000	0,0000	0,0000	0,0000	0,0212	0,0023
5	0,0000	0,0000	0,0000	0,0000	0,0026	0,0000
4	0,0000	0,0000	0,0000	0,0000	0,0155	0,0039
3	0,0000	0,0000	0,0000	0,0000	0,0679	0,0057
2	0,0000	0,0000	0,0000	0,0000	0,0287	0,0072
1	0,0000	0,0000	0,0000	0,0000	0,0001	0,0000
Total	0,0000	0,0000	0,0000	0,0000	0,1482	0,0190

Depth		Layer number	Total settlement (100% cons.)			Percentage of original layer height [%]
From [m]	To [m]		Primary [m]	Secondary 10 [days] [m]	After 10000 [days] [m]	
3,00	0,00	7	0,0123	0,0000	0,0122	0,41
0,00	-1,00	6	0,0212	0,0023	0,0300	3,00
-1,00	-4,00	5	0,0026	0,0000	0,0026	0,09
-4,00	-5,00	4	0,0155	0,0039	0,0305	3,05
-5,00	-9,00	3	0,0679	0,0057	0,0895	2,24
-9,00	-13,00	2	0,0287	0,0072	0,0569	1,42
-13,00	-15,00	1	0,0001	0,0000	0,0001	0,01
Total			0,1482	0,0190	0,2219	

### 3.4 Results for Vertical 4 (X = -1,25 m; Z = 0,00 m)

Depth [m]	Initial stress			Final stress		
	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]
Layer 7						
3,00	0,001	0,000	0,001	22,587	0,000	22,587
2,90	1,700	0,000	1,700	24,259	0,000	24,259

Depth [m]	Initial stress			Final stress		
	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]
2,80	3,400	0,000	3,400	25,931	0,000	25,931
2,70	5,100	0,000	5,100	27,602	0,000	27,602
2,60	6,800	0,000	6,800	29,270	0,000	29,270
2,50	8,500	0,000	8,500	30,932	0,000	30,932
2,40	10,200	0,000	10,200	32,585	0,000	32,585
2,30	11,900	0,000	11,900	34,229	0,000	34,229
2,20	13,600	0,000	13,600	35,861	0,000	35,861
2,10	15,300	0,000	15,300	37,482	0,000	37,482
2,00	17,000	0,000	17,000	39,091	0,000	39,091
1,50	25,500	0,000	25,500	46,973	0,000	46,973
0,80	37,400	0,000	37,400	57,699	0,000	57,699
0,00	51,000	0,000	51,000	69,777	0,000	69,777
Layer 6						
0,00	51,000	0,000	51,000	69,777	0,000	69,777
-0,36	56,832	0,000	56,832	76,915	2,001	74,914
-0,50	59,100	1,373	57,727	78,871	3,330	75,541
-1,00	67,200	6,278	60,922	85,887	8,087	77,800
Layer 5						
-1,00	67,200	6,278	60,922	85,887	8,087	77,801
-1,80	82,400	14,126	68,274	99,673	15,926	83,747
-2,50	95,700	20,993	74,707	111,847	22,787	89,061
-3,07	106,530	26,585	79,945	121,841	28,374	93,467
-4,00	124,200	35,708	88,492	138,293	37,490	100,803
Layer 4						
-4,00	124,200	35,708	88,492	138,293	37,491	100,803
-4,50	130,650	39,136	91,514	144,000	40,757	103,243
-5,00	137,100	42,565	94,535	149,762	44,036	105,726
Layer 3						
-5,00	137,100	42,565	94,536	149,762	44,036	105,727
-6,00	149,100	49,421	99,679	160,533	50,622	109,911
-7,00	161,100	56,277	104,823	171,472	57,241	114,231
-8,00	173,100	63,133	109,967	182,550	63,888	118,663
-9,00	185,100	69,989	115,111	193,745	70,558	123,187
Layer 2						
-9,00	185,100	69,989	115,111	193,745	70,558	123,187
-10,00	198,000	76,845	121,155	205,936	77,248	128,688
-11,00	210,900	83,701	127,199	218,210	83,956	134,254
-12,00	223,800	90,557	133,243	230,553	90,679	139,875
-13,00	236,700	97,413	139,287	242,955	97,415	145,541
Layer 1						
-13,00	236,700	97,413	139,287	242,956	97,415	145,541
-14,00	256,700	107,223	149,477	262,616	107,224	155,392
-15,00	276,700	117,033	159,667	282,311	117,033	165,277

