



November 21, 2022

Reference No. 20-1014B

Pearl Builders
25 Production Road
Brampton, Ontario
L6T 4N8

Attn: Firas Al-Sabek, Senior Project Manager

Re: Channel Slope Stability Analysis
664, 673 & 692 Essa Road and 320 Mapleview Drive West
Barrie, Ontario

GEI Consultants (GEI) was retained by Pearl Builders to assess the stability of the proposed channel slopes to be located within the re-aligned creek within the development, generally flowing from east to west through the middle of the site.

It is understood that the proposed channel will generally be 35 metres wide and the total height of the channel to retain flood flows will generally be 4.5 metres. The side slopes of the channel are proposed to slope at 2.75 horizontal to 1 vertical max. This letter report checks the slope stability of the proposed channel, and also checks slope stability for the channel if the side slope inclinations are steepened to increase the amount of developable space on the tableland. This report focuses on global stability only and does not comment on setbacks required for planning purposes (e.g. setbacks from the top of slope, long term stable top of slope position, etc.).

GEI previously carried out a geotechnical investigation and report at the site, "*Geotechnical Report, Proposed Residential and Commercial Development, 664, 674 & 692 Essa Road & 320 Mapleview Drive West, Barrie, Ontario,*" (Ref. No. 20-1014A, dated November 21, 2022). GEI advanced fifteen (15) boreholes across the site as part of the investigation. Boreholes 6, 8 and 9 to 11 were advanced near the channel location and were used to determine the subsurface stratigraphy for the analysis. The borehole logs and a borehole location plan are enclosed as Appendix A.

1 Slope Stability Analysis and Discussion

1.1 Soil Strength Design Parameters

Soil strength parameters for the soil strata encountered on site were estimated based on published information, empirical correlations for cohesionless soils relating SPT "N" values, soil type, unit weight and effective friction angle, and our experience on other slope evaluation projects. The values for use in the slope stability models at this site are as follows:

Stratum	γ - Bulk Unit Weight (kN/m ³)	ϕ - Friction Angle (degrees)	c' - Effective Cohesion (kPa)
Existing Earth Fill	19.0	30	0
Backfill			
Loose Native Soil			
Compact to Dense Native Soil	20.0	36	0

The estimated soil strength parameters are also indicated on the results of the slope stability analyses enclosed as Appendices C and D. The soil strength parameters are based on effective stress analysis for long-term slope stability, and total stress analysis for rapid drawdown (short-term condition). It is considered that these soil properties are conservative, and the site soils are stronger. Furthermore, other effects which can increase the stability of the slope, such as negative pore water pressures within unsaturated soils (matric suction), and root mat reinforcement, have not been modelled.

1.2 Channel Geometry and Subsurface Conditions

It is understood that the proposed channel will be 35 metres wide, 4.5 metres in height, and will have 2.75 horizontal to 1 vertical side slopes. It is understood that the 100-year flood level will reach approximately 1.83 metres below the crest of the channel. The tableland beyond the channel will be developed with buildings, LID measures, multi-use walkways, etc. and pedestrian bridges may cross the channel. Grading plans were not provided to GEI but limited grade changes are expected, so the ground surface elevation was assumed to be Elev. 305 metres based on the geodetic elevations of the surveyed borehole ground surface locations.

Boreholes 6, 8 and 9 to 11 were advanced near the channel location and were used to determine the subsurface stratigraphy for the analysis. The average stratigraphy expected to be encountered along the channel consists of an upper 0.8-metre-thick zone of earth fill, underlain by approximately 1.5 metres of loose cohesionless native soils typically consisting of silty sand glacial till, to sand, to silty sand. The loose soils are typically underlain by compact to dense cohesionless soils consisting of silty sand glacial till to gravelly sand, to sand. The dense soils extended beyond the vertical depth of investigation. The borehole logs and a borehole location plan are enclosed as Appendix A.

Monitoring wells installed near the channel encountered groundwater levels at depths ranging from approximately 0.7 to 1.4 metres below grade. A water level of 0.7 metres below grade was used in the analysis and was modelled to generally follow the topography of the channel and daylight near the bottom of the channel. Rapid drawdown was modelled assuming that the water level in the channel dropped from the 100-year flood level to an empty condition.

1.3 Slope Stability Analysis

Stability analyses were carried out using the commercially available computer program *Slide2* (Version 9.005) by RocScience Inc. The slope stability analyses were based on a force and moment limit equilibrium analysis using the Spencer method. This method of analysis calculates the minimum factor of safety (resisting versus driving forces) for numerous circular surfaces. The circular surfaces are centred on points on a grid with a set number of radius distances to be calculated for each centre. A



factor of safety of 1.0 indicates the slope is at a point of pending failure since the resisting forces are equal to the driving forces.

It is noted that MNR guidelines allow a factor of safety between 1.3 to 1.5 for active (e.g. residential and commercial) land use, which is applicable to this site. The minimum factors of safety recommended for design by the MNR are summarized below.

Land Uses	Design Minimum Factor of Safety
Passive: no buildings near slope; farm field, bush, forest, timberland, woods, wasteland, badlands, tundra.	1.10
Light: no habitable structures near slope; recreational parks, golf courses, buried small utilities, tile beds, barns, garages, swimming pools, sheds, satellite dishes, dog houses.	1.20 to 1.30
Active: habitable or occupied structures near slope; residential, commercial, and industrial buildings, retaining walls, storage/warehousing of non-hazardous substances.	1.30 to 1.50
Infrastructure and Public Use: public use structures or buildings (i.e. hospitals, schools, stadiums), cemeteries, bridges, high voltage power transmission lines, towers, storage/warehousing of hazardous materials, waste management areas.	1.40 to 1.50

The stability analyses were carried out for the channel for the range of side slope inclinations, below:

- 3.0H : 1V
- 2.75H : 1V
- 2.5H : 1V
- 2.0H : 1V

Each channel side slope was modelled with a subset of scenarios and target factors of safety (FOS). An FOS of 1.5 was selected for normal conditions (the upper range from the MNR table), an FOS of 1.3 was selected for 100-year flood conditions (the lower range from the MNR table), and an FOS of 1.0 was selected for rapid drawdown from a 100-year flood level (very low probability of occurrence) to ensure that the channel will remain marginally stable under the worst-case scenario that will be present within 100 years.

It must be noted that the global stability analysis in this report does not account for long term toe erosion of the channel, which could over-steepen and undermine the channel slope over time. It is assumed that the civil engineer will be designing the channel in a way that prevents long term erosion and scour of the channel side slopes from flowing water (e.g. rip rap or concrete lining, etc.).

The results of the stability analyses are summarized in the table below and the *Slide2* outputs are enclosed as Appendix C.

Channel Side Slope Inclination (H:V)	Scenario	Target Factor of Safety	Calculated Factor of Safety	Meets Target?
3.0 : 1	Normal Conditions	1.5	2.0	Yes
	100 Year Flood Level	1.3	1.7	Yes



Channel Side Slope Inclination (H:V)	Scenario	Target Factor of Safety	Calculated Factor of Safety	Meets Target?
	Rapid Drawdown from 100 Year Flood Level	1.0	1.1	Yes
2.75 : 1	Normal Conditions	1.5	1.9	Yes
	100 Year Flood Level	1.3	1.6	Yes
	Rapid Drawdown from 100 Year Flood Level	1.0	1.0	Yes
2.5 : 1	Normal Conditions	1.5	1.8	Yes
	100 Year Flood Level	1.3	1.5	Yes
	Rapid Drawdown from 100 Year Flood Level	1.0	0.9	No
2.0 : 1	Normal Conditions	1.5	1.5	Yes
	100 Year Flood Level	1.3	1.3	Yes
	Rapid Drawdown from 100 Year Flood Level	1.0	0.7	No

Channel side slopes as steep as 2.75 horizontal to 1 vertical as currently proposed for the site meets the target factors of safety (FOS) for normal conditions, 100-year flood conditions, and rapid drawdown from the 100-year flood level. Side slopes steeper than 2.75 horizontal to 1 vertical meet the target FOS for normal and flooded conditions, but do not meet the target FOS during rapid drawdown.

1.4 Discussion on Slope Stabilization Options

If steeper than 2.75 horizontal to 1 vertical channel side slopes are required to increase tableland area, there are engineered options available that can be designed and installed at the site to meet the target factors of safety. These options would require detailed design prior to construction.

For example, a reinforced soil slope (RSS) structure could be installed on site to increase the stability of a steeper channel slope. An RSS is a form of mechanically stabilized earth that uses planer reinforcement (usually multiple layers of geogrid) within an engineered soil backfill area to increase the stability of a slope compared to an unreinforced slope of the same inclination. The geogrid reinforcement may or may not be connected to facing material, depending on the final slope inclination. There are a variety of facing materials available that can provide aesthetic or natural appeal, such as welded wire mesh filled with gabion stones or soil, soil-filled bags, geoweb, geogrid wrappings, etc. and other proprietary products. Many of the facing elements can be vegetated after construction to create natural habitat and to help reduce surficial erosion of the slope face. Facing elements can be selected that provide increased scour and erosion protection from flowing water within the channel, in addition to other channel lining considerations (per the civil engineer). Cost savings and efficiency can be achieved by re-using existing soil at the site instead of importing high quality granular material, i.e. the existing cohesionless soils along the channel are excavated and then can be re-used as the engineered backfill with the geogrid reinforcing layers.



GEI carried out preliminary slope stability analysis for a 2 horizontal to 1 vertical channel slope that includes geogrid reinforcement to determine the feasibility of using an RSS structure at the site to increase tableland space. The geogrid was modelled to consist of Tensar UX1100 uniaxial geogrid with a horizontal length of 4 metres from the slope face, 0.4 metre vertical spacing, and extended down most of the channel face. It was assumed that the existing cohesionless soils would be sub-excavated and re-used as the engineered backfill material. Preliminary analysis shows that an RSS structure with 2H : 1V side slopes can be designed to meet the target factors of safety. The results from *Slide2* are enclosed as Appendix D and are summarized below.

Channel Side Slope Inclination (H:V)	Scenario	Target Factor of Safety	Calculated Factor of Safety	Meets Target?
2.0 : 1 with RSS	RSS – Normal Conditions	1.5	1.8	Yes
	RSS – 100 Year Flood Level	1.3	1.7	Yes
	RSS – Rapid Drawdown from 100 Year Flood Level	1.0	1.1	Yes

Other more robust stabilization options are also available such as armour stone, poured concrete or segmental block retaining walls that can provide enhanced scour and erosion protection while allowing for near-vertical inclinations along the channel. For the anticipated height of the walls, reinforcing elements will likely be required such as geogrid or earth anchors.



Closure

We trust this information is sufficient for your present purposes. Should you have any questions concerning the above, or can be of any further assistance, please do not hesitate to contact the undersigned.

