

The Specialist Element Designer:		Our Client:		Final Client:	
					
PROJECT:		HARTS FARM WAY, BROCKHAMPTON WEST, HAVANT - RSS BUND			
OUR CLIENT:		BURROWS GRAHAM			
PRINCIPAL ENGINEER:		BURROWS GRAHAM			
SPECIALIST DESIGNER:		TAILOR ENGINEERING GROUP LTD			
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PROJECT REF.:		REINFORCED SOIL SLOPE (RSS) BUND			
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BURROWS GRAHAM		FOR APPROVAL		A	20/02/2023
This design is in accordance with the principles set out in current European and British Standards, Codes of Practice, and industry specification. Reference to a particular standard, code of practice or specification does not imply total compliance with the whole of the document only that they are complied with, where considered appropriate, in the experience of the designer. This design remains the copyright and property of Tailor Engineering Group Ltd., Burrows Graham and Clowes Development (UK) Ltd have the right to use this design and this document for its intended purposes. This design proposal and document are not to be copied or disclosed to any person other than the person to whom it is originally intended. © 2023 TAILOR-ENGINEERING					



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FOREWORD

Burrows Graham requested that Tailor Engineering Group Ltd. (TEG) carry out specialist element design for reinforced soil slopes (RSS) to a bund as an element of the permanent works at Harts Farm Way Havant, Hampshire.

This report does not cover, and it not intended to cover, geotechnical aspects of the development beyond those mentioned above and within this document. For geotechnical recommendations beyond the aforementioned scope, the reader is referred to the Principal Designer and to the full GDR of the scheme.

Specific notes for this revision:

This design report presents a specific geotechnical component such as the reinforced soil slopes. Any solution outside this scope is not covered by this design and TEG should be informed so that a new design can be advised if required.

The Geotechnical Risk Register for the project is presented in Section 9.0. This attempts to close out risks wherever possible, but highlights residual risks, where considered appropriate.

All temporary works associated with the project are outside the scope of this report and associated specifications and drawings.

Further version can be provided and modified to incorporate comments following Client's review.

1.0 INTRODUCTION

The design of the reinforced soil slope has been undertaken by TEG as defined within this design report. The slopes in this scheme, will be combined with reinforcement geosynthetics and erosion control systems to create reinforced soil slopes (RSS) as part of a bund structure.

In this project:

- Burrows Graham (BG) is our Client and Principal Designer
- Principal Contractor is to be confirmed
- RSS Installer is to be confirmed
- Clowes Development (UK) Ltd is the developer (and BG's Client)
- Client's Geotechnical Advisor is to be confirmed
- Tailor Engineering Group Ltd (TEG) is the specialist element designer for the RSS.

The above parties should all read and check this design document before proceeding.

Please advise TEG before proceeding with construction if there are any errors in the scope.

The RSS are forming a screening bund. The RSS are indicated on TEG drawings attached to this document in the Appendix B.

The most onerous cross-sections have been considered in the design as per Appendix A (rev. 0 from 08/02/2023).

For intermediate slope heights the geosynthetic lengths from the higher section should be used.

2.0 SCOPE OF WORKS

1. This report is limited to the design of the geosynthetic reinforcement and it is assumed that the reinforced soil slopes are placed over a suitable formation layer with sufficient strength and stiffness to prevent failure and excess settlement of the RSS.
2. The limits of this element design are the reinforced soil zone extending from the front face of the green faced slope back to the rear of the geosynthetic reinforcement tails, and up to the underside of the surface vertically above the rear of the uppermost reinforcement tail. Deep seated rotational failures are excluded from the scope of TEG design.
3. The RSS will be constructed from Class 2 material to be compacted to 95% of maximum dry density (maximum dry density to be confirmed via compaction testing throughout the works). Compaction is to be in accordance with MCHW Specification for Highway Works, Series 600.
4. Further design and calculations might be required on specific sections and interfaces included but not limited to approach to culverts / other structures, tie-in zones to existing structures, strategic



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services, fences or light posts etc. These specific sections and interfaces are not part of this design report. These details must be considered during the design process. Burrows Graham should advise and provide TEG with further details. If required, dedicated calculation appendixes and detailed drawings would be created in due course to cover these interactions / interfaces.

For the sections mentioned in this design document:

- The RSS are modelled with a slope angle of 26 degrees from horizontal (1 vertical : 2 horizontal) and a flat crest slope; individual geosynthetic lifts are set as 400 mm high.
- Settlement of the structures due to consolidation of the foundation soil may also occur but is outside the scope of this design. Determination of both the short- and long-term settlements of the RSS are not part of this design.
- This design is for the permanent works only and is issued on the basis that a safe system of works is provided for construction.
- All slopes geometry, setting out and required offsets to be confirmed by others prior to construction. The party undertaking this work must identify the locations of all services prior to construction and ensure that none will be affected by the geosynthetics and its installation.

This design report is based on the information provided to TEG as follows:

- Enabling works excavation and filling specification for Clowes Development & Exton estates, Harts Farm Way, Havant prepared by Burrows Graham Ltd. Ref 21048-BGL-XX-XX-SP-S-D20, Version 1, dated 09/12/2022.
- Geo-Environmental Assessment, Former Brockhampton West Landfill, North of Harts Farm Way, Havant, Presented to Clowes Developments (UK) Ltd, Issued: July 2021, Delta-Simons Project No. 19-2099.04
- Preliminary Settlement Discussion, Brockhampton West, Havant, Presented to Exton Estates, Issued: 11th June 2021, Delta-Simons Project No. 19-2099.06.
- Factual Geo-Environmental Investigation Report, Former Brockhampton West Landfill, North of Harts Farm Way, Havant, Presented to Clowes Developments (UK) Ltd, Issued: November 2021, Delta-Simons Project No. 19-2099.08
- Havant Bund Assessment January 2022 prepared for Burrows Graham Ltd by Ground and Project Consultants Ltd, Final Report, Report No. 70634-1, Dated 06/01/2022.
- Brockhampton West report for Havant borough Council, Job No: A102760, WYG Environment Planning Transport Limited, dated August 2017.
- TEG keep a record of all email correspondence and phone calls (March 2022).

In addition, the following documents were used in the preparation of this design:

- BS 8006-1:2010+A1:2016. Code of practice for strengthened/reinforced soils and other fills.
- MCHW Specification for Highway Works, Series 600.
- BS EN 14475:2006. Execution of special geotechnical works. Reinforced fill.
- BS EN 1997-1:2004+A1:2013. Eurocode 7: Geotechnical design. – Part 1: General rules.
- BS EN 16907:2018 Earthworks.
- Tensar Basetex geotextile soil reinforcement technical specifications and relevant product partial factors.

Any solution outside this scope is not covered by this design and TEG should be informed so that a new design can be advised if required.

3.0 DESIGN PARAMETERS

The Principal Designer, Client's Geotechnical Advisor and Principal Contractor must ensure that all parameters used comply with those found on site. Any variance in these must be reported to TEG immediately so that the implications can be assessed. TEG have not conducted a site investigation nor tested the proposed fill. It is assumed that the values assumed for the fills are a true interpretation of the extent and properties of the soils and fills on the project.

TEG has not received a formal Ground Investigation Report (GIR) but a series of reports with the findings of physical ground investigation work and associated laboratory test, listed in Section 2.

A GIR should be included as part of the Geotechnical Design Report (GDR) as stated in section 3.4.1 of BS EN1997-1 (Eurocode 7). This should be forwarded to TEG so the design can be reviewed if available.



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The RSS bund will be constructed directly on top of a historic landfill site. Ground conditions considered in this design consist of the capping and landfill. During construction of the bund the capping geometry should not be altered. TEG has assumed for analysis purposes the following design parameter.

3.1 RSS FORMATION / FOUNDATION

The capping and landfill material at the bund formation / foundation level has been assumed to have the properties given in Table 1.

Table 1 – Geotechnical parameter assumed for the existing ground condition in drained condition

DESCRIPTION	UNIT WEIGHT (kN/m ³)	ASSUMED EFFECTIVE ANGLE OF INTERNAL FRICTION (°)	Pore pressure parameter, r_u	UNDRAINED SHEAR STRENGTH (kPa)
Capping	19	27	0.1	30
Landfill	8	30	0.1	25

3.2 REINFORCED SOIL SLOPE BACKFILL

The reinforced soil slope will be constructed using Class 2 (stoney-cohesive) fill in accordance with the MCHW Specification for Highway Works, Series 600.

The material proposed for use in the reinforced zone must be tested prior to placement to ensure that it complies with all the requirements of the above specification. Reference should be made to the Earthworks Specification for the project for testing requirements and testing frequencies.

Fills are to be compacted to 95% of maximum dry density (maximum dry density to be confirmed via compaction testing throughout the works). Compaction is to be in accordance with MCHW Series 600. The properties of the fills are summarised in Table 2:

Table 2 – Geotechnical parameter in the design of the RSS

DESCRIPTION	UNIT WEIGHT (kN/m ³)	ANGLE OF SHEARING RESISTANCE (°)	Pore pressure parameter, r_u	UNDRAINED SHEAR STRENGTH (kPa)
Reinforced soil fill within geosynthetics on RSS shallow slopes; Class 2 (series 600, MCHW)	19	25 (minimum)	0.1	80

The pH of the Class 2 fill will be in the range $4 < \text{pH} < 9$; the maximum moisture content must be kept below 20% (also to be confirmed by testing throughout works).

The fill shall be screened to remove cobbles and boulders before compaction. If the fill material becomes wet and/or adequate compaction cannot be achieved earthworks has to stop.

Classification testing of the proposed up-fill material must be undertaken by the RSS Installer to ensure the proposed fill material complies with Class 2 fill and that a minimum angle of internal friction of 25 degrees is achieved.

In addition to classification testing to ensure any site won material meets the requirements of Class 2, post placement testing, such as MCV and nuclear density testing must be carried out to ensure the fill is sufficiently compacted in accordance with the MCHW Specification for Highway Works, Volume 1.

QA/QC should follow the principles set out in BS EN 16907:2018 Earthworks and under responsibility of the RSS Installer or Principal Contractor.

3.3 UPFILL BEHIND THE REINFORCED SOIL STRUCTURES

Levels are to be raised behind the RSS, to create the proposed bund structure. We have therefore assumed that the fill material required to raise levels behind the reinforced soil zone of the slope will be Class 2 fill which complies with the requirements set on Table 2 above. The fill properties will be confirmed by the RSS Installer prior to construction.

3.4 SURCHARGE LOADS

It was assumed a traffic load of 10 kPa acting over the reinforced soil slope crest.

In this design, no allowance is included for temporary or permanent loadings or surcharge coming from fences / noise barriers and / or run-on slab and / or other structures.



3.5 GROUND WATER

It is assumed the reinforced slopes will be maintained in a fully drained condition. Please advise in which locations / sections of the project it is expected to have higher ground water level, so it can be included within the design of the RSS at specific location / section. A pore pressure ratio of 0.1 was assumed in the RSS and bund fill, capping and landfill.

No consideration of flood risk is undertaken in this report. Specialist flood risk advice should be sought with regard to drainage and flooding. Site drainage and erosion control measures are outside the scope of TEG design. Hydraulic limit states and the performance of the reinforced soil slope as a hydraulic or flood attenuation solution is beyond the scope of this design.

3.6 REINFORCEMENT GEOSYNTHETIC

The reinforced soil slopes will be constructed using BaseTex geotextile soil reinforcement or similar approved product. The properties and partial material factors for BaseTex geotextile soil reinforcement are listed in Table 3:

Table 3 – BaseTex geotextile soil reinforcement properties and partial factors

PARAMETER	Basetex 200/50
Ultimate Tensile Strength (longitudinal direction)	200 kN/m
Long Tensile Design Strength (longitudinal direction)	97 kN/m
PARTIAL MATERIAL FACTORS	
fd, installation damage coarse gravel	1.40
fe, environmental conditions design temperature 20°C, 4 < pH < 9	1.05
Creep, design temperature 20°C (%)	1.40
fm, factor for extrapolation of data	1.00
fn, factor for ramification of failure	1.00
Cds, coeff. of direct slip along reinforcement (Class 2 fill)	0.50*
Ci, coeff. of interaction soil/geosynthetic reinforcement (Class 2 fill)	0.50*

*values to be checked with relevant laboratory test according to ISO 12957-1:2018; "Determination of friction characteristics Part 1: Direct shear test".

3.7 GENERAL

In this design, no allowance is included for loads coming from building foundation and / or run-on slab and / or other structures.

4.0 ANALYSIS

All geotechnical analysis undertaken has been completed following BS EN1997-1:2004 Eurocode 7 (Design Approach 1) & BS 8006-1:2010 (Combination A).

- *System:* Steep reinforced soil slope.
- *Structure Category:* Strengthened Earthworks
- *Method of Analysis:* BS EN1997-1:2004 & BS 8006-1:2010
- *Design Life:* 60 years
- *Reinforcement included in the analysis:* BaseTex geotextile or similar approved

Tables 4 – 7 summarise the output of the analysis for each location examined. Detailed analysis files for each case are presented in Appendix A.

The length and strength of each BaseTex geotextile soil reinforcement in each section are defined in Appendix A and B.

Table 4. Summary of analysis, Section S2

Section		S2			
		Left hand side		Right hand side	
Maximum retained height of slope		4.52m		2.6m	
Number of reinforcement layers		11		6	
Reinforcement spacing in the vertical direction		0.4m			
		Left hand side		Right hand side	
		Short-term	Long-term	Short-term	Long-term
Global stability, Design Approach 1	Combination 1	2.69	2.85	3.94	4.74
	Combination 2	1.92	2.29	2.93	3.71
Short-term analysis					
		Left hand side		Right hand side	
Internal stability	Top	6.92		8.51	
	Bottom	2.20		>10	



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	Left hand side			Right hand side		
	Sliding	Overturning	Bearing	Sliding	Overturning	Bearing
Top	>10	>10	1.17			
Middle	>10	>10	1.08	>10	>10	1.28
Bottom	>10	>10	1.42	>10	>10	1.47
Long-term analysis						
		Left hand side		Right hand side		
Internal stability	Top	1.10		1.16		
	Bottom	1.16		1.21		
	Left hand side			Right hand side		
	Sliding	Overturning	Bearing	Sliding	Overturning	Bearing
Top	>10	>10	2.37			
Middle	>10	>10	1.51	>10	>10	1.66
Bottom	>10	>10	5.31	>10	>10	2.88

Table 5. Summary of analysis, Section S5

Section			S5			
			Left hand side		Right hand side	
Maximum retained height of slope			7.82m		7.51m	
Number of reinforcement layers			19		18	
Reinforcement spacing in the vertical direction			0.4m			
			Left hand side		Right hand side	
			Short-term	Long-term	Short-term	Long-term
Global stability, Design Approach 1	Combination 1		1.74	3.72	>10	>10
	Combination 2		1.24	2.98	>10	>10
Short-term analysis						
		Left hand side			Right hand side	
Internal stability	Top	6.95			6.73	
	Bottom	1.39			1.37	
		Left hand side			Right hand side	
	Sliding	Overturning	Bearing	Sliding	Overturning	Bearing
Top	>10	>10	4.99			
Middle	>10	>10	2.37	>10	>10	1.27
Bottom	>10	>10	1.43	>10	>10	1.17
Long-term analysis						
		Left hand side			Right hand side	
Internal stability	Top	1.10			1.18	
	Bottom	1.05			1.02	
		Left hand side			Right hand side	
	Sliding	Overturning	Bearing	Sliding	Overturning	Bearing
Top	>10	>10	2.81			
Middle	>10	>10	1.66	>10	>10	1.27
Bottom	>10	>10	1.14	>10	>10	3.09

Table 6. Summary of analysis, Section S6

Section			S6			
			Left hand side		Right hand side	
Maximum retained height of slope			5.35m		5.13m	
Number of reinforcement layers			13		12	
Reinforcement spacing in the vertical direction			0.4m			
			Left hand side		Right hand side	
			Short-term	Long-term	Short-term	Long-term
Global stability, Design Approach 1	Combination 1		1.92	3.21	>10	>10
	Combination 2		1.38	2.57	>10	>10
Short-term analysis						
			Left hand side		Right hand side	
Internal stability	Top		5.81		5.92	
	Bottom		1.75		2.03	
		Left hand side			Right hand side	
	Sliding	Overturning	Bearing	Sliding	Overturning	Bearing
Middle	>10	>10	2.16	>10	>10	2.29
Bottom	>10	>10	1.35	>10	>10	1.39
Long-term analysis						
			Left hand side		Right hand side	
Internal stability	Top		1.03		1.38	
	Bottom		1.15		1.10	
		Left hand side			Right hand side	
	Sliding	Overturning	Bearing	Sliding	Overturning	Bearing
Middle	>10	>10	2.75	>10	>10	2.88
Bottom	>10	>10	3.09	>10	>10	3.81



Table 7. Summary of analysis, Section S7

Section		S7					
		Left hand side		Right hand side			
Maximum retained height of slope		7.58m		6.2m			
Number of reinforcement layers		18		15			
Reinforcement spacing in the vertical direction		0.4m					
		Left hand side		Right hand side			
		Short-term	Long-term	Short-term	Long-term		
Global stability, Design Approach 1	Combination 1	1.40	3.21	10.01	>10		
	Combination 2	1.00	2.57	4.61	>10		
Short-term analysis							
		Left hand side		Right hand side			
Internal stability	Top	4.10		5.71			
	Bottom	1.36		1.60			
		Left hand side		Right hand side			
		Sliding	Overturning	Bearing	Sliding	Overturning	Bearing
Middle	>10	>10	1.50	>10	>10	>10	1.72
Bottom	>10	>10	1.05	>10	>10	>10	1.07
Long-term analysis							
		Left hand side			Right hand side		
Internal stability	Top	1.15			1.16		
	Bottom	1.05			1.04		
		Left hand side			Right hand side		
		Sliding	Overturning	Bearing	Sliding	Overturning	Bearing
Middle	7.08	>10	1.72	>10	>10	>10	1.45
Bottom	>10	>10	2.00	8.66	>10	>10	3.44

5.0 SUMMARY

The design analysis demonstrates that BaseTex 200/50 geotextile soil reinforcement RSS, if constructed in accordance with this document, TEG's drawings and the installed in accordance with the requirements of BS 8006-1:2010 and BS EN 14475:2006, is appropriate and fit for the intended purpose.

This design proposal and associated drawing have been produced using the methodology detailed above. However, it should be noted that the design proposal has been generated from information provided to TEG, which has not been independently verified and may contain assumptions and inaccuracies regarding geotechnical, hydraulic and other parameters.

The RSS Installer must ensure that all parameters assumed comply with those found on site. Any variance in these must be reported to TEG immediately so that the implications can be assessed. If any discrepancy is noted between the site conditions and the design assumptions (regarding slope geometry, water levels, soil conditions, proposed loadings etc.), the RSS Installer is to inform the Principal Contractor who will and must contact TEG immediately to facilitate a review of the design.

TEG did not undertake to supervise the construction of the reinforced soil slope structure, and therefore cannot comment on the standard of workmanship. The main issues to consider are rate of construction of the slopes, adequate compaction of the foundation soils and site won fill, and adequate drainage.

TEG accordingly does not accept responsibility for the accuracy or completeness of information or assumptions from which the design proposal has been produced.

The material suppliers can provide typical health & safety hazards to consider when approaching this work. Designer's hazards include falling from height, lifting geosynthetic rolls and metallic formwork units, plant operations, sharp wires moving under tension and cutting causing eye or skin damage.



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6.0 FURTHER NOTES

The following supervision requirements should be adhered to by the parties as defined in Section 1.0. If any issues arise on site which differ from what has been assumed in this design, TEG should be contacted urgently so the possible ramifications can be appraised.

The RSS construction should be carried out in accordance with the manufacturer's installation guidelines. The various sections of RSS to be constructed should be checked for the required retained height to ensure that they are within the scope of this design.

6.1 GROUND CONDITIONS

The Principal Contractor, RSS Installer and/or Principal Designer must ensure that all parameters used comply with those found on site. Any variance in these must be reported to TEG immediately so that the implications can be assessed.

The Principal Designer must ensure that RSS formation or foundation level provides sufficient bearing capacity to support the RSS over its full extent.

6.1.1 Soft soil and organic material

Organic material is an unsuitable material for founding any RSS. Should any organic material be found at formation level it should be excavated out down to competent stratum (prior to the construction of the RSS) and be replaced with compacted Class 6F5 or 6F2 granular fill compacted in layers in accordance with Series 600 of SHW.

6.1.2 Bearing capacity

The Principal Designer and/or the Client's Geotechnical Advisor must confirm the localised suitability of the material at formation level of the RSS. It must be ensured that RSS foundation material has an allowable bearing capacity as specified in this design report (refer also to Appendix A for bearing loads on each RSS). The Principal Contractor / Principal Designer must instruct to undertake a series of plate bearing tests at formation level to confirm the allowable bearing capacity prior to construction.

Field tests like plate bearing test, standard penetration test, pressuremeter test and / or field vane shear test are generally used to determine bearing capacity of soil. The Client's Geotechnical Advisor must select the most appropriate based on the existing ground condition and should prescribe test to be carried out at formation level to confirm the allowable bearing capacity prior to construction.

Formation level should also be proof-rolled and carefully inspected prior to construction to check for any soft spots. RSS can fail due to lower than required undrained shear strength in the foundation soil.

6.2 CONSTRUCTION MATERIALS

The material proposed for use in the reinforced zone (i.e. Class 2) must be tested prior to placement to ensure that it complies with all the requirements set into this document. Any material outside the requirements must not be used in the reinforced soil zone.

6.3 CONSTRUCTION CONSIDERATIONS

The RSS construction should be carried out in accordance with:

- BS 8006-1:2010+A1:2016. Code of practice for strengthened/reinforced soils and other fills.
- BS EN 14475:2006. Execution of special geotechnical works. Reinforced fill.
- And manufacturer's installation guidelines.

6.3.1 RSS construction

The fill in the reinforced block should be placed in layers and compacted in accordance with the MCHW. The fill should comply with Class 2 material and should be compacted in accordance with relevant specifications as specified before on Section 3.0.

BaseTex 200/50 geotextile soil reinforcement (or similar approved) would be placed in 400 mm high layers in which full width reinforcement, such as BaseTex 200/50, is extended forward from the reinforced fill to the face of each intervening layer of fill.

No form-work it is required to create the geotextile soil reinforcement layer structure and the geosynthetic must be extended 500 mm towards the face, so it can be trimmed down during the slope grading procedure, without reducing the length required from design. An erosion mat must be placed to avoid top-soil washing out.



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The stability of the face area of shallow slopes is generally influenced by the infiltration of water into the surface soils and the potential generation of a shallow slip parallel to the slope surface.

Simple overlaps should be used to make effective joints between the geotextile soil reinforcement placed horizontally in layers. The minimum overlap should be 200 mm wide and maintained during the operation. Further information on the installation can be supplied by the geotextile soil reinforcement manufacturers.

6.3.2 Rules to follow

Quality control testing of the fill materials should follow the principles set out in EN 16907:2018 and is the responsibility of the RSS Installer.

Seeded topsoil or hydroseeding should be placed in the face to achieve rapid vegetation. It should be ensured that the front face does not dry out in the first few months by watering as necessary. Seeding or hydroseeding specification by Specialist.

Should, three months after completing construction, no significant vegetation be visible we recommend that the face of the slope is hydroseeded.

Recommended rate of construction: when using geotextile soil reinforcement with site won fills the construction rate is very important. This design follows a staged construction process to allow pre-consolidation and pore pressure dissipation. Time is required between construction phases, defined as the construction of one or more lifts each day, to allow excess pore water pressures to dissipate.

For shallow slopes: up to no. 1 lifts a day (400 mm) can be constructed at any section.

The reinforced soil slope should not be constructed at a rate faster than recommended above. Constructing the structure at faster than recommended could lead to excessive settlement and movement of the structure and possible localised failure cause by excess pore pressures in the site won low permeability fill. Where excess movement or localised failure is observed construction activity must cease immediately and TEG notified.

The maximum rate of construction given refers to construction of the reinforced soil structure only and are not applicable to the dissipation of excess pore water pressures that may develop in the Class 2 fills elsewhere in the embankment.

6.4 PERMANENT AND TEMPORARY WORKS

The RSS design produced by TEG is issued on the basis that a safe system of works is provided for construction. Principal Contractor must produce a method statement and risk assessment for the works to be approved by the Principal Designer.

TEG is not responsible for temporary stability or design of any other temporary works.

The geometry of the capping over the landfill should not altered during construction of the bund.

6.5 HEAVY PLANTS

Heavy construction plant should not traffic behind the RSS during construction as this can cause possible bulging of the RSS. If construction plant is to operate at the crest of the RSS, a suitable haul road design must be undertaken (by others) and the RSS design amended by TEG.

6.6 EXCAVATION

There is allowance for unforeseen future excavation in front of the slope of 10% of its height, in accordance with BS EN 1997-1:2004 Eurocode 7. The Principal Contractor must contact TEG to ensure that if any possible excavation are required, those are not affecting the stability of the designed RSS.

6.7 DRAINAGE

Any excavated slopes should be checked for any flows or seepage that requires drainage measures. Any flows, seepage or standing water should be directed to a suitable outfall as soon as they are encountered. Provision must be made to drain water from the soil during dissipation of excess pore pressures generated during construction and over the life time of the structure.

Given the proposed slope is positioned on the boundary of the site, there is a significant risk that runoff following rainfall events, will be directed towards the reinforced soil zone. If this occurs, pore water pressures in the retained soil would increase, adversely affecting the RSS stability. A build-up of water inside the slope can wash out fine material and cause excess bulging and swelling. This is especially the case where cuts are made in the existing ground.



Inadequate drainage can result in pore water pressure in the fill, reduced shear strength resulting in possible stability issues and the possibility of settlement and deformation in the fill.

The Principal Contractor must ensure that prior to construction temporary cut-off drains are installed across the slope to direct any run-off away from the reinforced soil zone. Following construction, permanent maintained drainage must be provided alongside the plot to prevent site run-off from flowing towards the RSS bund.

Failure of RSS could occur if surface water is being allowed to drain towards the reinforced slope structure. This water could penetrate the Class 2 fill to such an extent that it flows through the reinforced backfill emerging through the front face, washing out material and distorting area of the face.

RSS are renowned to be very robust structures and failures are relatively rare. When they do occur the majority of the causes are found to be water management and drainage problems, also potentially under-compaction of the structural backfill.

6.8 FENCE

No fences are being installed on top of the soil reinforcement structure.

6.9 PLANTING AND TREES

Low height plants (e.g. small shrubs) might be allowed at the slope crest and within the reinforced soil zone. However, longer roots species and trees should be avoided as the stability of the RSS as well as the unreinforced embankment may be affected in the long term.

6.10 SITE GEOMETRY

All slope geometry, setting out and required offsets to be confirmed by Principal Contractor prior to construction. Principal Contractor must also confirm the locations of all services prior to construction and ensure that none will be affected by the reinforced soil slope and its installation.

The various sections of reinforced soil slope constructed should be checked for the required retained height to ensure that they are within the scope of this design.

The batter of the slope should be checked with every 1 m of construction to ensure it is within the allowed tolerances as set on BS EN 14475:2006.

6.11 AS BUILT DRAWINGS

Following construction, the Principal Contractor should provide as-built drawings and construction report for all aspect of the works. This should form the base of the final completion validation & verification report, post construction. Showing the following details as a minimum:

- Location of RSS structure with its line and level of the formation and/or levelling pad;
- Location and details of any existing services which may require maintenance;
- Locations of installed geosynthetic reinforcement e.g., geosynthetic layer depths, lengths & tail ends.
- GPS location and depth / level for all tests carried out on site.

As built drawings, construction report and validation & verification report are outside TEG scope.

6.12 MAINTENANCE REQUIREMENTS

Maintenance requirements for the reinforced soil slopes are as follows:

- The RSS should be routinely inspected for signs of any faults, vandalism or movement. The batter of the slope should be checked to ensure it remains within the allowed tolerances in accordance with BS EN 14475:2006.
- The ground above and below the embankments should also be inspected for signs of any movement.
- The RSS slope drainage must be routinely inspected and maintained annually and after particularly heavy rainfall events. This is essential to prevent the pore water pressures increasing behind the slope.
- It should be ensured that the front face does not dry out by watering as necessary. The front erosion mat is flammable. The erosion mat function is to retain fines on the front face until vegetation becomes established. Once vegetation is established the erosion mat becomes redundant.

These requirements should be included in the maintenance regime for the site/development.

TEG advise that this element of works should be treated as a 'Geotechnical Asset' and therefore managed in accordance with the "Risk-Based Approach to Geotechnical Asset Management" in the following way:



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- An annual inspection by the assigned designer to identify geotechnical defects. The first inspection should be undertaken no more than six months after completion of the construction contract in order to allow remedial work before payment of retention.
- Record the verticality, face steps and any movement of the slopes in a way which may be repeated in the future.
- Photograph areas of interest and maintain a photograph record.
- A report to the Client on issues noted during inspection that require monitoring or remedial.

7.0 CDM REGULATIONS

TEG is not the Principal Designer nor the GA (Geotechnical Advisor) in this scheme, but has considered the risks associated with this element of the works that affect or are affected by the design.

“Designers” are responsible for fulfilling their obligations as defined in the Construction (Design & Management) Regulations 2015.

TEG, as specialist element designer, understand that under the Regulations its duties are generally to;

- Ensure that the client for the project is aware of the duties and responsibilities that they have.
- So far as is reasonably practicable, taking due account of other relevant design considerations, avoid foreseeable risks to the health and safety of any persons carrying out, liable to be affected by such or maintaining the permanent fixtures and fittings of construction work.

In discharging this duty, the designer shall:

- Eliminate hazards that may give rise to risks
- Reduce risks from any remaining hazards and in doing so give collective measures priority over individual measures.

The designer shall also:

- Take all reasonable steps to provide with the design sufficient information about aspects of the design of the structure or its construction or maintenance as will adequately assist clients, other designers and contractors to comply with their duties under the Regulations.

In respect of this particular project, TEG hereby draws to the attention of the Principal Designer (Burrow Grahams) and the Principal Contractor that they have specific duties under CDM 2015.

However, since the Principal Designer has designated the chosen location and dimensions of the structure on this site, the Principal Designer has, in this respect, acted as a ‘designer’ under CDM 2015. The Principal Designer is therefore responsible for fulfilling all the obligations that this entails.

The scope of TEG, as element ‘designer’, to minimise design risks is therefore limited by those elements of the design pre-determined by the Principal Designer. The following significant design risks remain and must therefore be addressed by the Principal Designer and Principal Contractor.



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8.0 CONSTRUCTION HAZARDS

8.1 CONSTRUCTION OF GREEN FACED RSS

Table 8 – Notice of hazard identification (generic designer risk assessment)

CATEGORY C/D/M	ACTIVITY/ELEMENT	POSSIBLE HAZARD	RISK ASSESSMENT Low/Medium/High	ACTION PROPOSED	ACTION BY
C	Working at heights >2m	Falling	H	Wear Harness OR provide access scaffold	RSS Installer
C/M	Working at heights	Falling	M	Wear Harness OR provide access scaffold	RSS Installer
C	Cutting mesh, lacing, etc.	Personal Injury	M	Use of suitable PPE (safety goggles, gloves, etc.)	RSS Installer
C	Placing backfill	Personal Injury	M	Use mini excavator to place stone fill where practicable	RSS Installer
C	Excavation of embankment prior to installation of slope	Embankment Slip – Personal Injury	H	Excavation of embankment to a safe angle of repose for the short term.	RSS Installer
M	Steep retaining structures > 2m in height	Falling/Personal Injury	H	Provision of permanent fence / barrier at crest of RSS	Principal Contractor

Category: C = Construction, M = Maintenance/Use, D = Demolition

Table 9 – Notice of hazard identification (specific designer risk assessment)

CATEGORY C/D/M	ACTIVITY/ELEMENT	POSSIBLE HAZARD	RISK ASSESSMENT Low/Medium/High	ACTION PROPOSED	ACTION BY
C	Excavation into existing material to foundation level	Bank slip / Personal injury	H	Excavation of ground to a safe angle of repose for the short term and/ or foundation excavation & construction of lower courses carried out in short lengths. Use of granular backfill.	RSS Installer
C	Excavation into existing material to foundation level	Striking existing services/ Personal injury	M	Principal Designer to provide details of all existing services in the vicinity of the slope to Principal Contractor / RSS Installer. Use of Cable Avoidance Tools (CAT scanners).	RSS Installer
C	Excavation into existing material to foundation level	Striking live cables/ electrocution	M	Principal Designer to provide details of all existing electrical services in the vicinity of the slope to Principal Contractor. Electrical services to be relocated where risk is unacceptable. Use of Cable Avoidance Tools (CAT scanners).	RSS Installer
C	General Installation of RSS	Personal Injury	M	Adhere to Supplier Installation Guidelines.	RSS Installer

Category: C = Construction, M = Maintenance/Use, D = Demolition



9.0 SIGNIFICANT DESIGN RISK REMAINING

An essential part of the project lifecycle is the identification and management of risks, and all parties have a role in ensuring that risks are identified and avoided or reduced to tolerable levels. TEG has identified the below. All the parties involved should all read and check this Section 9.0 before proceeding.

1. RISK: FAILURE CAUSED BY ADOPTION OF INADEQUATE DESIGN PARAMETERS

No Ground Investigation Report (GIR) in accordance with Eurocode 7 has been received for the site, therefore this analysis is based on information from the received site investigation reports and soil parameters advised by the Client. Should a GIR be available, it must be forwarded for review prior to proceeding with these works.

Ground conditions are often uncertain and present risks which have to be managed proactively. The Principal Contractor, the Principal Designer and RSS Installer must ensure that all parameters assumed comply with those found on site. Any variance in these must be reported to TEG immediately so that the implications can be assessed. Particular attention should be given to areas of differing engineered fill thickness and varying geologies.

2. RISK: FAILURE CAUSED ON SHORT-TERM CONDITIONS IN THE FOUNDATION SOILS

The Principal Designer and/or the Geotechnical Advisor must ensure that all parameters assumed comply with those found on site. Any variance in these must be reported to TEG immediately so that the implications can be assessed.

3. RISK: INADEQUATE BEARING STRATUM AT FORMATION OF SLOPE

The Principal Contractor and the Principal Designer must confirm the localized suitability of the material at formation level of the reinforced slope. It must be ensured that competent material with an adequate allowable bearing is present at formation level by the Principal Designer prior to construction. The Principal Contractor and Principal Designer are responsible for ensuring that the RSS foundation has sufficient strength and stiffness to prevent failure and excess settlement of the reinforced soil slopes.

A series of plate bearing tests must be carried out at proposed formation level to confirm the allowable bearing capacity prior to construction. Failure to remove all unsuitable material at the formation level will also increase the possibility of settlement of the structure.

4. RISK: FAILURE OF THE REINFORCED SOIL STRUCTURES DUE TO INCORRECT ASSUMPTIONS ON THE STATE OF THE FOUNDATION SOILS

It is assumed in this design that the foundation soils will be in a drained state at all times, during construction and operation, of the embankment. The consequence of the foundation soil being in an undrained state could be that the factors of safety against failure would be lower and most likely reduce below the required 1.0.

5. RISK: INSTABILITY IN THE RSS AT THE FACE TRANSITIONS FROM 50 DEGREES TO SHALLOW GRADIENT

In transitioning from the RSS: care must be exercised to ensure that the reinforcement is installed at the correct elevations and is of the correct length for that elevation. Care is also required to ensure that the transition zone does not result in an over steep slopes that has not been considered in this design.

6. RISK: INSTABILITY OR SETTLEMENT DUE TO CONSTRUCTION SEQUENCE

In developing the construction sequence / methodology consideration must be given to the impacts this could have on the stability of the RSS. The entire embankment cross section (RSS & un-reinforced) is constructed from fills (Class 2) which can be sensitive to moisture. Careful control of moisture content is required to achieve adequate compaction / dry density in the fill. With these fills there is a possibility that excess pore pressures may develop which could lead to a reduction in strength and consolidation settlements in the body of the constructed earthworks.

It is recommended that the entire width of the embankment (RSS & un-reinforced) is be constructed at the same time to a uniform height. This would ensure that compaction of the fill is consistent and uniform over the full width of the embankment. If this is not possible and benching is used to join older and newly placed fill adequate compaction and quality control testing must be undertaken at the bench location and in the newly placed fill. Furthermore, adequate time must be allowed for dissipation of excess pore water pressures in all the embankment fills.

**7. RISK: SETTLEMENT DUE TO INSUFFICIENT FOUNDATION IMPROVEMENT**

Any ground improvement should be designed to provide adequate strength and stiffness improvement to the in-situ soil to prevent settlement of the reinforced soil structure.

8. RISK: FAILURE TO PROTECT THE REINFORCED SOIL SLOPE TOE

Embedment 10% of the height of the RSS with a minimum of 300 mm.

9. RISK: FAILURE DUE TO USE OF UNSUITABLE FILL WITHIN THE REINFORCED SOIL ZONE

The RSS Installer is responsible for all the selection and testing of the proposed Class 2 material both before and during construction, to ensure compliance with the geotechnical characteristics specified in 'Series 600' of the MCHW Specification for Highway Works. Testing is to include Plasticity Index, compaction and dry density tests as defined previously in this report.

10. RISK: EXCESSIVE SETTLEMENT/MOVEMENT CAUSED BY RAPID CONSTRUCTION

The reinforced soil slope should not be constructed at a rate faster than recommended in Section 6.3 CONSTRUCTION CONSIDERATIONS.

Constructing the structure at faster than recommended rates could lead to excessive settlement and movement of the structure and possible localized failure cause by excess pore pressures in the site won low permeability fill. Where excess movement or localized failure is observed construction, activity must cease immediately and TEG notified. Some settlement will occur after construction, depending on the compaction and condition of the backfill placed.

The maximum rate of construction given in Section 6.3 refer to construction of the reinforced soil structure only and are not applicable to the dissipation of excess pore water pressures that may develop in the Class 2 and fills elsewhere in the site. An analysis of the dissipation times required for the Class 2 should be undertaken and the rate of construction adjusted to control settlement/movement in the reinforced zones in the RSS.

11. RISK: EXCESSIVE SETTLEMENT/MOVEMENT CAUSED BY POOR PLACEMENT AND COMPACTION OF EMBANKMENT FILL

Proper placement and compaction of the backfill will avoid and minimize this possible issue. RSS are flexible, and some settlement will occur during and after construction. Some settlement of the subgrade will also occur after construction, depending on the compaction of the foundation soils and backfill. The settlement should be monitored, and all finishes, fences etc should be delayed until settlement is complete. Settlement calculations are outside TEG scope of works.

12. RISK: FAILURE OF THE REINFORCED SOIL STRUCTURES DUE TO POOR QUALITY FILL CONTROL

Quality control testing of the fill materials should follow the principles set out in EN 16907:2018 and is the responsibility of the RSS Installer.

13. RISK: FAILURE OF THE RSS SLOPE DUE TO INCORRECT CONSTRUCTION GEOMETRY

All slope geometry, setting out and required offsets to be confirmed by the RSS Installer and / or Principal Contractor / Principal Designer prior to construction.

14. RISK: RSS CONSTRUCTED OUTSIDE DESIGN TOLERANCES

We recommend that the batter of the slope is checked with every 1m of construction to ensure it is within the allowed tolerances. Heavy construction plant should not be trafficking behind the RSS slope during construction as this can cause excessive bulging of the RSS face. We recommend that an experienced installer is appointed to construct the reinforced soil slopes.

15. RISK: PROCEEDING WITH CONSTRUCTION PRIOR TO ACHIEVING NECESSARY APPROVALS

TEG is not responsible for gaining approval from public authorities for any works associated with this project. The Principal Contractor and / or Principal Designer are responsible for ensuring all relevant approvals are met prior to construction commencing. TEG advise that construction does not proceed until all necessary approvals are granted.

16. RISK: INEXPERIENCED INSTALLER APPOINTED TO CONSTRUCT THE RSS

An experienced installer and/or earthworks contractor should be appointed to construct the RSS bund. The installer should have experience on work of a similar nature in terms of constructing high reinforced soil slopes and earthworks with site-won stoney-cohesive fills.



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17. RISK: CHANGE IN PROPERTIES OF RSS FILL

An angle of friction of 25 degrees was assumed for the reinforced soil slope fill in preparing this design. If the embankment fill is found to have an angle of friction less than 25 degrees, TEG must be notified immediately so the design implications can be assessed.

18. RISK: FAILURE DUE TO POOR WATER MANAGEMENT AND DRAINAGE DESIGN

Site drainage is outside the scope of this design and further comments can be found on Section 6.7 of this document.

As previously mentioned, all hydraulics calculations (e.g., checking the seepage under and around the structure; so as to check the erosion of the stream close by the slopes) and the performance of these structures as a hydraulic or flood attenuation solution is beyond the scope of this design. No consideration of flood risk is undertaken in this report. Specialist flood risk advice should be sought with regard to drainage and flooding. Site drainage and erosion control measures are outside the scope of TEG.

Any requirements for this structure to perform as a hydraulic or flood/dam prevention structure are the responsibility of the Principal Designer.

19. RISK: FAILURE DUE TO AN EXTREME STORM or FLOOD EVENT RESULTING IN INSTABILITY OF THE STRUCTURE

Ponds / flood alleviation ditches may be constructed in close proximity to the RSS at some locations in the future. At locations of ponds / flood alleviation ditches it was assumed the water table would be at finish ground level when assessing stability.

20. BURIED SEWER / SERVICES

Buried sewer/services needs to be able to accommodate the loading imposed by the RSS and its construction. At the design stage the Principal Designer must satisfy themselves that any increase in ground stresses, from construction of the building or upfilling of the ground, does not increase the stress such that the stability of the sewer is compromised.



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APPENDIX

- Appendix A: calculation report
- Appendix B: RSS drawings
- Appendix C: Tensar Basetex 200/50 specifications



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Cross Section.....: Section S2

File.....: S2 drained analysis 06022023

Date.....: 02/03/2023

Checks according to: BS 8006-1:2010+A1:2016
Reinforced slope – Cat. 2 (medium)

TABLE OF CONTENTS

SOIL PROPERTIES

Soil: CAPPING

Description:

Cohesion Class.....: Soil material factor c' Cohesion..... [kN/m²].....: 0.00Friction Angle Class.....: Soil material factor $\tan(\phi)$

Friction Angle..... [°].....: 27.00

Ru value.....: 0.10

Weight Class.....: Soil unit weight

Bulk unit weight – above GWT..... [kN/m³].....: 19.00Bulk unit weight – below GWT..... [kN/m³].....: 19.00Elastic Modulus..... [kN/m²].....: 0.00

Poisson's ratio.....: 0.30

Soil: LANDFILL

Description:

Cohesion Class.....: Soil material factor c' Cohesion..... [kN/m²].....: 0.00Friction Angle Class.....: Soil material factor $\tan(\phi)$

Friction Angle..... [°].....: 30.00

Ru value.....: 0.20

Weight Class.....: Soil unit weight

Bulk unit weight – above GWT..... [kN/m³].....: 8.00Bulk unit weight – below GWT..... [kN/m³].....: 8.00Elastic Modulus..... [kN/m²].....: 0.00

Poisson's ratio.....: 0.30

Soil: RSS

Description: RSS backfill

Cohesion Class.....: Soil material factor c' Cohesion..... [kN/m²].....: 0.00

Friction Angle..... [°].....: 25.00

Ru value.....: 0.10

Weight Class.....: Soil unit weight

Bulk unit weight – above GWT..... [kN/m³].....: 19.00Bulk unit weight – below GWT..... [kN/m³].....: 19.00Elastic Modulus..... [kN/m²].....: 0.00

Poisson's ratio.....: 0.30

STRATA PROFILES

Stratum: BUND

Description:

Soil : RSS

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
22.26	7.11	32.69	11.63	34.90	11.63	41.00	9.03

Stratum: CAPPING

Description:

Soil : CAPPING

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
3.82	7.36	21.84	7.36	22.26	7.11	25.86	7.08

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33.51	8.65	40.90	8.75	41.00	9.03	69.11	9.05
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Stratum: LANDFILL**Description:**

Soil : LANDFILL

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
3.82	5.36	27.07	5.36	33.73	6.65	42.42	7.05
69.11	7.05						

REINFORCED BLOCKS**Block : L1**

Block dimensions.....[m].....: Base width.....= 4.00 Height.....= 0.40
Block Origin.....[m].....: Abscissa.....= 22.50 Ordinate.....= 7.20
Face inclination.....[°].....: 67.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 4.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : L2

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by L1
Face inclination.....[°].....: 66.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : L3

Block dimensions.....[m].....: Base width.....= 4.00 Height.....= 0.40
Back Shift.....[m].....= 0.00 by L2
Face inclination.....[°].....: 67.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00



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Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 4.00

Vertical spacing_____ [m]_____ = 0.40

Wrapped length_____ [m]_____ = 0.10

Block : L4

Block dimensions_____ [m]_____ : Base width_____ = 2.00 Height_____ = 0.80

Back Shift_____ [m]_____ = 0.00 by L3

Face inclination_____ [°]_____ : 67.00

Structural embankment type_____ : Sandy Clay

Structural embankment_____ : RSS

Backfill soil_____ : RSS

Covering soil_____ : RSS

Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00

Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 2.00

Vertical spacing_____ [m]_____ = 0.40

Wrapped length_____ [m]_____ = 0.10

Block : R1

Block dimensions_____ [m]_____ : Base width_____ = 2.00 Height_____ = 0.80

Block Origin_____ [m]_____ : Abscissa_____ = 41.00 Ordinate_____ = 9.03

Face inclination_____ [°]_____ : 67.00

Structural embankment type_____ : Sandy Clay

Structural embankment_____ : RSS

Backfill soil_____ : RSS

Covering soil_____ : RSS

Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00

Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 2.00

Vertical spacing_____ [m]_____ = 0.40

Wrapped length_____ [m]_____ = 0.10

Block : L5

Block dimensions_____ [m]_____ : Base width_____ = 4.00 Height_____ = 0.40

Back Shift_____ [m]_____ = 0.00 by L4

Face inclination_____ [°]_____ : 67.00

Structural embankment type_____ : Sandy Clay

Structural embankment_____ : RSS

Backfill soil_____ : RSS

Covering soil_____ : RSS

Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00

Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 4.00

Vertical spacing_____ [m]_____ = 0.40



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Wrapped length_____ [m]_____ = 0.10

Block : R2

Block dimensions_____ [m]_____ : Base width_____ = 4.00 Height_____ = 0.40

Back Shift_____ [m]_____ = 0.00 by R1

Face inclination_____ [°]_____ : 67.00

Structural embankment type_____ : Sandy Clay

Structural embankment_____ : RSS

Backfill soil_____ : RSS

Covering soil_____ : RSS

Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00

Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 4.00

Vertical spacing_____ [m]_____ = 0.40

Wrapped length_____ [m]_____ = 0.10

Block : L6

Block dimensions_____ [m]_____ : Base width_____ = 2.00 Height_____ = 0.80

Back Shift_____ [m]_____ = 0.00 by L5

Face inclination_____ [°]_____ : 67.00

Structural embankment type_____ : Sandy Clay

Structural embankment_____ : RSS

Backfill soil_____ : RSS

Covering soil_____ : RSS

Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00

Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 2.00

Vertical spacing_____ [m]_____ = 0.40

Wrapped length_____ [m]_____ = 0.10

Block : R3

Block dimensions_____ [m]_____ : Base width_____ = 2.00 Height_____ = 1.20

Back Shift_____ [m]_____ = 0.00 by R2

Face inclination_____ [°]_____ : 67.00

Structural embankment type_____ : Sandy Clay

Structural embankment_____ : RSS

Backfill soil_____ : RSS

Covering soil_____ : RSS

Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00

Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 2.00

Vertical spacing_____ [m]_____ = 0.40

Wrapped length_____ [m]_____ = 0.10

Block : L7

Block dimensions_____ [m]_____ : Base width_____ = 4.00 Height_____ = 0.40

Back Shift_____ [m]_____ = 0.00 by L6



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Face inclination[°] : 67.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 4.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : L8

Block dimensions[m] : Base width = 2.00 Height = 0.40

Back Shift[m] = 0.00 by L7

Face inclination[°] : 67.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

SURCHARGE LOADS**Distributed Loads : LOAD**

Description :

Class : External live loads

Magnitude[kN/m²] = 10.00

Inclination angle[°] = 0.00

Abscissa[m] : from = 32.69 To = 34.90

PROPERTIES OF THE USED REINFORCEMENTS

Basetex 200/50

Tensile strength UTS[kN/m] : 200.00
Minimum anchorage length[m] : 0.15
Breakage Safety Factor (gravel): 1.54
Breakage Safety Factor (sand): 1.52
Breakage Safety Factor (silty sand): 1.52
Breakage Safety Factor (sandy clay): 2.06
Interaction factor reinforcement/reinforcement: 0.16
Pullout coefficient reinforcement-gravel: 0.90
Pullout coefficient reinforcement-sand: 0.90
Pullout coefficient reinforcement-silt: 0.70
Pullout coefficient reinforcement-clay: 0.40



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REF. NUMBER:

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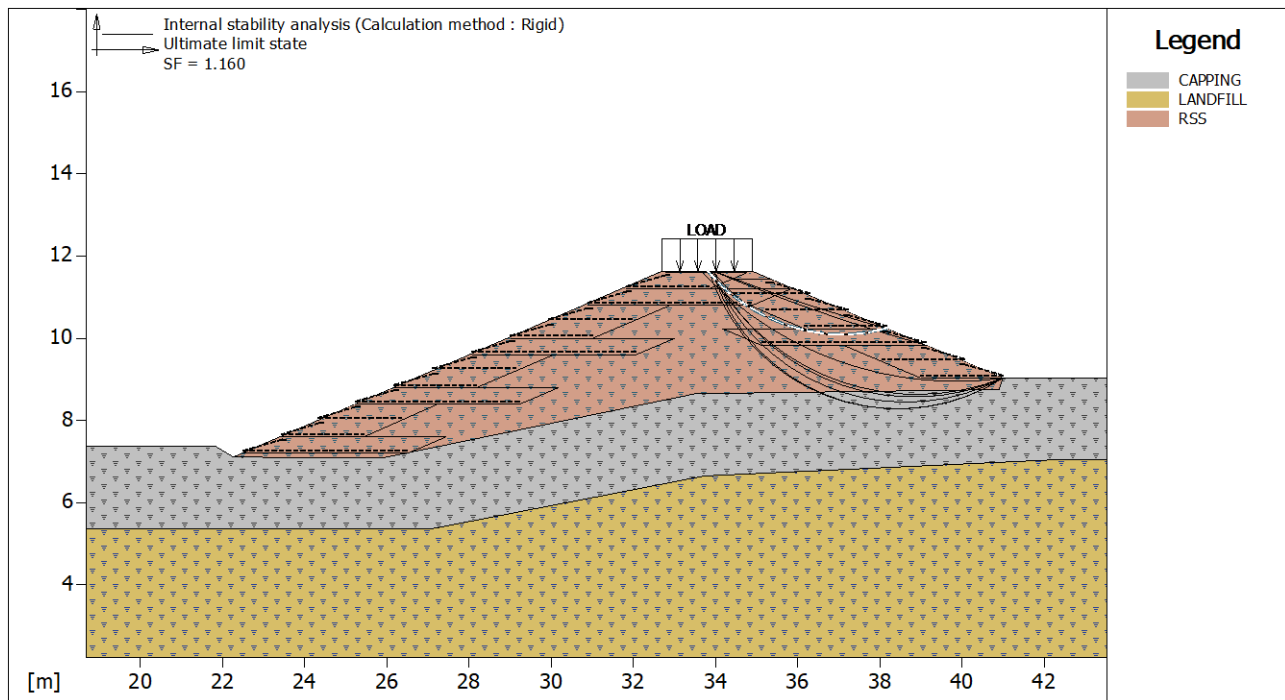
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CHECKS RESULTS

**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 1.160

Surfaces searching range

Block

R1

First point

32.00

Arrival range, abscises [m]

Second point

34.00

Number of starting point on the starting segment.....: 1

Total number of trial surfaces.....: 100

Minimum base length of slices.....[m].....: 0.50

Superior limit search angle.....[°].....: 0.00

Inferior limit search angle.....[°].....: 0.00

Multiplier

Class

1.30 External live loads

1.00 Soil material factor $\tan(\phi)$ 1.60 Soil material factor c'

1.50 Soil unit weight

1.00 Category of structure

1.30 Pull-out factor (= $f_p \times f_n$)



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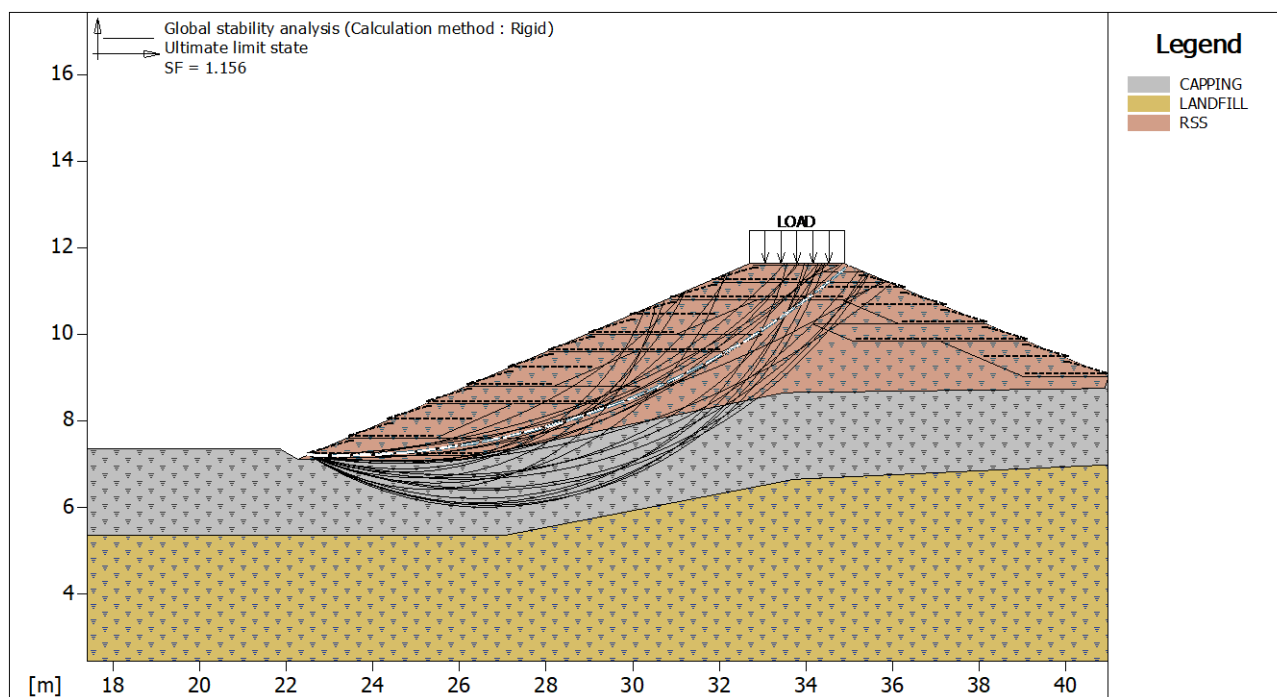
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**Global Stability Check :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 1.156

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
22.50	22.50	30.00	36.00
Number of starting point on the starting segment.....:		1	
Total number of trial surfaces.....:		101	
Minimum base length of slices.....[m].....:		0.50	
Superior limit search angle.....[°].....:		0.00	
Inferior limit search angle.....[°].....:		0.00	

Block : L7
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	11.5	8.8	5.68	1.31

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)



PROJECT:

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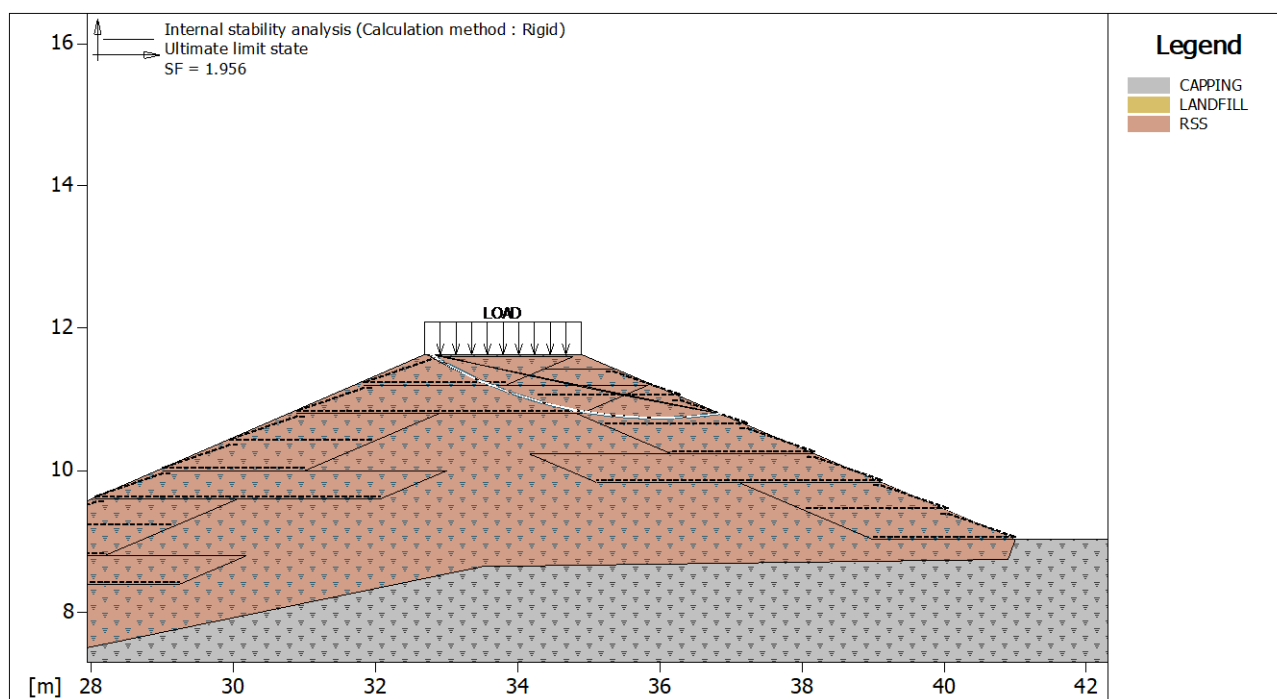
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**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 1.956

Surfaces searching range

Block	First point	Arrival range, abscises [m]	Second point
R3	32.00		33.00

Number of starting point on the starting segment.....: 1

Total number of trial surfaces.....: 100

Minimum base length of slices.....[m].....: 0.50

Superior limit search angle.....[°].....: 0.00

Inferior limit search angle.....[°].....: 0.00

Block : L8
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	1.8	1.4	35.71	1.29

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)



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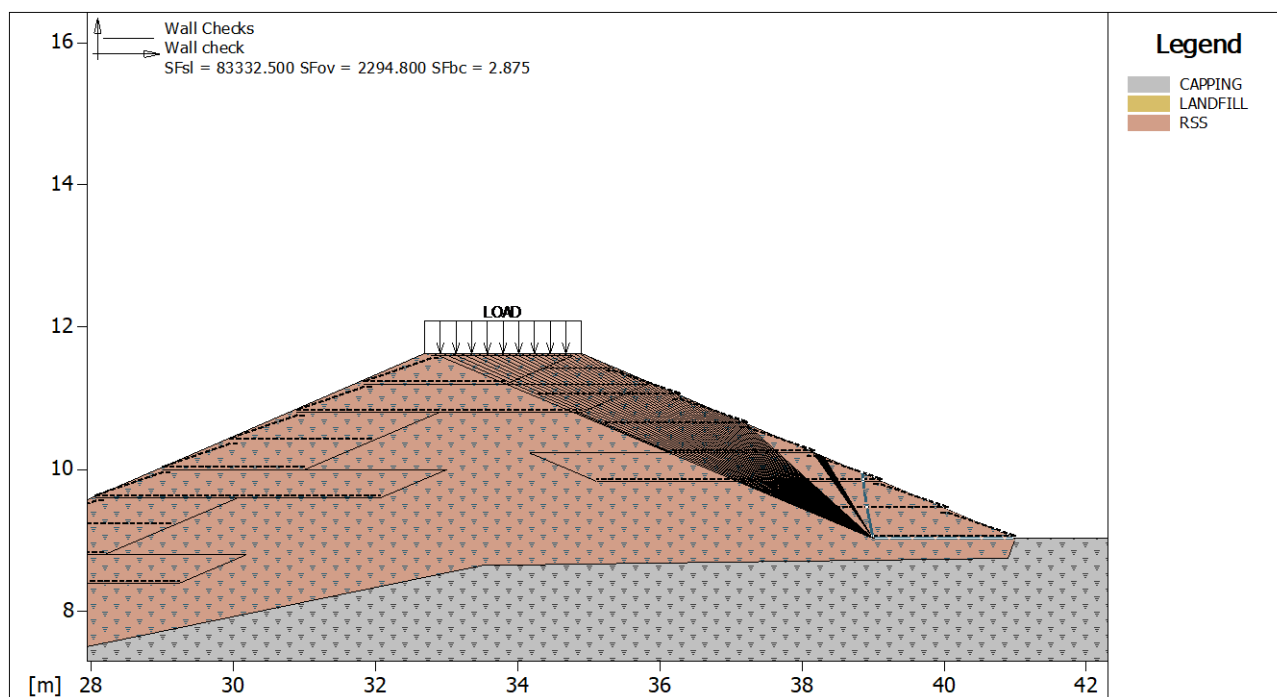
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**Wall Checks :**

Multiplier combination : Wall check

Considered block : R1

Resisting force.....[kN/m]..... 95.36

Active force.....[kN/m]..... -1.14

Sliding class.....: Sliding along base of structure

Sliding safety factor..... 83332.500

Restoring moment.....[kN*m/m]..... 980.29

Overturning moment.....[kN*m/m]..... 0.43

Overturning class: Overturning

Overturning safety factor..... 2294.800

Ultimate bearing pressure computed with Limit Equilibrium method

Ultimate bearing pressure.....[kN/m²]..... 294.04Active pressure.....[kN/m²]..... 102.28

Pressure class...: Bearing capacity

Bearing capacity safety factor..... 2.875

Equivalent bearing area.....[m]..... 2.00

Eccentricity of normal force.....[m]..... -3.79

Lever arm of overturning force.....[m]..... -0.38

Normal force on the base.....[kN]..... 204.51

Outer edge stress.....[kN/m²]..... -185.87Inner edge stress.....[kN/m²]..... 112.62**Multiplier****Class**

1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



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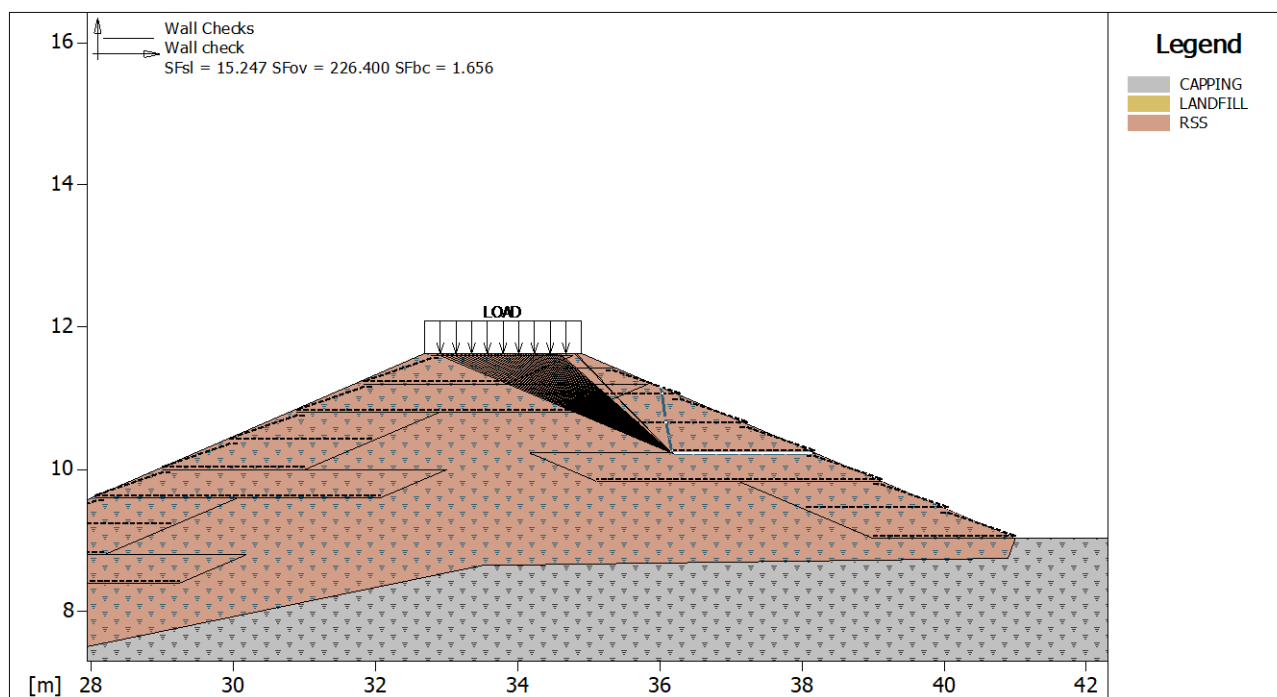
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**Wall Checks :**

Multiplier combination : Wall check

Considered block : R3

Resisting force.....[kN/m]..... 42.66

Active force.....[kN/m]..... 2.33

Sliding class.....: Sliding along base of structure

Sliding safety factor..... 15.247

Restoring moment.....[kN*m/m]..... 265.21

Overturning moment.....[kN*m/m]..... 1.17

Overturning class: Overturning

Overturning safety factor..... 226.400

Ultimate bearing pressure computed with Limit Equilibrium method

Ultimate bearing pressure.....[kN/m²]..... 75.78Active pressure.....[kN/m²]..... 45.75

Pressure class...: Bearing capacity

Bearing capacity safety factor..... 1.656

Equivalent bearing area.....[m]..... 2.00

Eccentricity of normal force.....[m]..... -1.89

Lever arm of overturning force.....[m]..... 0.50

Normal force on the base.....[kN]..... 91.48

Outer edge stress.....[kN/m²]..... -381.05Inner edge stress.....[kN/m²]..... 277.84**Multiplier****Class**

1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



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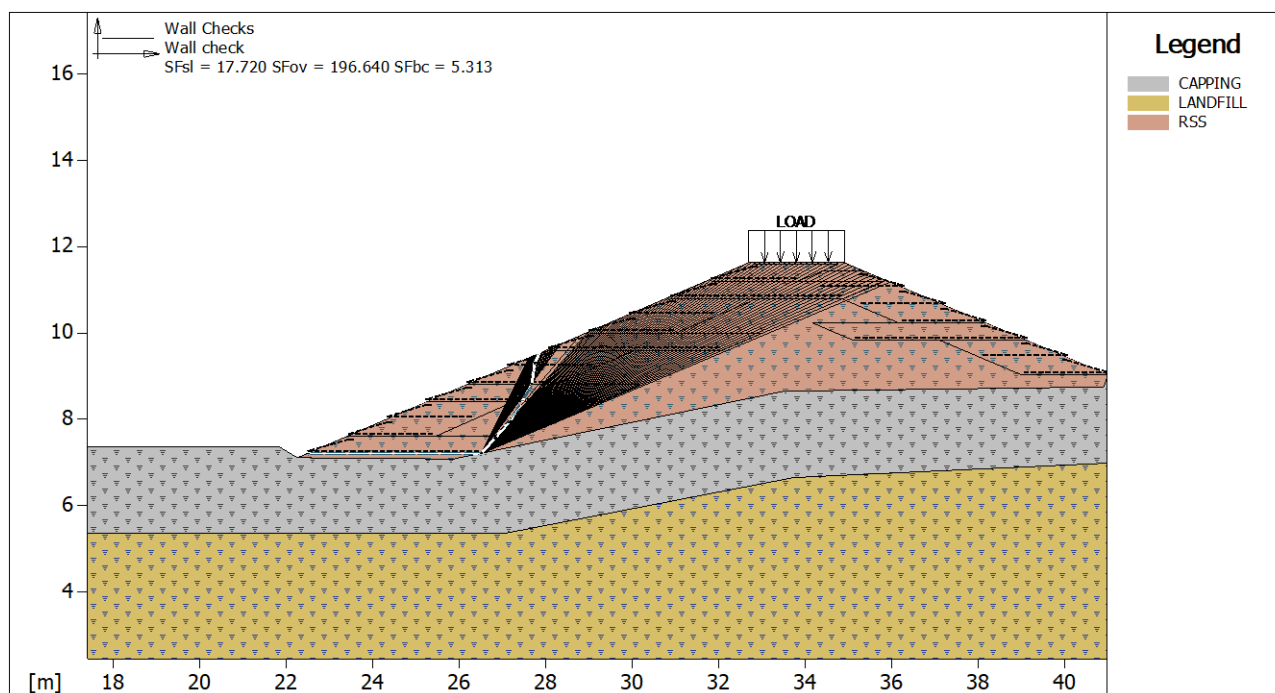
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**Wall Checks :**

Multiplier combination : Wall check

Considered block : L1

Resisting force.....[kN/m]..... 197.72

Active force.....[kN/m]..... 9.30

Sliding class.....: Sliding along base of structure

Sliding safety factor..... 17.720

Restoring moment.....[kN*m/m]..... 3000.90

Overturning moment.....[kN*m/m]..... 15.26

Overturning class: Overturning

Overturning safety factor..... 196.640

Ultimate bearing pressure computed with Limit Equilibrium method

Ultimate bearing pressure.....[kN/m²]..... 562.50Active pressure.....[kN/m²]..... 105.88

Pressure class...: Bearing capacity

Bearing capacity safety factor..... 5.313

Equivalent bearing area.....[m]..... 4.00

Eccentricity of normal force.....[m]..... -5.05

Lever arm of overturning force.....[m]..... 1.64

Normal force on the base.....[kN]..... 423.43

Outer edge stress.....[kN/m²]..... -414.01Inner edge stress.....[kN/m²]..... 275.23**Multiplier****Class**

1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



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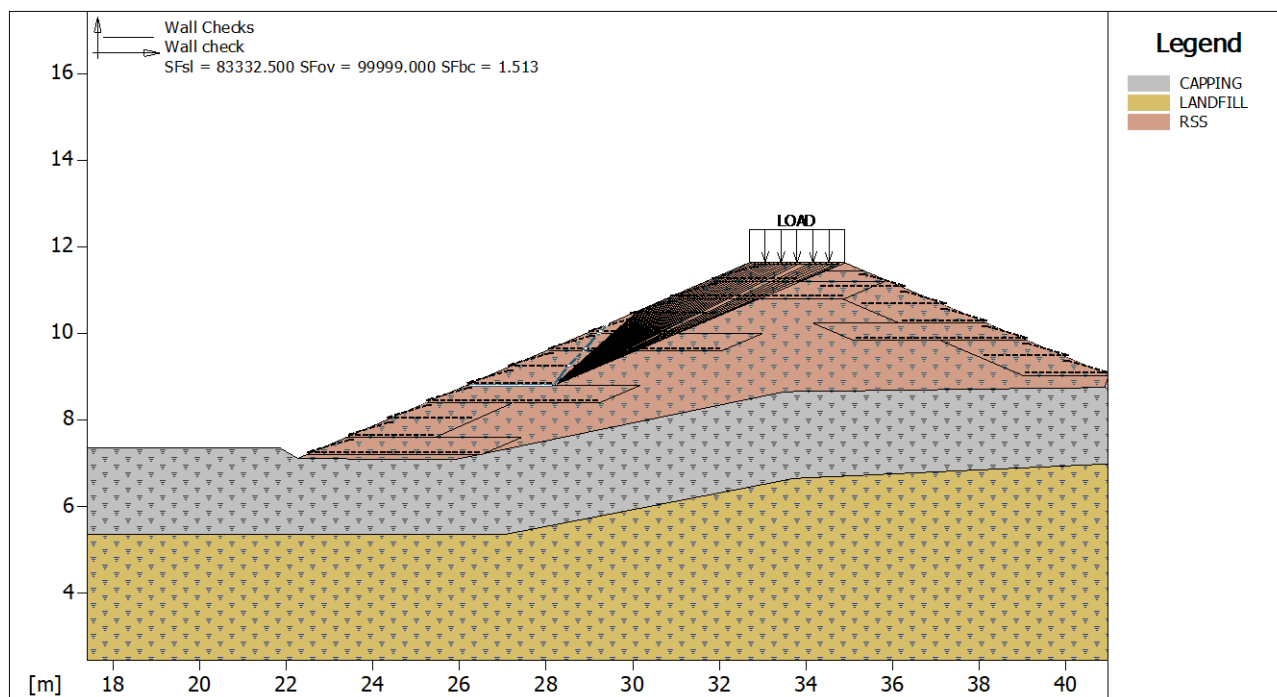
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**Wall Checks :**

Multiplier combination : Wall check

Considered block : L4

Resisting force [kN/m] 118.85

Active force [kN/m] -3.04

Sliding class : Sliding along base of structure

Sliding safety factor 83332.500

Restoring moment [kN*m/m] 1380.90

Overturning moment [kN*m/m] -9.17

Overturning class: Overturning

Overturning safety factor 99999.000

Ultimate bearing pressure computed with Meyerhof

Ultimate bearing pressure [kN/m²] 192.82Active pressure [kN/m²] 127.43

Pressure class...: Bearing capacity

Bearing capacity safety factor 1.513

Equivalent bearing area [m] 2.00

Eccentricity of normal force [m] -4.45

Lever arm of overturning force [m] 3.01

Normal force on the base [kN] 254.87

Outer edge stress [kN/m²] -179.62Inner edge stress [kN/m²] 105.83

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



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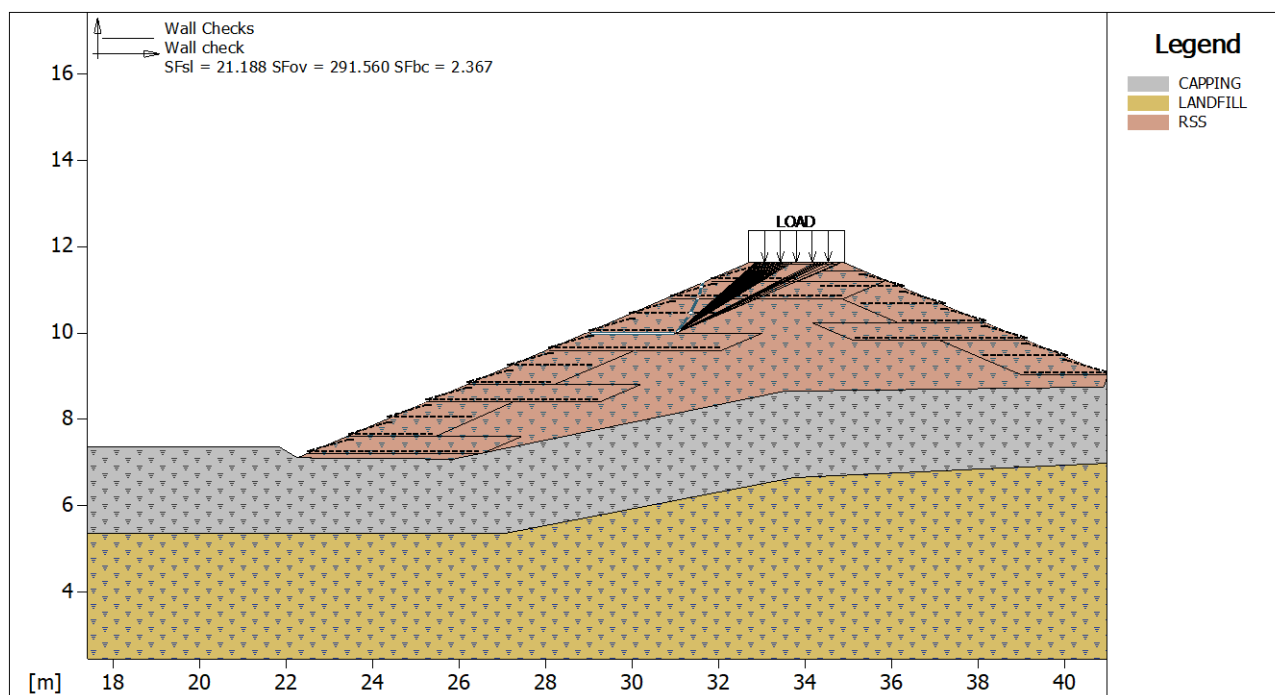
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**Wall Checks :**

Multiplier combination : Wall check

Considered block : L6

Resisting force.....[kN/m] : 69.71

Active force.....[kN/m] : 2.74

Sliding class.....: Sliding along base of structure

Sliding safety factor.....: 21.188

Restoring moment.....[kN*m/m] : 567.90

Overturning moment.....[kN*m/m] : 1.95

Overturning class: Overturning

Overturning safety factor.....: 291.560

Ultimate bearing pressure computed with Meyerhof

Ultimate bearing pressure.....[kN/m²] : 176.95Active pressure.....[kN/m²] : 74.75

