GEOTECHNICAL INVESTIGATION REPORT

PROPOSED SUBDIVISION

LOT 2 DP 349782
KOMOKORIKI HILL ROAD
KOMOKORIKI

438 KOMOKORIKI LTD

Reference: GL225.1

Prepared: 08/04/2022

Issued to: haighcontractingnz@gmail.com

Issued on: 21st April 2022

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1. INTRODUCTION

This report presents the findings of a geotechnical investigation carried out for a proposed subdivision of Lot 2 DP 349782. The purpose of our investigation was to assess subsoil conditions, analyse site stability and to provide recommendations for building foundations and the satisfactory development of the property.

Geoconsult were engaged in 2019 to undertake an initial Geotechnical Investigation for the proposed subdivision, the 2019 report has been reviewed and additional information has been obtained in 2022 and the original report has been revised to address the updated development proposal.

The revised report has been prepared for our client, 438 Komokoriki Ltd, in accordance with our proposal letter dated 22nd February 2022 and may be used in support of an application to Council for resource consent approval in respect of the proposed development as described herein.

2. SITE DESCRIPTION

The subject site (legally described as Lot 2, DP349782) shown in Figure 1, is located in Komokoriki. It comprises an irregular shaped property currently used as pastured farmland with an area of 92.5175 Hectares. The Kotorengaru Stream runs through the site adjacent to the south eastern site boundary, flowing from the northeast to the southwest.

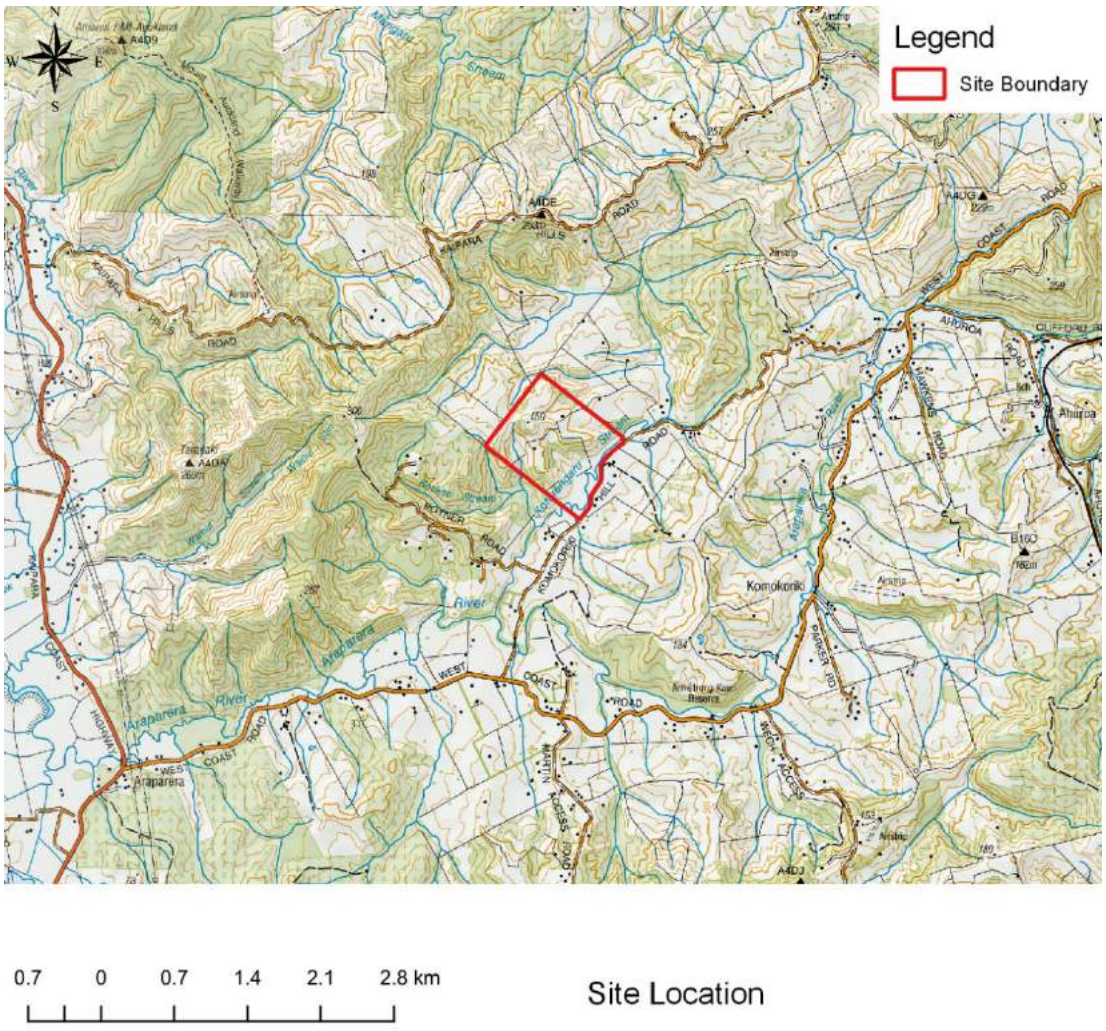


Figure 1: Site Location

No buildings currently occupy the property and we are not aware of any public sanitary sewer or stormwater pipes beneath the site.

3. GEOLOGY

The Geological Map of Auckland[1] (extract shown in Figure 2 below) shows the majority of the site is underlain by Pakiri Formation of the Waitemata Group.

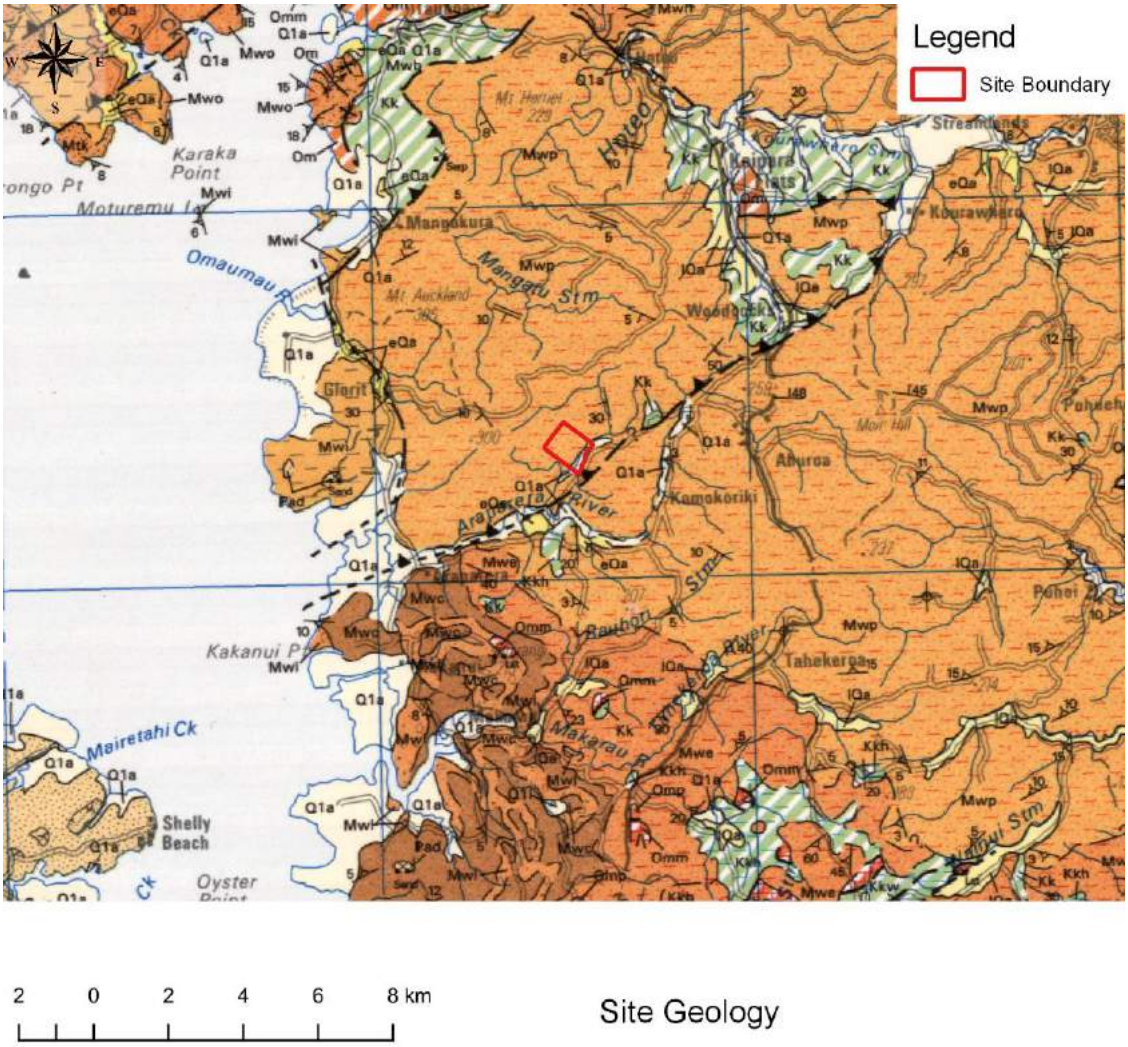


Figure 2: Site Geology

Low laying areas of the site adjacent to Kotorengaru Stream, have been mapped as being underlain by young holocene alluvial and colluvial deposits of the Tauranga Group comprising of sand, silt, clay with local gravel and peat beds.

The Pakiri Formation is a Flysch deposit consisting of alternating, thick-bedded, volcanic-rich, graded sandstone and siltstone with volcaniclastic grit beds. Weathering of these deposits close to the surface

[1] *Edbrooke S.W. (compiler) 2001. Geology of the Auckland Area. Institute of Geological and Nuclear Sciences 1:250 000 Geological Map 3. 1 Sheet + 74p. Lower Hutt, New Zealand: Institute of Geological and Nuclear Sciences limited*

typically results in the formation of a mantle of residual soil comprising clays and silts of variable plasticity, with some inter-bedded sand layers, and typically of firm to very stiff strength.

Furthermore, it should be noted that the geological map indicates that an inferred inactive thrust fault was mapped 250m south east of the site.

4. EXISTING GEOTECHNICAL INFORMATION

We are not aware of any previously existing geotechnical information relating to this site.

5. PROPOSED DEVELOPMENT

We have been supplied with a conceptual site plan (drawing numbered 21063-03 dated October 2021) prepared by Parallax Surveyors and Planners Ltd showing the proposed Lot layout and the locations of the proposed building platforms. The approximate locations of the proposed building platforms are shown on the attached site plan drawing number GL225.1/1.

The proposed subdivision has been reduced to 5 Lots, two less than the original 2019 proposal which comprised 7 lots.

We expect that on-site effluent and stormwater disposal will be required as part of the development and that overland flow paths need to be assessed. We have not considered these aspects which are outside of our scope.

It should be noted that at the time of writing this report an earthworks plan had not been made available to us. Any filling placed in areas of alluvial soils may induce settlement and require settlement analysis.

6. SITE PHOTOGRAPHS

Photograph 1:
Looking from the existing accessway that runs through the middle of the proposed lot subdivision towards the north east at the low laying regions of Lot 1. The Auckland Council GIS indicates that this area is mapped within the flood prone area, as it is adjacent to Kotorengaru Stream. Foundations designed within this area need to take this into consideration.

Photograph 2:
Looking from the accessway towards the north west with Lot 1 and Lot 3 to the right of the photograph and Lot 2 and Lot 4 in the centre and top of the image. The photo shows numerous visual signs indicating historical and/or presently active instability. The ground surface is steep across some of the site and shows evidence of a number of slump scarps. Furthermore, the steep nature of the property makes the land prone to longer term near surface soil creep and/or shallow seated slope failure within the upper soil layers.

7. SITE INVESTIGATION

Our 2019 site investigation work comprised the following:

- A walk over visual appraisal of the site.
- The drilling of 24 hand auger boreholes to depths of between 1.2 m and 5.0 m.
- The conducting of 6 Scala Penetrometer tests from the base of selected boreholes.
- The measurement of groundwater levels in the boreholes.
- The measurement of cross sections by tape and clinometer.