Yours Truly,

GEI Consultants

Prepared By:



Russell Wiginton, P.Eng.
Senior Geotechnical Engineer

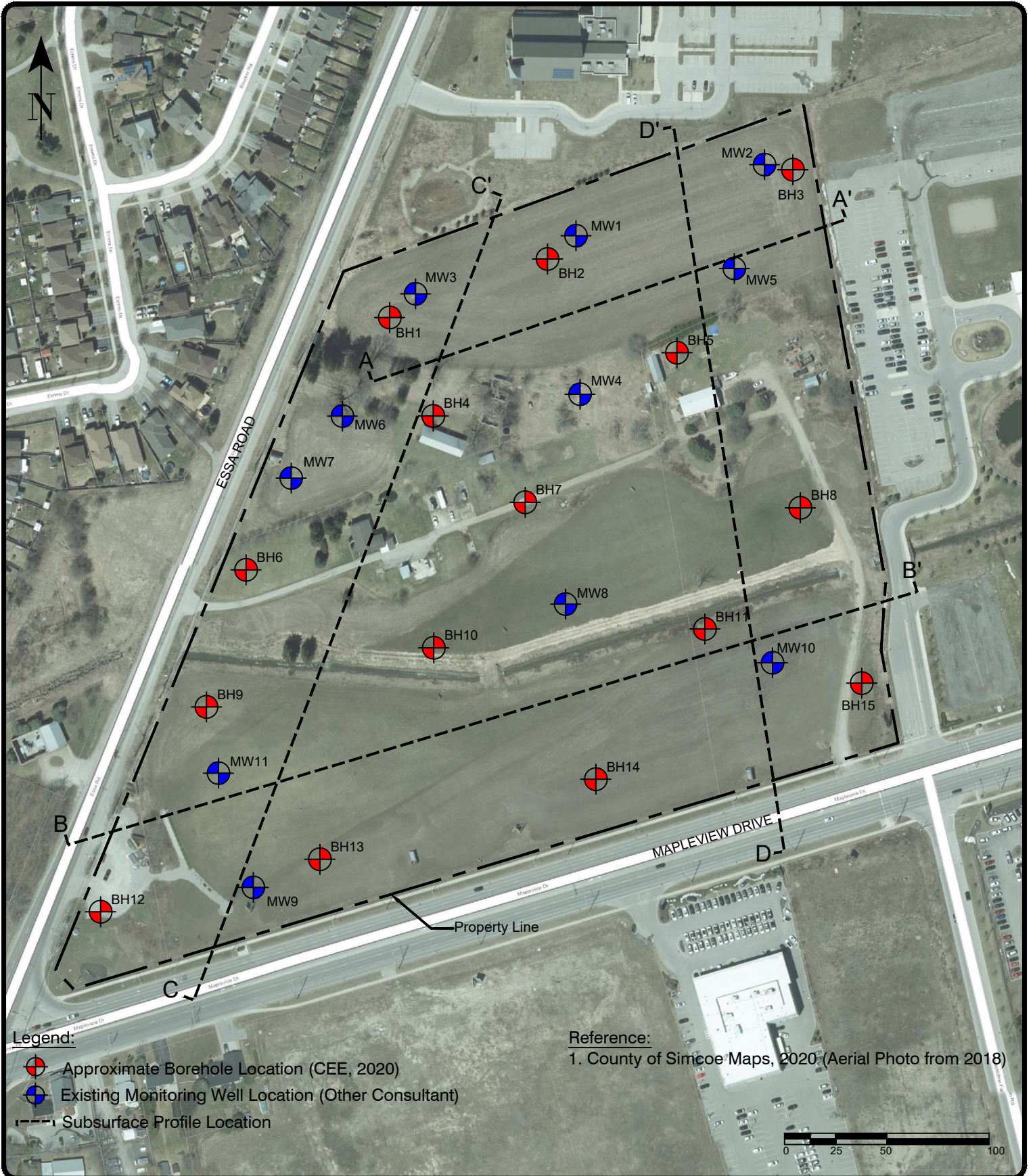
Reviewed By:



Alexander Winkelmann, P.Eng.
Geotechnical and Earth Sciences Manager

Appendix A –
BOREHOLE LOGS AND BOREHOLE LOCATION PLAN





Legend:

- Approximate Borehole Location (CEE, 2020)
- Existing Monitoring Well Location (Other Consultant)
- Subsurface Profile Location

Reference:

1. County of Simcoe Maps, 2020 (Aerial Photo from 2018)



647 Welham Rd, Unit 14, Barrie, ON, L4N 0B7
P: (705) 719-7994

Project:

664, 647 & 692 Essa Rd. & 320 Maplevue Dr., Barrie

Title:

BOREHOLE LOCATION PLAN

Approved by:

A.W.

Date:

March 2020

Project No.:

20-1014A

Drawn by:

B.H.

Scale:

1 : 2,500

Figure No.:

2

RECORD OF BOREHOLE No. 9



Project Number: 20-1014A
 Project Client: PetromaxX Construction
 Project Name: 664, 674 & 692 Essa Rd and 320 Mapleview
 Project Location: Barrie, Ontario
 Drilling Location: See Attached Drawing

Drilling Method: Solid Stem Drilling Machine: Track Mount
 Logged By: BH Northing: 4909361 Date Started: 2020-03-05
 Reviewed By: AW Easting: 602576 Date Completed: 2020-03-05

LITHOLOGY PROFILE		SOIL SAMPLING				DEPTH (m)	ELEVATION (m)	FIELD TESTING				LAB TESTING				Instrumentation Installation	COMMENTS & GRAIN SIZE DISTRIBUTION (%)			
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value			Shear Strength Testing (kPa)				Atterberg Limits					GR	SA	SI	CL
8.2	297.2					8														

CENTRAL EARTH ENGINEERING
 647 Welham Road, Unit 14
 Barrie, Ontario L4N 0B8
 T : (705) 719-7994
 E : info.com
 W : centralearth.com

Groundwater depth encountered on completion of drilling: **1.8m**
 Cave depth after auger removal: **2.1m**
 Groundwater depth observed on **Mar. 5/20** at a depth of: **1.79m**
 Observed on **Apr. 1/20** at a depth of: **1.01m**

Borehole details presented do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified geotechnical engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Boring Log'.

RECORD OF BOREHOLE No. 10



Project Number: 20-1014A
 Project Client: PetromaxX Construction
 Project Name: 664, 674 & 692 Essa Rd and 320 Mapleview
 Project Location: Barrie, Ontario
 Drilling Location: See Attached Drawing

Drilling Method: Solid Stem Drilling Machine: Track Mount
 Logged By: BH Northing: 4909395 Date Started: 2020-03-04
 Reviewed By: AW Easting: 602683 Date Completed: 2020-03-04

Lithology Plot	LITHOLOGY PROFILE		SOIL SAMPLING				DEPTH (m)	ELEVATION (m)	FIELD TESTING				LAB TESTING				Instrumentation Installation	COMMENTS & GRAIN SIZE DISTRIBUTION (%)			
	DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT "N" Value			Shear Strength Testing (kPa)				Atterberg Limits					GR	SA	SI	CL
	Geodetic 305.04m								Shear Strength Testing (kPa) X Other Test + Pocket Penetrometer ▲ Field Vane (Intact) △ Field Vane (Remolded) 40 80 120 160 Penetration Testing ○ SPT ● DCPT 10 20 30 40				Lab Testing △ Combustible Organic Vapour (ppm) ▲ Combustible Organic Vapour (%LEL) * Total Organic Vapour (ppm) 100 200 300 400 Atterberg Limits PL Water Content (%) LL 10 20 30 40								
	Topsoil = 360mm						0	305													
	FILL: Silty Sand, Trace Clay, Trace Gravel, Loose, Brown, Moist		SS	1	100	7	0.4	304.7	7					23							
	SILTY SAND GLACIAL TILL, Some Clay, Trace Gravel, Very Loose, Brown, Moist		SS	2	100	3	0.8	304.3	3					19							
	--- Loose, Moist to Wet ---		SS	3	100	7			7					14							
	SILT & SAND GLACIAL TILL, Some Clay, Trace Gravel, Compact, Grey, Moist		SS	4	100	26	2.3	302.8	26					9							
	GRAVELLY SAND, Some Silt, Compact, Brownish Grey, Wet		SS	5	100	18	3.1	302.0	18					14							
	--- Grey ---		SS	6A										7							
	SILT & CLAY, Trace Sand, Frequeny Silt Partings, Hard, Grey, Moist		SS	6B	100	39	4.8	300.2	39					22							
	SILTY SAND, Dense, Grey, Wet		SS	7	100	48	6.1	298.9	48					19							
	End of BH @ 6.6m						6.6	298.5													

CENTRAL EARTH ENGINEERING
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Groundwater depth encountered on completion of drilling: **4.9m**

Cave depth after auger removal: **4.9m**

Borehole details presented do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified geotechnical engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Boring Log'.

Scale: **1 : 50**
 Page: **1 of 1**

RECORD OF BOREHOLE No. 11



Project Number: 20-1014A
 Project Client: PetromaxX Construction
 Project Name: 664, 674 & 692 Essa Rd and 320 Mapleview
 Project Location: Barrie, Ontario
 Drilling Location: See Attached Drawing

Drilling Method: Solid Stem Drilling Machine: Track Mount
 Logged By: BH Northing: 4909403 Date Started: 2020-03-04
 Reviewed By: AW Easting: 602804 Date Completed: 2020-03-04

LITHOLOGY PROFILE		SOIL SAMPLING				DEPTH (m)	ELEVATION (m)	FIELD TESTING		LAB TESTING		Instrumentation Installation	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value			Shear Strength Testing (kPa)	Penetration Testing	Atterberg Limits	Water Content (%)		
Geodetic	305.31m												
0.2	Topsoil = 180mm					305.1							
	FILL: Sandy Silt, Some Clay to Clayey, Trace Gravel, Trace Silty Sand Nodules, Loose, Brown, Moist	SS	1	100	8								
0.8						304.6							
	SILTY SAND GLACIAL TILL, Some Clay, Trace Gravel, Compact, Brown, Moist to Wet	SS	2	100	11								
	--- Dense ---												
		SS	3	100	36								
2.0						303.3							
	SAND & SILT GLACIAL TILL, Some Clay, Trace Gravel, Hard, Brownish Grey, Moist to Wet												
2.5						302.8							
	GRAVELLY SAND, Some Silt to Silty, Dense, Brownish Grey, Wet	SS	4A	100	35								
			4B										
	--- Grey ---												
		SS	5	100	38								
4.6						300.7							
	SAND, Trace Silt, Trace Gravel, Dense to Compact, Brownish Grey, Wet	SS	6	89	49								
6.3						299.1							
	--- Some Silt to Silty ---	SS	7	33	28								
	End of BH @ 6.3m												
	Monitoring Well Extends Past End of Sampled Borehole Depth												
7.2						298.1							

CENTRAL EARTH ENGINEERING
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Groundwater depth encountered on completion of drilling: **2.1m**