Pressure class...: Bearing capacity

Bearing capacity safety factor.....: 2.367

Equivalent bearing area.....[m] : 2.00

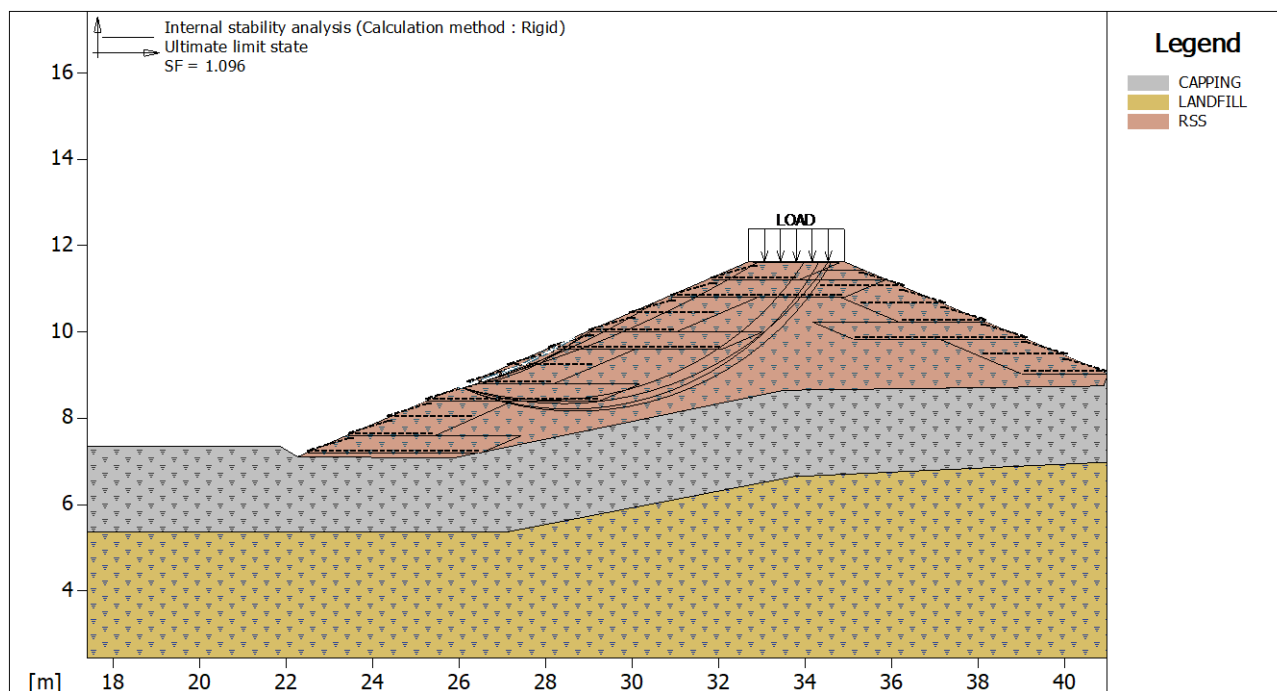
Eccentricity of normal force.....[m] : -2.79

Lever arm of overturning force.....[m] : 0.71

Normal force on the base.....[kN] : 149.49

Outer edge stress.....[kN/m²] : -237.73Inner edge stress.....[kN/m²] : 154.02

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



Internal Stability :

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 1.096

Surfaces searching range

Block	Arrival range, abscises [m]
L5	First point 26.00 Second point 36.00

Number of starting point on the starting segment.....: 1
Total number of trial surfaces.....: 100
Minimum base length of slices.....[m].....: 0.50
Superior limit search angle.....[°].....: 0.00
Inferior limit search angle.....[°].....: 0.00

Block : L4 Basotex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.1	0.1	500.00	1.00
0.400	50.0	0.2	0.1	500.00	2.00

Block : L5 Basotex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.1	0.1	500.00	1.00

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)



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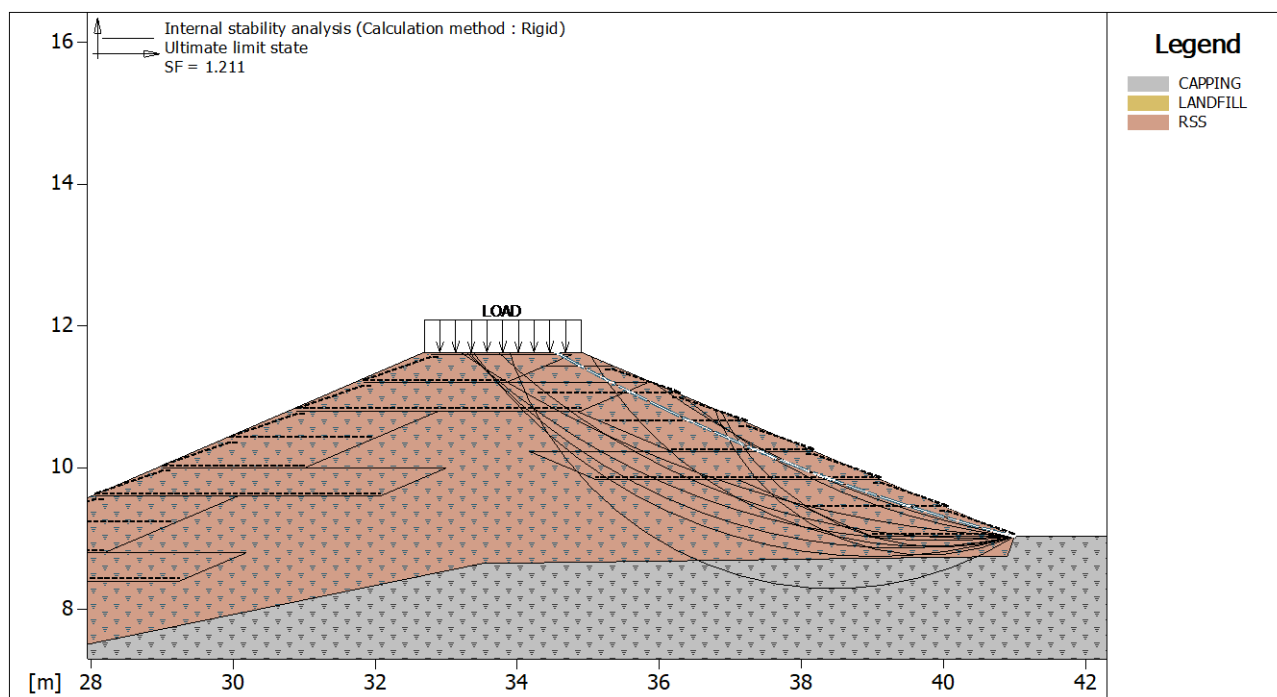
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**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 1.211

Surfaces searching range

Block

Arrival range, abscises [m]

R1

First point

Second point

30.00

37.00

Number of starting point on the starting segment.....: 1

Total number of trial surfaces.....: 100

Minimum base length of slices.....[m].....: 0.50

Superior limit search angle.....[°].....: 0.00

Inferior limit search angle.....[°].....: 0.00

Block : R1

Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.400	50.0	0.4	0.3	166.67	1.33

Block : R2

Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.9	0.7	71.43	1.29

Block : R3

Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	1.2	0.9	55.56	1.33
0.400	50.0	1.1	0.8	62.50	1.38
0.800	50.0	0.8	0.6	83.33	1.33

Multiplier

Class

1.30

External live loads

1.00

Soil material factor tan(phi)



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1.60	Soil material factor c'			
1.50	Soil unit weight			
1.00	Category of structure			
1.30	Pull-out factor (= fp x fn)			



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Cross Section.....: Section S2

File.....: S2 drained analysis global 06022023

Date.....: 02/03/2023

Checks according to: Eurocode 7 EN 1997-1
Eurocode 7 EN 1997-1

TABLE OF CONTENTS

SOIL PROPERTIES

Soil: CAPPING Description:
Cohesion Class.....: Effective cohesion
Cohesion..... [kN/m²].....: 0.00
Friction Angle Class.....: Angle of shearing resistance (Tan phi)
Friction Angle..... [°].....: 27.00
Ru value.....: 0.10
Weight Class.....: Weight density
Bulk unit weight – above GWT..... [kN/m³].....: 19.00
Bulk unit weight – below GWT..... [kN/m³].....: 19.00

Elastic Modulus..... [kN/m²].....: 0.00
Poisson's ratio.....: 0.30

Soil: LANDFILL Description:
Cohesion Class.....: Effective cohesion
Cohesion..... [kN/m²].....: 0.00
Friction Angle Class.....: Angle of shearing resistance (Tan phi)
Friction Angle..... [°].....: 30.00
Ru value.....: 0.20
Weight Class.....: Weight density
Bulk unit weight – above GWT..... [kN/m³].....: 8.00
Bulk unit weight – below GWT..... [kN/m³].....: 8.00

Elastic Modulus..... [kN/m²].....: 0.00
Poisson's ratio.....: 0.30

Soil: RSS Description: RSS backfill
Cohesion Class.....: Effective cohesion
Cohesion..... [kN/m²].....: 0.00
Friction Angle Class.....: Angle of shearing resistance (Tan phi)
Friction Angle..... [°].....: 25.00
Ru value.....: 0.10
Weight Class.....: Weight density
Bulk unit weight – above GWT..... [kN/m³].....: 19.00
Bulk unit weight – below GWT..... [kN/m³].....: 19.00

Elastic Modulus..... [kN/m²].....: 0.00
Poisson's ratio.....: 0.30

STRATA PROFILES

Stratum: BUND Description:
Soil : RSS

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
22.26	7.11	32.69	11.63	34.90	11.63	41.00	9.03

Stratum: CAPPING Description:
Soil : CAPPING

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
3.82	7.36	21.84	7.36	22.26	7.11	25.86	7.08
33.51	8.65	40.90	8.75	41.00	9.03	69.11	9.05



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Stratum: LANDFILL

Description:

Soil : LANDFILL

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
3.82	5.36	27.07	5.36	33.73	6.65	42.42	7.05
69.11	7.05						

REINFORCED BLOCKS**Block : L1**

Block dimensions_____ [m] : Base width_____ = 4.00 Height_____ = 0.40
Block Origin_____ [m] : Abscissa_____ = 22.50 Ordinate_____ = 7.20
Face inclination_____ [°] : 67.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m] = 4.00
Vertical spacing_____ [m] = 0.40
Wrapped length_____ [m] = 0.10

Block : L2

Block dimensions_____ [m] : Base width_____ = 2.00 Height_____ = 0.80
Back Shift_____ [m] = 0.00 by L1
Face inclination_____ [°] : 66.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m] = 2.00
Vertical spacing_____ [m] = 0.40
Wrapped length_____ [m] = 0.10

Block : L3

Block dimensions_____ [m] : Base width_____ = 4.00 Height_____ = 0.40
Back Shift_____ [m] = 0.00 by L2
Face inclination_____ [°] : 67.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :



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Basetex 200/50

Length [m] = 4.00

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10

Block : L4

Block dimensions [m] : Base width = 2.00 Height = 0.80

Back Shift [m] = 0.00 by L3

Face inclination [°] : 67.00

Structural embankment type : Sandy Clay

Structural embankment : RSS

Backfill soil : RSS

Covering soil : RSS

Foundation soil : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth [m] : 0.00

Natural soil slope [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length [m] = 2.00

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10

Block : R1

Block dimensions [m] : Base width = 2.00 Height = 0.80

Block Origin [m] : Abscissa = 4.100 Ordinate = 9.03

Face inclination [°] : 67.00

Structural embankment type : Sandy Clay

Structural embankment : RSS

Backfill soil : RSS

Covering soil : RSS

Foundation soil : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth [m] : 0.00

Natural soil slope [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length [m] = 2.00

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10

Block : L5

Block dimensions [m] : Base width = 4.00 Height = 0.40

Back Shift [m] = 0.00 by L4

Face inclination [°] : 67.00

Structural embankment type : Sandy Clay

Structural embankment : RSS

Backfill soil : RSS

Covering soil : RSS

Foundation soil : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth [m] : 0.00

Natural soil slope [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length [m] = 4.00

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10



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Block : R2

Block dimensions[m] : Base width = 4.00 Height = 0.40
Back Shift[m] = 0.00 by R1
Face inclination[°] : 67.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 4.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : L6

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by L5
Face inclination[°] : 67.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : R3

Block dimensions[m] : Base width = 2.00 Height = 1.20
Back Shift[m] = 0.00 by R2
Face inclination[°] : 67.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : L7

Block dimensions[m] : Base width = 4.00 Height = 0.40
Back Shift[m] = 0.00 by L6
Face inclination[°] : 67.00



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Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 4.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L8

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L7
Face inclination.....[°] : 67.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

SURCHARGE LOADS

Distributed Loads : LOAD

Description :

Class : Variable unfavourable

Magnitude.....[kN/m²] = 10.00 Inclination angle.....[°] = 0.00
Abscissa.....[m] : from = 32.69 To = 34.90

PROPERTIES OF THE USED REINFORCEMENTS

Basetex 200/50

Tensile strength UTS.....[kN/m] : 200.00
Minimum anchorage length.....[m] : 0.15
Breakage Safety Factor (gravel).....: 1.54
Breakage Safety Factor (sand).....: 1.52
Breakage Safety Factor (silty sand).....: 1.52
Breakage Safety Factor (sandy clay).....: 2.06
Interaction factor reinforcement/reinforcement.....: 0.16
Pullout coefficient reinforcement-gravel.....: 0.90
Pullout coefficient reinforcement-sand.....: 0.90
Pullout coefficient reinforcement-silt.....: 0.70
Pullout coefficient reinforcement-clay.....: 0.40



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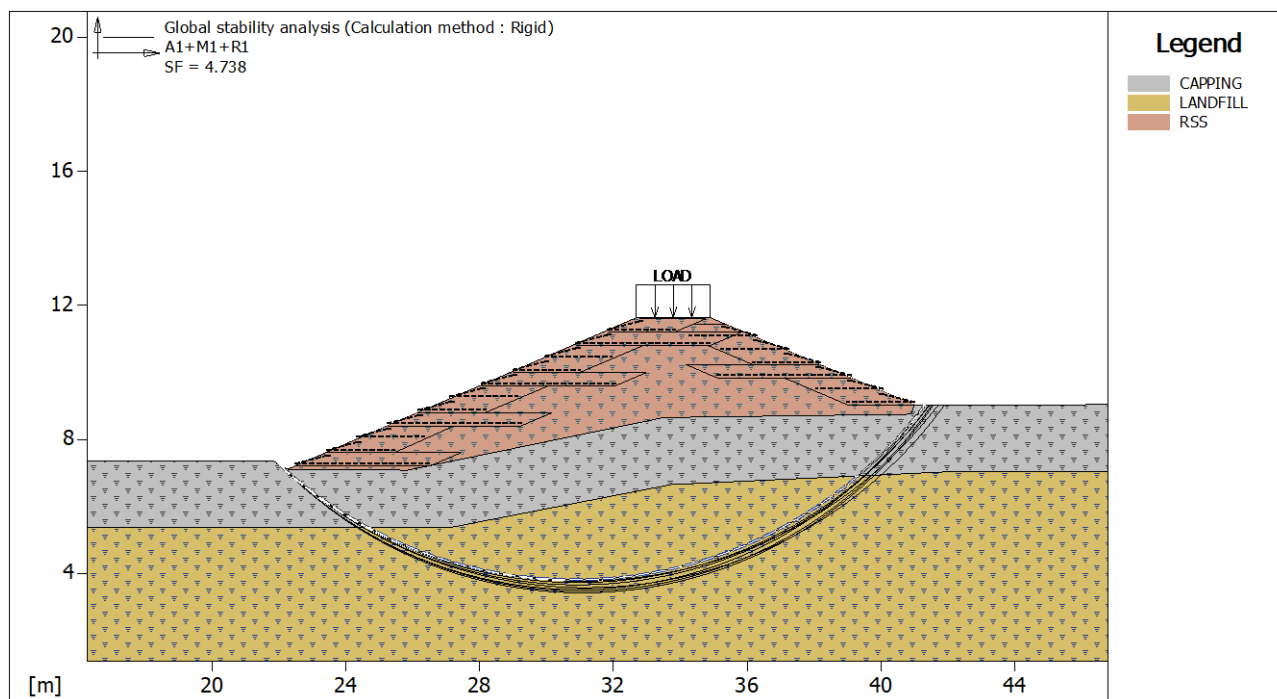
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CHECKS RESULTS



Global Stability Check :

Multiplier combination : A1+M1+R1

Reinforcements active Forces according to Rigid Method

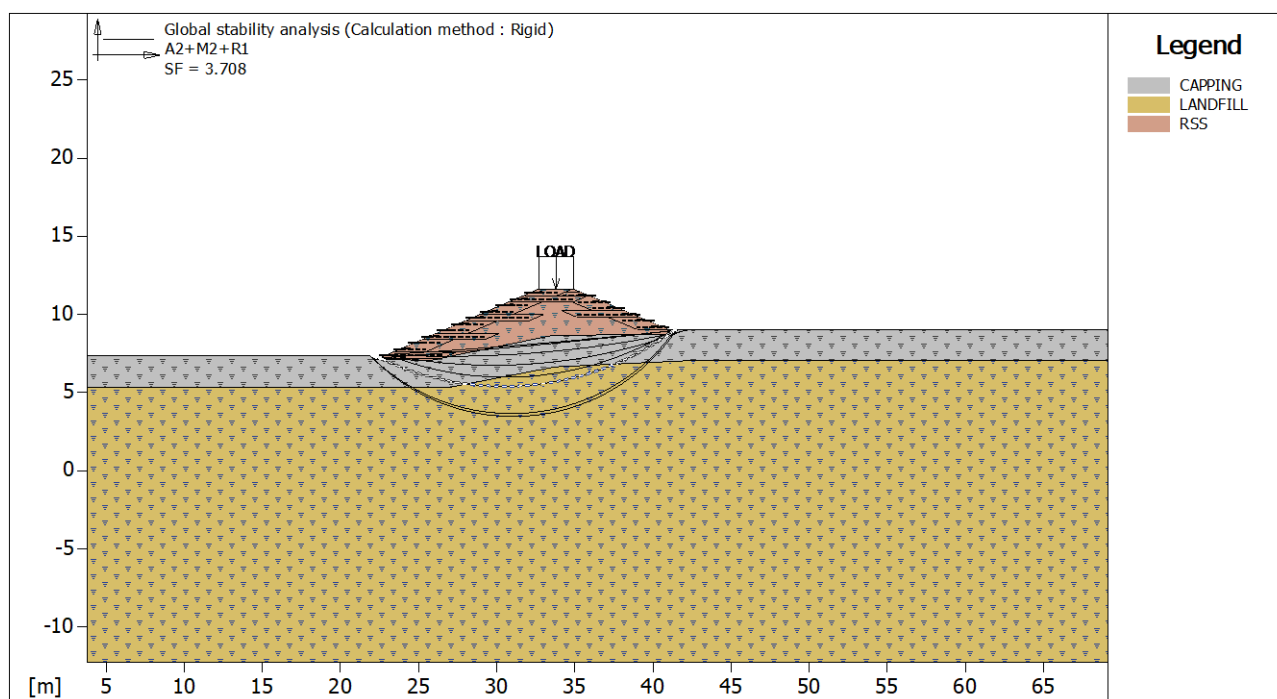
Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 4.738

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
22.00	23.00	41.00	60.00
Number of starting point on the starting segment.....:		1	
Total number of trial surfaces.....:		101	
Minimum base length of slices.....[m].....:		0.50	
Superior limit search angle.....[°].....:		0.00	
Inferior limit search angle.....[°].....:		0.00	

Multiplier	Class
1.50	Variable unfavourable
1.00	Angle of shearing resistance (Tan phi)
1.00	Effective cohesion
1.00	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



Global Stability Check :

Multiplier combination : A2+M2+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 3.708

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
22.00	23.00	41.00	60.00
Number of starting point on the starting segment.....:		3	
Total number of trial surfaces.....:		102	
Minimum base length of slices.....[m].....:		0.50	
Superior limit search angle.....[°].....:		0.00	
Inferior limit search angle.....[°].....:		0.00	

Multiplier	Class
1.30	Variable unfavourable
1.25	Angle of shearing resistance (Tan phi)
1.25	Effective cohesion
1.40	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



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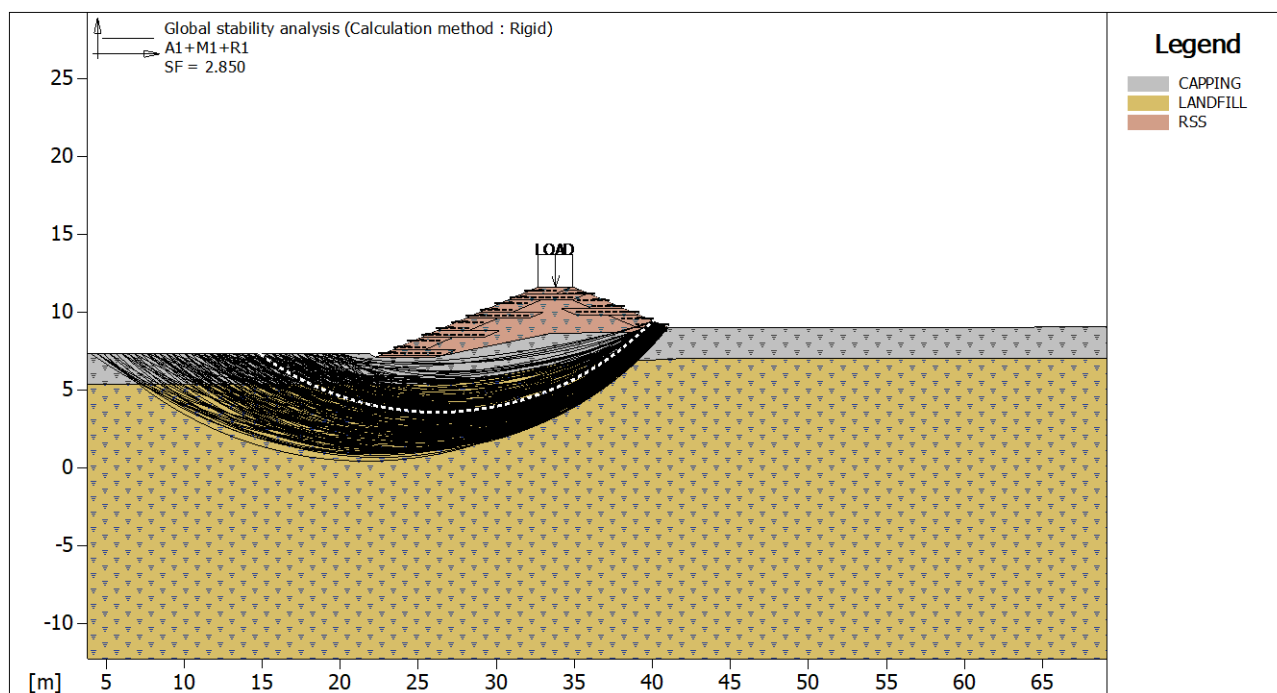
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**Global Stability Check :**

Multiplier combination : A1+M1+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 2.850

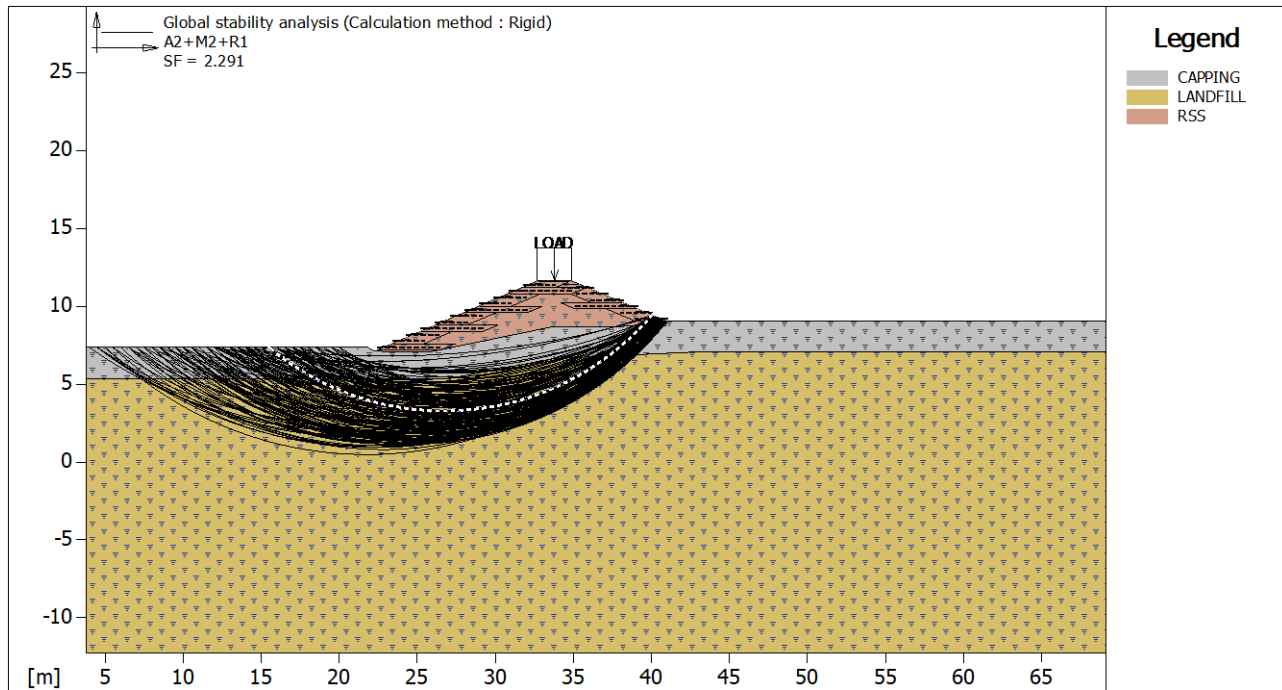
Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
4.00	20.00	40.00	41.00
Number of starting point on the starting segment.....:		41	
Total number of trial surfaces.....:		410	
Minimum base length of slices.....[m].....:		0.50	
Superior limit search angle.....[°].....:		0.00	
Inferior limit search angle.....[°].....:		0.00	

Block : R1
Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	2.5	2.5	20.00	1.00
0.400	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.50	Variable unfavourable
1.00	Angle of shearing resistance (Tan phi)
1.00	Effective cohesion
1.00	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



Global Stability Check :

Multiplier combination : A2+M2+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 2.291

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
4.00	20.00	40.00	41.00
Number of starting point on the starting segment.....:		33	
Total number of trial surfaces.....:		330	
Minimum base length of slices.....[m].....:		0.50	
Superior limit search angle.....[°].....:		0.00	
Inferior limit search angle.....[°].....:		0.00	

Block : R1
Basotex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	2.2	2.2	22.73	1.00
0.400	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.30	Variable unfavourable
1.25	Angle of shearing resistance (Tan phi)
1.25	Effective cohesion
1.40	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



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Cross Section.....: Section S2

File.....: S2 undrained analysis 06022023

Date.....: 02/03/2023

Checks according to:

BS 8006-1:2010+A1:2016

Reinforced slope – Cat. 2 (medium)

TABLE OF CONTENTS

SOIL PROPERTIES

Soil: CAPPING	Description:	
Cohesion.....	[kN/m ²]	30.00
Friction Angle Class.....	Soil material factor tan(phi)	
Friction Angle.....	[°]	0.00
Ru value.....		0.10
Weight Class.....	Soil unit weight	
Bulk unit weight – above GWT.....	[kN/m ³]	19.00
Bulk unit weight – below GWT.....	[kN/m ³]	19.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30
Soil: LANDFILL	Description:	
Cohesion.....	[kN/m ²]	25.00
Friction Angle Class.....	Soil material factor tan(phi)	
Friction Angle.....	[°]	0.00
Ru value.....		0.20
Weight Class.....	Soil unit weight	
Bulk unit weight – above GWT.....	[kN/m ³]	8.00
Bulk unit weight – below GWT.....	[kN/m ³]	8.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30
Soil: RSS	Description: RSS backfill	
Cohesion.....	[kN/m ²]	80.00
Friction Angle Class.....	Soil material factor tan(phi)	
Friction Angle.....	[°]	0.00
Ru value.....		0.10
Weight Class.....	Soil unit weight	
Bulk unit weight – above GWT.....	[kN/m ³]	19.00
Bulk unit weight – below GWT.....	[kN/m ³]	19.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30

STRATA PROFILES

Stratum: BUND	Description:						
Soil : RSS							
X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
22.26	7.11	32.69	11.63	34.90	11.63	41.00	9.03
Stratum: CAPPING	Description:						
Soil : CAPPING							
X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
3.82	7.36	21.84	7.36	22.26	7.11	25.86	7.08
33.51	8.65	40.90	8.75	41.00	9.03	69.11	9.05



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Stratum: LANDFILL

Description:

Soil : LANDFILL

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
3.82	5.36	27.07	5.36	33.73	6.65	42.42	7.05
69.11	7.05						

REINFORCED BLOCKS**Block : L1**

Block dimensions_____ [m] : Base width_____ = 4.00 Height_____ = 0.40
Block Origin_____ [m] : Abscissa_____ = 22.50 Ordinate_____ = 7.20
Face inclination_____ [°] : 67.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m] = 4.00
Vertical spacing_____ [m] = 0.40
Wrapped length_____ [m] = 0.10

Block : L2

Block dimensions_____ [m] : Base width_____ = 2.00 Height_____ = 0.80
Back Shift_____ [m] = 0.00 by L1
Face inclination_____ [°] : 66.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m] = 2.00
Vertical spacing_____ [m] = 0.40
Wrapped length_____ [m] = 0.10

Block : L3

Block dimensions_____ [m] : Base width_____ = 4.00 Height_____ = 0.40
Back Shift_____ [m] = 0.00 by L2
Face inclination_____ [°] : 67.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :



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Basetex 200/50

Length [m] = 4.00

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10

Block : L4

Block dimensions [m] : Base width = 2.00 Height = 0.80

Back Shift [m] = 0.00 by L3

Face inclination [°] : 67.00

Structural embankment type : Sandy Clay

Structural embankment : RSS

Backfill soil : RSS

Covering soil : RSS

Foundation soil : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth [m] : 0.00

Natural soil slope [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length [m] = 2.00

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10

Block : R1

Block dimensions [m] : Base width = 2.00 Height = 0.80

Block Origin [m] : Abscissa = 4.100 Ordinate = 9.03

Face inclination [°] : 67.00

Structural embankment type : Sandy Clay

Structural embankment : RSS

Backfill soil : RSS

Covering soil : RSS

Foundation soil : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth [m] : 0.00

Natural soil slope [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length [m] = 2.00

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10

Block : L5

Block dimensions [m] : Base width = 4.00 Height = 0.40

Back Shift [m] = 0.00 by L4

Face inclination [°] : 67.00

Structural embankment type : Sandy Clay

Structural embankment : RSS

Backfill soil : RSS

Covering soil : RSS

Foundation soil : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth [m] : 0.00

Natural soil slope [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length [m] = 4.00

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10



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Block : R2

Block dimensions[m] : Base width = 4.00 Height = 0.40
Back Shift[m] = 0.00 by R1
Face inclination[°] : 67.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 4.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : L6

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by L5
Face inclination[°] : 67.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : R3

Block dimensions[m] : Base width = 2.00 Height = 1.20
Back Shift[m] = 0.00 by R2
Face inclination[°] : 67.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : L7

Block dimensions[m] : Base width = 4.00 Height = 0.40
Back Shift[m] = 0.00 by L6
Face inclination[°] : 67.00



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Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 4.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L8

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L7
Face inclination.....[°] : 67.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

SURCHARGE LOADS

Distributed Loads : LOAD

Description :

Class : External live loads

Magnitude.....[kN/m²] = 10.00 Inclination angle.....[°] = 0.00
Abscissa.....[m] : from = 32.69 To = 34.90

PROPERTIES OF THE USED REINFORCEMENTS

Basetex 200/50

Tensile strength UTS.....[kN/m] : 200.00
Minimum anchorage length.....[m] : 0.15
Breakage Safety Factor (gravel).....: 1.54
Breakage Safety Factor (sand).....: 1.52
Breakage Safety Factor (silty sand).....: 1.52
Breakage Safety Factor (sandy clay).....: 2.06
Interaction factor reinforcement/reinforcement.....: 0.16
Pullout coefficient reinforcement-gravel.....: 0.90
Pullout coefficient reinforcement-sand.....: 0.90
Pullout coefficient reinforcement-silt.....: 0.70
Pullout coefficient reinforcement-clay.....: 0.40



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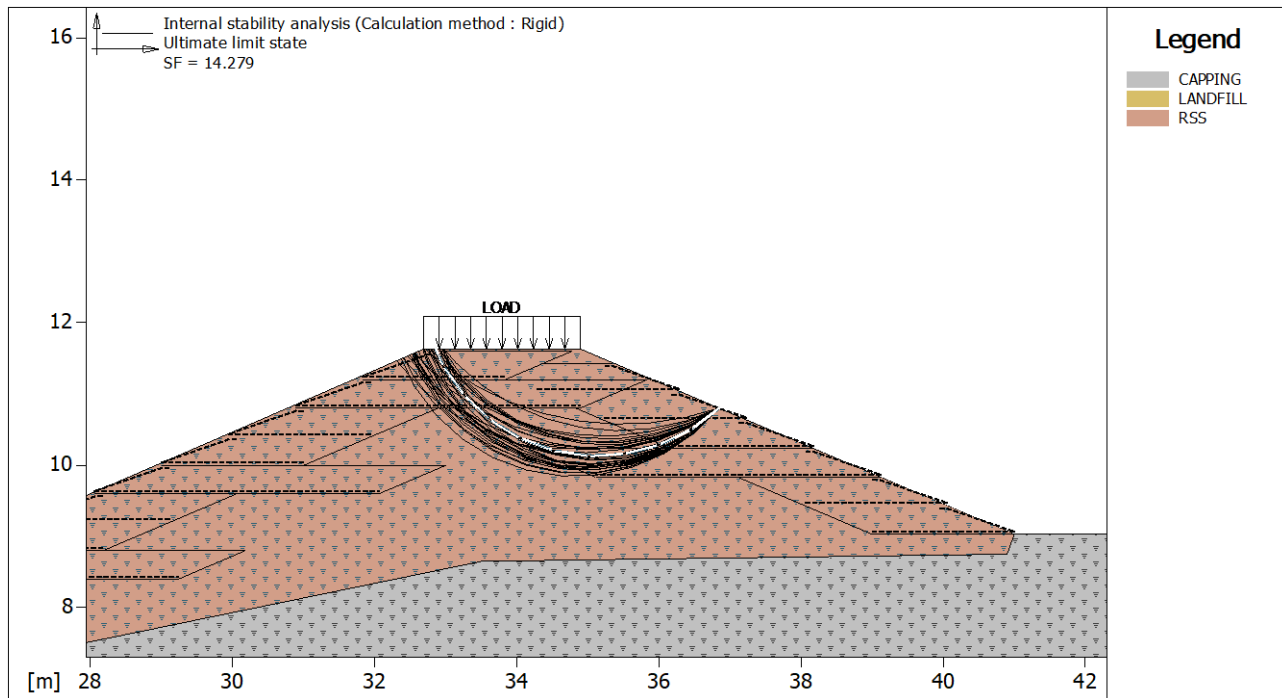
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CHECKS RESULTS



Internal Stability :

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor : 14.279

Surfaces searching range

Block

R3

Arrival range, abscises [m]

First point

32.00

Second point

33.00

Number of starting point on the starting segment : 1

Total number of trial surfaces : 100

Minimum base length of slices [m] : 0.50

Superior limit search angle [°] : 0.00

Inferior limit search angle [°] : 0.00

Block : L7

Basotex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J

Block : L8

Basotex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J

Multiplier

Class

1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)



PROJECT:

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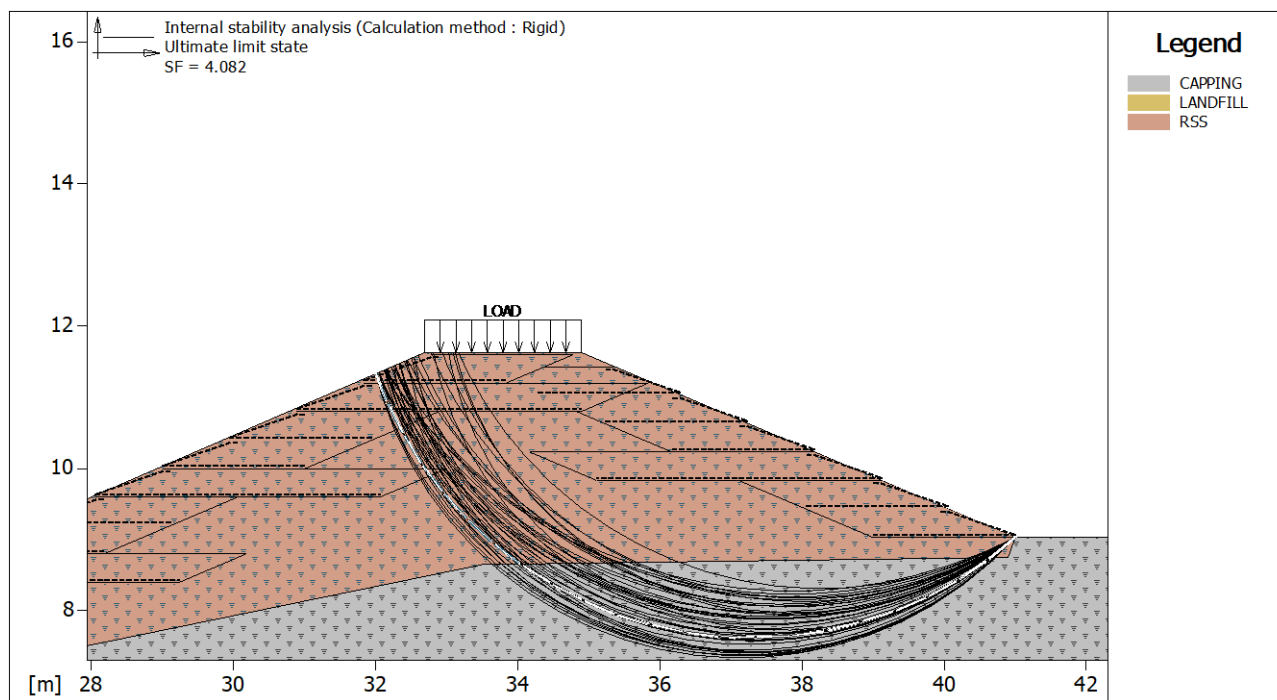
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**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 4.082

Surfaces searching range

Block

Arrival range, abscises [m]

R1

First point

Second point

32.00

34.00

Number of starting point on the starting segment.....: 1

Total number of trial surfaces.....: 100

Minimum base length of slices.....[m].....: 0.50

Superior limit search angle.....[°].....: 0.00

Inferior limit search angle.....[°].....: 0.00

Block : L7
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J

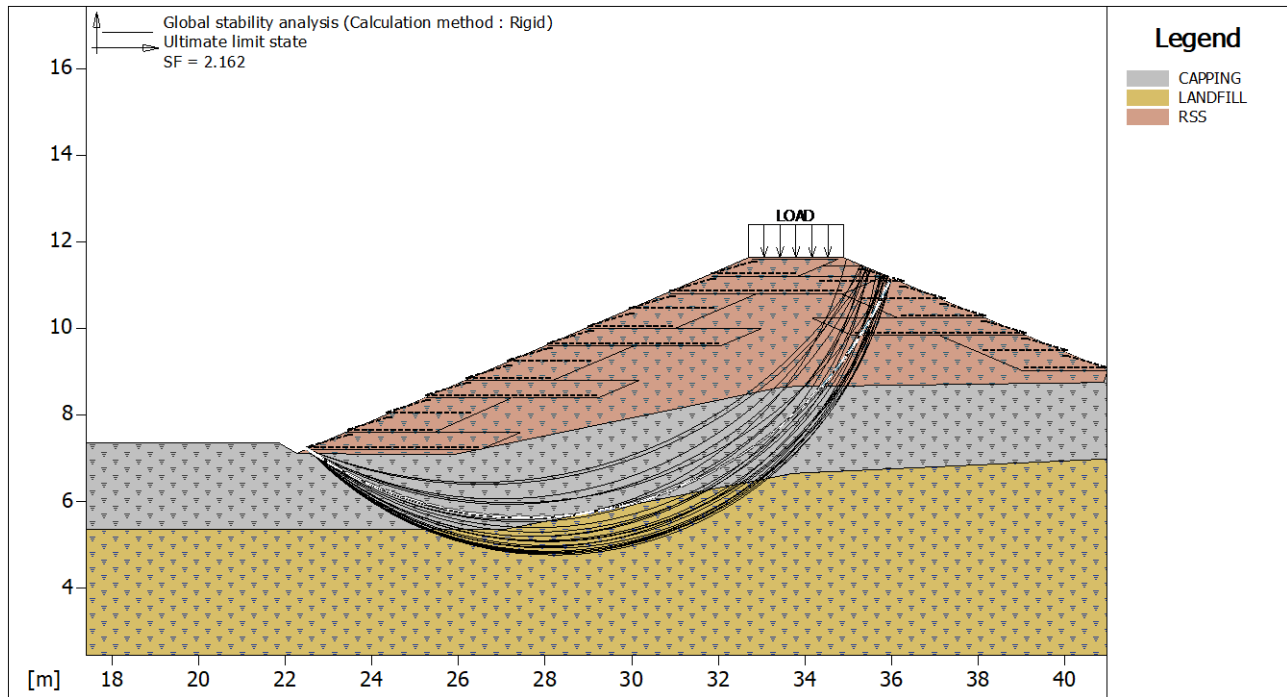
Block : L8
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J

Multiplier

Class

1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)



Global Stability Check :

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 2.162

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
22.50	22.50	30.00	36.00
Number of starting point on the starting segment.....:		1	
Total number of trial surfaces.....:		101	
Minimum base length of slices.....[m].....:		0.50	
Superior limit search angle.....[°].....:		0.00	
Inferior limit search angle.....[°].....:		0.00	

Block : R2 Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage [kN/m]	pullout [kN/m]	design [kN/m]	1/Fmax	
0.000	50.0	0.0	0.0	1.#J	-1.#J

Block : R3 Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage [kN/m]	pullout [kN/m]	design [kN/m]	1/Fmax	
0.400	50.0	0.0	0.0	1.#J	-1.#J
0.800	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)



PROJECT:

HARTS FARM WAY HAVANT, HAMPSHIRE - RSS BUND

REF. NUMBER:

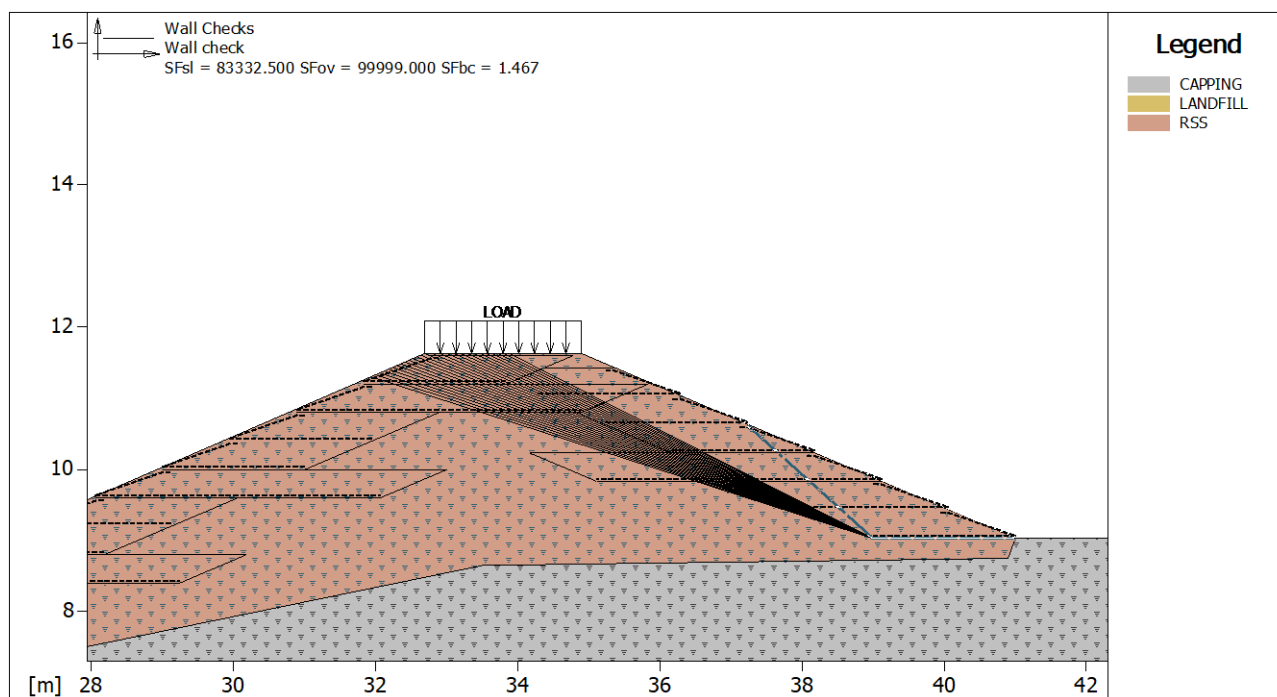
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DATE:

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**Wall Checks :**

Multiplier combination : Wall check

Considered block : R1

Resisting force.....[kN/m]..... 159.97

Active force.....[kN/m]..... -312.21

Sliding class.....: Sliding along base of structure

Sliding safety factor..... 83332.500

Restoring moment.....[kN*m/m]..... 980.29

Overturning moment.....[kN*m/m]..... -218.84

Overturning class: Overturning

Overturning safety factor..... 99999.000

Imposed ultimate bearing pressure

Ultimate bearing pressure.....[kN/m²]..... 150.00Active pressure.....[kN/m²]..... 102.28

Pressure class...: Bearing capacity

Bearing capacity safety factor..... 1.467

Equivalent bearing area.....[m]..... 2.00

Eccentricity of normal force.....[m]..... -4.86

Lever arm of overturning force.....[m]..... 0.70

Normal force on the base.....[kN]..... 204.51

Outer edge stress.....[kN/m²]..... -126.40Inner edge stress.....[kN/m²]..... 73.47**Multiplier****Class**

1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



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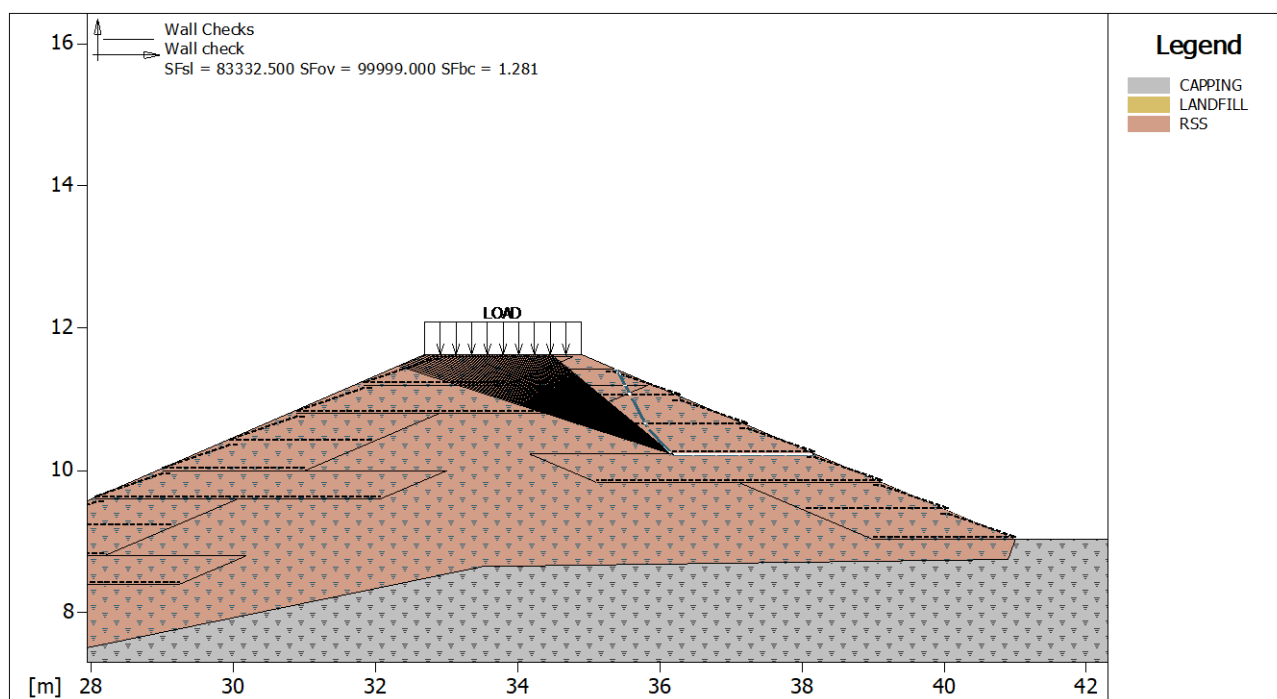
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**Wall Checks :**

Multiplier combination : Wall check

Considered block : R3

Resisting force [kN/m] 160.00

Active force [kN/m] -248.93

Sliding class : Sliding along base of structure

Sliding safety factor : 83332.500

Restoring moment [kN*m/m] 265.21

Overturning moment [kN*m/m] -177.72

Overturning class: Overturning

Overturning safety factor : 99999.000

Ultimate bearing pressure computed with Limit Equilibrium method

Ultimate bearing pressure [kN/m²] 169.90Active pressure [kN/m²] 132.61

Pressure class...: Bearing capacity

Bearing capacity safety factor : 1.281

Equivalent bearing area [m] 2.00

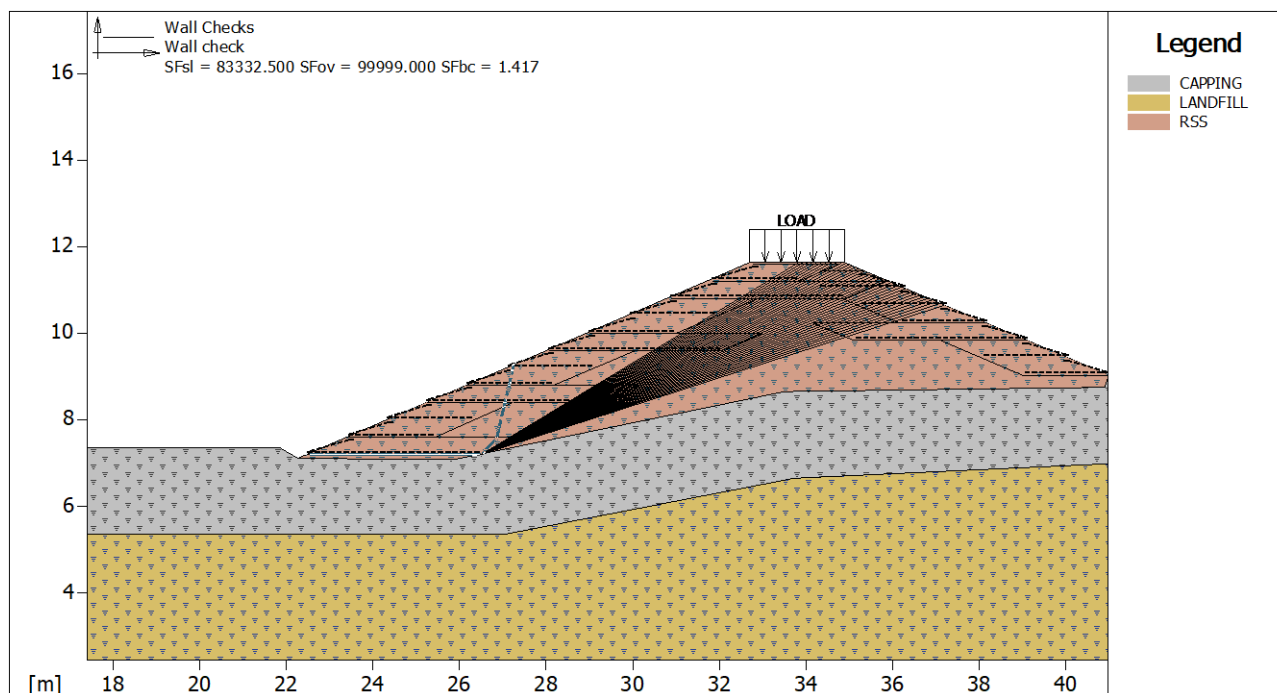
Eccentricity of normal force [m] -3.84

Lever arm of overturning force [m] 0.71

Normal force on the base [kN] 91.48

Outer edge stress [kN/m²] -81.36Inner edge stress [kN/m²] 49.18

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



Wall Checks :

Multiplier combination : Wall check

Considered block : L1

Resisting force.....[kN/m]..... 317.00

Active force.....[kN/m]..... -540.65

Sliding class.....: Sliding along base of structure

Sliding safety factor.....: 83332.500

Restoring moment.....[kN*m/m]..... 3000.90

Overturning moment.....[kN*m/m]..... -792.21

Overturning class: Overturning

Overturning safety factor.....: 99999.000

Imposed ultimate bearing pressure

Ultimate bearing pressure.....[kN/m²]..... 150.00

Active pressure.....[kN/m²]..... 105.86

Pressure class...: Bearing capacity

Bearing capacity safety factor.....: 1.417

Equivalent bearing area.....[m]..... 4.00

Eccentricity of normal force.....[m]..... -6.96

Lever arm of overturning force.....[m]..... 1.47

Normal force on the base.....[kN]..... 423.43

Outer edge stress.....[kN/m²]..... -222.48

Inner edge stress.....[kN/m²]..... 137.08

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



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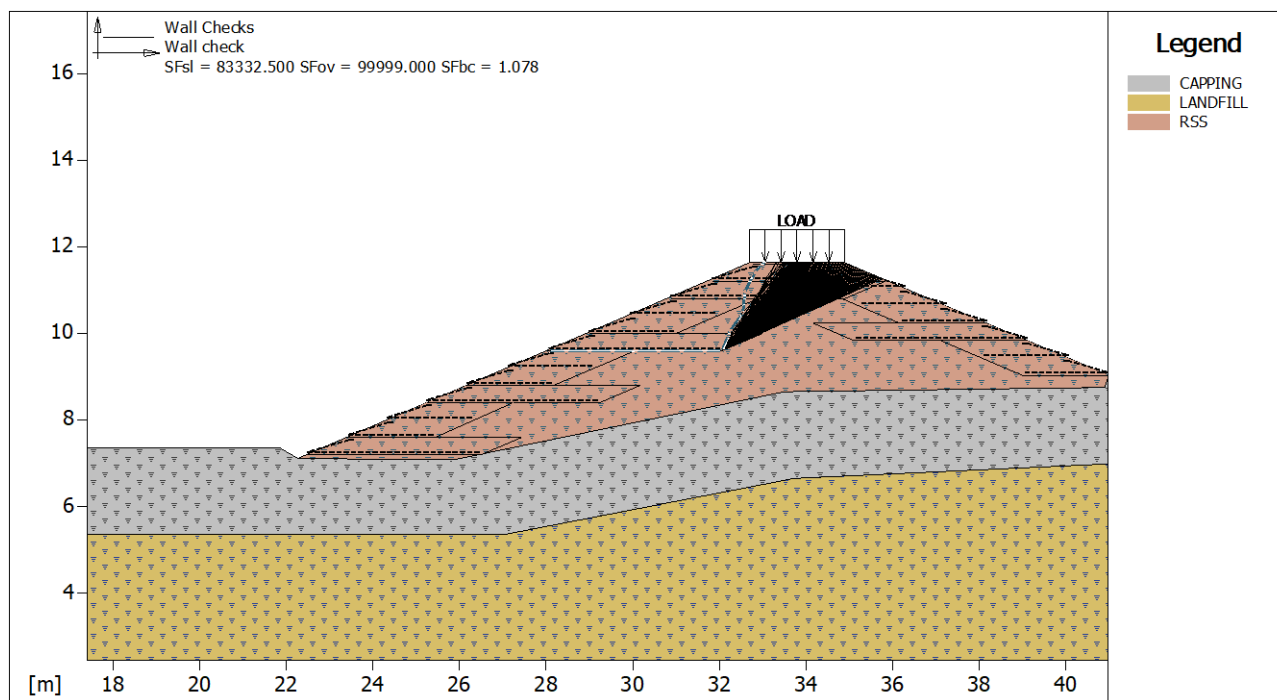
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**Wall Checks :**

Multiplier combination : Wall check

Considered block : L5

Resisting force [kN/m] 320.00

Active force [kN/m] -317.15

Sliding class : Sliding along base of structure

Sliding safety factor 83332.500

Restoring moment [kN*m/m] 904.63

Overturning moment [kN*m/m] -342.24

Overturning class: Overturning

Overturning safety factor 99999.000

Ultimate bearing pressure computed with Limit Equilibrium method

Ultimate bearing pressure [kN/m²] 102.97Active pressure [kN/m²] 95.51

Pressure class...: Bearing capacity

Bearing capacity safety factor 1.078

Equivalent bearing area [m] 4.00

Eccentricity of normal force [m] -3.85

Lever arm of overturning force [m] 1.08

Normal force on the base [kN] 212.98

Outer edge stress [kN/m²] -415.47Inner edge stress [kN/m²] 300.63**Multiplier****Class**

1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



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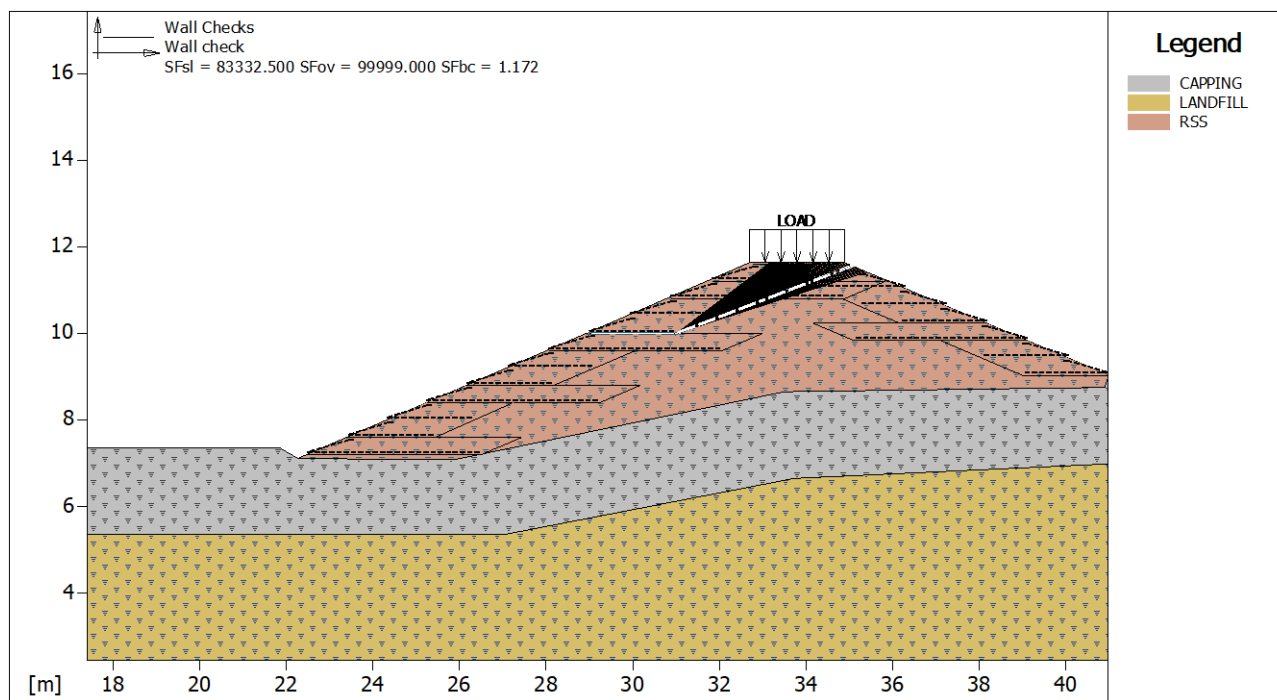
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**Wall Checks :**

Multiplier combination : Wall check

Considered block : L6

Resisting force [kN/m] 160.00

Active force [kN/m] -276.35

Sliding class : Sliding along base of structure

Sliding safety factor 83332.500

Restoring moment [kN*m/m] 567.90

Overturning moment [kN*m/m] -204.09

Overturning class: Overturning

Overturning safety factor 99999.000

Ultimate bearing pressure computed with Limit Equilibrium method

Ultimate bearing pressure [kN/m²] 184.10Active pressure [kN/m²] 157.10

Pressure class...: Bearing capacity

Bearing capacity safety factor 1.172

Equivalent bearing area [m] 2.00

Eccentricity of normal force [m] -4.16

Lever arm of overturning force [m] 0.74

Normal force on the base [kN] 149.49

Outer edge stress [kN/m²] -116.89Inner edge stress [kN/m²] 69.64**Multiplier****Class**

1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



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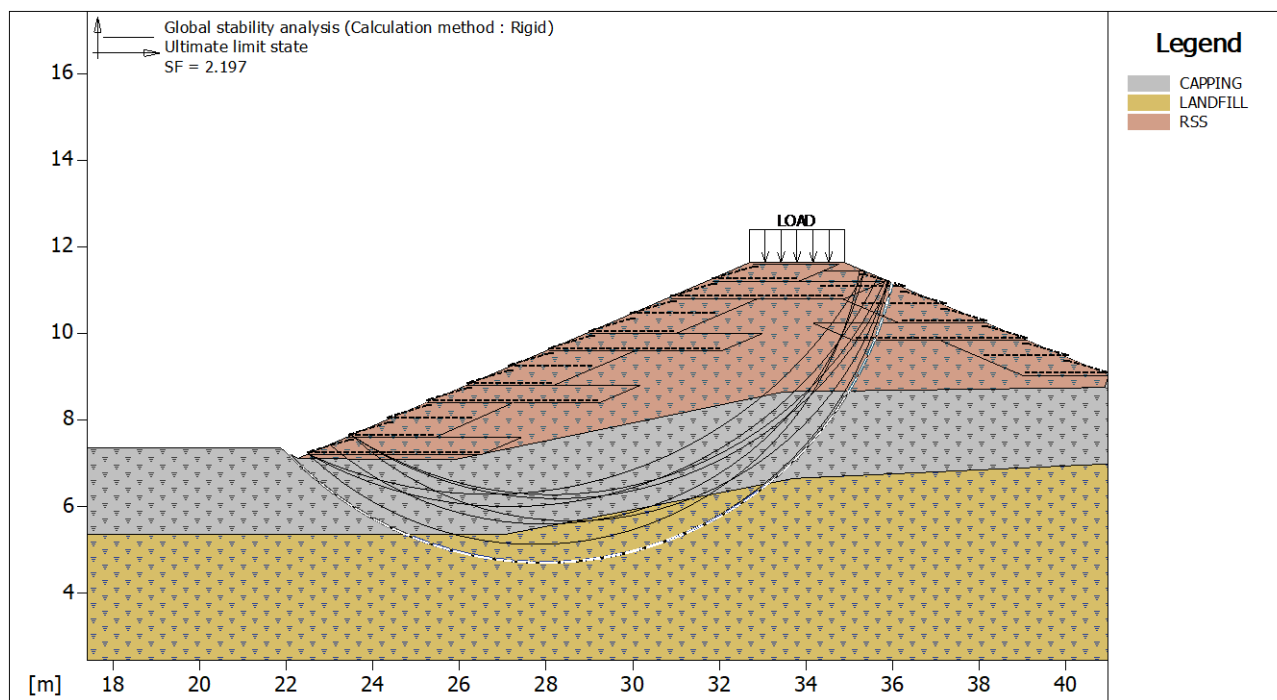
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**Global Stability Check :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 2.197

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
22.00	26.00	26.00	36.00
Number of starting point on the starting segment.....:		9	
Total number of trial surfaces.....:		108	
Minimum base length of slices.....[m].....:		0.50	
Superior limit search angle.....[°].....:		0.00	
Inferior limit search angle.....[°].....:		0.00	

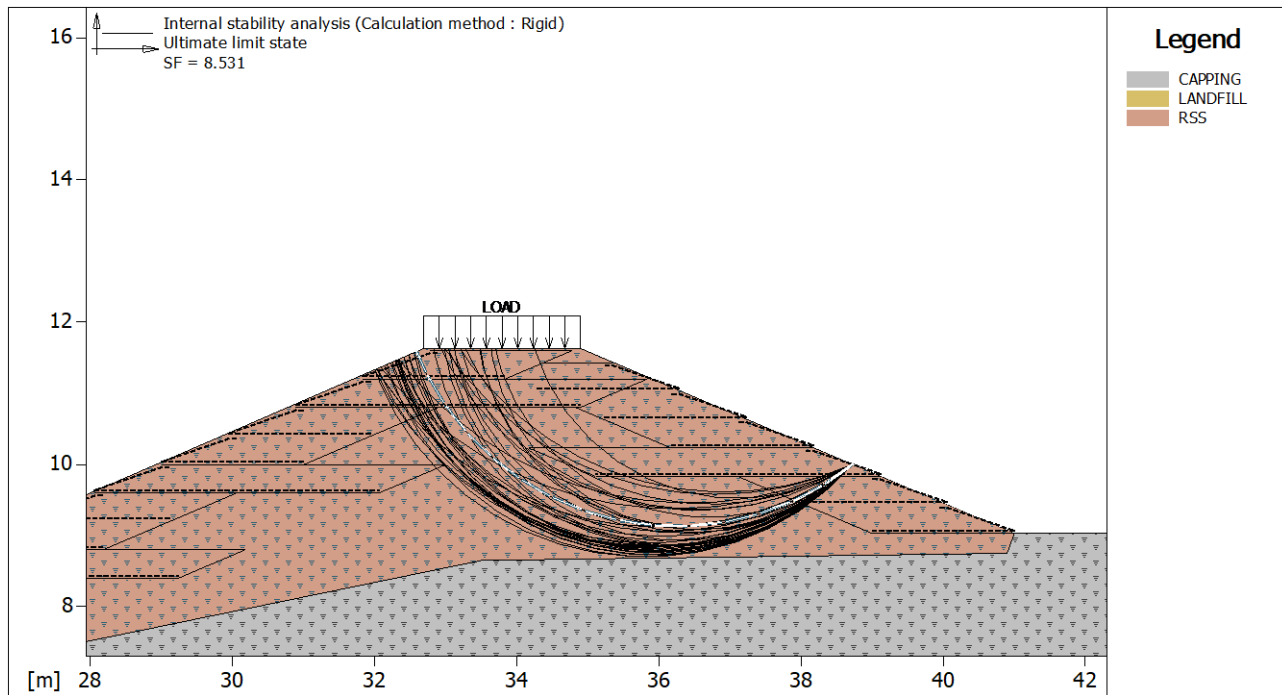
Block : R2
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
0.000	50.0	0.0	0.0	1.#J	-1.#J

Block : R3
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
0.400	50.0	0.0	0.0	1.#J	-1.#J
0.800	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)



Internal Stability :

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 8.531

Surfaces searching range

Block R2
First point 32.00
Arrival range, abscises [m]
Second point 37.00

Number of starting point on the starting segment.....: 1
Total number of trial surfaces.....: 100
Minimum base length of slices.....[m].....: 0.50
Superior limit search angle.....[°].....: 0.00
Inferior limit search angle.....[°].....: 0.00

Block : L7 Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
0.000	50.0	0.0	0.0	1.#J	-1.#J

Block : L8 Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
0.000	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)



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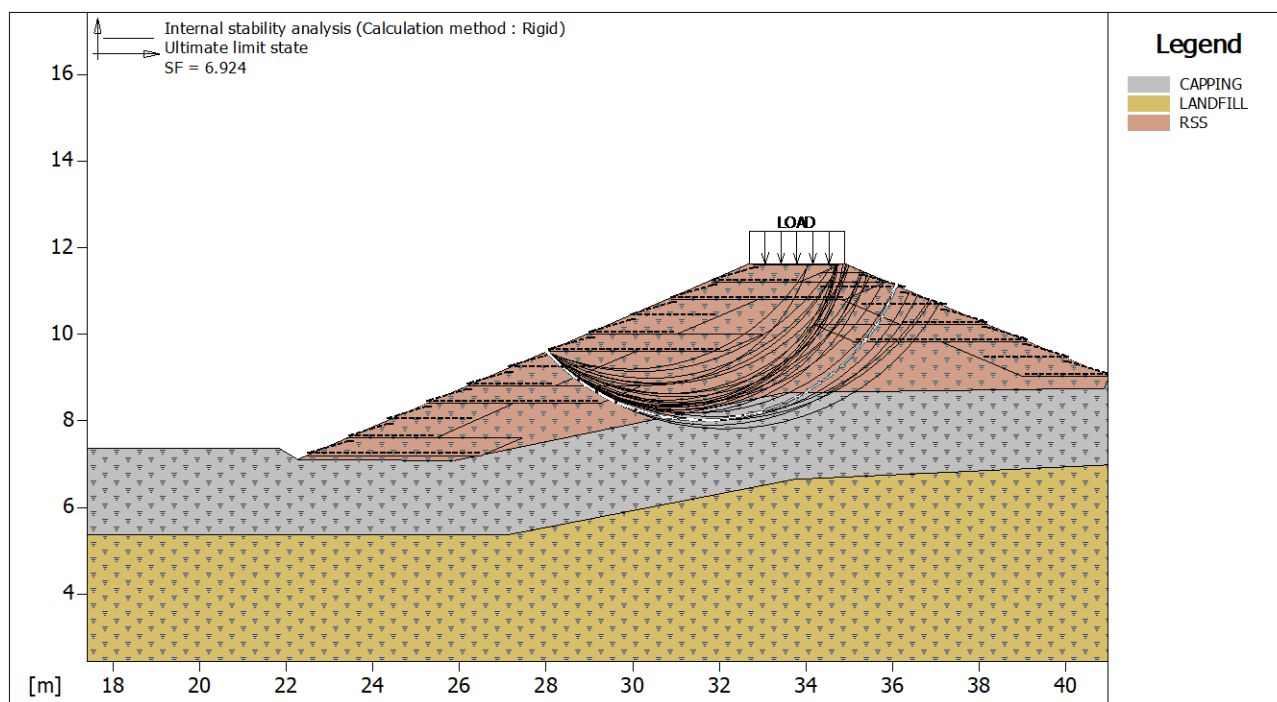
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**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor : 6.924

Surfaces searching range

Block

Arrival range, abscises [m]

L5

First point

Second point

28.00

38.00

Number of starting point on the starting segment : 1

Total number of trial surfaces : 100

Minimum base length of slices [m] : 0.50

Superior limit search angle [°] : 0.00

Inferior limit search angle [°] : 0.00

Block : R2

Basetex 200/50

Y

Tb

Tp

Td

Tb/Td

Tp/Td

breakage

pullout

design

1/Fmax

[m]

[kN/m]

[kN/m]

[kN/m]

0.000

50.0

0.0

0.0

1.#J

-1.#J

Block : R3

Basetex 200/50

Y

Tb

Tp

Td

Tb/Td

Tp/Td

breakage

pullout

design

1/Fmax

[m]

[kN/m]

[kN/m]

[kN/m]

0.400

50.0

0.0

0.0

1.#J

-1.#J

0.800

50.0

0.0

0.0

1.#J

-1.#J

Multiplier

Class

1.30

External live loads

1.00

Soil material factor tan(phi)

1.60

Soil material factor c'

1.50

Soil unit weight

1.00

Category of structure

1.30

Pull-out factor (= fp x fn)



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Cross Section.....: Section S2

File.....: S2 undrained analysis global 06022023

Date.....: 02/03/2023

Checks according to: Eurocode 7 EN 1997-1

Eurocode 7 EN 1997-1

TABLE OF CONTENTS

SOIL PROPERTIES

Soil: CAPPING		Description:
Cohesion Class.....	Undrained shear strength	
Cohesion.....	[kN/m ²]	30.00
Friction Angle Class.....	Angle of shearing resistance (Tan phi)	
Friction Angle.....	[°]	0.00
Ru value.....		0.10
Weight Class.....	Weight density	
Bulk unit weight – above GWT.....	[kN/m ³]	19.00
Bulk unit weight – below GWT.....	[kN/m ³]	19.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30

Soil: LANDFILL		Description:
Cohesion Class.....	Undrained shear strength	
Cohesion.....	[kN/m ²]	25.00
Friction Angle Class.....	Angle of shearing resistance (Tan phi)	
Friction Angle.....	[°]	0.00
Ru value.....		0.20
Weight Class.....	Weight density	
Bulk unit weight – above GWT.....	[kN/m ³]	8.00
Bulk unit weight – below GWT.....	[kN/m ³]	8.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30

Soil: RSS		Description: RSS backfill
Cohesion Class.....	Undrained shear strength	
Cohesion.....	[kN/m ²]	80.00
Friction Angle Class.....	Angle of shearing resistance (Tan phi)	
Friction Angle.....	[°]	0.00
Ru value.....		0.10
Weight Class.....	Weight density	
Bulk unit weight – above GWT.....	[kN/m ³]	19.00
Bulk unit weight – below GWT.....	[kN/m ³]	19.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30

STRATA PROFILES

Stratum: BUND		Description:					
Soil : RSS							
X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
22.26	7.11	32.69	11.63	34.90	11.63	41.00	9.03

Stratum: CAPPING		Description:					
Soil : CAPPING							
X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
3.82	7.36	21.84	7.36	22.26	7.11	25.86	7.08
33.51	8.65	40.90	8.75	41.00	9.03	69.11	9.05



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Stratum: LANDFILL

Description:

Soil : LANDFILL

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
3.82	5.36	27.07	5.36	33.73	6.65	42.42	7.05
69.11	7.05						

REINFORCED BLOCKS**Block : L1**

Block dimensions_____ [m] : Base width_____ = 4.00 Height_____ = 0.40
Block Origin_____ [m] : Abscissa_____ = 22.50 Ordinate_____ = 7.20
Face inclination_____ [°] : 67.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m] = 4.00
Vertical spacing_____ [m] = 0.40
Wrapped length_____ [m] = 0.10

Block : L2

Block dimensions_____ [m] : Base width_____ = 2.00 Height_____ = 0.80
Back Shift_____ [m] = 0.00 by L1
Face inclination_____ [°] : 66.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m] = 2.00
Vertical spacing_____ [m] = 0.40
Wrapped length_____ [m] = 0.10

Block : L3

Block dimensions_____ [m] : Base width_____ = 4.00 Height_____ = 0.40
Back Shift_____ [m] = 0.00 by L2
Face inclination_____ [°] : 67.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00



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Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 4.00
Vertical spacing_____ [m]_____ = 0.40
Wrapped length_____ [m]_____ = 0.10

Block : L4

Block dimensions_____ [m]_____ : Base width_____ = 2.00 Height_____ = 0.80
Back Shift_____ [m]_____ = 0.00 by L3
Face inclination_____ [°]_____ : 67.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 2.00
Vertical spacing_____ [m]_____ = 0.40
Wrapped length_____ [m]_____ = 0.10

Block : R1

Block dimensions_____ [m]_____ : Base width_____ = 2.00 Height_____ = 0.80
Block Origin_____ [m]_____ : Abscissa_____ = 41.00 Ordinate_____ = 9.03
Face inclination_____ [°]_____ : 67.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 2.00
Vertical spacing_____ [m]_____ = 0.40
Wrapped length_____ [m]_____ = 0.10

Block : L5

Block dimensions_____ [m]_____ : Base width_____ = 4.00 Height_____ = 0.40
Back Shift_____ [m]_____ = 0.00 by L4
Face inclination_____ [°]_____ : 67.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 4.00
Vertical spacing_____ [m]_____ = 0.40
Wrapped length_____ [m]_____ = 0.10



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Block : R2

Block dimensions[m] : Base width = 4.00 Height = 0.40

Back Shift[m] = 0.00 by R1

Face inclination[°] : 67.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 4.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : L6

Block dimensions[m] : Base width = 2.00 Height = 0.80

Back Shift[m] = 0.00 by L5

Face inclination[°] : 67.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : R3

Block dimensions[m] : Base width = 2.00 Height = 1.20

Back Shift[m] = 0.00 by R2

Face inclination[°] : 67.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : L7

Block dimensions[m] : Base width = 4.00 Height = 0.40

Back Shift[m] = 0.00 by L6

Face inclination[°] : 67.00



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Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 4.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L8

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L7
Face inclination.....[°] : 67.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

SURCHARGE LOADS

Distributed Loads : LOAD

Description :

Class : Variable unfavourable

Magnitude.....[kN/m²] = 10.00 Inclination angle.....[°] = 0.00
Abscissa.....[m] : from = 32.69 To = 34.90

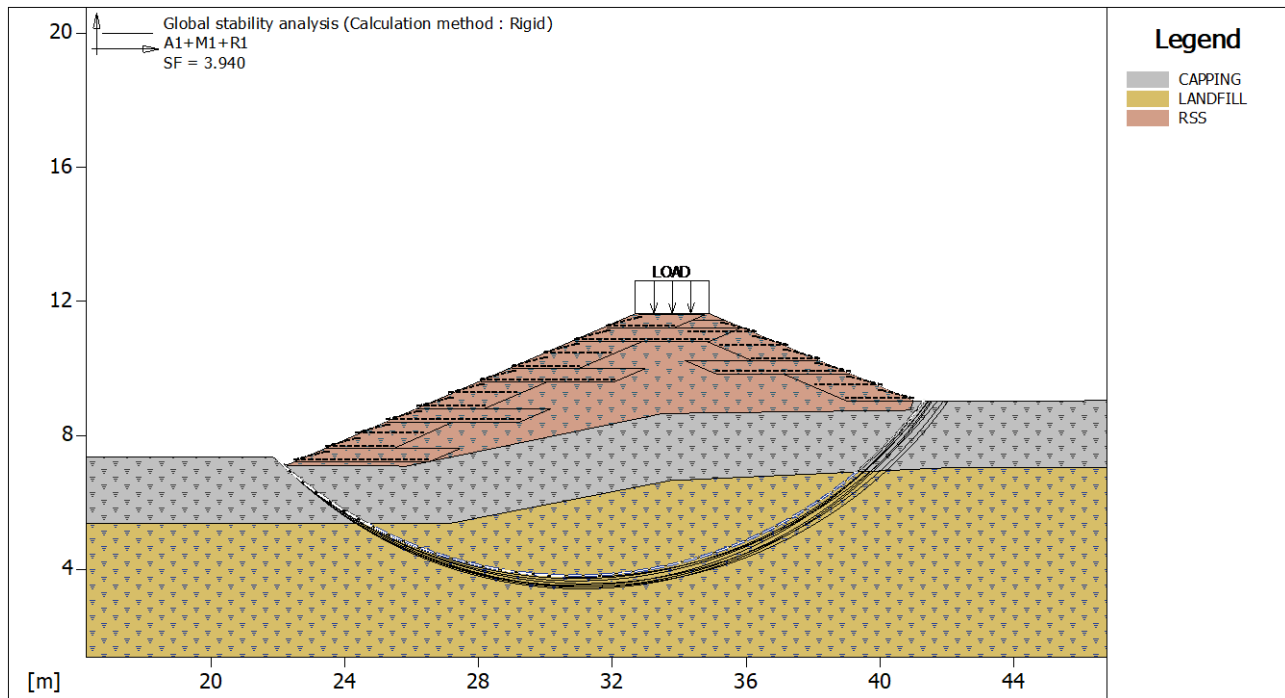
PROPERTIES OF THE USED REINFORCEMENTS

Basetex 200/50

Tensile strength UTS[kN/m] : 200.00
Minimum anchorage length.....[m] : 0.15
Breakage Safety Factor (gravel).....: 1.54
Breakage Safety Factor (sand).....: 1.52
Breakage Safety Factor (silty sand).....: 1.52
Breakage Safety Factor (sandy clay).....: 2.06
Interaction factor reinforcement/reinforcement.....: 0.16
Pullout coefficient reinforcement-gravel.....: 0.90
Pullout coefficient reinforcement-sand.....: 0.90
Pullout coefficient reinforcement-silt.....: 0.70
Pullout coefficient reinforcement-clay.....: 0.40