Layer number	Swelling		Settlement b. Sp.		Settlement a. Sp.	
	Primary [m]	Secondary [m]	Primary [m]	Secondary 10 [days] [m]	Primary [m]	Secondary 10 [days] [m]
7	0,0000	0,0000	0,0000	0,0000	0,0128	0,0000
6	0,0000	0,0000	0,0000	0,0000	0,0227	0,0025
5	0,0000	0,0000	0,0000	0,0000	0,0027	0,0000
4	0,0000	0,0000	0,0000	0,0000	0,0161	0,0040
3	0,0000	0,0000	0,0000	0,0000	0,0698	0,0058
2	0,0000	0,0000	0,0000	0,0000	0,0291	0,0073
1	0,0000	0,0000	0,0000	0,0000	0,0001	0,0000
Total	0,0000	0,0000	0,0000	0,0000	0,1533	0,0196

Depth		Layer number	Total settlement (100% cons.)			Percentage of original layer height [%]
From [m]	To [m]		Primary [m]	Secondary 10 [days] [m]	After 10000 [days] [m]	
3,00	0,00	7	0,0128	0,0000	0,0127	0,42
0,00	-1,00	6	0,0227	0,0025	0,0321	3,21

Depth		Layer number	Total settlement (100% cons.)			Percentage of original layer height [%]
From [m]	To [m]		Primary [m]	Secondary 10 [days] [m]	After 10000 [days] [m]	
-1,00	-4,00	5	0,0027	0,0000	0,0027	0,09
-4,00	-5,00	4	0,0161	0,0040	0,0317	3,17
-5,00	-9,00	3	0,0698	0,0058	0,0920	2,30
-9,00	-13,00	2	0,0291	0,0073	0,0578	1,45
-13,00	-15,00	1	0,0001	0,0000	0,0001	0,01
Total			0,1533	0,0196	0,2291	

**3.5 Results for Vertical 5 (X = 0,00 m; Z = 0,00 m)**

Depth [m]	Initial stress			Final stress		
	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]
Layer 7						
3,00	0,001	0,000	0,001	21,026	0,000	21,026
2,90	1,700	0,000	1,700	22,698	0,000	22,698
2,80	3,400	0,000	3,400	24,372	0,000	24,372
2,70	5,100	0,000	5,100	26,044	0,000	26,044
2,60	6,800	0,000	6,800	27,709	0,000	27,709
2,50	8,500	0,000	8,500	29,363	0,000	29,363
2,40	10,200	0,000	10,200	31,004	0,000	31,004
2,30	11,900	0,000	11,900	32,631	0,000	32,631
2,20	13,600	0,000	13,600	34,244	0,000	34,244
2,10	15,300	0,000	15,300	35,845	0,000	35,845
2,00	17,000	0,000	17,000	37,434	0,000	37,434
1,50	25,500	0,000	25,500	45,268	0,000	45,268
0,80	37,400	0,000	37,400	56,076	0,000	56,076
0,00	51,000	0,000	51,000	68,355	0,000	68,355
Layer 6						
0,00	51,000	0,000	51,000	68,356	0,000	68,356
-0,36	56,832	0,000	56,832	75,538	1,942	73,596
-0,50	59,100	1,373	57,727	77,537	3,274	74,262
-1,00	67,200	6,278	60,922	84,702	8,040	76,661
Layer 5						
-1,00	67,200	6,278	60,922	84,702	8,040	76,662
-1,80	82,400	14,126	68,274	98,692	15,880	82,812
-2,50	95,700	20,993	74,707	111,020	22,741	88,279
-3,07	106,530	26,585	79,945	121,121	28,328	92,793
-4,00	124,200	35,708	88,492	137,716	37,445	100,271
Layer 4						
-4,00	124,200	35,708	88,492	137,717	37,445	100,271
-4,50	130,650	39,136	91,514	143,492	40,718	102,774
-5,00	137,100	42,565	94,535	149,314	44,002	105,312
Layer 3						
-5,00	137,100	42,565	94,536	149,314	44,002	105,313
-6,00	149,100	49,421	99,679	160,183	50,597	109,586
-7,00	161,100	56,277	104,823	171,195	57,223	113,972
-8,00	173,100	63,133	109,967	182,329	63,874	118,455
-9,00	185,100	69,989	115,111	193,566	70,548	123,018
Layer 2						
-9,00	185,100	69,989	115,111	193,566	70,548	123,018
-10,00	198,000	76,845	121,155	205,791	77,242	128,549
-11,00	210,900	83,701	127,199	218,091	83,952	134,139
-12,00	223,800	90,557	133,243	230,455	90,677	139,778
-13,00	236,700	97,413	139,287	242,874	97,415	145,459
Layer 1						
-13,00	236,700	97,413	139,287	242,874	97,415	145,459
-14,00	256,700	107,223	149,477	262,547	107,224	155,323
-15,00	276,700	117,033	159,667	282,251	117,033	165,218