Cave depth after auger removal: **3.4m**

Groundwater depth observed on **Mar. 5/20** at a depth of: **1.47m**

Observed on **Apr. 1/20** at a depth of: **0.68m**

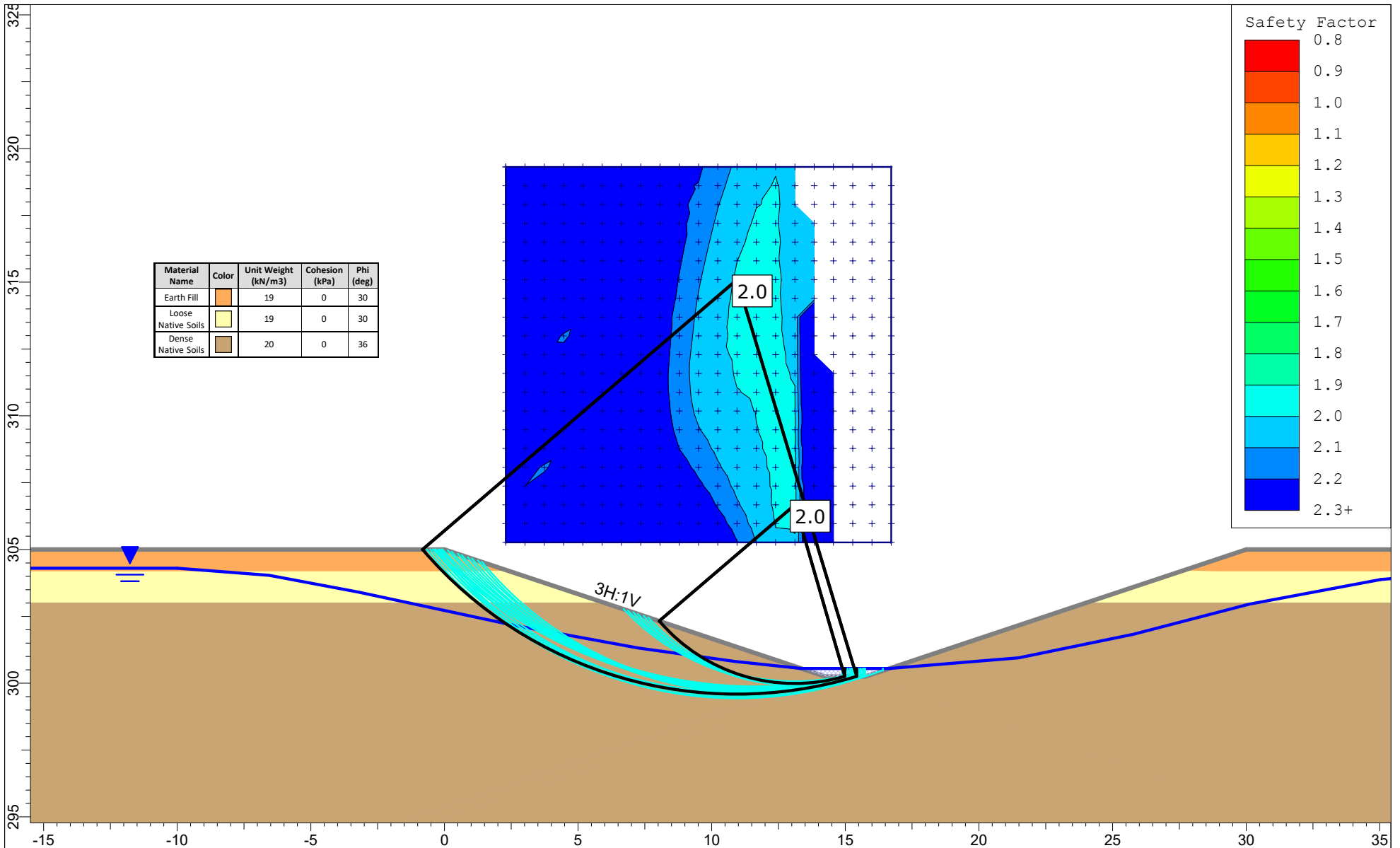
Borehole details presented do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified geotechnical engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Boring Log'.

Scale: **1 : 50**

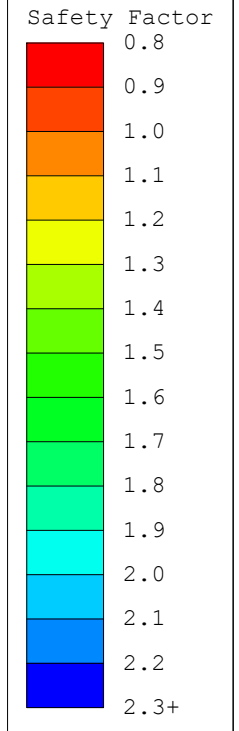
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Appendix B –
SLOPE STABILITY ANALYSIS – VARIOUS CHANNEL SIDE SLOPES

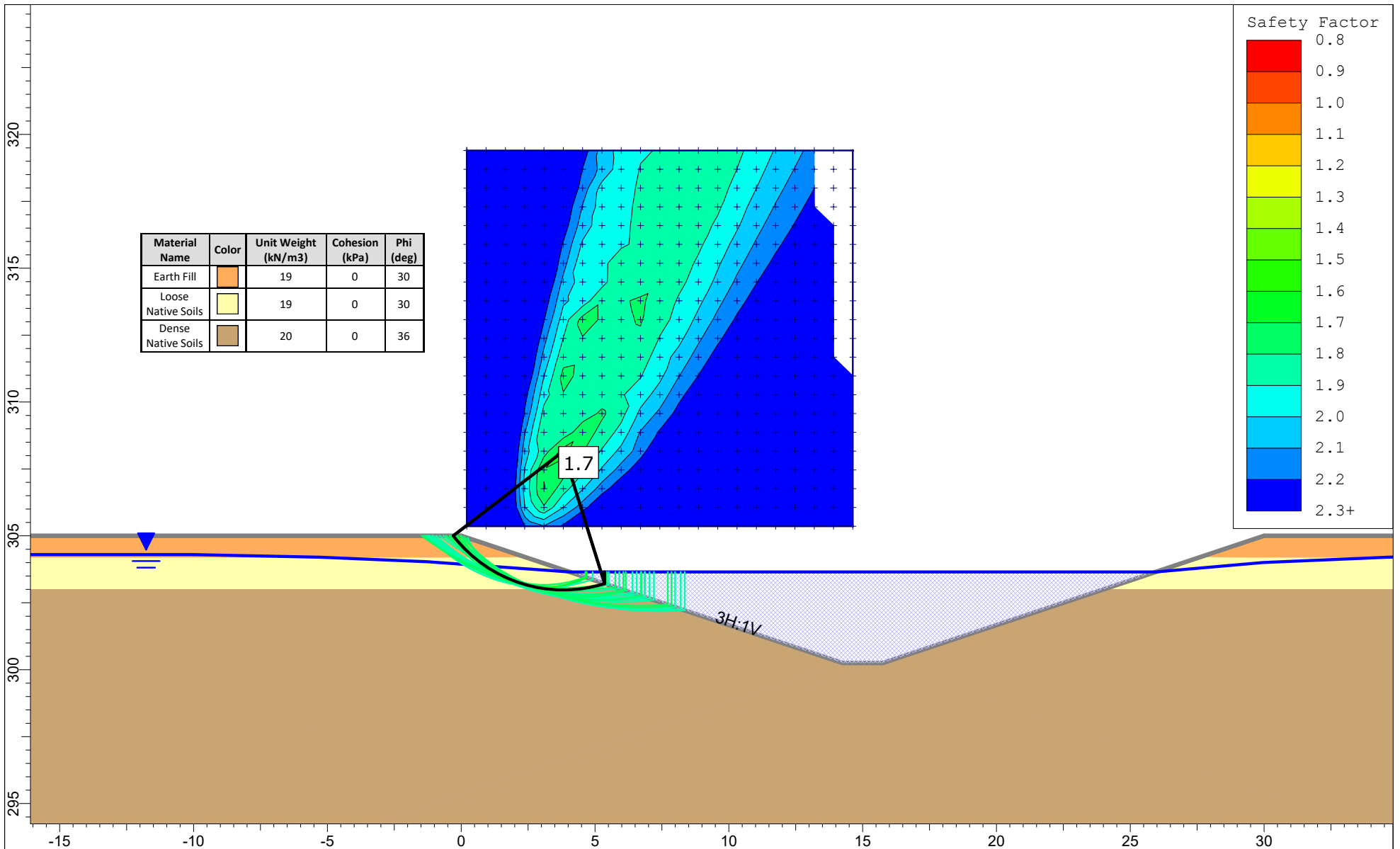





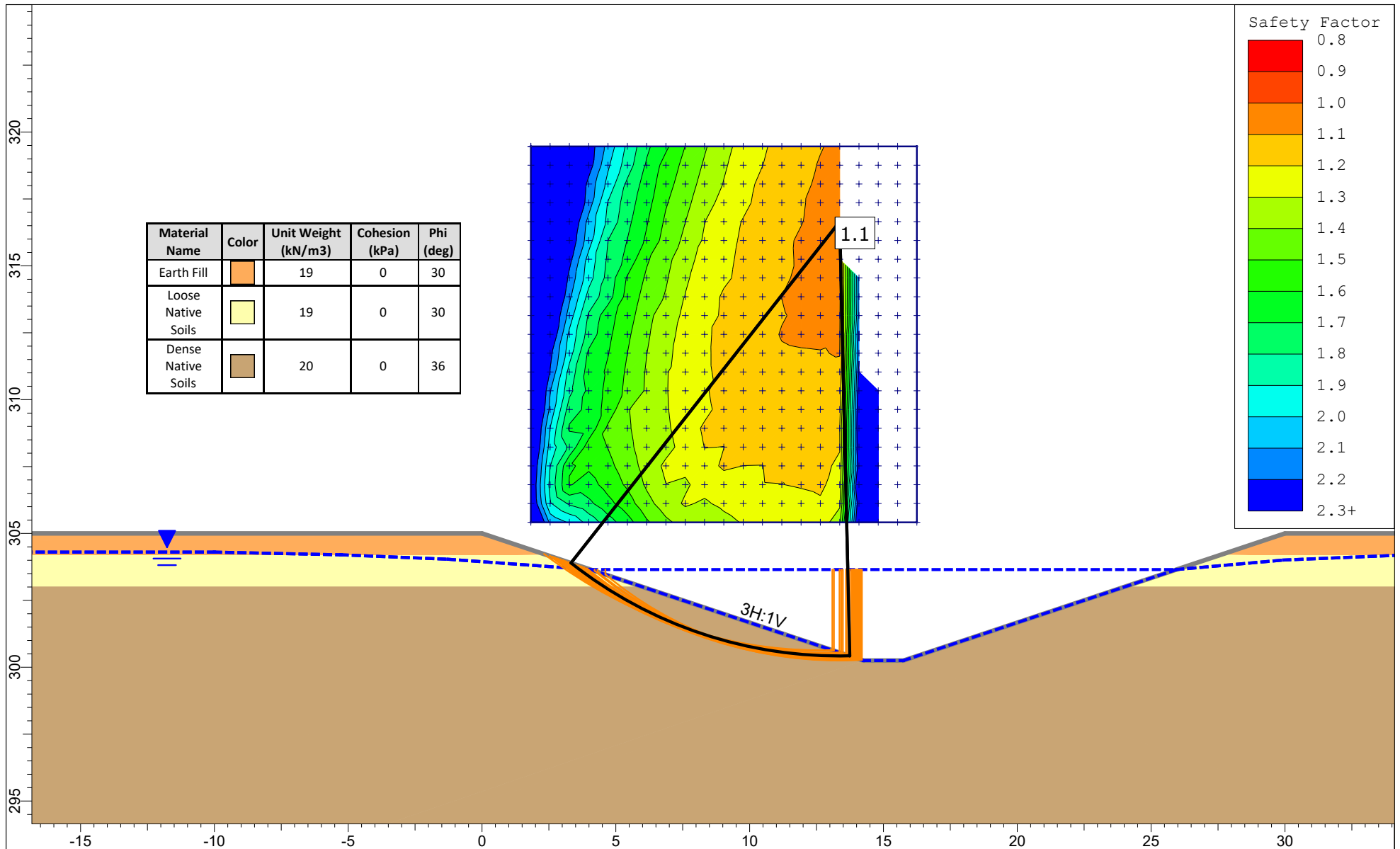
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Earth Fill		19	0	30
Loose Native Soils		19	0	30
Dense Native Soils		20	0	36