CHECKS RESULTS



Global Stability Check :

Multiplier combination : A1+M1+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 3.940

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
22.00	23.00	41.00	60.00
Number of starting point on the starting segment.....:		1	
Total number of trial surfaces.....:		101	
Minimum base length of slices.....[m].....:		0.50	
Superior limit search angle.....[°].....:		0.00	
Inferior limit search angle.....[°].....:		0.00	

Multiplier	Class
1.50	Variable unfavourable
1.00	Angle of shearing resistance (Tan phi)
1.00	Effective cohesion
1.00	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



PROJECT:

HARTS FARM WAY HAVANT, HAMPSHIRE – RSS BUND

REF. NUMBER:

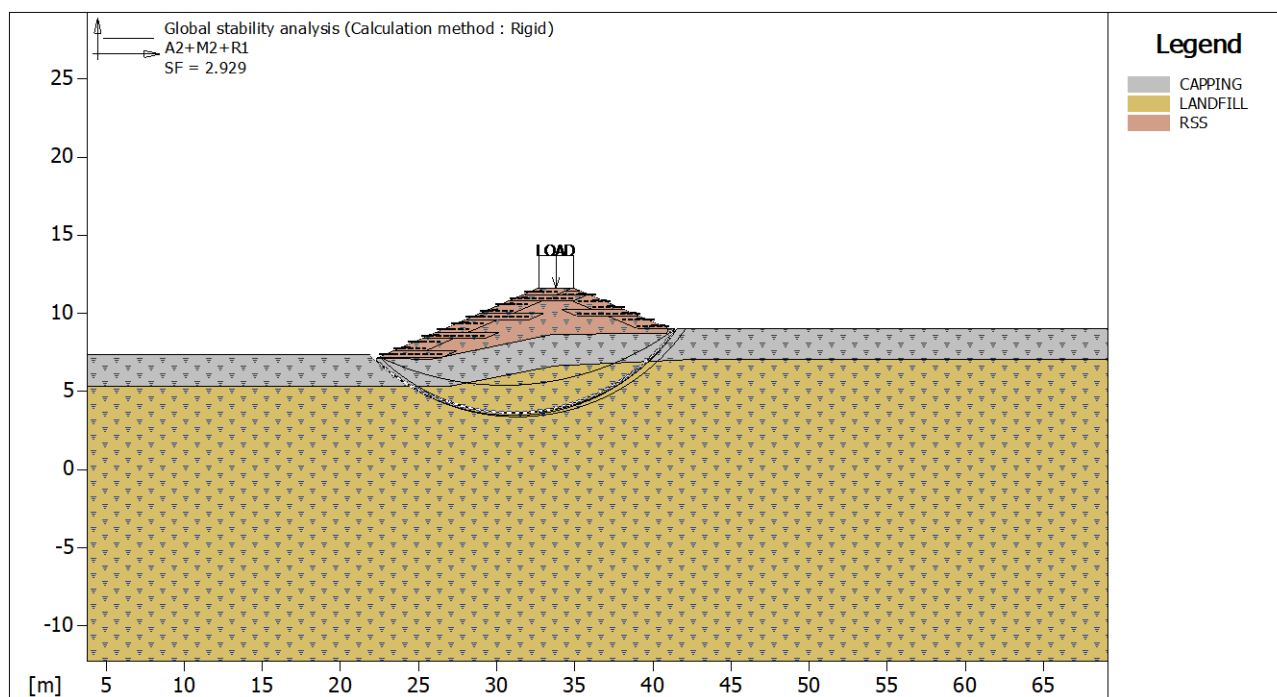
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**Global Stability Check :**

Multiplier combination : A2+M2+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 2.929

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
22.00	23.00	41.00	60.00
Number of starting point on the starting segment.....:		3	
Total number of trial surfaces.....:		102	
Minimum base length of slices.....[m].....:		0.50	
Superior limit search angle.....[°].....:		0.00	
Inferior limit search angle.....[°].....:		0.00	

Multiplier	Class
1.30	Variable unfavourable
1.25	Angle of shearing resistance (Tan phi)
1.25	Effective cohesion
1.40	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



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REF. NUMBER:

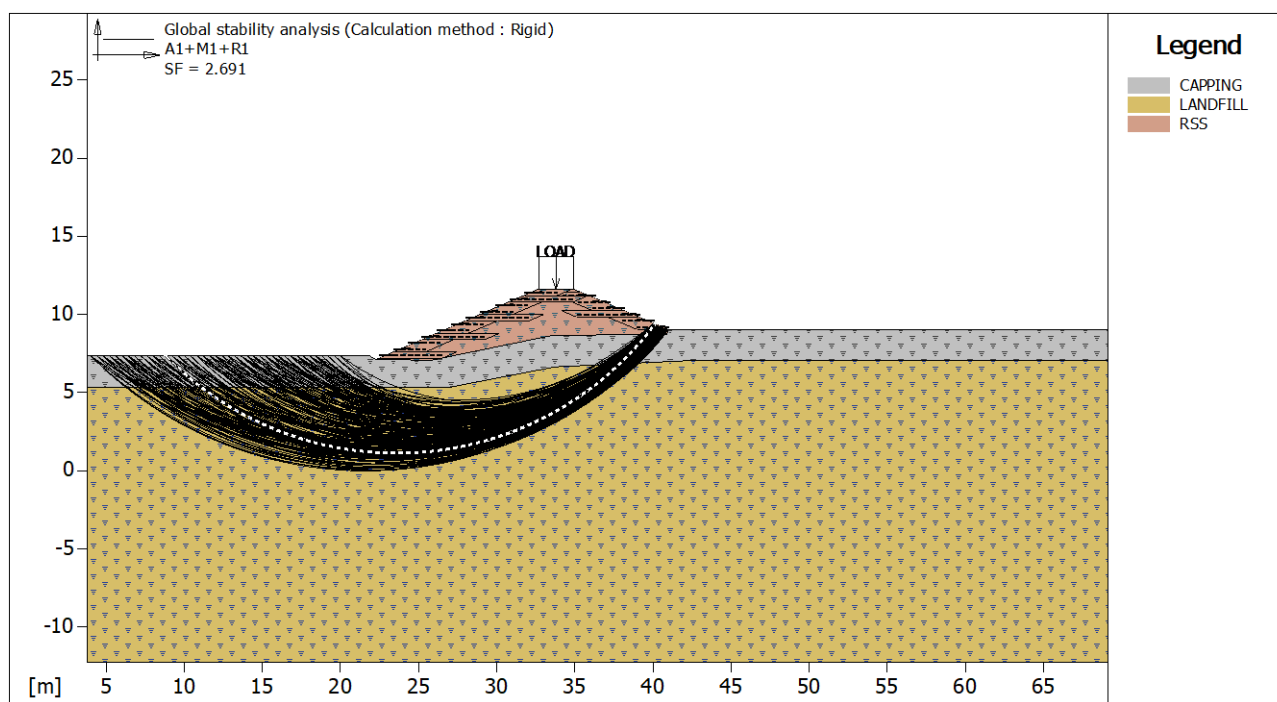
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**Global Stability Check :**

Multiplier combination : A1+M1+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 2.691

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
4.00	20.00	40.00	41.00
Number of starting point on the starting segment.....:		41	
Total number of trial surfaces.....:		410	
Minimum base length of slices.....[m].....:		0.50	
Superior limit search angle.....[°].....:		0.00	
Inferior limit search angle.....[°].....:		0.00	

Block : R1
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
0.000	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.50	Variable unfavourable
1.00	Angle of shearing resistance (Tan phi)
1.00	Effective cohesion
1.00	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



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REF. NUMBER:

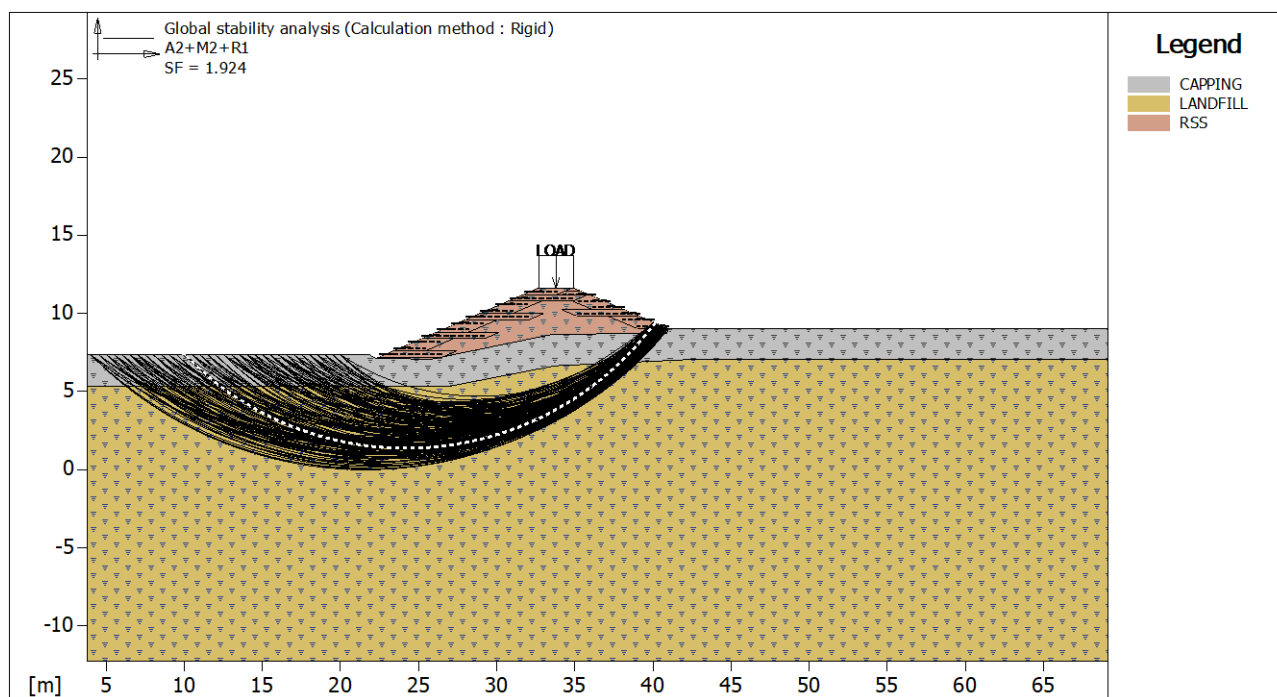
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**Global Stability Check :**

Multiplier combination : A2+M2+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 1.924

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
4.00	20.00	40.00	41.00
Number of starting point on the starting segment.....:		33	
Total number of trial surfaces.....:		330	
Minimum base length of slices.....[m].....:		0.50	
Superior limit search angle.....[°].....:		0.00	
Inferior limit search angle.....[°].....:		0.00	

Block : R1
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.30	Variable unfavourable
1.25	Angle of shearing resistance (Tan phi)
1.25	Effective cohesion
1.40	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



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Cross Section.....: Section S5

File.....: S5 drained analysis 06022023

Date.....: 02/03/2023

Checks according to: BS 8006-1:2010+A1:2016
Reinforced slope – Cat. 2 (medium)

TABLE OF CONTENTS SOIL PROPERTIES

Soil: CAPPING		Description:
Cohesion Class.....	: Soil material factor c'	
Cohesion.....	[kN/m ²]	0.00
Friction Angle Class.....	: Soil material factor tan(phi)	
Friction Angle.....	[°]	27.00
Ru value.....		0.10
Weight Class.....	: Soil unit weight	
Bulk unit weight – above GWT.....	[kN/m ³]	19.00
Bulk unit weight – below GWT.....	[kN/m ³]	19.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30

Soil: LANDFILL		Description:
Cohesion Class.....	: Soil material factor c'	
Cohesion.....	[kN/m ²]	0.00
Friction Angle Class.....	: Soil material factor tan(phi)	
Friction Angle.....	[°]	30.00
Ru value.....		0.20
Weight Class.....	: Soil unit weight	
Bulk unit weight – above GWT.....	[kN/m ³]	8.00
Bulk unit weight – below GWT.....	[kN/m ³]	8.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30

Soil: RSS		Description: RSS backfill
Cohesion Class.....	: Soil material factor c'	
Cohesion.....	[kN/m ²]	0.00
Friction Angle.....	[°]	25.00
Ru value.....		0.10
Weight Class.....	: Soil unit weight	
Bulk unit weight – above GWT.....	[kN/m ³]	19.00
Bulk unit weight – below GWT.....	[kN/m ³]	19.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30

STRATA PROFILES

Stratum: BUND		Description:					
Soil : RSS							
X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
27.15	7.73	42.66	15.55	44.71	15.55	59.68	8.04

Stratum: CAPPING		Description:					
Soil : CAPPING							
X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
7.55	6.69	26.30	7.91	27.15	7.73	29.55	7.73
38.84	9.90	49.51	9.97	53.87	8.04	59.68	8.04
60.45	8.36	71.20	8.36				



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Stratum: LANDFILL

Description:

Soil : LANDFILL

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
7.55	4.69	26.15	5.90	53.44	6.04	71.20	6.04

REINFORCED BLOCKS**Block : L1**

Block dimensions_____ [m] _____: Base width_____ = 2.00 Height_____ = 0.80
Block Origin_____ [m] _____: Abscissa_____ = 27.30 Ordinate_____ = 7.80
Face inclination_____ [°] _____: 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basotex 200/50

Length_____ [m] _____ = 2.00
Vertical spacing_____ [m] _____ = 0.40
Wrapped length_____ [m] _____ = 0.10

Block : R1

Block dimensions_____ [m] _____: Base width_____ = 5.00 Height_____ = 0.40
Block Origin_____ [m] _____: Abscissa_____ = 59.60 Ordinate_____ = 8.10
Face inclination_____ [°] _____: 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basotex 200/50

Length_____ [m] _____ = 5.00
Vertical spacing_____ [m] _____ = 0.40
Wrapped length_____ [m] _____ = 0.10

Block : R2

Block dimensions_____ [m] _____: Base width_____ = 2.00 Height_____ = 0.80
Back Shift_____ [m] _____ = 0.00 by R1
Face inclination_____ [°] _____: 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basotex 200/50



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Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : L2

Block dimensions.....[m].....: Base width.....= 4.50 Height.....= 0.40
Back Shift.....[m].....= 0.00 by L1
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 4.50
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : L3

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by L2
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R3

Block dimensions.....[m].....: Base width.....= 5.00 Height.....= 0.40
Back Shift.....[m].....= 0.00 by R2
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 5.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

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Block : R4

Block dimensions[m] : Base width = 2.00 Height = 0.80

Back Shift[m] = 0.00 by R3

Face inclination[°] : 63.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : L4

Block dimensions[m] : Base width = 5.00 Height = 0.40

Back Shift[m] = 0.00 by L3

Face inclination[°] : 63.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 5.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : L5

Block dimensions[m] : Base width = 2.00 Height = 0.80

Back Shift[m] = 0.00 by L4

Face inclination[°] : 63.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : R5

Block dimensions[m] : Base width = 5.00 Height = 0.40

Back Shift[m] = 0.00 by R4

Face inclination[°] : 63.00

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Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

Block : R6

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80

Back Shift.....[m] = 0.00 by R5

Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

Block : L6

Block dimensions.....[m] : Base width..... = 5.00 Height..... = 0.40

Back Shift.....[m] = 0.00 by L5

Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: CAPPING

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

Block : L7

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80

Back Shift.....[m] = 0.00 by L6

Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS



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Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

Block : R7

Block dimensions.....[m] : Base width..... = 5.00 Height..... = 0.40

Back Shift.....[m] = 0.00 by R6

Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay

Structural embankment.....: RSS

Backfill soil.....: RSS

Covering soil.....: RSS

Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

Block : R8

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80

Back Shift.....[m] = 0.00 by R7

Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay

Structural embankment.....: RSS

Backfill soil.....: RSS

Covering soil.....: RSS

Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

Block : L8

Block dimensions.....[m] : Base width..... = 5.00 Height..... = 0.40

Back Shift.....[m] = 0.00 by L7

Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay

Structural embankment.....: RSS

Backfill soil.....: RSS

Covering soil.....: RSS

Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00



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Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 5.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : L9

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by L8
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R9

Block dimensions.....[m].....: Base width.....= 10.00 Height.....= 0.40
Back Shift.....[m].....= 0.00 by R8
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 10.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R10

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by R9
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10



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Block : L10

Block dimensions[m] : Base width = 5.00 Height = 0.40
Back Shift[m] = 0.00 by L9
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 5.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : L11

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by L10
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: CAPPING

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : R11

Block dimensions[m] : Base width = 5.00 Height = 0.40
Back Shift[m] = 0.00 by R10
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 5.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : R12

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by R11
Face inclination[°] : 63.00



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Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L12

Block dimensions.....[m] : Base width..... = 4.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L11
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 4.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L13

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L12
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

SURCHARGE LOADS

Distributed Loads : LOAD

Description :

Class : External live loads

Magnitude.....[kN/m²] = 10.00 Inclination angle.....[°] = 0.00
Abscissa.....[m] : from = 42.66 To = 44.71



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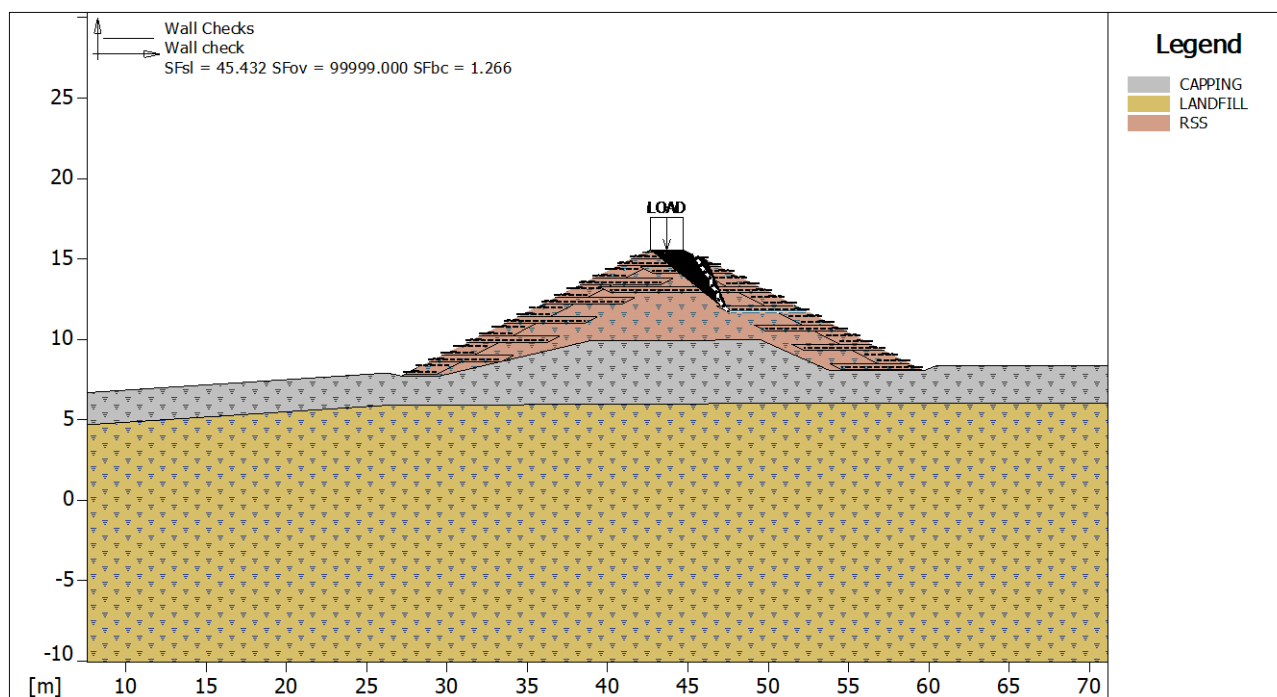
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PROPERTIES OF THE USED REINFORCEMENTS

Basotex 200/50

Tensile strength UTS	[kN/m]	200.00
Minimum anchorage length	[m]	0.15
Breakage Safety Factor (gravel)		1.54
Breakage Safety Factor (sand)		1.52
Breakage Safety Factor (silty sand)		1.52
Breakage Safety Factor (sandy clay)		2.06
Interaction factor reinforcement/reinforcement		0.16
Pullout coefficient reinforcement-gravel		0.90
Pullout coefficient reinforcement-sand		0.90
Pullout coefficient reinforcement-silt		0.70
Pullout coefficient reinforcement-clay		0.40

CHECKS RESULTS



Wall Checks :

Multiplier combination : Wall check

Considered block : R7

Resisting force	[kN/m]	303.59
Active force	[kN/m]	5.57
Sliding class	Sliding along base of structure	
Sliding safety factor		45.432
Restoring moment	[kN*m/m]	4818.80
Overturning moment	[kN*m/m]	-8.10
Overturning class	Overturning	
Overturning safety factor		99999.000
Ultimate bearing pressure computed with Limit Equilibrium method		

Ultimate bearing pressure	[kN/m ²]	164.80
Active pressure	[kN/m ²]	130.21
Pressure class	Bearing capacity	
Bearing capacity safety factor		1.266
Equivalent bearing area	[m]	5.00
Eccentricity of normal force	[m]	-4.91
Lever arm of overturning force	[m]	-1.45
Normal force on the base	[kN]	651.05
Outer edge stress	[kN/m ²]	-958.35
Inner edge stress	[kN/m ²]	688.66

Multiplier

Class



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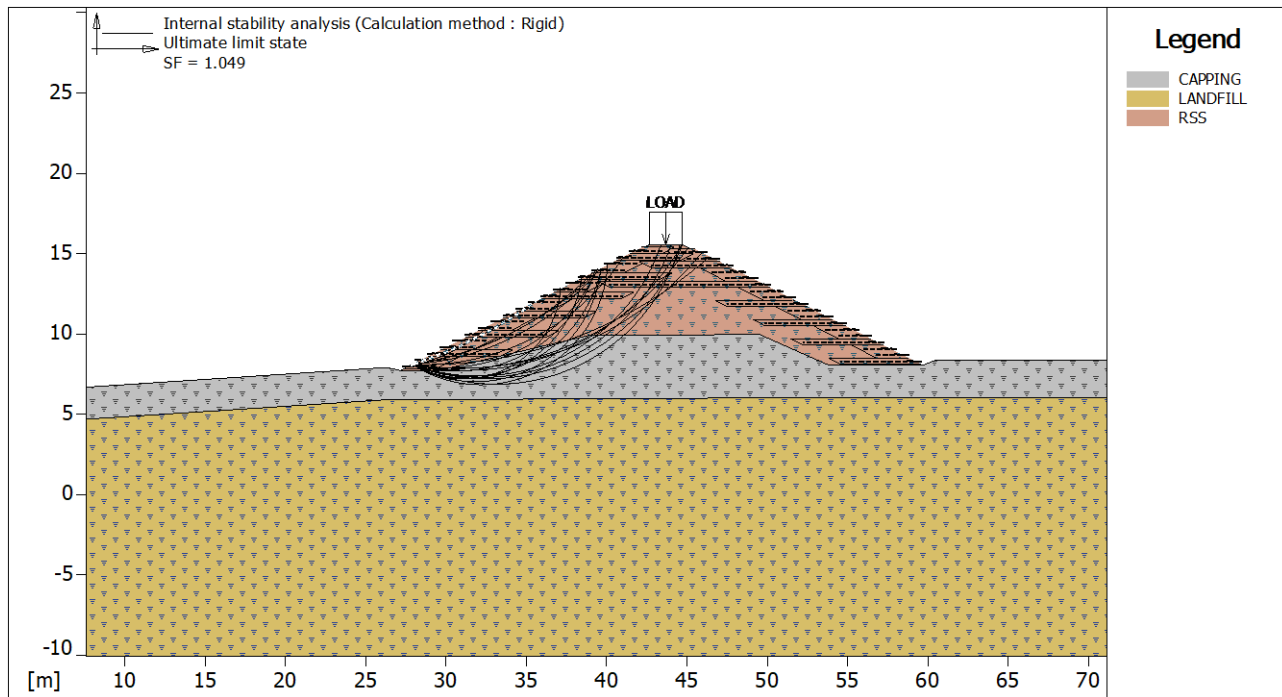
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1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning

**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 1.049

Surfaces searching range

Block

Arrival range, abscises [m]

L1

First point

Second point

32.00

48.00

Number of starting point on the starting segment.....: 1

Total number of trial surfaces.....: 100

Minimum base length of slices.....[m].....: 0.50

Superior limit search angle.....[°].....: 0.00

Inferior limit search angle.....[°].....: 0.00

Block : L1
Basotex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
	[kN/m]	[kN/m]	[kN/m]		
0.400	50.0	0.1	0.0	1.#J	1.#J

Block : L2
Basotex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.4	0.3	166.67	1.33

Block : L3



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Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.9	0.7	71.43	1.29
0.400	50.0	1.2	0.9	55.56	1.33

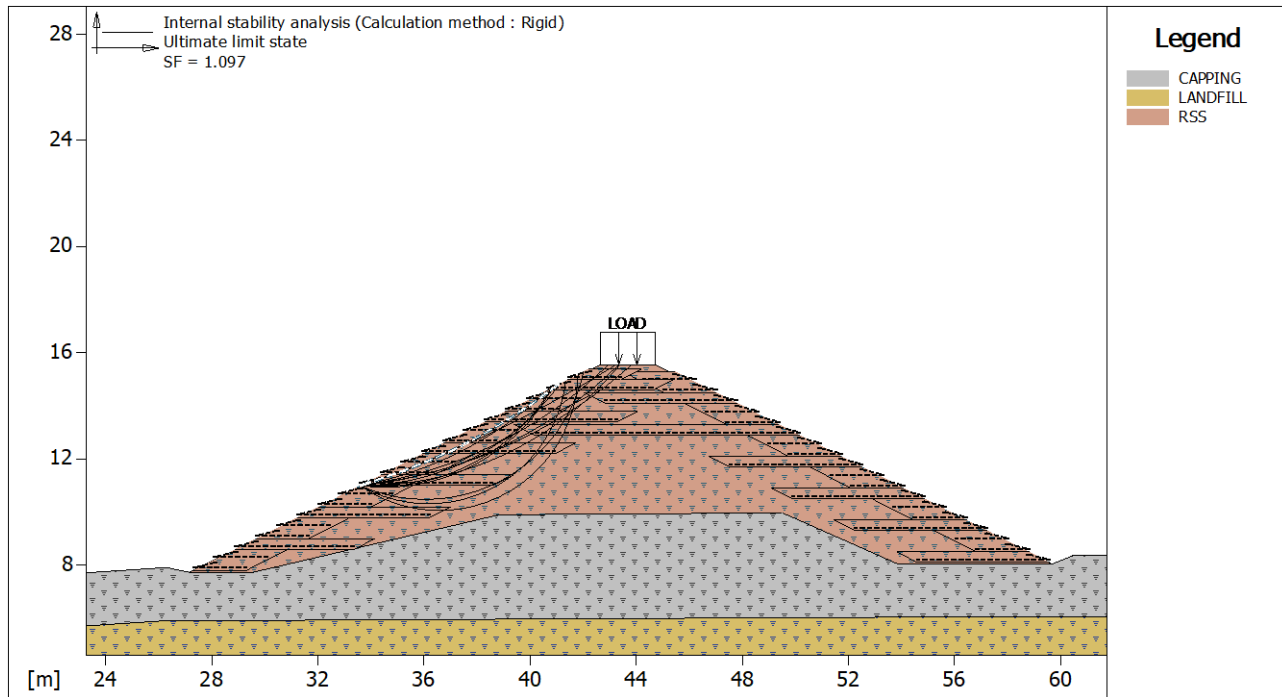
Block : L4 Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	1.3	1.0	50.00	1.30

Block : L5 Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	1.2	0.9	55.56	1.33
0.400	50.0	0.9	0.7	71.43	1.29

Block : L6 Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.6	0.4	125.00	1.50

Block : L7 Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.3	0.2	250.00	1.50
0.400	50.0	0.1	0.0	1.#J	1.#J

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)



Internal Stability :

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 1.097

Surfaces searching range

Block
L6

Arrival range, abscises [m]
First point 40.00
Second point 46.00

Number of starting point on the starting segment.....: 1
Total number of trial surfaces.....: 100
Minimum base length of slices.....[m].....: 0.50
Superior limit search angle.....[°].....: 0.00
Inferior limit search angle.....[°].....: 0.00

Block : L7 Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.5	0.4	125.00	1.25
0.400	50.0	1.2	0.9	55.56	1.33

Block : L8 Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	1.6	1.3	38.46	1.23

Block : L9 Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	1.7	1.3	38.46	1.31
0.400	50.0	1.6	1.2	41.67	1.33

Block : L10 Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
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[m]	breakage [kN/m]	pullout [kN/m]	design [kN/m]	1/Fmax	
0.000	50.0	1.2	0.9	55.56	1.33

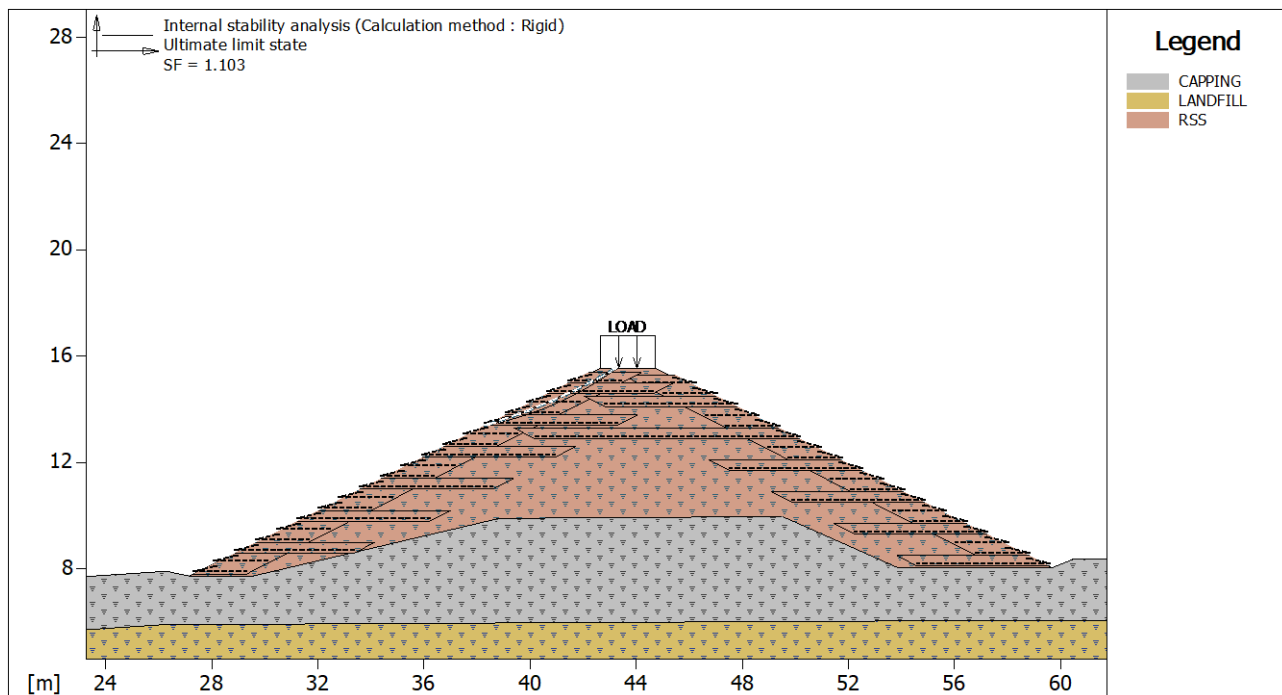
Block : L11
Basetex 200/50

Y	Tb breakage [kN/m]	Tp pullout [kN/m]	Td design [kN/m]	Tb/Td 1/Fmax	Tp/Td
[m]					
0.000	50.0	0.8	0.6	83.33	1.33
0.400	50.0	0.4	0.3	166.67	1.33

Block : L12
Basetex 200/50

Y	Tb breakage [kN/m]	Tp pullout [kN/m]	Td design [kN/m]	Tb/Td 1/Fmax	Tp/Td
[m]					
0.000	50.0	0.1	0.1	500.00	1.00

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)

**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 1.103

Surfaces searching range

Block	First point	Arrival range, abscises [m]	Second point
L10	43.00		48.00

Number of starting point on the starting segment.....: 1
Total number of trial surfaces.....: 100
Minimum base length of slices.....[m].....: 0.50



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Superior limit search angle [°] : 0.00
Inferior limit search angle [°] : 0.00

Block : L11
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.5	0.4	125.00	1.25
0.400	50.0	1.1	0.9	55.56	1.22

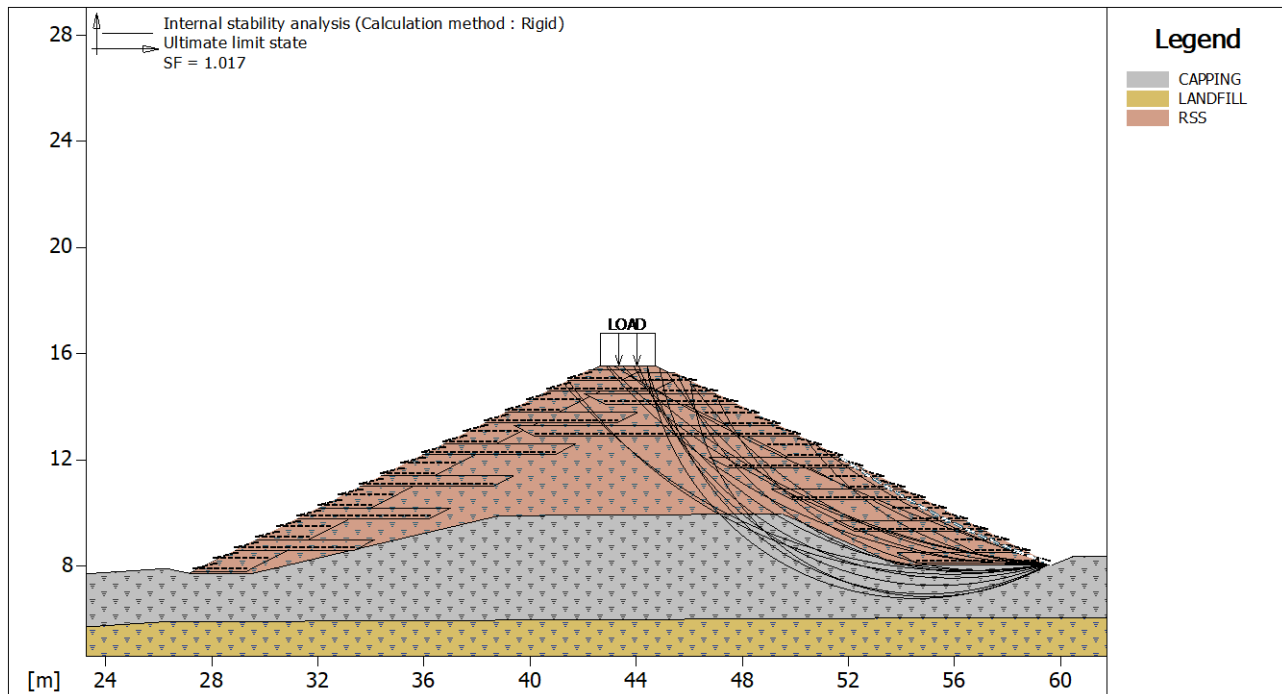
Block : L12
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	1.5	1.1	45.45	1.36

Block : L13
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	1.5	1.1	45.45	1.36

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)

**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor : 1.017

Surfaces searching range



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Block	Arrival range, abscises [m]	
R1	First point	Second point
	40.00	52.00
Number of starting point on the starting segment.....		1
Total number of trial surfaces.....		100
Minimum base length of slices.....[m].....		0.50
Superior limit search angle.....[°].....		0.00
Inferior limit search angle.....[°].....		0.00

Block : R2					
Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.2	0.2	250.00	1.00
0.400	50.0	0.6	0.4	125.00	1.50

Block : R3					
Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.9	0.7	71.43	1.29

Block : R4					
Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	1.0	0.8	62.50	1.25
0.400	50.0	1.0	0.8	62.50	1.25

Block : R5					
Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.9	0.7	71.43	1.29

Block : R6					
Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.6	0.5	100.00	1.20
0.400	50.0	0.4	0.3	166.67	1.33

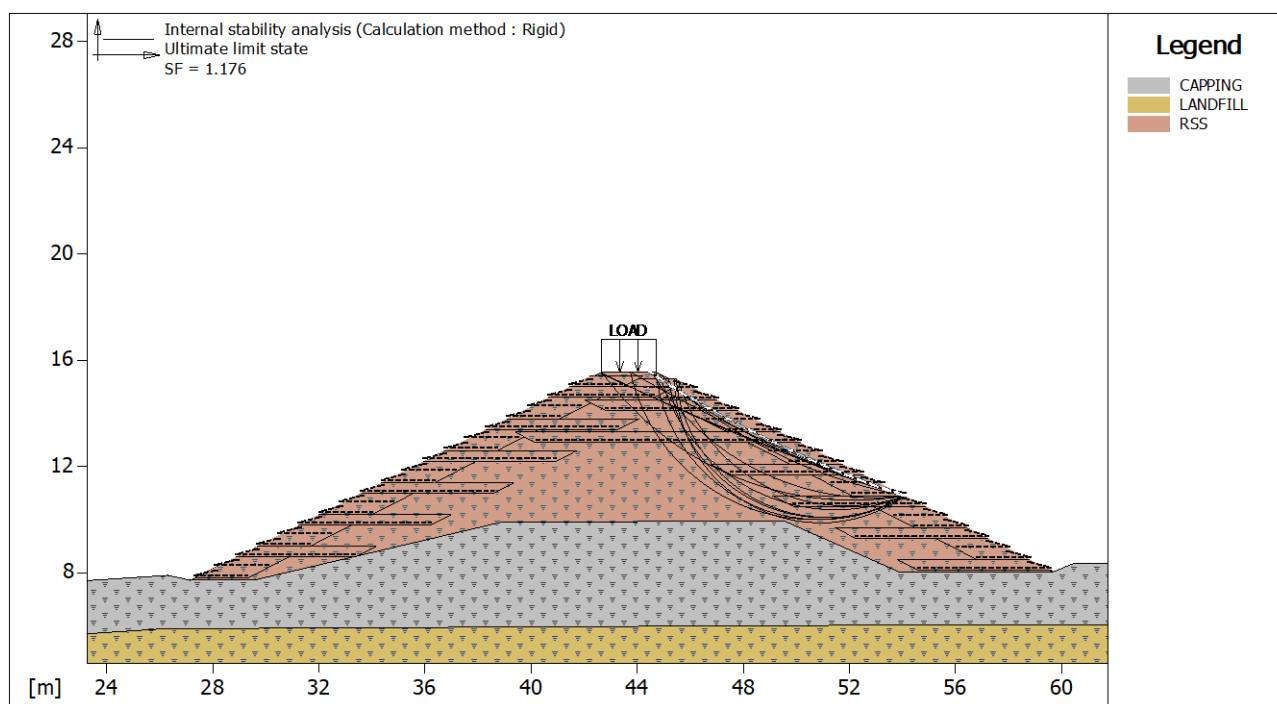
Block : R7					
Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.2	0.1	500.00	2.00

Block : R8					
Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure



1.30 Pull-out factor (= fp x fn)



Internal Stability :

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor : 1.176

Surfaces searching range

Block	Arrival range, abscises [m]
R6	First point 36.00 Second point 46.00

Number of starting point on the starting segment : 1
Total number of trial surfaces : 100
Minimum base length of slices [m] : 0.50
Superior limit search angle [°] : 0.00
Inferior limit search angle [°] : 0.00

Block : R6 Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.400	50.0	0.3	0.2	250.00	1.50

Block : R7 Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.9	0.7	71.43	1.29

Block : R8 Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	1.5	1.1	45.45	1.36
0.400	50.0	2.0	1.5	33.33	1.33

Block : R9



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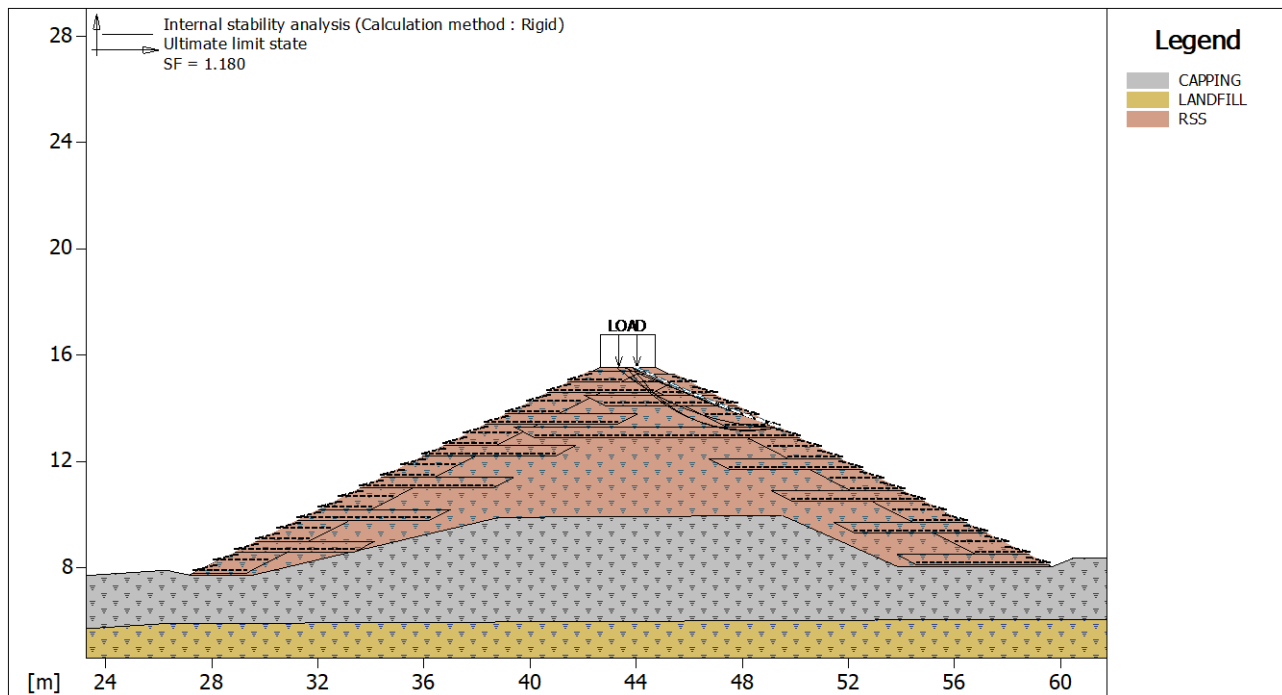
Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	2.3	1.8	27.78	1.28

Block : R10 Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	2.4	1.8	27.78	1.33
0.400	50.0	2.3	1.8	27.78	1.28

Block : R11 Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	2.1	1.6	31.25	1.31

Block : R12 Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	1.7	1.3	38.46	1.31
0.400	50.0	1.3	1.0	50.00	1.30

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)



Internal Stability :
Multiplier combination : Ultimate limit state
Reinforcements active Forces according to Rigid Method



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Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor: 1.180

Surfaces searching range

Block R10

Arrival range, abscises [m]

First point 40.00

Second point 44.00

Number of starting point on the starting segment: 1

Total number of trial surfaces: 100

Minimum base length of slices [m]: 0.50

Superior limit search angle [°]: 0.00

Inferior limit search angle [°]: 0.00

Block : R10
Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.400	50.0	0.3	0.2	250.00	1.50

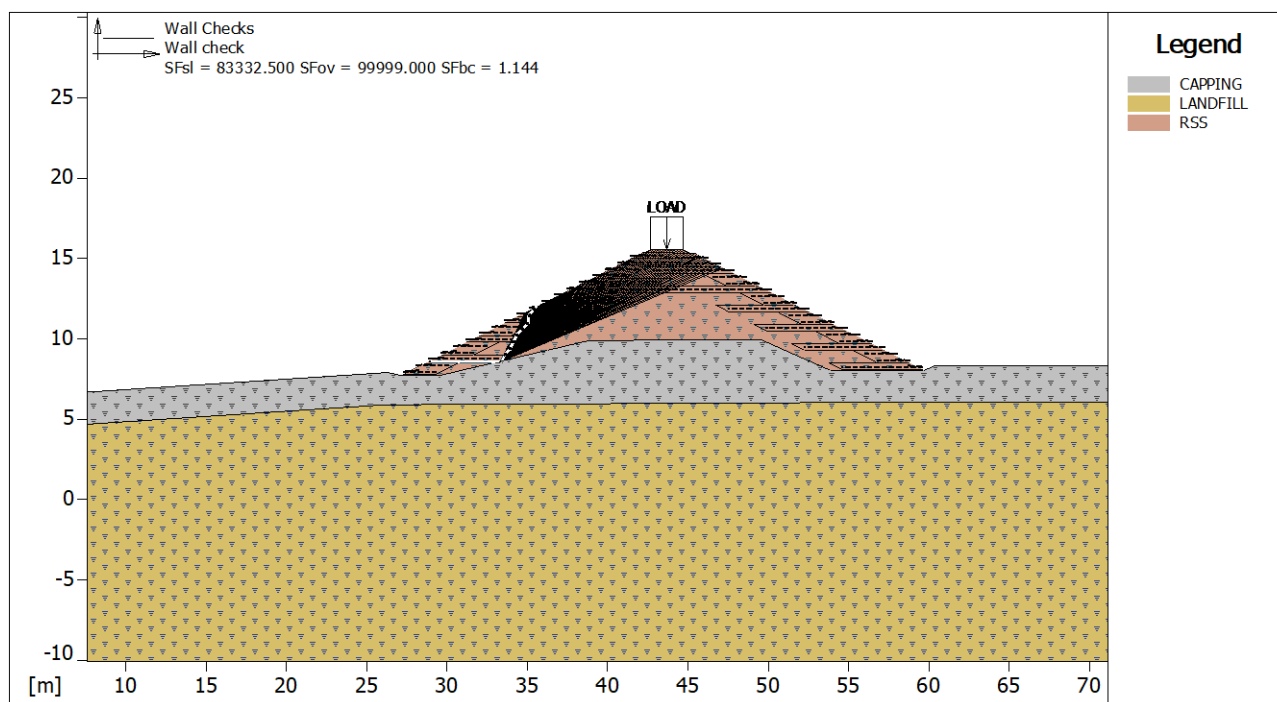
Block : R11
Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.7	0.6	83.33	1.17

Block : R12
Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	1.3	1.0	50.00	1.30
0.400	50.0	1.7	1.3	38.46	1.31

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)



Wall Checks :

Multiplier combination : Wall check

Considered block : L2

Resisting force.....[kN/m].....: 367.50

Active force.....[kN/m].....: -21.50

Sliding class.....: Sliding along base of structure

Sliding safety factor.....: 83332.500

Restoring moment.....[kN*m/m].....: 7124.80

Overturning moment.....[kN*m/m].....: -117.05

Overturning class: Overturning

Overturning safety factor.....: 99999.000

Imposed ultimate bearing pressure

Ultimate bearing pressure.....[kN/m²].....: 200.00

Active pressure.....[kN/m²].....: 174.78

Pressure class...: Bearing capacity

Bearing capacity safety factor.....: 1.144

Equivalent bearing area.....[m].....: 4.50

Eccentricity of normal force.....[m].....: -6.96

Lever arm of overturning force.....[m].....: 5.44

Normal force on the base.....[kN].....: 786.52

Outer edge stress.....[kN/m²].....: -453.94

Inner edge stress.....[kN/m²].....: 286.86

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



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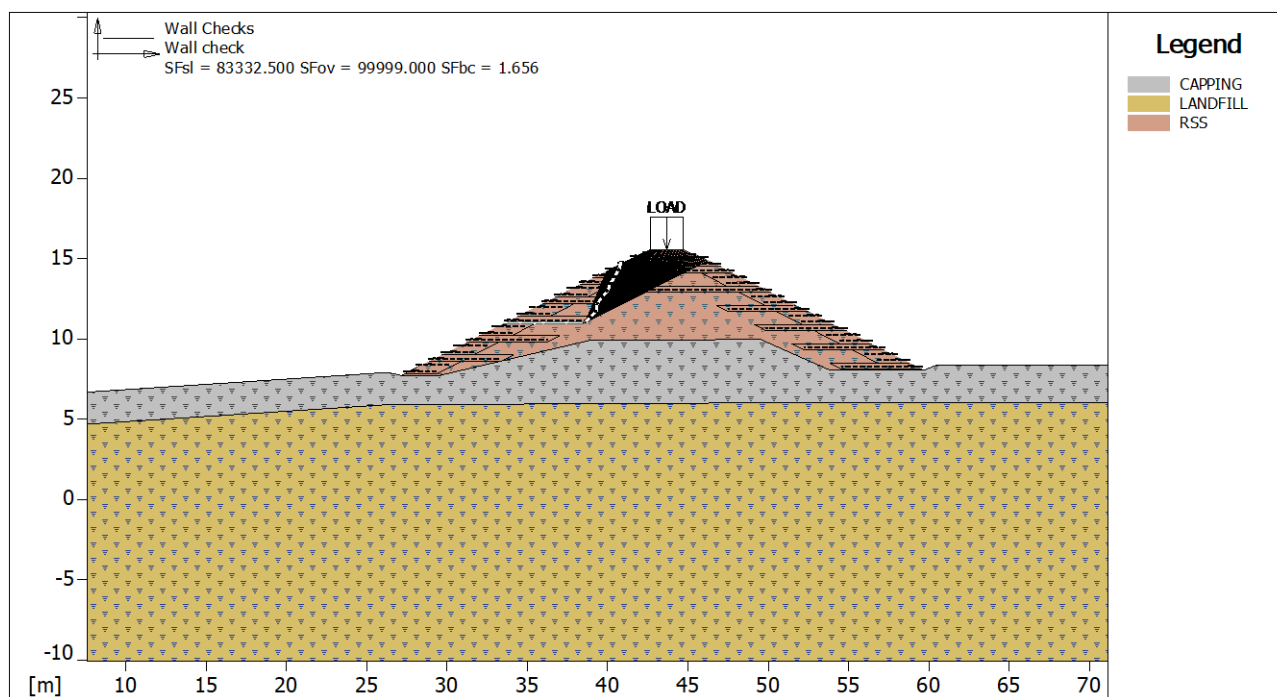
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**Wall Checks :**

Multiplier combination : Wall check

Considered block : L6

Resisting force.....[kN/m]..... 245.42

Active force.....[kN/m]..... -13.57

Sliding class.....: Sliding along base of structure

Sliding safety factor..... 83332.500

Restoring moment.....[kN*m/m]..... 3476.20

Overturning moment.....[kN*m/m]..... -66.68

Overturning class: Overturning

Overturning safety factor..... 99999.000

Ultimate bearing pressure computed with Limit Equilibrium method

Ultimate bearing pressure.....[kN/m²]..... 174.40Active pressure.....[kN/m²]..... 105.30

Pressure class...: Bearing capacity

Bearing capacity safety factor..... 1.656

Equivalent bearing area.....[m]..... 5.00

Eccentricity of normal force.....[m]..... -4.23

Lever arm of overturning force.....[m]..... 4.91

Normal force on the base.....[kN]..... 526.31

Outer edge stress.....[kN/m²]..... -1266.12Inner edge stress.....[kN/m²]..... 962.17

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



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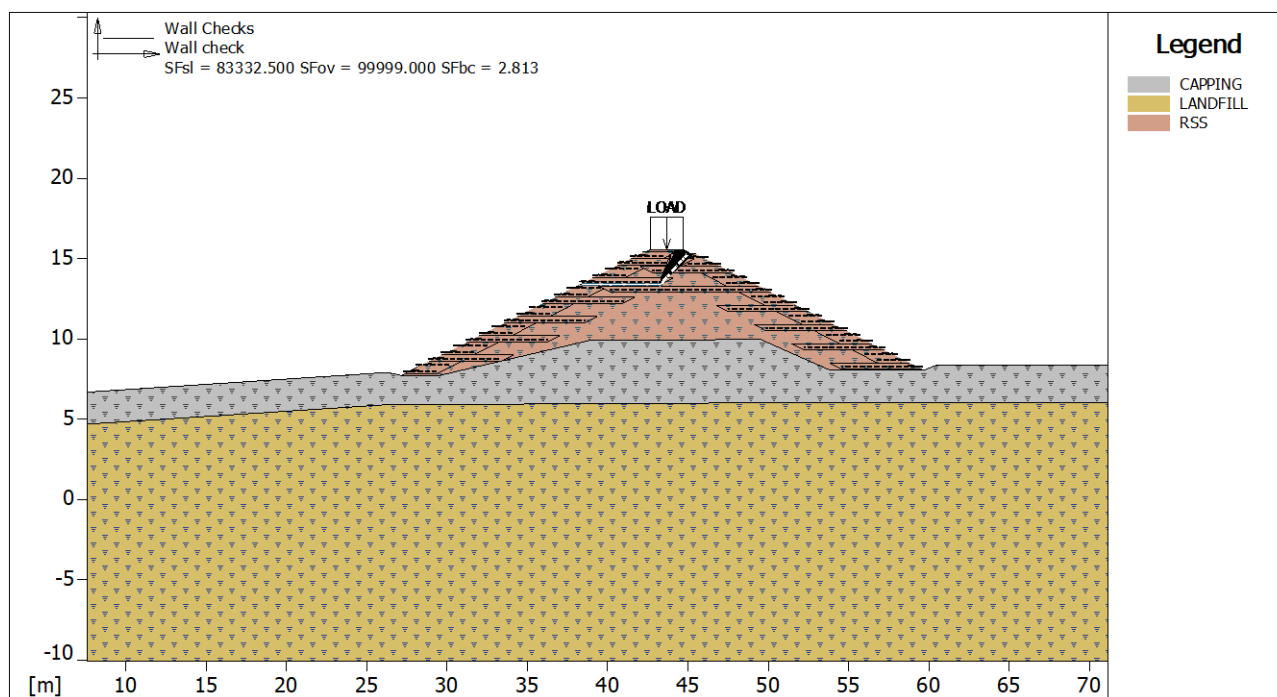
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**Wall Checks :**

Multiplier combination : Wall check

Considered block : L10

Resisting force.....[kN/m].....: 116.91

Active force.....[kN/m].....: -10.87

Sliding class.....: Sliding along base of structure

Sliding safety factor.....: 83332.500

Restoring moment.....[kN*m/m].....: 1042.40

Overturning moment.....[kN*m/m].....: -10.07

Overturning class: Overturning

Overturning safety factor.....: 99999.000

Ultimate bearing pressure computed with Limit Equilibrium method

Ultimate bearing pressure.....[kN/m²].....: 141.16Active pressure.....[kN/m²].....: 50.19

Pressure class...: Bearing capacity

Bearing capacity safety factor.....: 2.813

Equivalent bearing area.....[m].....: 5.00

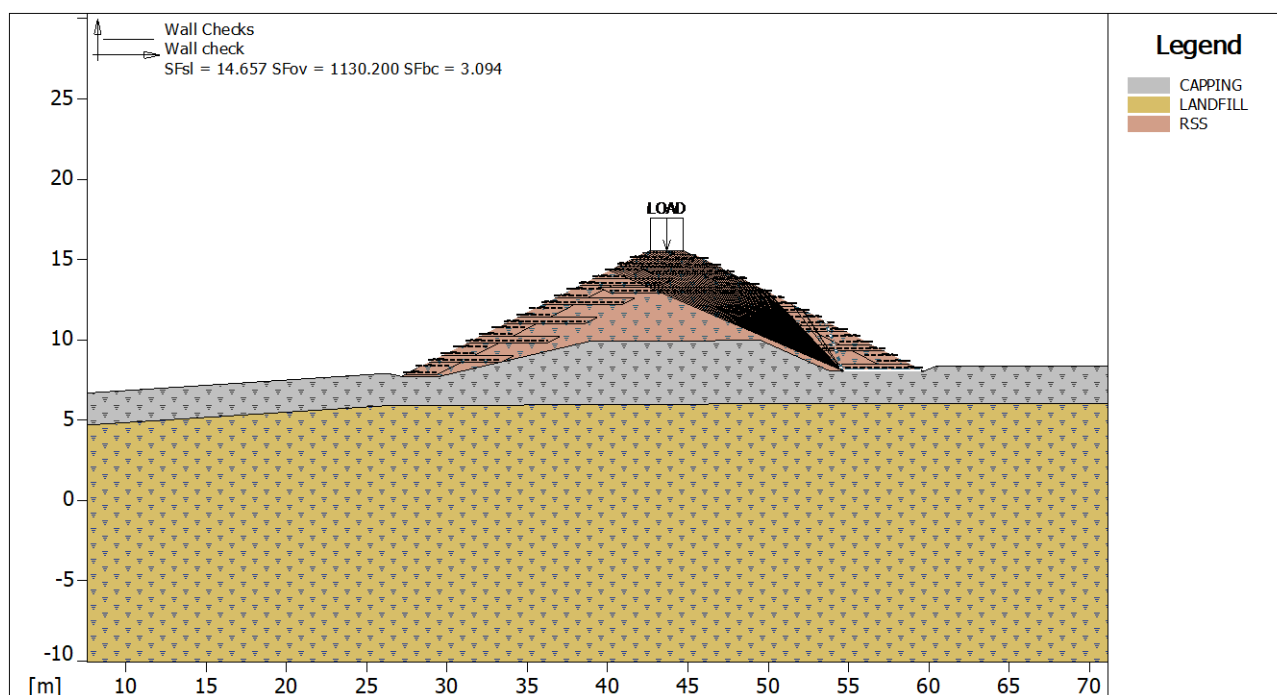
Eccentricity of normal force.....[m].....: -1.70

Lever arm of overturning force.....[m].....: 0.93

Normal force on the base.....[kN].....: 250.71

Outer edge stress.....[kN/m²].....: -836.76Inner edge stress.....[kN/m²].....: 1149.41

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



Wall Checks :

Multiplier combination : Wall check

Considered block : R1

Resisting force.....[kN/m]..... 496.36

Active force.....[kN/m]..... 28.22

Sliding class.....: Sliding along base of structure

Sliding safety factor.....: 14.657

Restoring moment.....[kN*m/m]..... 11784.00

Overturning moment.....[kN*m/m]..... 10.43

Overturning class: Overturning

Overturning safety factor.....: 1130.200

Ultimate bearing pressure computed with Limit Equilibrium method

Ultimate bearing pressure.....[kN/m²]..... 658.86

Active pressure.....[kN/m²]..... 212.96

Pressure class...: Bearing capacity

Bearing capacity safety factor.....: 3.094

Equivalent bearing area.....[m]..... 5.00

Eccentricity of normal force.....[m]..... -8.56

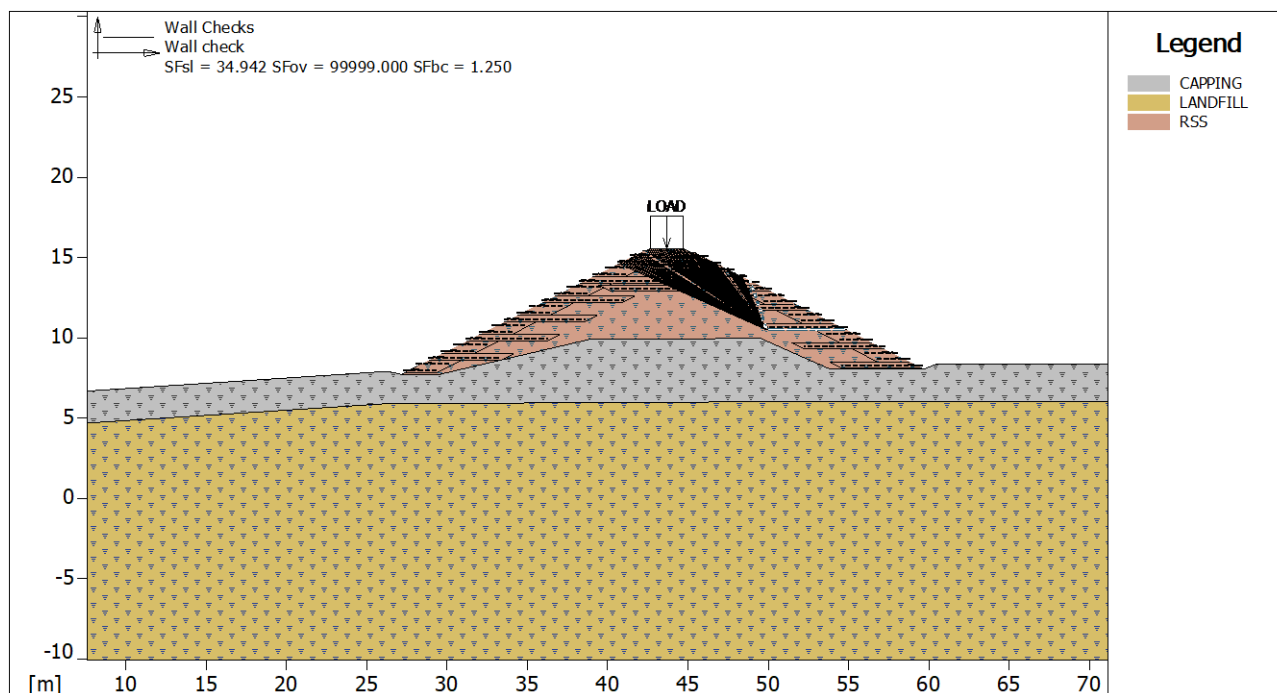
Lever arm of overturning force.....[m]..... 0.37

Normal force on the base.....[kN]..... 1064.40

Outer edge stress.....[kN/m²]..... -459.86

Inner edge stress.....[kN/m²]..... 284.26

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



Wall Checks :

Multiplier combination : Wall check

Considered block : R5

Resisting force.....[kN/m] : 367.85

Active force.....[kN/m] : 8.77

Sliding class.....: Sliding along base of structure

Sliding safety factor.....: 34.942

Restoring moment.....[kN*m/m] : 6816.20

Overturning moment.....[kN*m/m] : -21.68

Overturning class: Overturning

Overturning safety factor.....: 99999.000

Ultimate bearing pressure computed with Limit Equilibrium method

Ultimate bearing pressure.....[kN/m²] : 197.22

Active pressure.....[kN/m²] : 157.78

Pressure class...: Bearing capacity

Bearing capacity safety factor.....: 1.250

Equivalent bearing area.....[m] : 5.00

Eccentricity of normal force.....[m] : -6.17

Lever arm of overturning force.....[m] : -2.47

Normal force on the base.....[kN] : 788.85

Outer edge stress.....[kN/m²] : -649.95

Inner edge stress.....[kN/m²] : 434.90

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



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Cross Section.....: Section S5

File.....: S5 drained analysis global 06022023

Date.....: 02/03/2023

Checks according to: Eurocode 7 EN 1997-1
Eurocode 7 EN 1997-1

TABLE OF CONTENTS

SOIL PROPERTIES

Soil: CAPPING		Description:
Cohesion Class.....	: Effective cohesion	
Cohesion.....	[kN/m ²]	0.00
Friction Angle Class.....	: Angle of shearing resistance (Tan phi)	
Friction Angle.....	[°]	27.00
Ru value.....		0.10
Weight Class.....	: Weight density	
Bulk unit weight – above GWT.....	[kN/m ³]	19.00
Bulk unit weight – below GWT.....	[kN/m ³]	19.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30
Soil: LANDFILL		Description:
Cohesion Class.....	: Effective cohesion	
Cohesion.....	[kN/m ²]	0.00
Friction Angle Class.....	: Angle of shearing resistance (Tan phi)	
Friction Angle.....	[°]	30.00
Ru value.....		0.20
Weight Class.....	: Weight density	
Bulk unit weight – above GWT.....	[kN/m ³]	8.00
Bulk unit weight – below GWT.....	[kN/m ³]	8.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30
Soil: RSS		Description: RSS backfill
Cohesion Class.....	: Effective cohesion	
Cohesion.....	[kN/m ²]	0.00
Friction Angle Class.....	: Angle of shearing resistance (Tan phi)	
Friction Angle.....	[°]	25.00
Ru value.....		0.10
Weight Class.....	: Weight density	
Bulk unit weight – above GWT.....	[kN/m ³]	19.00
Bulk unit weight – below GWT.....	[kN/m ³]	19.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30

STRATA PROFILES

Stratum: BUND		Description:	
Soil : RSS			
X	Y	X	Y
[m]	[m]	[m]	[m]
27.15	7.73	42.66	15.55
44.71	15.55	59.68	8.04
Stratum: CAPPING		Description:	
Soil : CAPPING			
X	Y	X	Y
[m]	[m]	[m]	[m]
7.55	6.69	26.30	7.91
38.84	9.90	49.51	9.97
60.45	8.36	71.20	8.36



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Stratum: LANDFILL

Description:

Soil : LANDFILL

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
7.55	4.69	26.15	5.90	53.44	6.04	71.20	6.04

REINFORCED BLOCKS**Block : L1**

Block dimensions_____ [m] : Base width_____ = 2.00 Height_____ = 0.80
Block Origin_____ [m] : Abscissa_____ = 27.30 Ordinate_____ = 7.80
Face inclination_____ [°] : 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m] = 2.00
Vertical spacing_____ [m] = 0.40
Wrapped length_____ [m] = 0.10

Block : R1

Block dimensions_____ [m] : Base width_____ = 5.00 Height_____ = 0.40
Block Origin_____ [m] : Abscissa_____ = 59.60 Ordinate_____ = 8.10
Face inclination_____ [°] : 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m] = 5.00
Vertical spacing_____ [m] = 0.40
Wrapped length_____ [m] = 0.10

Block : R2

Block dimensions_____ [m] : Base width_____ = 2.00 Height_____ = 0.80
Back Shift_____ [m] = 0.00 by R1
Face inclination_____ [°] : 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :



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Basetex 200/50

Length [m] = 2.00

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10

Block : L2

Block dimensions [m] : Base width = 4.50 Height = 0.40

Back Shift [m] = 0.00 by L1

Face inclination [°] : 63.00

Structural embankment type : Sandy Clay

Structural embankment : RSS

Backfill soil : RSS

Covering soil : RSS

Foundation soil : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth [m] : 0.00

Natural soil slope [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length [m] = 4.50

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10

Block : L3

Block dimensions [m] : Base width = 2.00 Height = 0.80

Back Shift [m] = 0.00 by L2

Face inclination [°] : 63.00

Structural embankment type : Sandy Clay

Structural embankment : RSS

Backfill soil : RSS

Covering soil : RSS

Foundation soil : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth [m] : 0.00

Natural soil slope [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length [m] = 2.00

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10

Block : R3

Block dimensions [m] : Base width = 5.00 Height = 0.40

Back Shift [m] = 0.00 by R2

Face inclination [°] : 63.00

Structural embankment type : Sandy Clay

Structural embankment : RSS

Backfill soil : RSS

Covering soil : RSS

Foundation soil : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth [m] : 0.00

Natural soil slope [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length [m] = 5.00

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10



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Block : R4

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by R3
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : L4

Block dimensions[m] : Base width = 5.00 Height = 0.40
Back Shift[m] = 0.00 by L3
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 5.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : L5

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by L4
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : R5

Block dimensions[m] : Base width = 5.00 Height = 0.40
Back Shift[m] = 0.00 by R4
Face inclination[°] : 63.00



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Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R6

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by R5
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L6

Block dimensions.....[m] : Base width..... = 5.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L5
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: CAPPING

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L7

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by L6
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS



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Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basotex 200/50

Length.....[m] = 2.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

Block : R7

Block dimensions.....[m] : Base width..... = 5.00 Height..... = 0.40

Back Shift.....[m] = 0.00 by R6

Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay

Structural embankment.....: RSS

Backfill soil.....: RSS

Covering soil.....: RSS

Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basotex 200/50

Length.....[m] = 5.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

Block : R8

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80

Back Shift.....[m] = 0.00 by R7

Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay

Structural embankment.....: RSS

Backfill soil.....: RSS

Covering soil.....: RSS

Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basotex 200/50

Length.....[m] = 2.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

Block : L8

Block dimensions.....[m] : Base width..... = 5.00 Height..... = 0.40

Back Shift.....[m] = 0.00 by L7

Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay

Structural embankment.....: RSS

Backfill soil.....: RSS

Covering soil.....: RSS

Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00



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Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 5.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : L9

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by L8
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R9

Block dimensions.....[m].....: Base width.....= 10.00 Height.....= 0.40
Back Shift.....[m].....= 0.00 by R8
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 10.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R10

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by R9
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10



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Block : L10

Block dimensions[m] : Base width = 5.00 Height = 0.40
Back Shift[m] = 0.00 by L9
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 5.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : L11

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by L10
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: CAPPING

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : R11

Block dimensions[m] : Base width = 5.00 Height = 0.40
Back Shift[m] = 0.00 by R10
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 5.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : R12

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by R11
Face inclination[°] : 63.00



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Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L12

Block dimensions.....[m] : Base width..... = 4.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L11
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 4.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L13

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L12
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

SURCHARGE LOADS

Distributed Loads : LOAD

Description :

Class : Variable unfavourable

Magnitude.....[kN/m²] = 10.00 Inclination angle.....[°] = 0.00
Abscissa.....[m] : from = 42.66 To = 44.71



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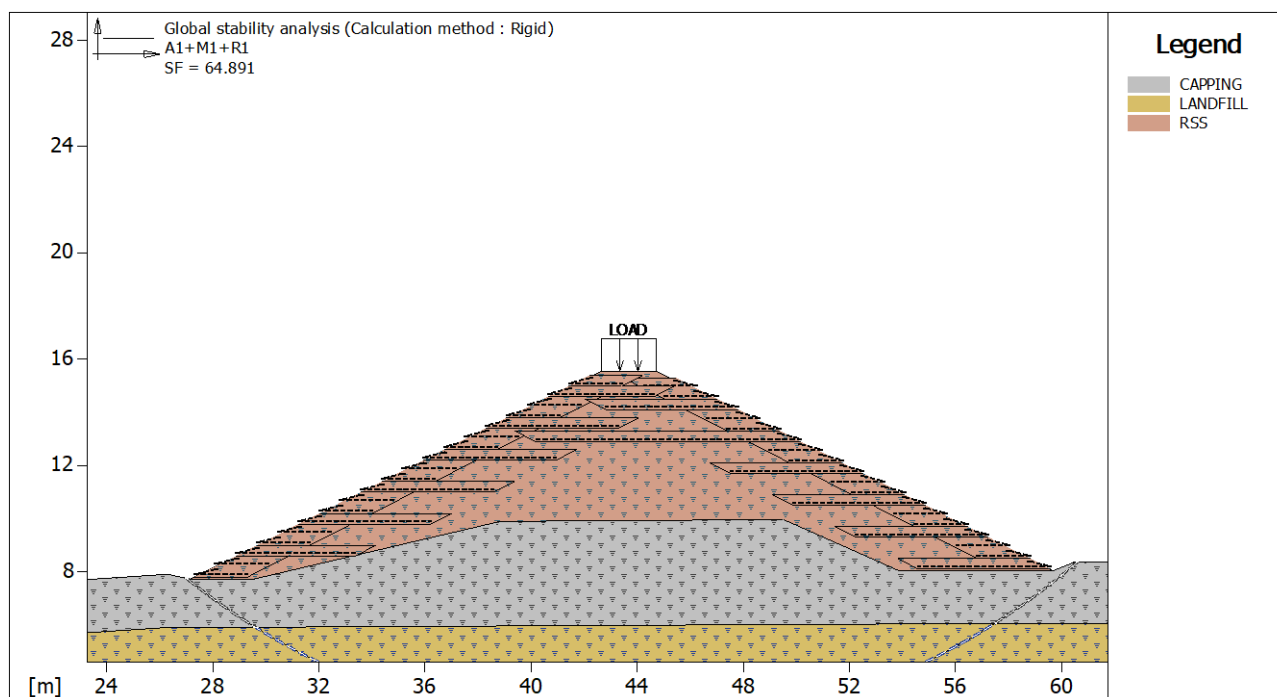
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PROPERTIES OF THE USED REINFORCEMENTS

Basotex 200/50

Tensile strength UTS	[kN/m]	200.00
Minimum anchorage length	[m]	0.15
Breakage Safety Factor (gravel)		1.54
Breakage Safety Factor (sand)		1.52
Breakage Safety Factor (silty sand)		1.52
Breakage Safety Factor (sandy clay)		2.06
Interaction factor reinforcement/reinforcement		0.16
Pullout coefficient reinforcement-gravel		0.90
Pullout coefficient reinforcement-sand		0.90
Pullout coefficient reinforcement-silt		0.70
Pullout coefficient reinforcement-clay		0.40

CHECKS RESULTS



Global Stability Check :

Multiplier combination : A1+M1+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor..... 64.891

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
27.00	28.00	60.00	70.00
Number of starting point on the starting segment		3	
Total number of trial surfaces		102	
Minimum base length of slices		[m] 0.50	
Superior limit search angle		[°] 0.00	
Inferior limit search angle		[°] 0.00	

Multiplier	Class
1.50	Variable unfavourable
1.00	Angle of shearing resistance (Tan phi)
1.00	Effective cohesion
1.00	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



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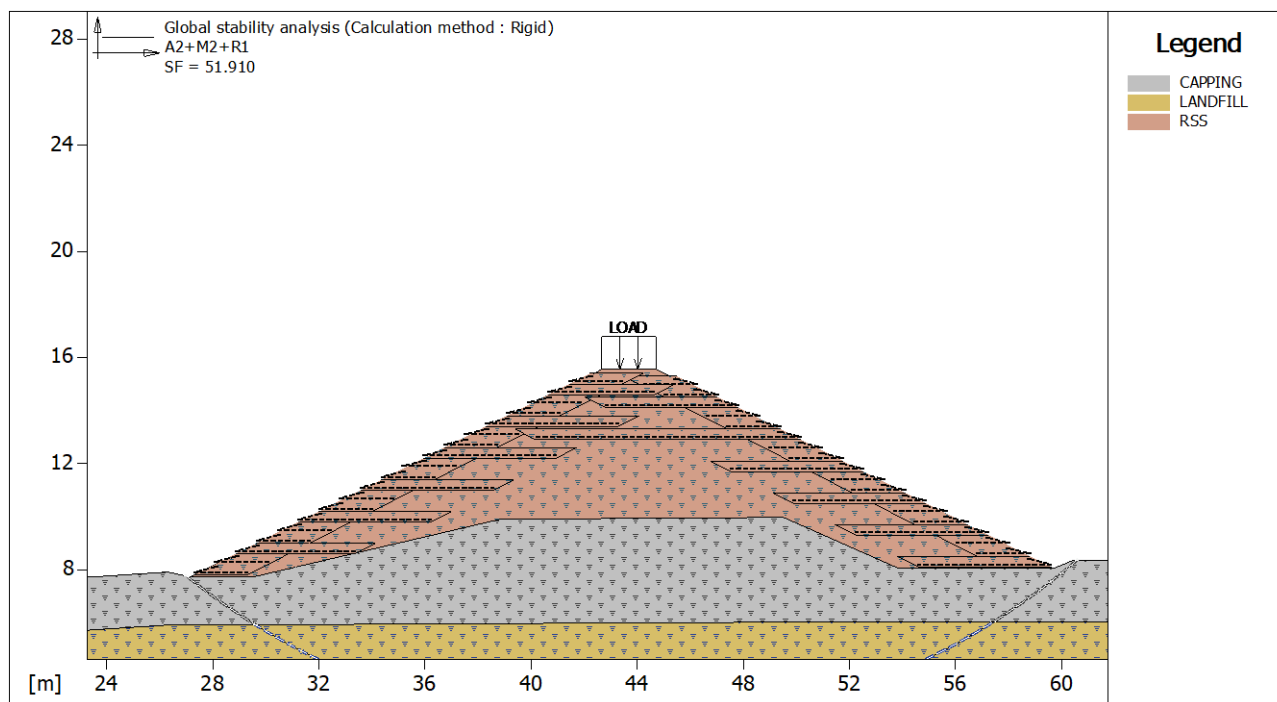
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**Global Stability Check :**

Multiplier combination : A2+M2+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 51.910

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
27.00	28.00	60.00	70.00
Number of starting point on the starting segment.....:		3	
Total number of trial surfaces.....:		102	
Minimum base length of slices.....[m].....:		0.50	
Superior limit search angle.....[°].....:		0.00	
Inferior limit search angle.....[°].....:		0.00	

Multiplier	Class
1.30	Variable unfavourable
1.25	Angle of shearing resistance (Tan phi)
1.25	Effective cohesion
1.40	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