Our 2022 site investigation work comprised the following:

- A walk over visual appraisal of the site.
- The drilling of 5 hand auger boreholes to depths of between 2.3 m and 5.0 m.
- Collecting of soils samples from each building platform.
- The conducting of Soil Expansivity laboratory testing on the soils collected.

The approximate locations of the boreholes are shown on our attached site plan drawing number GL225.1/1. The borehole logs and Scala Penetrometer test results are also attached. The soil descriptions given on the logs are in general accordance with the New Zealand Geotechnical Society's "Field Description of Soil and Rock." The undrained shear strength values given on the logs are 'Shear Vane Strengths', factored in accordance with the New Zealand Geotechnical Society Guidelines, not direct readings from the shear vane dial. The groundwater levels were measured following drilling and are indicated on the borehole logs. The cross sections are also attached as drawing number GL225/2.

8. SUBSOIL CONDITIONS

Detailed descriptions of the subsoils encountered in the boreholes are given on the attached borehole logs. The subsoils were generally found to comprise:

- **Topsoil to between 100 mm and 300 mm depth**, overlying:

- **Residual Pakiri Formation Soils to the termination of all boreholes,** consisting of stiff to hard orange, brown and grey with localised thin interbedded layers of clay and sand with undrained shear strengths greater than 52 kPa.

The following soil parameters (shown in Table 1) inferred from strength data presented in the attached borehole logs have been adopted.

Table 1: Adopted Soil Parameters

Layer	Friction Angle, ϕ' (°)	Unit Weight, γ (kN/m^3)	Effective Cohesion c', (kPa)	Undrained Shear Strength Su, (kPa)
Non-Engineered Fill	28	17.5	2	50
Stiff Residual Soil	30	17.5	2	50
Very Stiff Residual Soil	32	17.5	3	100
Hard Residual Soil	34	17.5	5	200
Rock*	36	20.0	10	200

* Note that rock parameters will need further exploration to define.

The Scala Penetrometer tests carried out from the base of boreholes HA11 to HA13 and HA22 to HA24 obtained effective refusal (defined as 10 or more blows per 50 mm penetration) at depths of between 2.4 m and 5.9 m below ground level. This is inferred to be the surface of the underlying less weathered sandstone and siltstone of the Pakiri Formation deposits.

The groundwater levels measured in the boreholes following completion of drilling were found to be at depths of between 1.3 m and 4.3 m below ground level. These levels may not be representative of worst-case groundwater conditions on the site, water levels may be higher following times of heavy or prolonged rainfall and/or during wetter winter conditions.

1. LABORATORY TESTING

During our 2022 site investigation, soil samples were collected from the hand auger boreholes at between 0.5 m and 1.0 m depth. These samples were tested for Atterberg Limits and Linear Shrinkage, in accordance with NZS4402:1986, to assess the expansive soil classification for the site.

The results of the laboratory tests are as follow:

Sample Location	Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Linear Shrinkage (%)
HA1	38	63	37	26	11
HA2	26	92	37	55	21
HA3	33	110	37	73	17
HA4	29	95	39	56	18
HA5	26	92	36	56	17

Based on Unified Soil Classification System (USCS) the soils at the site are generally classified as CH - CLAY, high liquid limit.

NZS 3604:2011 states that expansive soils are those with a liquid limit more than 50% when tested in accordance with NZS4402 Test 2.2, and a linear shrinkage more than 15% when tested in accordance with NZS4402 Test 2.6 and are therefore excluded from the "Good Ground" definition. Based on the values of the liquid limit and linear shrinkage for the subject site, the subsoils at this site are considered to be outside the criteria of "Good Ground" given in NZS3604:2011.

Based on the laboratory testing results, and with reference to site expansivity classification by BRANZ 2008 and MBIE for the New Zealand Building Code B1 Structure, November 2019, the subsoils at this site are considered to be classified as moderately expansive, and it is recommended that a subsoil classification of **"Moderately Expansive - M"** is adopted for the subject site. Based on the MBIE moderately expansive soils have an I_{SS} range of 2.0% to 3.7% and a 500 year design characteristic surface movement return (y_s) of 23 mm to 44 mm.

2. SEISMIC SITE SUBSOIL CLASS

In accordance with New Zealand Standard 1170.5 Section 3.1.1, the site subsoil site classification is determined to Category C – Shallow soils.

3. SITE STABILITY

The site shows numerous visual signs indicating historical and/or presently active instability. The ground surface is steep across most of the site and shows evidence of a number of slump scarps. In addition, we consider that the steep nature of the property makes the land prone to longer term near surface soil creep and/or shallow seated slope failure within the upper soil layers.

Considering the information given above, a slope stability analysis for the sections shown in GL225/2 for the residential development was undertaken under static and seismic conditions. The Analyses were carried out using Slide[2] in accordance with Section 2 of Auckland Council's Code of Practise for Land Development and Subdivision ver1.6 (24 Sep 2013).

For analysis under static conditions, we adopted the monitored groundwater level as the normal groundwater conditions. Under extreme groundwater conditions (assumed in wetter winter conditions following periods of heavier prolonged run) we have elevated the modelled groundwater conditions. These two groundwater tables have been annotated on the sections provided in GL225/2.

A horizontal peak ground acceleration of 0.14g (500 yr event) under ultimate limit state design was adopted for the purpose of the seismic design. A 15kPa loading pressure has been assumed for each building platform.

A summary of the factor of safety (F.O.S) calculated against failure under moderately conservative groundwater, extreme groundwater and 500yr seismic event cases is shown in Table 2 below. The results of the slope stability analyses have also been attached.

[2] *The limit equilibrium slope stability software package (v6, Rocscience).*

Table 2: Factor of Safety (FOS) for the slope stability along Sections 1 to 6

	Sections					
Condition	**1**	**2**	**3**	**4**	**5**	**6**
Normal groundwater conditions	1.04**	1.83	1.23*	1.82	1.29*	1.69
Extreme groundwater conditions	1.04**	1.60	1.23*	1.45	1.25*	1.44
Seismic conditions	2.23	1.97	3.75	5.25	1.66	1.34

* These slopes have been predicted beyond the proposed building footprint.
** Foundations within this lot need to be specifically designed to address global stability issues.

Based on the results of our analyses, and provided that the recommendations outlined in this report are followed, we consider the site to be currently stable and generally suitable for construction of the proposed dwellings. It is also considered that the proposed development is unlikely to adversely affect the existing stability of the site.

It should be noted that some of the results shown in Table 2 indicate that a lower FOS than that required by Auckland Council, however, the majority of these slopes were calculated beyond the proposed building footprint. The only calculated global slopes with a predicted FOS lower than the council requirement encroaching into the proposed building footprint were the ones calculated in section 1. We recommend that foundations are specifically designed within Lot 5 to address global stability issues.

4. RECOMMENDATIONS

4.1 Earthworks

We recommend that all earthworks be carried out in accordance with NZS4431:1989 “Code of Practise for Residential Development”. Any fill placed should be appropriately monitored and tested during placement and compaction and its suitability for final residential development confirmed by way of a Statement of Professional Opinion by a suitably qualified Geotechnical Engineer. Cuts and fills greater than 600 mm depth should be assessed by a Geotechnical Engineer familiar with the contents of this report.

4.1.1 Topsoil, Fill and Unsuitable Soils

All vegetation, topsoil, fill and any soft or otherwise unsuitable material should be removed from the building platform or earthworks area. The topsoil layer was found to vary from 100 mm to 300 mm deep across the property. The fill may also need to be removed subject to our inspection during construction. No fill was encountered in any of our boreholes but there may be deposits outside of our test locations.

If any part of the proposed dwelling is to be constructed on a timber floor supported on timber piles existing topsoil and fill may remain in place to that area provided that all surface vegetation has been removed, the required sub floor clearance is provided and the piles are embedded to the required minimum depths as discussed in the foundations section below.

All excavated topsoil and unsuitable material should be removed from site or stockpiled away from the building platform and/or earthworks area and clear of the steeper site slopes.

4.1.2 Cuts and Fills

Due to the steepness of the property any cuts or fills required for the proposed development should be supported using retaining walls designed by a suitably qualified structural engineer familiar with the contents of this report.

In order to ensure no slippage occurs, the earthworks should be carried out during a forecast period of fine weather only. It should involve stripping, excavating and disposing soil off the site and immediate and full construction of the retaining wall along the exposed face.

Excavations should be checked by a geotechnical engineer. Appropriate silt control should be placed and maintained all times.

Design recommendations for retaining walls are outlined in the Retaining Walls section below.

4.2 Foundations

4.2.1 General

The subsoils at this site were found to comprise stiff natural soils. The soils have adequate bearing capacity, are of relatively low compressibility and are considered suitable foundation soils for the proposed new dwellings. They are however considered to be moderately expansive and are therefore outside the criteria for "Good Ground" given in NZS3604:2011. Shallow foundations are considered to be generally appropriate, however, foundation depths should allow for the moderately expansive nature of the soils. Alternatively, a waffle raft floor slab will require specific structural design to allow for the expansive nature of the soils. Specific recommendations are outlined below.

Due to the moderately steep nature of parts of the site and indications of shallow soil movement, we recommend that the foundations be piled if the dwelling is to be located within 10m upslope of moderately steep ground (steeper than 1v:4h, or 14^{o}).

4.2.2 Shallow Footings

Conventional shallow pad and strip footings, generally in accordance with the requirements of NZS3604:2011, should be embedded a minimum depth of 600 mm below cleared ground level into stiff natural soils. The following bearing capacities are considered appropriate for foundation design:

Ultimate Bearing Capacity	300 kPa
Allowable Bearing Pressure (F.O.S = 3)	100 kPa
Dependable Bearing Capacity (Φ = 0.5)	150 kPa

4.2.3 Waffle Raft Slabs

Waffle raft slabs should be designed for moderately expansive soils in accordance with the requirements of AS2870:2011. The following bearing capacities are considered appropriate for raft floor slab design:

Ultimate Bearing Capacity	300 kPa
Allowable Bearing Pressure (F.O.S = 3)	100 kPa
Dependable Bearing Capacity (Φ = 0.5)	150 kPa

4.2.4 Pile Foundations

Due to the moderately steep nature of parts of the site and indications of shallow soil movement piles will be required to safeguard against the effects of potential longer-term soil creep or shallow seated slope failure.

If the proposed dwellings are to be located within 10m of moderately steep (>14^{o}) ground, piles beneath the leading-edge foundations are recommended. These piles should be designed to resist lateral earth pressure over the upper 1.5 m below the ground surface. The magnitude of lateral loading acting on each

pile should be calculated assuming at rest earth pressures over a width of 3 times the pile diameter to a depth of 1.5 m using a coefficient of lateral earth pressure Ko = 0.5 and a soil unit weight of 18kN/m^3. Passive resistance in front of the piles below 1.5 m depth can be calculated using Broms method with a soil undrained shear strength C_u = 60 kPa.

Piles should be embedded a minimum depth of 2.0m below final ground level and at least 0.5 m below any fill into stiff natural ground. Greater pile depths may be required to satisfy structural design considerations.

The following soil parameters are considered appropriate for axial load design purposes:

	End Bearing	Side Adhesion*
Ultimate Capacity	540 kPa	30 kPa
Allowable Stress (F.O.S. = 3)	180 kPa	10 kPa
Dependable Capacity (Φ = 0.5)	270 kPa	15 kPa

** Side adhesion should be ignored over any portion of the pile shaft passing through fill and over the upper 1.5 m below ground level whichever is the greater depth.*

Either bored and cast in situ reinforced concrete piles, bored and concrete encased timber piles or driven timber piles would be suitable. Driven piles should be installed to an appropriate driving set as determined by the Hiley Formula.

4.2.5 Floor Slabs

Either conventional slab on grade concrete floors, in accordance with the requirements of NZS3604:2011, or waffle raft slabs designed for moderately expansive soils in accordance with the requirements of AS2870:2011 are considered appropriate.