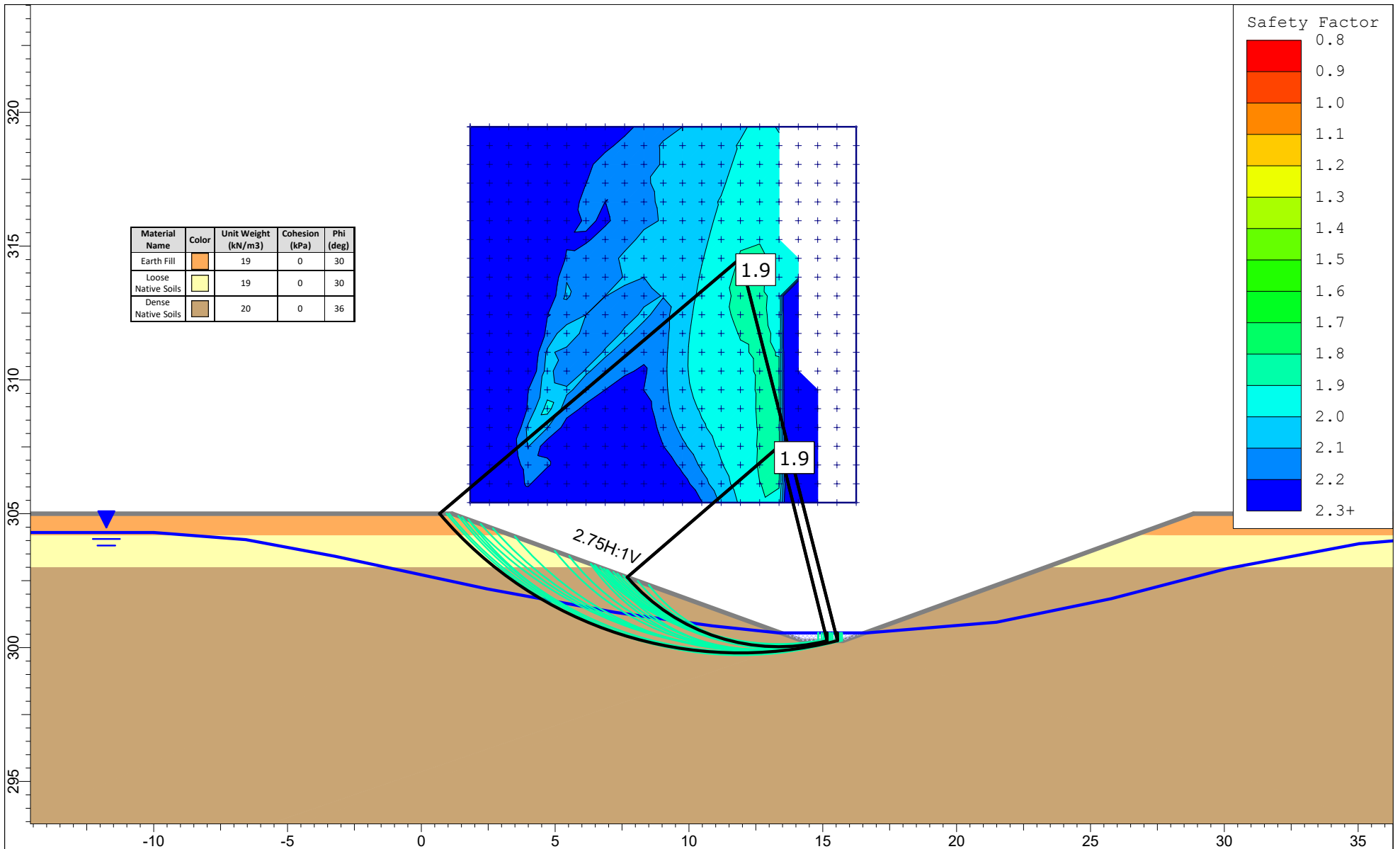
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	<i>Analysis Description</i> Normal Conditions, 3H:1V Side Slopes		
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	<i>Date</i> 2020-07-27	<i>File Name</i> Mapleview Essa Channel Stability.slmd	



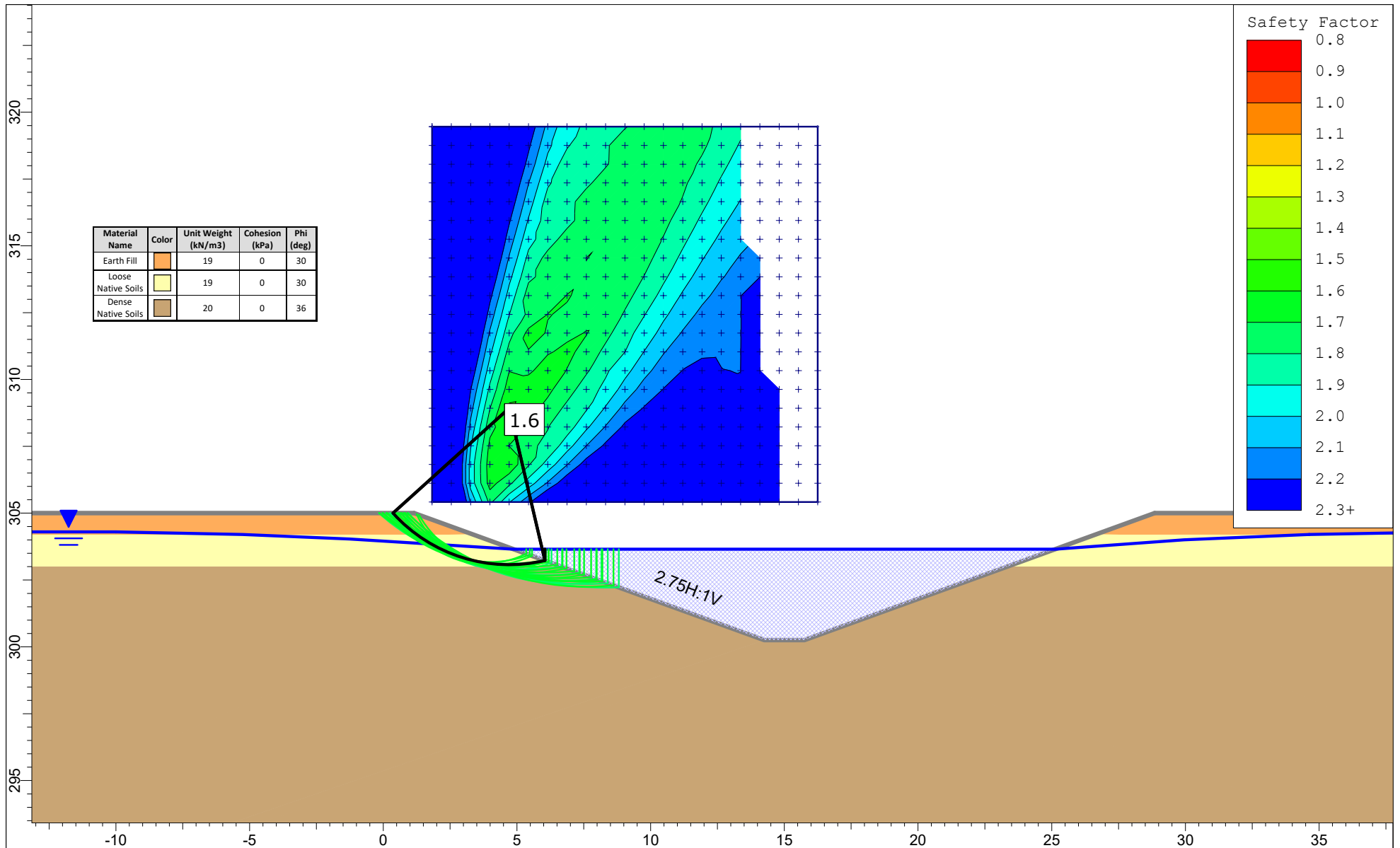
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	<i>Analysis Description</i> 100 Year Flood, 3H:1V Side Slopes		
	<i>Drawn By</i> RW	<i>Scale</i> 1:200	<i>Company</i>
	<i>Date</i> 2020-07-27	<i>File Name</i> Mapleview Essa Channel Stability.slmd	