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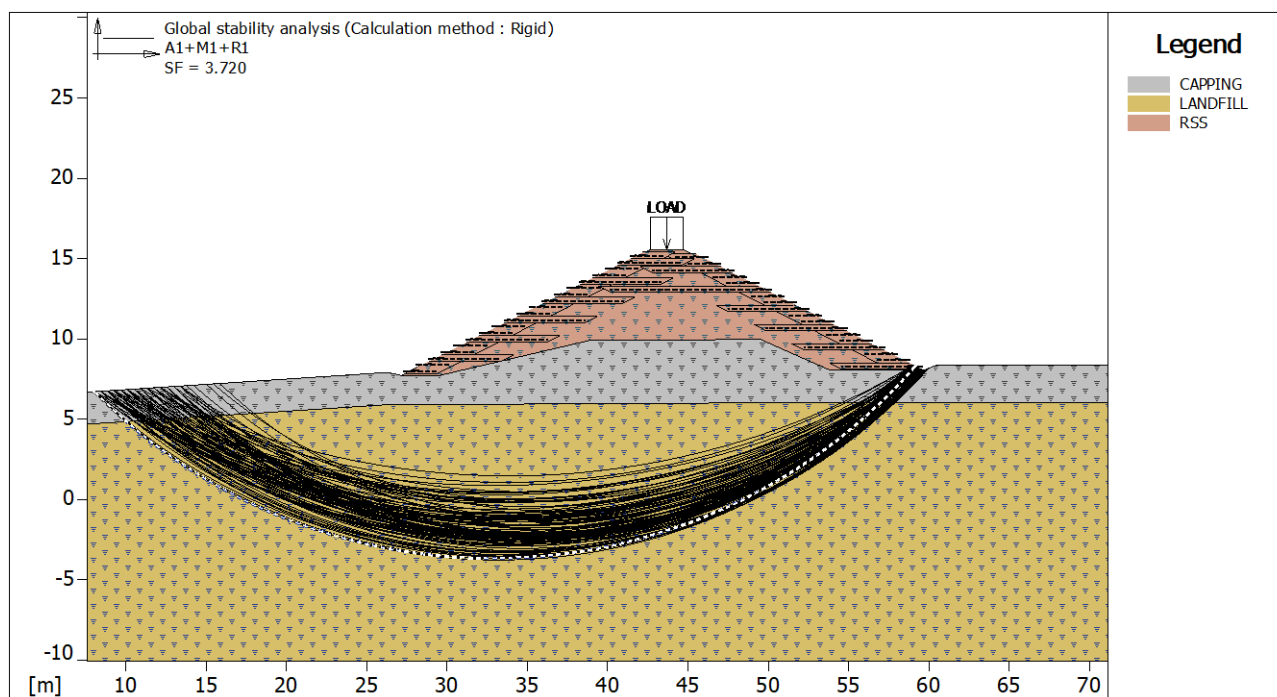
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**Global Stability Check :**

Multiplier combination : A1+M1+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 3.720

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
8.00	27.00	59.00	60.00
Number of starting point on the starting segment.....:		47	
Total number of trial surfaces.....:		470	
Minimum base length of slices.....[m].....:		0.50	
Superior limit search angle.....[°].....:		0.00	
Inferior limit search angle.....[°].....:		0.00	

Block : R1
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
0.000	50.0	0.6	0.6	83.33	1.00

Multiplier	Class
1.50	Variable unfavourable
1.00	Angle of shearing resistance (Tan phi)
1.00	Effective cohesion
1.00	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



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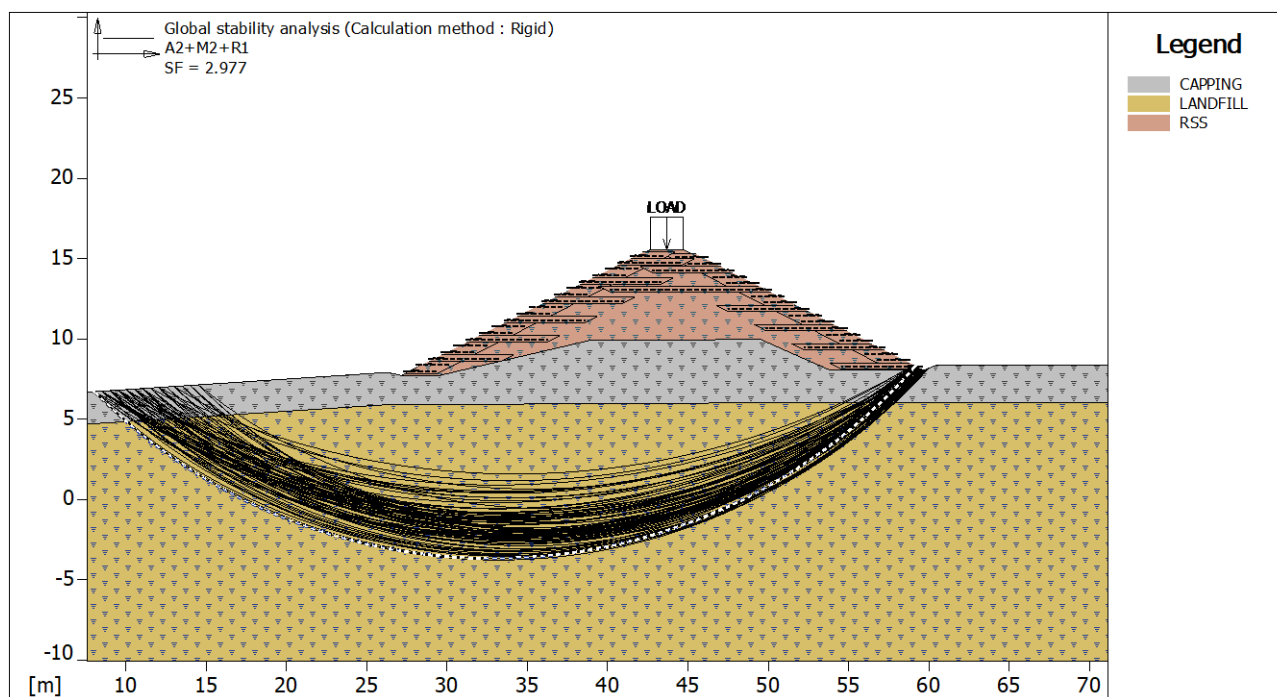
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**Global Stability Check :**

Multiplier combination : A2+M2+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 2.977

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
8.00	27.00	59.00	60.00
Number of starting point on the starting segment.....:		39	
Total number of trial surfaces.....:		390	
Minimum base length of slices.....[m].....:		0.50	
Superior limit search angle.....[°].....:		0.00	
Inferior limit search angle.....[°].....:		0.00	

Block : R1
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
0.000	50.0	0.6	0.6	83.33	1.00

Multiplier	Class
1.30	Variable unfavourable
1.25	Angle of shearing resistance (Tan phi)
1.25	Effective cohesion
1.40	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



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Cross Section.....: Section S5

File.....: S5 undrained analysis 06022023

Date.....: 02/03/2023

Checks according to:

BS 8006-1:2010+A1:2016

Reinforced slope – Cat. 2 (medium)

TABLE OF CONTENTS

SOIL PROPERTIES

Soil: CAPPING

Description:

Cohesion.....	[kN/m ²].....	30.00
Friction Angle Class.....	Soil material factor tan(phi)	
Friction Angle.....	[°].....	0.00
Ru value.....		0.10
Weight Class.....	Soil unit weight	
Bulk unit weight – above GWT.....	[kN/m ³].....	19.00
Bulk unit weight – below GWT.....	[kN/m ³].....	19.00
Elastic Modulus.....	[kN/m ²].....	0.00
Poisson's ratio.....		0.30

Soil: LANDFILL

Description:

Cohesion.....	[kN/m ²].....	25.00
Friction Angle Class.....	Soil material factor tan(phi)	
Friction Angle.....	[°].....	0.00
Ru value.....		0.20
Weight Class.....	Soil unit weight	
Bulk unit weight – above GWT.....	[kN/m ³].....	8.00
Bulk unit weight – below GWT.....	[kN/m ³].....	8.00
Elastic Modulus.....	[kN/m ²].....	0.00
Poisson's ratio.....		0.30

Soil: RSS

Description: RSS backfill

Cohesion.....	[kN/m ²].....	80.00
Friction Angle Class.....	Soil material factor tan(phi)	
Friction Angle.....	[°].....	0.00
Ru value.....		0.10
Weight Class.....	Soil unit weight	
Bulk unit weight – above GWT.....	[kN/m ³].....	19.00
Bulk unit weight – below GWT.....	[kN/m ³].....	19.00
Elastic Modulus.....	[kN/m ²].....	0.00
Poisson's ratio.....		0.30

STRATA PROFILES

Stratum: BUND

Description:

Soil : RSS

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
27.15	7.73	42.66	15.55	44.71	15.55	59.68	8.04

Stratum: CAPPING

Description:

Soil : CAPPING

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
7.55	6.69	26.30	7.91	27.15	7.73	29.55	7.73
38.84	9.90	49.51	9.97	53.87	8.04	59.68	8.04
60.45	8.36	71.20	8.36				



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Stratum: LANDFILL

Description:

Soil : LANDFILL

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
7.55	4.69	26.15	5.90	53.44	6.04	71.20	6.04

REINFORCED BLOCKS**Block : L1**

Block dimensions_____ [m] _____: Base width_____ = 2.00 Height_____ = 0.80
Block Origin_____ [m] _____: Abscissa_____ = 27.30 Ordinate_____ = 7.80
Face inclination_____ [°] _____: 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m] _____ = 2.00
Vertical spacing_____ [m] _____ = 0.40
Wrapped length_____ [m] _____ = 0.10

Block : R1

Block dimensions_____ [m] _____: Base width_____ = 5.00 Height_____ = 0.40
Block Origin_____ [m] _____: Abscissa_____ = 59.60 Ordinate_____ = 8.10
Face inclination_____ [°] _____: 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m] _____ = 5.00
Vertical spacing_____ [m] _____ = 0.40
Wrapped length_____ [m] _____ = 0.10

Block : R2

Block dimensions_____ [m] _____: Base width_____ = 2.00 Height_____ = 0.80
Back Shift_____ [m] _____ = 0.00 by R1
Face inclination_____ [°] _____: 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

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Length_____ [m]_____ = 2.00

Vertical spacing_____ [m]_____ = 0.40

Wrapped length_____ [m]_____ = 0.10

Block : L2

Block dimensions_____ [m]_____ : Base width_____ = 4.50 Height_____ = 0.40

Back Shift_____ [m]_____ = 0.00 by L1

Face inclination_____ [°]_____ : 63.00

Structural embankment type_____ : Sandy Clay

Structural embankment_____ : RSS

Backfill soil_____ : RSS

Covering soil_____ : RSS

Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00

Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 4.50

Vertical spacing_____ [m]_____ = 0.40

Wrapped length_____ [m]_____ = 0.10

Block : L3

Block dimensions_____ [m]_____ : Base width_____ = 2.00 Height_____ = 0.80

Back Shift_____ [m]_____ = 0.00 by L2

Face inclination_____ [°]_____ : 63.00

Structural embankment type_____ : Sandy Clay

Structural embankment_____ : RSS

Backfill soil_____ : RSS

Covering soil_____ : RSS

Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00

Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 2.00

Vertical spacing_____ [m]_____ = 0.40

Wrapped length_____ [m]_____ = 0.10

Block : R3

Block dimensions_____ [m]_____ : Base width_____ = 5.00 Height_____ = 0.40

>10	>10
-----	-----

Face inclination_____ [°]_____ : 63.00

Structural embankment type_____ : Sandy Clay

Structural embankment_____ : RSS

Backfill soil_____ : RSS

Covering soil_____ : RSS

Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00

Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 5.00

Vertical spacing_____ [m]_____ = 0.40

Wrapped length_____ [m]_____ = 0.10



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Block : R4

Block dimensions[m] : Base width = 2.00 Height = 0.80

Back Shift[m] = 0.00 by R3

Face inclination[°] : 63.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : L4

Block dimensions[m] : Base width = 5.00 Height = 0.40

Back Shift[m] = 0.00 by L3

Face inclination[°] : 63.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 5.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : L5

Block dimensions[m] : Base width = 2.00 Height = 0.80

Back Shift[m] = 0.00 by L4

Face inclination[°] : 63.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : R5

Block dimensions[m] : Base width = 5.00 Height = 0.40

Back Shift[m] = 0.00 by R4

Face inclination[°] : 63.00



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Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R6

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by R5
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L6

Block dimensions.....[m] : Base width..... = 5.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L5
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: CAPPING

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L7

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by L6
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS



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Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R7

Block dimensions.....[m] : Base width..... = 5.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by R6
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R8

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by R7
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L8

Block dimensions.....[m] : Base width..... = 5.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L7
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00



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Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 5.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : L9

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by L8
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R9

Block dimensions.....[m].....: Base width.....= 10.00 Height.....= 0.40
Back Shift.....[m].....= 0.00 by R8
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 10.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R10

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by R9
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10



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Block : L10

Block dimensions[m] : Base width = 5.00 Height = 0.40

Back Shift[m] = 0.00 by L9

Face inclination[°] : 63.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 5.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : L11

Block dimensions[m] : Base width = 2.00 Height = 0.80

Back Shift[m] = 0.00 by L10

Face inclination[°] : 63.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: CAPPING

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : R11

Block dimensions[m] : Base width = 5.00 Height = 0.40

Back Shift[m] = 0.00 by R10

Face inclination[°] : 63.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 5.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : R12

Block dimensions[m] : Base width = 2.00 Height = 0.80

Back Shift[m] = 0.00 by R11

Face inclination[°] : 63.00



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Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

Block : L12

Block dimensions.....[m] : Base width..... = 4.00 Height..... = 0.40

Back Shift.....[m] = 0.00 by L11

Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 4.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

Block : L13

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.40

Back Shift.....[m] = 0.00 by L12

Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

SURCHARGE LOADS**Distributed Loads : LOAD**

Description :

Class : External live loads

Magnitude.....[kN/m²] = 10.00 Inclination angle.....[°] = 0.00

Abscissa.....[m] : from = 42.66 To = 44.71



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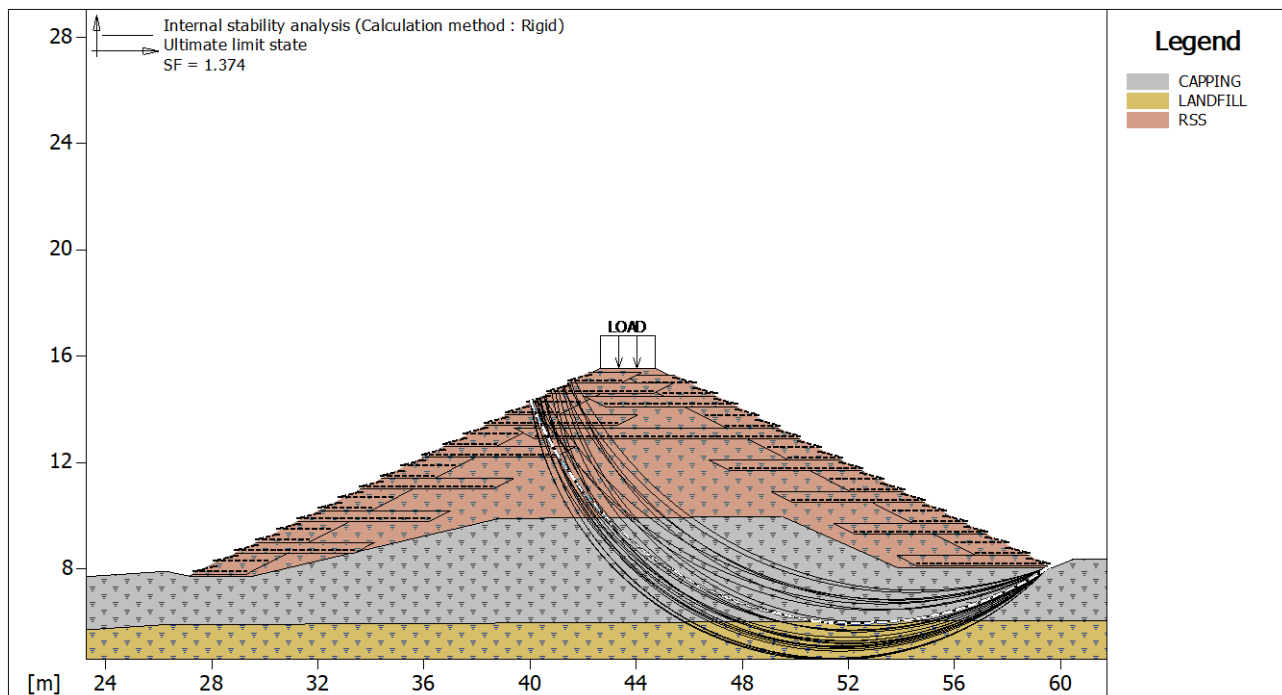
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PROPERTIES OF THE USED REINFORCEMENTS

Basetex 200/50

Tensile strength UTS	[kN/m]	200.00
Minimum anchorage length	[m]	0.15
Breakage Safety Factor (gravel)		1.54
Breakage Safety Factor (sand)		1.52
Breakage Safety Factor (silty sand)		1.52
Breakage Safety Factor (sandy clay)		2.06
Interaction factor reinforcement/reinforcement		0.16
Pullout coefficient reinforcement-gravel		0.90
Pullout coefficient reinforcement-sand		0.90
Pullout coefficient reinforcement-silt		0.70
Pullout coefficient reinforcement-clay		0.40

CHECKS RESULTS



Internal Stability :

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor..... 1.374

Surfaces searching range

Block	First point	Arrival range, abscises [m]	Second point
R1	40.00		52.00

Number of starting point on the starting segment	1
Total number of trial surfaces	100
Minimum base length of slices	[m] 0.50
Superior limit search angle	[°] 0.00
Inferior limit search angle	[°] 0.00

Block : R9
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J

Block : L10
Basetex 200/50

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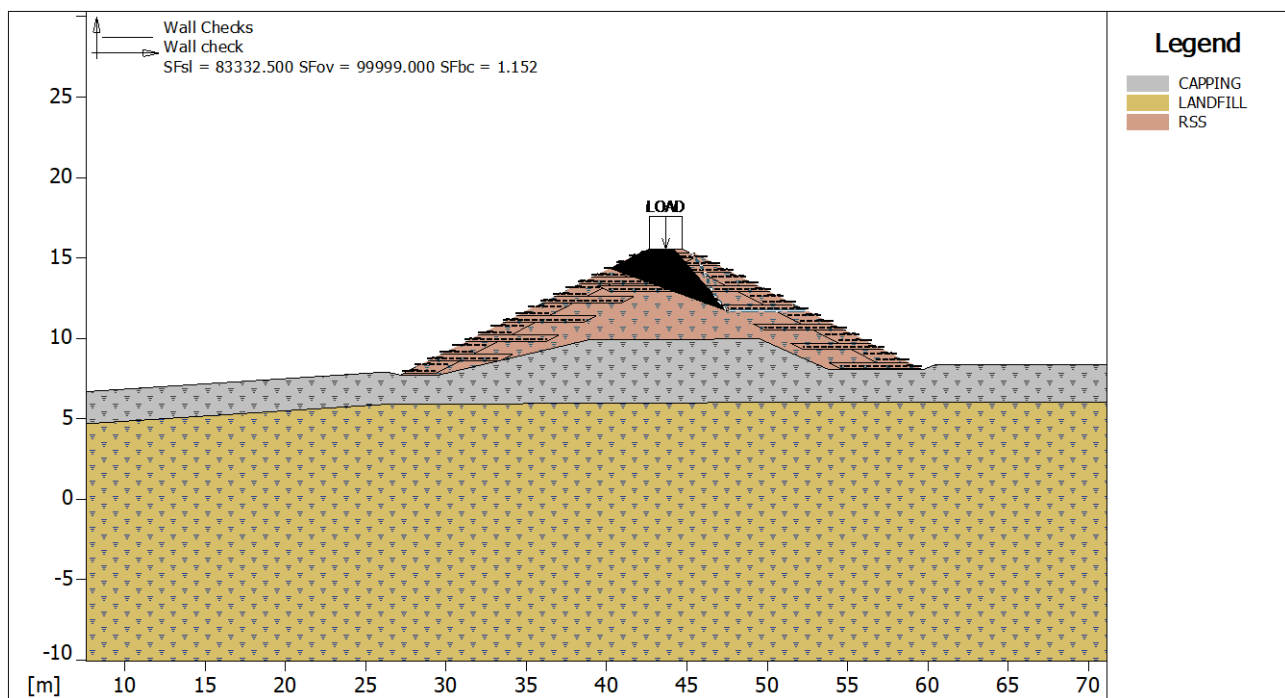
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Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J

Block : L11
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J
0.400	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)

**Wall Checks :**

Multiplier combination : Wall check

Considered block : R7

Resisting force.....[kN/m]..... 400.00

Active force.....[kN/m]..... -494.62

Sliding class.....: Sliding along base of structure

Sliding safety factor..... 83332.500

Restoring moment.....[kN*m/m]..... 4818.80

Overturning moment.....[kN*m/m]..... -897.30

Overturning class: Overturning

Overturning safety factor..... 99999.000

Imposed ultimate bearing pressure

Ultimate bearing pressure.....[kN/m²]..... 150.00Active pressure.....[kN/m²]..... 130.21

Pressure class...: Bearing capacity

Bearing capacity safety factor..... 1.152

Equivalent bearing area.....[m]..... 5.00

Eccentricity of normal force.....[m]..... -6.28



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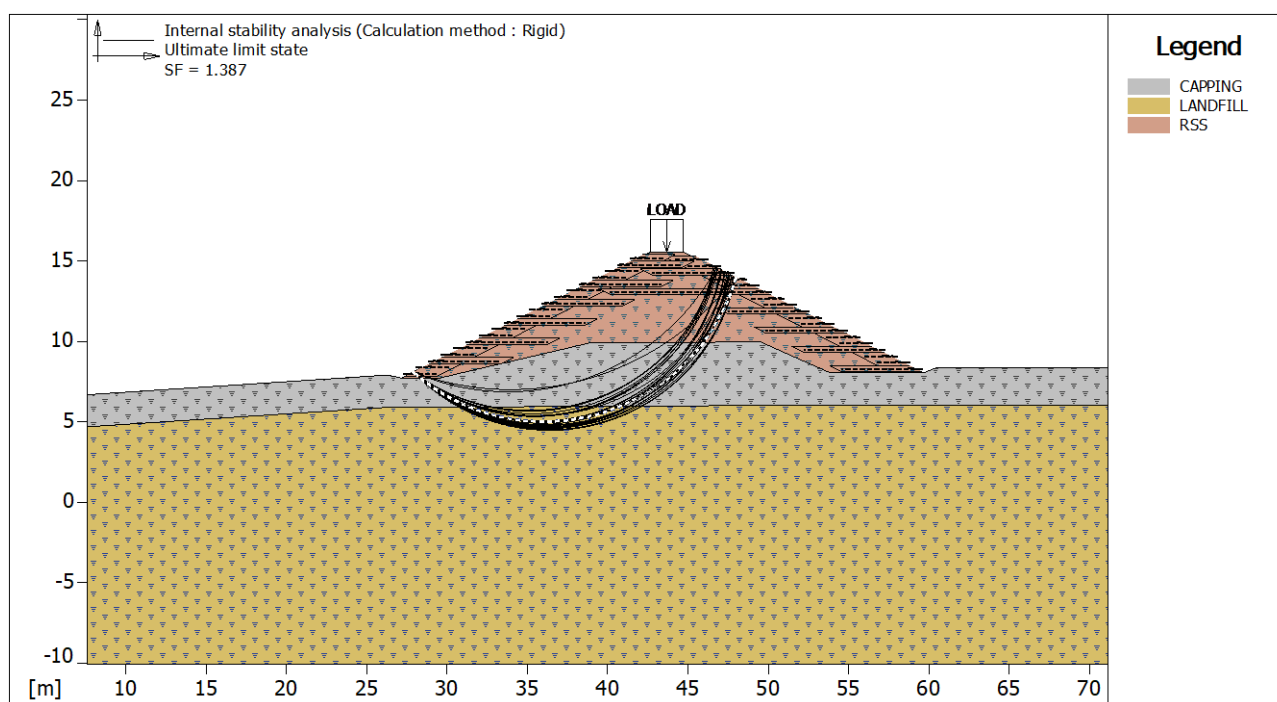
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Lever arm of overturning force.....[m]..... 1.81
Normal force on the base.....[kN]..... 651.05
Outer edge stress.....[kN/m²]..... -515.38
Inner edge stress.....[kN/m²]..... 343.13

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning

**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor..... 1.387

Surfaces searching range

Block	First point	Arrival range, abscises [m]	Second point
L1	32.00		48.00

Number of starting point on the starting segment..... 1
Total number of trial surfaces..... 100
Minimum base length of slices.....[m]..... 0.50
Superior limit search angle.....[°]..... 0.00
Inferior limit search angle.....[°]..... 0.00

Block : R9					
Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
0.000	50.0	0.0	0.0	1.#J	-1.#J

Block : R10
Basetex 200/50



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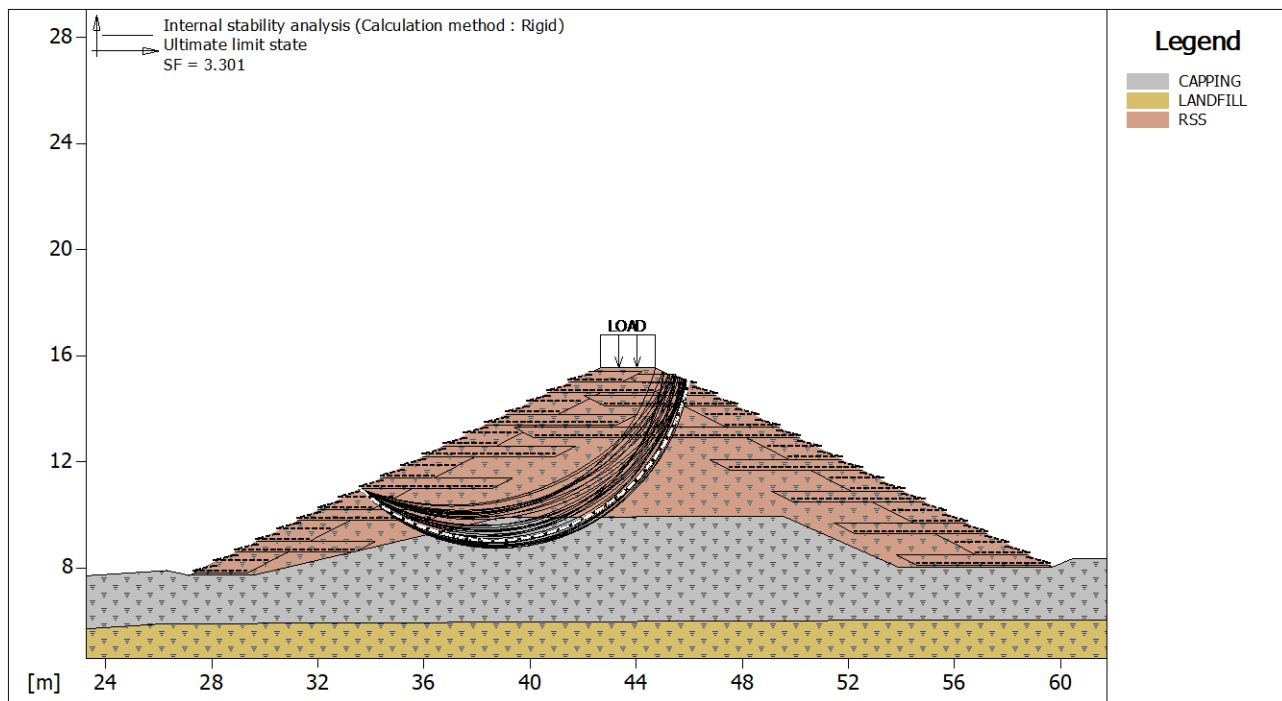
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Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage [kN/m]	pullout [kN/m]	design [kN/m]	1/Fmax	
0.000	50.0	0.0	0.0	1.#J	-1.#J
0.400	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)

**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 3.301

Surfaces searching range		
Block	Arrival range, abscises [m]	
L6	First point 40.00	Second point 46.00
Number of starting point on the starting segment.....: 1		
Total number of trial surfaces.....: 100		
Minimum base length of slices.....[m].....: 0.50		
Superior limit search angle.....[°].....: 0.00		
Inferior limit search angle.....[°].....: 0.00		

Block : R9
Basotex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage [kN/m]	pullout [kN/m]	design [kN/m]	1/Fmax	
0.000	50.0	0.0	0.0	1.#J	-1.#J

Block : R11
Basotex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
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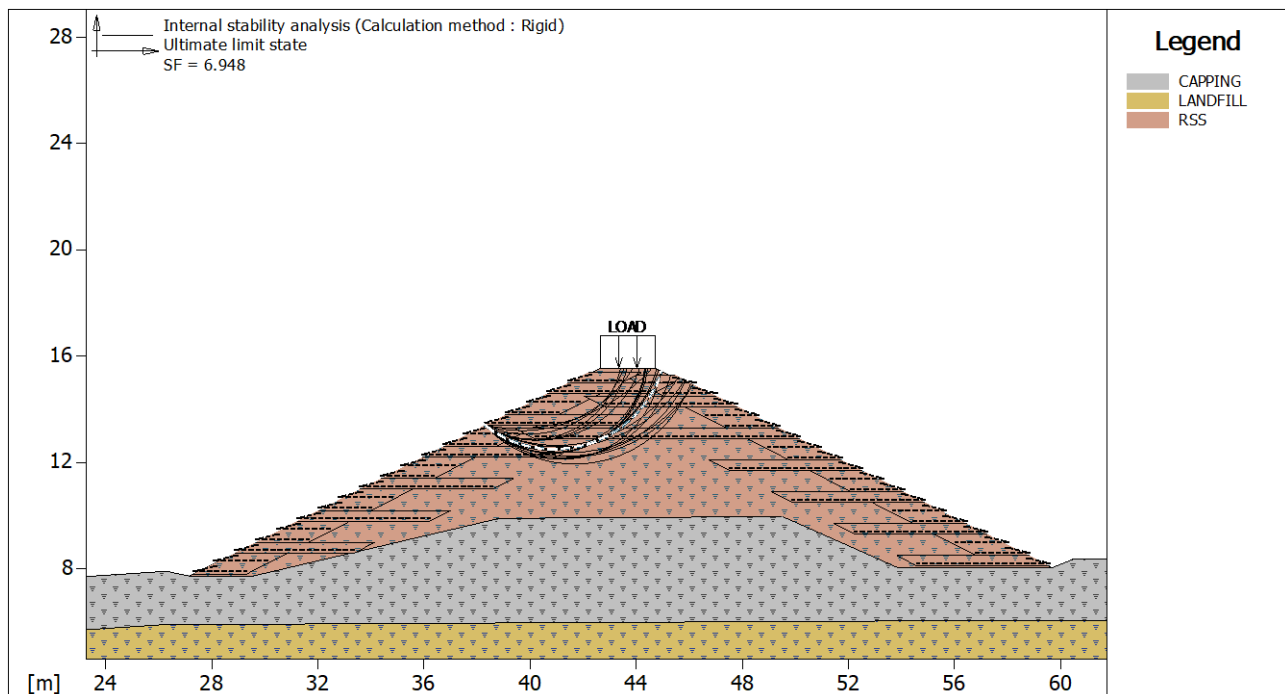
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[m]	breakage [kN/m]	pullout [kN/m]	design [kN/m]	1/Fmax	
0.000	50.0	0.0	0.0	1.#J	-1.#J

Block : R12
Basetex 200/50

Y	Tb breakage [kN/m]	Tp pullout [kN/m]	Td design [kN/m]	Tb/Td 1/Fmax	Tp/Td
0.000	50.0	0.0	0.0	1.#J	-1.#J
0.400	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)

**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 6.948

Surfaces searching range

Block	First point	Second point
L10	43.00	48.00

Number of starting point on the starting segment.....: 1
Total number of trial surfaces.....: 100
Minimum base length of slices.....[m].....: 0.50
Superior limit search angle.....[°].....: 0.00
Inferior limit search angle.....[°].....: 0.00

Block : R9
Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
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[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J

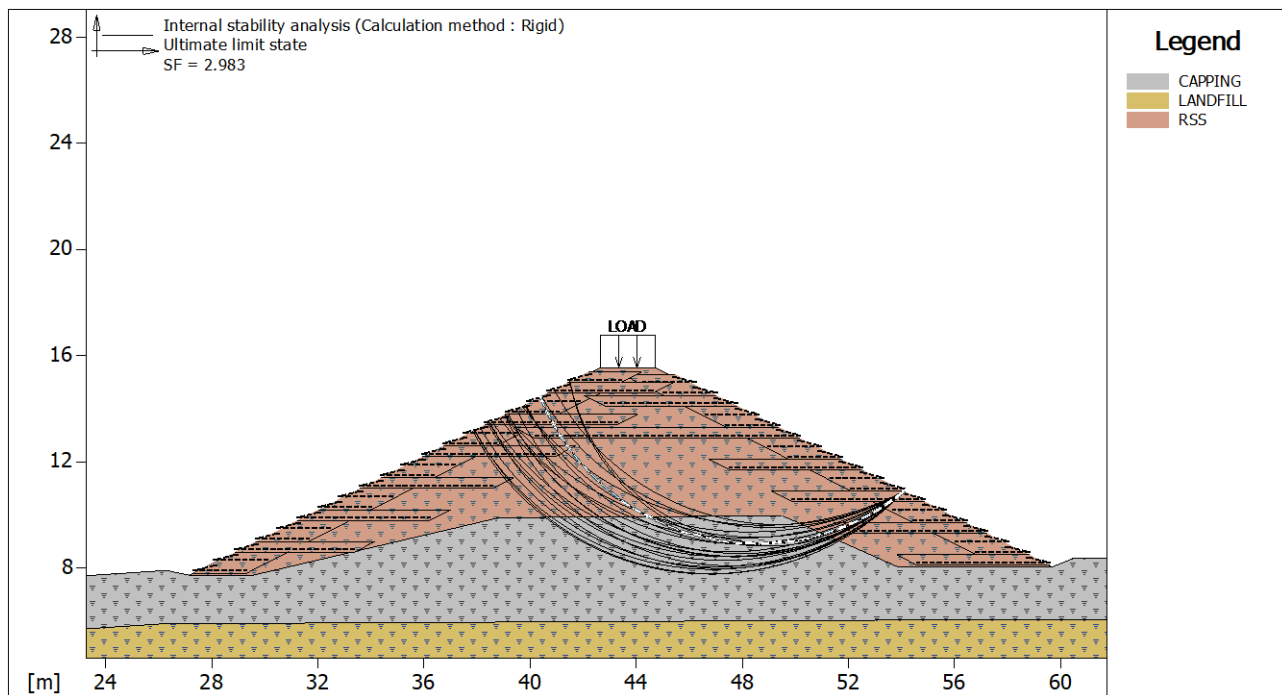
Block : R11
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J

Block : R12
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.400	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)

**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor..... 2.983

Surfaces searching range

Block	First point	Arrival range, abscises [m]	Second point
R6	36.00		46.00

Number of starting point on the starting segment.....	1
Total number of trial surfaces.....	100
Minimum base length of slices.....[m].....	0.50
Superior limit search angle.....[°].....	0.00
Inferior limit search angle.....[°].....	0.00



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Block : R9
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J

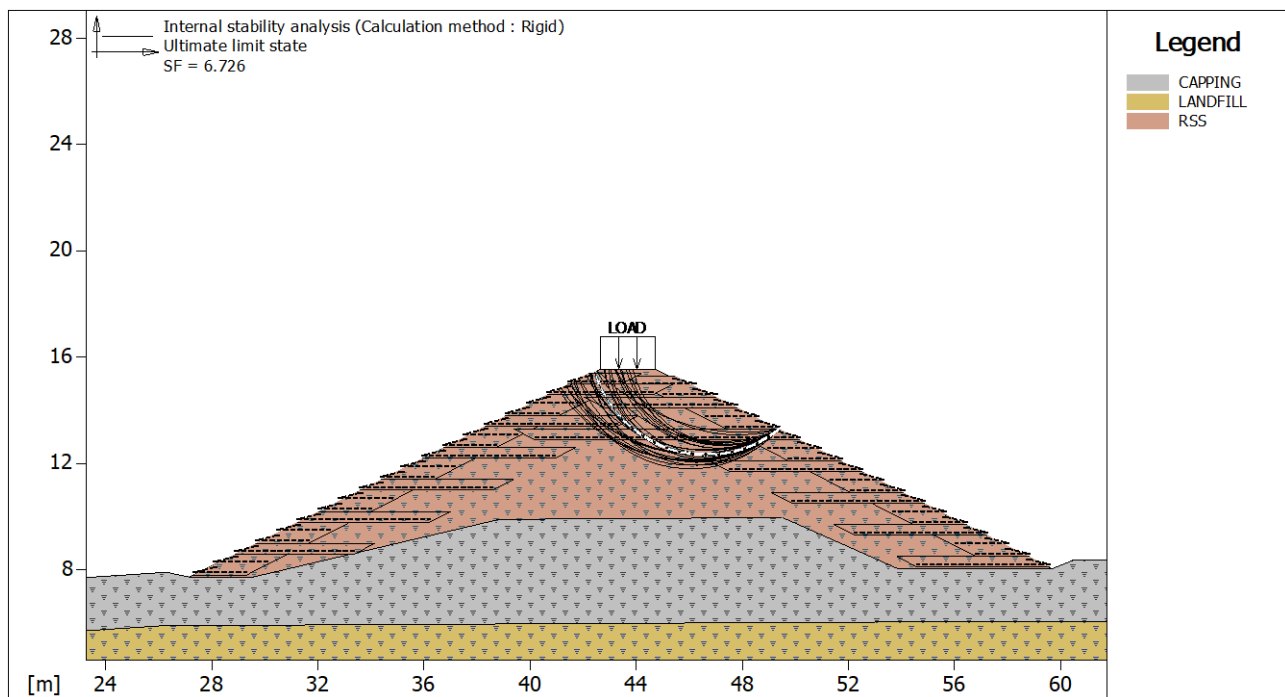
Block : L10
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J

Block : L11
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J
0.400	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)

**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 6.726

Surfaces searching range

Block

R10

Arrival range, abscises [m]

First point

Second point



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40.00

44.00

Number of starting point on the starting segment: 1
Total number of trial surfaces: 100
Minimum base length of slices [m]: 0.50
Superior limit search angle [°]: 0.00
Inferior limit search angle [°]: 0.00

Block : R9
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J

Block : R11
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J

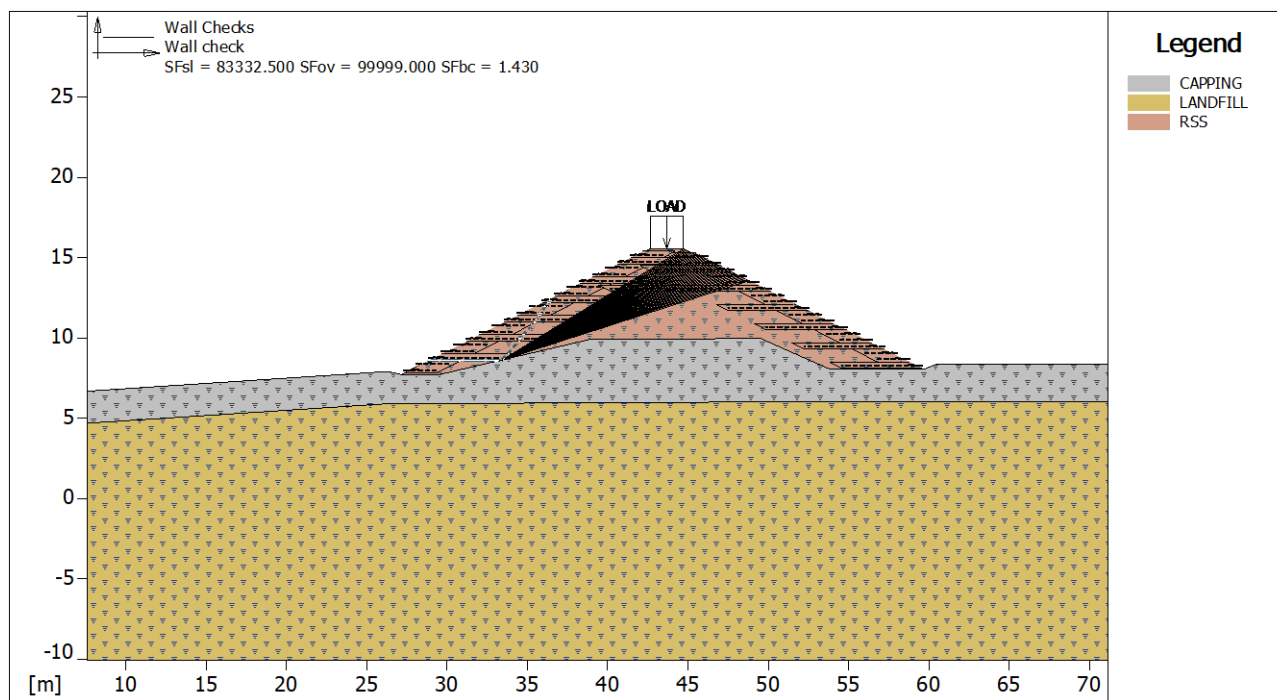
Block : L12
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J

Block : L13
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)



Wall Checks :

Multiplier combination : Wall check

Considered block : L2

Resisting force [kN/m] 355.01

Active force [kN/m] -819.63

Sliding class : Sliding along base of structure

Sliding safety factor : 83332.500

Restoring moment [kN*m/m] 7124.80

Overturning moment [kN*m/m] -1721.30

Overturning class: Overturning

Overturning safety factor : 99999.000

Imposed ultimate bearing pressure

Ultimate bearing pressure [kN/m²] 250.00

Active pressure [kN/m²] 174.78

Pressure class...: Bearing capacity

Bearing capacity safety factor : 1.430

Equivalent bearing area [m] 4.50

Eccentricity of normal force [m] -9.00

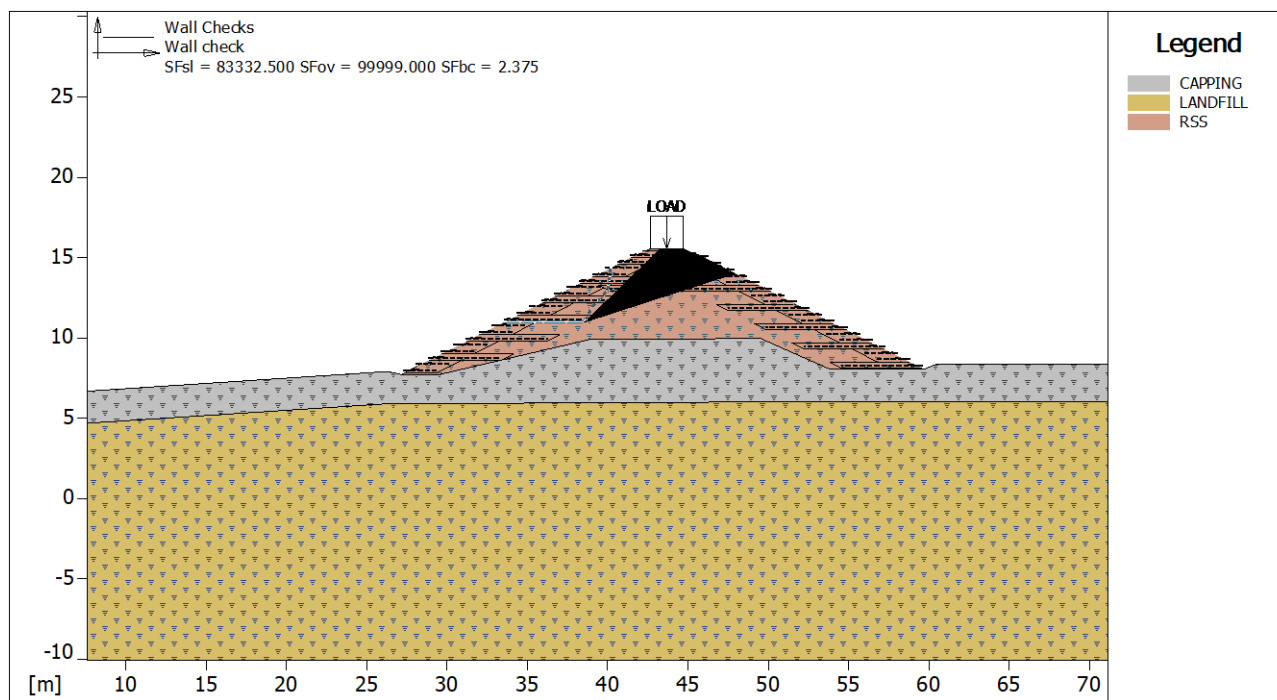
Lever arm of overturning force [m] 2.10

Normal force on the base [kN] 786.52

Outer edge stress [kN/m²] -291.45

Inner edge stress [kN/m²] 174.88

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



Wall Checks :

Multiplier combination : Wall check

Considered block : L6

Resisting force [kN/m] 400.00

Active force [kN/m] -626.06

Sliding class : Sliding along base of structure

Sliding safety factor : 83332.500

Restoring moment [kN*m/m] 3476.20

Overturning moment [kN*m/m] -1288.50

Overturning class: Overturning

Overturning safety factor : 99999.000

Imposed ultimate bearing pressure

Ultimate bearing pressure [kN/m²] 250.00

Active pressure [kN/m²] 105.26

Pressure class...: Bearing capacity

Bearing capacity safety factor : 2.375

Equivalent bearing area [m] 5.00

Eccentricity of normal force [m] -6.55

Lever arm of overturning force [m] 2.06

Normal force on the base [kN] 526.31

Outer edge stress [kN/m²] -379.86

Inner edge stress [kN/m²] 250.01

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



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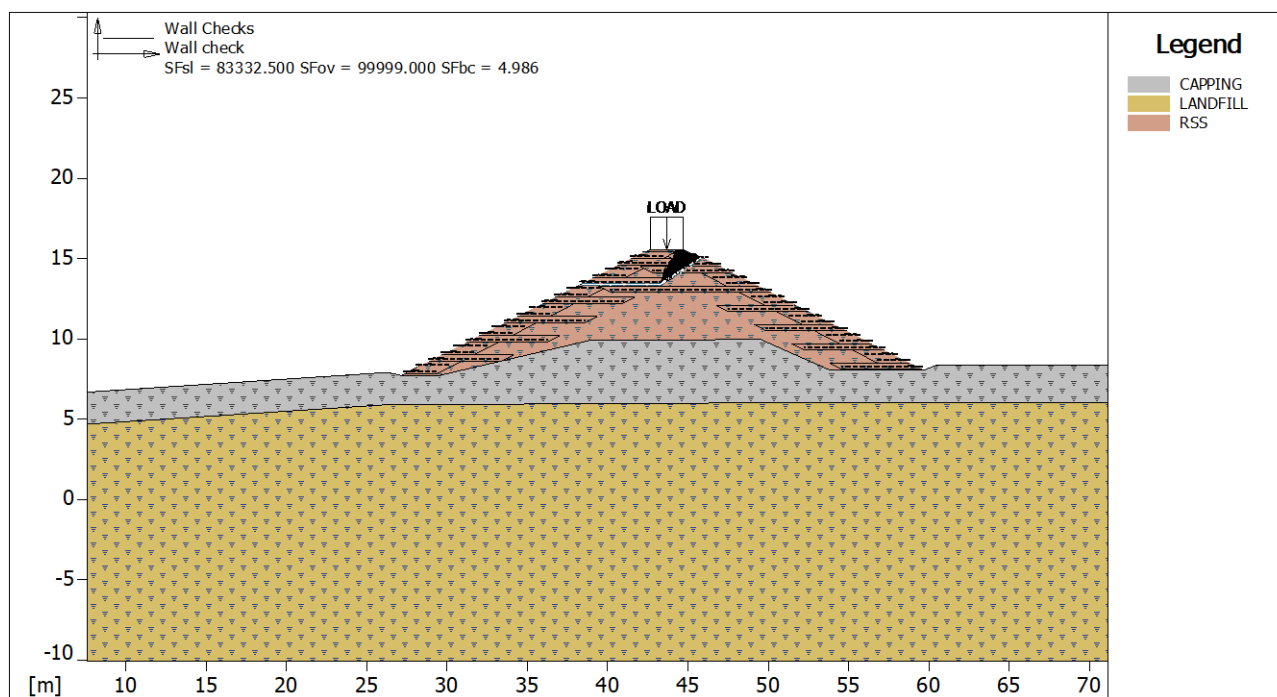
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**Wall Checks :**

Multiplier combination : Wall check

Considered block : L10

Resisting force.....[kN/m]..... 400.00

Active force.....[kN/m]..... -269.58

Sliding class.....: Sliding along base of structure

Sliding safety factor..... 83332.500

Restoring moment.....[kN*m/m]..... 1042.40

Overturning moment.....[kN*m/m]..... -221.50

Overturning class: Overturning

Overturning safety factor..... 99999.000

Imposed ultimate bearing pressure

Ultimate bearing pressure.....[kN/m²]..... 250.00Active pressure.....[kN/m²]..... 50.14

Pressure class...: Bearing capacity

Bearing capacity safety factor..... 4.986

Equivalent bearing area.....[m]..... 5.00

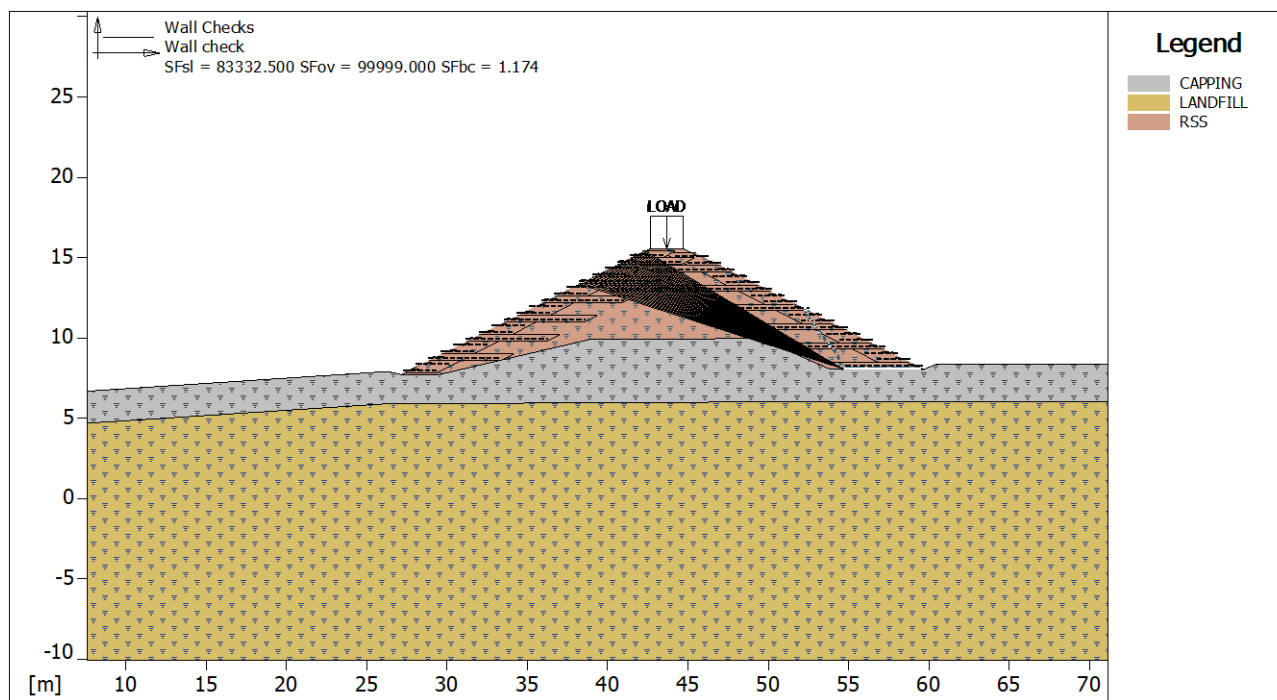
Eccentricity of normal force.....[m]..... -2.54

Lever arm of overturning force.....[m]..... 0.82

Normal force on the base.....[kN]..... 250.71

Outer edge stress.....[kN/m²]..... -560645.13Inner edge stress.....[kN/m²]..... 554589.31

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



Wall Checks :

Multiplier combination : Wall check

Considered block : R1

Resisting force [kN/m] 400.00

Active force [kN/m] -831.73

Sliding class : Sliding along base of structure

Sliding safety factor : 83332.500

Restoring moment [kN*m/m] 11784.00

Overturning moment [kN*m/m] -1930.50

Overturning class: Overturning

Overturning safety factor : 99999.000

Imposed ultimate bearing pressure

Ultimate bearing pressure [kN/m²] 250.00

Active pressure [kN/m²] 212.88

Pressure class...: Bearing capacity

Bearing capacity safety factor : 1.174

Equivalent bearing area [m] 5.00

Eccentricity of normal force [m] -10.39

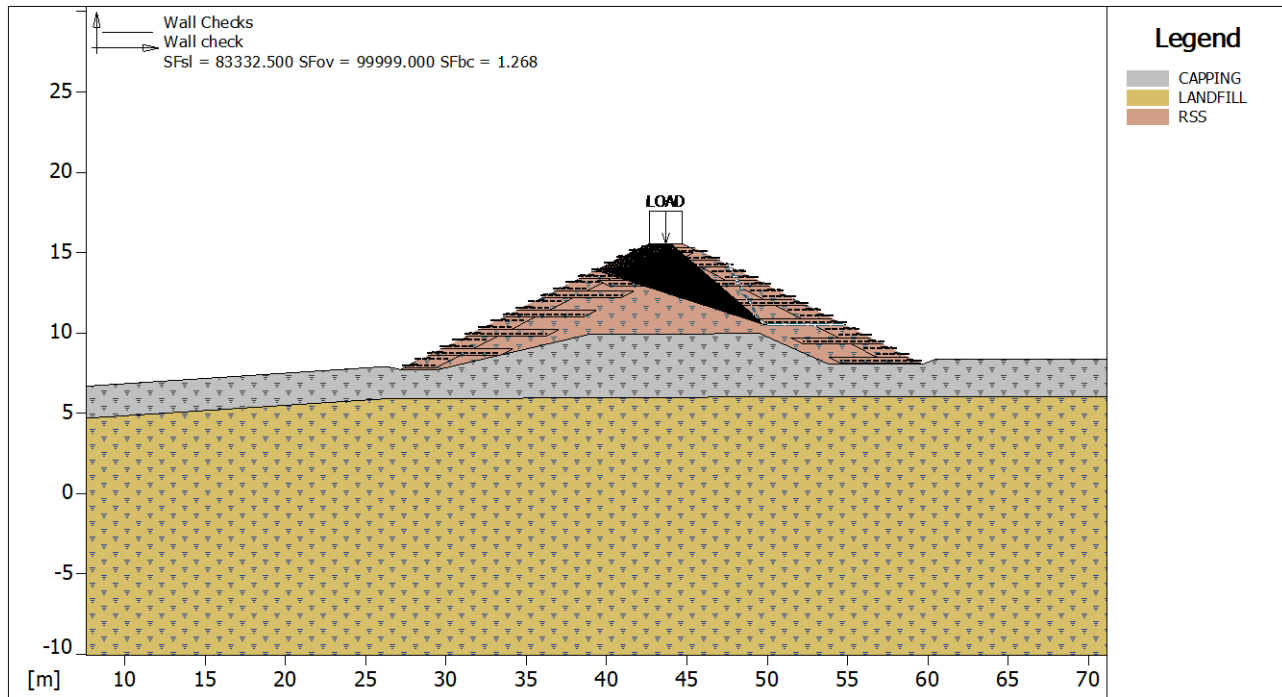
Lever arm of overturning force [m] 2.32

Normal force on the base [kN] 1064.40

Outer edge stress [kN/m²] -334.18

Inner edge stress [kN/m²] 199.19

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



Wall Checks :

Multiplier combination : Wall check

Considered block : R5

Resisting force [kN/m] 400.00

Active force [kN/m] -673.35

Sliding class : Sliding along base of structure

Sliding safety factor : 83332.500

Restoring moment [kN*m/m] 6816.20

Overturning moment [kN*m/m] -1583.00

Overturning class: Overturning

Overturning safety factor : 99999.000

Imposed ultimate bearing pressure

Ultimate bearing pressure [kN/m²] 200.00

Active pressure [kN/m²] 157.77

Pressure class...: Bearing capacity

Bearing capacity safety factor : 1.268

Equivalent bearing area [m] 5.00

Eccentricity of normal force [m] -8.15

Lever arm of overturning force [m] 2.35

Normal force on the base [kN] 788.85

Outer edge stress [kN/m²] -372.12

Inner edge stress [kN/m²] 232.44

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



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Cross Section.....: Section S5

File.....: S5 undrained analysis global 06022023

Date.....: 02/03/2023

Checks according to: Eurocode 7 EN 1997-1

Eurocode 7 EN 1997-1

TABLE OF CONTENTS
SOIL PROPERTIES

Soil: CAPPING		Description:
Cohesion Class.....	Undrained shear strength	
Cohesion.....	[kN/m ²]	30.00
Friction Angle Class.....	Angle of shearing resistance (Tan phi)	
Friction Angle.....	[°]	0.00
Ru value.....		0.10
Weight Class.....	Weight density	
Bulk unit weight – above GWT.....	[kN/m ³]	19.00
Bulk unit weight – below GWT.....	[kN/m ³]	19.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30

Soil: LANDFILL		Description:
Cohesion Class.....	Undrained shear strength	
Cohesion.....	[kN/m ²]	25.00
Friction Angle Class.....	Angle of shearing resistance (Tan phi)	
Friction Angle.....	[°]	0.00
Ru value.....		0.20
Weight Class.....	Weight density	
Bulk unit weight – above GWT.....	[kN/m ³]	8.00
Bulk unit weight – below GWT.....	[kN/m ³]	8.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30

Soil: RSS		Description: RSS backfill
Cohesion Class.....	Undrained shear strength	
Cohesion.....	[kN/m ²]	80.00
Friction Angle Class.....	Angle of shearing resistance (Tan phi)	
Friction Angle.....	[°]	0.00
Ru value.....		0.10
Weight Class.....	Weight density	
Bulk unit weight – above GWT.....	[kN/m ³]	19.00
Bulk unit weight – below GWT.....	[kN/m ³]	19.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30

STRATA PROFILES

Stratum: BUND		Description:					
Soil : RSS							
X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
27.15	7.73	42.66	15.55	44.71	15.55	59.68	8.04

Stratum: CAPPING		Description:					
Soil : CAPPING							
X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
7.55	6.69	26.30	7.91	27.15	7.73	29.55	7.73
38.84	9.90	49.51	9.97	53.87	8.04	59.68	8.04
60.45	8.36	71.20	8.36				



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Stratum: LANDFILL

Description:

Soil : LANDFILL

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
7.55	4.69	26.15	5.90	53.44	6.04	71.20	6.04

REINFORCED BLOCKS**Block : L1**

Block dimensions_____ [m] _____: Base width_____ = 2.00 Height_____ = 0.80
Block Origin_____ [m] _____: Abscissa_____ = 27.30 Ordinate_____ = 7.80
Face inclination_____ [°] _____: 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basotex 200/50

Length_____ [m] _____ = 2.00
Vertical spacing_____ [m] _____ = 0.40
Wrapped length_____ [m] _____ = 0.10

Block : R1

Block dimensions_____ [m] _____: Base width_____ = 5.00 Height_____ = 0.40
Block Origin_____ [m] _____: Abscissa_____ = 59.60 Ordinate_____ = 8.10
Face inclination_____ [°] _____: 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basotex 200/50

Length_____ [m] _____ = 5.00
Vertical spacing_____ [m] _____ = 0.40
Wrapped length_____ [m] _____ = 0.10

Block : R2

Block dimensions_____ [m] _____: Base width_____ = 2.00 Height_____ = 0.80
Back Shift_____ [m] _____ = 0.00 by R1
Face inclination_____ [°] _____: 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basotex 200/50



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Length_____ [m]_____ = 2.00
Vertical spacing_____ [m]_____ = 0.40
Wrapped length_____ [m]_____ = 0.10

Block : L2

Block dimensions_____ [m]_____ : Base width_____ = 4.50 Height_____ = 0.40
Back Shift_____ [m]_____ = 0.00 by L1
Face inclination_____ [°]_____ : 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 4.50
Vertical spacing_____ [m]_____ = 0.40
Wrapped length_____ [m]_____ = 0.10

Block : L3

Block dimensions_____ [m]_____ : Base width_____ = 2.00 Height_____ = 0.80
Back Shift_____ [m]_____ = 0.00 by L2
Face inclination_____ [°]_____ : 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 2.00
Vertical spacing_____ [m]_____ = 0.40
Wrapped length_____ [m]_____ = 0.10

Block : R3

Block dimensions_____ [m]_____ : Base width_____ = 5.00 Height_____ = 0.40
Back Shift_____ [m]_____ = 0.00 by R2
Face inclination_____ [°]_____ : 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 5.00
Vertical spacing_____ [m]_____ = 0.40
Wrapped length_____ [m]_____ = 0.10

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Block : R4

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by R3
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : L4

Block dimensions[m] : Base width = 5.00 Height = 0.40
Back Shift[m] = 0.00 by L3
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 5.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : L5

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by L4
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : R5

Block dimensions[m] : Base width = 5.00 Height = 0.40
Back Shift[m] = 0.00 by R4
Face inclination[°] : 63.00



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Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R6

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by R5
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L6

Block dimensions.....[m] : Base width..... = 5.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L5
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: CAPPING

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L7

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by L6
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS



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Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

Block : R7

Block dimensions.....[m] : Base width..... = 5.00 Height..... = 0.40

Back Shift.....[m] = 0.00 by R6

Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay

Structural embankment.....: RSS

Backfill soil.....: RSS

Covering soil.....: RSS

Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

Block : R8

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80

Back Shift.....[m] = 0.00 by R7

Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay

Structural embankment.....: RSS

Backfill soil.....: RSS

Covering soil.....: RSS

Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

Block : L8

Block dimensions.....[m] : Base width..... = 5.00 Height..... = 0.40

Back Shift.....[m] = 0.00 by L7

Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay

Structural embankment.....: RSS

Backfill soil.....: RSS

Covering soil.....: RSS

Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00



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Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 5.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : L9

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by L8
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R9

Block dimensions.....[m].....: Base width.....= 10.00 Height.....= 0.40
Back Shift.....[m].....= 0.00 by R8
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 10.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R10

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by R9
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10



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Block : L10

Block dimensions[m] : Base width = 5.00 Height = 0.40

Back Shift[m] = 0.00 by L9

Face inclination[°] : 63.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 5.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : L11

Block dimensions[m] : Base width = 2.00 Height = 0.80

Back Shift[m] = 0.00 by L10

Face inclination[°] : 63.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: CAPPING

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : R11

Block dimensions[m] : Base width = 5.00 Height = 0.40

Back Shift[m] = 0.00 by R10

Face inclination[°] : 63.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 5.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : R12

Block dimensions[m] : Base width = 2.00 Height = 0.80

Back Shift[m] = 0.00 by R11

Face inclination[°] : 63.00



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Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L12

Block dimensions.....[m] : Base width..... = 4.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L11
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 4.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L13

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L12
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

SURCHARGE LOADS

Distributed Loads : LOAD

Description :

Class : Variable unfavourable

Magnitude.....[kN/m²] = 10.00 Inclination angle.....[°] = 0.00
Abscissa.....[m] : from = 42.66 To = 44.71



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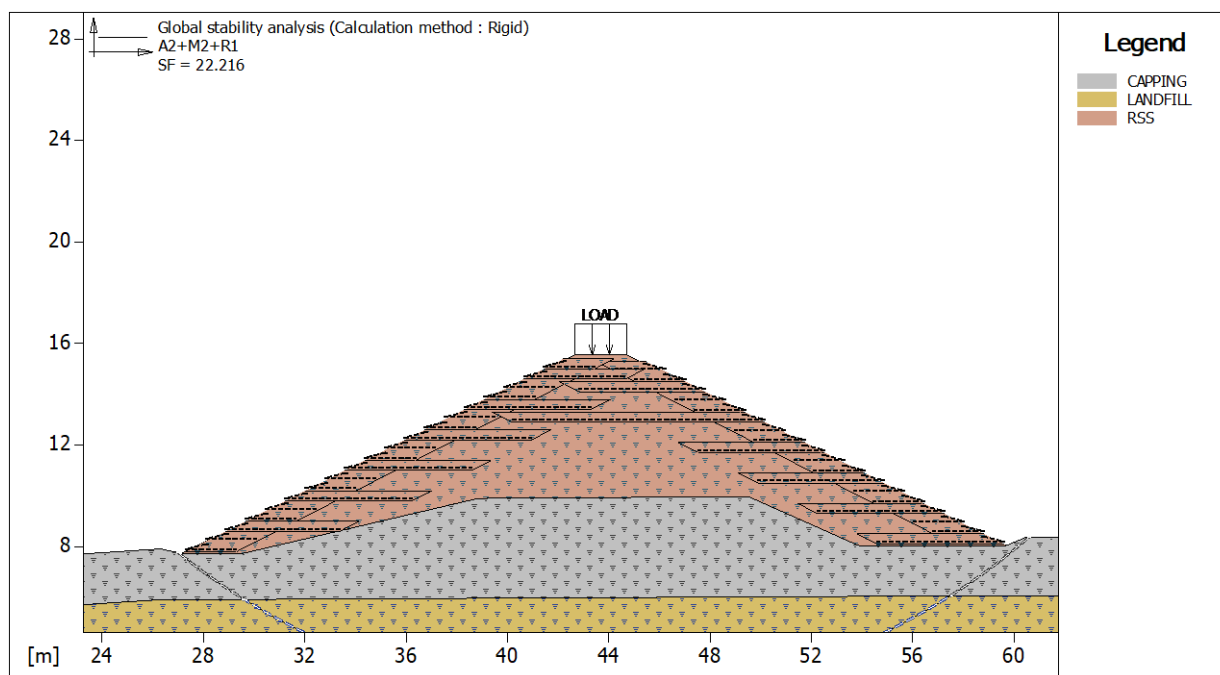
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PROPERTIES OF THE USED REINFORCEMENTS

Basetex 200/50

Tensile strength UTS	[kN/m]	200.00
Minimum anchorage length	[m]	0.15
Breakage Safety Factor (gravel)		1.54
Breakage Safety Factor (sand)		1.52
Breakage Safety Factor (silty sand)		1.52
Breakage Safety Factor (sandy clay)		2.06
Interaction factor reinforcement/reinforcement		0.16
Pullout coefficient reinforcement-gravel		0.90
Pullout coefficient reinforcement-sand		0.90
Pullout coefficient reinforcement-silt		0.70
Pullout coefficient reinforcement-clay		0.40

CHECKS RESULTS



Global Stability Check :

Multiplier combination : A2+M2+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor..... 22.216

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
27.00	28.00	60.00	70.00
Number of starting point on the starting segment		3	
Total number of trial surfaces		102	
Minimum base length of slices		[m] : 0.50	
Superior limit search angle		[°] : 0.00	
Inferior limit search angle		[°] : 0.00	

Multiplier	Class
1.30	Variable unfavourable
1.25	Angle of shearing resistance (Tan phi)
1.25	Effective cohesion
1.40	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



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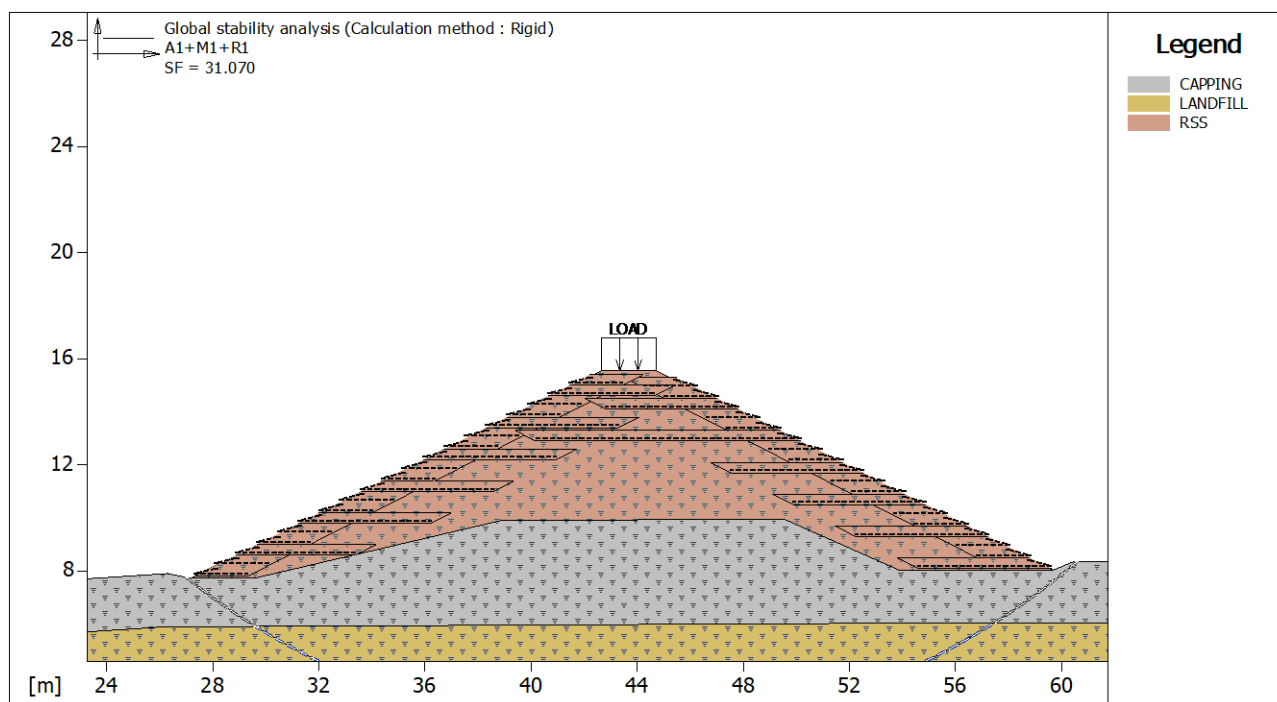
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**Global Stability Check :**

Multiplier combination : A1+M1+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor : 31.070

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
27.00	28.00	60.00	70.00
Number of starting point on the starting segment.....		3	
Total number of trial surfaces.....		102	
Minimum base length of slices..... [m].....		0.50	
Superior limit search angle..... [°].....		0.00	
Inferior limit search angle..... [°].....		0.00	

Multiplier	Class
1.50	Variable unfavourable
1.00	Angle of shearing resistance (Tan phi)
1.00	Effective cohesion
1.00	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



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REF. NUMBER:

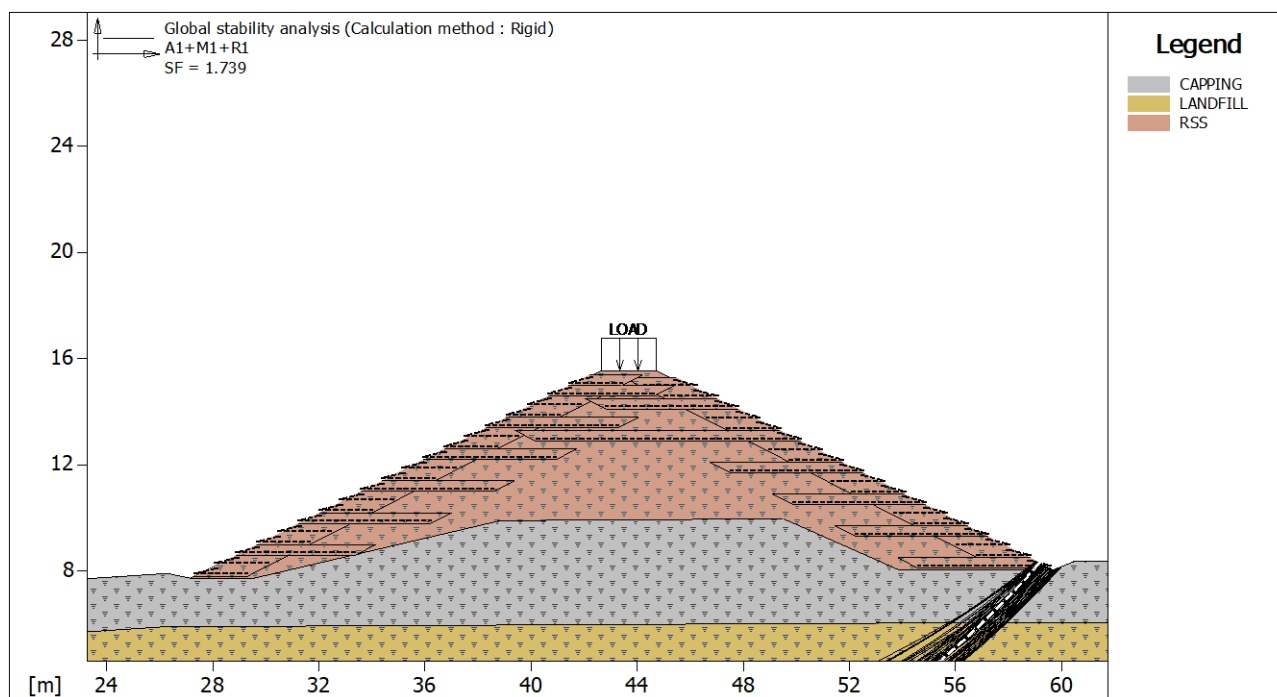
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**Global Stability Check :**

Multiplier combination : A1+M1+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 1.739

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
8.00	27.00	59.00	60.00
Number of starting point on the starting segment.....:		47	
Total number of trial surfaces.....:		470	
Minimum base length of slices.....[m].....:		0.50	
Superior limit search angle.....[°].....:		0.00	
Inferior limit search angle.....[°].....:		0.00	

Block : R1
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.50	Variable unfavourable
1.00	Angle of shearing resistance (Tan phi)
1.00	Effective cohesion
1.00	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



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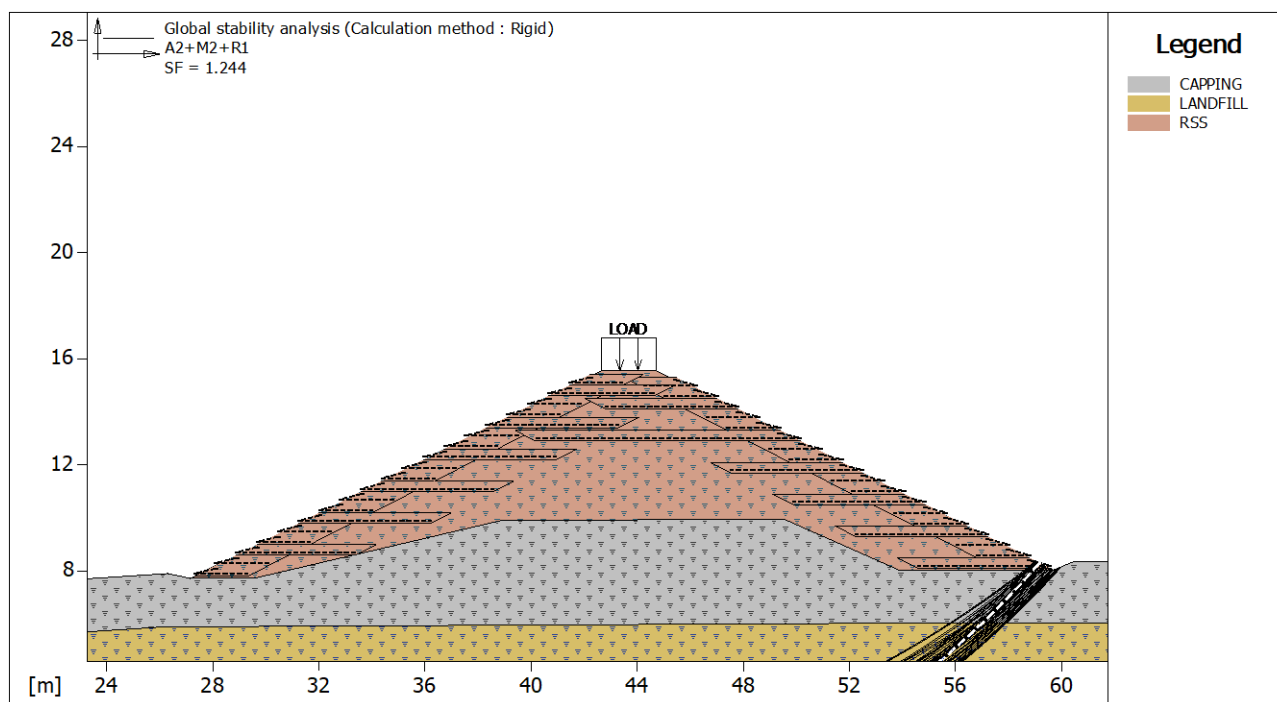
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**Global Stability Check :**

Multiplier combination : A2+M2+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor : 1.244

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
8.00	27.00	59.00	60.00
Number of starting point on the starting segment.....		39	
Total number of trial surfaces.....		390	
Minimum base length of slices..... [m].....		0.50	
Superior limit search angle..... [°].....		0.00	
Inferior limit search angle..... [°].....		0.00	

Block : R1
Basotex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
0.000	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.30	Variable unfavourable
1.25	Angle of shearing resistance (Tan phi)
1.25	Effective cohesion
1.40	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



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Cross Section.....: Section S7

File.....: S6 drained analysis 06022023

Date.....: 02/03/2023

Checks according to: BS 8006-1:2010+A1:2016
Reinforced slope – Cat. 2 (medium)

TABLE OF CONTENTS

SOIL PROPERTIES

Soil: CAPPING		Description:
Cohesion Class.....	Soil material factor c'	
Cohesion.....	[kN/m ²]	0.00
Friction Angle Class.....	Soil material factor tan(phi)	
Friction Angle.....	[°]	27.00
Ru value.....		0.10
Weight Class.....	Soil unit weight	
Bulk unit weight – above GWT.....	[kN/m ³]	19.00
Bulk unit weight – below GWT.....	[kN/m ³]	19.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30