Layer number	Swelling		Settlement b. Sp.		Settlement a. Sp.	
	Primary [m]	Secondary [m]	Primary [m]	Secondary 10 [days] [m]	Primary [m]	Secondary 10 [days] [m]
7	0,0000	0,0000	0,0000	0,0000	0,0122	0,0000
6	0,0000	0,0000	0,0000	0,0000	0,0212	0,0023
5	0,0000	0,0000	0,0000	0,0000	0,0026	0,0000
4	0,0000	0,0000	0,0000	0,0000	0,0155	0,0039
3	0,0000	0,0000	0,0000	0,0000	0,0679	0,0057
2	0,0000	0,0000	0,0000	0,0000	0,0287	0,0072
1	0,0000	0,0000	0,0000	0,0000	0,0001	0,0000
Total	0,0000	0,0000	0,0000	0,0000	0,1482	0,0190

Depth		Layer number	Total settlement (100% cons.)			Percentage of original layer height [%]
From [m]	To [m]		Primary [m]	Secondary 10 [days] [m]	After 10000 [days] [m]	
3,00	0,00	7	0,0122	0,0000	0,0121	0,40
0,00	-1,00	6	0,0212	0,0023	0,0301	3,01
-1,00	-4,00	5	0,0026	0,0000	0,0026	0,09
-4,00	-5,00	4	0,0155	0,0039	0,0305	3,05
-5,00	-9,00	3	0,0679	0,0057	0,0895	2,24
-9,00	-13,00	2	0,0287	0,0072	0,0569	1,42
-13,00	-15,00	1	0,0001	0,0000	0,0001	0,01
Total			0,1482	0,0190	0,2218	

### 3.6 Results for Vertical 6 (X = 3,30 m; Z = 0,00 m)

Depth [m]	Initial stress			Final stress		
	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]
Layer 7						
3,00	0,001	0,000	0,001	1,935	0,000	1,935
2,90	1,700	0,000	1,700	3,769	0,000	3,769
2,80	3,400	0,000	3,400	5,611	0,000	5,611
2,70	5,100	0,000	5,100	7,478	0,000	7,478
2,60	6,800	0,000	6,800	9,354	0,000	9,354
2,50	8,500	0,000	8,500	11,224	0,000	11,224
2,40	10,200	0,000	10,200	13,083	0,000	13,083
2,30	11,900	0,000	11,900	14,930	0,000	14,930
2,20	13,600	0,000	13,600	16,769	0,000	16,769
2,10	15,300	0,000	15,300	18,602	0,000	18,602
2,00	17,000	0,000	17,000	20,431	0,000	20,431
1,50	25,500	0,000	25,500	29,549	0,000	29,549
0,80	37,400	0,000	37,400	42,243	0,000	42,243
0,00	51,000	0,000	51,000	56,601	0,000	56,601
Layer 6						
0,00	51,000	0,000	51,000	56,601	0,000	56,601
-0,36	56,832	0,000	56,832	64,081	1,369	62,713
-0,50	59,100	1,373	57,727	66,432	2,726	63,706
-1,00	67,200	6,278	60,922	74,781	7,573	67,207
Layer 5						
-1,00	67,200	6,278	60,922	74,781	7,574	67,207
-1,80	82,400	14,126	68,274	90,331	15,418	74,913
-2,50	95,700	20,993	74,707	103,818	22,282	81,537
-3,07	106,530	26,585	79,945	114,734	27,871	86,863
-4,00	124,200	35,708	88,492	132,441	36,991	95,451
Layer 4						
-4,00	124,200	35,708	88,492	132,441	36,991	95,451
-4,50	130,650	39,136	91,514	138,775	40,322	98,453
-5,00	137,100	42,565	94,535	145,091	43,657	101,433
Layer 3						
-5,00	137,100	42,565	94,536	145,091	43,658	101,433