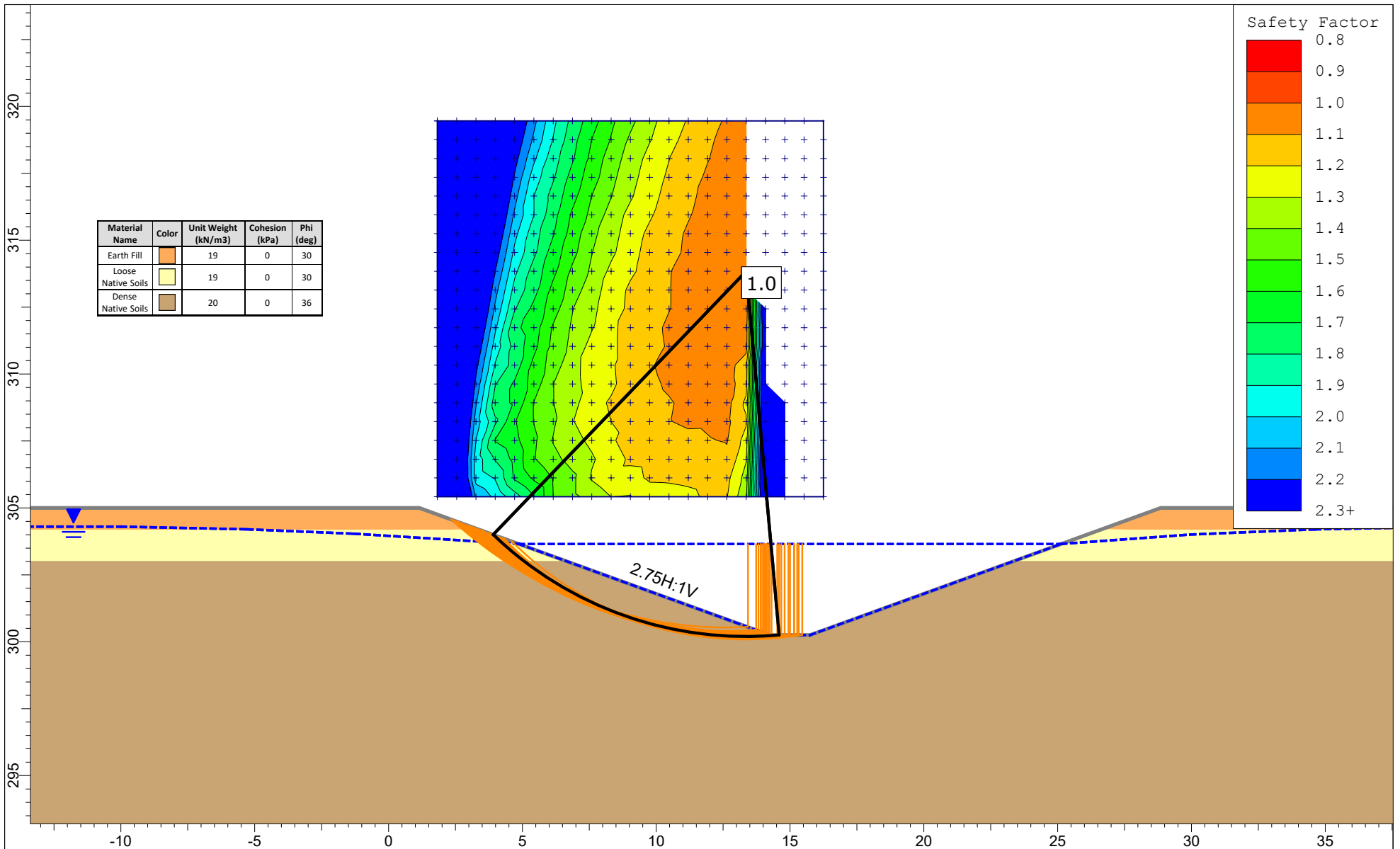
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	<i>Analysis Description</i> Rapid Drawdown from 100 Year Flood, 3H:1V Side Slopes		
	<i>Drawn By</i> RW	<i>Scale</i> 1:200	<i>Company</i>
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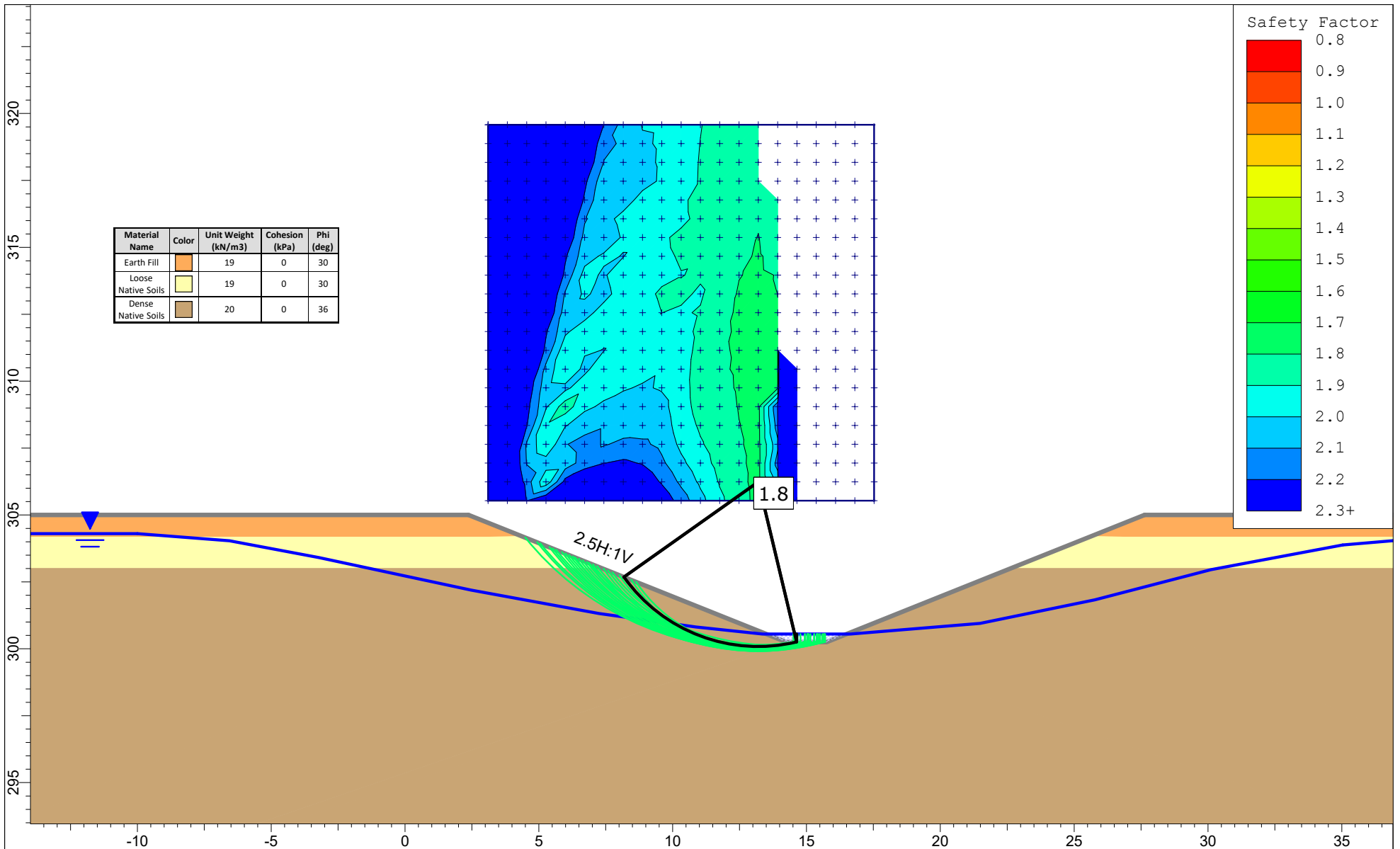
<i>Project</i>			
20-1014B 664, 674 & 692 Essa Road & 320 Maplevew Drive West, Barrie			
<i>Analysis Description</i>			
Normal Conditions, 2.75H:1V Side Slopes			
<i>Drawn By</i>	RW	<i>Scale</i>	1:200
<i>Date</i>	2020-07-27	<i>Company</i>	
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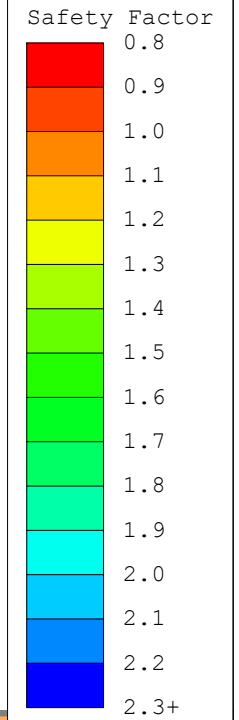
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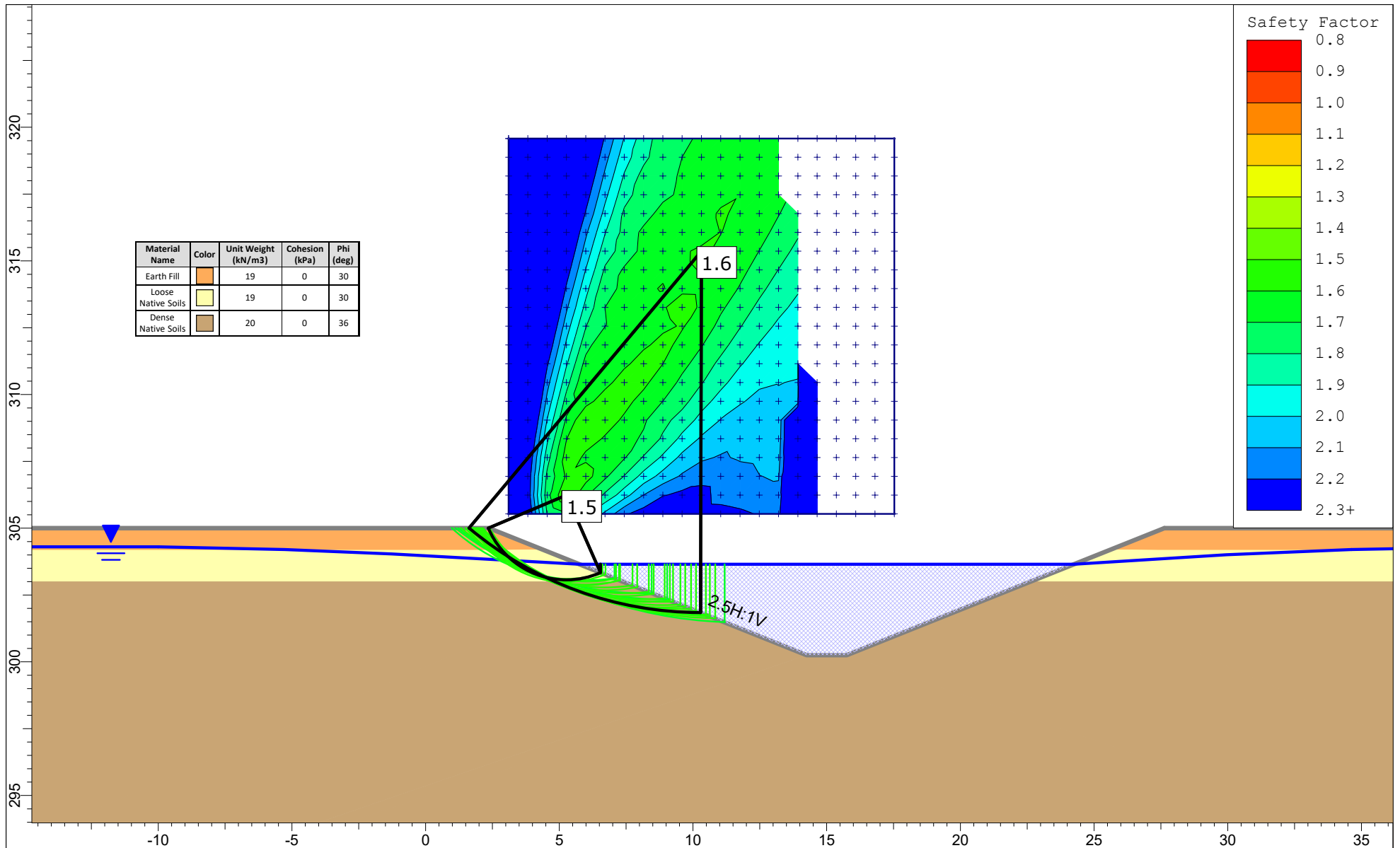
	<i>Project</i> 20-1014B 664, 674 & 692 Essa Road & 320 Maplevew Drive West, Barrie		
	<i>Analysis Description</i> Rapid Drawdown from 100 Year Flood, 2.75H:1V Side Slopes		
	<i>Drawn By</i> RW	<i>Scale</i> 1:200	<i>Company</i>
	<i>Date</i> 2020-07-27	<i>File Name</i> Maplevew Essa Channel Stability.slmd	