Soil: LANDFILL		Description:
Cohesion Class.....	Soil material factor c'	
Cohesion.....	[kN/m ²]	0.00
Friction Angle Class.....	Soil material factor tan(phi)	
Friction Angle.....	[°]	30.00
Ru value.....		0.20
Weight Class.....	Soil unit weight	
Bulk unit weight – above GWT.....	[kN/m ³]	8.00
Bulk unit weight – below GWT.....	[kN/m ³]	8.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30

Soil: RSS		Description: RSS backfill
Cohesion Class.....	Soil material factor c'	
Cohesion.....	[kN/m ²]	0.00
Friction Angle Class.....	Soil material factor tan(phi)	
Friction Angle.....	[°]	25.00
Ru value.....		0.10
Weight Class.....	Soil unit weight	
Bulk unit weight – above GWT.....	[kN/m ³]	19.00
Bulk unit weight – below GWT.....	[kN/m ³]	19.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30

STRATA PROFILES

Stratum: BUND		Description:					
Soil : RSS							
X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
32.97	10.68	43.44	16.03	45.66	16.11	55.65	10.99

Stratum: CAPPING		Description:					
Soil : CAPPING							
X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
11.34	8.84	21.19	9.63	32.25	10.87	32.71	10.68
35.12	10.68	35.54	10.68	42.67	11.81	49.75	11.94
51.37	10.99	69.62	10.99				



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Stratum: LANDFILL

Description:

Soil : LANDFILL

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
11.50	6.84	31.95	8.82	50.83	8.99	69.62	8.99

REINFORCED BLOCKS**Block : L1**

Block dimensions_____ [m] _____: Base width_____ = 4.00 Height_____ = 0.40
Block Origin_____ [m] _____: Abscissa_____ = 33.00 Ordinate_____ = 10.70
Face inclination_____ [°] _____: 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basotex 200/50

Length_____ [m] _____ = 4.00
Vertical spacing_____ [m] _____ = 0.40
Wrapped length_____ [m] _____ = 0.10

Block : R1

Block dimensions_____ [m] _____: Base width_____ = 4.00 Height_____ = 0.40
Block Origin_____ [m] _____: Abscissa_____ = 55.60 Ordinate_____ = 11.00
Face inclination_____ [°] _____: 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basotex 200/50

Length_____ [m] _____ = 4.00
Vertical spacing_____ [m] _____ = 0.40
Wrapped length_____ [m] _____ = 0.10

Block : L2

Block dimensions_____ [m] _____: Base width_____ = 2.00 Height_____ = 0.80
Back Shift_____ [m] _____ = 0.00 by L1
Face inclination_____ [°] _____: 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basotex 200/50



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Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R2

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by R1
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : L3

Block dimensions.....[m].....: Base width.....= 5.00 Height.....= 0.40
Back Shift.....[m].....= 0.00 by L2
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 5.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R3

Block dimensions.....[m].....: Base width.....= 5.00 Height.....= 0.40
Back Shift.....[m].....= 0.00 by R2
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 5.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10



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Block : L4

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by L3
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : R4

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by R3
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : L5

Block dimensions[m] : Base width = 5.00 Height = 0.40
Back Shift[m] = 0.00 by L4
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 5.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : R5

Block dimensions[m] : Base width = 5.00 Height = 0.40
Back Shift[m] = 0.00 by R4
Face inclination[°] : 63.00



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Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L6

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by L5
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R6

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by R5
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L7

Block dimensions.....[m] : Base width..... = 5.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L6
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS



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Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

Block : R7

Block dimensions.....[m] : Base width..... = 5.00 Height..... = 0.40

Back Shift.....[m] = 0.00 by R6

Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay

Structural embankment.....: RSS

Backfill soil.....: RSS

Covering soil.....: RSS

Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

Block : L8

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 1.20

Back Shift.....[m] = 0.00 by L7

Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay

Structural embankment.....: RSS

Backfill soil.....: RSS

Covering soil.....: RSS

Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

Block : R8

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80

Back Shift.....[m] = 0.00 by R7

Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay

Structural embankment.....: RSS

Backfill soil.....: RSS

Covering soil.....: RSS

Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00



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Reinforcements pattern :

Basetex 200/50

Length [m] = 2.00

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10

SURCHARGE LOADS**Distributed Loads : LOAD**

Description :

Class : External live loads

Magnitude [kN/m²] = 10.00

Inclination angle [°] = 0.00

Abscissa [m] : from = 43.44 To = 45.66

PROPERTIES OF THE USED REINFORCEMENTS

Basetex 200/50

Tensile strength UTS [kN/m] : 200.00

Minimum anchorage length [m] : 0.15

Breakage Safety Factor (gravel) : 1.54

Breakage Safety Factor (sand) : 1.52

Breakage Safety Factor (silty sand) : 1.52

Breakage Safety Factor (sandy clay) : 2.06

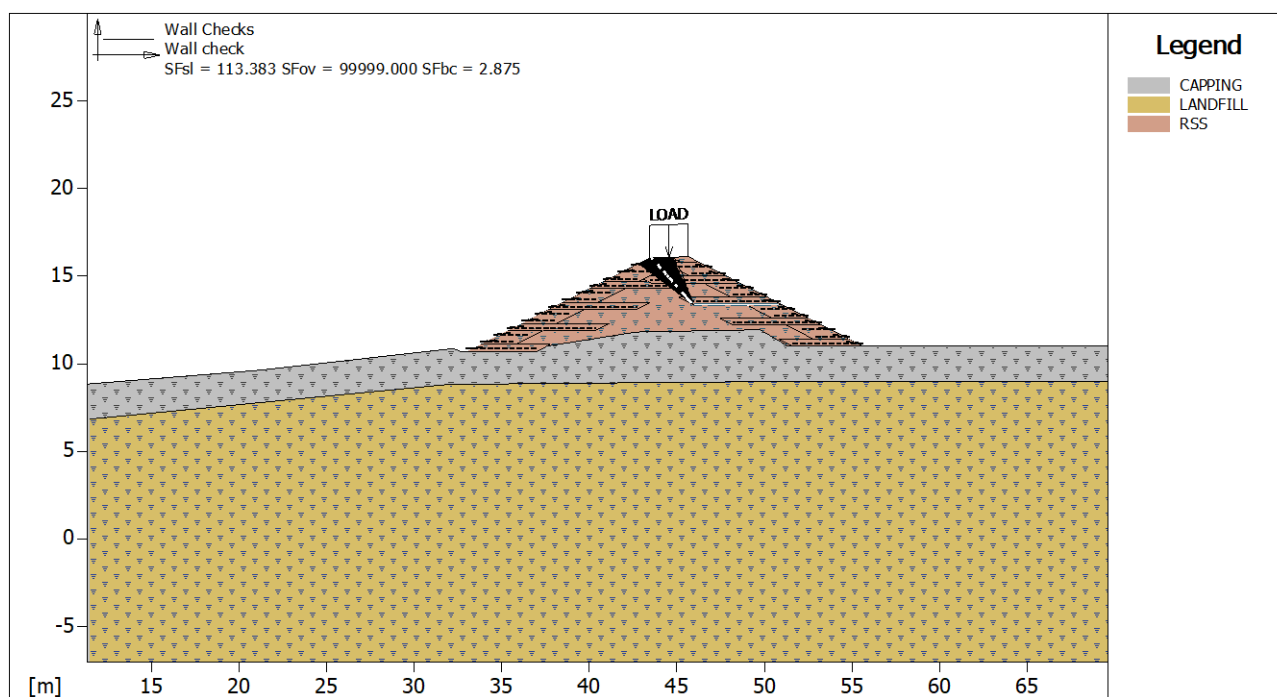
Interaction factor reinforcement/reinforcement : 0.16

Pullout coefficient reinforcement-gravel : 0.90

Pullout coefficient reinforcement-sand : 0.90

Pullout coefficient reinforcement-silt : 0.70

Pullout coefficient reinforcement-clay : 0.40

CHECKS RESULTS**Wall Checks :**

Multiplier combination : Wall check

Considered block : R5

Resisting force [kN/m] : 152.74

Active force [kN/m] : 1.12

Sliding class : Sliding along base of structure

Sliding safety factor : 113.383

Restoring moment [kN*m/m] : 1559.80

Overturning moment [kN*m/m] : -6.01

Overturning class : Overturning



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Overturning safety factor.....: 99999.000

Ultimate bearing pressure computed with Limit Equilibrium method

Ultimate bearing pressure.....[kN/m²].....: 188.34Active pressure.....[kN/m²].....: 65.51

Pressure class...: Bearing capacity

Bearing capacity safety factor.....: 2.875

Equivalent bearing area.....[m].....: 5.00

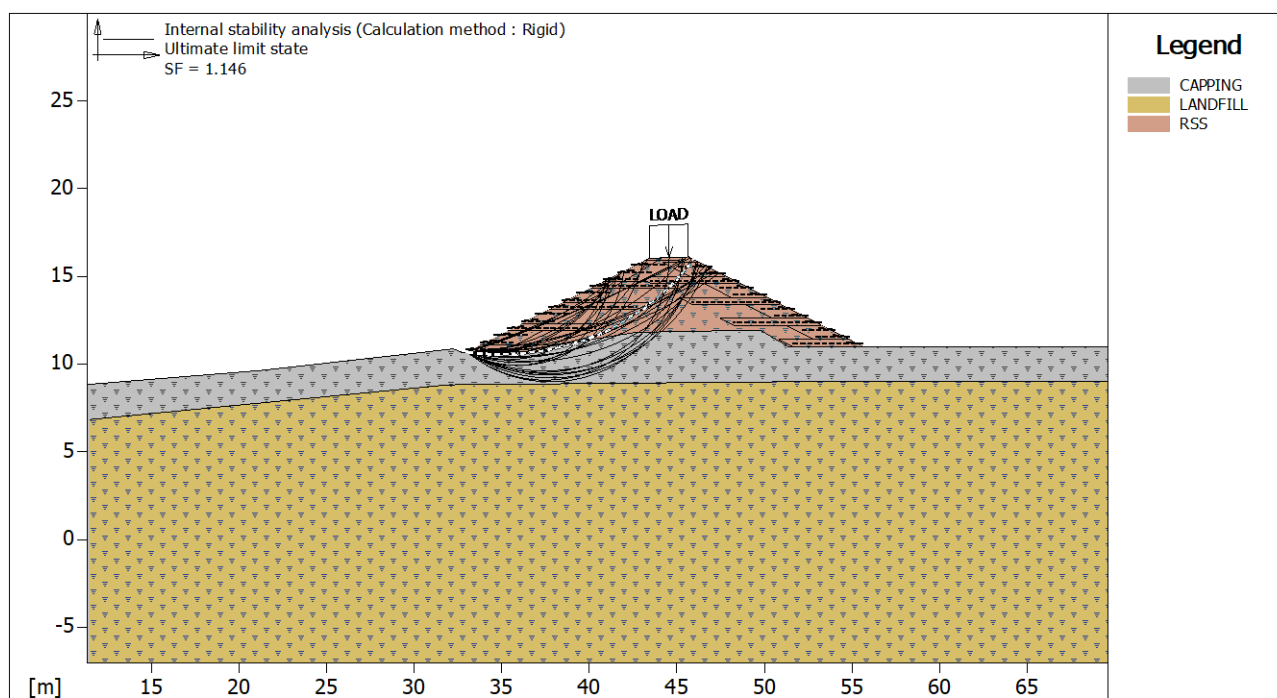
Eccentricity of normal force.....[m].....: -2.28

Lever arm of overturning force.....[m].....: -5.35

Normal force on the base.....[kN].....: 327.55

Outer edge stress.....[kN/m²].....: -22487.75Inner edge stress.....[kN/m²].....: 23979.33

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning

**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 1.146

Surfaces searching range

Block

L1

Arrival range, abscises [m]

First point

40.00

Second point

50.00

Number of starting point on the starting segment.....: 1

Total number of trial surfaces.....: 100

Minimum base length of slices.....[m].....: 0.50

Superior limit search angle.....[°].....: 0.00

Inferior limit search angle.....[°].....: 0.00

Block : L7



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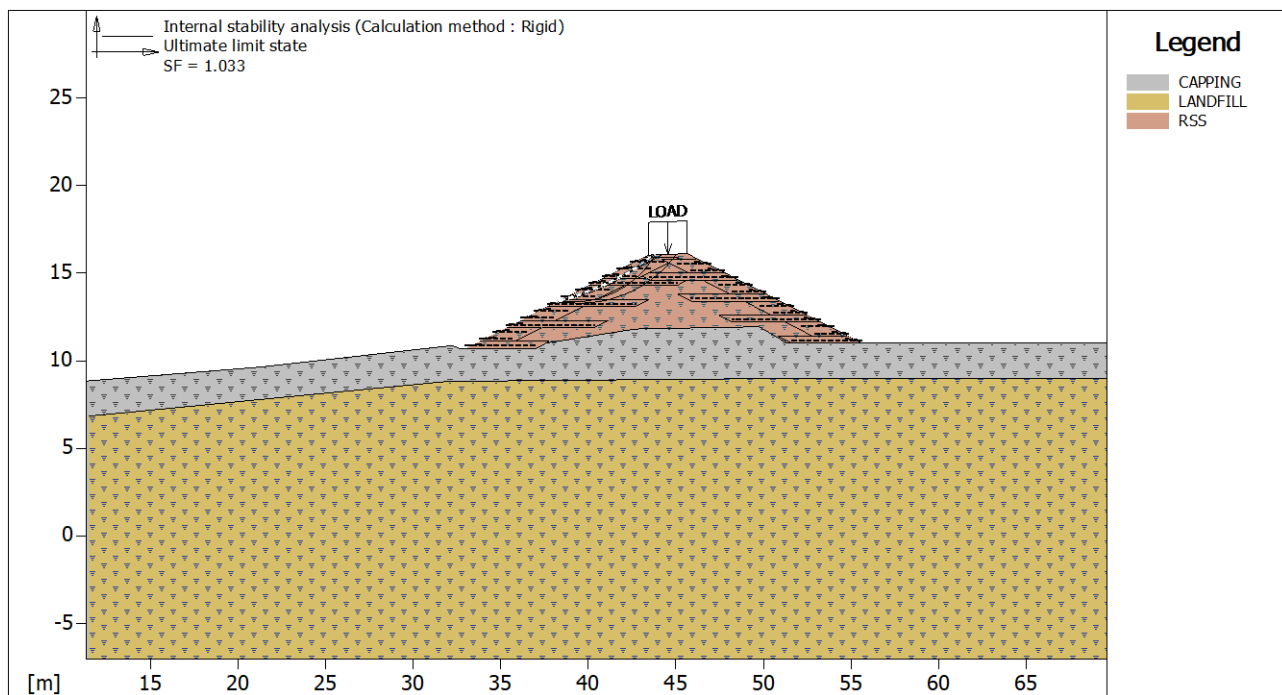
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Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	13.2	10.1	4.95	1.31

Block : R7 Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	23.2	17.8	2.81	1.30

Block : R8 Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.400	50.0	6.2	4.8	10.42	1.29

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)

**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 1.033

Surfaces searching range		
Block	Arrival range, abscises [m]	
L5	First point 43.00	Second point 50.00
Number of starting point on the starting segment.....:		1
Total number of trial surfaces.....:		100
Minimum base length of slices..... [m].....:		0.50



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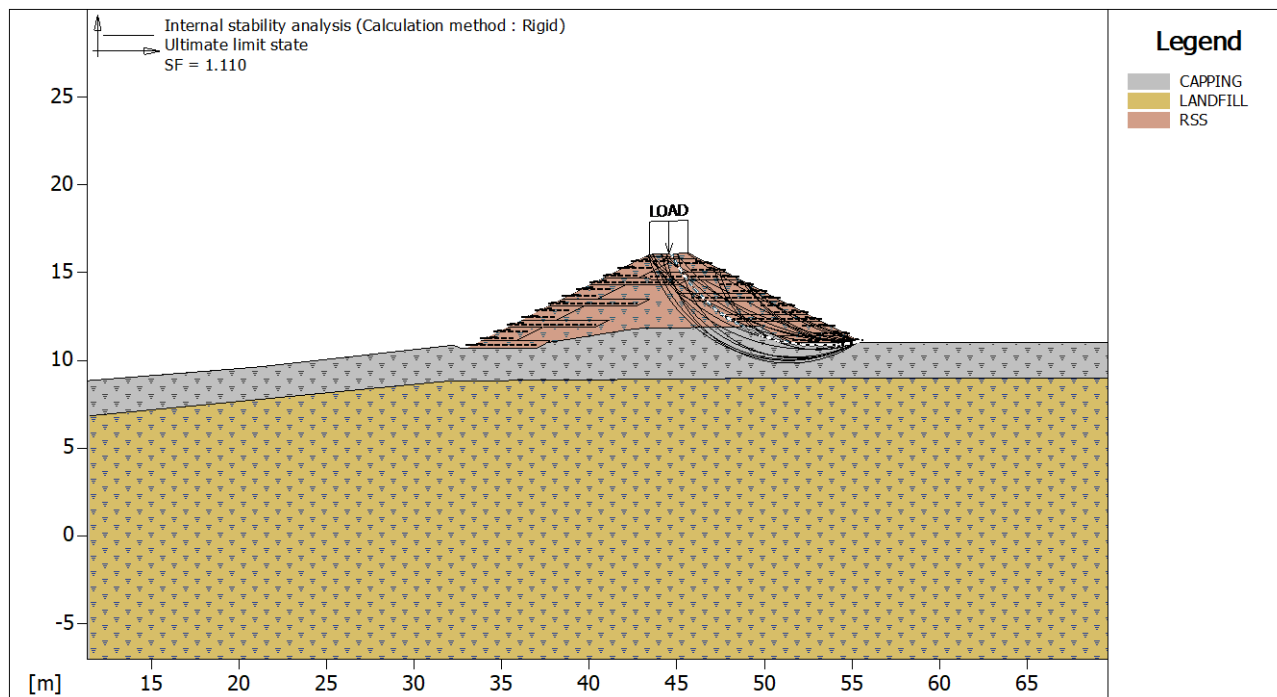
Superior limit search angle [°] : 0.00
Inferior limit search angle [°] : 0.00

Block : L6 Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.1	0.1	500.00	1.00
0.400	50.0	0.8	0.7	71.43	1.14

Block : L7 Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	1.4	1.1	45.45	1.27

Block : L8 Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	1.5	1.2	41.67	1.25
0.400	50.0	1.3	1.0	50.00	1.30
0.800	50.0	0.8	0.6	83.33	1.33

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)



Internal Stability :

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor : 1.110



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Surfaces searching range

Block	Arrival range, abscises [m]
R1	First point 40.00 Second point 50.00

Number of starting point on the starting segment.....: 1
Total number of trial surfaces.....: 100
Minimum base length of slices.....[m].....: 0.50
Superior limit search angle.....[°].....: 0.00
Inferior limit search angle.....[°].....: 0.00

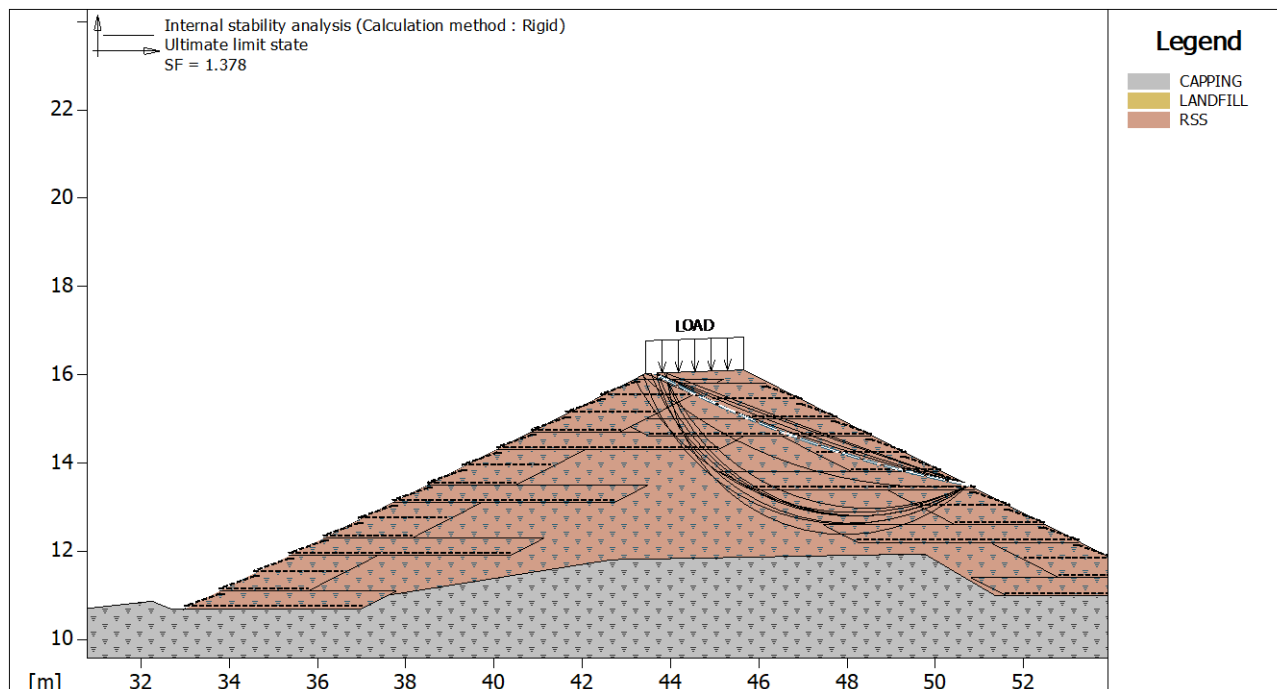
Block : R5
Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	17.9	13.8	3.62	1.30

Block : R7
Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	21.0	16.2	3.09	1.30

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)

**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 1.378

Surfaces searching range

Block	Arrival range, abscises [m]
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R5

First point
40.00Second point
44.00

Number of starting point on the starting segment : 1
Total number of trial surfaces : 100
Minimum base length of slices [m] : 0.50
Superior limit search angle [°] : 0.00
Inferior limit search angle [°] : 0.00

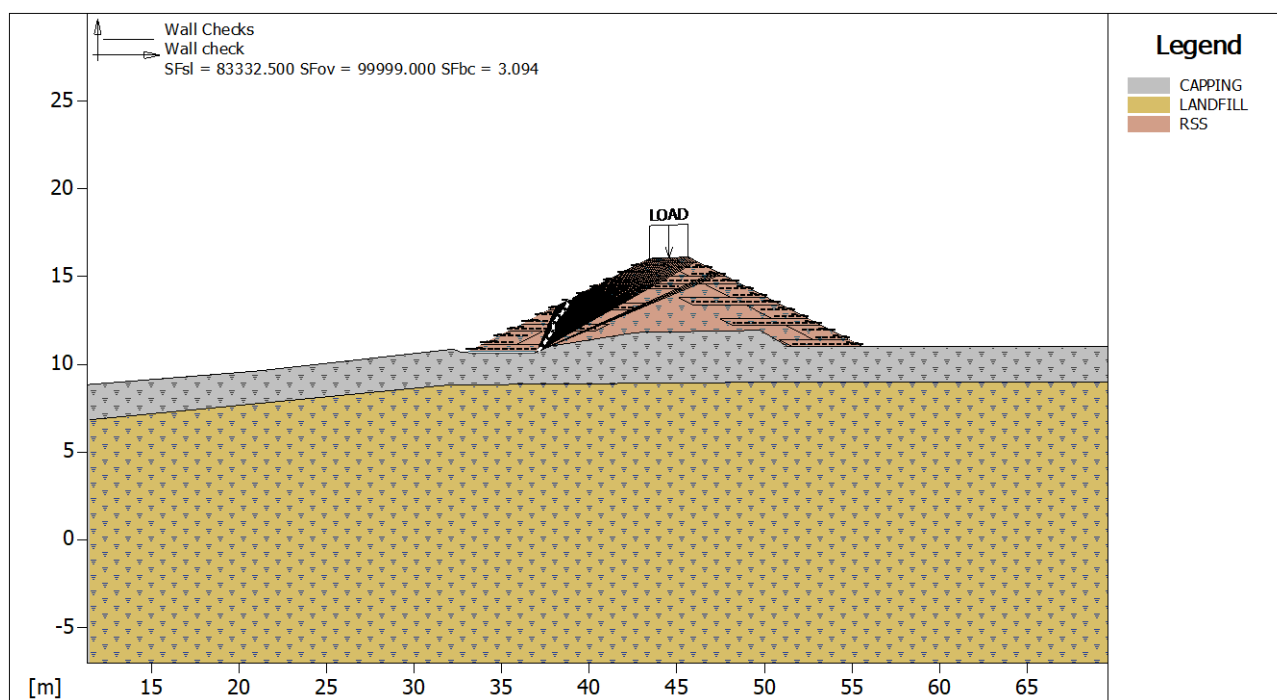
Block : R6
Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	1.4	1.1	45.45	1.27
0.400	50.0	4.6	3.5	14.29	1.31

Block : R7
Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	7.5	5.8	8.62	1.29

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)

**Wall Checks :**

Multiplier combination : Wall check

Considered block : L1

Resisting force [kN/m] : 284.63
Active force [kN/m] : -10.46
Sliding class : Sliding along base of structure
Sliding safety factor : 83332.500
Restoring moment [kN*m/m] : 4463.30
Overturning moment [kN*m/m] : -39.21



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Overturning class: Overturning

Overturning safety factor.....: 99999.000

Ultimate bearing pressure computed with Limit Equilibrium method

Ultimate bearing pressure.....[kN/m²].....: 458.11Active pressure.....[kN/m²].....: 148.08

Pressure class: Bearing capacity

Bearing capacity safety factor.....: 3.094

Equivalent bearing area.....[m].....: 4.00

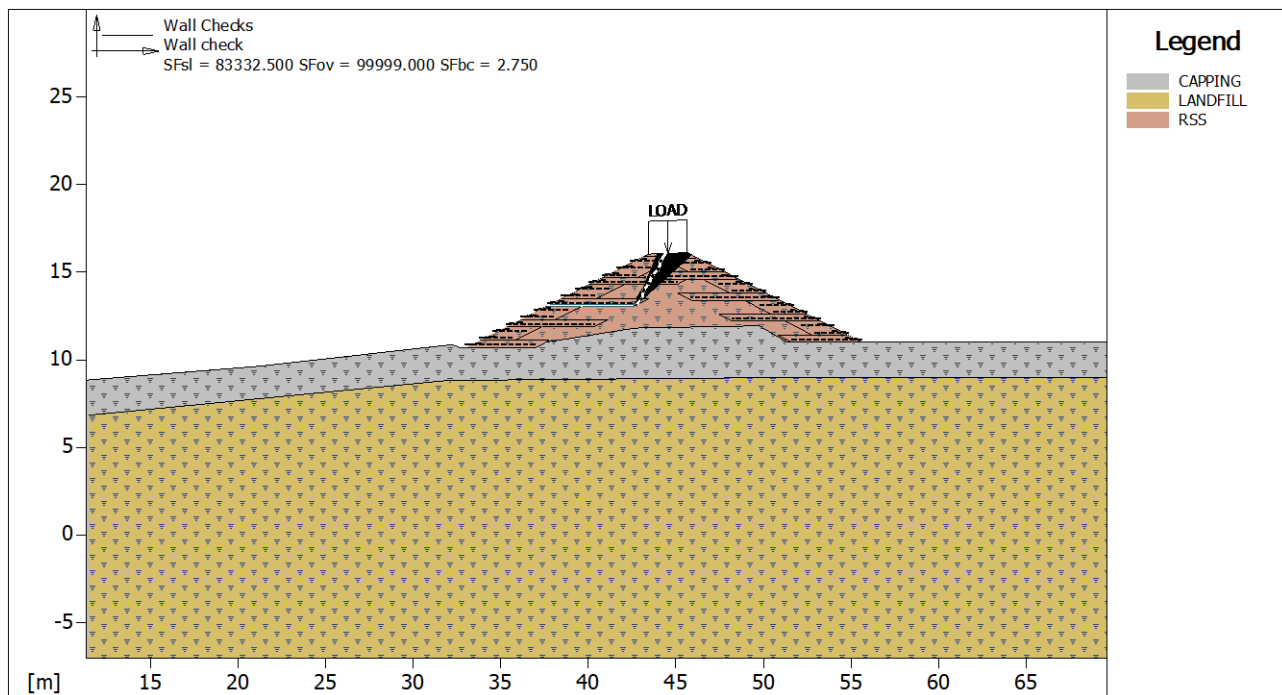
Eccentricity of normal force.....[m].....: -5.60

Lever arm of overturning force.....[m].....: 3.75

Normal force on the base.....[kN].....: 592.21

Outer edge stress.....[kN/m²].....: -465.59Inner edge stress.....[kN/m²].....: 301.22

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning

**Wall Checks :**

Multiplier combination : Wall check

Considered block : L5

Resisting force.....[kN/m].....: 161.97

Active force.....[kN/m].....: -6.72

Sliding class.....: Sliding along base of structure

Sliding safety factor.....: 83332.500

Restoring moment.....[kN*m/m].....: 1733.90

Overturning moment.....[kN*m/m].....: -24.18

Overturning class: Overturning

Overturning safety factor.....: 99999.000

Ultimate bearing pressure computed with Limit Equilibrium method

Ultimate bearing pressure.....[kN/m²].....: 191.08Active pressure.....[kN/m²].....: 69.48



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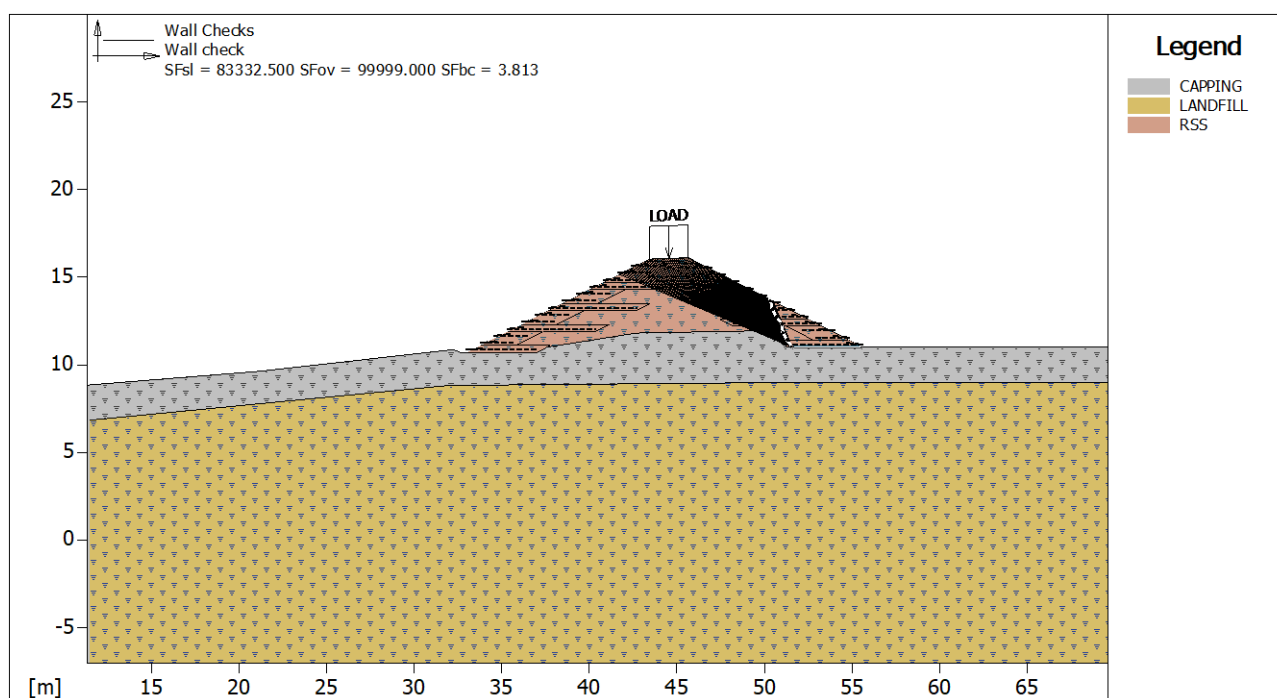
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Pressure class: Bearing capacity

Bearing capacity safety factor	:	2.750
Equivalent bearing area	[m]	5.00
Eccentricity of normal force	[m]	-2.56
Lever arm of overturning force	[m]	3.60
Normal force on the base	[kN]	347.36
Outer edge stress	[kN/m ²]	-357981.78
Inner edge stress	[kN/m ²]	352315.22

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning

**Wall Checks :**

Multiplier combination : Wall check

Considered block : R1

Resisting force	[kN/m]	268.18
Active force	[kN/m]	-10.48
Sliding class	: Sliding along base of structure	
Sliding safety factor	:	83332.500
Restoring moment	[kN*m/m]	4203.80
Overturning moment	[kN*m/m]	-4.107
Overturning class	: Overturning	
Overturning safety factor	:	99999.000

Ultimate bearing pressure computed with Limit Equilibrium method

Ultimate bearing pressure	[kN/m ²]	548.25
Active pressure	[kN/m ²]	143.80
Pressure class	: Bearing capacity	
Bearing capacity safety factor	:	3.813
Equivalent bearing area	[m]	4.00
Eccentricity of normal force	[m]	-5.38
Lever arm of overturning force	[m]	3.92
Normal force on the base	[kN]	575.11



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Outer edge stress [kN/m²] : -491.15
Inner edge stress [kN/m²] : 321.05

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



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Cross Section.....: Section S6

File.....: S6 drained analysis global 06022023

Date.....: 02/03/2023

Checks according to: Eurocode 7 EN 1997-1
Eurocode 7 EN 1997-1TABLE OF CONTENTS
SOIL PROPERTIES

Soil: CAPPING		Description:
Cohesion Class.....	Effective cohesion	
Cohesion.....	[kN/m ²]	0.00
Friction Angle Class.....	Angle of shearing resistance (Tan phi)	
Friction Angle.....	[°]	27.00
Ru value.....		0.10
Weight Class.....	Weight density	
Bulk unit weight – above GWT.....	[kN/m ³]	19.00
Bulk unit weight – below GWT.....	[kN/m ³]	19.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30
Soil: LANDFILL		Description:
Cohesion Class.....	Effective cohesion	
Cohesion.....	[kN/m ²]	0.00
Friction Angle Class.....	Angle of shearing resistance (Tan phi)	
Friction Angle.....	[°]	30.00
Ru value.....		0.20
Weight Class.....	Weight density	
Bulk unit weight – above GWT.....	[kN/m ³]	8.00
Bulk unit weight – below GWT.....	[kN/m ³]	8.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30
Soil: RSS		Description: RSS backfill
Cohesion Class.....	Effective cohesion	
Cohesion.....	[kN/m ²]	0.00
Friction Angle Class.....	Angle of shearing resistance (Tan phi)	
Friction Angle.....	[°]	25.00
Ru value.....		0.10
Weight Class.....	Weight density	
Bulk unit weight – above GWT.....	[kN/m ³]	19.00
Bulk unit weight – below GWT.....	[kN/m ³]	19.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30

STRATA PROFILES

Stratum: BUND		Description:					
Soil : RSS							
X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
32.97	10.68	43.44	16.03	45.66	16.11	55.65	10.99
Stratum: CAPPING		Description:					
Soil : CAPPING							
X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
11.34	8.84	21.19	9.63	32.25	10.87	32.71	10.68
35.12	10.68	35.54	10.68	42.67	11.81	49.75	11.94
51.37	10.99	69.62	10.99				



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Stratum: LANDFILL

Description:

Soil : LANDFILL

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
11.50	6.84	31.95	8.82	50.83	8.99	69.62	8.99

REINFORCED BLOCKS**Block : L1**

Block dimensions_____ [m] : Base width_____ = 4.00 Height_____ = 0.40
Block Origin_____ [m] : Abscissa_____ = 33.00 Ordinate_____ = 10.70
Face inclination_____ [°] : 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m] = 4.00
Vertical spacing_____ [m] = 0.40
Wrapped length_____ [m] = 0.10

Block : R1

Block dimensions_____ [m] : Base width_____ = 4.00 Height_____ = 0.40
Block Origin_____ [m] : Abscissa_____ = 55.60 Ordinate_____ = 11.00
Face inclination_____ [°] : 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m] = 4.00
Vertical spacing_____ [m] = 0.40
Wrapped length_____ [m] = 0.10

Block : L2

Block dimensions_____ [m] : Base width_____ = 2.00 Height_____ = 0.80
Back Shift_____ [m] = 0.00 by L1
Face inclination_____ [°] : 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :



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Basetex 200/50

Length [m] = 2.00

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10

Block : R2

Block dimensions [m] : Base width = 2.00 Height = 0.80

Back Shift [m] = 0.00 by R1

Face inclination [°] : 63.00

Structural embankment type : Sandy Clay

Structural embankment : RSS

Backfill soil : RSS

Covering soil : RSS

Foundation soil : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth [m] : 0.00

Natural soil slope [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length [m] = 2.00

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10

Block : L3

Block dimensions [m] : Base width = 5.00 Height = 0.40

Back Shift [m] = 0.00 by L2

Face inclination [°] : 63.00

Structural embankment type : Sandy Clay

Structural embankment : RSS

Backfill soil : RSS

Covering soil : RSS

Foundation soil : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth [m] : 0.00

Natural soil slope [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length [m] = 5.00

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10

Block : R3

Block dimensions [m] : Base width = 5.00 Height = 0.40

Back Shift [m] = 0.00 by R2

Face inclination [°] : 63.00

Structural embankment type : Sandy Clay

Structural embankment : RSS

Backfill soil : RSS

Covering soil : RSS

Foundation soil : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth [m] : 0.00

Natural soil slope [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length [m] = 5.00

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10



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Block : L4

Block dimensions[m] : Base width = 2.00 Height = 0.80

Back Shift[m] = 0.00 by L3

Face inclination[°] : 63.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : R4

Block dimensions[m] : Base width = 2.00 Height = 0.80

Back Shift[m] = 0.00 by R3

Face inclination[°] : 63.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : L5

Block dimensions[m] : Base width = 5.00 Height = 0.40

Back Shift[m] = 0.00 by L4

Face inclination[°] : 63.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 5.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : R5

Block dimensions[m] : Base width = 5.00 Height = 0.40

Back Shift[m] = 0.00 by R4

Face inclination[°] : 63.00



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Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L6

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by L5
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R6

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by R5
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L7

Block dimensions.....[m] : Base width..... = 5.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L6
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS



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Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R7

Block dimensions.....[m] : Base width..... = 5.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by R6
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L8

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 1.20
Back Shift.....[m] = 0.00 by L7
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R8

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by R7
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00



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Reinforcements pattern :

Basetex 200/50

Length [m] = 2.00

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10

SURCHARGE LOADS

Distributed Loads : LOAD

Description :

Class : Variable unfavourable

Magnitude [kN/m²] = 10.00

Inclination angle [°] = 0.00

Abscissa [m] : from = 43.44 To = 45.66

PROPERTIES OF THE USED REINFORCEMENTS

Basetex 200/50

Tensile strength UTS [kN/m] : 200.00

Minimum anchorage length [m] : 0.15

Breakage Safety Factor (gravel) : 1.54

Breakage Safety Factor (sand) : 1.52

Breakage Safety Factor (silty sand) : 1.52

Breakage Safety Factor (sandy clay) : 2.06

Interaction factor reinforcement/reinforcement : 0.16

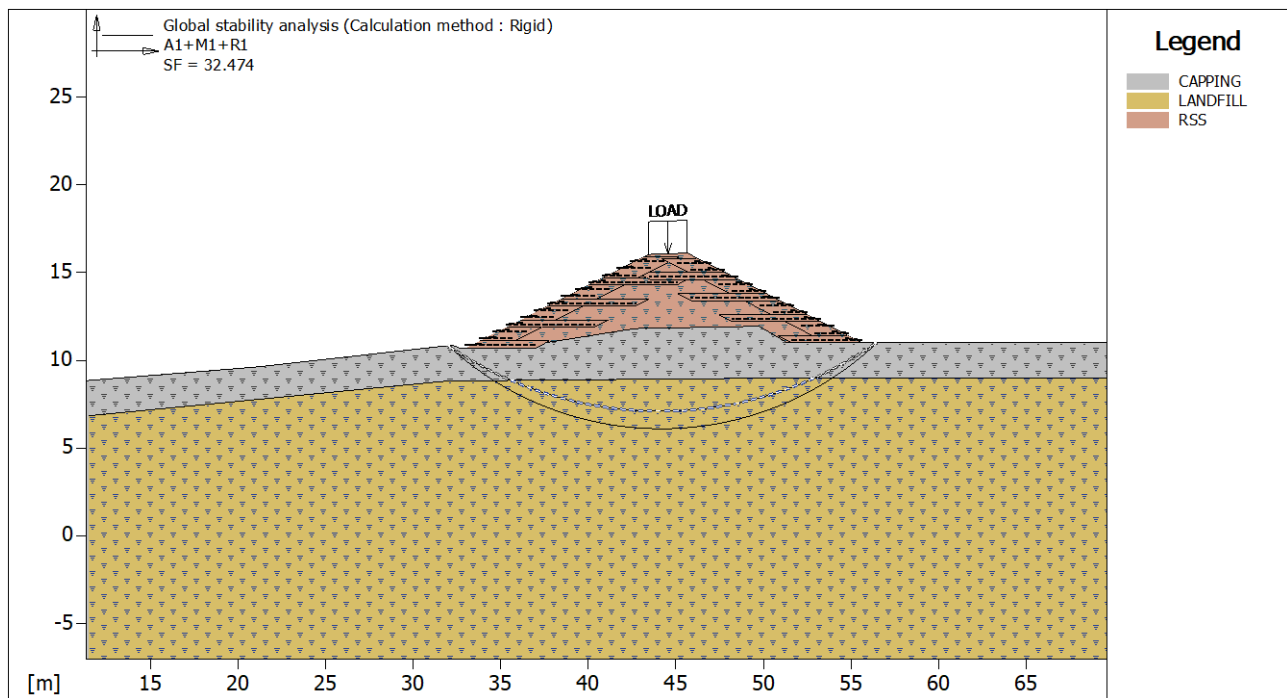
Pullout coefficient reinforcement-gravel : 0.90

Pullout coefficient reinforcement-sand : 0.90

Pullout coefficient reinforcement-silt : 0.70

Pullout coefficient reinforcement-clay : 0.40

CHECKS RESULTS



Global Stability Check :

Multiplier combination : A1+M1+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor : 32.474

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
32.00	33.00	56.00	69.00



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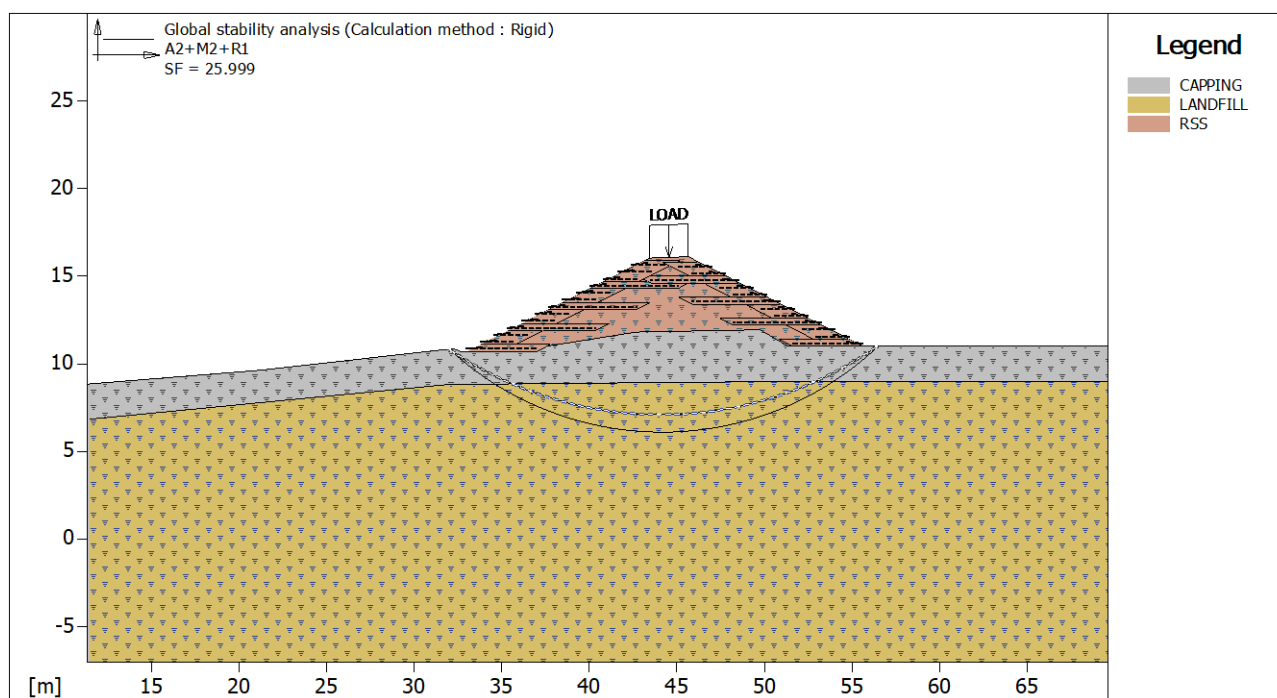
0

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Number of starting point on the starting segment.....	3
Total number of trial surfaces.....	102
Minimum base length of slices.....[m].....	0.50
Superior limit search angle.....[°].....	0.00
Inferior limit search angle.....[°].....	0.00

Multiplier	Class
1.50	Variable unfavourable
1.00	Angle of shearing resistance (Tan phi)
1.00	Effective cohesion
1.00	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability

**Global Stability Check :**

Multiplier combination : A2+M2+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor..... 25.999

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
32.00	33.00	56.00	69.00

Number of starting point on the starting segment.....	3
Total number of trial surfaces.....	102
Minimum base length of slices.....[m].....	0.50
Superior limit search angle.....[°].....	0.00
Inferior limit search angle.....[°].....	0.00

Multiplier	Class
1.30	Variable unfavourable
1.25	Angle of shearing resistance (Tan phi)
1.25	Effective cohesion
1.40	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



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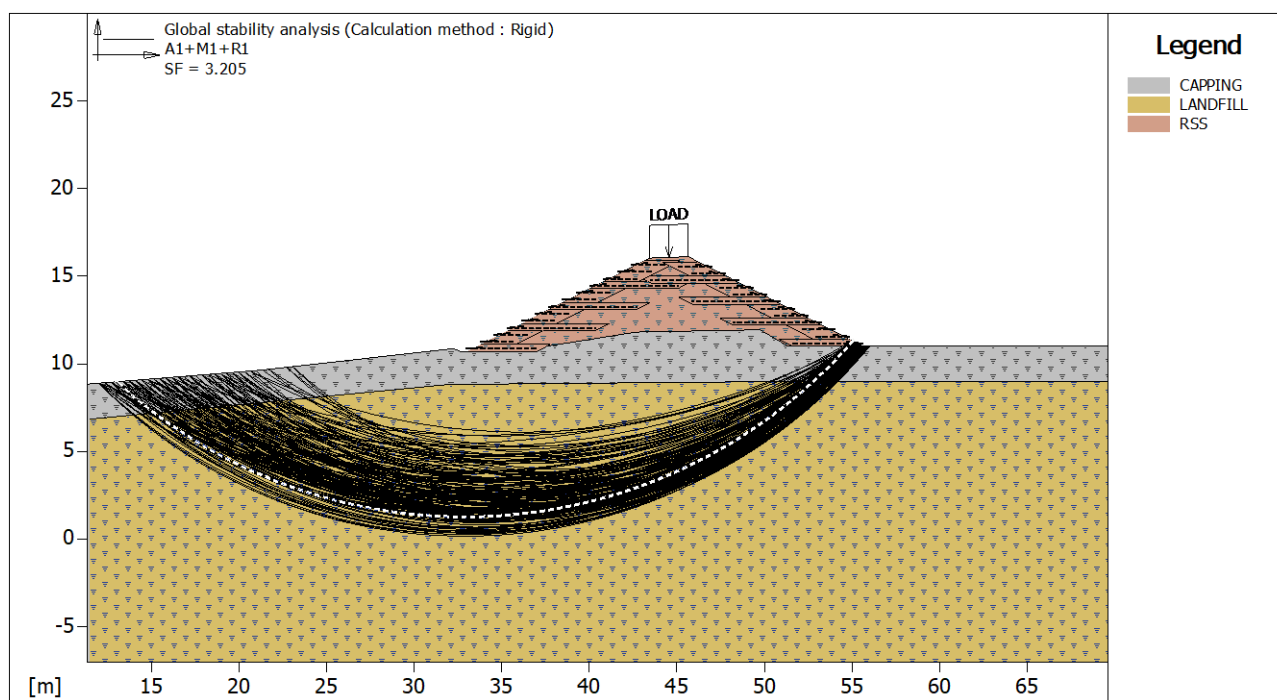
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**Global Stability Check :**

Multiplier combination : A1+M1+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor: 3.205

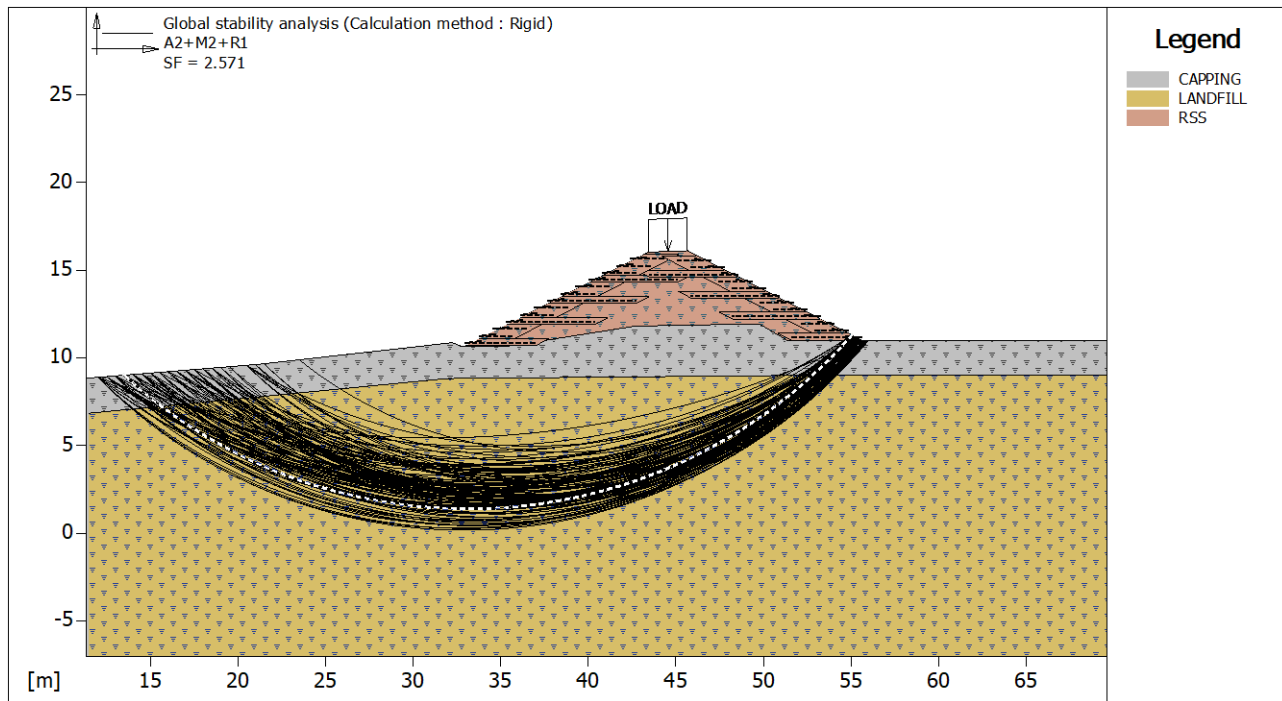
Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
12.00	30.00	55.00	56.00
Number of starting point on the starting segment: 53			
Total number of trial surfaces: 530			
Minimum base length of slices: 0.50 [m]			
Superior limit search angle: 0.00 [°]			
Inferior limit search angle: 0.00 [°]			

Block : R1
Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	1.1	1.1	45.45	1.00

Multiplier	Class
1.50	Variable unfavourable
1.00	Angle of shearing resistance (Tan phi)
1.00	Effective cohesion
1.00	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



Global Stability Check :

Multiplier combination : A2+M2+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor : 2.571

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
12.00	30.00	55.00	56.00
Number of starting point on the starting segment		37	
Total number of trial surfaces		370	
Minimum base length of slices		[m] : 0.50	
Superior limit search angle		[°] : 0.00	
Inferior limit search angle		[°] : 0.00	

Block : R1 Basotex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	1.1	1.1	45.45	1.00

Multiplier	Class
1.30	Variable unfavourable
1.25	Angle of shearing resistance (Tan phi)
1.25	Effective cohesion
1.40	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



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Cross Section.....: Section S6

File.....: S6 undrained analysis 06022023

Date.....: 02/03/2023

Checks according to: BS 8006-1:2010+A1:2016
Reinforced slope – Cat. 2 (medium)

TABLE OF CONTENTS

SOIL PROPERTIES

Soil: CAPPING	Description:	
Cohesion.....	[kN/m ²]	30.00
Friction Angle Class.....	Soil material factor tan(phi)	
Friction Angle.....	[°]	0.00
Ru value.....		0.10
Weight Class.....	Soil unit weight	
Bulk unit weight – above GWT.....	[kN/m ³]	19.00
Bulk unit weight – below GWT.....	[kN/m ³]	19.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30
Soil: LANDFILL	Description:	
Cohesion.....	[kN/m ²]	25.00
Friction Angle Class.....	Soil material factor tan(phi)	
Friction Angle.....	[°]	0.00
Ru value.....		0.20
Weight Class.....	Soil unit weight	
Bulk unit weight – above GWT.....	[kN/m ³]	8.00
Bulk unit weight – below GWT.....	[kN/m ³]	8.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30
Soil: RSS	Description: RSS backfill	
Cohesion.....	[kN/m ²]	80.00
Friction Angle Class.....	Soil material factor tan(phi)	
Friction Angle.....	[°]	0.00
Ru value.....		0.10
Weight Class.....	Soil unit weight	
Bulk unit weight – above GWT.....	[kN/m ³]	19.00
Bulk unit weight – below GWT.....	[kN/m ³]	19.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30

STRATA PROFILES

Stratum: BUND	Description:						
Soil : RSS							
X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
32.97	10.68	43.44	16.03	45.66	16.11	55.65	10.99
Stratum: CAPPING	Description:						
Soil : CAPPING							
X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
11.34	8.84	21.19	9.63	32.25	10.87	32.71	10.68
35.12	10.68	35.54	10.68	42.67	11.81	49.75	11.94
51.37	10.99	69.62	10.99				



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Stratum: LANDFILL

Description:

Soil : LANDFILL

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
11.50	6.84	31.95	8.82	50.83	8.99	69.62	8.99

REINFORCED BLOCKS**Block : L1**

Block dimensions_____ [m] _____: Base width_____ = 4.00 Height_____ = 0.40
Block Origin_____ [m] _____: Abscissa_____ = 33.00 Ordinate_____ = 10.70
Face inclination_____ [°] _____: 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00

Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basotex 200/50

Length_____ [m] _____ = 4.00
Vertical spacing_____ [m] _____ = 0.40
Wrapped length_____ [m] _____ = 0.10

Block : R1

Block dimensions_____ [m] _____: Base width_____ = 4.00 Height_____ = 0.40
Block Origin_____ [m] _____: Abscissa_____ = 55.60 Ordinate_____ = 11.00
Face inclination_____ [°] _____: 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00

Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basotex 200/50

Length_____ [m] _____ = 4.00
Vertical spacing_____ [m] _____ = 0.40
Wrapped length_____ [m] _____ = 0.10

Block : L2

Block dimensions_____ [m] _____: Base width_____ = 2.00 Height_____ = 0.80
Back Shift_____ [m] _____ = 0.00 by L1
Face inclination_____ [°] _____: 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00

Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basotex 200/50



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Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R2

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by R1
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : L3

Block dimensions.....[m].....: Base width.....= 5.00 Height.....= 0.40
Back Shift.....[m].....= 0.00 by L2
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 5.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R3

Block dimensions.....[m].....: Base width.....= 5.00 Height.....= 0.40
Back Shift.....[m].....= 0.00 by R2
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 5.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10



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Block : L4

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by L3
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : R4

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by R3
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : L5

Block dimensions[m] : Base width = 5.00 Height = 0.40
Back Shift[m] = 0.00 by L4
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 5.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : R5

Block dimensions[m] : Base width = 5.00 Height = 0.40
Back Shift[m] = 0.00 by R4
Face inclination[°] : 63.00



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Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L6

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by L5
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R6

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by R5
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L7

Block dimensions.....[m] : Base width..... = 5.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L6
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS



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Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R7

Block dimensions.....[m] : Base width..... = 5.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by R6
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L8

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 1.20
Back Shift.....[m] = 0.00 by L7
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R8

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by R7
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00



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Reinforcements pattern :

Basetex 200/50

Length [m] = 2.00

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10

SURCHARGE LOADS**Distributed Loads : LOAD**

Description :

Class : External live loads

Magnitude [kN/m²] = 10.00

Inclination angle [°] = 0.00

Abscissa [m] : from = 43.44 To = 45.66

PROPERTIES OF THE USED REINFORCEMENTS

Basetex 200/50

Tensile strength UTS [kN/m] : 200.00

Minimum anchorage length [m] : 0.15

Breakage Safety Factor (gravel) : 1.54

Breakage Safety Factor (sand) : 1.52

Breakage Safety Factor (silty sand) : 1.52

Breakage Safety Factor (sandy clay) : 2.06

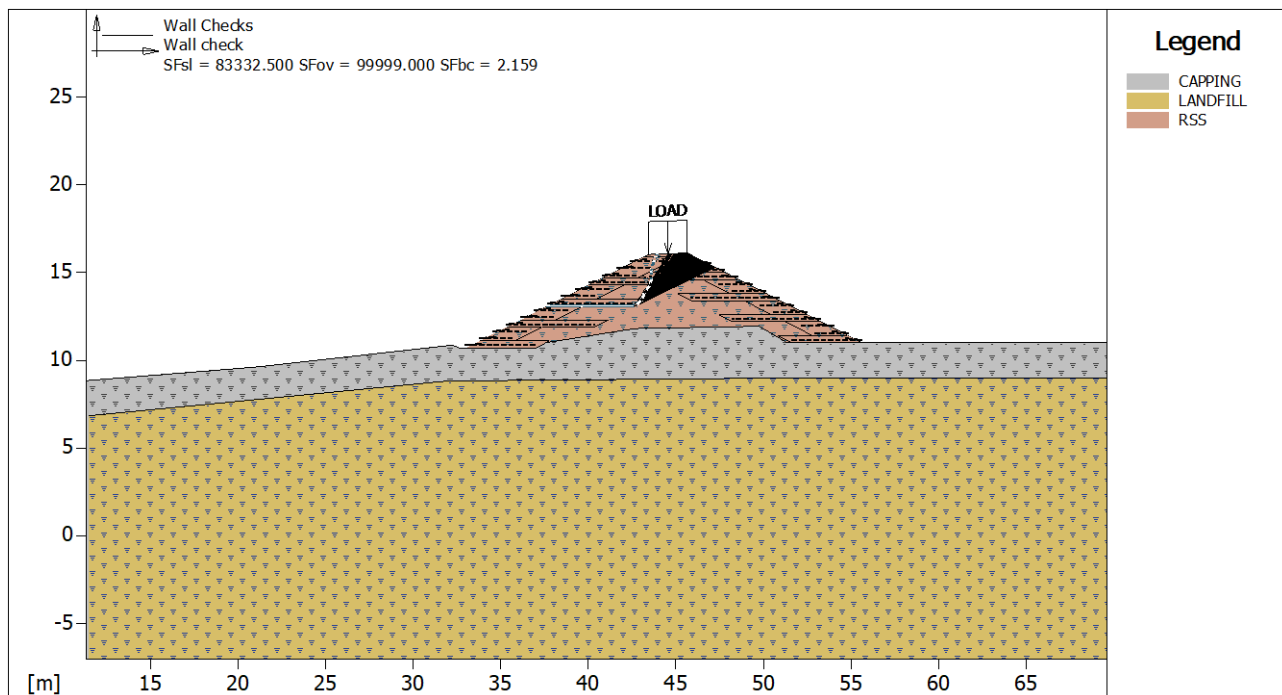
Interaction factor reinforcement/reinforcement : 0.16

Pullout coefficient reinforcement-gravel : 0.90

Pullout coefficient reinforcement-sand : 0.90

Pullout coefficient reinforcement-silt : 0.70

Pullout coefficient reinforcement-clay : 0.40

CHECKS RESULTS**Wall Checks :**

Multiplier combination : Wall check

Considered block : L5

Resisting force [kN/m] : 400.00

Active force [kN/m] : -377.82

Sliding class : Sliding along base of structure

Sliding safety factor : 83332.500

Restoring moment [kN*m/m] : 1733.90

Overturning moment [kN*m/m] : -459.77

Overturning class: Overturning



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Overturning safety factor.....: 99999.000

Imposed ultimate bearing pressure

Ultimate bearing pressure.....[kN/m²].....: 150.00Active pressure.....[kN/m²].....: 69.47

Pressure class...: Bearing capacity

Bearing capacity safety factor.....: 2.159

Equivalent bearing area.....[m].....: 5.00

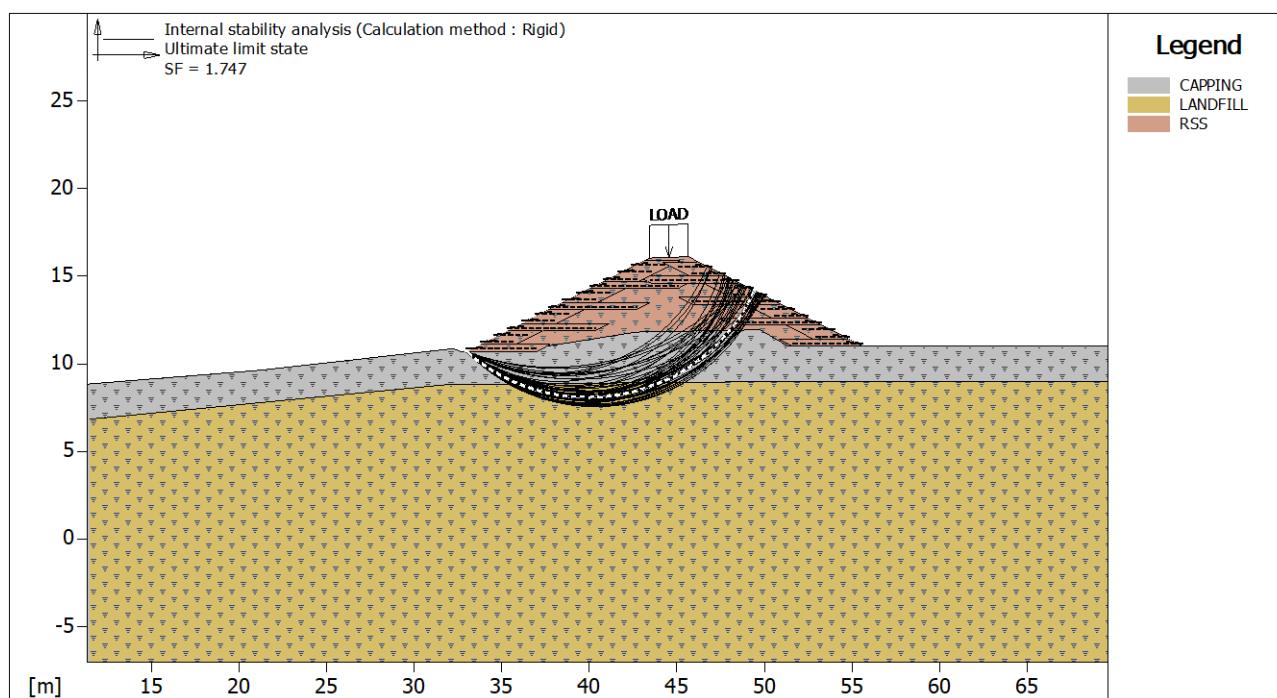
Eccentricity of normal force.....[m].....: -3.82

Lever arm of overturning force.....[m].....: 1.22

Normal force on the base.....[kN].....: 347.36

Outer edge stress.....[kN/m²].....: -1281.13Inner edge stress.....[kN/m²].....: 1017.03

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning

**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 1.747

Surfaces searching range			
Block	Arrival range, abscises [m]		
L1	First point	Second point	
	40.00	50.00	
Number of starting point on the starting segment.....			1
Total number of trial surfaces.....			100
Minimum base length of slices.....[m].....			0.50
Superior limit search angle.....[°].....			0.00
Inferior limit search angle.....[°].....			0.00



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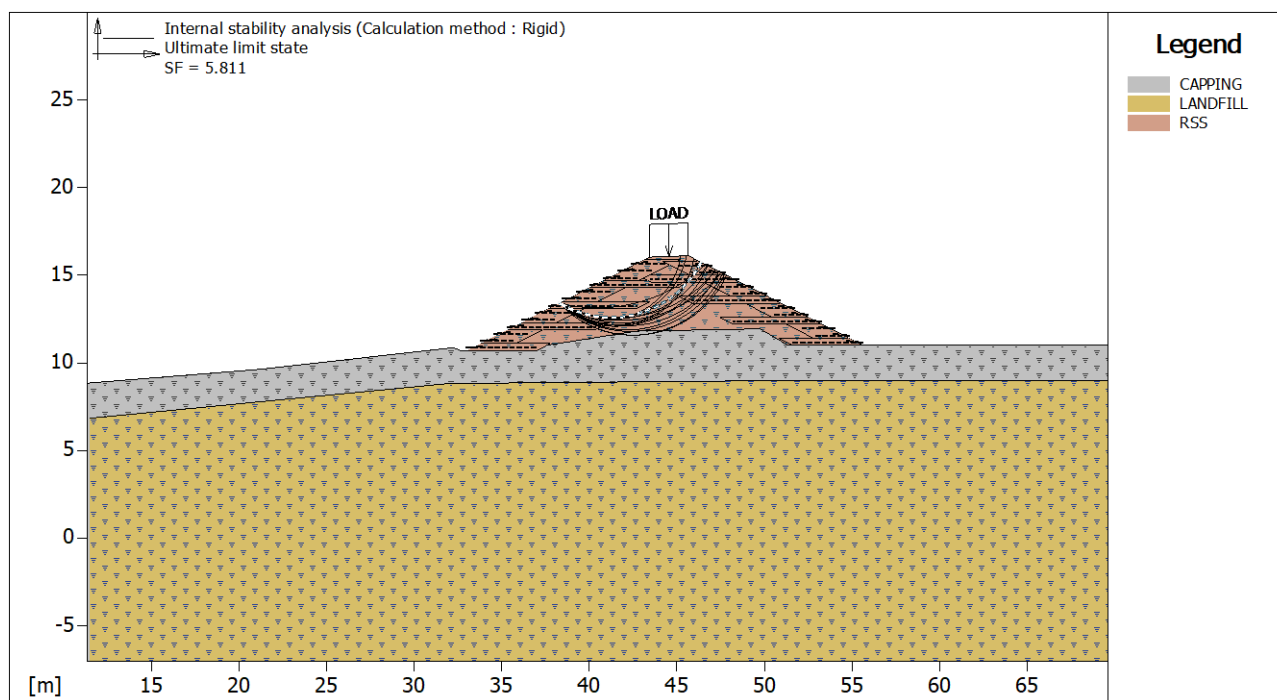
Block : R5
Basotex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage [kN/m]	pullout [kN/m]	design [kN/m]	1/Fmax	
0.000	50.0	0.0	0.0	1.#J	-1.#J

Block : R6
Basotex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage [kN/m]	pullout [kN/m]	design [kN/m]	1/Fmax	
0.000	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)

**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor: 5.811

Surfaces searching range

Block

L5

Arrival range, abscises [m]

First point

43.00

Second point

50.00

Number of starting point on the starting segment: 1

Total number of trial surfaces: 100

Minimum base length of slices[m]: 0.50

Superior limit search angle[°]: 0.00

Inferior limit search angle[°]: 0.00

Block : R7
Basotex 200/50



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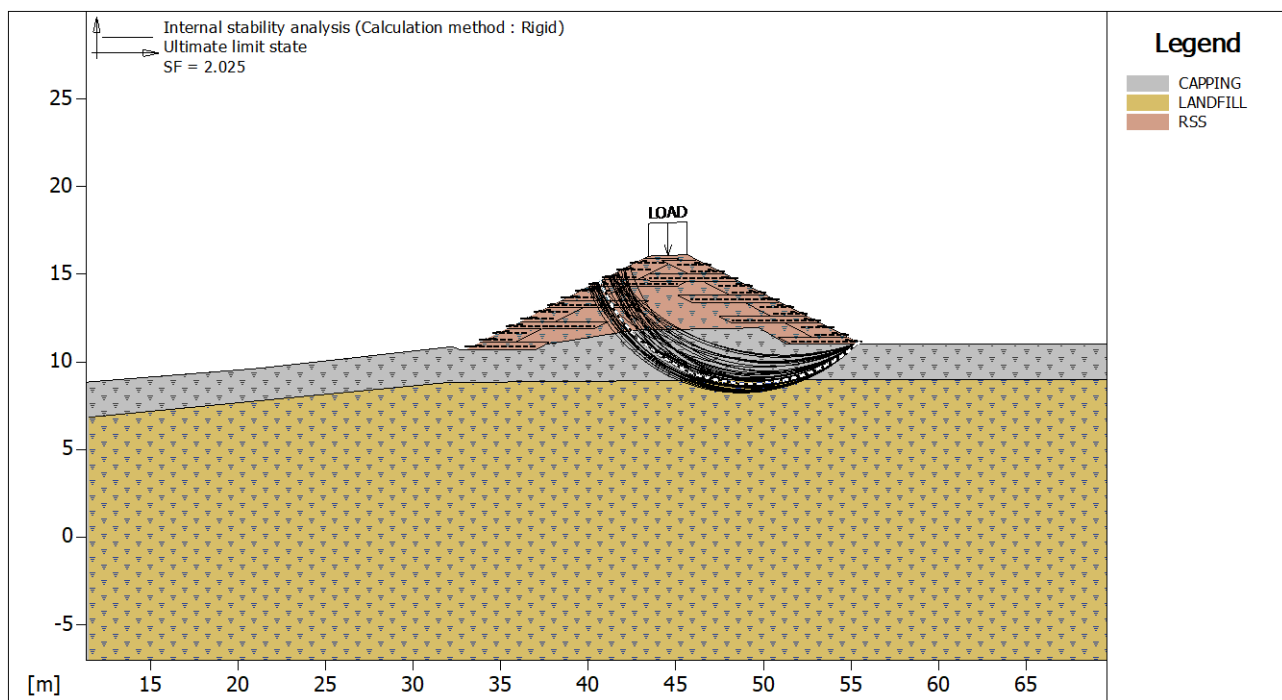
08/02/2023

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J

Block : R8
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J
0.400	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)

**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor : 2.025

Surfaces searching range

Block	First point	Arrival range, abscises [m]	Second point
R1	40.00		50.00
Number of starting point on the starting segment..... : 1			
Total number of trial surfaces..... : 100			
Minimum base length of slices..... [m] : 0.50			
Superior limit search angle..... [°] : 0.00			
Inferior limit search angle..... [°] : 0.00			

Block : L5
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
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[m]	breakage [kN/m]	pullout [kN/m]	design [kN/m]	1/Fmax	
0.000	50.0	0.0	0.0	1.#J	-1.#J

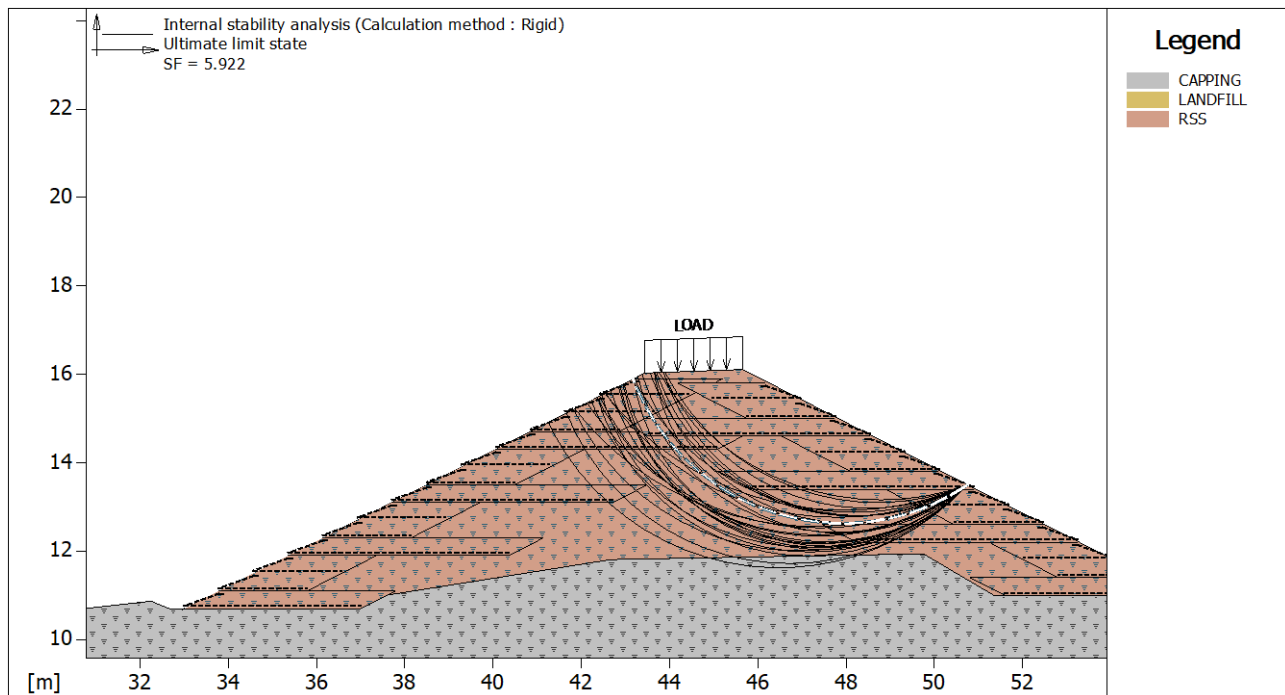
Block : L6
Basetex 200/50

Y	Tb breakage [kN/m]	Tp pullout [kN/m]	Td design [kN/m]	Tb/Td 1/Fmax	Tp/Td
[m]					
0.400	50.0	0.0	0.0	1.#J	-1.#J

Block : L7
Basetex 200/50

Y	Tb breakage [kN/m]	Tp pullout [kN/m]	Td design [kN/m]	Tb/Td 1/Fmax	Tp/Td
[m]					
0.000	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)

**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor..... 5.922

Surfaces searching range

Block	First point	Arrival range, abscises [m]	Second point
R5	40.00		44.00

Number of starting point on the starting segment.....	1
Total number of trial surfaces.....	100
Minimum base length of slices.....[m].....	0.50
Superior limit search angle.....[°].....	0.00



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Inferior limit search angle.....[°].....: 0.00

Block : L7
Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J

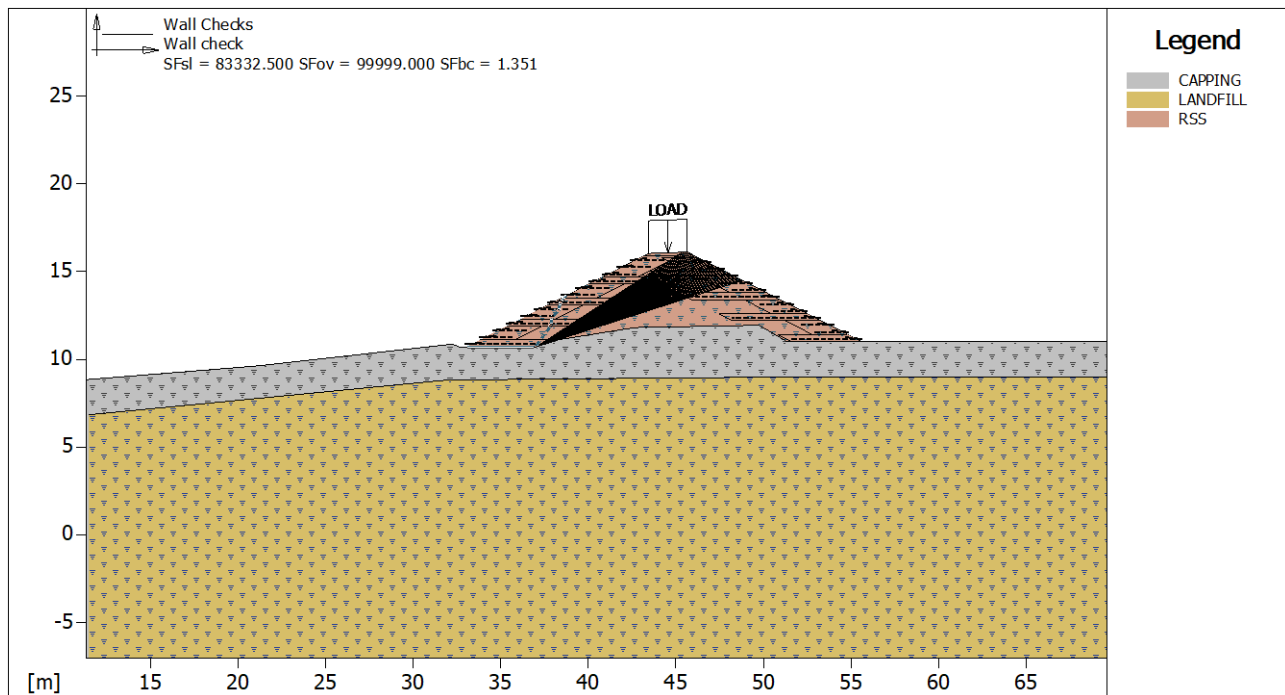
Block : R7
Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J