Conventional slabs on grade should be founded on a layer of clean, well graded, compacted hardfill placed on ground stripped of vegetation, topsoil, fill and any soft or otherwise unsuitable material. The hardfill should be compacted using a vibrating plate compactor or roller and topped with a blinding layer of sand or other approved fines.

Care should be taken in the preparation of the slab subgrade soils to ensure they do not dry out or become excessively wet prior to pouring of the floor slabs. In this respect some moisture conditioning or protection of the subgrade soils may be required prior to placing hardfill and/or pouring the slabs.

4.3 Retaining Walls

Where required, retaining walls should be provided to support cut or fill faces. Free standing cantilever walls can be designed for active earth pressures. Walls that are incorporated within the structure should be designed for at rest earth pressures.

The following soil parameters are considered appropriate for retaining wall design:

Cohesion (c')	0 kPa
Angle of Internal Friction (ϕ')	30^o
Soil Unit Weight (γ)	18 kN/m^3

For timber pole walls an undrained shear strength C_u = 60 kPa can be assumed for the soil in front of the poles when calculating lateral soil resistance.

For masonry block cantilever walls and gravity walls, a piled foundation system is required to support such a wall due to the depth of fill and alluvial deposits. Recommendations for the pile foundations is given above in section 10.2.2 of this report. When calculating sliding resistance an undrained shear strength of C_u = 60 kPa can be assumed for the soil at the base of the wall. This should be reduced by an adhesion factor of 0.65, giving a geotechnical ultimate base adhesion of 40kPa. These values should be reduced by a factor of 0.5 for limit state design.

The effects of sloping ground above and/or below the walls should be taken into account in the design along with any other surcharges that may apply. Walls of any height which carry any type of surcharge load will require specific structural design and a building consent.

Free draining granular backfill and a perforated drain coil should be provided behind all retaining walls. Retaining walls should be constructed as soon as possible following excavation of steep site cuts. Steep cut faces left unprotected may be detrimental to the stability of the site and neighbouring sections.

4.4 Specific Structural Design

A suitably qualified structural engineer, familiar with the contents of this report, should be engaged to design the retaining walls, foundations, piles and floor slab for the proposed dwellings.

4.5 Vegetation

Vegetation should be maintained as much as possible during and after completion of the development works. Vegetation reduces surface water and groundwater effects and assists in maintaining slope stability through root binding action. Any newly planted trees should be kept well clear of the foundations of the new dwelling to avoid the potential for settlement that can occur due to the localised ground shrinkage possible as high-water demand tree species mature.

4.6 Stormwater Control

Stormwater from paved areas, roofs, tank overflows and all other sources should be collected in sealed pipes and discharged to a safe disposal point away from the development area with an energy dissipater fitted at its outlet. Concentrated stormwater flows should not be allowed to discharge onto or into the ground close to the buildings or on sloping ground as this would be detrimental to foundation conditions and site stability.

4.7 Plan Review

It is recommended that Geoconsult is engaged to review detailed development plans when they are available. This is to ensure that the information used as the basis for this report is consistent with final development proposal and that the recommendations provided in this report have been interpreted correctly.

A plan review will incur additional charges which, unless stated otherwise, are not included in our fee for the preparation of this report. Our fee for a plan review will vary depending on the complexity of the proposed works and the time required to adequately review the drawings against this report and any subsequent correspondence.

4.8 Council Request for Further Information

Should Council request further geotechnical information during Resource Consent and/or Building Consent processing additional charges are likely to be incurred which, unless stated otherwise, are not

included in our fee for the preparation of this report. Our fee to provide any additional information required will vary depending on the work and time required to adequately address the request and may include additional site testing, analyses and reporting. Should such a request be made we can provide a fixed price fee proposal to address the request for approval prior to undertaking any further work required.

4.9 Site Inspections during Construction

It is recommended that Geoconsult is engaged to inspect building cuts, exposed subgrade for pile holes and building foundations during construction. This is to confirm expected ground conditions and to ensure compliance with the recommendations contained in this report.

It is the Client's responsibility to ensure that we are notified of any required inspections and that we are given adequate notice to carry out the inspections (at least 24 hours).

We will issue a Producer Statement – Geotechnical Review (PS4) upon successful completion of the inspected works. The inspections and preparation of the Producer Statement will be at additional cost to that of preparing this report.

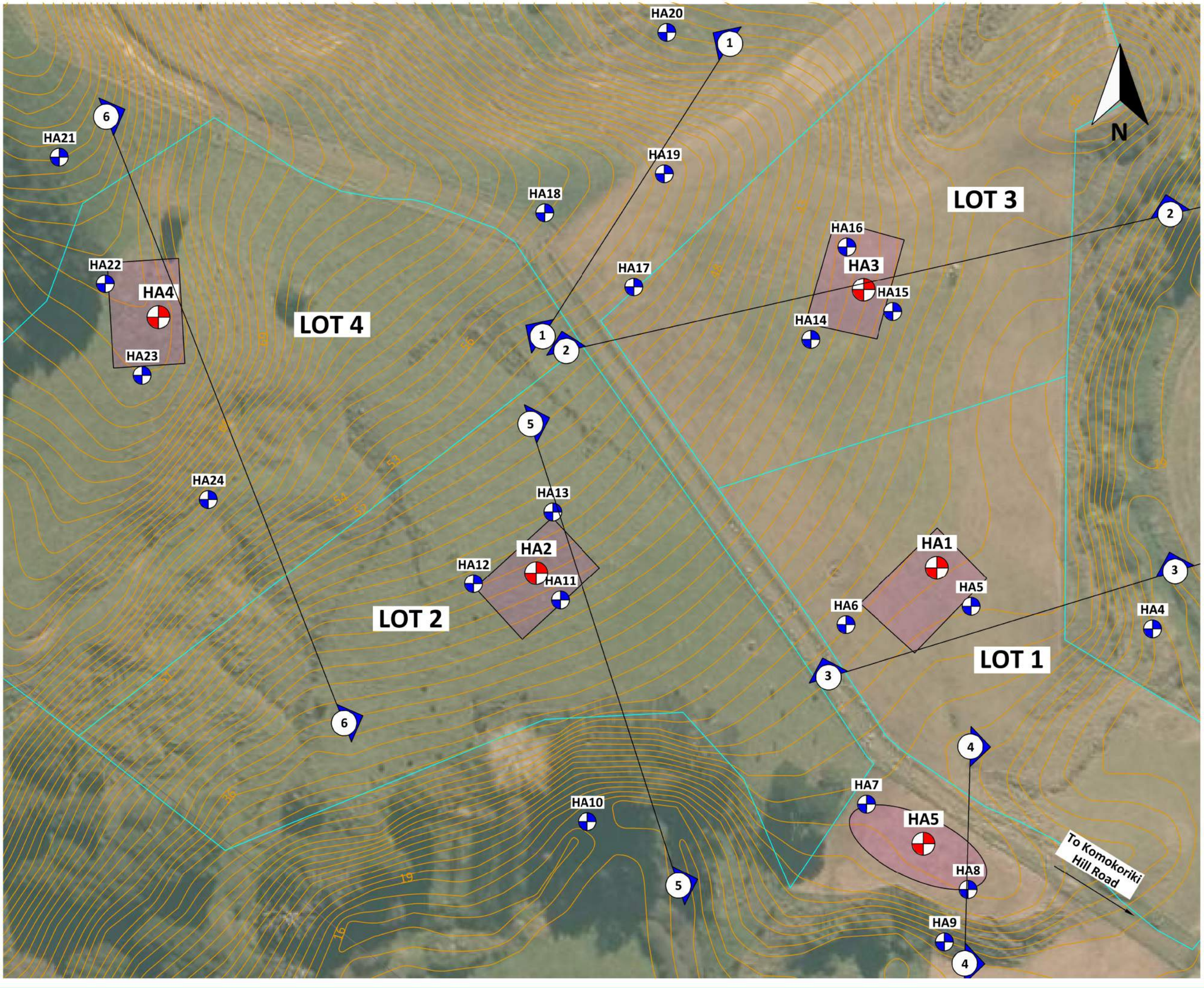
5. LIMITATIONS

The recommendations and opinions contained in this report are based on the subsoils encountered at discrete test locations. We have made assumptions about the nature of the ground conditions across the site based on this limited subsoil information and actual ground conditions may vary from those assumed in this report. If any variations from the assumed ground conditions are found to exist during construction the matter should be referred back to Geoconsult.

This report has been prepared solely for the benefit of 438 Komokoriki Ltd as our client and their nominated agents for the purposes of the specific brief as stated in this report. Geoconsult accepts no liability in respect to any matters arising from the use of the information given in this report by any other person or organisation or for any other purpose except that it may be relied upon by Council in support of an application for resource consent and/or building consent approval for the proposed development as described herein.

GEOCONSULT

Author:	**Jacob Malamatenios** **Geotechnical Engineer**	**Signed:**	
Reviewed:	**Bryce Schou** **Senior Geotechnical Engineer**	**Signed:**	
Authorised:	**Phil Williams** **Geotechnical Team Leader**	**Signed:**	



Notes:

1. LOCATIONS OF ALL FEATURES ARE APPROXIMATE ONLY.
2. THIS DRAWING IS BASED ON AUCKLAND COUNCIL GIS PHOTOGRAPHY IN ADDITION TO A PARRALAX SUBDIVISION CONFIGURATION PLAN REF: 21063-03, DATED: OCT 2021.
3. DRAWING NOT TO BE USED FOR CONSTRUCTION PURPOSES.

Key:

- 2022 HAND AUGER BOREHOLE LOCATION
- 2019 HAND AUGER BOREHOLE LOCATION
- 2019 CROSS SECTION
- PROPOSED BUILDING PLATFORM

REV:	DESCRIPTION:	BY:	DATE:
-	-	-	-

STATUS: NOT FOR CONSTRUCTION

Geoconsult

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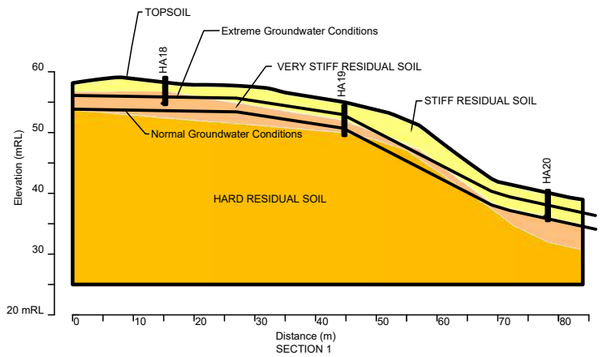
PROJECT: 438 KOMOKORIKI LTD
PROPOSED SUBDIVISION

SITE: LOT 2 DP 349782
KOMOKORIKI HILL ROAD

TITLE: SITE PLAN

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
1 : 1000	MAR 2022	JM	PW
SHEET NO:	DRAWING NO:		REVISION:
1 OF 1	GL225.1/1		-