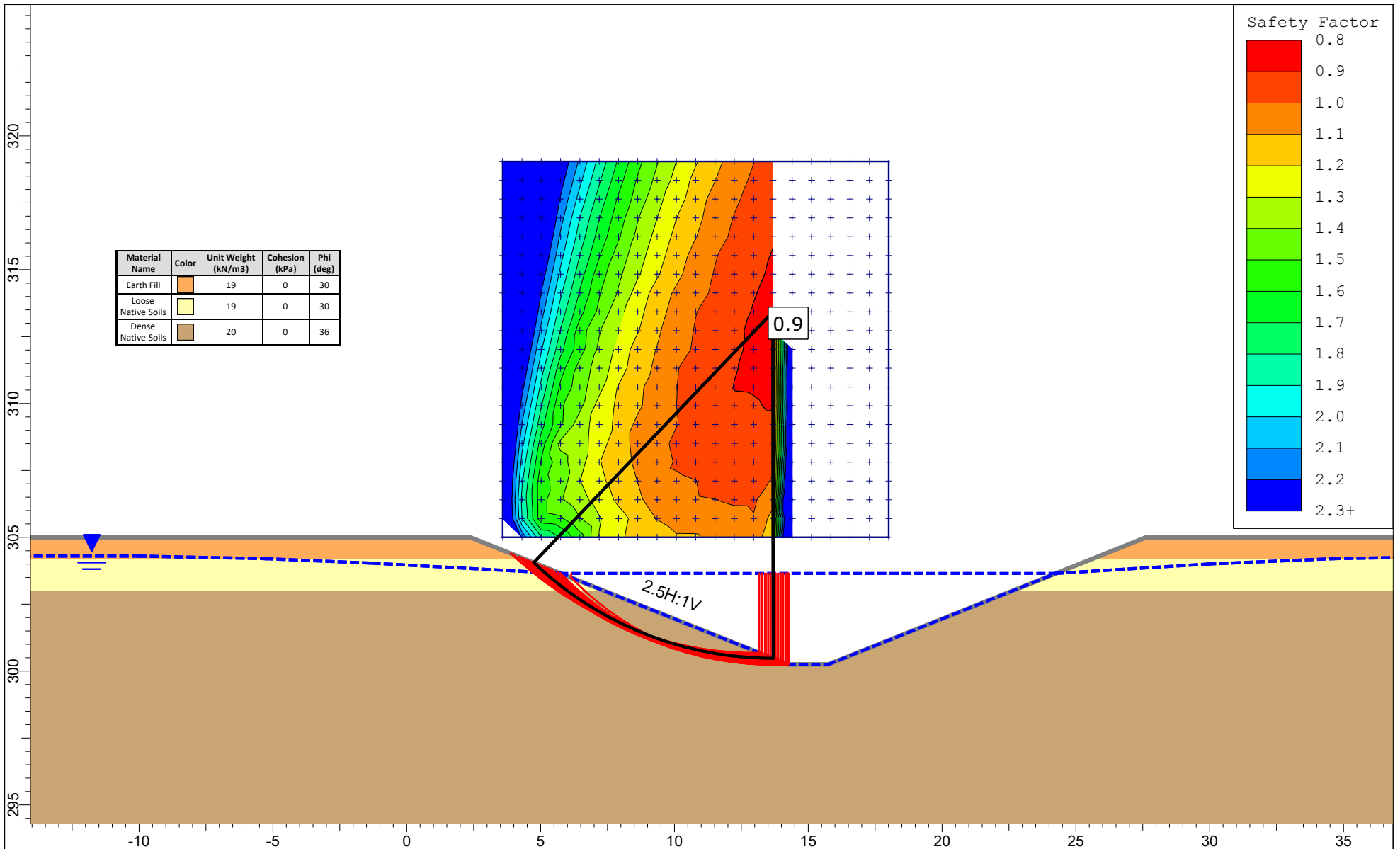
Material Name	Color	Unit Weight (kN/m ³)	Cohesion (kPa)	Phi (deg)
Earth Fill	Orange	19	0	30
Loose Native Soils	Yellow	19	0	30
Dense Native Soils	Brown	20	0	36




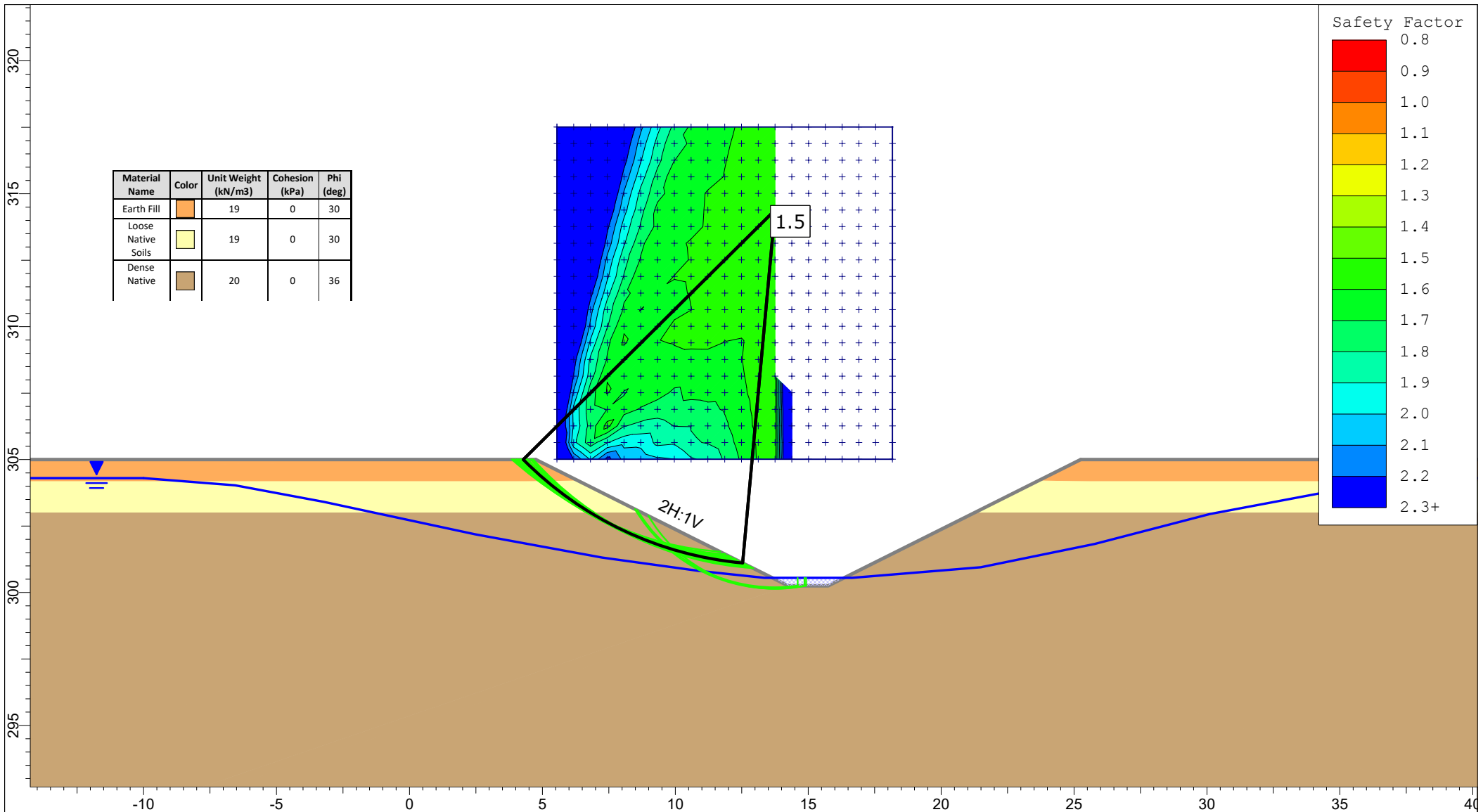
	<i>Project</i> 20-1014B 664, 674 & 692 Essa Road & 320 Mapleview Drive West, Barrie		
	<i>Analysis Description</i> Normal Conditions, 2.5H:1V Side Slopes		
	<i>Drawn By</i> RW	<i>Scale</i> 1:200	<i>Company</i>
	<i>Date</i> 2020-07-27	<i>File Name</i> Mapleview Essa Channel Stability.slmd	



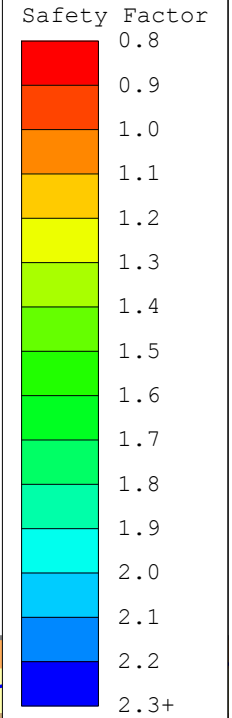
	<i>Project</i> 20-1014B 664, 674 & 692 Essa Road & 320 Mapleview Drive West, Barrie		
	<i>Analysis Description</i> 100 Year Flood, 2.5H:1V Side Slopes		
	<i>Drawn By</i> RW	<i>Scale</i> 1:200	<i>Company</i>
	<i>Date</i> 2020-07-27	<i>File Name</i> Mapleview Essa Channel Stability.slmd	