Block : L8
Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.800	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)

**Wall Checks :**

Multiplier combination : Wall check

Considered block : L1

Resisting force.....[kN/m].....: 253.00

Active force.....[kN/m].....: -685.54

Sliding class.....: Sliding along base of structure

Sliding safety factor.....: 83332.500

Restoring moment.....[kN*m/m].....: 4463.30

Overturning moment.....[kN*m/m].....: -1227.90



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Overturning class: Overturning

Overturning safety factor.....: 99999.000

Imposed ultimate bearing pressure

Ultimate bearing pressure.....[kN/m²].....: 200.00Active pressure.....[kN/m²].....: 148.05

Pressure class: Bearing capacity

Bearing capacity safety factor.....: 1.351

Equivalent bearing area.....[m].....: 4.00

Eccentricity of normal force.....[m].....: -7.61

Lever arm of overturning force.....[m].....: 1.79

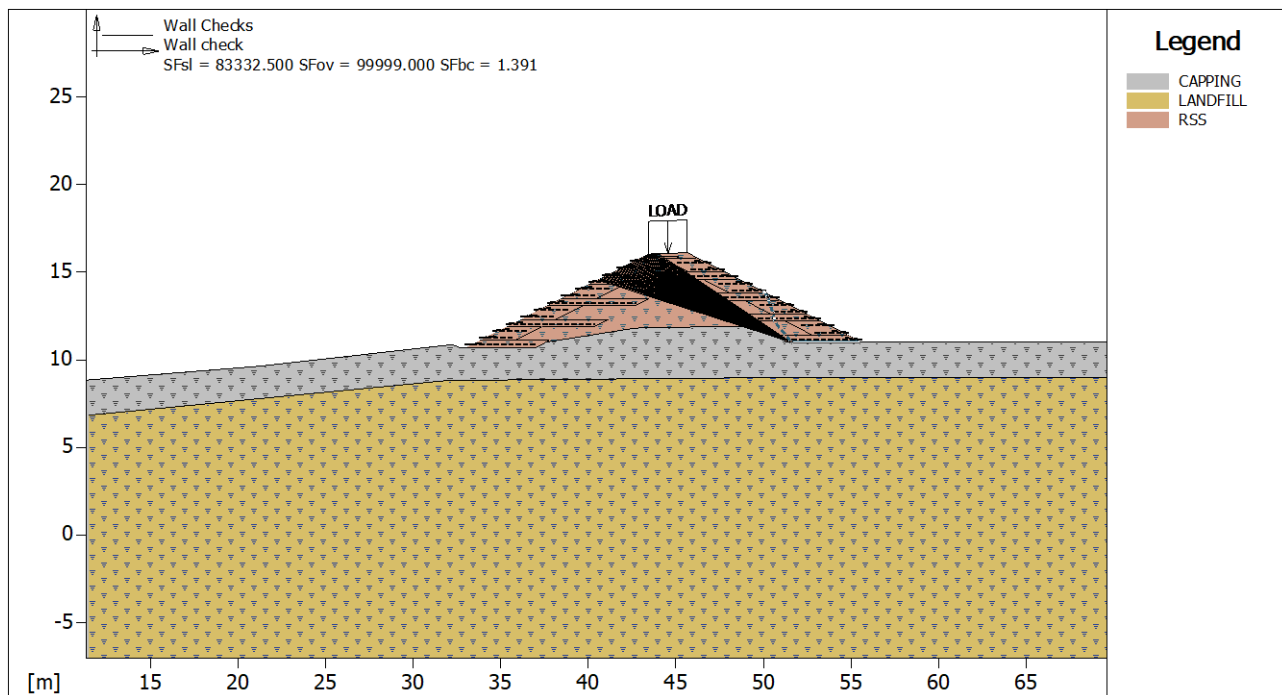
Normal force on the base.....[kN].....: 592.21

Outer edge stress.....[kN/m²].....: -267.57Inner edge stress.....[kN/m²].....: 162.01

Multiplier

Class

1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning

**Wall Checks :**

Multiplier combination : Wall check

Considered block : R1

Resisting force.....[kN/m].....: 320.00

Active force.....[kN/m].....: -678.17

Sliding class.....: Sliding along base of structure

Sliding safety factor.....: 83332.500

Restoring moment.....[kN*m/m].....: 4203.80

Overturning moment.....[kN*m/m].....: -1207.90

Overturning class: Overturning

Overturning safety factor.....: 99999.000

Imposed ultimate bearing pressure

Ultimate bearing pressure.....[kN/m²].....: 200.00Active pressure.....[kN/m²].....: 143.78



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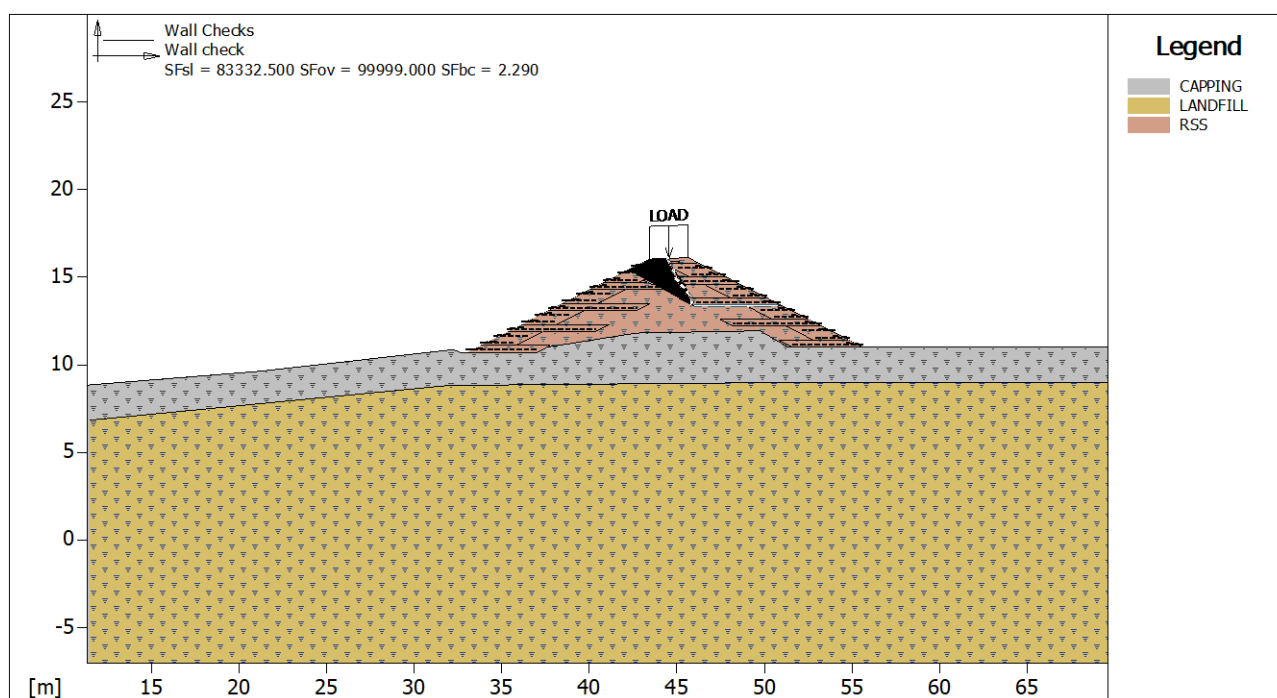
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Pressure class: Bearing capacity

Bearing capacity safety factor	:	1.391
Equivalent bearing area	[m]	4.00
Eccentricity of normal force	[m]	-7.41
Lever arm of overturning force	[m]	1.78
Normal force on the base	[kN]	575.11
Outer edge stress	[kN/m ²]	-271.57
Inner edge stress	[kN/m ²]	165.26

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning

**Wall Checks :**

Multiplier combination : Wall check

Considered block : R5

Resisting force	[kN/m]	400.00
Active force	[kN/m]	-331.72
Sliding class	: Sliding along base of structure	
Sliding safety factor	:	83332.500
Restoring moment	[kN*m/m]	1559.80
Overturning moment	[kN*m/m]	-355.44
Overturning class	: Overturning	
Overturning safety factor	:	99999.000
Imposed ultimate bearing pressure		

Ultimate bearing pressure	[kN/m ²]	150.00
Active pressure	[kN/m ²]	65.51
Pressure class	: Bearing capacity	
Bearing capacity safety factor	:	2.290
Equivalent bearing area	[m]	5.00
Eccentricity of normal force	[m]	-3.35
Lever arm of overturning force	[m]	1.07
Normal force on the base	[kN]	327.55



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Outer edge stress [kN/m²] : -2484.60
Inner edge stress [kN/m²] : 2097.97

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



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Cross Section.....: Section S6

File.....: S6 undrained analysis global 06022023

Date.....: 02/03/2023

Checks according to: Eurocode 7 EN 1997-1
Eurocode 7 EN 1997-1TABLE OF CONTENTS
SOIL PROPERTIES

Soil: CAPPING

Description:

Cohesion Class.....: Undrained shear strength

Cohesion..... [kN/m²].....: 30.00

Friction Angle Class.....: Angle of shearing resistance (Tan phi)

Friction Angle..... [°].....: 0.00

Ru value.....: 0.10

Weight Class.....: Weight density

Bulk unit weight – above GWT..... [kN/m³].....: 19.00Bulk unit weight – below GWT..... [kN/m³].....: 19.00Elastic Modulus..... [kN/m²].....: 0.00

Poisson's ratio.....: 0.30

Soil: LANDFILL

Description:

Cohesion Class.....: Undrained shear strength

Cohesion..... [kN/m²].....: 25.00

Friction Angle Class.....: Angle of shearing resistance (Tan phi)

Friction Angle..... [°].....: 0.00

Ru value.....: 0.20

Weight Class.....: Weight density

Bulk unit weight – above GWT..... [kN/m³].....: 8.00Bulk unit weight – below GWT..... [kN/m³].....: 8.00Elastic Modulus..... [kN/m²].....: 0.00

Poisson's ratio.....: 0.30

Soil: RSS

Description: RSS backfill

Cohesion Class.....: Undrained shear strength

Cohesion..... [kN/m²].....: 80.00

Friction Angle Class.....: Angle of shearing resistance (Tan phi)

Friction Angle..... [°].....: 0.00

Ru value.....: 0.10

Weight Class.....: Weight density

Bulk unit weight – above GWT..... [kN/m³].....: 19.00Bulk unit weight – below GWT..... [kN/m³].....: 19.00Elastic Modulus..... [kN/m²].....: 0.00

Poisson's ratio.....: 0.30

STRATA PROFILES

Stratum: BUND

Description:

Soil : RSS

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
32.97	10.68	43.44	16.03	45.66	16.11	55.65	10.99

Stratum: CAPPING

Description:

Soil : CAPPING

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
11.34	8.84	21.19	9.63	32.25	10.87	32.71	10.68
35.12	10.68	35.54	10.68	42.67	11.81	49.75	11.94
51.37	10.99	69.62	10.99				



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Stratum: LANDFILL

Description:

Soil : LANDFILL

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
11.50	6.84	31.95	8.82	50.83	8.99	69.62	8.99

REINFORCED BLOCKS**Block : L1**

Block dimensions_____ [m] _____: Base width_____ = 4.00 Height_____ = 0.40
Block Origin_____ [m] _____: Abscissa_____ = 33.00 Ordinate_____ = 10.70
Face inclination_____ [°] _____: 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m] _____ = 4.00
Vertical spacing_____ [m] _____ = 0.40
Wrapped length_____ [m] _____ = 0.10

Block : R1

Block dimensions_____ [m] _____: Base width_____ = 4.00 Height_____ = 0.40
Block Origin_____ [m] _____: Abscissa_____ = 55.60 Ordinate_____ = 11.00
Face inclination_____ [°] _____: 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m] _____ = 4.00
Vertical spacing_____ [m] _____ = 0.40
Wrapped length_____ [m] _____ = 0.10

Block : L2

Block dimensions_____ [m] _____: Base width_____ = 2.00 Height_____ = 0.80
Back Shift_____ [m] _____ = 0.00 by L1
Face inclination_____ [°] _____: 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50



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Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R2

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by R1
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : L3

Block dimensions.....[m].....: Base width.....= 5.00 Height.....= 0.40
Back Shift.....[m].....= 0.00 by L2
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 5.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R3

Block dimensions.....[m].....: Base width.....= 5.00 Height.....= 0.40
Back Shift.....[m].....= 0.00 by R2
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 5.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10



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Block : L4

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by L3
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : R4

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by R3
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : L5

Block dimensions[m] : Base width = 5.00 Height = 0.40
Back Shift[m] = 0.00 by L4
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 5.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : R5

Block dimensions[m] : Base width = 5.00 Height = 0.40
Back Shift[m] = 0.00 by R4
Face inclination[°] : 63.00



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Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L6

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by L5
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R6

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by R5
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L7

Block dimensions.....[m] : Base width..... = 5.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L6
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS



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Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R7

Block dimensions.....[m] : Base width..... = 5.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by R6
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 5.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L8

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 1.20
Back Shift.....[m] = 0.00 by L7
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R8

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by R7
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00



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Reinforcements pattern :

Basetex 200/50

Length [m] = 2.00

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10

SURCHARGE LOADS

Distributed Loads : LOAD

Description :

Class : Variable unfavourable

Magnitude [kN/m²] = 10.00

Inclination angle [°] = 0.00

Abscissa [m] : from = 43.44 To = 45.66

PROPERTIES OF THE USED REINFORCEMENTS

Basetex 200/50

Tensile strength UTS [kN/m] : 200.00

Minimum anchorage length [m] : 0.15

Breakage Safety Factor (gravel) : 1.54

Breakage Safety Factor (sand) : 1.52

Breakage Safety Factor (silty sand) : 1.52

Breakage Safety Factor (sandy clay) : 2.06

Interaction factor reinforcement/reinforcement : 0.16

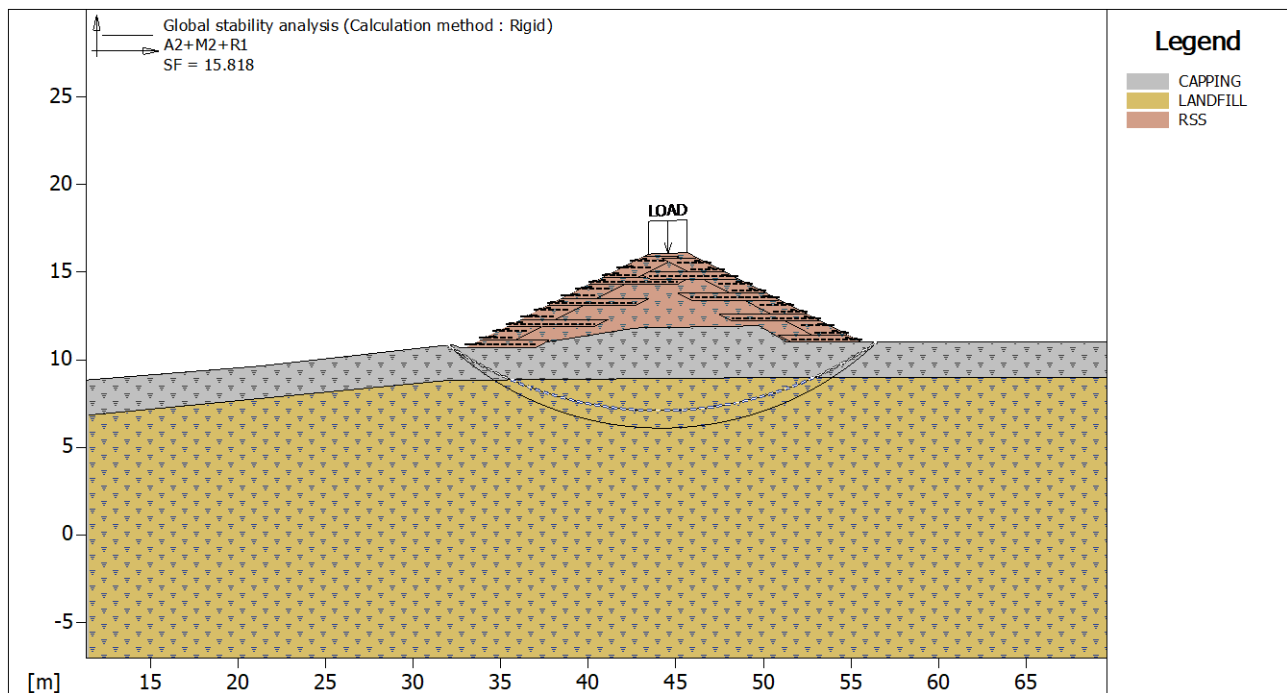
Pullout coefficient reinforcement-gravel : 0.90

Pullout coefficient reinforcement-sand : 0.90

Pullout coefficient reinforcement-silt : 0.70

Pullout coefficient reinforcement-clay : 0.40

CHECKS RESULTS



Global Stability Check :

Multiplier combination : A2+M2+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor : 15.818

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
32.00	33.00	56.00	69.00



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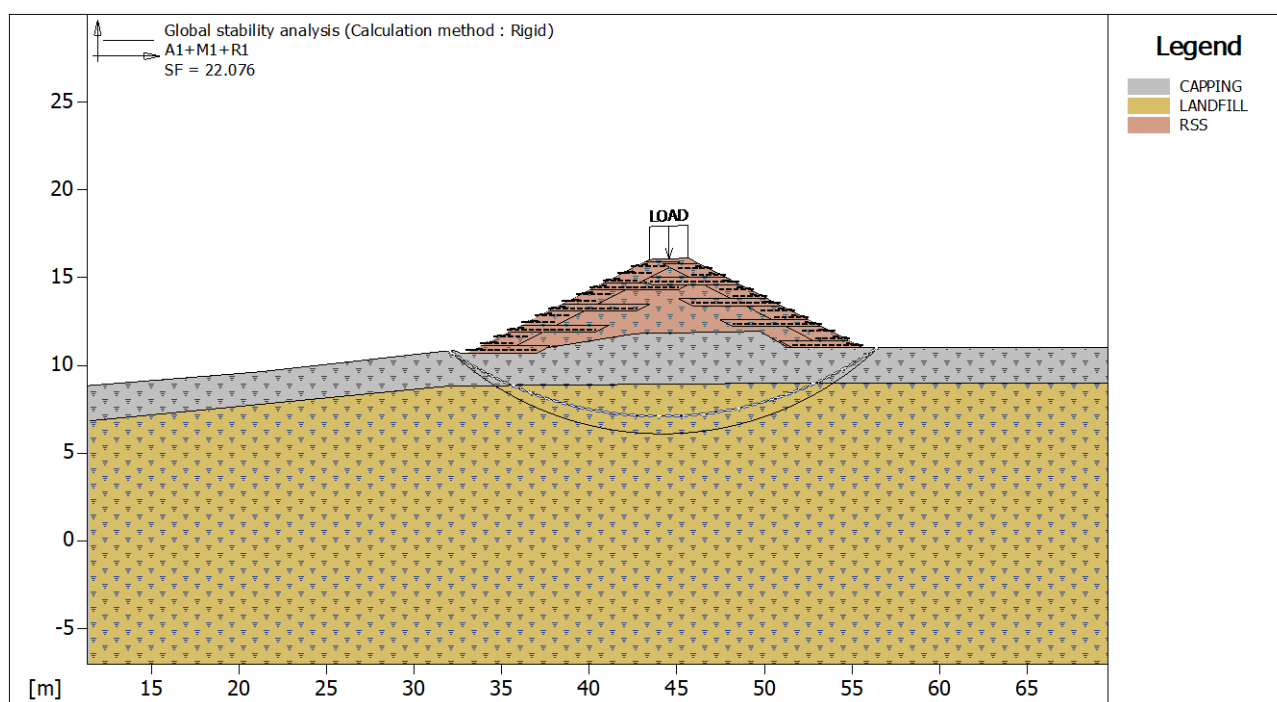
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Number of starting point on the starting segment.....	3
Total number of trial surfaces.....	102
Minimum base length of slices.....[m].....	0.50
Superior limit search angle.....[°].....	0.00
Inferior limit search angle.....[°].....	0.00

Multiplier	Class
1.30	Variable unfavourable
1.25	Angle of shearing resistance (Tan phi)
1.25	Effective cohesion
1.40	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability

**Global Stability Check :**

Multiplier combination : A1+M1+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor..... 22.076

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
32.00	33.00	56.00	69.00

Number of starting point on the starting segment.....	3
Total number of trial surfaces.....	102
Minimum base length of slices.....[m].....	0.50
Superior limit search angle.....[°].....	0.00
Inferior limit search angle.....[°].....	0.00

Multiplier	Class
1.50	Variable unfavourable
1.00	Angle of shearing resistance (Tan phi)
1.00	Effective cohesion
1.00	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



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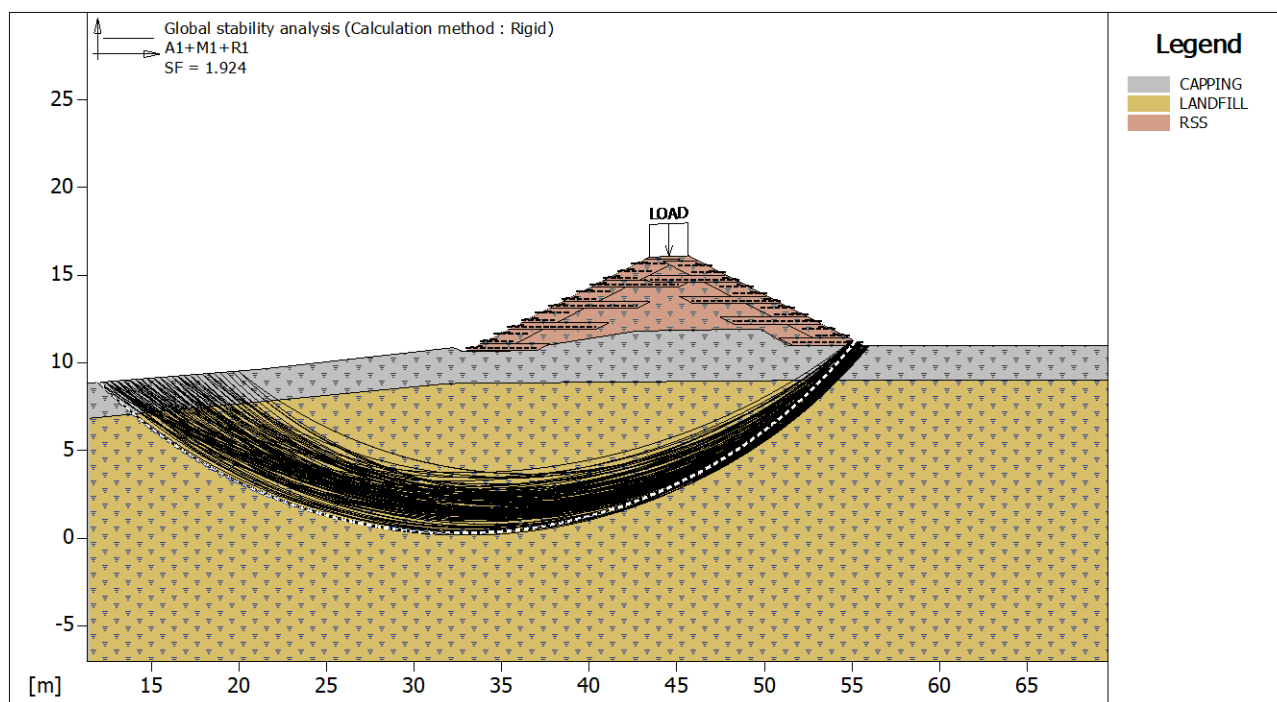
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**Global Stability Check :**

Multiplier combination : A1+M1+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor : 1.924

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
12.00	30.00	55.00	56.00
Number of starting point on the starting segment.....		53	
Total number of trial surfaces.....		530	
Minimum base length of slices..... [m].....		0.50	
Superior limit search angle..... [°].....		0.00	
Inferior limit search angle..... [°].....		0.00	

Block : R1
Basotex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
0.000	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.50	Variable unfavourable
1.00	Angle of shearing resistance (Tan phi)
1.00	Effective cohesion
1.00	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



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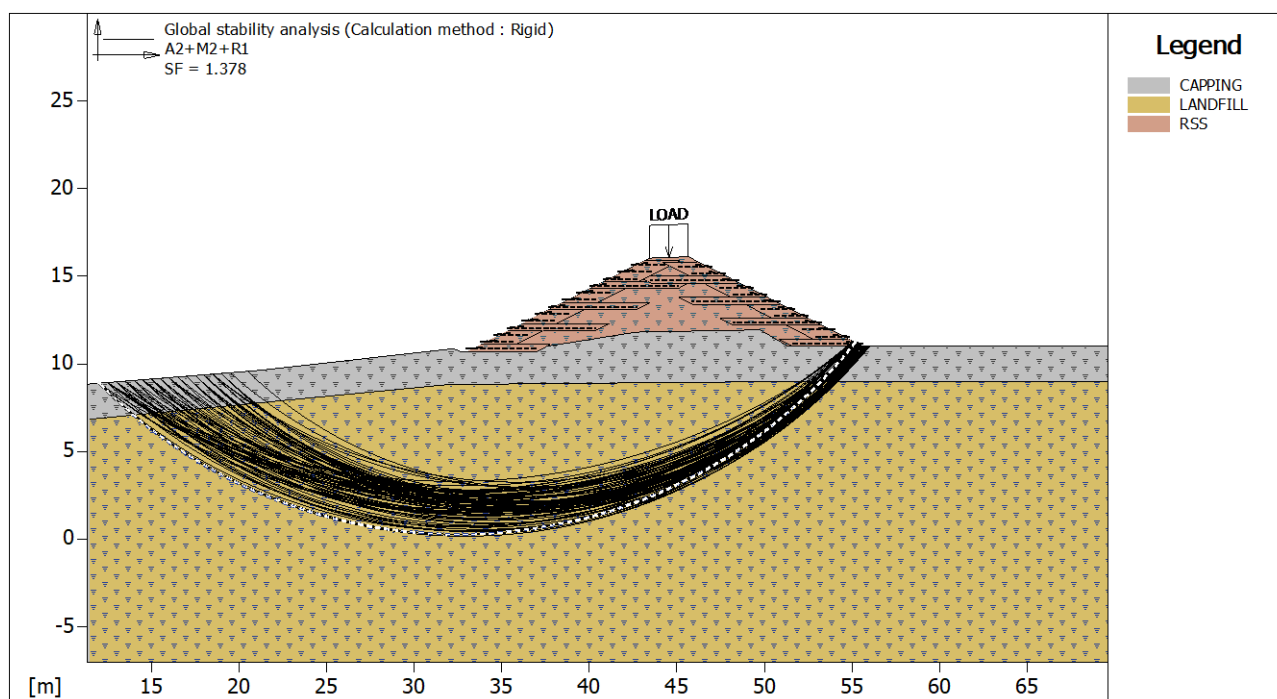
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**Global Stability Check :**

Multiplier combination : A2+M2+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 1.378

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
12.00	30.00	55.00	56.00
Number of starting point on the starting segment.....:		37	
Total number of trial surfaces.....:		370	
Minimum base length of slices.....[m].....:		0.50	
Superior limit search angle.....[°].....:		0.00	
Inferior limit search angle.....[°].....:		0.00	

Block : R1
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
0.000	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.30	Variable unfavourable
1.25	Angle of shearing resistance (Tan phi)
1.25	Effective cohesion
1.40	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



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Cross Section.....: Section S7

File.....: S7 drained analysis 06022023

Date.....: 02/03/2023

Checks according to: BS 8006-1:2010+A1:2016
Reinforced slope – Cat. 2 (medium)

TABLE OF CONTENTS

SOIL PROPERTIES

Soil: CAPPING		Description:
Cohesion Class.....	Soil material factor c'	
Cohesion.....	[kN/m ²]	0.00
Friction Angle Class.....	Soil material factor tan(phi)	
Friction Angle.....	[°]	27.00
Ru value.....		0.10
Weight Class.....	Soil unit weight	
Bulk unit weight – above GWT.....	[kN/m ³]	19.00
Bulk unit weight – below GWT.....	[kN/m ³]	19.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30
Soil: LANDFILL		Description:
Cohesion Class.....	Soil material factor c'	
Cohesion.....	[kN/m ²]	0.00
Friction Angle Class.....	Soil material factor tan(phi)	
Friction Angle.....	[°]	30.00
Ru value.....		0.20
Weight Class.....	Soil unit weight	
Bulk unit weight – above GWT.....	[kN/m ³]	8.00
Bulk unit weight – below GWT.....	[kN/m ³]	8.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30
Soil: RSS		Description: RSS backfill
Cohesion Class.....	Soil material factor c'	
Cohesion.....	[kN/m ²]	0.00
Friction Angle.....	[°]	25.00
Ru value.....		0.10
Weight Class.....	Soil unit weight	
Bulk unit weight – above GWT.....	[kN/m ³]	19.00
Bulk unit weight – below GWT.....	[kN/m ³]	19.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30

STRATA PROFILES

Stratum: BUND		Description:					
Soil : RSS							
X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
52.45	12.96	67.26	20.54	74.06	20.54	87.86	14.34
Stratum: CAPPING		Description:					
Soil : CAPPING							
X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
16.45	10.94	52.20	13.22	52.45	12.96	56.16	12.96
56.58	13.27	58.40	13.26	58.91	13.39	63.10	13.39
63.40	13.61	67.81	13.61	68.09	13.83	76.78	13.83
76.87	13.93	87.85	13.95	87.86	14.34	88.81	14.42



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199.95

14.42

Stratum: LANDFILL

Description:

Soil : LANDFILL

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
16.45	8.94	51.39	11.17	87.87	12.42	199.95	12.42

REINFORCED BLOCKS**Block : L1**

Block dimensions.....[m] : Base width..... = 4.00 Height..... = 0.40
Block Origin.....[m] : Abscissa..... = 52.50 Ordinate..... = 13.00
Face inclination.....[°] : 65.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 4.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L2

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by L1
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L3

Block dimensions.....[m] : Base width..... = 6.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L2
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00



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Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 6.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R1

Block dimensions.....[m].....: Base width.....= 4.00 Height.....= 0.40
Block Origin.....[m].....: Abscissa.....= 87.86 Ordinate.....= 14.30
Face inclination.....[°].....: 62.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 4.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : L4

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by L3
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: CAPPING

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R2

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by R1
Face inclination.....[°].....: 65.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10



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Block : L5

Block dimensions[m] : Base width = 6.00 Height = 0.40
Back Shift[m] = 0.00 by L4
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 6.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : R3

Block dimensions[m] : Base width = 4.00 Height = 0.40
Back Shift[m] = 0.00 by R2
Face inclination[°] : 65.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: CAPPING

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 4.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : L6

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by L5
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : R4

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by R3
Face inclination[°] : 65.00



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Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L7

Block dimensions.....[m] : Base width..... = 6.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L6
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 6.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R5

Block dimensions.....[m] : Base width..... = 4.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by R4
Face inclination.....[°] : 65.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 4.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L8

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by L7
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS



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Foundation soil : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth [m] : 0.00

Natural soil slope [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length [m] = 2.00

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10

Block : R6

Block dimensions [m] : Base width = 2.00 Height = 0.80

Back Shift [m] = 0.00 by R5

Face inclination [°] : 67.00

Structural embankment type : Sandy Clay

Structural embankment : RSS

Backfill soil : RSS

Covering soil : RSS

Foundation soil : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth [m] : 0.00

Natural soil slope [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length [m] = 2.00

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10

Block : L9

Block dimensions [m] : Base width = 6.00 Height = 0.40

Back Shift [m] = 0.00 by L8

Face inclination [°] : 63.00

Structural embankment type : Sandy Clay

Structural embankment : RSS

Backfill soil : RSS

Covering soil : RSS

Foundation soil : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth [m] : 0.00

Natural soil slope [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length [m] = 6.00

Vertical spacing [m] = 0.40

Wrapped length [m] = 0.10

Block : R7

Block dimensions [m] : Base width = 4.00 Height = 0.40

Back Shift [m] = 0.00 by R6

Face inclination [°] : 67.00

Structural embankment type : Sandy Clay

Structural embankment : RSS

Backfill soil : RSS

Covering soil : RSS

Foundation soil : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth [m] : 0.00

Natural soil slope [°] : 0.00



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Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 4.00
Vertical spacing_____ [m]_____ = 0.40
Wrapped length_____ [m]_____ = 0.20

Block : L10

Block dimensions_____ [m]_____ : Base width_____ = 2.00 Height_____ = 0.80
Back Shift_____ [m]_____ = 0.00 by L9
Face inclination_____ [°]_____ : 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 2.00
Vertical spacing_____ [m]_____ = 0.40
Wrapped length_____ [m]_____ = 0.10

Block : R8

Block dimensions_____ [m]_____ : Base width_____ = 2.00 Height_____ = 0.80
Back Shift_____ [m]_____ = 0.00 by R7
Face inclination_____ [°]_____ : 67.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 2.00
Vertical spacing_____ [m]_____ = 0.40
Wrapped length_____ [m]_____ = 0.10

Block : L11

Block dimensions_____ [m]_____ : Base width_____ = 6.00 Height_____ = 0.40
Back Shift_____ [m]_____ = 0.00 by L10
Face inclination_____ [°]_____ : 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 6.00
Vertical spacing_____ [m]_____ = 0.40

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Wrapped length_____ [m]_____ = 0.10

Block : R9

Block dimensions_____ [m]_____ : Base width_____ = 4.00 Height_____ = 0.40

Back Shift_____ [m]_____ = 0.00 by R8

Face inclination_____ [°]_____ : 67.00

Structural embankment type_____ : Sandy Clay

Structural embankment_____ : RSS

Backfill soil_____ : RSS

Covering soil_____ : RSS

Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00

Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 4.00

Vertical spacing_____ [m]_____ = 0.40

Wrapped length_____ [m]_____ = 0.10

Block : L12

Block dimensions_____ [m]_____ : Base width_____ = 2.00 Height_____ = 0.80

Back Shift_____ [m]_____ = 0.00 by L11

Face inclination_____ [°]_____ : 63.00

Structural embankment type_____ : Sandy Clay

Structural embankment_____ : RSS

Backfill soil_____ : RSS

Covering soil_____ : RSS

Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00

Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 2.00

Vertical spacing_____ [m]_____ = 0.40

Wrapped length_____ [m]_____ = 0.10

Block : R10

Block dimensions_____ [m]_____ : Base width_____ = 2.00 Height_____ = 0.80

Back Shift_____ [m]_____ = 0.00 by R9

Face inclination_____ [°]_____ : 67.00

Structural embankment type_____ : Sandy Clay

Structural embankment_____ : RSS

Backfill soil_____ : RSS

Covering soil_____ : RSS

Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00

Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 2.00

Vertical spacing_____ [m]_____ = 0.40

Wrapped length_____ [m]_____ = 0.10



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SURCHARGE LOADS

Distributed Loads : LOAD

Description :

Class : External live loads

Magnitude [kN/m²] = 10.00

Inclination angle [°] = 0.00

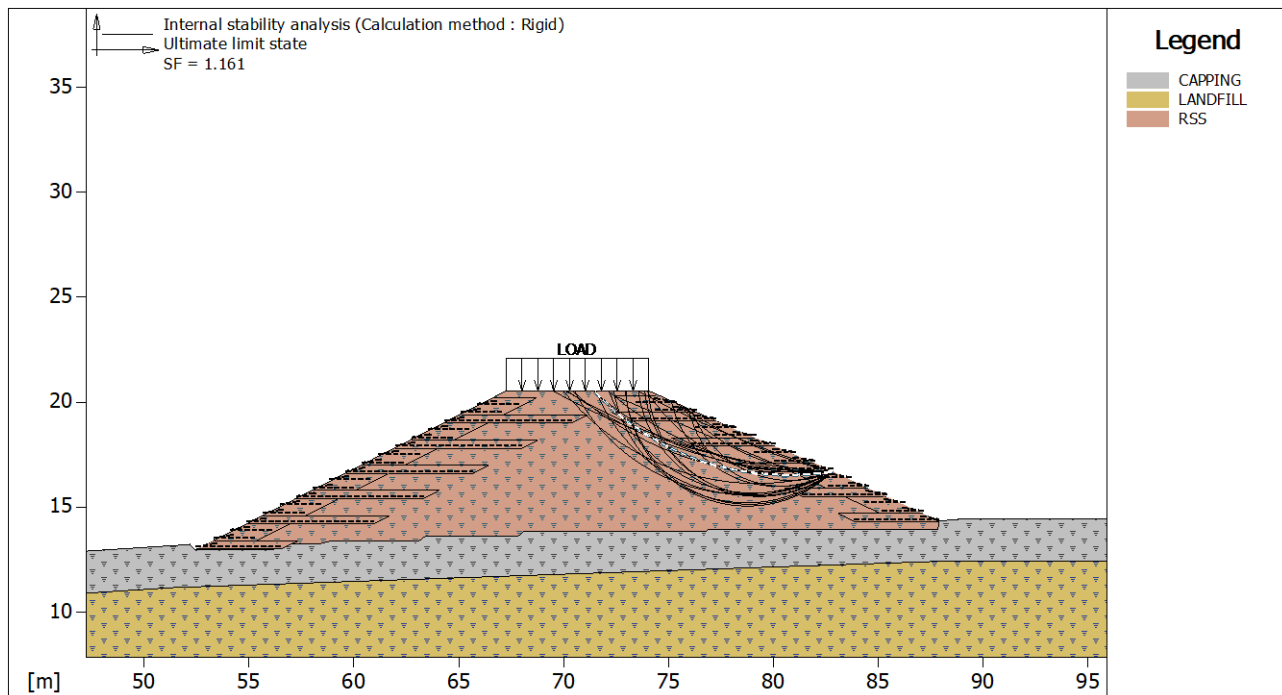
Abscissa [m] : from = 67.26 To = 74.06

PROPERTIES OF THE USED REINFORCEMENTS

Basetex 200/50

Tensile strength UTS	[kN/m]	200.00
Minimum anchorage length	[m]	0.15
Breakage Safety Factor (gravel)		1.54
Breakage Safety Factor (sand)		1.52
Breakage Safety Factor (silty sand)		1.52
Breakage Safety Factor (sandy clay)		2.06
Interaction factor reinforcement/reinforcement		0.16
Pullout coefficient reinforcement-gravel		0.90
Pullout coefficient reinforcement-sand		0.90
Pullout coefficient reinforcement-silt		0.70
Pullout coefficient reinforcement-clay		0.40

CHECKS RESULTS



Internal Stability :

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor : 1.161

Surfaces searching range

Block

R5

First point

65.00

Arrival range, abscises [m]

Second point

77.00

Number of starting point on the starting segment : 1

Total number of trial surfaces : 100

Minimum base length of slices [m] : 0.50

Superior limit search angle [°] : 0.00

Inferior limit search angle [°] : 0.00

Multiplier

Class

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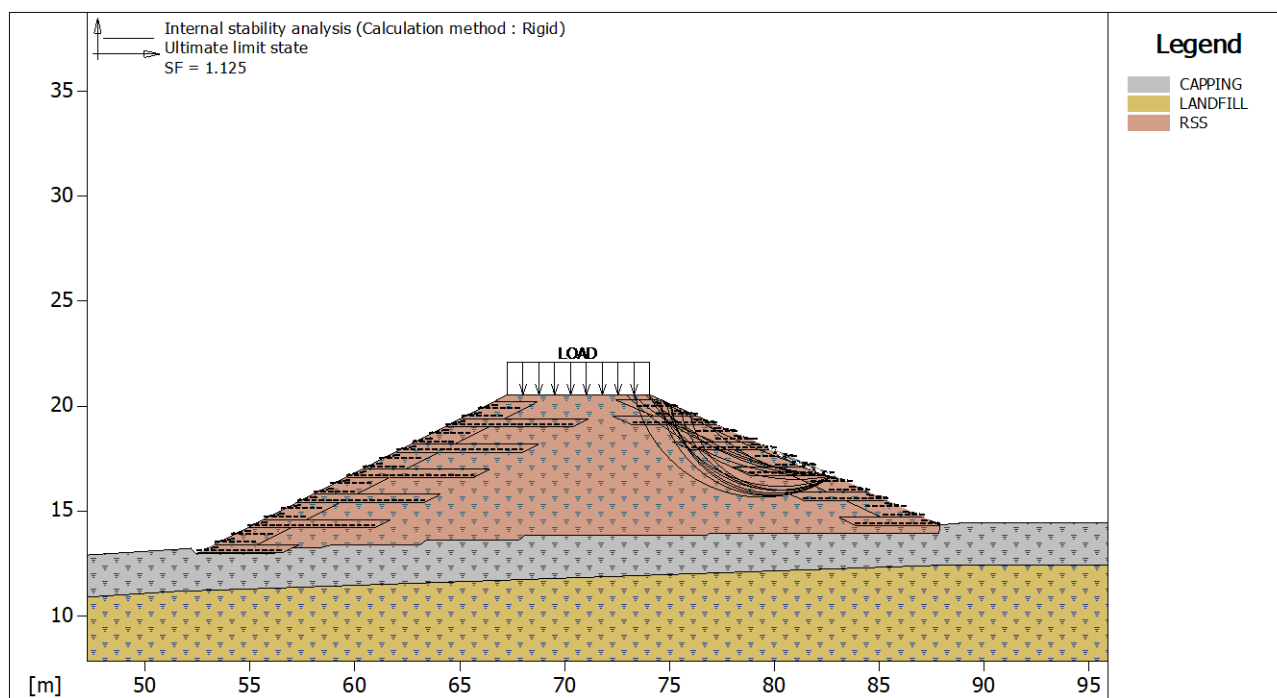
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1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)

**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 1.125

Surfaces searching range

Block	First point	Arrival range, abscises [m]	Second point
R5	65.00		80.00

Number of starting point on the starting segment.....: 1

Total number of trial surfaces.....: 100

Minimum base length of slices.....[m].....: 0.50

Superior limit search angle.....[°].....: 0.00

Inferior limit search angle.....[°].....: 0.00

Block : R6
Basotex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.3	0.2	250.00	1.50
0.400	50.0	0.3	0.2	250.00	1.50

Block : R7
Basotex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.2	0.1	500.00	2.00

Multiplier

Class

1.30	External live loads
1.00	Soil material factor tan(phi)



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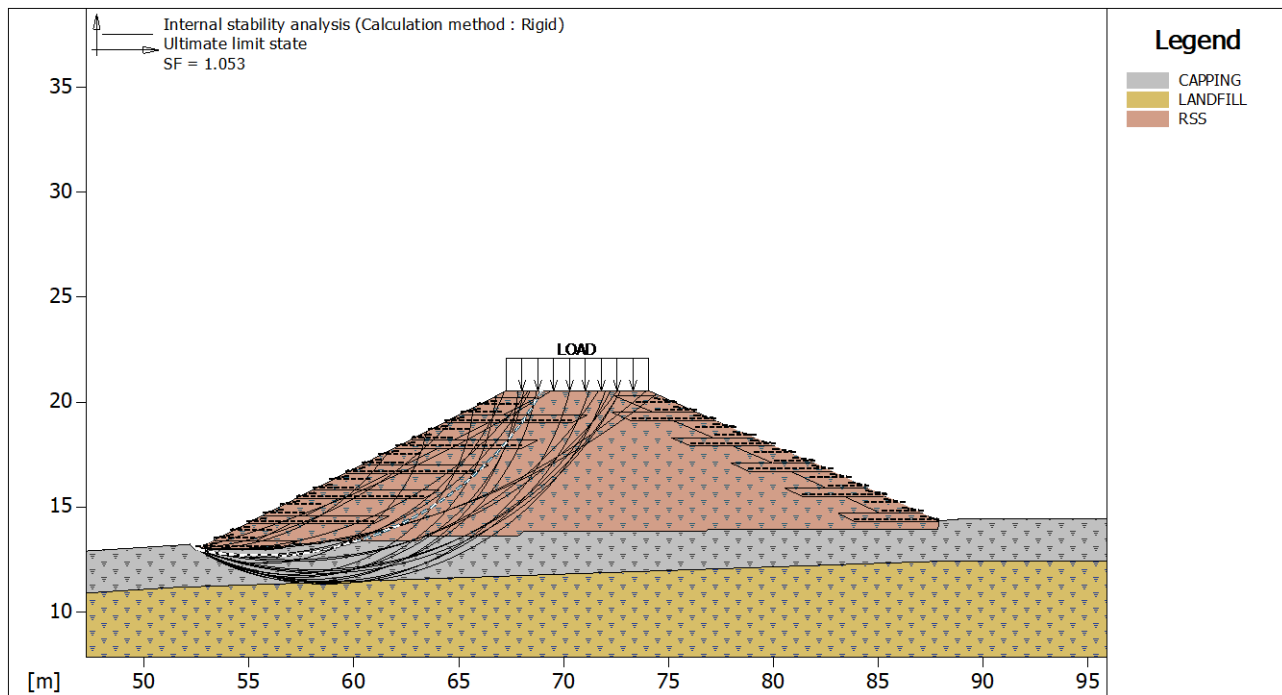
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1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= $f_p \times f_n$)

**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor : 1.053

Block	Surfaces searching range	
	First point	Second point
L1	60.00	75.00
Arrival range, abscises [m]		
Number of starting point on the starting segment : 1		
Total number of trial surfaces : 100		
Minimum base length of slices [m] : 0.50		
Superior limit search angle [°] : 0.00		
Inferior limit search angle [°] : 0.00		

Block : L9
Basotex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	29.2	22.5	2.22	1.30

Block : L11
Basotex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	33.6	25.9	1.93	1.30

Multiplier	Class
1.30	External live loads
1.00	Soil material factor $\tan(\phi)$
1.60	Soil material factor c'
1.50	Soil unit weight



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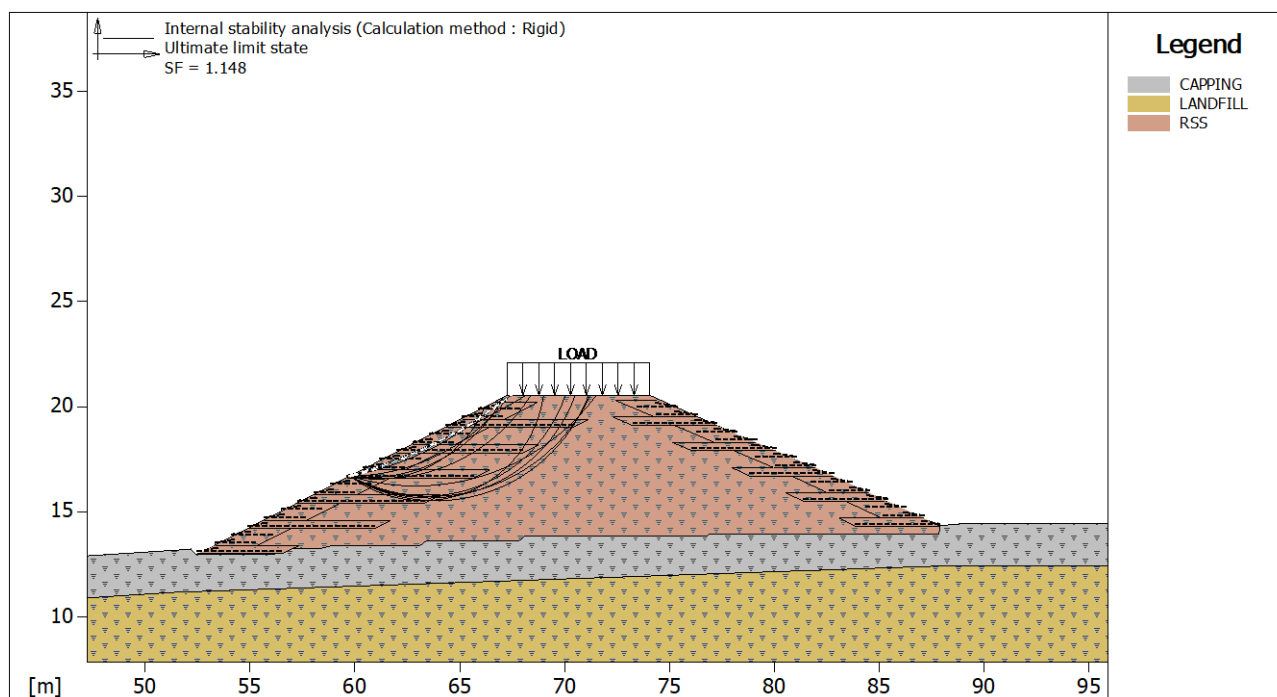
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1.00

Category of structure

1.30

Pull-out factor (= fp x fn)

**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 1.148

Surfaces searching range

Block

Arrival range, abscises [m]

L7

First point

Second point

66.00

75.00

Number of starting point on the starting segment.....: 1

Total number of trial surfaces.....: 100

Minimum base length of slices.....[m].....: 0.50

Superior limit search angle.....[°].....: 0.00

Inferior limit search angle.....[°].....: 0.00

Block : L8

Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.5	0.4	125.00	1.25
0.400	50.0	1.5	1.1	45.45	1.36

Block : L9

Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	2.3	1.8	27.78	1.28

Block : L10

Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	2.6	2.0	25.00	1.30
0.400	50.0	2.5	1.9	26.32	1.32



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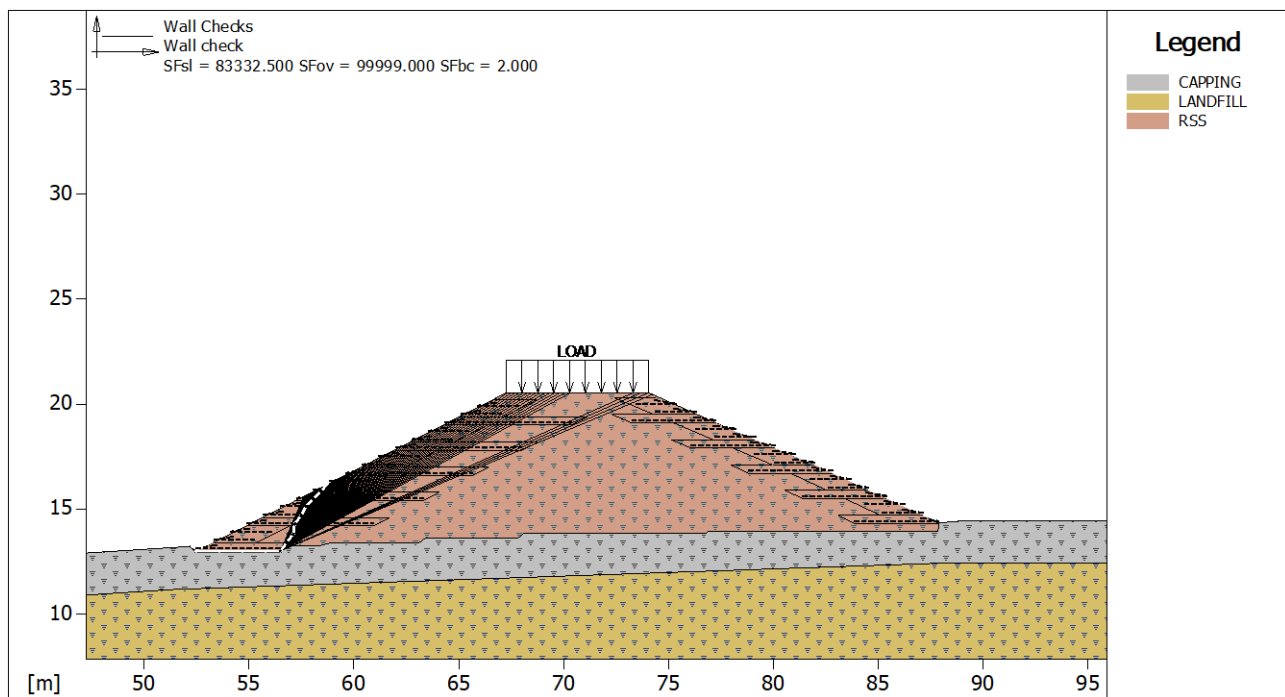
Block : L11
Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	2.1	1.6	31.25	1.31

Block : L12
Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	1.6	1.2	41.67	1.33
0.400	50.0	0.9	0.7	71.43	1.29

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)

**Wall Checks :**

Multiplier combination : Wall check

Considered block : L1

Resisting force.....[kN/m]..... 493.11

Active force.....[kN/m]..... -30.97

Sliding class.....: Sliding along base of structure

Sliding safety factor..... 83332.500

Restoring moment.....[kN*m/m]..... 11151.00

Overturning moment.....[kN*m/m]..... -137.62

Overturning class: Overturning

Overturning safety factor..... 99999.000

Ultimate bearing pressure computed with Limit Equilibrium method

Ultimate bearing pressure.....[kN/m²]..... 525.53

Active pressure.....[kN/m²]..... 262.76

Pressure class...: Bearing capacity

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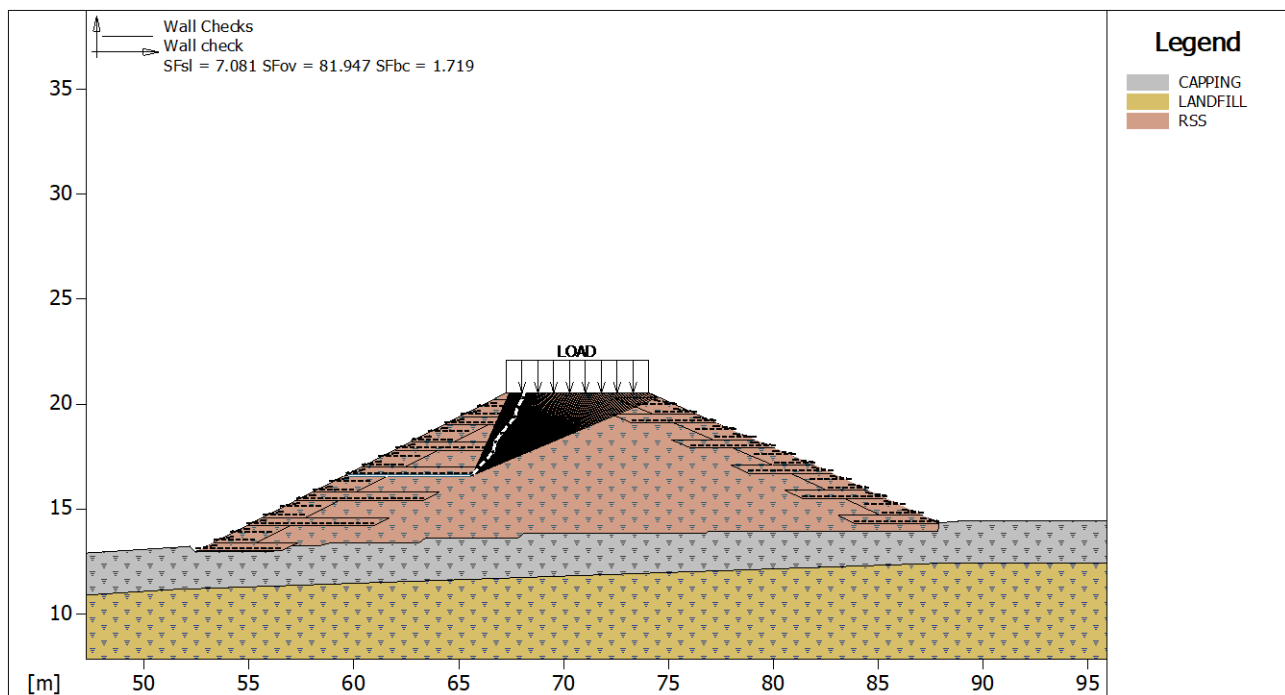
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Bearing capacity safety factor	:	2.000
Equivalent bearing area	[m]	4.00
Eccentricity of normal force	[m]	-8.75
Lever arm of overturning force	[m]	4.44
Normal force on the base	[kN]	1050.60
Outer edge stress	[kN/m ²]	-380.78
Inner edge stress	[kN/m ²]	225.02

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning

**Wall Checks :**

Multiplier combination : Wall check

Considered block : L7

Resisting force	[kN/m]	280.32
Active force	[kN/m]	32.99
Sliding class	: Sliding along base of structure	
Sliding safety factor	:	7.081
Restoring moment	[kN*m/m]	4006.30
Overturning moment	[kN*m/m]	48.89
Overturning class	: Overturning	
Overturning safety factor	:	81.947
Ultimate bearing pressure computed with Limit Equilibrium method		

Ultimate bearing pressure	[kN/m ²]	172.46
Active pressure	[kN/m ²]	100.34
Pressure class	: Bearing capacity	
Bearing capacity safety factor	:	1.719
Equivalent bearing area	[m]	6.00
Eccentricity of normal force	[m]	-3.58
Lever arm of overturning force	[m]	1.48
Normal force on the base	[kN]	601.15
Outer edge stress	[kN/m ²]	-10015.10



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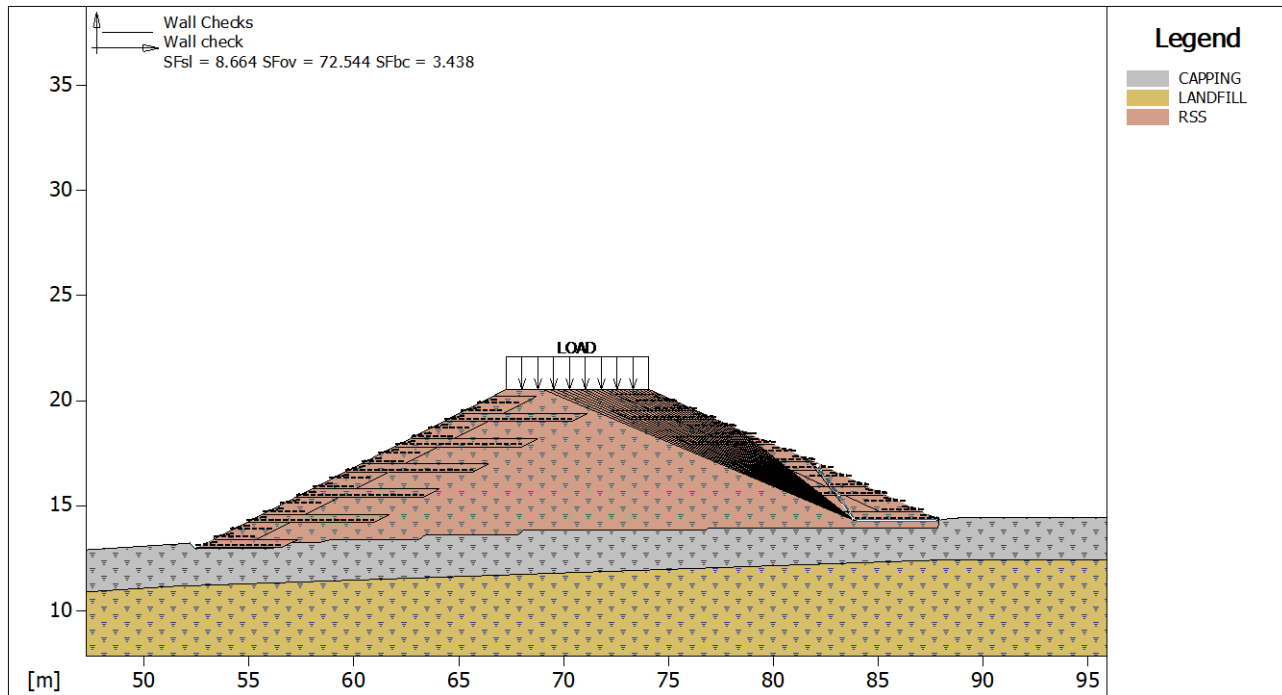
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Inner edge stress [kN/m²] 8984.32

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning

**Wall Checks :**

Multiplier combination : Wall check

Considered block : R1

Resisting force [kN/m] 261.53

Active force [kN/m] 25.15

Sliding class : Sliding along base of structure

Sliding safety factor 8.664

Restoring moment [kN*m/m] 4779.80

Overturning moment [kN*m/m] 65.89

Overturning class: Overturning

Overturning safety factor 72.544

Ultimate bearing pressure computed with Limit Equilibrium method

Ultimate bearing pressure [kN/m²] 482.46Active pressure [kN/m²] 140.35

Pressure class...: Bearing capacity

Bearing capacity safety factor 3.438

Equivalent bearing area [m] 4.00

Eccentricity of normal force [m] -6.41

Lever arm of overturning force [m] 2.62

Normal force on the base [kN] 560.84

Outer edge stress [kN/m²] -34.135Inner edge stress [kN/m²] 214.03

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'



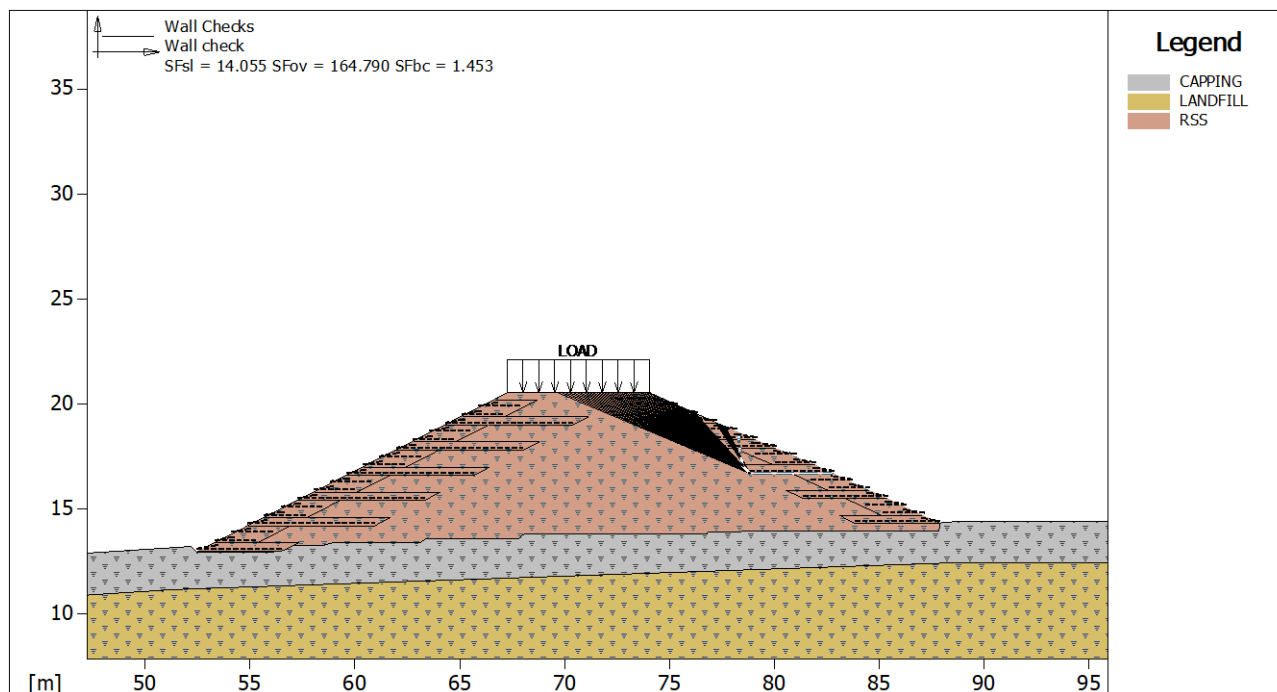
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1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



Wall Checks :

Multiplier combination : Wall check

Considered block : R5

Resisting force	[kN/m]	162.99
Active force	[kN/m]	9.66
Sliding class	Sliding along base of structure	
Sliding safety factor		14.055
Restoring moment	[kN*m/m]	2151.20
Overturning moment	[kN*m/m]	13.05
Overturning class	Overturning	
Overturning safety factor		164.790
Ultimate bearing pressure computed with Limit Equilibrium method		

Ultimate bearing pressure	[kN/m ²]	127.03
Active pressure	[kN/m ²]	87.42
Pressure class	Bearing capacity	
Bearing capacity safety factor		1.453
Equivalent bearing area	[m]	4.00
Eccentricity of normal force	[m]	-4.12
Lever arm of overturning force	[m]	1.35
Normal force on the base	[kN]	349.54
Outer edge stress	[kN/m ²]	-564.20
Inner edge stress	[kN/m ²]	399.09

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



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REF. NUMBER:

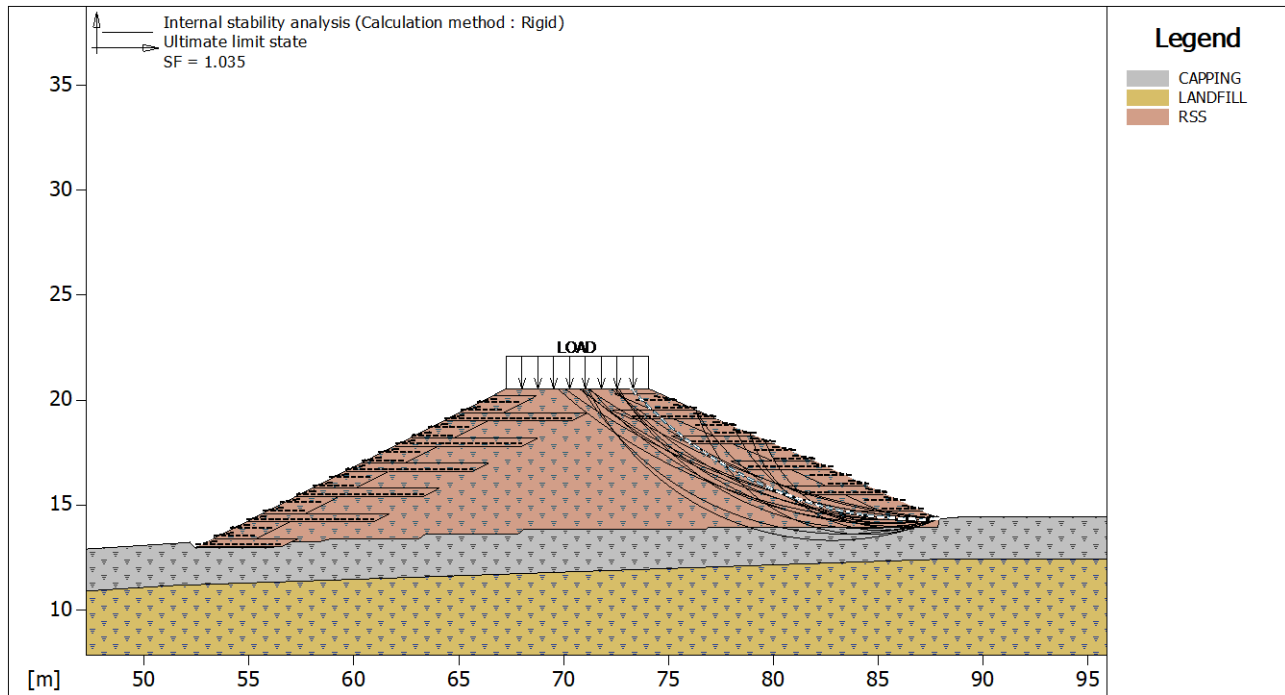
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**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor : 1.035

Surfaces searching range

Block

R1

First point

65.00

Arrival range, abscises [m]

Second point

80.00

Number of starting point on the starting segment : 1

Total number of trial surfaces : 100

Minimum base length of slices [m] : 0.50

Superior limit search angle [°] : 0.00

Inferior limit search angle [°] : 0.00

Block : R9
Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	13.5	10.4	4.81	1.30

Block : R10
Basetex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.400	50.0	5.2	4.0	12.50	1.30

Multiplier

Class

1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)



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File.....: S7 drained analysis global 06022023

Date.....: 02/03/2023

Checks according to: Eurocode 7 EN 1997-1
Eurocode 7 EN 1997-1

TABLE OF CONTENTS

SOIL PROPERTIES

Soil: CAPPING		Description:
Cohesion Class.....: Effective cohesion		
Cohesion.....	[kN/m ²]	0.00
Friction Angle Class.....: Angle of shearing resistance (Tan phi)		
Friction Angle.....	[°]	27.00
Ru value.....		0.10
Weight Class.....: Weight density		
Bulk unit weight – above GWT.....	[kN/m ³]	19.00
Bulk unit weight – below GWT.....	[kN/m ³]	19.00
Elastic Modulus.....		[kN/m ²] 0.00
Poisson's ratio.....		0.30

Soil: LANDFILL		Description:
Cohesion Class.....: Effective cohesion		
Cohesion.....	[kN/m ²]	0.00
Friction Angle Class.....: Angle of shearing resistance (Tan phi)		
Friction Angle.....	[°]	30.00
Ru value.....		0.20
Weight Class.....: Weight density		
Bulk unit weight – above GWT.....	[kN/m ³]	8.00
Bulk unit weight – below GWT.....	[kN/m ³]	8.00
Elastic Modulus.....		[kN/m ²] 0.00
Poisson's ratio.....		0.30

Soil: RSS		Description: RSS backfill
Cohesion Class.....: Effective cohesion		
Cohesion.....	[kN/m ²]	0.00
Friction Angle Class.....: Angle of shearing resistance (Tan phi)		
Friction Angle.....	[°]	25.00
Ru value.....		0.10
Weight Class.....: Weight density		
Bulk unit weight – above GWT.....	[kN/m ³]	19.00
Bulk unit weight – below GWT.....	[kN/m ³]	19.00
Elastic Modulus.....		[kN/m ²] 0.00
Poisson's ratio.....		0.30

STRATA PROFILES

Stratum: BUND		Description:					
Soil : RSS							
X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
52.45	12.96	67.26	20.54	74.06	20.54	87.86	14.34

Stratum: CAPPING		Description:					
Soil : CAPPING							
X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
16.45	10.94	52.20	13.22	52.45	12.96	56.16	12.96
56.58	13.27	58.40	13.26	58.91	13.39	63.10	13.39
63.40	13.61	67.81	13.61	68.09	13.83	76.78	13.83
76.87	13.93	87.85	13.95	87.86	14.34	88.81	14.42



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199.95

14.42

Stratum: LANDFILL

Description:

Soil : LANDFILL

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
16.45	8.94	51.39	11.17	87.87	12.42	199.95	12.42

REINFORCED BLOCKS**Block : L1**

Block dimensions_____ [m] : Base width_____ = 4.00 Height_____ = 0.40
Block Origin_____ [m] : Abscissa_____ = 52.50 Ordinate_____ = 13.00
Face inclination_____ [°] : 65.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m] = 4.00
Vertical spacing_____ [m] = 0.40
Wrapped length_____ [m] = 0.10

Block : L2

Block dimensions_____ [m] : Base width_____ = 2.00 Height_____ = 0.80
Back Shift_____ [m] = 0.00 by L1
Face inclination_____ [°] : 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m] = 2.00
Vertical spacing_____ [m] = 0.40
Wrapped length_____ [m] = 0.10

Block : L3

Block dimensions_____ [m] : Base width_____ = 6.00 Height_____ = 0.40
Back Shift_____ [m] = 0.00 by L2
Face inclination_____ [°] : 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00



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Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 6.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R1

Block dimensions.....[m].....: Base width.....= 4.00 Height.....= 0.40
Block Origin.....[m].....: Abscissa.....= 87.86 Ordinate.....= 14.30
Face inclination.....[°].....: 62.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 4.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : L4

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by L3
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: CAPPING

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R2

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by R1
Face inclination.....[°].....: 65.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10



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Block : L5

Block dimensions[m] : Base width = 6.00 Height = 0.40

Back Shift[m] = 0.00 by L4

Face inclination[°] : 63.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 6.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : R3

Block dimensions[m] : Base width = 4.00 Height = 0.40

Back Shift[m] = 0.00 by R2

Face inclination[°] : 65.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: CAPPING

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 4.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : L6

Block dimensions[m] : Base width = 2.00 Height = 0.80

Back Shift[m] = 0.00 by L5

Face inclination[°] : 63.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : R4

Block dimensions[m] : Base width = 2.00 Height = 0.80

Back Shift[m] = 0.00 by R3

Face inclination[°] : 65.00



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Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L7

Block dimensions.....[m] : Base width..... = 6.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L6
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 6.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R5

Block dimensions.....[m] : Base width..... = 4.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by R4
Face inclination.....[°] : 65.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 4.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L8

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by L7
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS



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Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

Block : R6

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80

Back Shift.....[m] = 0.00 by R5

Face inclination.....[°] : 67.00

Structural embankment type.....: Sandy Clay

Structural embankment.....: RSS

Backfill soil.....: RSS

Covering soil.....: RSS

Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

Block : L9

Block dimensions.....[m] : Base width..... = 6.00 Height..... = 0.40

Back Shift.....[m] = 0.00 by L8

Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay

Structural embankment.....: RSS

Backfill soil.....: RSS

Covering soil.....: RSS

Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 6.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

Block : R7

Block dimensions.....[m] : Base width..... = 4.00 Height..... = 0.40

Back Shift.....[m] = 0.00 by R6

Face inclination.....[°] : 67.00

Structural embankment type.....: Sandy Clay

Structural embankment.....: RSS

Backfill soil.....: RSS

Covering soil.....: RSS

Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00



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Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 4.00
Vertical spacing_____ [m]_____ = 0.40
Wrapped length_____ [m]_____ = 0.20

Block : L10

Block dimensions_____ [m]_____ : Base width_____ = 2.00 Height_____ = 0.80
Back Shift_____ [m]_____ = 0.00 by L9
Face inclination_____ [°]_____ : 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 2.00
Vertical spacing_____ [m]_____ = 0.40
Wrapped length_____ [m]_____ = 0.10

Block : R8

Block dimensions_____ [m]_____ : Base width_____ = 2.00 Height_____ = 0.80
Back Shift_____ [m]_____ = 0.00 by R7
Face inclination_____ [°]_____ : 67.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 2.00
Vertical spacing_____ [m]_____ = 0.40
Wrapped length_____ [m]_____ = 0.10

Block : L11

Block dimensions_____ [m]_____ : Base width_____ = 6.00 Height_____ = 0.40
Back Shift_____ [m]_____ = 0.00 by L10
Face inclination_____ [°]_____ : 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 6.00
Vertical spacing_____ [m]_____ = 0.40



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Wrapped length.....[m] = 0.10

Block : R9

Block dimensions.....[m] : Base width..... = 4.00 Height..... = 0.40

Back Shift.....[m] = 0.00 by R8

Face inclination.....[°] : 67.00

Structural embankment type.....: Sandy Clay

Structural embankment.....: RSS

Backfill soil.....: RSS

Covering soil.....: RSS

Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 4.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

Block : L12

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80

Back Shift.....[m] = 0.00 by L11

Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay

Structural embankment.....: RSS

Backfill soil.....: RSS

Covering soil.....: RSS

Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10

Block : R10

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80

Back Shift.....[m] = 0.00 by R9

Face inclination.....[°] : 67.00

Structural embankment type.....: Sandy Clay

Structural embankment.....: RSS

Backfill soil.....: RSS

Covering soil.....: RSS

Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00

Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00

Vertical spacing.....[m] = 0.40

Wrapped length.....[m] = 0.10



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SURCHARGE LOADS

Distributed Loads : LOAD

Description :

Class : Variable unfavourable

Magnitude [kN/m²] = 10.00

Inclination angle [°] = 0.00

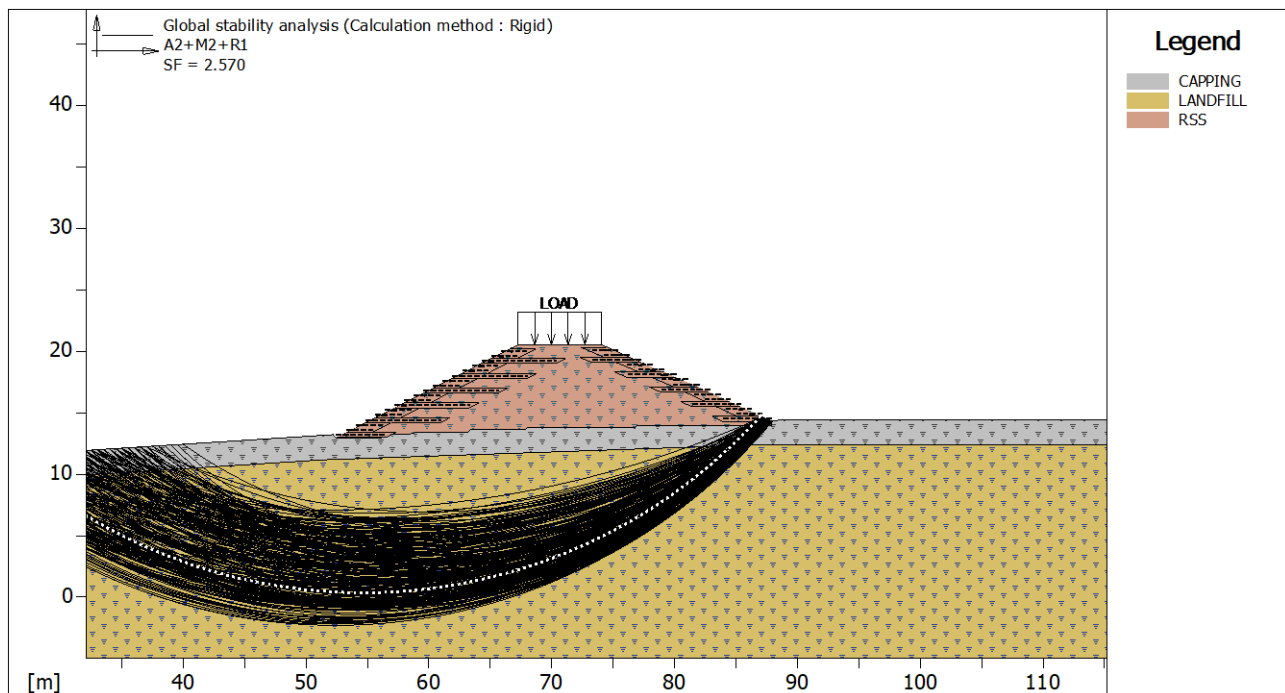
Abscissa [m] : from = 67.26 To = 74.06

PROPERTIES OF THE USED REINFORCEMENTS

Basotex 200/50

Tensile strength UTS	[kN/m]	200.00
Minimum anchorage length	[m]	0.15
Breakage Safety Factor (gravel)		1.54
Breakage Safety Factor (sand)		1.52
Breakage Safety Factor (silty sand)		1.52
Breakage Safety Factor (sandy clay)		2.06
Interaction factor reinforcement/reinforcement		0.16
Pullout coefficient reinforcement-gravel		0.90
Pullout coefficient reinforcement-sand		0.90
Pullout coefficient reinforcement-silt		0.70
Pullout coefficient reinforcement-clay		0.40