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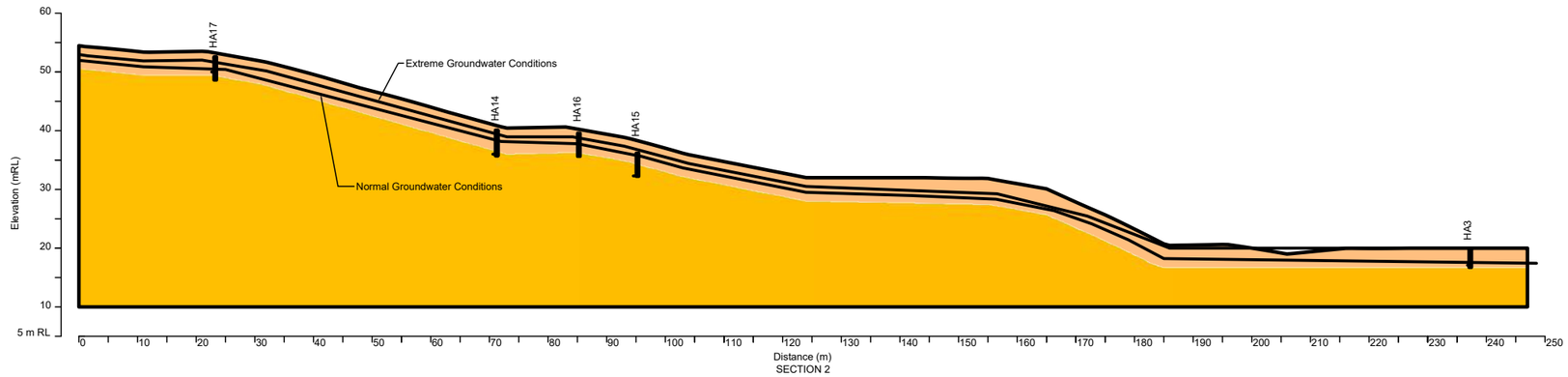
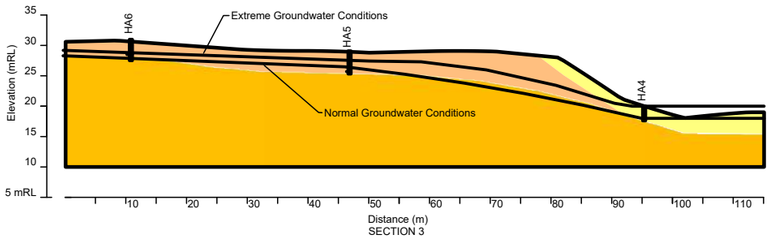


SECTION 2



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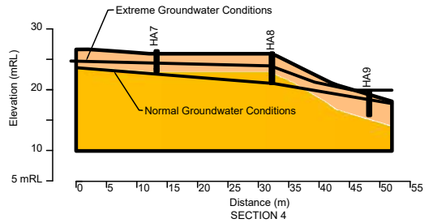

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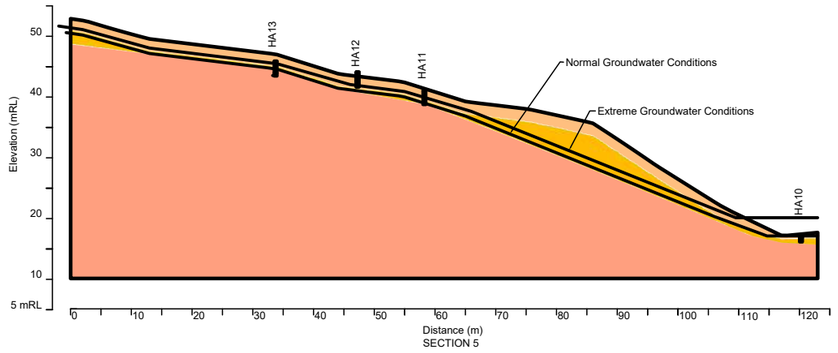

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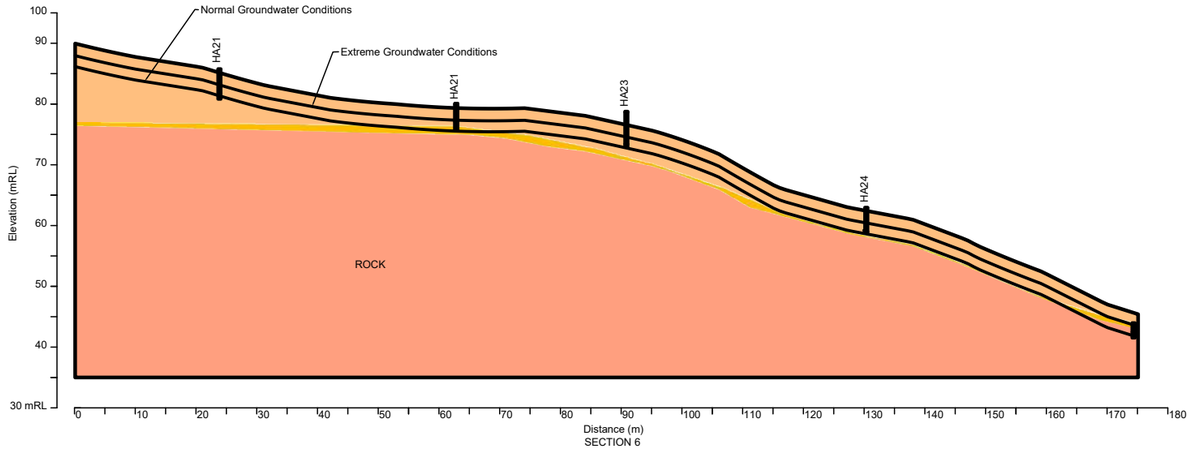

SECTION 6

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SKETCH REVISIONS

REV	DATE	DESCRIPTION
0	03.07.19	First Issue

	DATE	INITIAL
DRAWN	03.07.19	M.A
SKETCH CHECK	03.07.19	

CLIENT / PROJECT

SKETCH TITLE

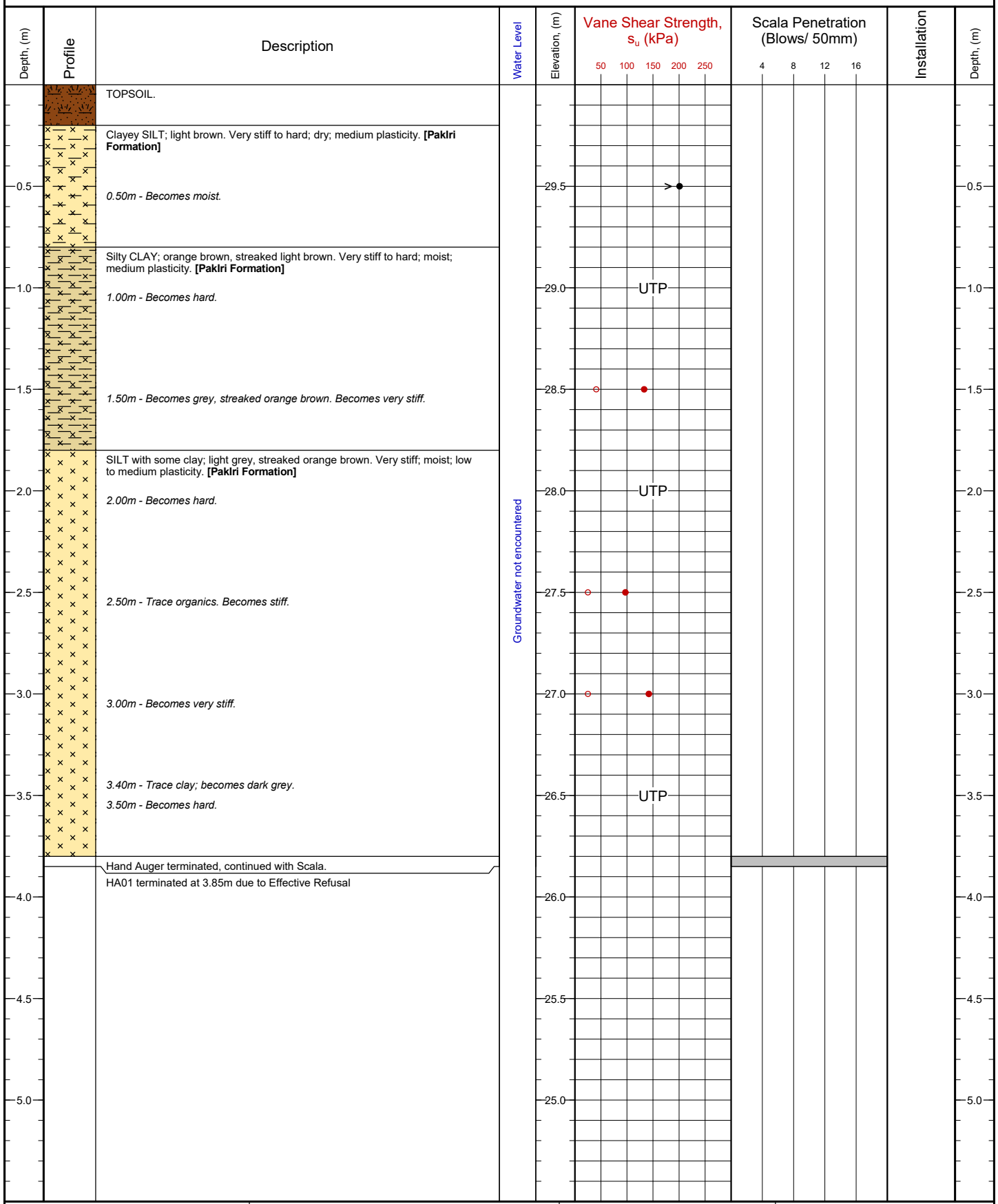
BK & MC Scott Farms LTD Geological Cross Sections
Proposed Subdivision
Komokoriki Hill Road

SCALE

1:1000

SKETCH NO.	SHEET NO.	REV.
GL225/2	02	0

HAND AUGER LOG



Project: Komokoriki Hill Road	**NZTM 2000 N,E (m):** 5961354.00, 1734834.00	**Logged By:** TK (17/03/2022)	**Hand Auger Number:**
Location: Makarau 0981, New Zealand	**Location Method:** Handheld GPS	**Checked By:** ROT (1/04/2022)	**HA01**
	Elevation (m): 30.00	**Client Ref:** GL225.1	
	Final Depth (m): 3.85	**G.I. Job Ref:** 220225	

Comments:

HAND AUGER LOG

Depth (m)	Description
0.0	TOPSOIL.
0.0	Clayey SILT; light brown. Very stiff; dry; medium plasticity. **[Paklri Formation]**
0.5	*0.50m - Becomes very stiff to hard.*
1.5	*1.50m - Becomes stiff.*
2.0	Sandy SILT with some clay; dark orange brown. Medium dense; moist; sand, medium. **[Paklri Formation]**
2.2	SILT with trace clay; grey. Dense; moist; non-plastic. **[Paklri Formation]**
2.2	Hand Augers terminated, continued with Scala.
2.3	HA02 terminated at 2.30m due to Effective refusal