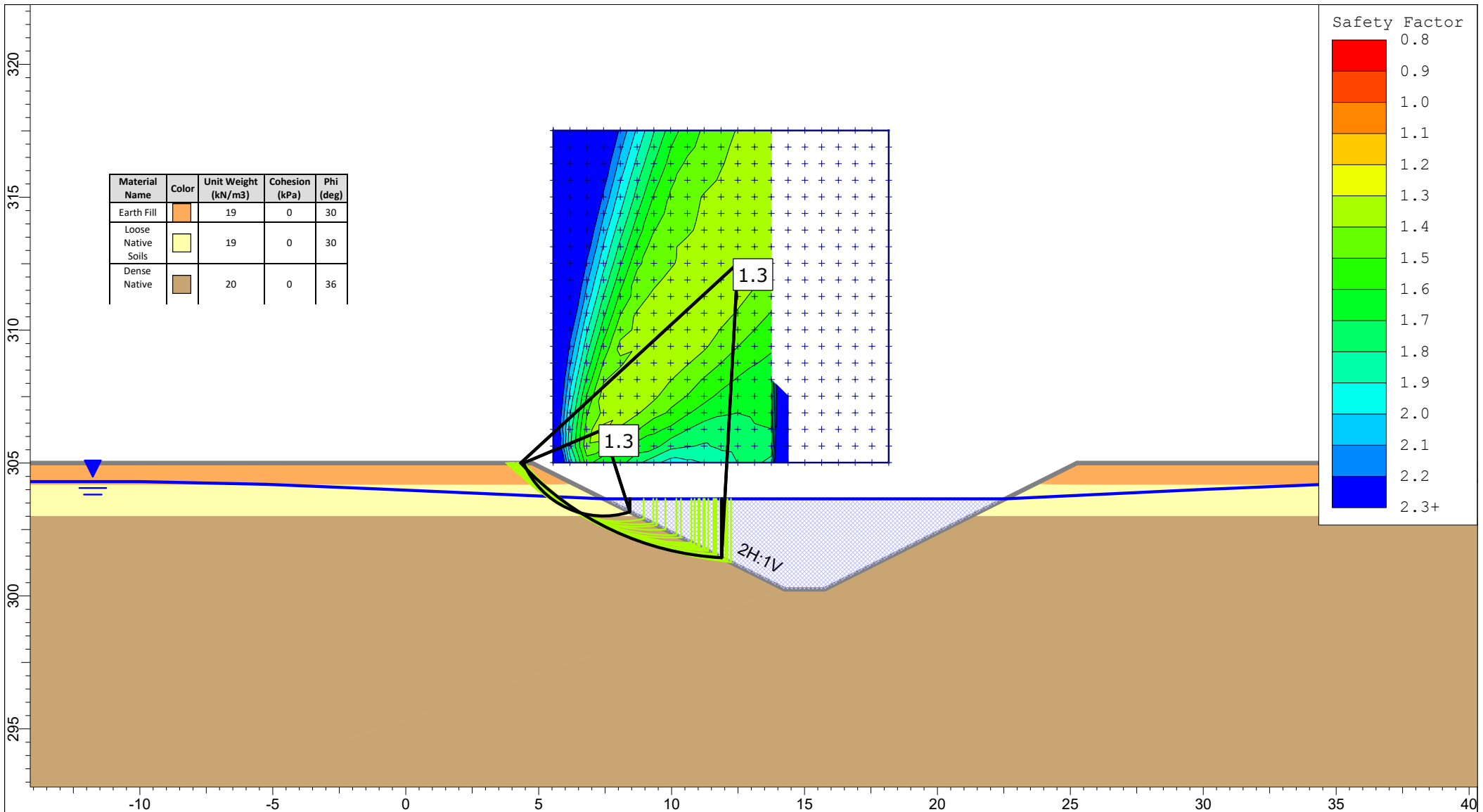
	<i>Project</i> 20-1014B 664, 674 & 692 Essa Road & 320 Maplevew Drive West, Barrie		
	<i>Analysis Description</i> Rapid Drawdown from 100 Year Flood, 2.5H:1V Side Slopes		
	<i>Drawn By</i> RW	<i>Scale</i> 1:200	<i>Company</i>
	<i>Date</i> 2020-07-27	<i>File Name</i> Maplevew Essa Channel Stability.slmd	




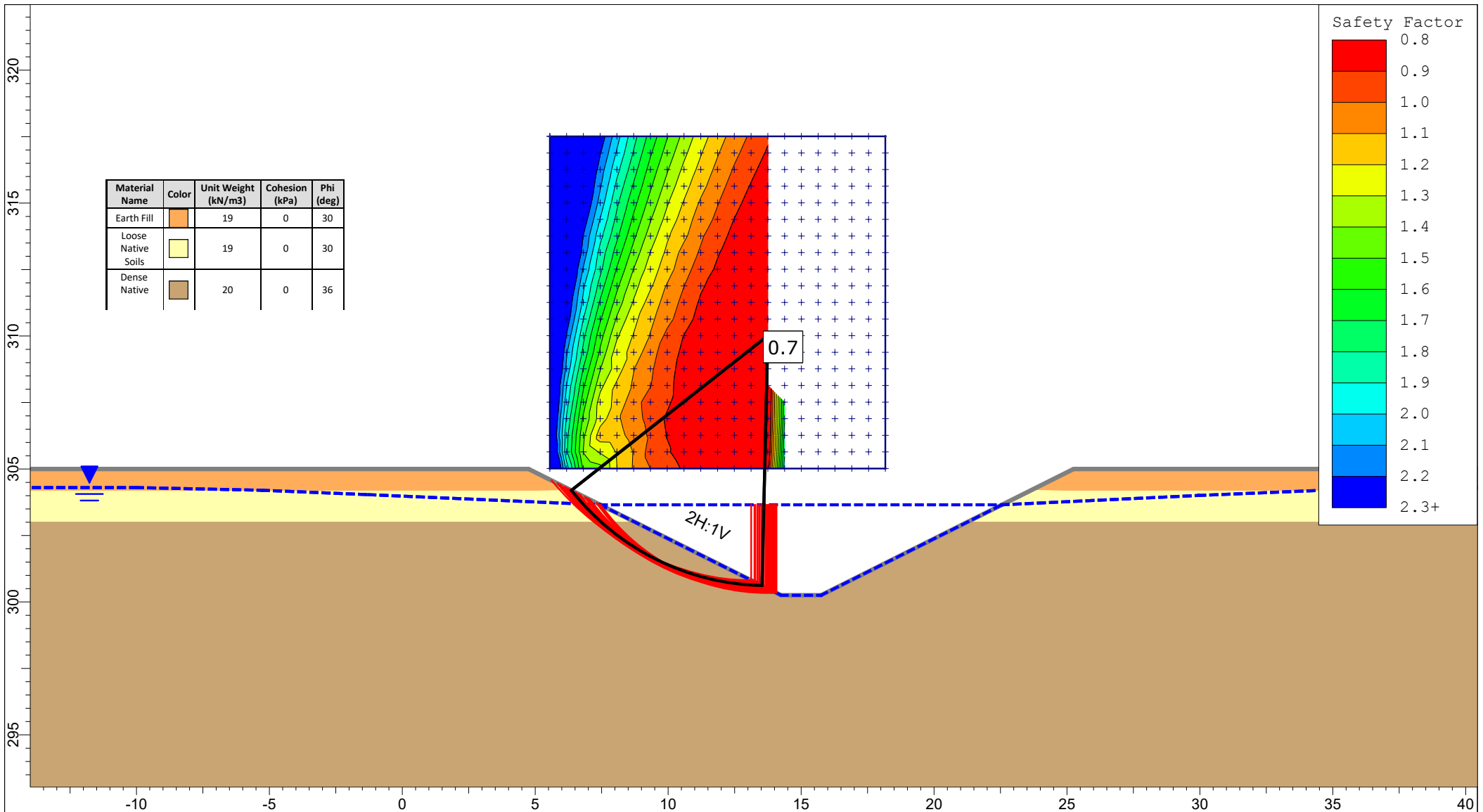
Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)
Earth Fill		19	0	30
Loose Native Soils		19	0	30
Dense Native		20	0	36




	<i>Project</i> 20-1014B 664, 674 & 692 Essa Road & 320 Mapleview Drive West, Barrie		
	<i>Analysis Description</i> Normal Conditions, 2H:1V Side Slopes		
	<i>Drawn By</i> RW	<i>Scale</i> 1:200	<i>Company</i>
	<i>Date</i> 2020-07-27		<i>File Name</i> Mapleview Essa Channel Stability.slmd



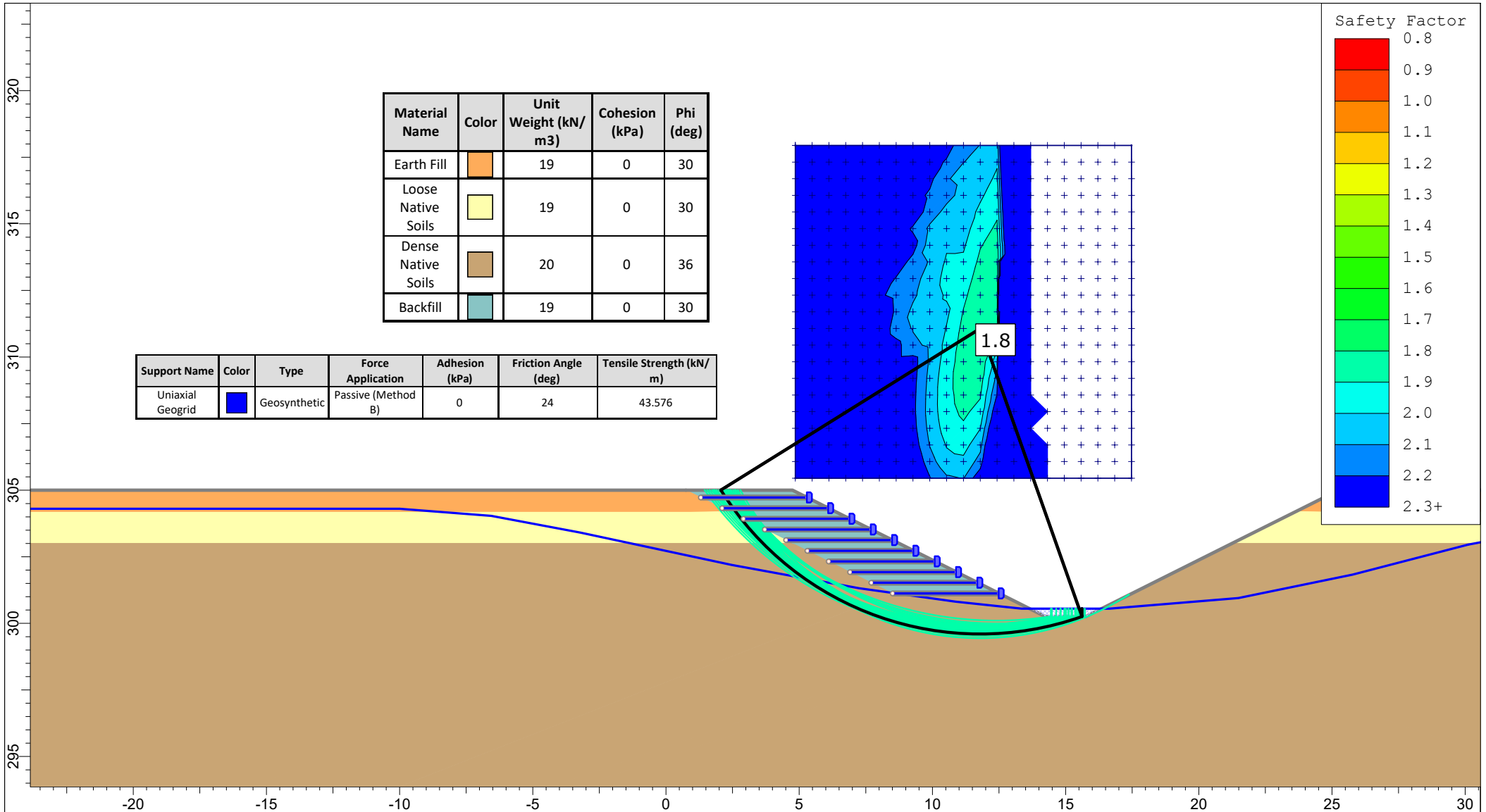
	<i>Project</i> 20-1014B 664, 674 & 692 Essa Road & 320 Mapleview Drive West, Barrie		
	<i>Analysis Description</i> 100 Year Flood, 2H:1V Side Slopes		
	<i>Drawn By</i> RW	<i>Scale</i> 1:200	<i>Company</i>
	<i>Date</i> 2020-07-27		<i>File Name</i> Mapleview Essa Channel Stability.slmd