CHECKS RESULTS



Global Stability Check :

Multiplier combination : A2+M2+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor : 2.570

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
20.00	56.00	87.00	88.00
Number of starting point on the starting segment		73	
Total number of trial surfaces		730	
Minimum base length of slices [m]		0.50	
Superior limit search angle [°]		0.00	
Inferior limit search angle [°]		0.00	

Block : R1



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Basotex 200/50

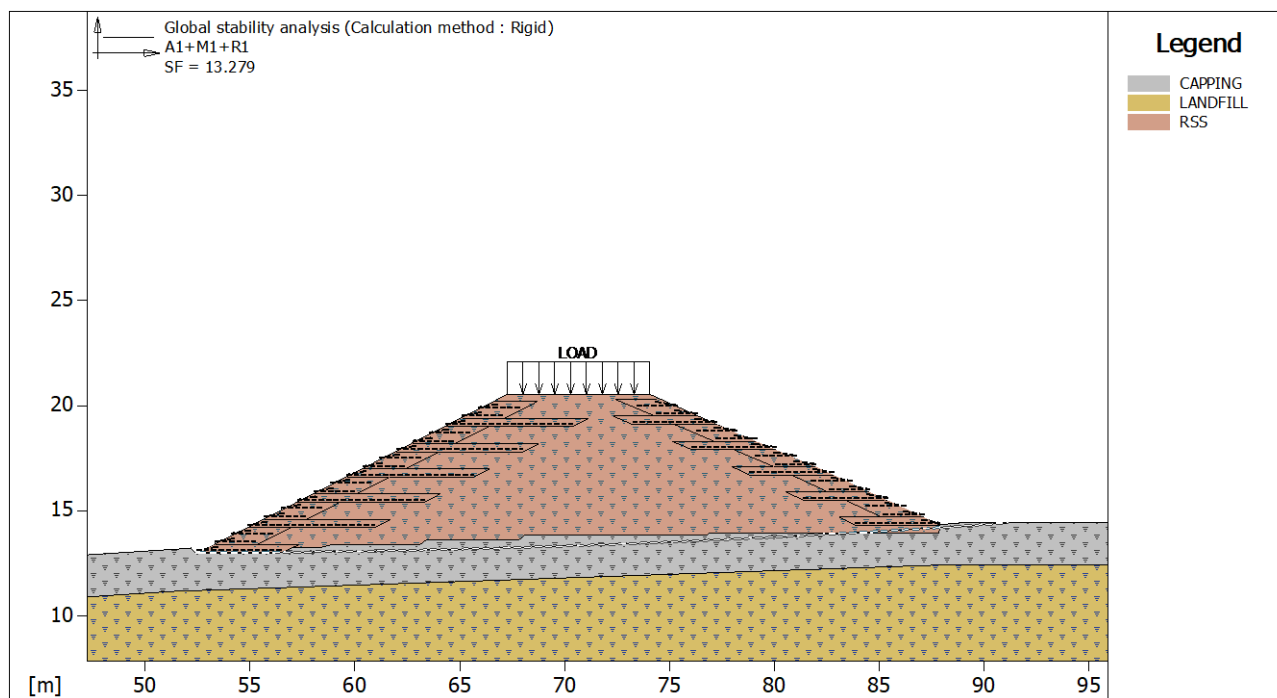
Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	2.5	2.5	20.00	1.00

Block : R2

Basotex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
	breakage	pullout	design	1/Fmax	
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.1	0.1	500.00	1.00

Multiplier	Class
1.30	Variable unfavourable
1.25	Angle of shearing resistance (Tan phi)
1.25	Effective cohesion
1.40	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability

**Global Stability Check :**

Multiplier combination : A1+M1+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 13.279

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
52.00	53.00	90.00	95.00
Number of starting point on the starting segment.....:		3	
Total number of trial surfaces.....:		102	
Minimum base length of slices.....[m].....:		0.50	
Superior limit search angle.....[°].....:		0.00	
Inferior limit search angle.....[°].....:		0.00	

Multiplier	Class
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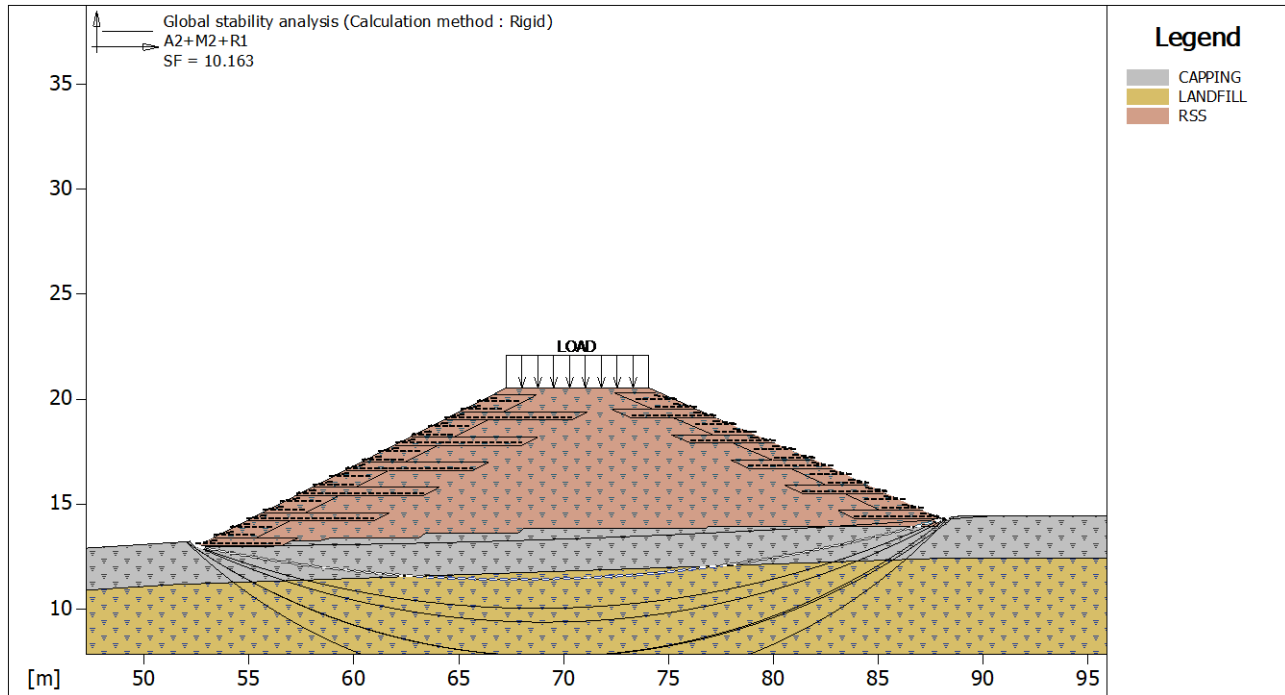
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1.50	Variable unfavourable
1.00	Angle of shearing resistance (Tan phi)
1.00	Effective cohesion
1.00	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability

**Global Stability Check :**

Multiplier combination : A2+M2+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 10.163

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
52.00	53.00	88.00	95.00
Number of starting point on the starting segment.....:		3	
Total number of trial surfaces.....:		102	
Minimum base length of slices.....[m].....:		0.50	
Superior limit search angle.....[°].....:		0.00	
Inferior limit search angle.....[°].....:		0.00	

Multiplier	Class
1.30	Variable unfavourable
1.25	Angle of shearing resistance (Tan phi)
1.25	Effective cohesion
1.40	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



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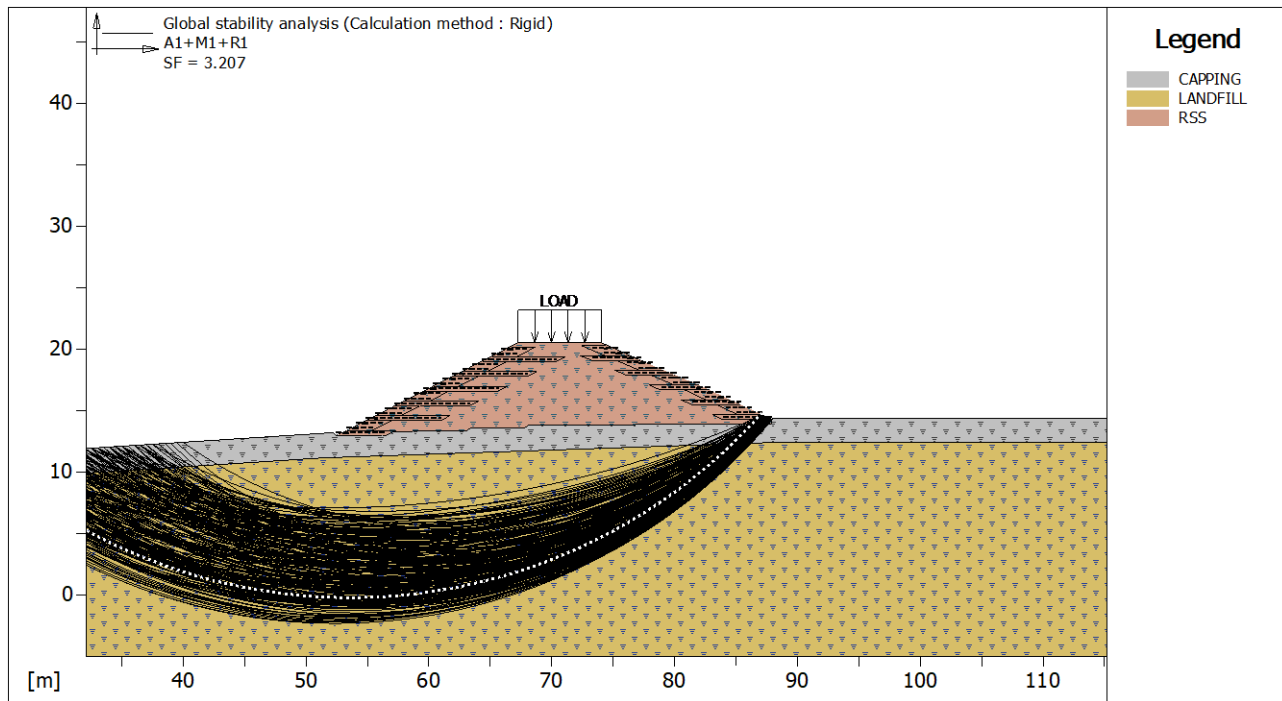
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**Global Stability Check :**

Multiplier combination : A1+M1+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor : 3.207

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
20.00	52.00	87.00	88.00
Number of starting point on the starting segment		65	
Total number of trial surfaces		650	
Minimum base length of slices		[m] : 0.50	
Superior limit search angle		[°] : 0.00	
Inferior limit search angle		[°] : 0.00	

Block : R1
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
0.000	50.0	2.4	2.4	20.83	1.00

Block : R2
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
0.000	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.50	Variable unfavourable
1.00	Angle of shearing resistance (Tan phi)
1.00	Effective cohesion
1.00	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



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File.....: S7 undrained analysis 06022023

Date.....: 02/03/2023

Checks according to: BS 8006-1:2010+A1:2016
Reinforced slope – Cat. 2 (medium)

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SOIL PROPERTIES

Soil: CAPPING	Description:	
Cohesion.....	[kN/m ²]	30.00
Friction Angle Class.....	Soil material factor tan(phi)	
Friction Angle.....	[°]	0.00
Ru value.....		0.10
Weight Class.....	Soil unit weight	
Bulk unit weight – above GWT.....	[kN/m ³]	19.00
Bulk unit weight – below GWT.....	[kN/m ³]	19.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30

Soil: LANDFILL	Description:	
Cohesion.....	[kN/m ²]	25.00
Friction Angle Class.....	Soil material factor tan(phi)	
Friction Angle.....	[°]	0.00
Ru value.....		0.20
Weight Class.....	Soil unit weight	
Bulk unit weight – above GWT.....	[kN/m ³]	8.00
Bulk unit weight – below GWT.....	[kN/m ³]	8.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30

Soil: RSS	Description: RSS backfill	
Cohesion.....	[kN/m ²]	80.00
Friction Angle Class.....	Soil material factor tan(phi)	
Friction Angle.....	[°]	0.00
Ru value.....		0.10
Weight Class.....	Soil unit weight	
Bulk unit weight – above GWT.....	[kN/m ³]	19.00
Bulk unit weight – below GWT.....	[kN/m ³]	19.00
Elastic Modulus.....	[kN/m ²]	0.00
Poisson's ratio.....		0.30

STRATA PROFILES

Stratum: BUND	Description:						
Soil : RSS							
X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
52.45	12.96	67.26	20.54	74.06	20.54	87.86	14.34

Stratum: CAPPING	Description:						
Soil : CAPPING							
X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
16.45	10.94	52.20	13.22	52.45	12.96	56.16	12.96
56.58	13.27	58.40	13.26	58.91	13.39	63.10	13.39
63.40	13.61	67.81	13.61	68.09	13.83	76.78	13.83
76.87	13.93	87.85	13.95	87.86	14.34	88.81	14.42
199.95	14.42						



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Stratum: LANDFILL

Description:

Soil : LANDFILL

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
16.45	8.94	51.39	11.17	87.87	12.42	199.95	12.42

REINFORCED BLOCKS**Block : L1**

Block dimensions_____ [m] _____: Base width_____ = 4.00 Height_____ = 0.40
Block Origin_____ [m] _____: Abscissa_____ = 52.50 Ordinate_____ = 13.00
Face inclination_____ [°] _____: 65.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m] _____ = 4.00
Vertical spacing_____ [m] _____ = 0.40
Wrapped length_____ [m] _____ = 0.10

Block : L2

Block dimensions_____ [m] _____: Base width_____ = 2.00 Height_____ = 0.80
Back Shift_____ [m] _____ = 0.00 by L1
Face inclination_____ [°] _____: 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m] _____ = 2.00
Vertical spacing_____ [m] _____ = 0.40
Wrapped length_____ [m] _____ = 0.10

Block : L3

Block dimensions_____ [m] _____: Base width_____ = 6.00 Height_____ = 0.40
Back Shift_____ [m] _____ = 0.00 by L2
Face inclination_____ [°] _____: 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50



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Length_____ [m]_____ = 6.00
Vertical spacing_____ [m]_____ = 0.40
Wrapped length_____ [m]_____ = 0.10

Block : R1

Block dimensions_____ [m]_____ : Base width_____ = 4.00 Height_____ = 0.40
Block Origin_____ [m]_____ : Abscissa_____ = 87.86 Ordinate_____ = 14.30
Face inclination_____ [°]_____ : 62.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 4.00
Vertical spacing_____ [m]_____ = 0.40
Wrapped length_____ [m]_____ = 0.10

Block : L4

Block dimensions_____ [m]_____ : Base width_____ = 2.00 Height_____ = 0.80
Back Shift_____ [m]_____ = 0.00 by L3
Face inclination_____ [°]_____ : 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : CAPPING

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 2.00
Vertical spacing_____ [m]_____ = 0.40
Wrapped length_____ [m]_____ = 0.10

Block : R2

Block dimensions_____ [m]_____ : Base width_____ = 2.00 Height_____ = 0.80
Back Shift_____ [m]_____ = 0.00 by R1
Face inclination_____ [°]_____ : 65.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m]_____ = 2.00
Vertical spacing_____ [m]_____ = 0.40
Wrapped length_____ [m]_____ = 0.10



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Block : L5

Block dimensions[m] : Base width = 6.00 Height = 0.40

Back Shift[m] = 0.00 by L4

Face inclination[°] : 63.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 6.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : R3

Block dimensions[m] : Base width = 4.00 Height = 0.40

Back Shift[m] = 0.00 by R2

Face inclination[°] : 65.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: CAPPING

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 4.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : L6

Block dimensions[m] : Base width = 2.00 Height = 0.80

Back Shift[m] = 0.00 by L5

Face inclination[°] : 63.00

Structural embankment type: Sandy Clay

Structural embankment: RSS

Backfill soil: RSS

Covering soil: RSS

Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00

Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00

Vertical spacing[m] = 0.40

Wrapped length[m] = 0.10

Block : R4

Block dimensions[m] : Base width = 2.00 Height = 0.80

Back Shift[m] = 0.00 by R3

Face inclination[°] : 65.00



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Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L7

Block dimensions.....[m] : Base width..... = 6.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L6
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 6.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R5

Block dimensions.....[m] : Base width..... = 4.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by R4
Face inclination.....[°] : 65.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 4.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L8

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by L7
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS



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Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R6

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by R5
Face inclination.....[°] : 67.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L9

Block dimensions.....[m] : Base width..... = 6.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L8
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 6.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R7

Block dimensions.....[m] : Base width..... = 4.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by R6
Face inclination.....[°] : 67.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00



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Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 4.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.20

Block : L10

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by L9
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R8

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by R7
Face inclination.....[°].....: 67.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : L11

Block dimensions.....[m].....: Base width.....= 6.00 Height.....= 0.40
Back Shift.....[m].....= 0.00 by L10
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 6.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10



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Block : R9

Block dimensions[m] : Base width = 4.00 Height = 0.40
Back Shift[m] = 0.00 by R8
Face inclination[°] : 67.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 4.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : L12

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by L11
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : R10

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by R9
Face inclination[°] : 67.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

SURCHARGE LOADS**Distributed Loads : LOAD**

Description :



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Class : External live loads

Magnitude [kN/m²] = 10.00 Inclination angle [°] = 0.00

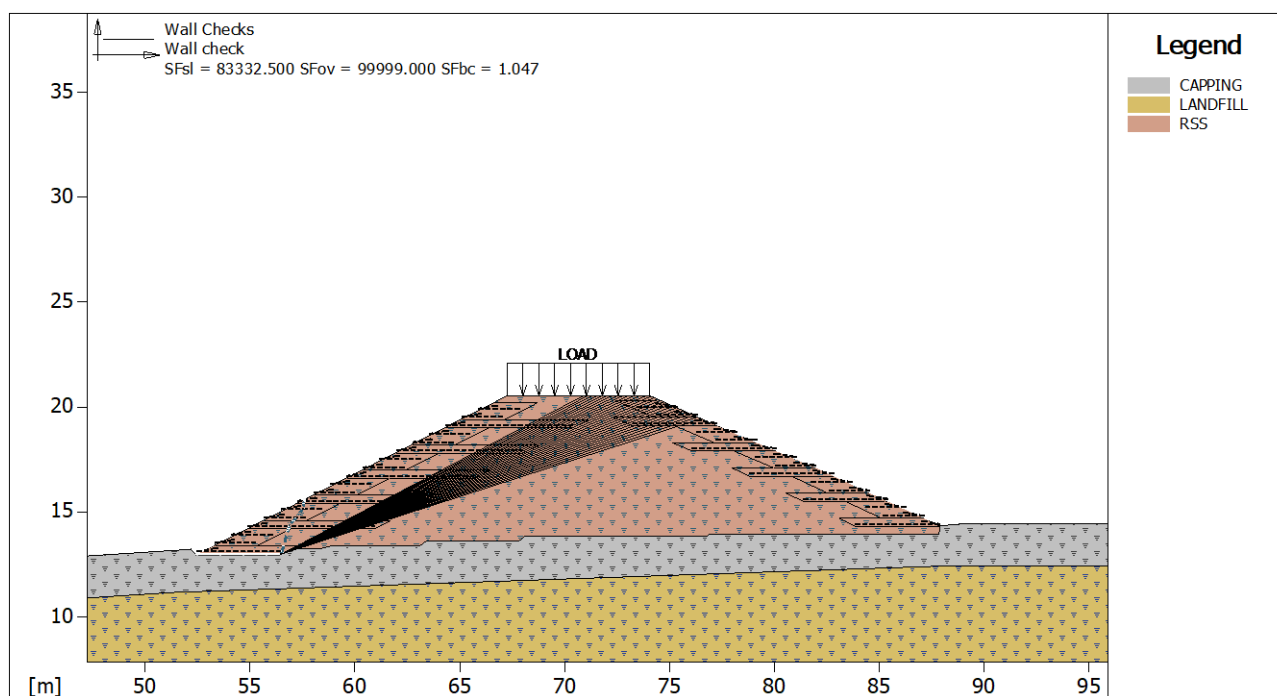
Abscissa [m] : from = 67.26 To = 74.06

PROPERTIES OF THE USED REINFORCEMENTS

Basetex 200/50

Tensile strength UTS	[kN/m]	200.00
Minimum anchorage length	[m]	0.15
Breakage Safety Factor (gravel)		1.54
Breakage Safety Factor (sand)		1.52
Breakage Safety Factor (silty sand)		1.52
Breakage Safety Factor (sandy clay)		2.06
Interaction factor reinforcement/reinforcement		0.16
Pullout coefficient reinforcement-gravel		0.90
Pullout coefficient reinforcement-sand		0.90
Pullout coefficient reinforcement-silt		0.70
Pullout coefficient reinforcement-clay		0.40

CHECKS RESULTS



Wall Checks :

Multiplier combination : Wall check

Considered block : L1

Resisting force	[kN/m]	305.64
Active force	[kN/m]	-842.77
Sliding class	Sliding along base of structure	
Sliding safety factor		83332.500
Restoring moment	[kN*m/m]	11151.00
Overturning moment	[kN*m/m]	-1654.50
Overturning class	Overturning	
Overturning safety factor		99999.000
Imposed ultimate bearing pressure		

Ultimate bearing pressure	[kN/m ²]	275.00
Active pressure	[kN/m ²]	262.65
Pressure class	Bearing capacity	
Bearing capacity safety factor		1.047
Equivalent bearing area	[m]	4.00
Eccentricity of normal force	[m]	-10.19
Lever arm of overturning force	[m]	1.96



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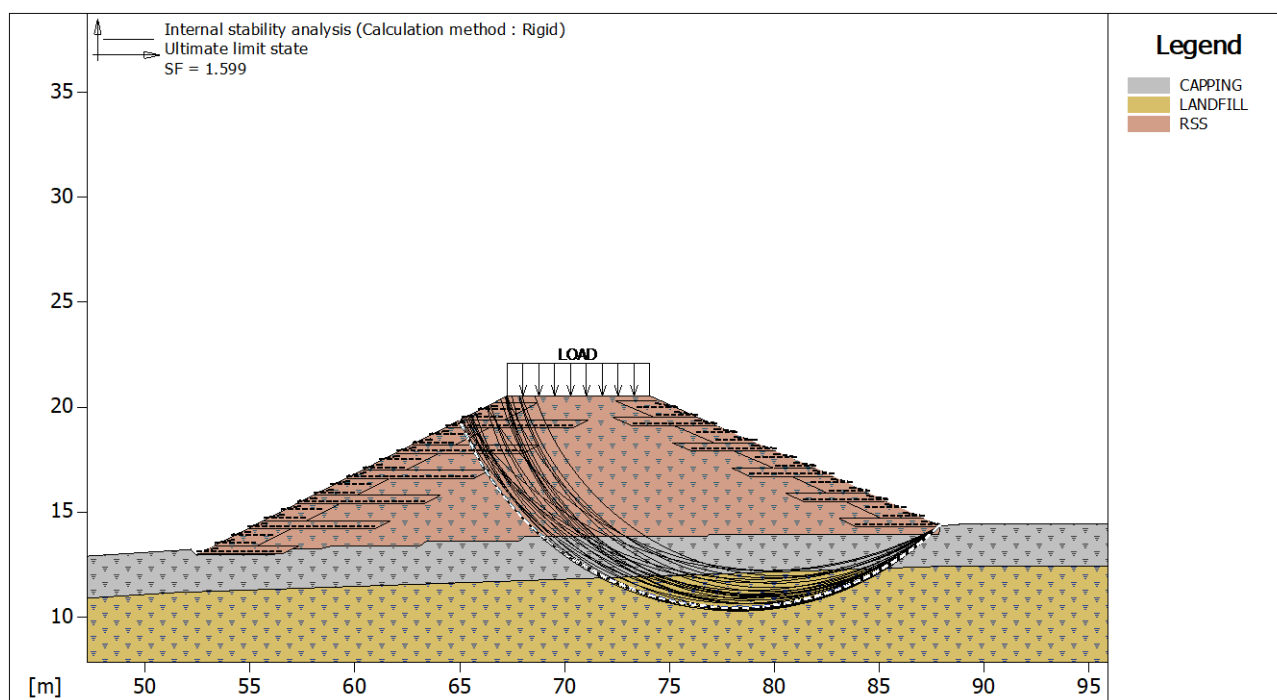
0

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Normal force on the base.....[kN] : 1050.60
Outer edge stress.....[kN/m²] : -303.59
Inner edge stress.....[kN/m²] : 175.29

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning

**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 1.599

Surfaces searching range

Block	First point	Arrival range, abscises [m]	Second point
R1	65.00		77.00

Number of starting point on the starting segment.....: 1
Total number of trial surfaces.....: 100
Minimum base length of slices.....[m] : 0.50
Superior limit search angle.....[°] : 0.00
Inferior limit search angle.....[°] : 0.00

Block : L9
Basotex 200/50

Y	Tb breakage	Tp pullout	Td design	Tb/Td 1/Fmax	Tp/Td
[m]	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J

Block : L10
Basotex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
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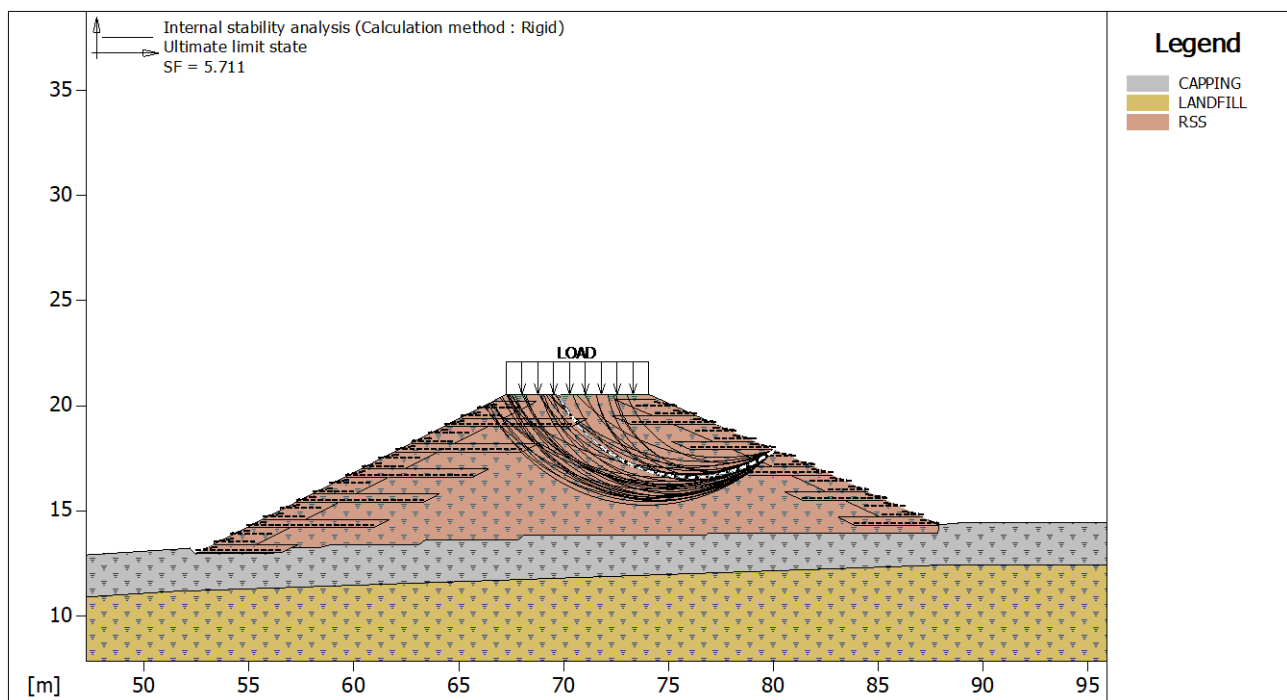
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[m]	breakage [kN/m]	pullout [kN/m]	design [kN/m]	1/Fmax	
0.400	50.0	0.0	0.0	1.#J	-1.#J

Block : L11
Basetex 200/50

Y	Tb breakage [kN/m]	Tp pullout [kN/m]	Td design [kN/m]	Tb/Td 1/Fmax	Tp/Td
0.000	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)

**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 5.711

Surfaces searching range

Block	First point	Second point
R7	65.00	75.00

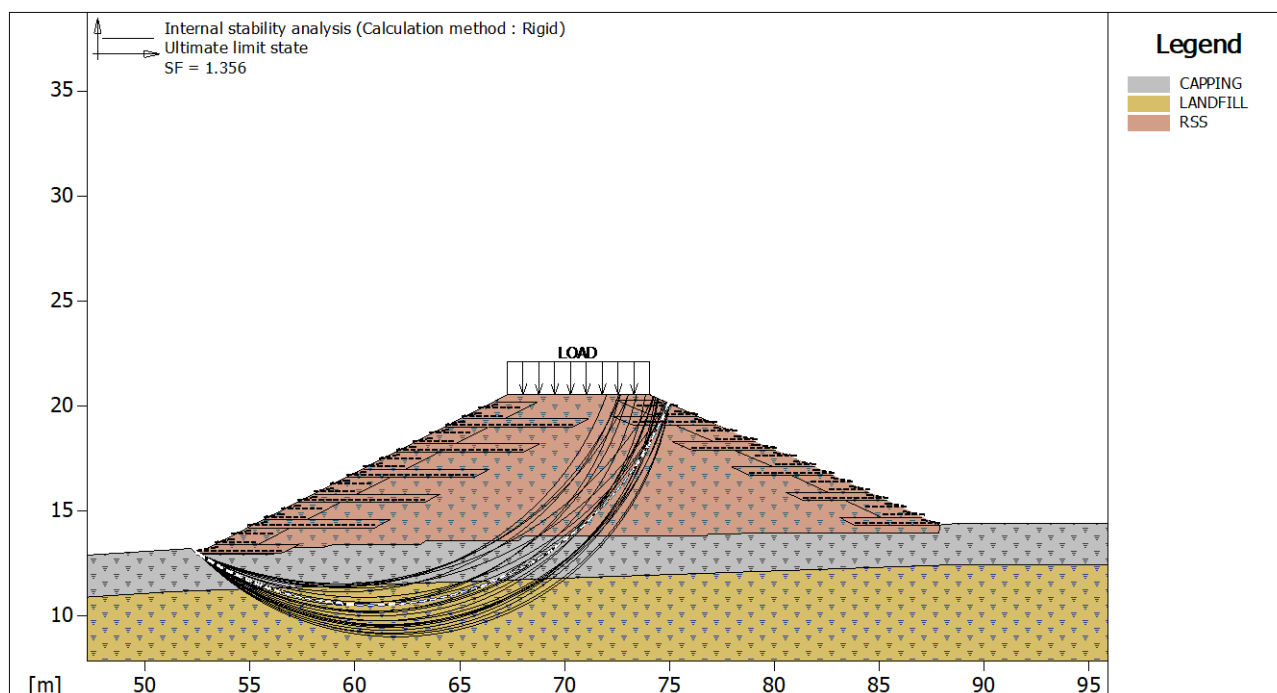
Number of starting point on the starting segment.....: 1
Total number of trial surfaces.....: 100
Minimum base length of slices.....[m].....: 0.50
Superior limit search angle.....[°].....: 0.00
Inferior limit search angle.....[°].....: 0.00

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight



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1.00	Category of structure
1.30	Pull-out factor (= fp x fn)



Internal Stability :

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 1.356

Surfaces searching range		
Block	Arrival range, abscises [m]	
L1	First point 60.00	Second point 75.00
Number of starting point on the starting segment.....		1
Total number of trial surfaces.....		100
Minimum base length of slices..... [m].....		0.50
Superior limit search angle..... [°].....		0.00
Inferior limit search angle..... [°].....		0.00

Block : R9 Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage [kN/m]	pullout [kN/m]	design [kN/m]	1/Fmax	
0.000	50.0	0.0	0.0	1.#J	-1.#J

Block : R10 Basetex 200/50					
Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage [kN/m]	pullout [kN/m]	design [kN/m]	1/Fmax	
0.000	50.0	0.0	0.0	1.#J	-1.#J
0.400	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)



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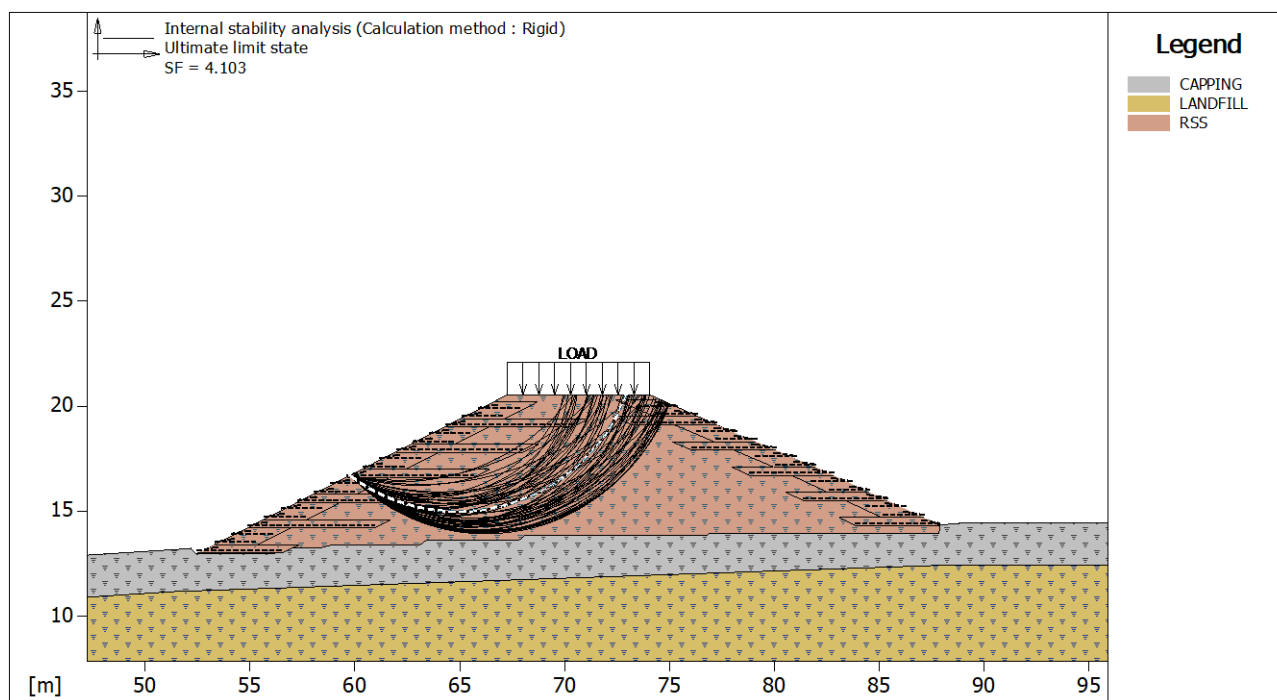
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**Internal Stability :**

Multiplier combination : Ultimate limit state

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 4.103

Surfaces searching range

Block

Arrival range, abscises [m]

L7

First point
66.00Second point
75.00

Number of starting point on the starting segment.....: 1

Total number of trial surfaces.....: 100

Minimum base length of slices.....[m].....: 0.50

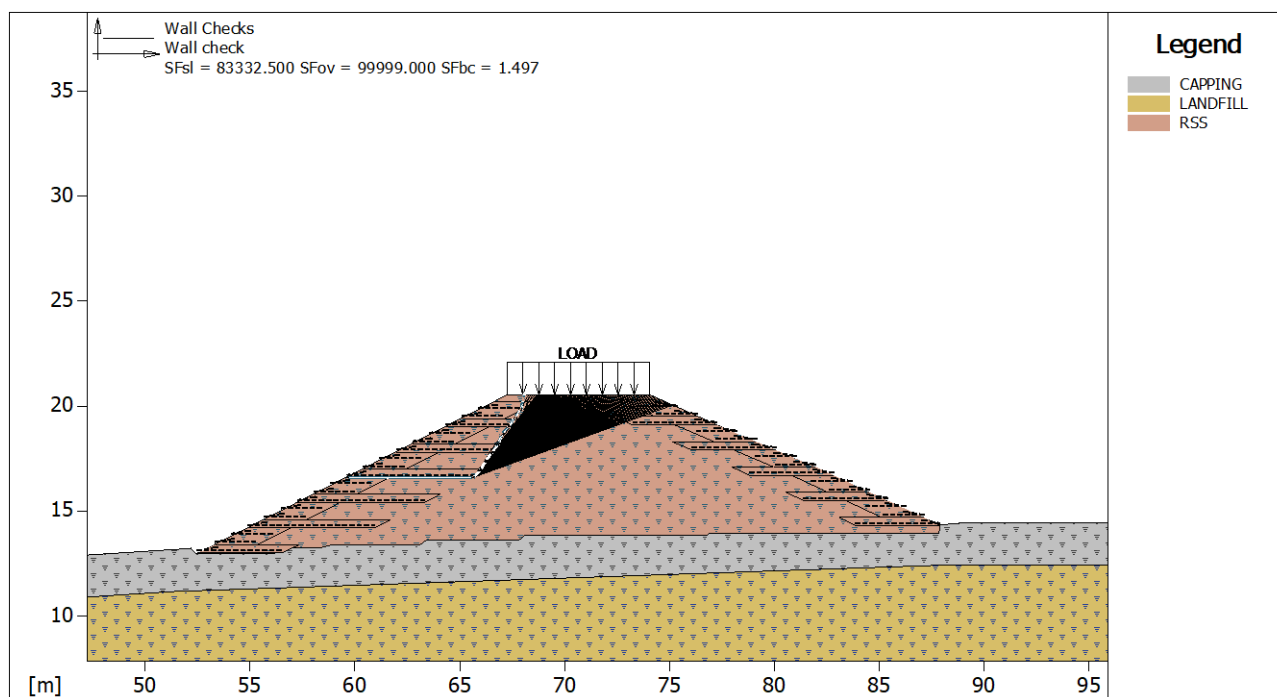
Superior limit search angle.....[°].....: 0.00

Inferior limit search angle.....[°].....: 0.00

Multiplier

Class

1.30	External live loads
1.00	Soil material factor $\tan(\phi)$
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= $f_p \times f_n$)



Wall Checks :

Multiplier combination : Wall check

Considered block : L7

Resisting force.....[kN/m]..... 480.00

Active force.....[kN/m]..... -552.90

Sliding class.....: Sliding along base of structure

Sliding safety factor..... 83332.500

Restoring moment.....[kN*m/m]..... 4006.30

Overturning moment.....[kN*m/m]..... -1176.70

Overturning class: Overturning

Overturning safety factor..... 99999.000

Imposed ultimate bearing pressure

Ultimate bearing pressure.....[kN/m²]..... 150.00

Active pressure.....[kN/m²]..... 100.19

Pressure class...: Bearing capacity

Bearing capacity safety factor..... 1.497

Equivalent bearing area.....[m]..... 6.00

Eccentricity of normal force.....[m]..... -5.62

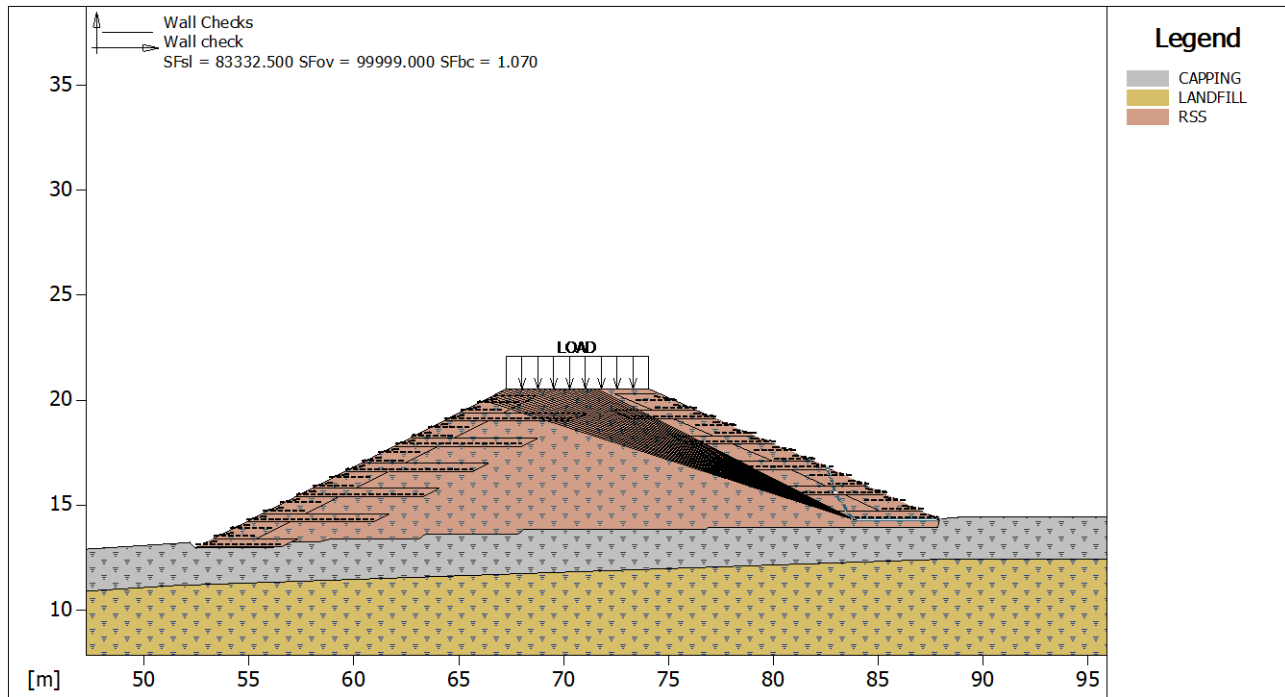
Lever arm of overturning force.....[m]..... 2.13

Normal force on the base.....[kN]..... 601.15

Outer edge stress.....[kN/m²]..... -852.08

Inner edge stress.....[kN/m²]..... 622.80

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



Wall Checks :

Multiplier combination : Wall check

Considered block : R1

Resisting force [kN/m] 319.95

Active force [kN/m] -637.43

Sliding class : Sliding along base of structure

Sliding safety factor : 83332.500

Restoring moment [kN*m/m] 4779.80

Overturning moment [kN*m/m] -1055.00

Overturning class: Overturning

Overturning safety factor : 99999.000

Imposed ultimate bearing pressure

Ultimate bearing pressure [kN/m²] 150.00

Active pressure [kN/m²] 140.21

Pressure class...: Bearing capacity

Bearing capacity safety factor : 1.070

Equivalent bearing area [m] 4.00

Eccentricity of normal force [m] -8.40

Lever arm of overturning force [m] 1.66

Normal force on the base [kN] 560.84

Outer edge stress [kN/m²] -216.20

Inner edge stress [kN/m²] 128.62

Multiplier	Class
1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning



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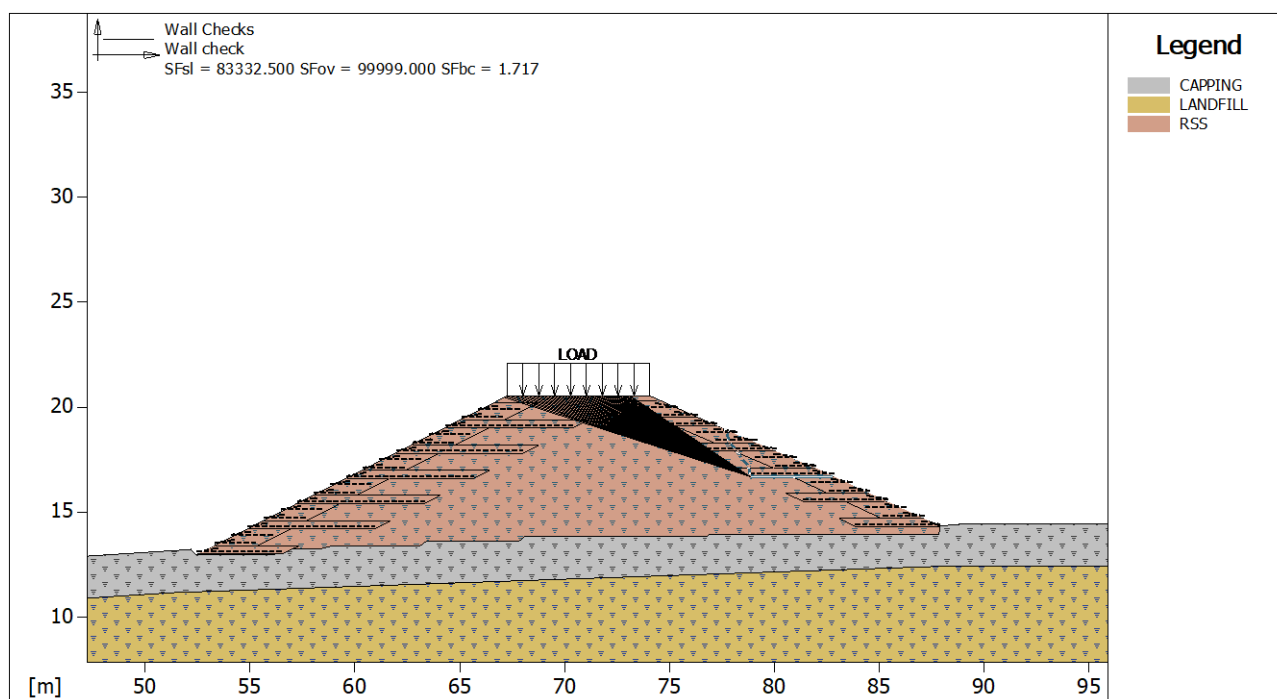
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**Legend**CAPPING
LANDFILL
RSS**Wall Checks :**

Multiplier combination : Wall check

Considered block : R5

Resisting force [kN/m] 320.00

Active force [kN/m] -507.88

Sliding class : Sliding along base of structure

Sliding safety factor : 83332.500

Restoring moment [kN*m/m] 2151.20

Overturning moment [kN*m/m] -721.18

Overturning class: Overturning

Overturning safety factor : 99999.000

Imposed ultimate bearing pressure

Ultimate bearing pressure [kN/m²] 150.00Active pressure [kN/m²] 87.39

Pressure class...: Bearing capacity

Bearing capacity safety factor : 1.717

Equivalent bearing area [m] 4.00

Eccentricity of normal force [m] -6.22

Lever arm of overturning force [m] 1.42

Normal force on the base [kN] 349.54

Outer edge stress [kN/m²] -224.70Inner edge stress [kN/m²] 14.183**Multiplier****Class**

1.30	External live loads
1.00	Soil material factor tan(phi)
1.60	Soil material factor c'
1.50	Soil unit weight
1.00	Category of structure
1.30	Pull-out factor (= fp x fn)
1.20	Sliding along base of structure
1.00	Bearing capacity
1.00	Overturning

Cross Section : Section S7

File : S7 undrained analysis global 06022023



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Checks according to: Eurocode 7 EN 1997-1
Eurocode 7 EN 1997-1

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SOIL PROPERTIES

Soil: CAPPING		Description:
Cohesion Class	Undrained shear strength	
Cohesion	[kN/m ²]	30.00
Friction Angle Class	Angle of shearing resistance (Tan phi)	
Friction Angle	[°]	0.00
Ru value		0.10
Weight Class	Weight density	
Bulk unit weight – above GWT	[kN/m ³]	19.00
Bulk unit weight – below GWT	[kN/m ³]	19.00
Elastic Modulus	[kN/m ²]	0.00
Poisson's ratio		0.30
Soil: LANDFILL		Description:
Cohesion Class	Undrained shear strength	
Cohesion	[kN/m ²]	25.00
Friction Angle Class	Angle of shearing resistance (Tan phi)	
Friction Angle	[°]	0.00
Ru value		0.20
Weight Class	Weight density	
Bulk unit weight – above GWT	[kN/m ³]	8.00
Bulk unit weight – below GWT	[kN/m ³]	8.00
Elastic Modulus	[kN/m ²]	0.00
Poisson's ratio		0.30
Soil: RSS		Description: RSS backfill
Cohesion Class	Undrained shear strength	
Cohesion	[kN/m ²]	80.00
Friction Angle Class	Angle of shearing resistance (Tan phi)	
Friction Angle	[°]	0.00
Ru value		0.10
Weight Class	Weight density	
Bulk unit weight – above GWT	[kN/m ³]	19.00
Bulk unit weight – below GWT	[kN/m ³]	19.00
Elastic Modulus	[kN/m ²]	0.00
Poisson's ratio		0.30

STRATA PROFILES

Stratum: BUND		Description:					
Soil : RSS							
X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
52.45	12.96	67.26	20.54	74.06	20.54	87.86	14.34
Stratum: CAPPING		Description:					
Soil : CAPPING							
X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
16.45	10.94	52.20	13.22	52.45	12.96	56.16	12.96
56.58	13.27	58.40	13.26	58.91	13.39	63.10	13.39
63.40	13.61	67.81	13.61	68.09	13.83	76.78	13.83
76.87	13.93	87.85	13.95	87.86	14.34	88.81	14.42
199.95	14.42						



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Stratum: LANDFILL

Description:

Soil : LANDFILL

X	Y	X	Y	X	Y	X	Y
[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
16.45	8.94	51.39	11.17	87.87	12.42	199.95	12.42

REINFORCED BLOCKS**Block : L1**

Block dimensions_____ [m] : Base width_____ = 4.00 Height_____ = 0.40
Block Origin_____ [m] : Abscissa_____ = 52.50 Ordinate_____ = 13.00
Face inclination_____ [°] : 65.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m] = 4.00
Vertical spacing_____ [m] = 0.40
Wrapped length_____ [m] = 0.10

Block : L2

Block dimensions_____ [m] : Base width_____ = 2.00 Height_____ = 0.80
Back Shift_____ [m] = 0.00 by L1
Face inclination_____ [°] : 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length_____ [m] = 2.00
Vertical spacing_____ [m] = 0.40
Wrapped length_____ [m] = 0.10

Block : L3

Block dimensions_____ [m] : Base width_____ = 6.00 Height_____ = 0.40
Back Shift_____ [m] = 0.00 by L2
Face inclination_____ [°] : 63.00

Structural embankment type_____ : Sandy Clay
Structural embankment_____ : RSS
Backfill soil_____ : RSS
Covering soil_____ : RSS
Foundation soil_____ : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth_____ [m] : 0.00
Natural soil slope_____ [°] : 0.00

Reinforcements pattern :

Basetex 200/50



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Length.....[m].....= 6.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R1

Block dimensions.....[m].....: Base width.....= 4.00 Height.....= 0.40
Block Origin.....[m].....: Abscissa.....= 87.86 Ordinate.....= 14.30
Face inclination.....[°].....: 62.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 4.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : L4

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by L3
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: CAPPING

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R2

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by R1
Face inclination.....[°].....: 65.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

**PROJECT:**

HARTS FARM WAY HAVANT, HAMPSHIRE – RSS BUND

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Block : L5

Block dimensions[m] : Base width = 6.00 Height = 0.40
Back Shift[m] = 0.00 by L4
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 6.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : R3

Block dimensions[m] : Base width = 4.00 Height = 0.40
Back Shift[m] = 0.00 by R2
Face inclination[°] : 65.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: CAPPING

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 4.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : L6

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by L5
Face inclination[°] : 63.00

Structural embankment type: Sandy Clay
Structural embankment: RSS
Backfill soil: RSS
Covering soil: RSS
Foundation soil: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : R4

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by R3
Face inclination[°] : 65.00



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Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L7

Block dimensions.....[m] : Base width..... = 6.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L6
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 6.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R5

Block dimensions.....[m] : Base width..... = 4.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by R4
Face inclination.....[°] : 65.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 4.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L8

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by L7
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS



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Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R6

Block dimensions.....[m] : Base width..... = 2.00 Height..... = 0.80
Back Shift.....[m] = 0.00 by R5
Face inclination.....[°] : 67.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 2.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : L9

Block dimensions.....[m] : Base width..... = 6.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by L8
Face inclination.....[°] : 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m] = 6.00
Vertical spacing.....[m] = 0.40
Wrapped length.....[m] = 0.10

Block : R7

Block dimensions.....[m] : Base width..... = 4.00 Height..... = 0.40
Back Shift.....[m] = 0.00 by R6
Face inclination.....[°] : 67.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00



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Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 4.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.20

Block : L10

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by L9
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : R8

Block dimensions.....[m].....: Base width.....= 2.00 Height.....= 0.80
Back Shift.....[m].....= 0.00 by R7
Face inclination.....[°].....: 67.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 2.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10

Block : L11

Block dimensions.....[m].....: Base width.....= 6.00 Height.....= 0.40
Back Shift.....[m].....= 0.00 by L10
Face inclination.....[°].....: 63.00

Structural embankment type.....: Sandy Clay
Structural embankment.....: RSS
Backfill soil.....: RSS
Covering soil.....: RSS
Foundation soil.....: RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth.....[m] : 0.00
Natural soil slope.....[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length.....[m].....= 6.00
Vertical spacing.....[m].....= 0.40
Wrapped length.....[m].....= 0.10



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Block : R9

Block dimensions[m] : Base width = 4.00 Height = 0.40
Back Shift[m] = 0.00 by R8
Face inclination[°] : 67.00

Structural embankment type : Sandy Clay
Structural embankment : RSS
Backfill soil : RSS
Covering soil : RSS
Foundation soil : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 4.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : L12

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by L11
Face inclination[°] : 63.00

Structural embankment type : Sandy Clay
Structural embankment : RSS
Backfill soil : RSS
Covering soil : RSS
Foundation soil : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

Block : R10

Block dimensions[m] : Base width = 2.00 Height = 0.80
Back Shift[m] = 0.00 by R9
Face inclination[°] : 67.00

Structural embankment type : Sandy Clay
Structural embankment : RSS
Backfill soil : RSS
Covering soil : RSS
Foundation soil : RSS

Brinch Hansen, Vesic or Meyerhof bearing capacity parameters

Embedment depth[m] : 0.00
Natural soil slope[°] : 0.00

Reinforcements pattern :

Basetex 200/50

Length[m] = 2.00
Vertical spacing[m] = 0.40
Wrapped length[m] = 0.10

SURCHARGE LOADS**Distributed Loads : LOAD**

Description :



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HARTS FARM WAY HAVANT, HAMPSHIRE – RSS BUND

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Class : Variable unfavourable

Magnitude [kN/m²] = 10.00 Inclination angle [°] = 0.00

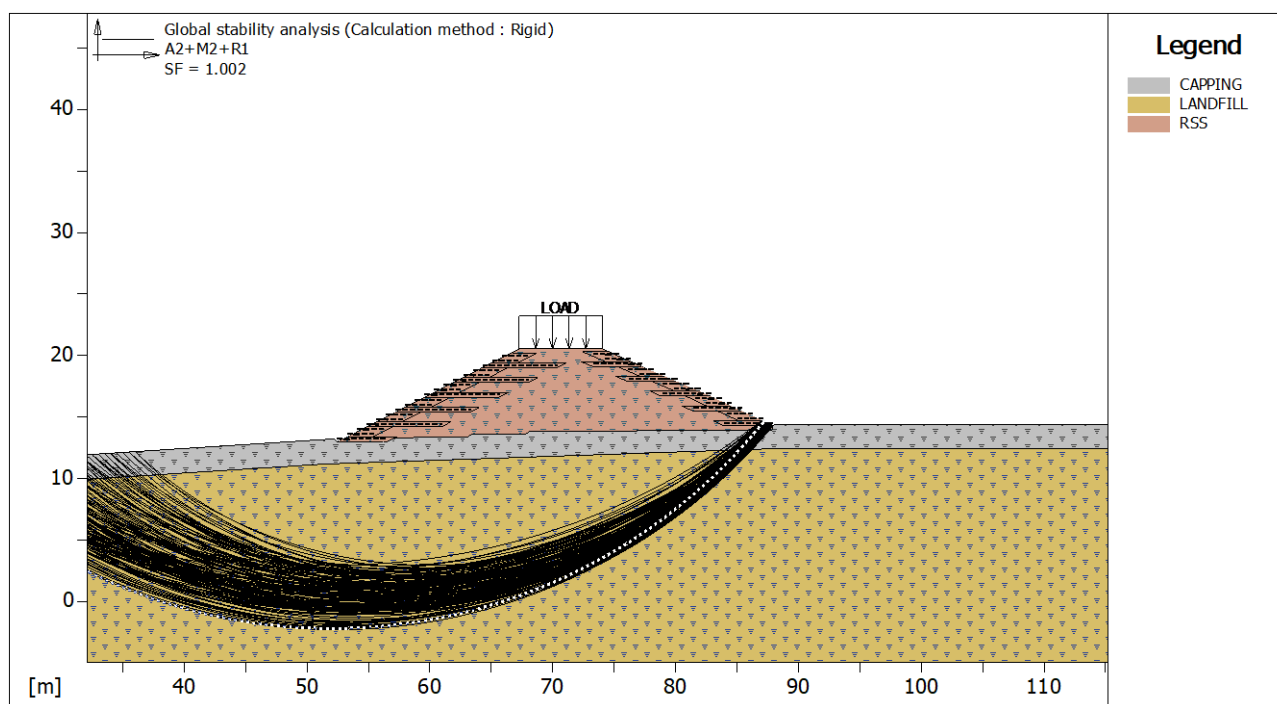
Abscissa [m] : from = 67.26 To = 74.06

PROPERTIES OF THE USED REINFORCEMENTS

Basotex 200/50

Tensile strength UTS	[kN/m]	200.00
Minimum anchorage length	[m]	0.15
Breakage Safety Factor (gravel)		1.54
Breakage Safety Factor (sand)		1.52
Breakage Safety Factor (silty sand)		1.52
Breakage Safety Factor (sandy clay)		2.06
Interaction factor reinforcement/reinforcement		0.16
Pullout coefficient reinforcement-gravel		0.90
Pullout coefficient reinforcement-sand		0.90
Pullout coefficient reinforcement-silt		0.70
Pullout coefficient reinforcement-clay		0.40

CHECKS RESULTS



Global Stability Check :

Multiplier combination : A2+M2+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor : 1.002

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
20.00	56.00	87.00	88.00
Number of starting point on the starting segment		73	
Total number of trial surfaces		730	
Minimum base length of slices [m]		0.50	
Superior limit search angle [°]		0.00	
Inferior limit search angle [°]		0.00	

Block : R1
Basotex 200/50

Y Tb Tp Td Tb/Td Tp/Td



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HARTS FARM WAY HAVANT, HAMPSHIRE – RSS BUND

REF. NUMBER:

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REVISION:

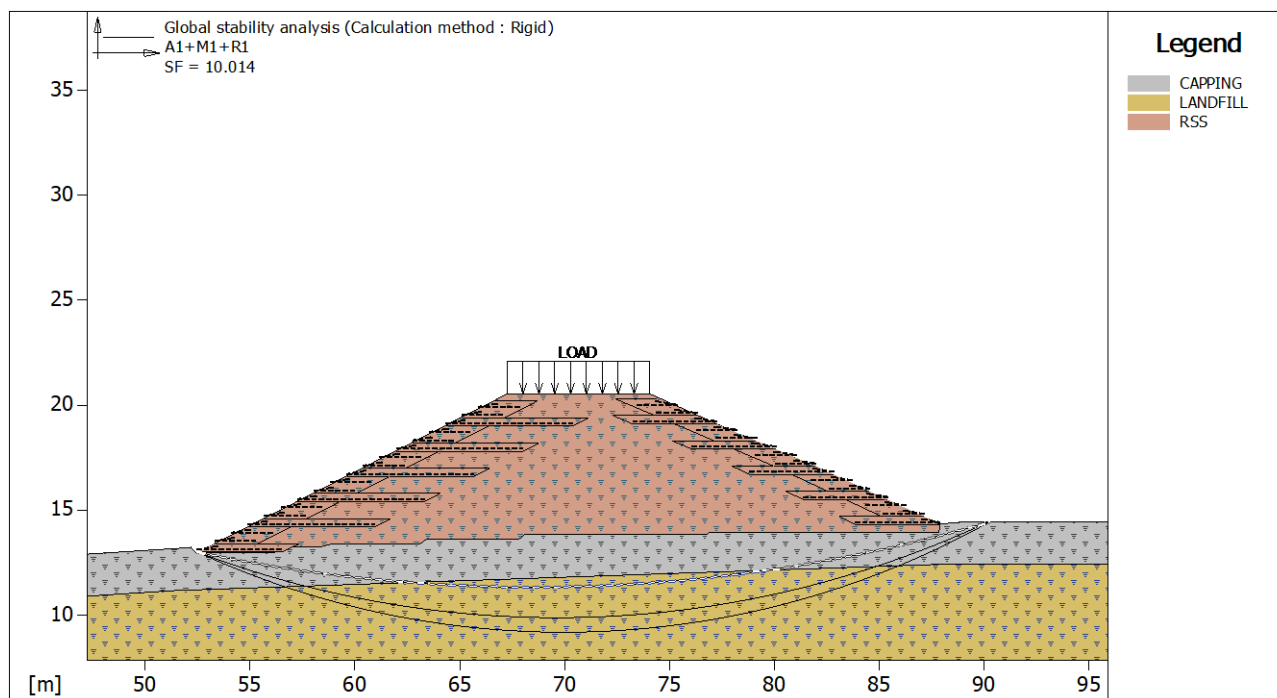
0

DATE:

08/02/2023

[m]	breakage [kN/m]	pullout [kN/m]	design [kN/m]	1/Fmax	
0.000	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.30	Variable unfavourable
1.25	Angle of shearing resistance (Tan phi)
1.25	Effective cohesion
1.40	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability

**Global Stability Check :**

Multiplier combination : A1+M1+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 10.014

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
52.00	53.00	90.00	95.00
Number of starting point on the starting segment.....:		3	
Total number of trial surfaces.....:		102	
Minimum base length of slices.....[m].....:		0.50	
Superior limit search angle.....[°].....:		0.00	
Inferior limit search angle.....[°].....:		0.00	

Multiplier	Class
1.50	Variable unfavourable
1.00	Angle of shearing resistance (Tan phi)
1.00	Effective cohesion
1.00	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



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PROJECT:

HARTS FARM WAY HAVANT, HAMPSHIRE – RSS BUND

REF. NUMBER:

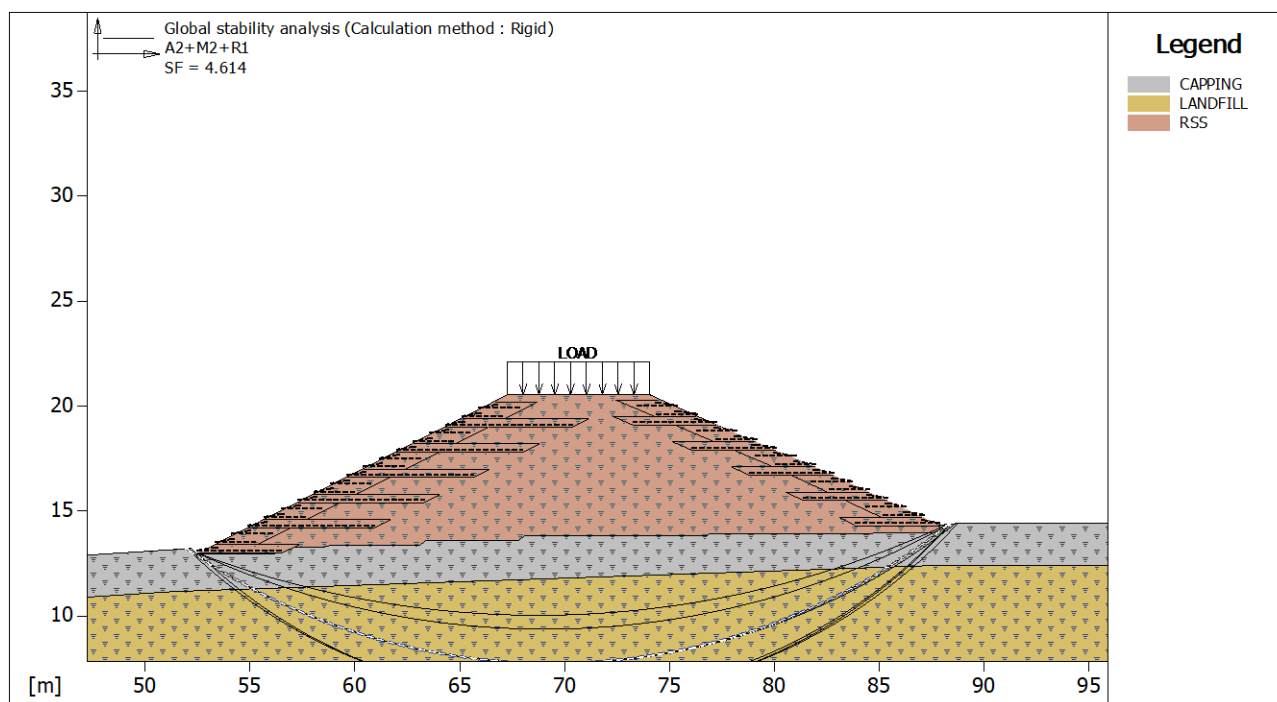
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DATE:

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**Global Stability Check :**

Multiplier combination : A2+M2+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor : 4.614

Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
52.00	53.00	88.00	95.00
Number of starting point on the starting segment.....		3	
Total number of trial surfaces.....		102	
Minimum base length of slices..... [m].....		0.50	
Superior limit search angle..... [°].....		0.00	
Inferior limit search angle..... [°].....		0.00	

Multiplier	Class
1.30	Variable unfavourable
1.25	Angle of shearing resistance (Tan phi)
1.25	Effective cohesion
1.40	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



PROJECT:

HARTS FARM WAY HAVANT, HAMPSHIRE – RSS BUND

REF. NUMBER:

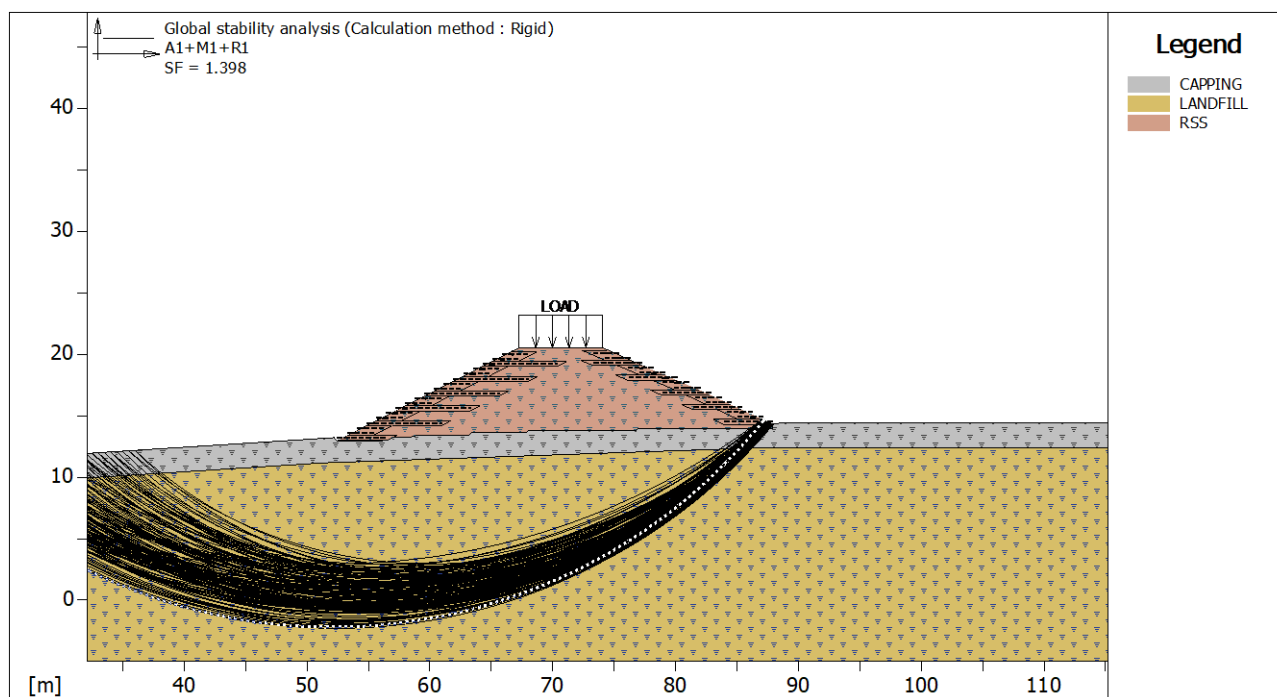
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**Global Stability Check :**

Multiplier combination : A1+M1+R1

Reinforcements active Forces according to Rigid Method

Stability analysis with circular surfaces according to Janbu's Method

Evaluated Safety Factor.....: 1.398

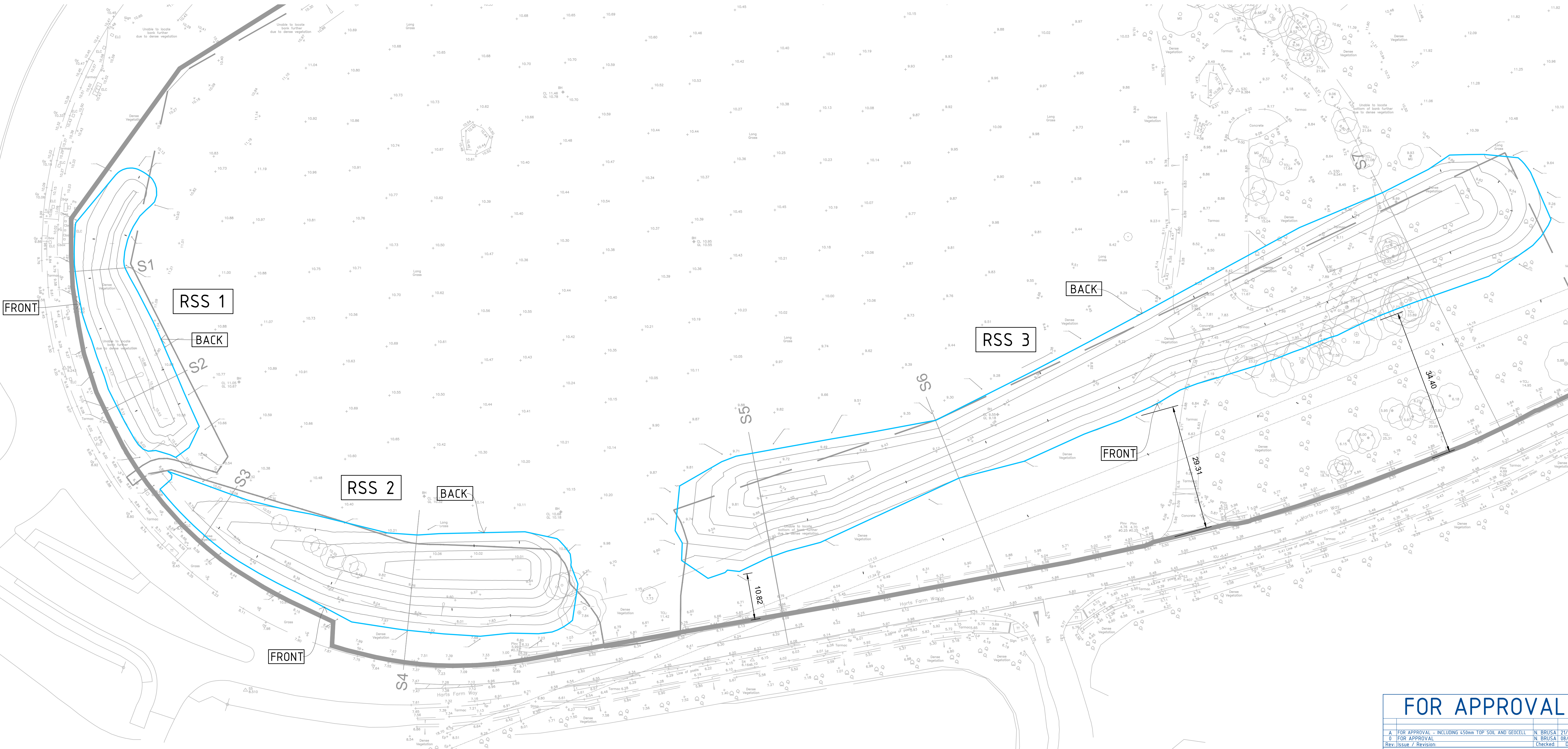
Surfaces searching range

Starting range, abscises [m]		Arrival range, abscises [m]	
First point	Second point	First point	Second point
20.00	52.00	87.00	88.00
Number of starting point on the starting segment.....:		65	
Total number of trial surfaces.....:		650	
Minimum base length of slices.....[m].....:		0.50	
Superior limit search angle.....[°].....:		0.00	
Inferior limit search angle.....[°].....:		0.00	

Block : R1
Basetex 200/50

Y	Tb	Tp	Td	Tb/Td	Tp/Td
[m]	breakage	pullout	design	1/Fmax	
	[kN/m]	[kN/m]	[kN/m]		
0.000	50.0	0.0	0.0	1.#J	-1.#J

Multiplier	Class
1.50	Variable unfavourable
1.00	Angle of shearing resistance (Tan phi)
1.00	Effective cohesion
1.00	Undrained shear strength
1.00	Weight density
1.00	Tensile strength of reinforcement
1.00	Pullout resistance of reinforcement
1.00	Ground resistance for overall stability



FOR APPROVAL

A	FOR APPROVAL - INCLUDING £50mm TOP SOIL AND GEOTELL	N. BRUSA	21/02/23
0	FOR APPROVAL	N. BRUSA	08/02/23
Rev. Issue / Revision		Checked:	Date:

Specialist Element Designer:

Tailor
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Project: HARTS FARM WAY, BROCKHAMPTON
WEST, HAVANT - RSS BUND

Our Client: Final Client:

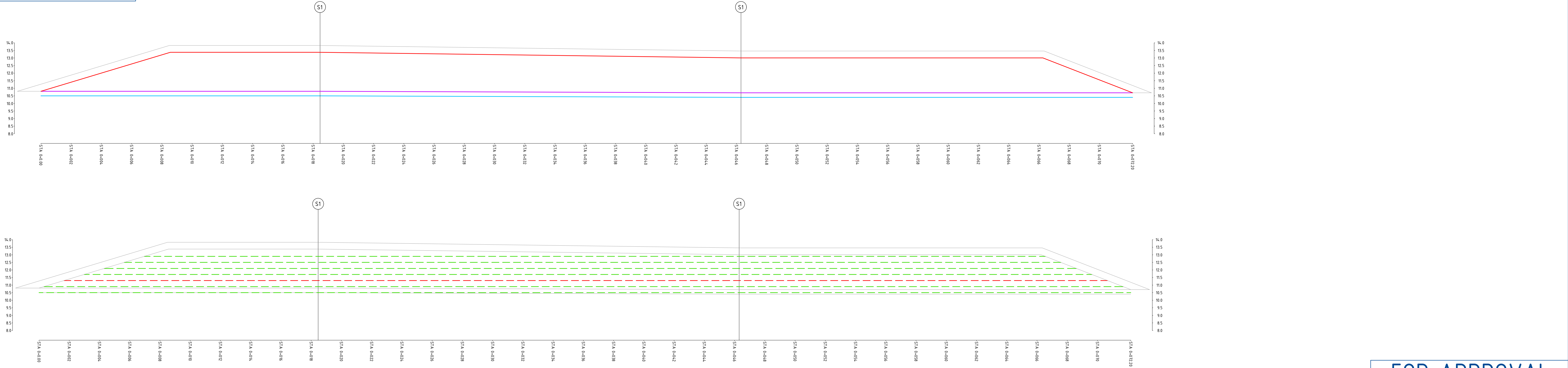
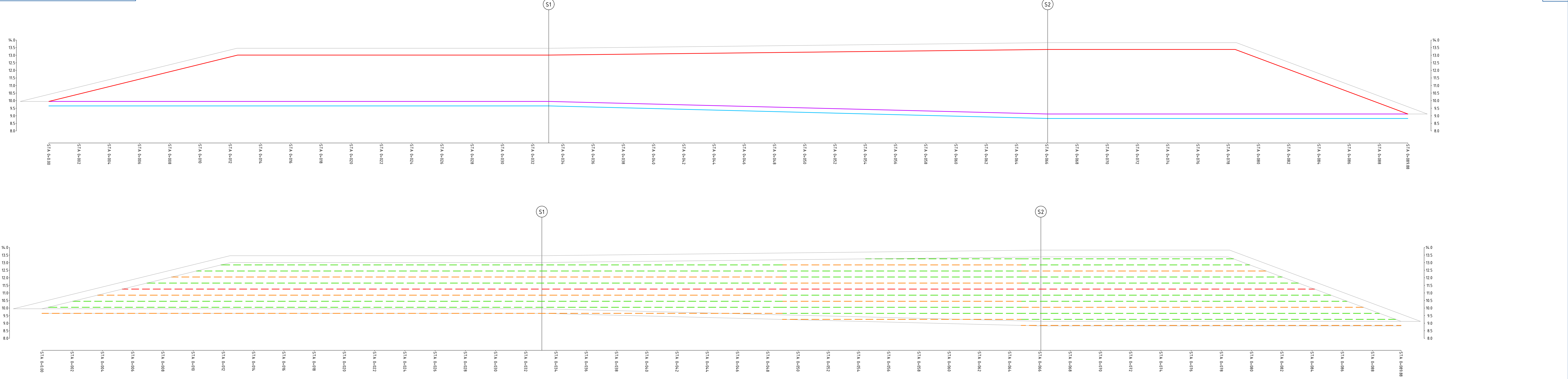
Burrows
Graham