Water Level: Groundwater not encountered

Elevation (m): 45.5, 45.0, 44.5, 44.0, 43.5, 43.0, 42.5, 42.0, 41.5, 41.0

Vane Shear Strength, s_u (kPa): 50, 100, 150, 200, 250

Scala Penetration (Blows/ 50mm): 4, 8, 12, 16

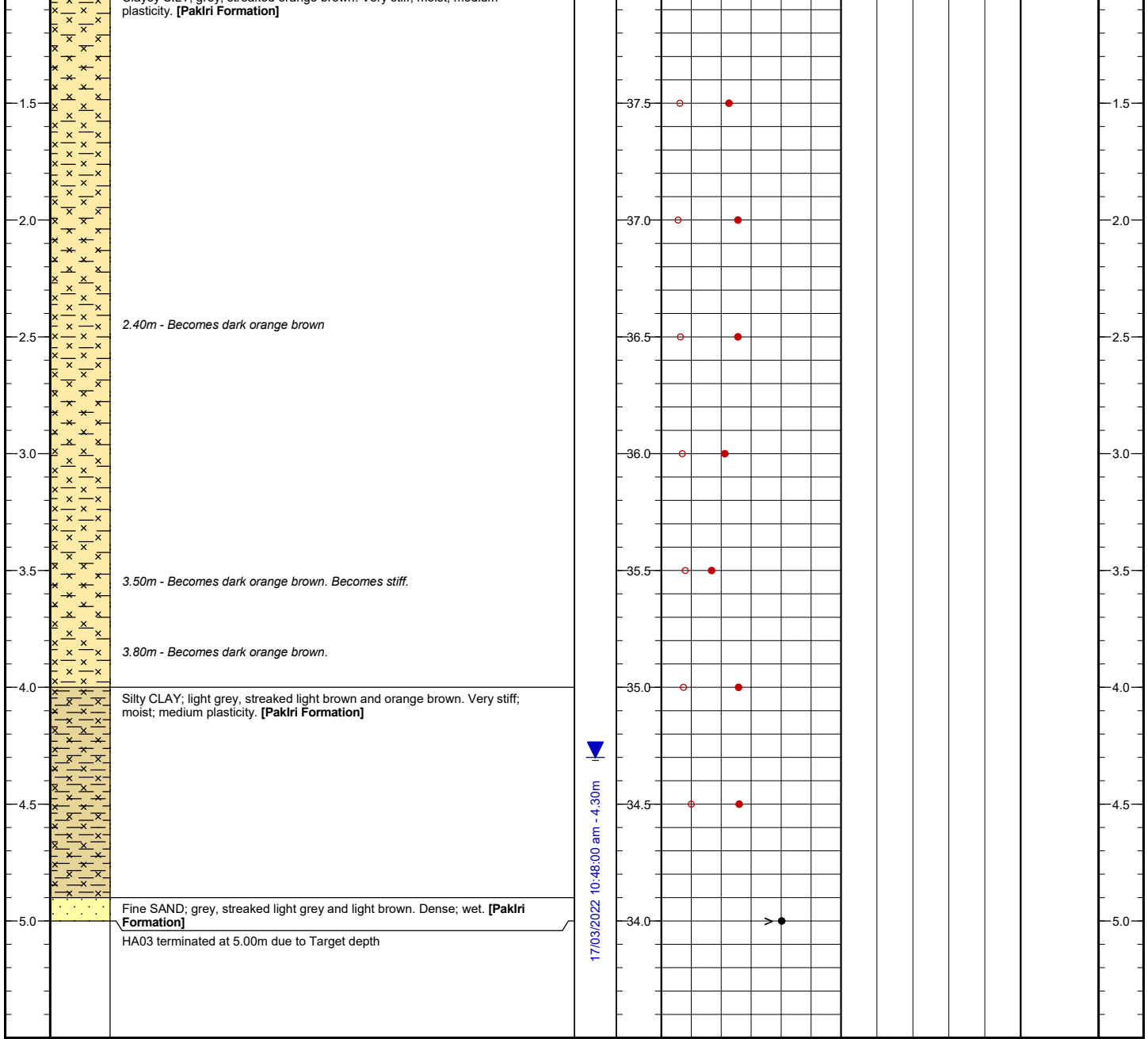
Installation

Depth (m): 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0

Project: Komokoriki Hill Road	**NZTM 2000 N,E (m):** 5961367.00, 1734713.00	**Logged By:** AG (17/03/2022)	**Hand Auger Number:**
	Location Method: Handheld GPS	**Checked By:** ROT (1/04/2022)	**HA02**
Location: Makarau 0981, New Zealand	**Elevation (m):** 46.00	**Client Ref:** GL225.1	
	Final Depth (m): 2.30	**G.I. Job Ref:** 220225	

Comments:

HAND AUGER LOG



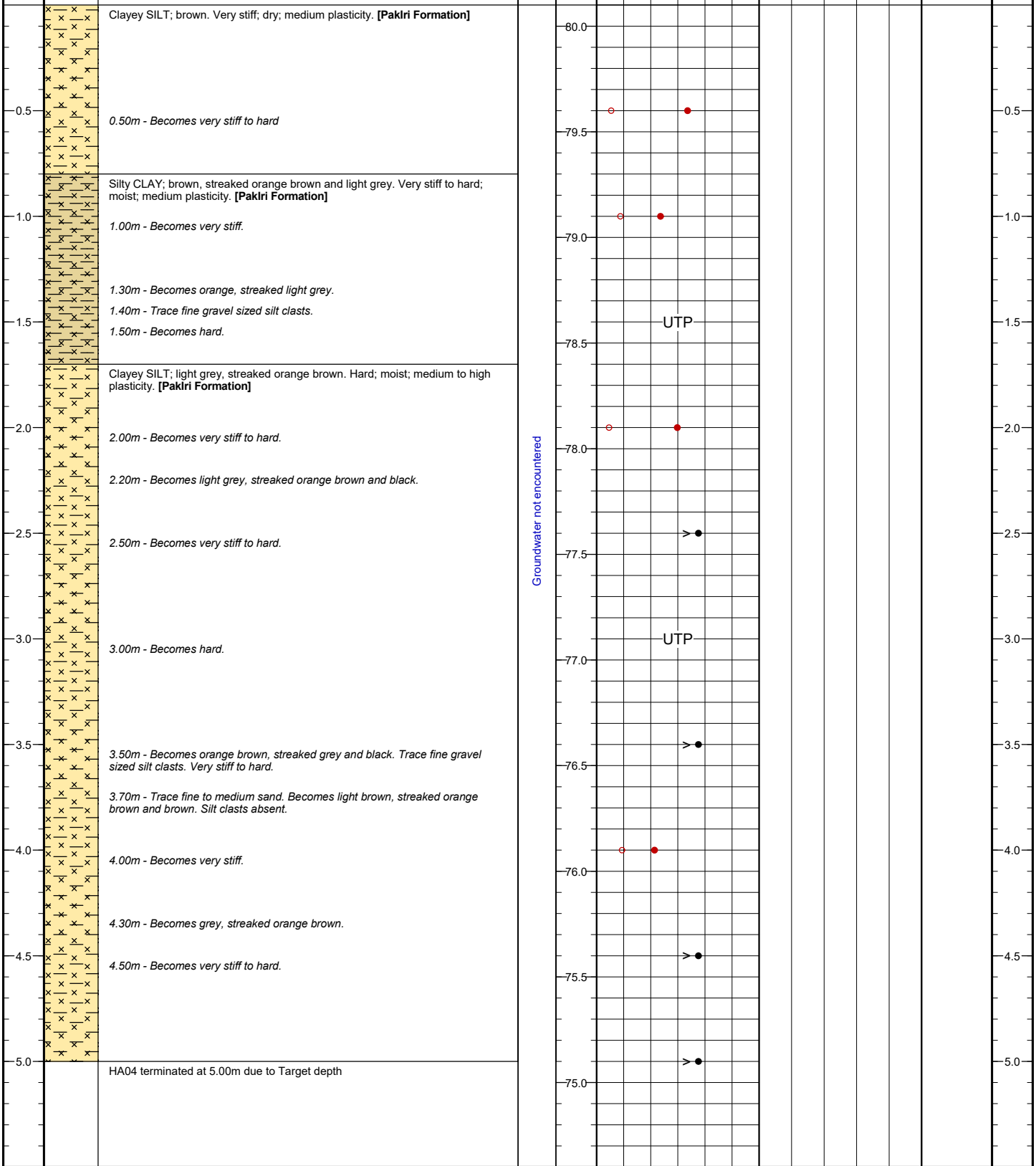
Project: Komokoriki Hill Road	**NZTM 2000 N,E (m):** 5961430.00, 1734804.00	**Logged By:** TK (17/03/2022)	**Hand Auger Number:**
Location: Makarau 0981, New Zealand	**Location Method:** Handheld GPS	**Checked By:** ROT (1/04/2022)	**HA03**
	Elevation (m): 39.00	**Client Ref:** GL225.1	
	Final Depth (m): 5.00	**G.I. Job Ref:** 220225	

Comments:

HAND AUGER LOG

Geoconsult

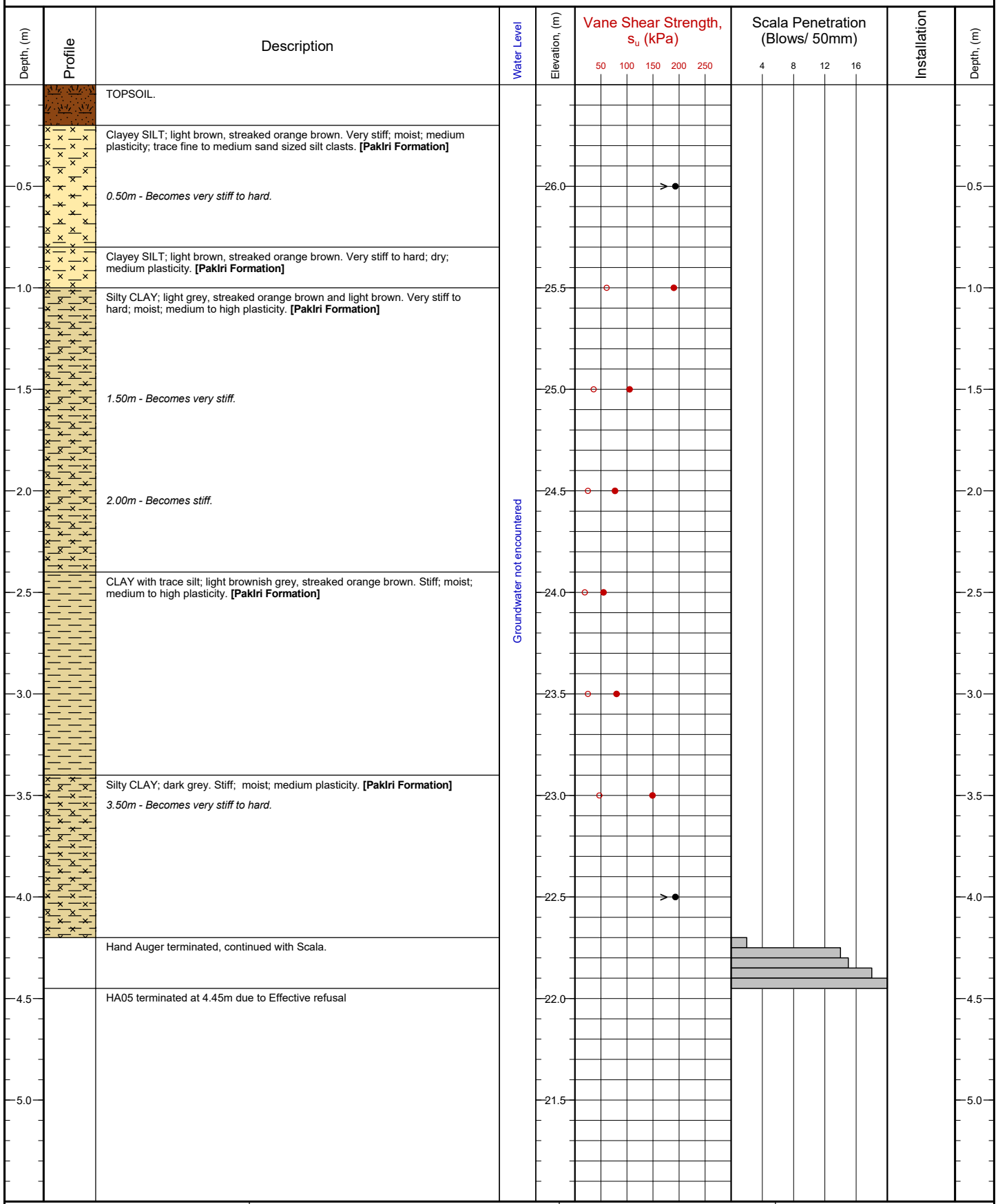
GROUND INVESTIGATION



Project: Komokoriki Hill Road	**NZTM 2000 N,E (m):** 5961424.00, 1734603.00	**Logged By:** YC (17/03/2022)	**Hand Auger Number:**
Location: Makarau 0981, New Zealand	**Location Method:** Handheld GPS	**Checked By:** ROT (1/04/2022)	**HA04**
	Elevation (m): 80.10	**Client Ref:** GL225.1	
	Final Depth (m): 5.00	**G.I. Job Ref:** 220225	

Comments:

HAND AUGER LOG



Project: Komokoriki Hill Road	**NZTM 2000 N,E (m):** 5961274.00, 1734826.00	**Logged By:** AG (17/03/2022)	**Hand Auger Number:**
Location: Makarau 0981, New Zealand	**Location Method:** Handheld GPS	**Checked By:** ROT (1/04/2022)	**HA05**
	Elevation (m): 26.50	**Client Ref:** GL225.1	
	Final Depth (m): 4.45	**G.I. Job Ref:** 220225	

Comments:

INDEX TESTING SUMMARY

Borehole Number	Testing Depth, (m)	SHEAR STRENGTH TESTING				LABORATORY TESTING					Remarks
		Pocket Penetrometer, (kPa)	Hand Shear Vane			Natural Moisture Content, (%)	Atterberg Limits			Linear Shrinkage, (%)	
			Peak, (kPa)	Remoulded, (kPa)	Sensitivity		Liquid Limit, (%)	Plastic Limit, (%)	Plasticty Index		
HA01	0.50		201+								
HA01	0.75					38	63	37	26	11	
HA01	1.00		UTP								
HA01	1.50		133	41	3.24						
HA01	2.00		UTP								
HA01	2.50		97	25	3.88						
HA01	3.00		142	25	5.68						
HA01	3.50		UTP								
HA02	0.50		193+								
HA02	0.75					26	92	37	55	21	
HA02	1.00		193+								
HA02	1.50		74	44	1.68						
HA03	0.50		141	18	7.83						
HA03	0.75					33	110	37	73	17	
HA03	1.00		101	41	2.46						
HA03	1.50		113	31	3.65						
HA03	2.00		128	28	4.57						
HA03	2.50		128	32	4.00						
HA03	3.00		106	35	3.03						
HA03	3.50		84	40	2.10						
HA03	4.00		129	37	3.49						
HA03	4.50		130	50	2.60						
HA03	5.00		201+								
HA04	0.50		168	27	6.22						
HA04	0.75					29	95	39	56	18	
HA04	1.00		118	44	2.68						
HA04	1.50		UTP								

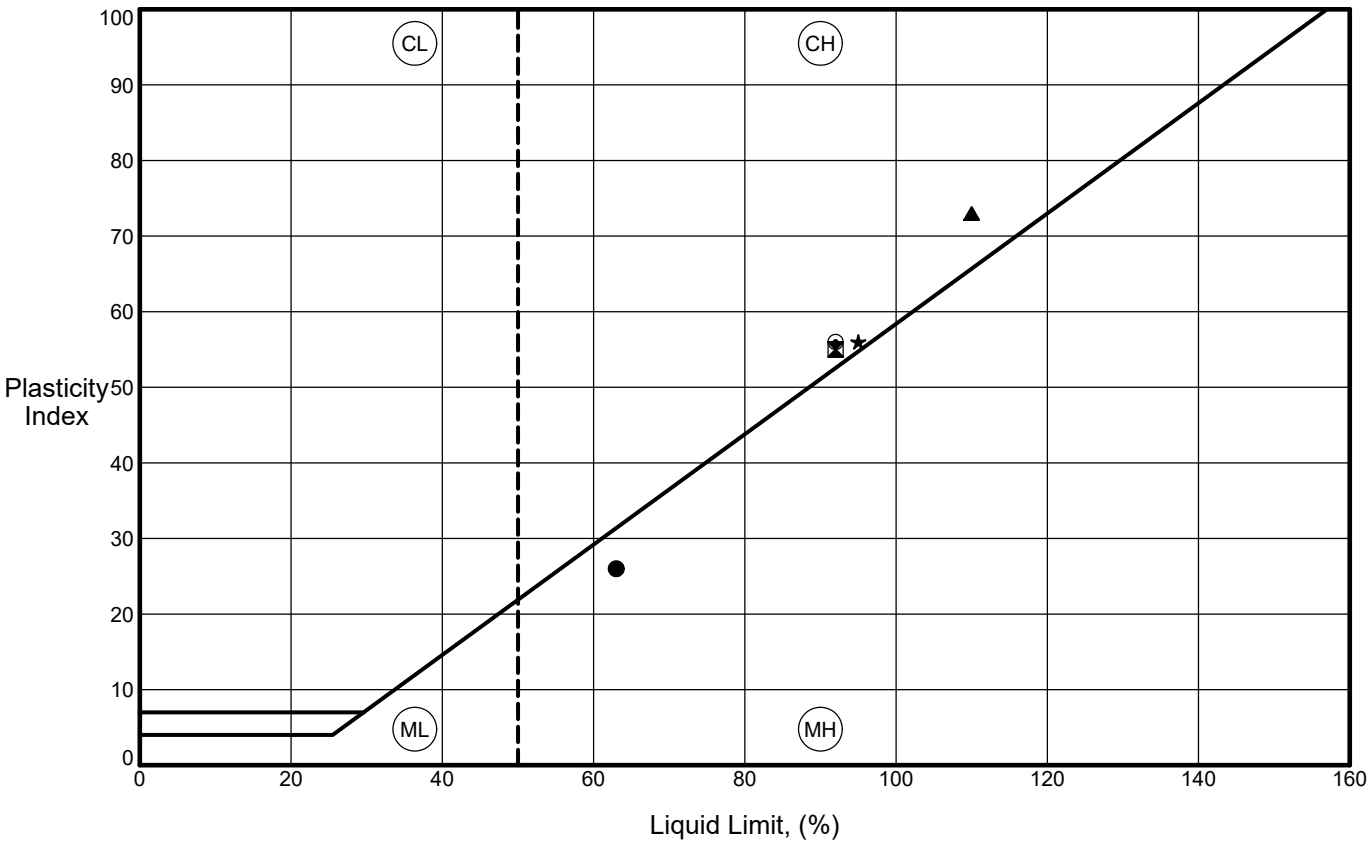
Location: Makarau 0981, New Zealand
Client: Geoconsult
Engineer: Jacob Malamatenios
G.I. Job Ref: 220225
Project: Komokoriki Hill Road

INDEX TESTING SUMMARY

Borehole Number	Testing Depth, (m)	SHEAR STRENGTH TESTING				LABORATORY TESTING					Remarks
		Pocket Penetrometer, (kPa)	Hand Shear Vane			Natural Moisture Content, (%)	Atterberg Limits			Linear Shrinkage, (%)	
			Peak, (kPa)	Remoulded, (kPa)	Sensitivity		Liquid Limit, (%)	Plastic Limit, (%)	Plasticty Index		
HA04	2.00		149	23	6.48						
HA04	2.50		188+								
HA04	3.00		UTP								
HA04	3.50		188+								
HA04	4.00		107	47	2.28						
HA04	4.50		188+								
HA04	5.00		188+								
HA05	0.50		193+								
HA05	0.75					26	92	36	56	17	
HA05	1.00		190	61	3.11						
HA05	1.50		105	36	2.92						
HA05	2.00		77	25	3.08						
HA05	2.50		55	19	2.89						
HA05	3.00		80	25	3.20						
HA05	3.50		149	47	3.17						
HA05	4.00		193+								

Location: Makarau 0981, New Zealand
Engineer: Jacob Malamatenios
G.I. Job Ref: 220225
Client: Geoconsult
Project: Komokoriki Hill Road

ATTERBERG LIMITS & LINEAR SHRINKAGE TESTING



CL: CLAY, low liquid limit
ML: SILT, low liquid limit
CH: CLAY, high liquid limit
MH: SILT, high liquid limit

Borehole Number	Depth, (m)	Moisture Content, (%)	Liquid Limit, (%)	Plastic Limit, (%)	Plasticity Index	Linear Shrinkage, (%)
● HA01	0.75	38	63	37	26	11
⊠ HA02	0.75	26	92	37	55	21
▲ HA03	0.75	33	110	37	73	17
★ HA04	0.75	29	95	39	56	18
⊙ HA05	0.75	26	92	36	56	17

The chart and soil classification terminology above is for reference only; it is taken from ASTM D2487-17 "Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classicisation System)", January 2018 which are based on the classification scheme developed by A. Casagrande in the 1940's (Casagrande, A., 1948: Classification and identification of soil. Transactions of the American Society of Civil Engineers, v113, p.901-930).

Project:	Komokoriki Hill Road	**G.I. Job Ref:**	220225	**Client:**	Geoconsult
Location:	Makarau 0981, New Zealand	**Client Ref:**	GL225.1	**Engineer:**	Jacob Malamatenios

BOREHOLE LOG

Geoconsult GEOTECHNICAL CONSULTANTS

Borehole No **HA01**

Sheet 1 of 1

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: AA
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: AA
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734985.10 - 5961468.30	Level: 19.90 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
		TOPSOIL.								
		SILT, trace fine sand, orange brown and brown. Very stiff, moist to wet. [Pakiri Formation]	0.20		19.70	200+				
1		*At 1m becoming orange brown streaked light grey, wet.*				200+				1
						168	73	2		
2						134	55	2		2
		At 2.1m becoming orange brown streaked light grey and brown.				146	61	2		
3						134	58	2		3
		At 3.3m becoming grey, saturated.				128	44	3		
		At 3.8m becoming grey streaked orange brown.								
4		End of borehole at 4.00 m	4.00		15.90	105	46	2		4

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
No groundwater encountered.
End of borehole at target depth.

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BOREHOLE LOG

Geoconsult GEOTECHNICAL CONSULTANTS

Borehole No **HA02**

Sheet 1 of 1

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: AA
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: AA
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734976.50 - 5961445.40	Level: 19.90 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Soil Description	Depth (m)	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
	TOPSOIL.							
	SILT trace fine sand, orange brown and grey. Very stiff, moist. [Pakiri Formation]	0.20	19.70					
				134	58	2		
1				160	58	3		1
	At 1.1m becoming light grey streaked orange brown, wet.							
				130	58	2		
	Clayey SILT, light grey streaked orange brown. Very stiff, wet, low plasticity. [Pakiri Formation]	1.70	18.20					
2				131	61	2		2
	Silty CLAY, orange brown streaked light grey. Very stiff, wet, high plasticity. [Pakiri Formation]	2.30	17.60					
	Clayey SILT, trace fine sand, dark grey. Stiff, wet, low plasticity. [Pakiri Formation]	2.50	17.40	73	29	3		
3				58	29	2		3
	At 3.5m becoming hard.			UTP				
	End of borehole at 3.80 m	3.80	16.10					
4				UTP				4

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
Groundwater measured at 1.3m on completion of borehole
End of borehole, too hard to auger further.

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BOREHOLE LOG

Geoconsult GEOTECHNICAL CONSULTANTS

Borehole No **HA03**

Sheet 1 of 1

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: AA
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: AA
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734955.70 - 5961457.80	Level: 20.00 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
		TOPSOIL.								
		SILT trace fine sand, orange brown mixed orange. Very stiff, moist. [Pakiri Formation]	0.20		19.80					
						172	73	2		
1						200+				1
		At 1.2m becoming light grey streaked orange brown.								
		At 1.4m becoming light grey streaked orange brown and black.				200+				
		At 1.8m becoming light grey streaked orange brown, brown and black.								
2						134	66	2		2
		Clayey SILT, orange brown streaked light grey speckled black. Very stiff, wet, low plasticity. [Pakiri Formation]	2.10		17.90					
		At 2.2m becoming light grey streaked orange brown.								
						146	41	4		
		At 2.8m minor fine sand.								
			2.90	▼	17.10					
3		Sandy SILT, bluish grey. Very stiff, saturated. [Pakiri Formation]				114	36	3		3
		SILT, dark grey. Hard. [Pakiri Formation]	3.10		16.90					
		End of borehole at 3.30 m	3.30		16.70	UTP				
4										4

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
Groundwater measured at 2.9m on completion of borehole
End of borehole, too hard to auger further.

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BOREHOLE LOG

Geoconsult GEOTECHNICAL CONSULTANTS

Borehole No **HA04**

Sheet 1 of 1

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: MA
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: MA
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734890.80 - 5961335.34	Level: 20.00 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
		SILT, dark brown. Moist to wet, low plasticity. Trace rootlets. [TOPSOIL]								
		SILT, brown. Stiff, moist to wet, low plasticity. [Pakiri Formation]	0.20		19.80	71	31	2		
1		Silty SAND fine to medium, grey brown, orange brown. Wet to saturated. [Pakiri Formation]	0.90		19.10	54	29	2		1
		At 1.4m becomes greenish grey.				57	29	2		
2		*At 2m becomes brownish grey with orange mottles.*								2
		End of borehole at 2.40 m	2.40		17.60					
3										3
4										4

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
No groundwater encountered.
End of borehole due to refusal.