Depth [m]	Initial stress			Final stress		
	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]
-6,00	149,100	49,421	99,679	156,780	50,337	106,443
-7,00	161,100	56,277	104,823	168,435	57,029	111,406
-8,00	173,100	63,133	109,967	180,076	63,734	116,342
-9,00	185,100	69,989	115,111	191,714	70,449	121,265
Layer 2						
-9,00	185,100	69,989	115,111	191,714	70,449	121,265
-10,00	198,000	76,845	121,155	204,259	77,175	127,084
-11,00	210,900	83,701	127,199	216,817	83,912	132,904
-12,00	223,800	90,557	133,243	229,390	90,659	138,730
-13,00	236,700	97,413	139,287	241,979	97,414	144,564
Layer 1						
-13,00	236,700	97,413	139,287	241,979	97,414	144,564
-14,00	256,700	107,223	149,477	261,777	107,224	154,553
-15,00	276,700	117,033	159,667	281,585	117,033	164,552

Layer number	Swelling		Settlement b. Sp.		Settlement a. Sp.	
	Primary	Secondary	Primary	Secondary 10 [days]	Primary	Secondary 10 [days]
	[m]	[m]	[m]	[m]	[m]	[m]
7	0,0000	0,0000	0,0000	0,0000	0,0033	0,0000
6	0,0000	0,0000	0,0000	0,0000	0,0083	0,0009
5	0,0000	0,0000	0,0000	0,0000	0,0013	0,0000
4	0,0000	0,0000	0,0000	0,0000	0,0097	0,0024
3	0,0000	0,0000	0,0000	0,0000	0,0488	0,0041
2	0,0000	0,0000	0,0000	0,0000	0,0235	0,0059
1	0,0000	0,0000	0,0000	0,0000	0,0001	0,0000
Total	0,0000	0,0000	0,0000	0,0000	0,0951	0,0133

Depth		Layer number	Total settlement (100% cons.)			Percentage of original layer height [%]
From [m]	To [m]		Primary [m]	Secondary 10 [days] [m]	After 10000 [days] [m]	
3,00	0,00	7	0,0033	0,0000	0,0033	0,11
0,00	-1,00	6	0,0083	0,0009	0,0118	1,18
-1,00	-4,00	5	0,0013	0,0000	0,0013	0,04
-4,00	-5,00	4	0,0097	0,0024	0,0193	1,93
-5,00	-9,00	3	0,0488	0,0041	0,0645	1,61
-9,00	-13,00	2	0,0235	0,0059	0,0468	1,17
-13,00	-15,00	1	0,0001	0,0000	0,0001	0,01
Total			0,0951	0,0133	0,1472	

### 3.7 Results for Vertical 7 (X = 70,00 m; Z = 0,00 m)

Depth [m]	Initial stress			Final stress		
	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]
Layer 7						
3,00	0,001	0,000	0,001	0,001	0,000	0,001
2,90	1,700	0,000	1,700	1,700	0,000	1,700
2,80	3,400	0,000	3,400	3,400	0,000	3,400
2,70	5,100	0,000	5,100	5,100	0,000	5,100
2,60	6,800	0,000	6,800	6,800	0,000	6,800
2,50	8,500	0,000	8,500	8,500	0,000	8,500
2,40	10,200	0,000	10,200	10,200	0,000	10,200
2,30	11,900	0,000	11,900	11,900	0,000	11,900
2,20	13,600	0,000	13,600	13,600	0,000	13,600
2,10	15,300	0,000	15,300	15,300	0,000	15,300
2,00	17,000	0,000	17,000	17,000	0,000	17,000
1,50	25,500	0,000	25,500	25,500	0,000	25,500
0,80	37,400	0,000	37,400	37,400	0,000	37,400
0,00	51,000	0,000	51,000	51,000	0,000	51,000