Clowes
DEVELOPMENTS

Drawing: RSS OVERALL PLAN - VIEW DRAWING

Designed: NBrusa	Date: 21/02/23	Project No: UK-2309
Drawn: NBrusa	Date: 21/02/23	Scale: As Shown at A1
Checked: NBrusa	Date: 21/02/23	Revision:
Drawing No: UK-2309-07-A-A	Revision: A	

LEGEND:
RSS FORMATION LEVEL



- LEGEND:
- RSS CREST LEVEL
 - RSS FINISHED GROUND LEVEL
 - RSS FORMATION LEVEL
 - REINFORCEMENT 2m LONG
 - REINFORCEMENT 4m LONG
 - REINFORCEMENT 5m LONG
 - REINFORCEMENT 6m LONG
 - REINFORCEMENT 10m LONG
 - CONTINUOUS REINFORCEMENT (BACK-TO-FRONT RSS)
 - TOP SOIL PROFILE (450mm + GEOCELLS)

FOR APPROVAL

A	FOR APPROVAL - INCLUDING 450mm TOP SOIL AND GEOCELL	N. BRUSA	21/02/23
0	FOR APPROVAL	N. BRUSA	08/02/23
Rev.	Issue / Revision	Checked:	Date:

Specialist Element Designer:

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Project: HARTS FARM WAY, BROCKHAMPTON
WEST, HAVANT - RSS BUND

Our Client:

Burrows
Graham

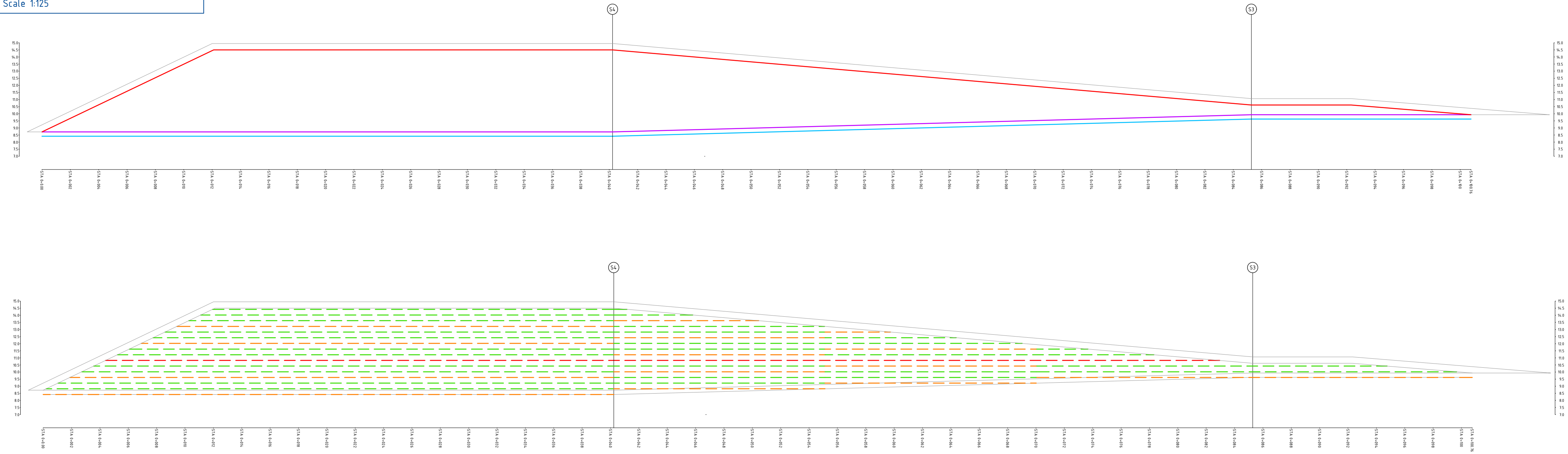
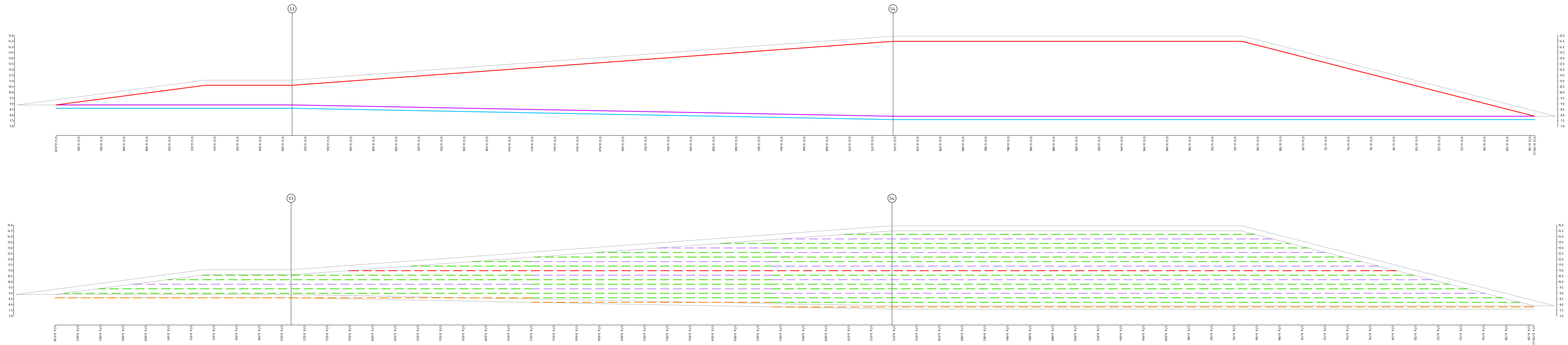
Final Client:

Clowes
DEVELOPMENTS

Drawing: ELEVATION RSS 1 - VIEW DRAWING

Designed: NBrusa	Date: 21/02/23	Project No: UK-2309
Drawn: NBrusa	Date: 21/02/23	Scale: As Shown at A1
Checked: NBrusa	Date: 21/02/23	Revision: A

Drawing No: UK-2309-02-A-A



LEGEND:

- RSS CREST LEVEL
- RSS FINISHED GROUND LEVEL
- RSS FORMATION LEVEL
- REINFORCEMENT 2m LONG
- REINFORCEMENT 4m LONG
- REINFORCEMENT 5m LONG
- REINFORCEMENT 6m LONG
- REINFORCEMENT 10m LONG
- CONTINUOUS REINFORCEMENT (BACK-TO-FRONT RSS)
- TOP SOIL PROFILE (450mm + GEOCELLS)

FOR APPROVAL

A	FOR APPROVAL - INCLUDING £50mm TOP SOIL AND GEOCELL	N. BRUSA	21/02/23
0	FOR APPROVAL	N. BRUSA	08/02/23
Rev. Issue / Revision:		Checked:	Date:

Specialist Element Designer:

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Project: HARTS FARM WAY, BROCKHAMPTON
WEST, HAVANT - RSS BUND

Our Client:

Burrows
Graham

Final Client:

Clowes
DEVELOPMENTS

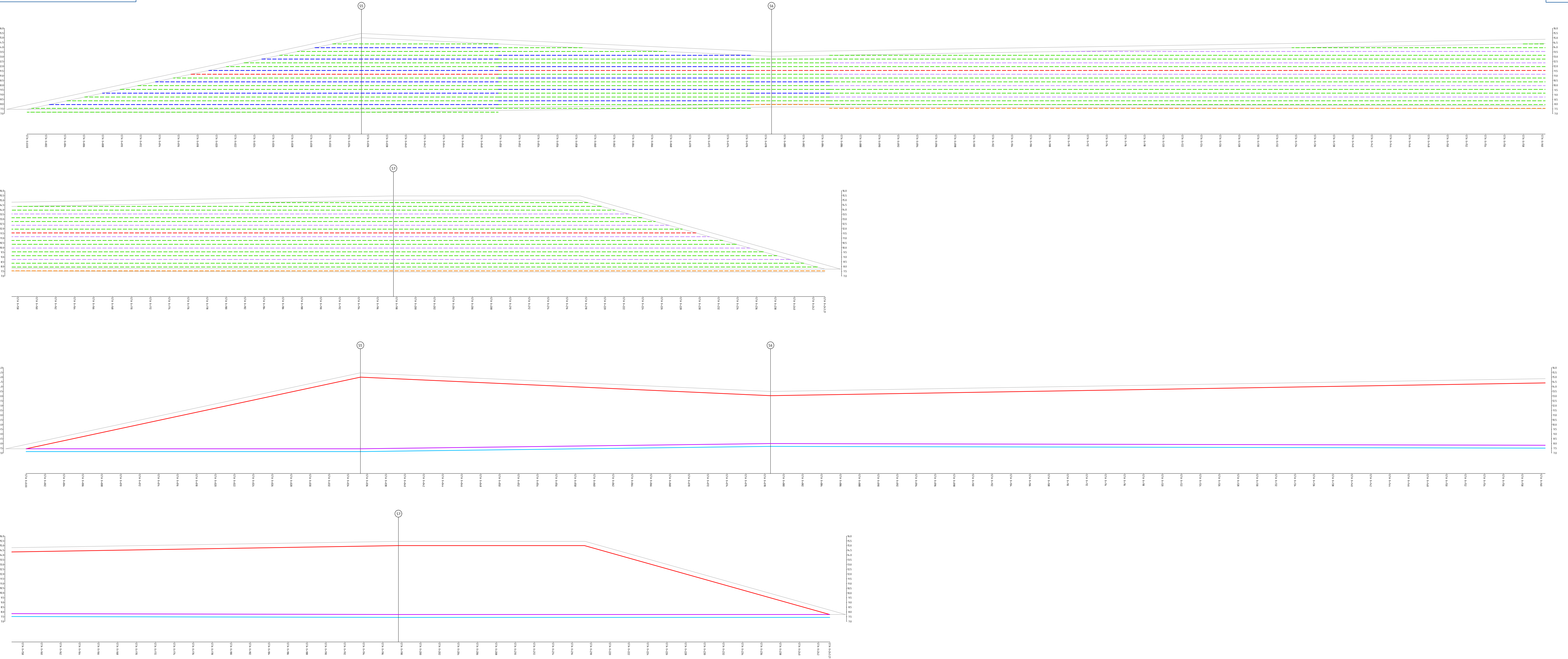
Drawing: ELEVATION RSS 2 - VIEW DRAWING

Designed: NBrusa Date: 21/02/23 Project No: UK-2309

Drawn: NBrusa Date: 21/02/23 Scale: As Shown at A1

Checked: NBrusa Date: 21/02/23

Drawing No: UK-2309-03-A-A Revision: A



- LEGEND:
- RSS CREST LEVEL
 - RSS FINISHED GROUND LEVEL
 - RSS FORMATION LEVEL
 - REINFORCEMENT 2m LONG
 - REINFORCEMENT 4m LONG
 - REINFORCEMENT 5m LONG
 - REINFORCEMENT 6m LONG
 - REINFORCEMENT 10m LONG
 - CONTINUOUS REINFORCEMENT (BACK-TO-FRONT RSS)
 - TOP SOIL PROFILE (450mm + GEOCELLS)

FOR APPROVAL

A	FOR APPROVAL - INCLUDING £50mm TOP SOIL AND GEOCELL	N. BRUSA	21/02/23
0	FOR APPROVAL	N. BRUSA	08/02/23
Rev.	Issue / Revision	Checked:	Date:

Specialist Element Designer:



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Project: HARTS FARM WAY, BROCKHAMPTON
WEST, HAVANT - RSS BUND

Our Client:



Final Client:



Drawing: ELEVATION RSS 3 FRONT - VIEW DRAWING

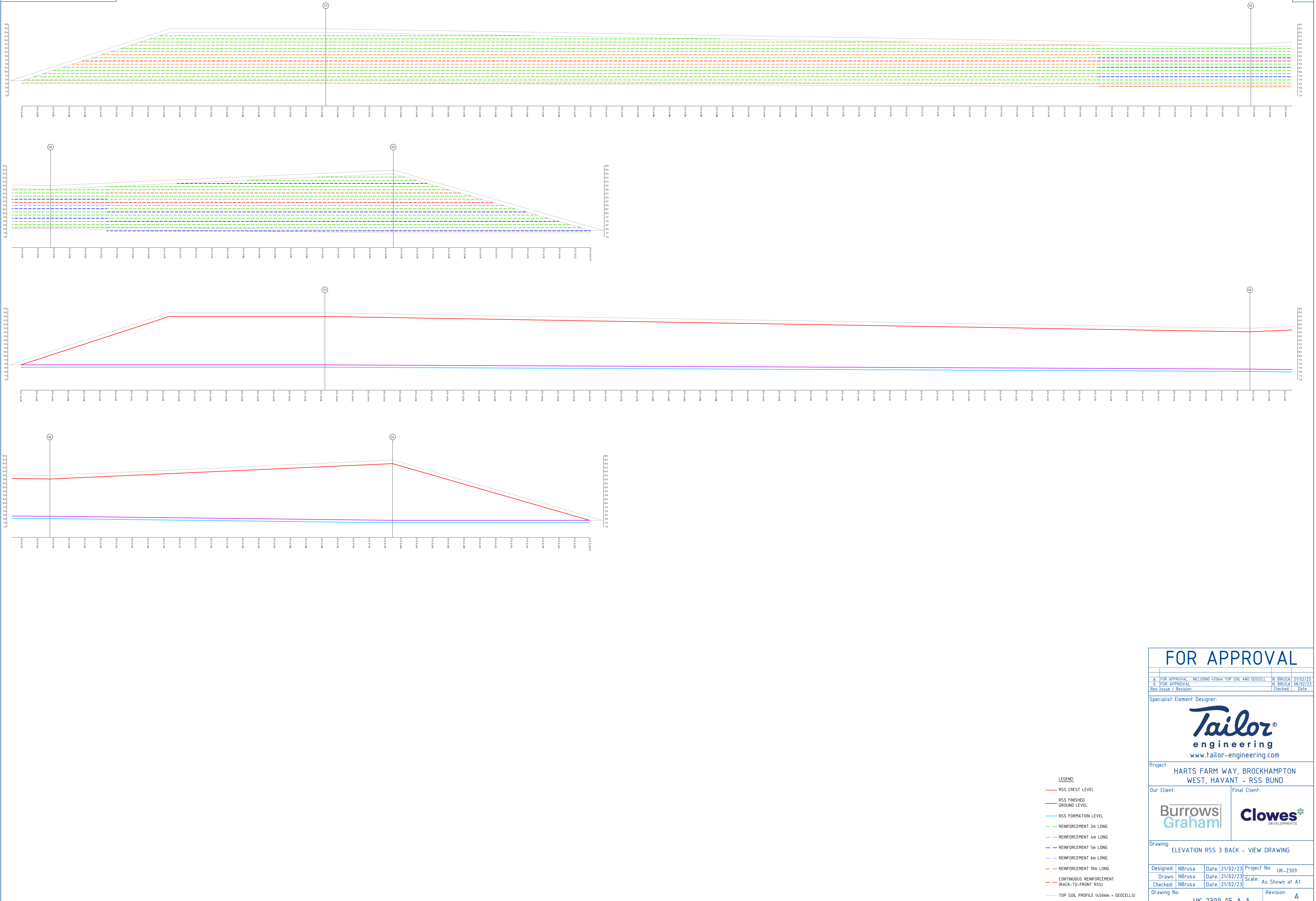
Designed:	NBrusa	Date:	21/02/23	Project No:	UK-2309
Drawn:	NBrusa	Date:	21/02/23	Scale:	As Shown at A1
Checked:	NBrusa	Date:	21/02/23		

Drawing No:

UK-2309-04-A-A

Revision:

A



FOR APPROVAL

A	FOR APPROVAL - INCLUDING £50mm TOP SOIL AND GEOCELL	N. BRUSA	21/02/23
0	FOR APPROVAL	N. BRUSA	08/02/23
Rev.	Issue / Revision	Checked:	Date:

Specialist Element Designer:

www.tailor-engineering.com

Project: HARTS FARM WAY, BROCKHAMPTON
WEST, HAVANT - RSS BUND

Our Client:

Final Client:

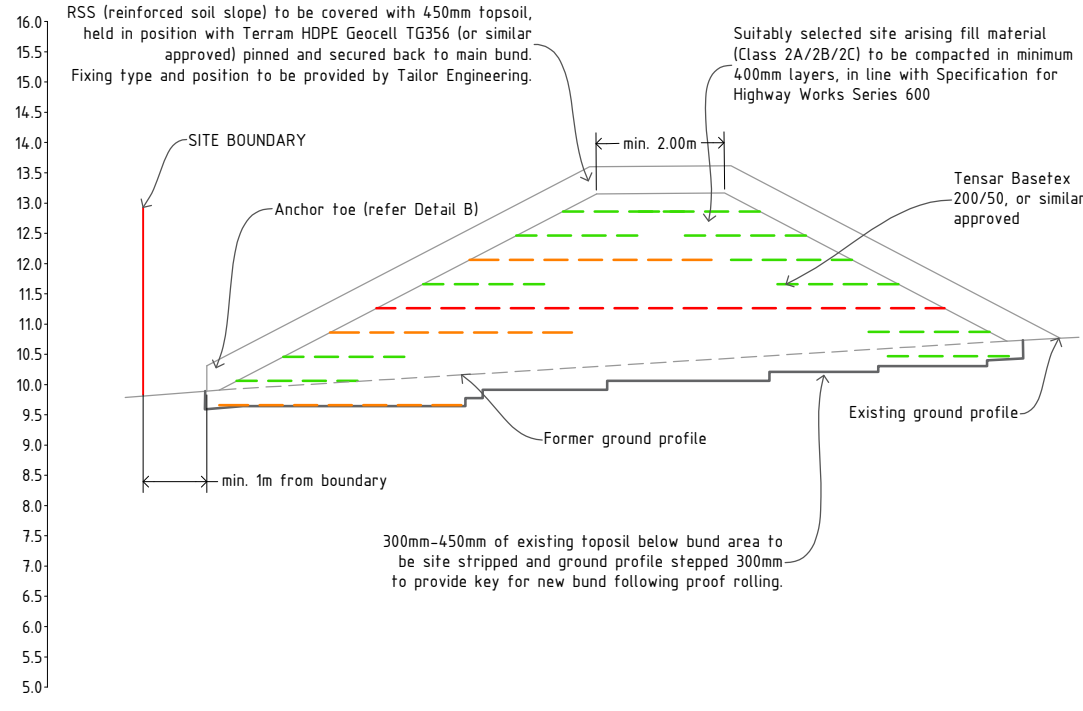
Drawing: ELEVATION RSS 3 BACK - VIEW DRAWING

Designed: NBrusa	Date: 21/02/23	Project No: UK-2309
Drawn: NBrusa	Date: 21/02/23	Scale: As Shown at A1
Checked: NBrusa	Date: 21/02/23	

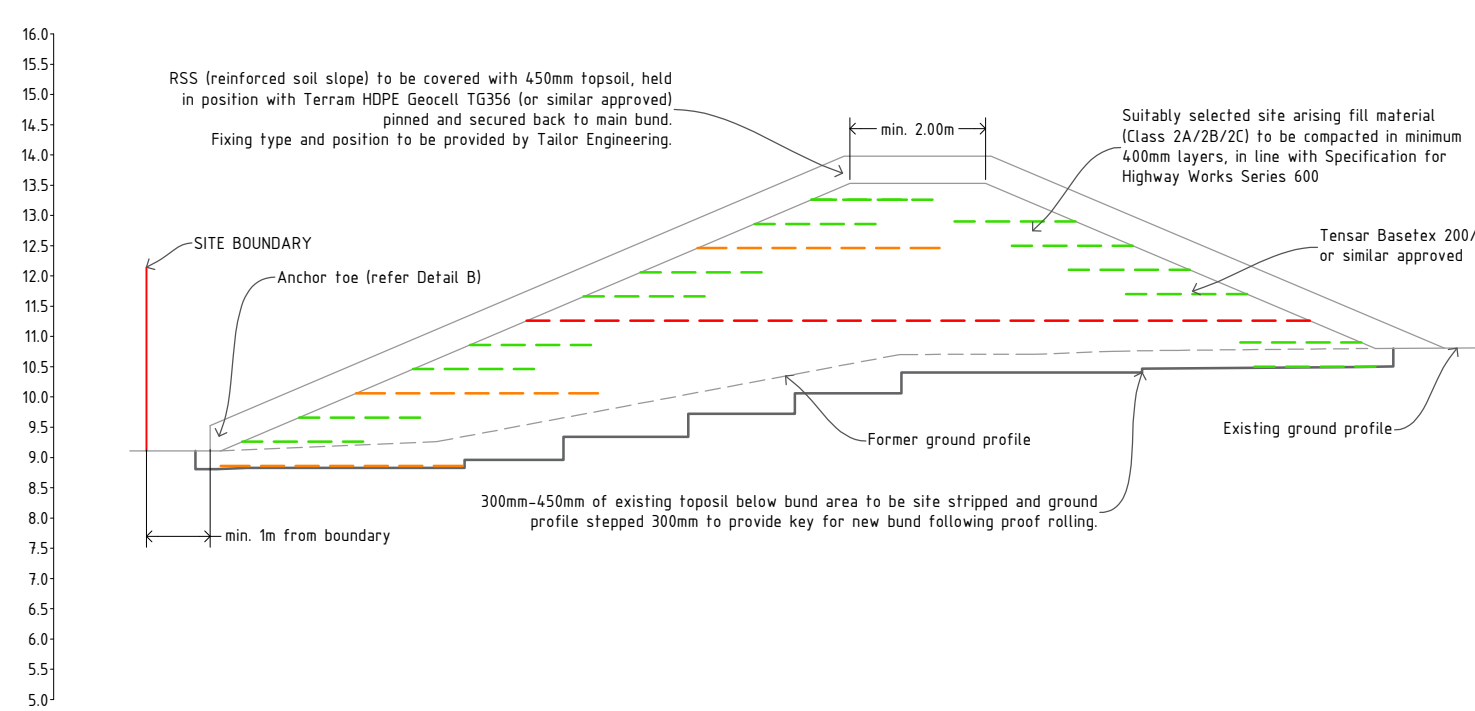
Drawing No: UK-2309-05-A-A

Revision: A

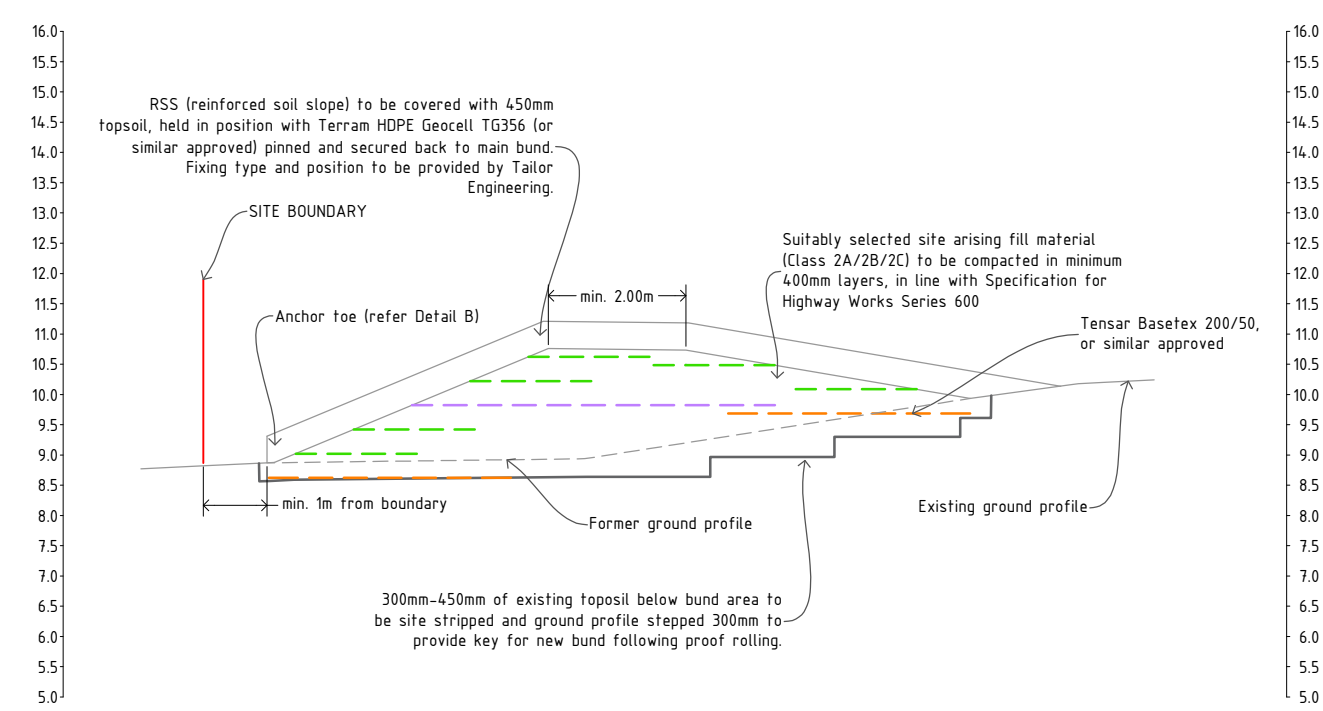
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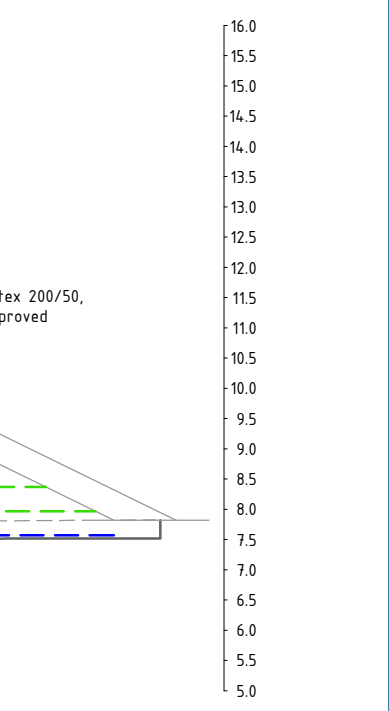
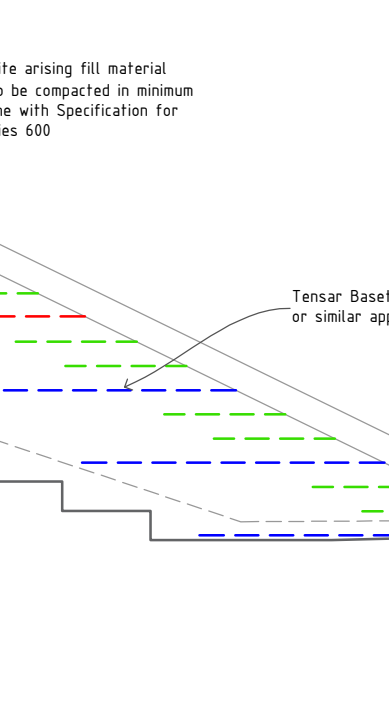
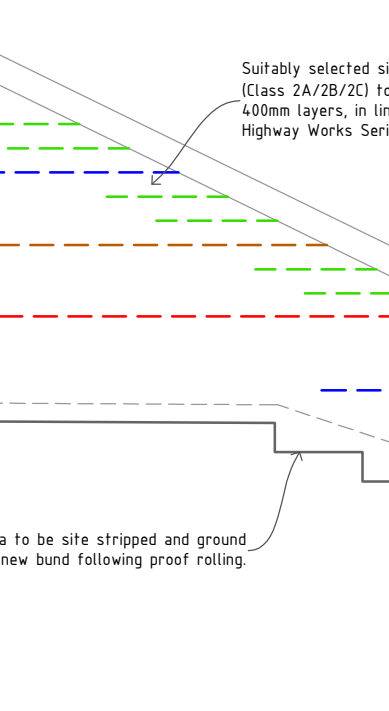
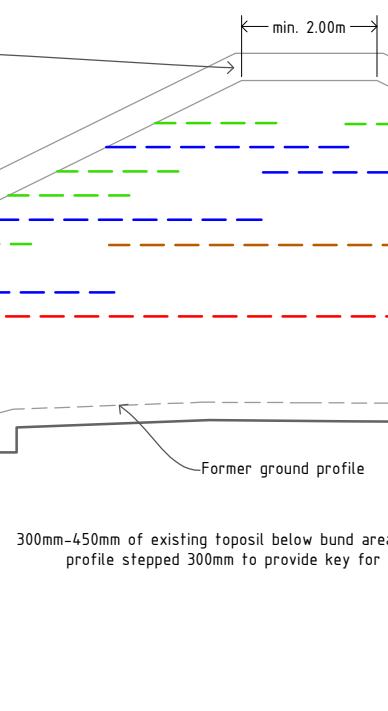
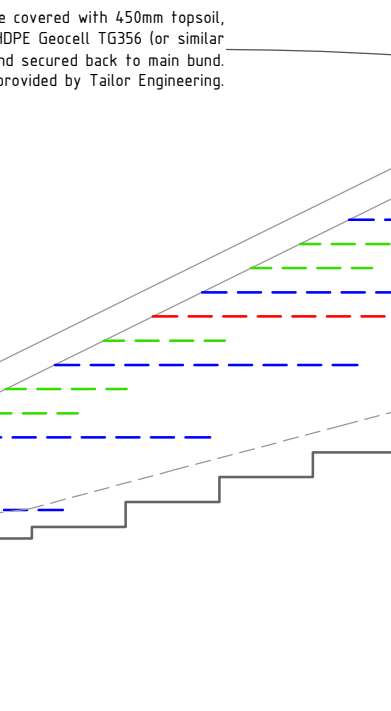
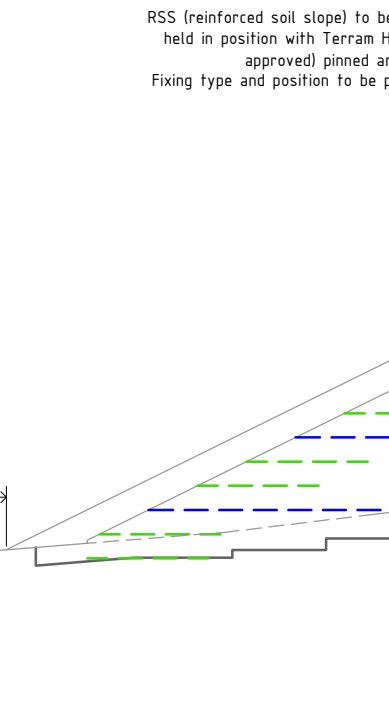
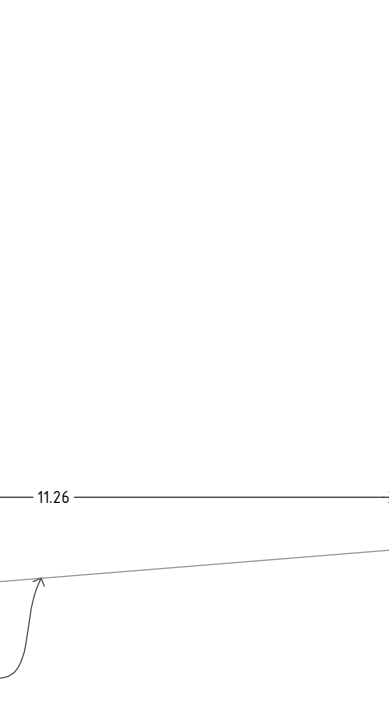
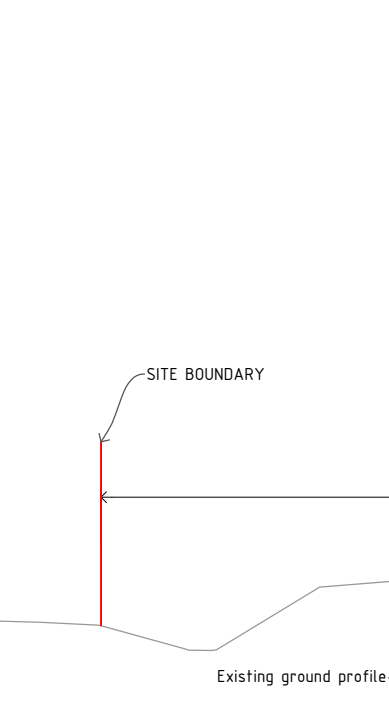
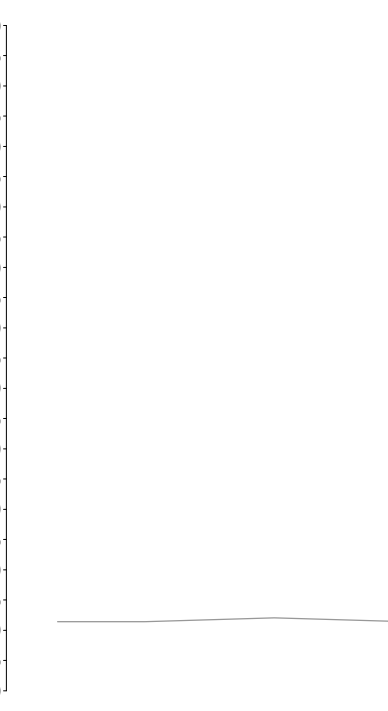
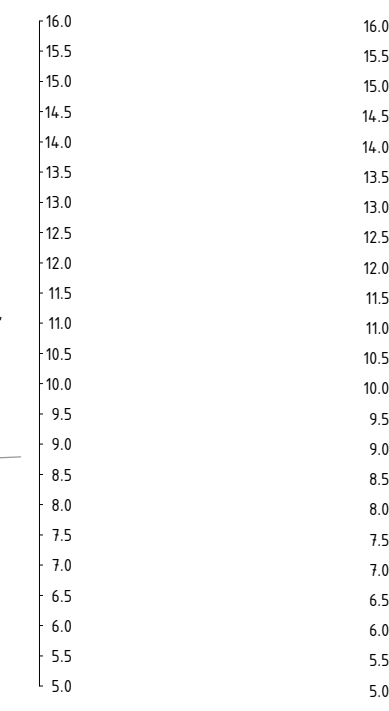
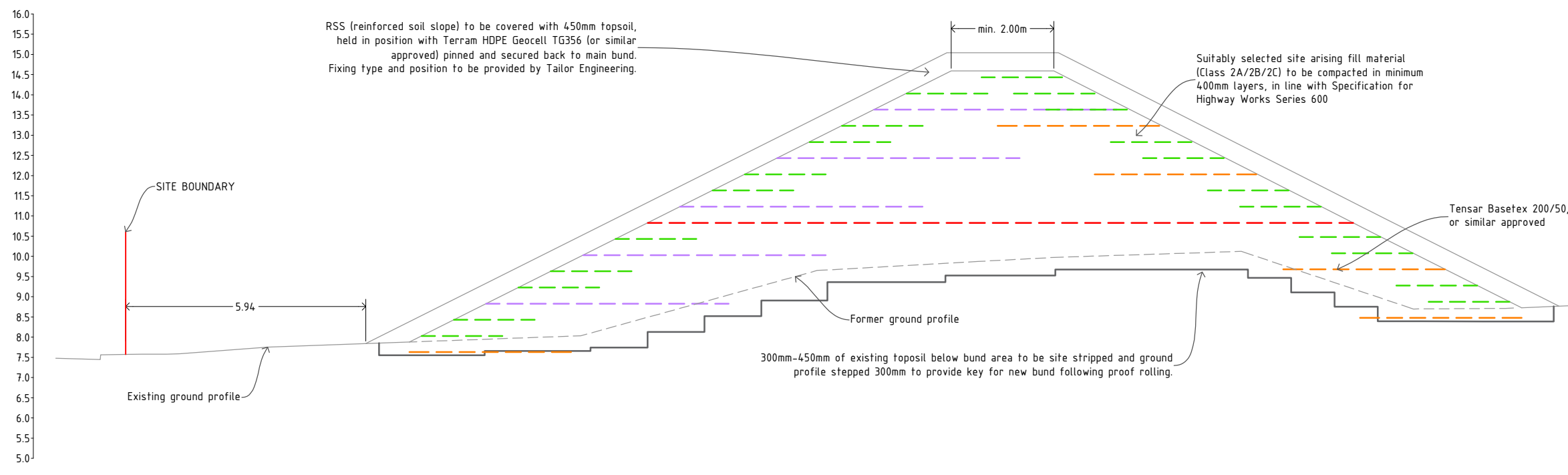
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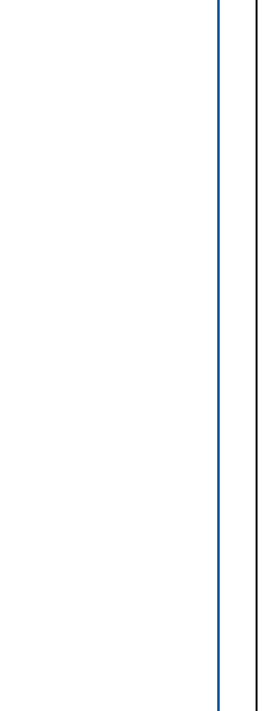
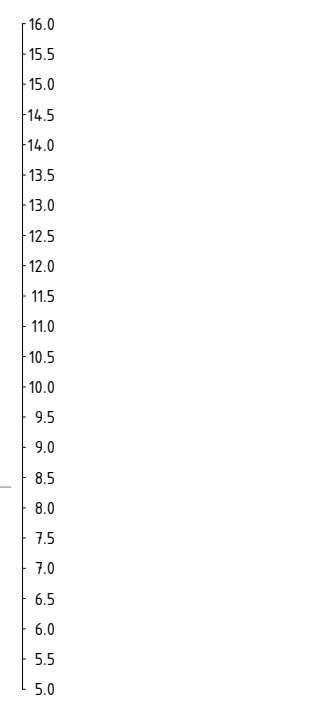
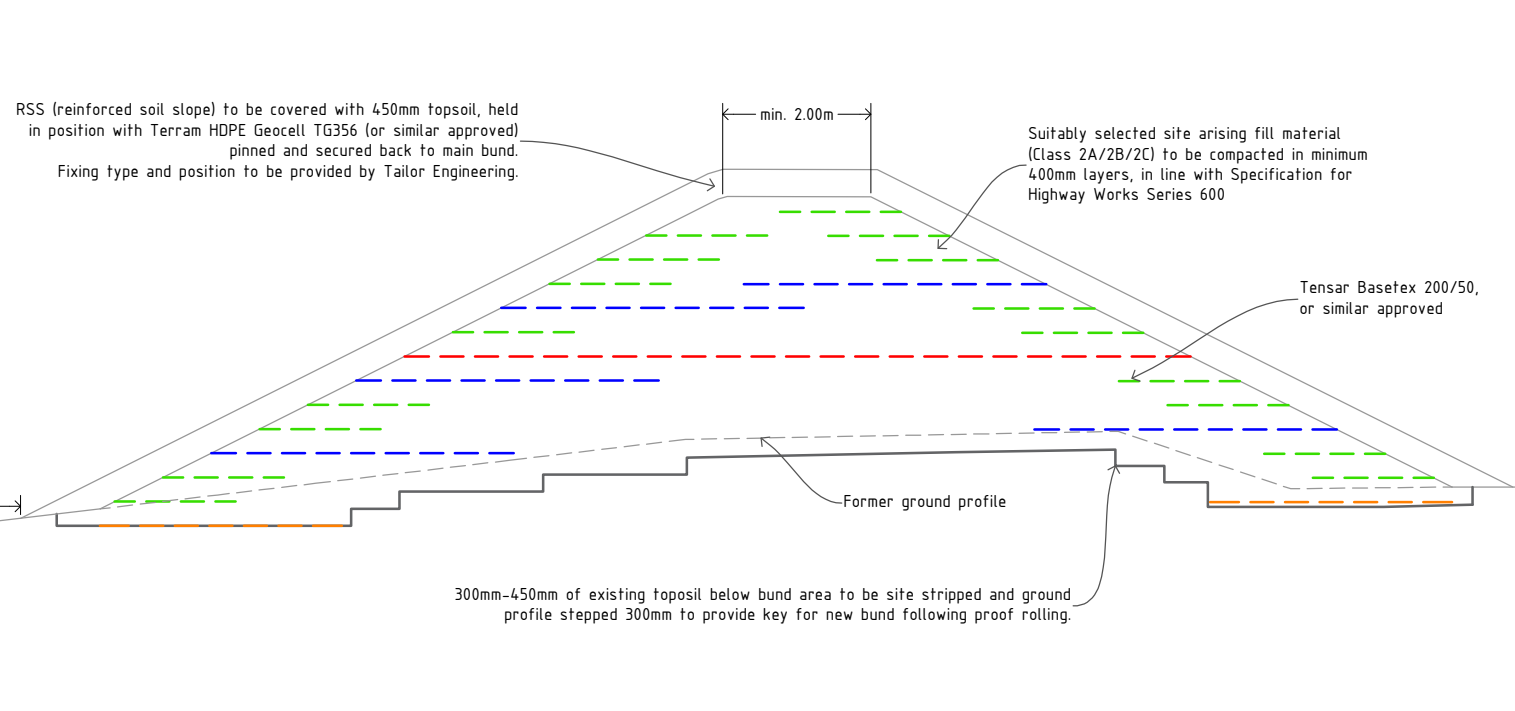
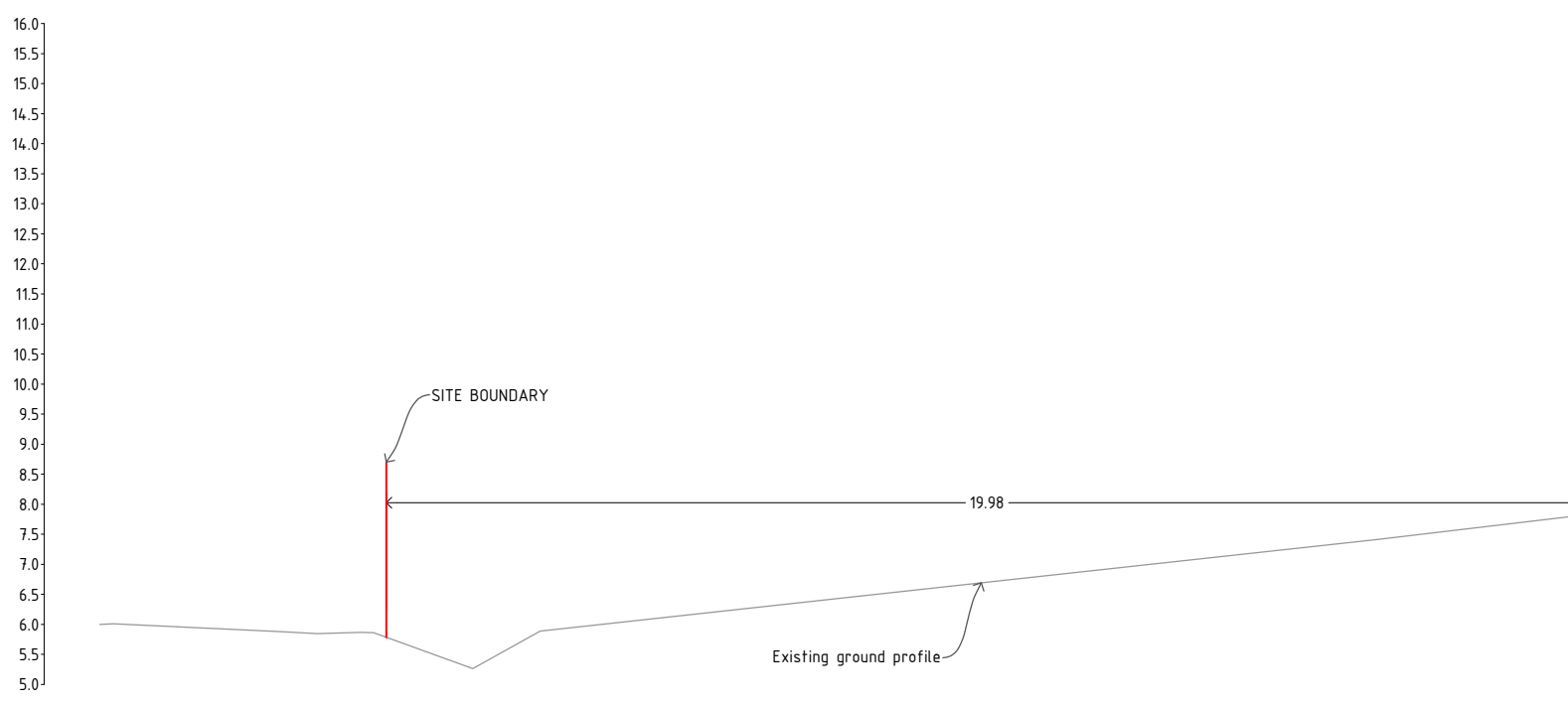
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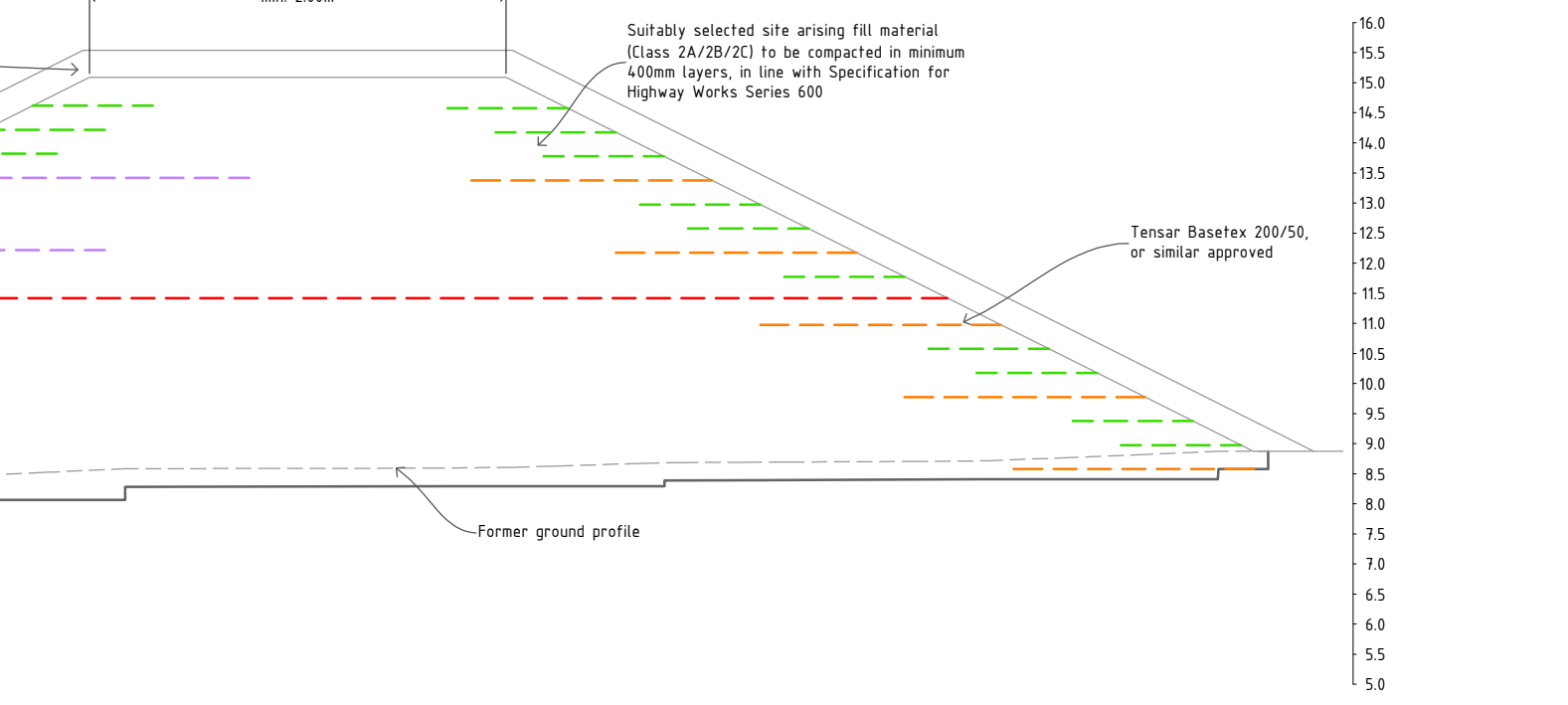
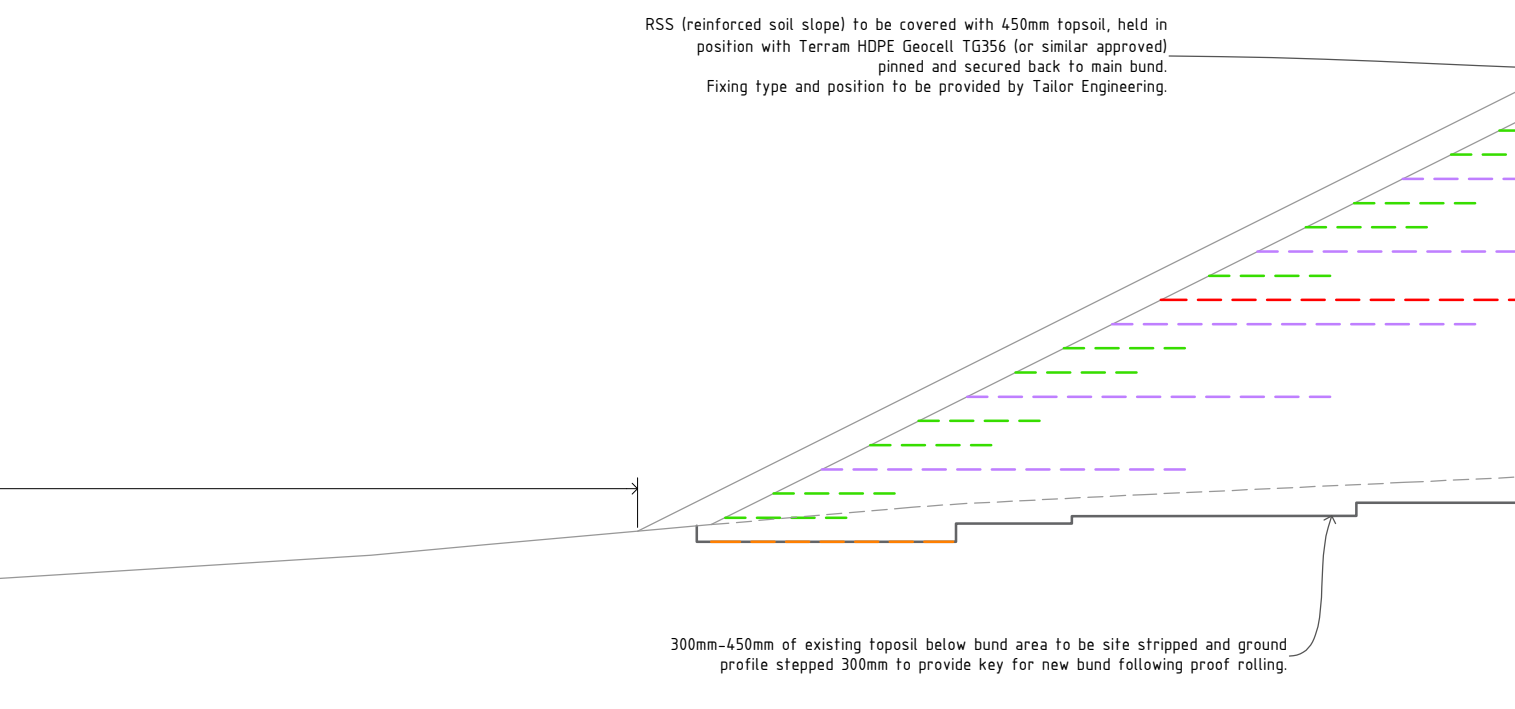
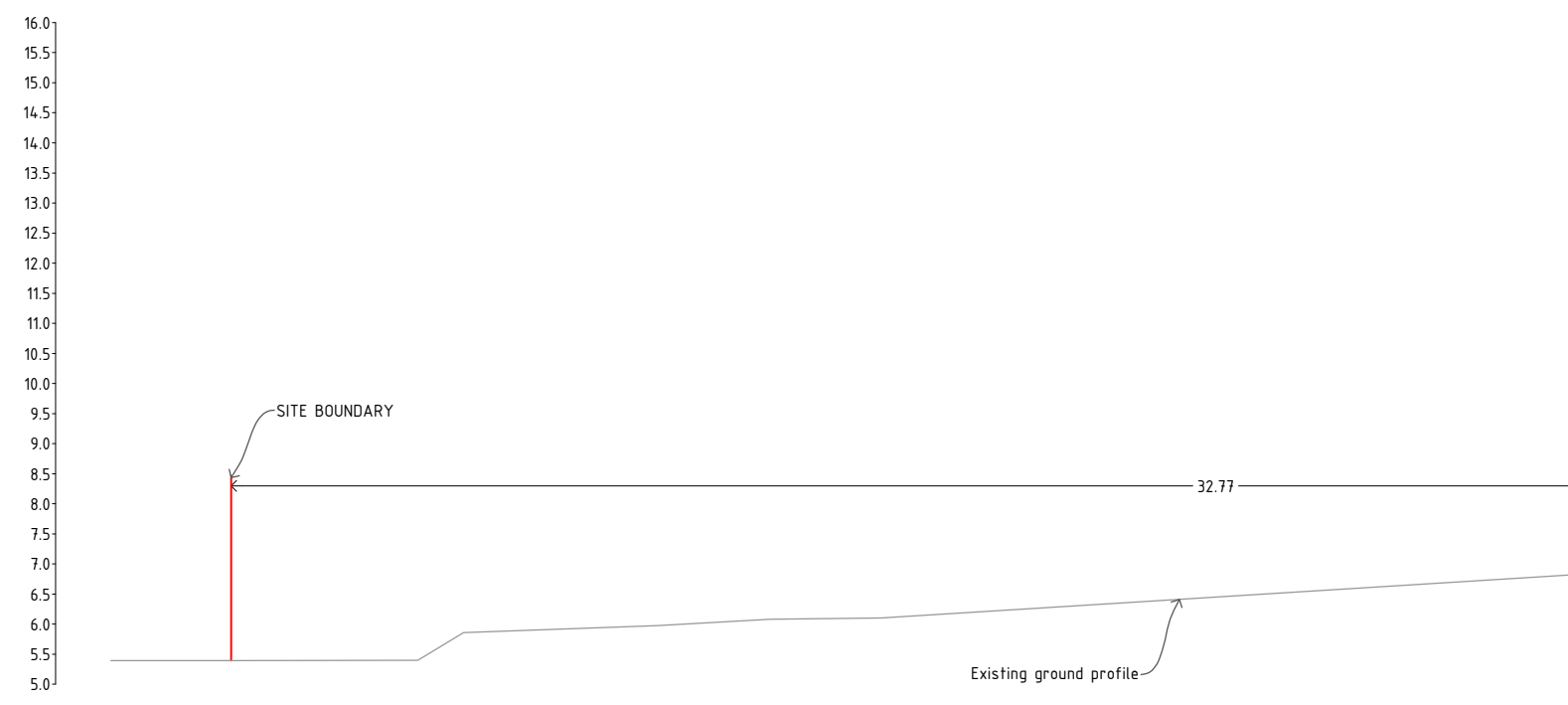
SECTION S4-4



SECTION S6-6



SECTION S7-7



LEGEND:

- FORMER GROUND PROFILE
- EXISTING GROUND PROFILE
- ORIGINAL GROUND LEVEL AT TOE OF WALL
- REINFORCEMENT 2m LONG
- REINFORCEMENT 4m LONG
- REINFORCEMENT 5m LONG
- REINFORCEMENT 6m LONG
- REINFORCEMENT 10m LONG
- CONTINUOUS REINFORCEMENT (BACK-TO-FRONT RSS)

FOR APPROVAL

0 FOR APPROVAL - INCLUDING 450mm TOP SOIL AND GEOCELL N. BRUSA 21/02/23
Rev. Issue / Revision: Checked: Date:

Specialist Element Designer:

Tailor
engineering
www.tailor-engineering.com

Project: HARTS FARM WAY, BROCKHAMPTON
WEST, HAVANT - RSS BUND

Our Client: Final Client:

Burrows
Graham

Clowes
DEVELOPMENTS

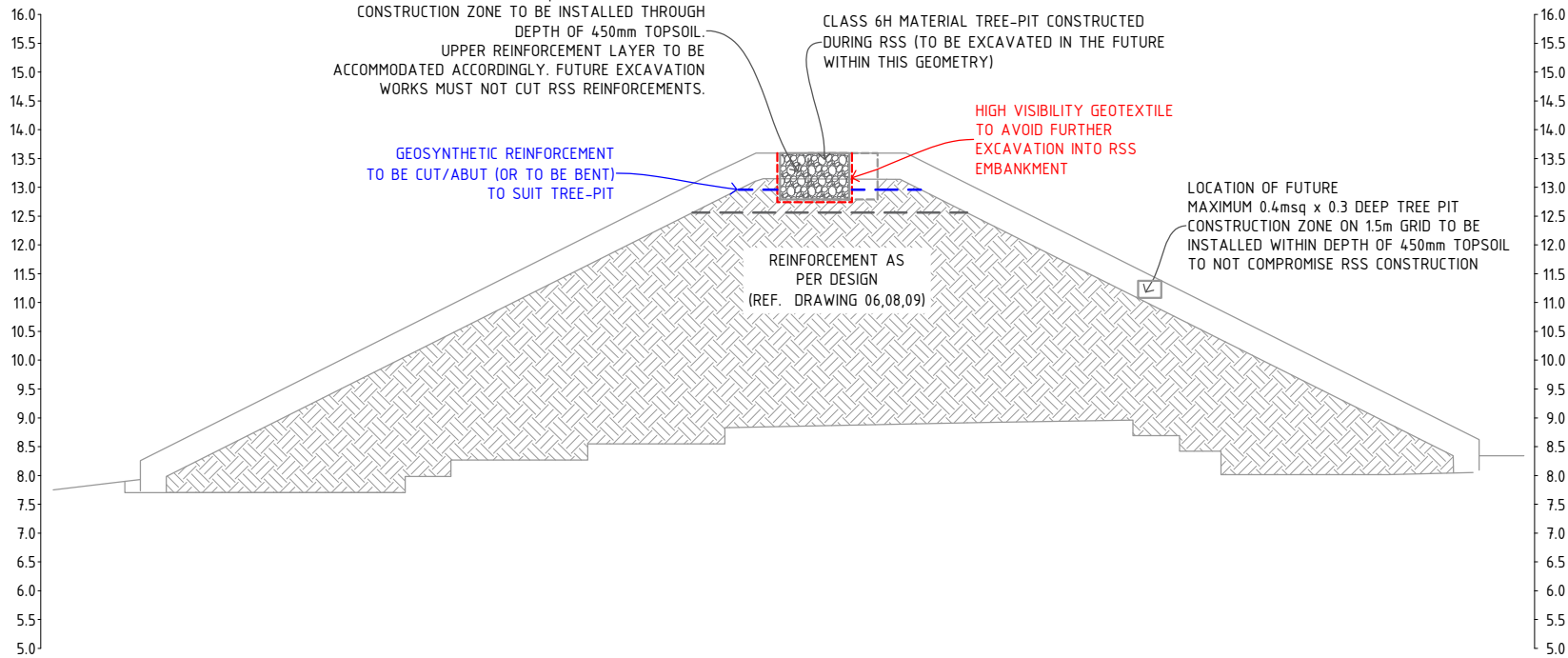
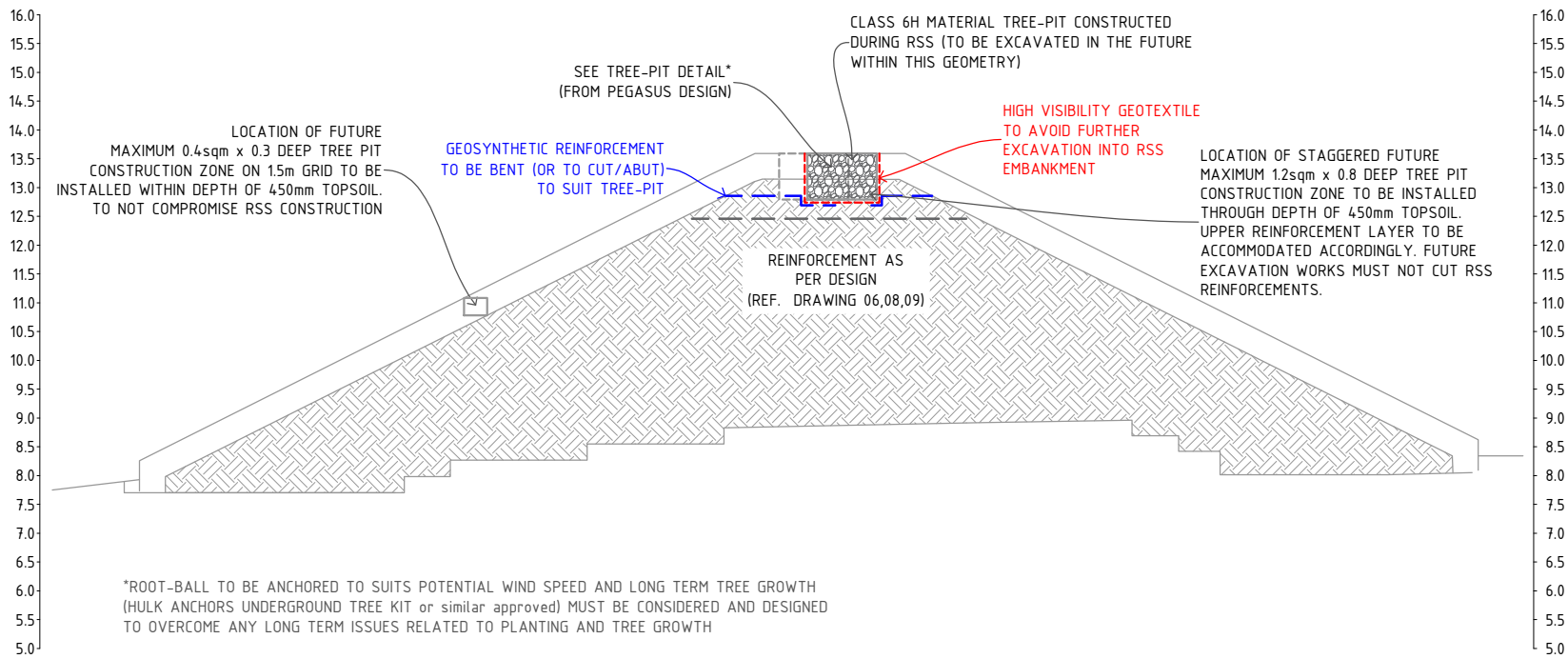
Drawing: TYPICAL SECTION - VIEW DRAWING

Designed: NBrusa Date: 21/02/23 Project No: UK-2309

Drawn: NBrusa Date: 21/02/23 Scale: As Shown at A1

Checked: NBrusa Date: 21/02/23

Drawing No: UK-2309-09-0-A Revision: 0

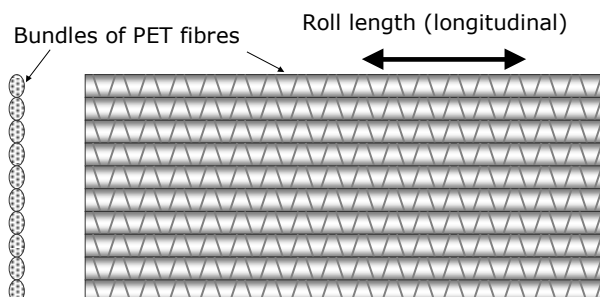


FOR APPROVAL			
FOR APPROVAL - INCLUDING 150mm TOP SOIL AND GEOTEXTILE		N. BRUSA 21/02/23	
DESIGNED / DRAWN		CHECKED / ISSUED	
Specialist Element Designer			
Tailor engineering www.tailor-engineering.com			
Project: HARTS FARM WAY, BROCKHAMPTON WEST, HAVANT - RSS BUND			
Our Client:		Final Client:	
Burrows Graham		Clowes DEVELOPMENTS	
Drawing: TYPICAL SECTION TREE-PIT DETAIL			
Designed: NBrusa	Date: 21/02/23	Project No: UK-2309	
Drawn: NBrusa	Date: 21/02/23	Scale: As Shown at A4	
Checked: NBrusa	Date: 21/02/23		
Drawing No: UK-2309-10-0-A		Revision: 0	

Basetex 200/50 Geotextile Product Specification

Basetex 200/50 geotextile is used for the reinforcement of soils in construction of structures such as embankments, fills supported by piles and fills placed over voids.

Basetex 200/50 is a high strength geotextile manufactured by the weft insertion process. It consists of bundles of high tenacity polyester fibres which have a high degree of straightness in the longitudinal direction, that is, in the principal direction of loading.



Basetex 200/50 Geotextile

Polymer (1)		PET
Roll width	m	4.4
Roll length	m	100
Unit weight	kg/m ²	0.48
Thickness	mm	2.0
Roll weight	kg	217
Quality control strength longitudinal		
QC strength T _{ult} (2)	kN/m	200.0
Approx strain at max.load	%	10.5
Quality control strength transverse		
QC strength T _{ult}	kN/m	50.0
Long term creep rupture strength ULS (3)		
P _c or T _{CR} for 20° C (4)	kN/m	127.0
Resistance to hydrolysis		
Molecular Weight (Mn) (5)		>25,000
Carboxyl End Group (CEG)		<30

- (1) PET denotes high tenacity polyester.
- (2) Determined as a minimum mean value in accordance with BS EN ISO 10319:2008.
- (3) Determined as a lower bound using standard extrapolation techniques to creep rupture data obtained following the test procedure in BS EN ISO 13431:1999 extended to 120 year design life using the Stepped Isochronous Method. All tests carried out on samples of the Basetex finished product.
- (4) In soil temperature.
- (5) Average Number Molecular Weight, determined in accordance with an appropriate standard, for example GRI GG8/ ASTM D4603
- (6) Carboxyl End Group determined in accordance with an appropriate standard, for example GRI GG7
- (7) **Basetex 200/50** is resistant to chemicals naturally found in soils, including aqueous solutions of salts, acids and alkalis (pH = 4.0 to 9) and is non-biodegradable.
- (8) **Basetex 200/50** is manufactured in accordance with a Quality Management System which complies with the requirements of BS EN ISO 9001:2008
- (9) All quoted dimensions and values are typical unless stated otherwise.

Determination of the suitability of any information or material for the use contemplated or the manner of use is the sole responsibility of the user.

Tensar is a registered trade mark

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Installation and Safe Handling Procedures for Tensar Basetex® Knitted Geotextile

This Installation Guideline provides information for the safe and efficient installation of Tensar Basetex® high strength geotextile. The advice results from many years of worldwide experience of installing Tensar Basetex. Where applicable, the Contractor shall ensure that the installation fully complies with local Regulations and should refer to the Designer's Risk Assessment and COSHH statements.

Safe Unloading & Storage Requirements

Tensar Basetex geotextile comes in standard roll sizes (4.4m x 100m) and standard grades varying from 200kN/m to 1200kN/m longitudinal QC, tensile strength. Non-standard strength rolls are also available for specific large requirements. Please consult Tensar International for information on such project specific rolls. Rolls normally arrive on site, either in a container (see Figure 1) or on a truck. The standard roll weights range from 217kg to 950kg, so it is imperative that the roll weight is evenly distributed during lifting operations. The general lifting arrangement for loading/unloading adopts a suitable rigid core pole or 'carpet pole' which is inserted through the hollow core of the roll (Figure 2). Appropriate carpet pole dimensions are indicated in Table 1. This pole is not supplied with the Basetex rolls and should be obtained by the Contractor separately. For handling on site and during installation a Lifting Beam Set comprising of a 2 leg chain sling, spreader beam, lifting bar and end clamps should be used. Tensar in the UK can provide a Lifting Beam Set on request.

Basetex grade	Standard Roll Size (m)	Typical roll weight (kg)	Interior Diameter of Core (mm)	Core length (mm)	Carpet Pole minimum length (mm) & maximum outside diameter (mm)
200/50	4.4 x 100	217	98	4400	4500 x (85)
300/50	4.4 x 100	290	98	4400	4500 x (85)
400/50	4.4 x 100	357	98	4400	4500 x (85)
600/50	4.4 x 100	505	98	4400	4500 x (85)
600/100	4.4 x 100	534	150	4400	4500 x (140)
800/50	4.4 x 100	677	150	4400	4500 x (140)
800/100	4.4 x 100	711	150	4400	4500 x (140)
1000/50	4.4 x 100	820	150	4400	4500 x (140)
1000/100	4.4 x 100	860	150	4400	4500 x (140)
1200/50	4.4 x 100	950	150	4400	4500 x (140)

Notes

(1) Roll weight indicated is for standard roll length but Basetex may be supplied with bespoke roll lengths. Bespoke weight can be estimated based on actual vs bespoke length

(2) Although the max diameter carpet pole is mentioned as 140mm, normally an 85mm diameter carpet pole can be used across the whole product range, this is provided the carpet pole can take the load.

Table 1 Tensar Basetex geotextile roll sizes and handling data



Figure 2 *Extracting rolls from container with forklift fitted with a 4m carpet pole*

Unloading

Rolls are normally unloaded from the container or truck using a steel carpet pole, fixed to a forklift truck, as shown on Figure 2. Due to the weight and flexibility of the rolls, it is not recommended to lift using straps around the end of the rolls or lift from the mid roll length (Figure 3). The use of straps is also a potential safety hazard and in addition, if the core is broken or distorted, proper installation and on-site handling of the Basetex rolls will be difficult.



Figure 3 *Incorrect method of lifting – must not be used*

Storage

Basetex rolls should be temporarily stored either on a timber platform or prepared ground, to keep the roll cores straight to facilitate later lifting (Figure 4). They should be stacked no more than 4 rolls high.



Figure 4 *Tensar Basetex rolls stacked on site (Max 4 rolls high)*

Handling & Installation on Site

When lifting and handling on site it is better to use a Lifting Beam Set. The complete lifting beam set includes a 2-leg chain sling, spreader beam, lifting bar and end clamps. The end clamps are used to centre the roll on the lifting bar and also to limit sideways movement of the roll during installation, they must be tightened onto the lifting bar before lifting. A typical Lifting Beam Set is shown in Figure 5.

The steel lifting bar which is inserted through the roll core must be used in conjunction with a suitable spreader beam. Both the lifting bar and spreader beam must be properly designed and fabricated to safely carry the loading. The beam supports the lifting chains at each end of the roll and spreads the load uniformly across the roll width. The spreader beam is usually slung from the bucket of an excavator which should be certified as suitable for lifting the appropriate grade and weight of Basetex roll. The lifting beam and any other lifting equipment should hold test certification of the maximum SWL (Safe working load). Tensar in the UK can provide a Lifting Beam Set on request.

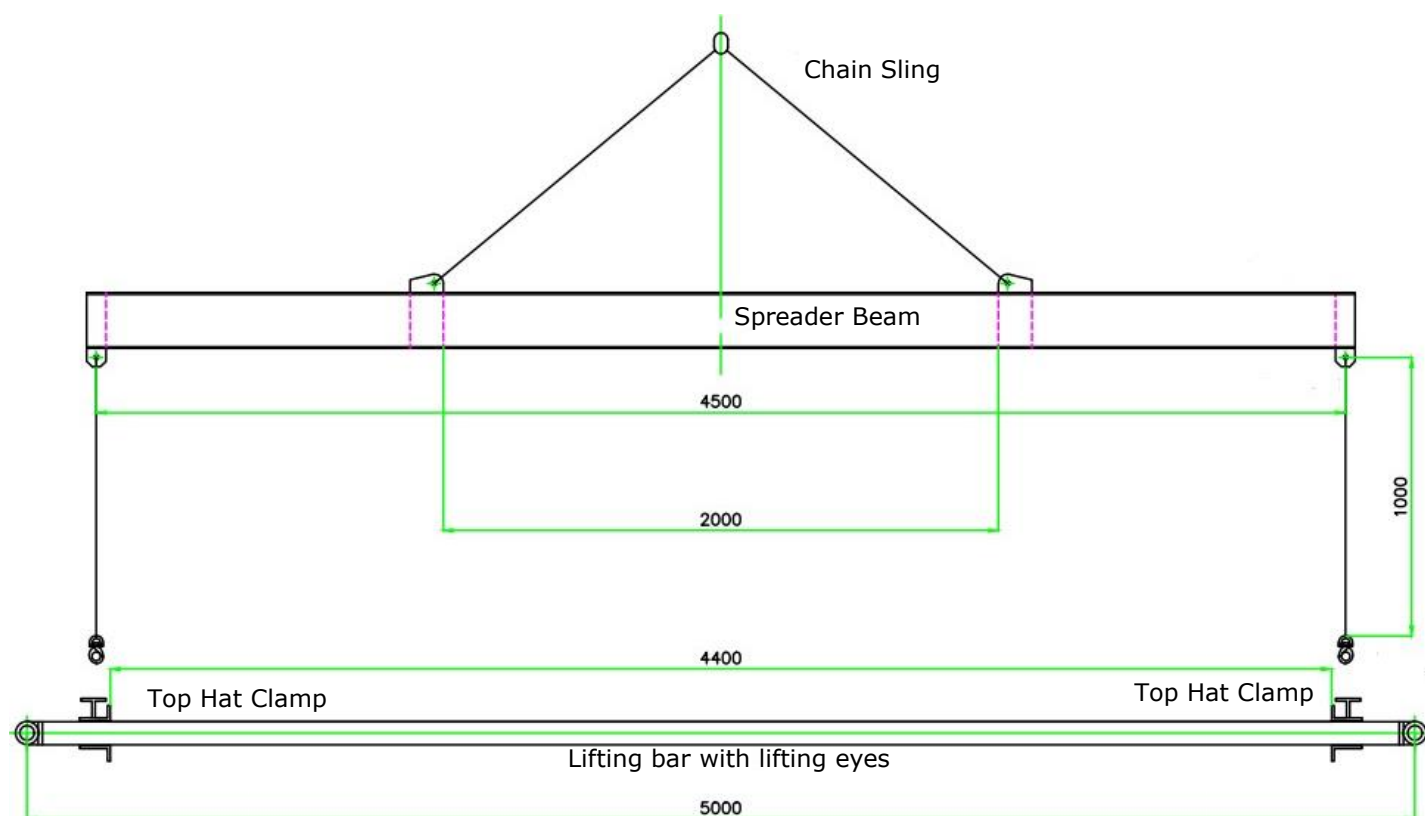


Figure 5 Lifting Beam Set. Spreader Beam, Lifting Bar and Clamps



Figure 6 *Lifting beam set for Basetex geotextile roll handling*

Cutting Basetex

The product can be cut using a sharp blade; however, the most efficient method is to use an electric hot knife. This method seals the cut ends of the fabric to prevent fraying during subsequent handling. Cutting by this method should take place outdoors or in a well-ventilated area. Tensar does not provide cutting equipment.

Subgrade Preparation

The existing subgrade surface must be free of major protrusions such as rocks, tree and bush stumps and construction debris. All local hollows and depressions should be filled with approved backfill and if conditions allow, the sub-grade should be levelled.

Tensar Basetex rolls should be taken to the installation area in the original roll wrapping. The wrapping should then be removed without damaging the Basetex. Most Basetex products are manufactured with greater strength in the longitudinal direction (i.e., at 90 degrees to the core). It is therefore critical that the rolls are oriented in the direction indicated by the contract drawings.

Installation of Basetex

Operatives should wear appropriate personal protective equipment including heavy duty gloves and eye protection. In strong sunlight the glare from the surface of Basetex products can be very intense, and consideration should be given to wearing suitable eye protection. Due to the roll weights, it is recommended when lifting rolls, that a Lifting Beam Set be used in conjunction with an excavator. Operatives should not attempt to manually lift the rolls for health and safety reasons. The spreader beam and any other lifting equipment should be certified for the maximum safe working load.

If the subgrade can be trafficked without excessive rutting, it is recommended that Basetex can be unrolled in front of a backward moving excavator with the lifting beam attached to the front bucket (Figure 7). If the subgrade is soft, the excavator can stand at the end of the run and the Basetex unrolled manually by pulling from the suspended core. Construction equipment should not directly traffic the Basetex to minimise any damage to the material.

The rolls should be laid flat on the prepared formation and pulled hand taut to remove any slackness, wrinkles or folding. The ends and edges of the Basetex should have sand or fill (Figure 7 and 8) placed at regular intervals to hold the Basetex in place during placement of backfill, especially during windy conditions.

Note - all lifting operations should be carried in accordance with the safety requirements and safety standards associated with the country to which the lifting activity takes places.



Jointing

Adjacent rolls should have a nominal side overlap of 500 mm (Figure 8). Strips should be continuous lengths or installed with the specified design overlap. A temporary **non-structural** longitudinal joint can be created by sewing. A full-strength structural connection through sewing is not possible. Advice on the most appropriate sewing methods should be obtained from suitably experienced suppliers of portable industrial sewing machines. This sewn joint is generally used as a construction expedient if the foundation is on swampy ground where laying the material may be difficult. The specified design overlap length should still be included within this sewn joint.

Figure 8 Nominal 500 mm side overlap between adjacent rolls of Basetex geotextile)

Placing Fill

Approved fill should be placed onto the Basetex (Figures 10 and 11) as soon as practical after the Basetex has been laid down. Truck loads of fill should be tipped into piles on top of placed fill and not tipped directly onto the Basetex. The fill piles should be spread by mechanical plant which causes the material to cascade onto the Basetex, such as an excavator bucket or dozer with an open bucket.

Fill should be spread in layers of not less than 150mm finished thickness directly on top of the Basetex to protect it from damage. Care should be taken to avoid damage to the Basetex. No traffic or site plant shall be permitted to travel over the Basetex prior to placing fill on it.



Figure 9 Laying Basetex geotextile using a Lifting Beam Set



General Manual Handling Information

As discussed above, all manual handling should be done in accordance with the safety requirements and safety standards associated with the country. More information specific to the handling of rolls can be found on the UK HSE (Health & Safety Executive) website in the "Manual handling in the textiles industry" manual.

<https://www.hse.gov.uk/textiles/textiles-and-manual-handling.htm>

Contact Tensar International Limited if more specific advice is required.

This document was formerly published with the reference: CS_BTinstall

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