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BOREHOLE LOG

Geoconsult GEOTECHNICAL CONSULTANTS

Borehole No **HA05**

Sheet 1 of 1

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: AA
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: AA
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734840.00 - 5961340.90	Level: 29.10 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Soil Description	Depth (m)	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
	TOPSOIL.							
	Clayey SILT trace fine sand, orange brown mixed brown. Very stiff, dry to moist, low plasticity. [Pakiri Formation]	0.20	28.90	146	87	2		
1				139	80	2		1
	SILT, light grey streaked orange brown. Very stiff, wet. [Pakiri Formation]	1.10	28.00	182	66	3		
2				120	73	2		2
	At 2.2m minor fine sand.							
	At 2.5m trace fine gravel sized silt clasts.			175	44	4		
3				109	66	2		3
	At 3.4m becoming dark grey.			200+				
	End of borehole at 3.80 m	3.80	25.30	UTP				
4								4

Groundwater

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
Groundwater measured at 3.4m on completion of borehole
End of borehole, too hard to auger further.

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BOREHOLE LOG

Geoconsult GEOTECHNICAL CONSULTANTS

Borehole No **HA06**

Sheet 1 of 1

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: AA
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: AA
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734804.10 - 5961335.90	Level: 31.00 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
		TOPSOIL.								
		Clayey SILT trace fine sand, orange brown streaked brown. Very stiff, dry to moist, low plasticity. [Pakiri Formation]	0.20		30.80	168	58	3		
		At 0.8m becoming orange brown streaked brown and black.								
		At 0.9m becoming brown streaked limonite and black.								
1		*At 1.1m becoming orange brown streaked light grey.*				200+				1
		SILT, trace fine sand, light grey streaked black, pink and orange brown. Very stiff, wet. [Pakiri Formation]	1.30		29.70	200+				
2		*At 2.3m becoming dark orange streaked black, water seepage.*				146	41	4		2
		At 2.5m becoming light grey streaked dark grey and grey.		▼		200+				
		At 2.8m minor fine sand.								
3		*At 3.2m becoming dark orange streaked dark brown.*								3
		At 3.3m dark grey, very stiff to hard.								
		End of borehole at 3.50 m	3.50		27.50	UTP				
4										4

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
Groundwater measured at 2.5m on completion of borehole
End of borehole, too hard to auger further.

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BOREHOLE LOG

Geoconsult GEOTECHNICAL CONSULTANTS

Borehole No **HA07**

Sheet 1 of 1

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: JM
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: JM
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734810.00 - 5961284.60	Level: 26.50 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
		TOPSOIL.								
		SILT, orange brown. Very stiff, dry to moist. [Pakiri Formation]	0.20		26.30					
		Clayey SILT, orange brown. Very stiff, dry to moist, low plasticity. [Pakiri Formation]	0.50		26.00	210+				
1		Silty CLAY, light grey streaked orange brown. Very stiff, moist, high plasticity. [Pakiri Formation]	0.90		25.60	153	64	2		1
		Clayey SILT, trace fine sand, light grey streaked orange brown. Very stiff, moist, low plasticity. [Pakiri Formation]	1.10		25.40					
		At 1.5m minor fine sand.				137	58	2		
		SILT, minor fine sand, light grey streaked orange brown. Very stiff, moist. [Pakiri Formation]	1.70		24.80					
2		*At 1.8m becoming orange brown streaked light grey.* *At 2m becoming dark orange brown streaked light grey.*				115	38	3		2
		At 2.3m sand absent.								
		Clayey SILT, light grey streaked orange brown. Very stiff, moist, low plasticity. [Pakiri Formation]	2.40		24.10	153	37	4		
		SILT, trace fine sand, light grey streaked orange brown. Very stiff, moist. [Pakiri Formation]	2.60		23.90					
3		*At 2.9m becoming dark orange brown, some fine to medium gravel (limonite), groundwater seepage.* *At 3m becoming dark grey, sand and gravel absent.*				UTP				3
		End of borehole at 3.50 m	3.50		23.00	UTP				
4										4

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
No groundwater encountered.
End of borehole, too hard to auger further.

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Geoconsult GEOTECHNICAL CONSULTANTS

BOREHOLE LOG

Borehole No **HA08**

Sheet 1 of 2

Project:	Proposed Rural Subdivision			Project No:	GL225
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki			Date Drilled:	19-06-2019
Client:	BK & MC Scott Farms Limited			Hole Type:	HA
Coords:	1734839.65 - 5961260.90	Level:	26.10 m AOD	Hole Diameter:	50mm

Drilled:	ZM
Logged:	ZM
Checked:	MA
Scale	1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
		TOPSOIL.	0.10		26.00					
		SILT, some fine sand, orange brown. Very stiff, moist. [Pakiri Formation]								
		At 0.5m becoming orange brown streaked light grey and light brown.				188	40	5		
		At 0.8m becoming moist to wet.								
1		*At 1m becoming orange brown streaked light grey.*				104	31	3		1
						103	33	3		
		At 1.8m sand absent.								
2		*At 2m becoming light grey streaked orange brown.*				131	33	4		2
		At 2.5m trace fine sand.				145	30	5		
3		*At 2.9m becoming orange brown streaked dark brown and light grey, minor fine to medium limonite.*				190+				3
		At 3.2m becoming light grey streaked orange brown, limonite gravel absent.				190+				
4						190+				4
		Sandy SILT, orange brown mottled dark orange brown. Very stiff, wet. [Pakiri Formation]	4.10		22.00					
						190+				
		Continued on next sheet								

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
No groundwater encountered.
End of borehole at target depth.

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BOREHOLE LOG

Geoconsult GEOTECHNICAL CONSULTANTS

Borehole No **HA08**

Sheet 2 of 2

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: ZM
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: ZM
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734839.65 - 5961260.90	Level: 26.10 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
5		End of borehole at 5.00 m	5.00		21.10	159	40	4		5
6										6
7										7
8										8
9										9

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
No groundwater encountered.
End of borehole at target depth.

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BOREHOLE LOG

Borehole No **HA09**

Sheet 1 of 1

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: JM
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: JM
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734832.00 - 5961246.00	Level: 19.80 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
		TOPSOIL.	0.10		19.70					
		SILT, orange brown. Very stiff, moist, low plasticity. [Pakiri Formation]				107	31	3		
		At 0.8m becoming dry to moist.								
1						107	43	2		1
		At 1.1m trace fine sand.								
		At 1.2m trace fine to coarse gravel sized silt clasts.								
		At 1.4m some fine sand, silt clasts absent.				210+				
		At 1.8m trace fine sand, becoming light grey streaked dark orange brown.								
2		*At 2m becoming grey brown, minor fine sand.*				210+				2
		At 2.2m becoming light grey streaked dark orange brown.								
		Sandy SILT, grey brown. Very stiff, wet. [Pakiri Formation]	2.40		17.40	210+				
		SILT trace fine sand, light grey streaked dark orange brown. Very stiff, dry to moist. [Pakiri Formation]	2.80		17.00					
3		*At 3m intermittant layers of grey brown sandy silt and light gey streaked dark orange brown silt.*				156	55	3		3
		At 3.6m becoming dark orange brown, some fine to medium limonite gravel.				137	40	3		
		At 3.8m becoming light brown mottled dark orange brown, hard.								
4		End of borehole at 4.00 m	4.00		15.80	UTP				4

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
No groundwater encountered.
End of borehole, too hard to auger further.

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BOREHOLE LOG

Borehole No **HA10**

Sheet 1 of 1

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: ZM
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: ZM
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734729.43 - 5961304.27	Level: 17.20 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
		Clayey SILT, trace fine sand, orange brown mottled light grey and grey brown. Very stiff, moist to wet, low plasticity. [Pakiri Formation]								
		SILT, minor fine to medium sand and fine limonite gravel. Hard, moist. [Pakiri Formation]	0.50		16.70	UTP				
1						UTP				1
		End of borehole at 1.20 m	1.20		16.00	UTP				
2										2
3										3
4										4

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
No groundwater encountered.
End of borehole, too hard to auger further.

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BOREHOLE LOG

Borehole No **HA11**

Sheet 1 of 1

Project:	Proposed Rural Subdivision			Project No:	GL225
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki			Date Drilled:	19-06-2019
Client:	BK & MC Scott Farms Limited			Hole Type:	HA
Coords:	1734722.81 - 5961342.70	Level:	41.00 m AOD	Hole Diameter:	50mm

Drilled:	ZM										
Logged:	ZM										
Checked:	MA										
Scale	1:25										

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
		TOPSOIL.								
		SILT, trace fine sand, orange brown. Very stiff, moist. [Pakiri Formation]	0.15		40.85					
		Clayey SILT, orange brown streaked light grey. Very stiff, moist, low plasticity. [Pakiri Formation]	0.50		40.50	145	48	3		
		At 0.8m minor fine sand.								
1						147	37	4		1
		SILT, light grey streaked orange brown. Very stiff, moist to wet. [Pakiri Formation]	1.20		39.80					
		At 1.5m minor fine sand.				155	30	5		
		At 1.8m sand absent.								
2		Fine Sandy SILT, light grey mottled orange brown and light brown. Hard, moist. [Pakiri Formation]	2.00		39.00	UTP				2
		End of borehole at 2.40 m	2.40		38.60	UTP				
3										3
4										4

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
No groundwater encountered.
End of borehole, too hard to auger further.

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BOREHOLE LOG

Borehole No **HA12**

Sheet 1 of 1

Project:	Proposed Rural Subdivision			Project No:	GL225
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki			Date Drilled:	19-06-2019
Client:	BK & MC Scott Farms Limited			Hole Type:	HA
Coords:	1734698.20 - 59661346.90	Level:	44.00 m AOD	Hole Diameter:	50mm

Drilled:	ZM
Logged:	ZM
Checked:	MA
Scale	1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
		TOPSOIL.	0.10		43.90					
		SILT, minor fine sand, light brown mottled dark orange brown grey brown and light grey. Very stiff, moist. [Pakiri Formation]								
		At 0.4m becoming orange brown streaked light grey and black.				111	37	3		
		Clayey SILT, orange brown streaked light grey. Very stiff, moist, low plasticity. [Pakiri Formation]	0.60		43.40					
1						122	56	2		1
		SILT, minor fine to medium sand, orange brown streaked light grey and dark orange brown. Very stiff, moist to wet. [Pakiri Formation]	1.30		42.70					
		At 1.5m becoming light grey streaked orange brown and black.				190+				
		At 1.7m some fine sand.								
		Fine Sandy SILT, grey streaked orange brown. Hard, moist. [Pakiri Formation]	1.90		42.10					
2						UTP				2
		SILT, trace fine sand, grey mottled orange brown. Hard, moist to wet. [Pakiri Formation]	2.30		41.70					
		At 2.4m becoming dark grey streaked orange brown.	2.50		41.50	UTP				
		End of borehole at 2.50 m								
3										3
4										4

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
No groundwater encountered.
End of borehole, too hard to auger further.

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BOREHOLE LOG

Borehole No **HA13**

Sheet 1 of 1

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: ZM
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: ZM
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734720.56 - 5961367.67	Level: 45.80 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
		TOPSOIL.	0.10		45.70					
		SILT, trace fine to medium sand and fine limonite gravel, orange brown streaked grey light brown. Very stiff, moist. [Pakiri Formation]				159	57	3		
		Clayey SILT, trace fine limonite gravel, orange brown streaked orange brown. Very stiff, moist to wet, high plasticity. [Pakiri Formation]	0.60		45.20					
		At 0.8m some fine to medium limonite gravel.								
1		*At 1m limonite gravel absent.*				150	46	3		1
		SILT, trace fine sand, orange brown streaked light grey and black. Very stiff, moist to wet. [Puketoka Formation]	1.20		44.60					
		At 1.3m minor fine to medium limonite gravel.				159	26	6		
		At 1.8m becoming light grey streaked orange brown and black.								
2						190+				2
		At 2.3m becoming dark grey, limonite gravel absent, hard.								
		At 2.4m ground water seepage.								
		End of borehole at 2.50 m	2.50		43.30	UTP				
3										3
4										4

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
Groundwater measured at 2.4m on completion of borehole
End of borehole, too hard to auger further.