Depth [m]	Initial stress			Final stress		
	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]	S-total [kN/m <sup>2</sup> ]	S-water [kN/m <sup>2</sup> ]	S-eff. [kN/m <sup>2</sup> ]
Layer 6						
0,00	51,000	0,000	51,000	51,000	0,000	51,000
-0,36	56,832	0,000	56,832	56,832	0,000	56,832
-0,50	59,100	1,373	57,727	59,100	1,374	57,727
-1,00	67,200	6,278	60,922	67,200	6,279	60,922
Layer 5						
-1,00	67,200	6,278	60,922	67,200	6,279	60,922
-1,80	82,400	14,126	68,274	82,400	14,127	68,274
-2,50	95,700	20,993	74,707	95,700	20,994	74,707
-3,07	106,530	26,585	79,945	106,530	26,585	79,945
-4,00	124,200	35,708	88,492	124,200	35,709	88,492
Layer 4						
-4,00	124,200	35,708	88,492	124,201	35,709	88,492
-4,50	130,650	39,136	91,514	130,650	39,137	91,514
-5,00	137,100	42,565	94,535	137,100	42,565	94,536
Layer 3						
-5,00	137,100	42,565	94,536	137,101	42,565	94,536
-6,00	149,100	49,421	99,679	149,101	49,421	99,680
-7,00	161,100	56,277	104,823	161,101	56,277	104,824
-8,00	173,100	63,133	109,967	173,101	63,133	109,968
-9,00	185,100	69,989	115,111	185,101	69,989	115,112
Layer 2						
-9,00	185,100	69,989	115,111	185,101	69,989	115,112
-10,00	198,000	76,845	121,155	198,002	76,845	121,157
-11,00	210,900	83,701	127,199	210,902	83,701	127,201
-12,00	223,800	90,557	133,243	223,803	90,557	133,246
-13,00	236,700	97,413	139,287	236,704	97,413	139,290
Layer 1						
-13,00	236,700	97,413	139,287	236,704	97,413	139,290
-14,00	256,700	107,223	149,477	256,704	107,223	149,481
-15,00	276,700	117,033	159,667	276,705	117,033	159,672

Layer number	Swelling		Settlement b. Sp.		Settlement a. Sp.	
	Primary [m]	Secondary [m]	Primary [m]	Secondary 10 [days] [m]	Primary [m]	Secondary 10 [days] [m]
7	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
6	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
5	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
4	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
3	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
2	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
1	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Total	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000

Depth		Layer number	Total settlement (100% cons.)			Percentage of original layer height [%]
From [m]	To [m]		Primary [m]	Secondary 10 [days] [m]	After 10000 [days] [m]	
3,00	0,00	7	0,0000	0,0000	0,0000	0,00
0,00	-1,00	6	0,0000	0,0000	0,0000	0,00
-1,00	-4,00	5	0,0000	0,0000	0,0000	0,00
-4,00	-5,00	4	0,0000	0,0000	0,0000	0,00
-5,00	-9,00	3	0,0000	0,0000	0,0000	0,00
-9,00	-13,00	2	0,0000	0,0000	0,0000	0,00
-13,00	-15,00	1	0,0000	0,0000	0,0000	0,00
Total			0,0000	0,0000	0,0000	

## 4 Settlements

### 4.1 Settlements

Vertical number	X co-ordinate [m]	Z co-ordinate [m]	Surface level [m]	Settlement [m]
1	-60,00	0,00	3,00	0,000
2	-5,80	0,00	3,00	0,147
3	-2,50	0,00	3,00	0,222
4	-1,25	0,00	3,00	0,229
5	0,00	0,00	3,00	0,222
6	3,30	0,00	3,00	0,147
7	70,00	0,00	3,00	0,000

### 4.2 Maintain Profile Calculation Results

Load 1 consists of 6,380 m<sup>3</sup> per Width

The extra amount of soil to be added is 1,770 m<sup>3</sup> per Width

This equals the found settlements for non-uniform loads

## 5 Warnings and errors

List of non-fatal warnings and errors generated during calculation.

- 1 D-Settlement will incorporate submerging as a one-off load reduction at time zero, due to the limitations of the Terzaghi model. Use the Darcy model for a gradual weight reduction of soil and loading during submerging
- 2 The Terzaghi model uses one consolidation coefficient for loading/unloading. This can underestimate residual settlements after unloading. Switch to Darcy for, more accurate calculations of the consolidation stage.

## End of Report