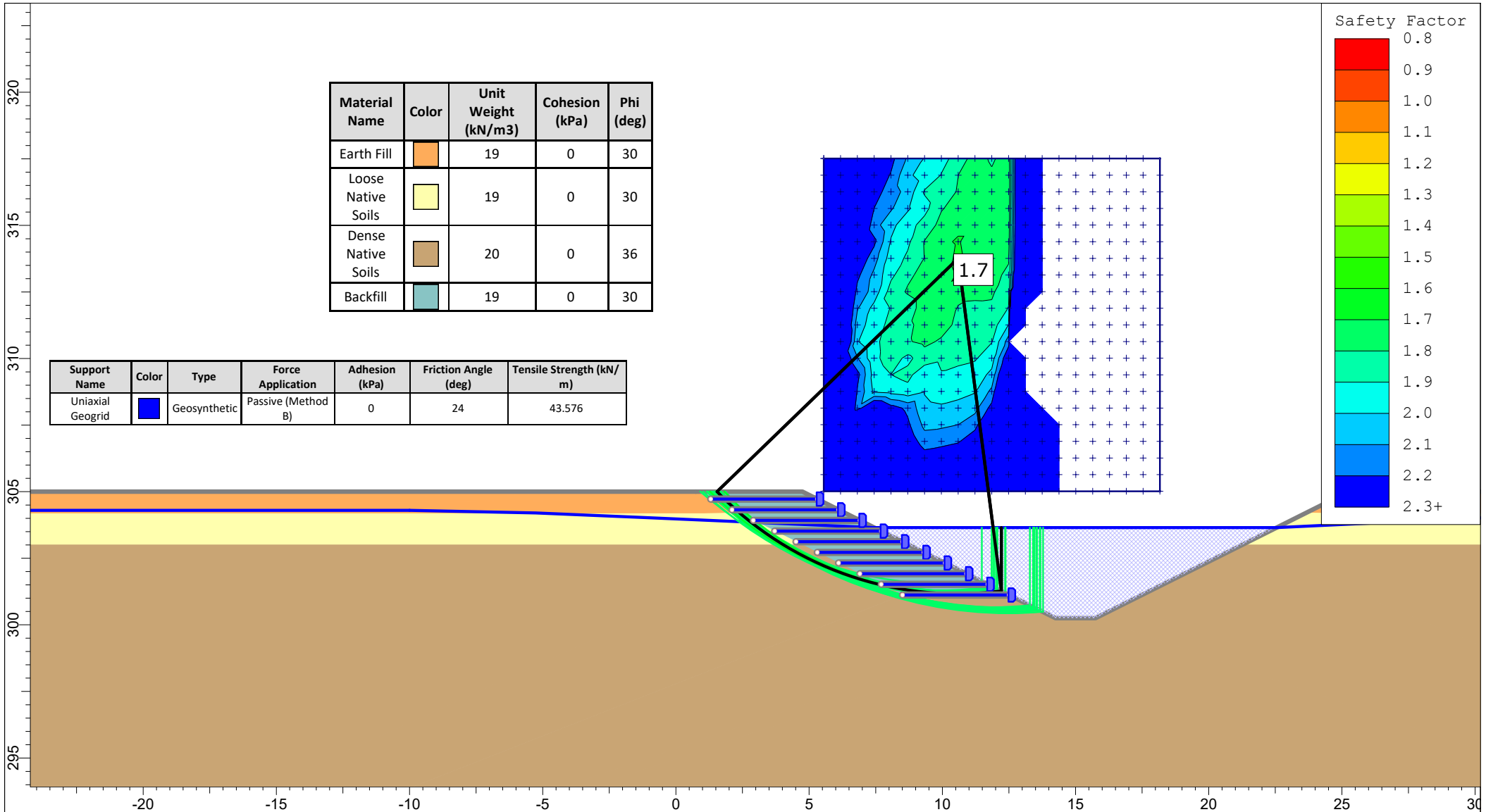
	<i>Project</i> 20-1014B 664, 674 & 692 Essa Road & 320 Mapleview Drive West, Barrie		
	<i>Analysis Description</i> Rapid Drawdown from 100 Year Flood, 2H:1V Side Slopes		
	<i>Drawn By</i> RW	<i>Scale</i> 1:200	<i>Company</i>
	<i>Date</i> 2020-07-27		<i>File Name</i> Mapleview Essa Channel Stability.slmd


Appendix C –
PRELIMINARY SLOPE STABILITY ANALYSIS – RSS STRUCTURE

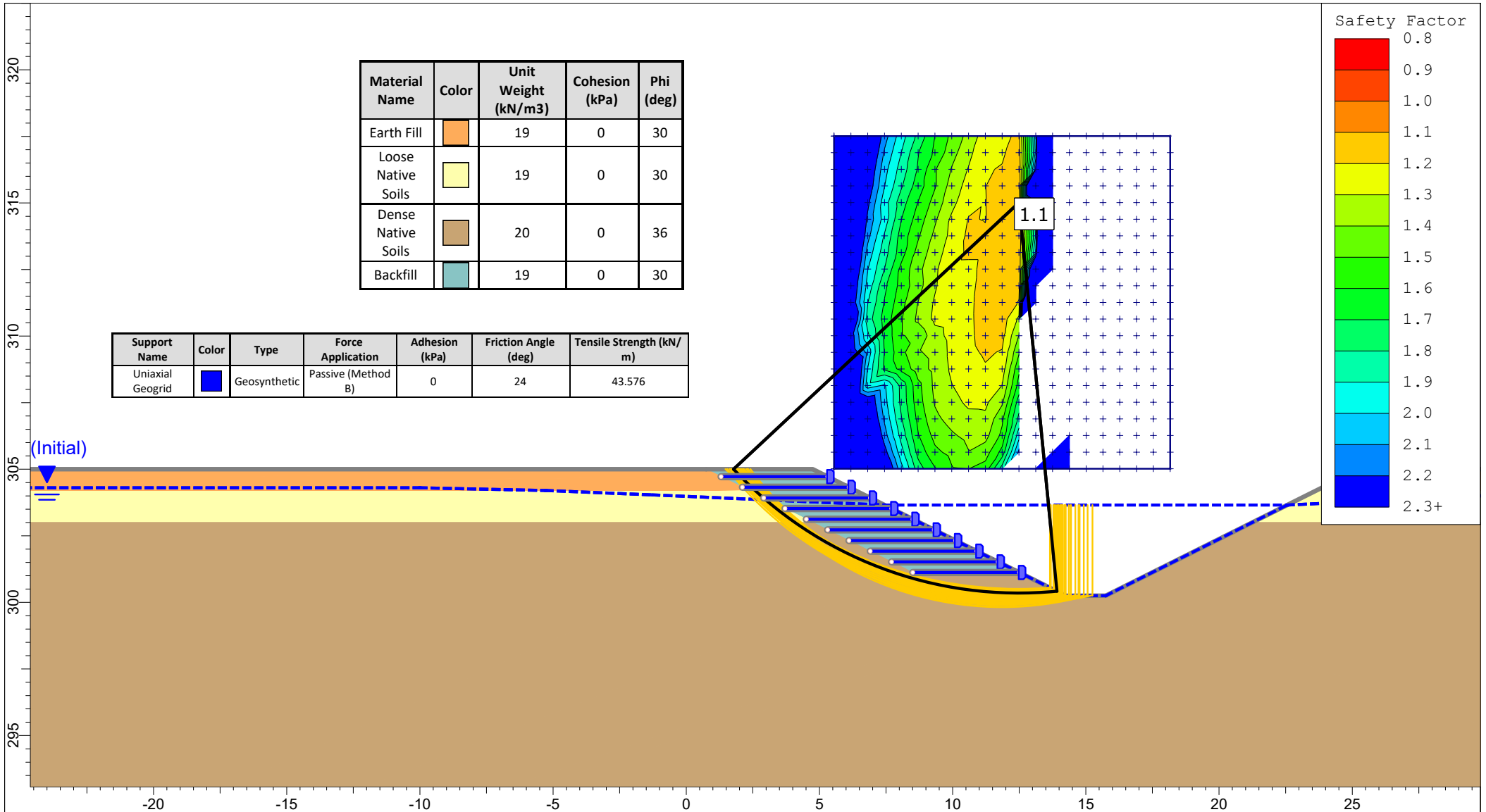




	<i>Project</i> 20-1014B 664, 674 & 692 Essa Road & 320 Mapleview Drive West, Barrie		
	<i>Analysis Description</i> RSS Structure - Normal Conditions, 2H:1V Side Slopes		
	<i>Drawn By</i> RW	<i>Scale</i> 1:200	<i>Company</i>
	<i>Date</i> 2020-07-27	<i>File Name</i> Mapleview Essa Channel Stability.slm	



	<i>Project</i> 20-1014B 664, 674 & 692 Essa Road & 320 Mapleview Drive West, Barrie		
	<i>Analysis Description</i> RSS Structure - 100 Year Flood, 2H:1V Side Slopes		
	<i>Drawn By</i> RW	<i>Scale</i> 1:200	<i>Company</i>
	<i>Date</i> 2020-07-27		<i>File Name</i> Mapleview Essa Channel Stability.slmd



<i>Project</i>			20-1014B 664, 674 & 692 Essa Road & 320 Mapleview Drive West, Barrie		
<i>Analysis Description</i>			RSS Structure - Rapid Drawdown from 100 Year Flood, 2H:1V Side Slopes		
<i>Drawn By</i>	RW	<i>Scale</i>	1:200	<i>Company</i>	
<i>Date</i>	2020-07-27			<i>File Name</i>	Mapleview Essa Channel Stability.slmd