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BOREHOLE LOG

Borehole No **HA14**

Sheet 1 of 1

Project:	Proposed Rural Subdivision			Project No:	GL225
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki			Date Drilled:	19-06-2019
Client:	BK & MC Scott Farms Limited			Hole Type:	HA
Coords:	1734793.80 - 5961416.90	Level:	40.10 m AOD	Hole Diameter:	50mm

Drilled:	AA
Logged:	AA
Checked:	MA
Scale	1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
		TOPSOIL.								
		Clayey SILT, trace fine sand, orange brown streaked brown. Very stiff, dry to moist, low plasticity. [Pakiri Formation]	0.20		39.90					
		At 0.4m becoming orange brown streaked orange, moist.				128	64	2		
1						109	47	2		1
		SILT, light grey streaked orange brown. Very stiff, wet. [Pakiri Formation]	1.10		39.00					
		At 1.2m becoming light grey streaked orange brown and limonite, minor fine sand.				146	44	3		
2						124	44	3		2
		At 2.4m becoming light grey streaked orange brown.				124	36	3		
		2.8-2.9m limonite horizon.								
3		*At 3m becoming dark orange streaked dark brown.*				160	66	2		3
		At 3.2m minor fine sand.								
		At 3.4m sand absent.				182	73	2		
		At 3.8m becoming dark orange with brown streaks.								
4				▼		198	44	5		4
		At 4.3m becoming dark grey, hard.								
		End of borehole at 4.40 m	4.40		35.70	UTP				

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
Groundwater measured at 4.1m on completion of borehole
End of borehole, too hard to auger further.

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BOREHOLE LOG

Geoconsult GEOTECHNICAL CONSULTANTS

Borehole No **HA15**

Sheet 1 of 1

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: MA
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: MA
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734816.70 - 5961424.50	Level: 36.20 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
		SILT, dark brown, minor fine sand. Moist to wet, low plasticity. Trace rootlets. [TOPSOIL.]	0.10		36.10					
		Clayey SILT, mottled orange brown and grey brown. Very stiff, moist, low plasticity. [Pakiri Formation]				179	67	3		
1						112	65	2		1
						145	41	4		
		At 1.7m becomes grey with orange brown mottles.								
2		Fine Sandy SILT, mottled brown and orange. Very stiff, moist to wet. [Pakiri Formation]	2.00		34.20	145	47	3		2
		Silty CLAY, brown grey. Very stiff, moist. [Pakiri Formation]	2.40		33.80	187	67	3		
3		Fine Sandy SILT, orange brown with pockets of orange. Very stiff to hard, moist to wet, low plasticity. [Pakiri Formation]	3.00		33.20	114	71	2		3
		Clayey SILT minor fine sand, brown grey. Very stiff to hard, moist. [Pakiri Formation]	3.50		32.70	220+				
4		End of borehole at 4.00 m	4.00		32.20	188	97	2		4

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
Groundwater measured at 3.9m on completion of borehole
End of borehole at target depth.

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BOREHOLE LOG

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Borehole No **HA16**

Sheet 1 of 1

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: MA
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: MA
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734804.10 - 5961443.20	Level: 39.60 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
	SILT, brown with red brown streaks. Moist, low plasticity. Trace rootlets. [TOPSOIL]								
		0.30		39.30					
	Clayey SILT, mottled orange brown and grey brown. Stiff to very stiff, moist to wet, low plasticity. [Pakiri Formation]				135	50	3		
1					96	42	2		1
	At 1.4m becomes orange stained , some fine sand, moist to wet.				97	39	2		
	At 1.6m absent of sand, grey with orange brown mottles, moist.								
2	Fine to medium Sandy SILT, mottled brown orange, moist. [Pakiri Formation]	2.00		37.60	88	34	3		2
		2.30		37.30					
	Clayey SILT, grey with orange mottles. Stiff to very stiff, moist, low plasticity. [Pakiri Formation]				86	34	3		
	At 2.9m absent of sand.								
3					161	71	2		3
	At 3.3m some fine sand, stained orange.				91	36	3		
		3.90		35.70					
4	SILT, brown grey. Moist, low plasticity. [Pakiri Formation]	4.00		35.60	UTP				4
	End of borehole at 4.00 m								

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
No groundwater encountered.
End of borehole at target depth.

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BOREHOLE LOG

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Borehole No **HA17**

Sheet 1 of 1

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: AA
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: AA
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734743.50 - 5961431.50	Level: 52.60 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
		TOPSOIL.								
		Clayey SILT, trace fine sand, orange brown mixed brown. Very stiff, dry to moist, low plasticity. [Pakiri Formation]	0.20		52.40					
		At 0.5m becoming moist, dark brown streaks.				131	66	2		
		At 0.9m limonite clasts.								
1						194	36	5		1
		SILT, light grey speckled brown black. Very stiff, wet. [Pakiri Formation]	1.20		51.40					
		At 1.3m becoming light grey streaked light orange black dark brown and limonite.				200+				
		At 1.9m becoming light grey streaked black.								
2		*At 2m becoming light grey streaked orange brown, wet.*				175	55	3		2
		At 2.4m becoming wet to saturated.								
				▼		190	44	4		
3						190	34	6		3
		At 3.3m becoming light grey streaked limonite and orange.								
						190	44	4		
4		End of borehole at 4.00 m	4.00		48.60	200+				4

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
Groundwater measured at 2.6m on completion of borehole
End of borehole at target depth.

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BOREHOLE LOG

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Borehole No **HA18**

Sheet 1 of 1

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: MA
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: MA
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734724.02 - 5961446.95	Level: 59.10 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
		SILT, light brown. Very stiff, moist. [TOPSOIL]	0.10		59.00					
		SILT, light brown. Very stiff, moist, low plasticity. [Pakiri Formation]				179	75	2		
		Clayey SILT, mottled orange brown and grey brown. Stiff to very stiff, moist, low plasticity. [Pakiri Formation]	0.70		58.40					
1		*At 1m with some fine to medium sand.*				99	50	2		1
		At 1.4m becomes grey brown with orange mottles.				220+				
		At 1.6m orange staining.								
		Sandy SILT, grey brown with orange stained mottles. Very stiff to hard, moist to wet. [Pakiri Formation]	1.70		57.40					
2						220+				2
						148	36	4		
		SILT, light grey with pockets of orange stains. Very stiff, moist, low plasticity. [Pakiri Formation]	2.60		56.50					
3						179	36	5		3
		Clayey SILT, light grey with orange mottles. Very stiff, moist, low plasticity. [Pakiri Formation]	3.50		55.60	177	67	3		
		At 3.9m orange stain dark orange limonite inclusions.								
4		*At 4.1m becomes bluish grey.*				220+				4
		End of borehole at 4.50 m	4.50		54.60	UTP				

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
Groundwater measured at 4.3m on completion of borehole
End of borehole at target depth.

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BOREHOLE LOG

Borehole No **HA19**

Sheet 1 of 2

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: MA
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: MA
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734752.20 - 5961463.90	Level: 54.50 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
		SILT, dark brown, low plasticity. Trace rootlets. [Pakiri Formation]	0.10		54.40					
		SILT, light brown. Very stiff, moist, low plasticity. [Pakiri Formation]				169	34	5		
		Clayey SILT, orange mottled brown and grey brown. Stiff to very stiff, moist, low plasticity. [Pakiri Formation]	0.80		53.70					
1						136	67	2		1
		At 1.6m becomes mottle pinkish red grey brown, some fine sand, moist to wet.				136	42	3		
2		*At 2.1m becomes orange with pink orange mottles.*				104	34	3		2
		At 2.6m becomes grey brown pink red with orange mottles.				128	42	3		
		At 2.9m limonite inclusions.								
3		Fine to Medium Sandy SILT, orange with pink red streaks. Stiff to hard, moist. [Pakiri Formation]	3.00		51.50	91	34	3		3
		At 3.5m mottled pink red and orange.				205	36	6		
		At 3.9m orange stained with brown grey streaks.								
4		*At 4.1m trace limonite.*				220+				4
						179	67	3		
		Continued on next sheet								

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
No groundwater encountered.
End of borehole at target depth.

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BOREHOLE LOG

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Borehole No **HA19**

Sheet 2 of 2

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: MA
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: MA
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734752.20 - 5961463.90	Level: 54.50 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
5		End of borehole at 5.00 m	5.00		49.50	220+				5
6										6
7										7
8										8
9										9

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
No groundwater encountered.
End of borehole at target depth.

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BOREHOLE LOG

Borehole No **HA20**

Sheet 1 of 2

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: MA
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: MA
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734253.10 - 5961503.50	Level: 40.50 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
		SILT, dark brown. Moist, low plasticity. Trace rootlets. [TOPSOIL]								
		Clayey SILT, orange brown mottled grey brown. Moist, low plasticity. [Pakiri Formation]	0.20		40.30	140	54	3		
1						138	71	2		1
		At 1.5m becomes mottled grey orange with some fine sand.				89	41	2		
2		*At 2m becomes mottled red orange light grey with some fine sand.*				122	57	2		2
						106	67	2		
		Fine gravelly SILT some fine to coarse sand, mottled dark brown light brown. Saturated. [Pakiri Formation]	2.90		37.60	52	54	1		
3						220+				3
		Fine Coarse Sandy SILT, orange brown, limonite streaked. [Pakiri Formation]	3.80		36.70					
4						97	32	3		4
		SILT, grey brown orange brown. Moist.	4.50		36.00	148	36	4		
		Continued on next sheet								

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
Groundwater measured at 4.3m on completion of borehole
End of borehole at target depth.

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BOREHOLE LOG

Geoconsult GEOTECHNICAL CONSULTANTS

Borehole No **HA20**

Sheet 2 of 2

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: MA
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: MA
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734253.10 - 5961503.50	Level: 40.50 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
5		[Pakiri Formation]								5
		At 4.9m limonite.								
		End of borehole at 5.00 m	5.00		35.50	122	58	2		
6										6
7										7
8										8
9										9

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
Groundwater measured at 4.3m on completion of borehole
End of borehole at target depth.

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BOREHOLE LOG

Geoconsult GEOTECHNICAL CONSULTANTS

Borehole No **HA21**

Sheet 1 of 2

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: JM
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: JM
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734580.12 - 5961467.90	Level: 85.80 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
		TOPSOIL.								
		Clayey SILT, orange brown streaked orange. Very stiff, dry to moist, low plasticity. [Pakiri Formation]	0.20		85.60					
						206	61	3		
		At 0.7m becoming moist, light grey brown streaked orange brown.								
1						107	61	2		1
		SILT, light grey brown streaked orange brown. Stiff, moist to wet. [Pakiri Formation]	1.30		84.50					
						160	38	4		
		At 1.6m becoming light grey.								
2						134	32	4		2
						122	27	5		
		At 2.7m becoming grey streaked orange.								
3						137	47	3		3
						169	46	4		
4						174	61	3		4
						177	64	3		
		Continued on next sheet								

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
No groundwater encountered.
End of borehole at target depth.

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BOREHOLE LOG

Geoconsult GEOTECHNICAL CONSULTANTS

Borehole No **HA21**

Sheet 2 of 2

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: JM
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: JM
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734580.12 - 5961467.90	Level: 85.80 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
		At 4.9m becoming dark grey.								
		End of borehole at 5.00 m	5.00		80.80	137	55	2		

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
No groundwater encountered.
End of borehole at target depth.

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BOREHOLE LOG

Borehole No **HA22**

Sheet 1 of 1

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: JM
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: JM
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734593.21 - 5961431.79	Level: 80.10 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
	TOPSOIL.	0.15		79.95					
	Clayey SILT, orange brown. Very stiff, dry to moist. Trace rootlets. [Pakiri Formation]				210+				
	At 0.7m rootlets absent.	0.80		79.30					
1	SILT, light grey streaked orange brown. Very stiff, dry to moist, friable. [Pakiri Formation]				202	55	4		1
	At 1.1m becoming dry, trace fine sand.								
	At 1.25m becoming dark orange brown (limonite staining).								
	At 1.3m becoming light grey.				168	35	5		
	At 1.9m becoming moist.								
2	*At 2m becoming orange brown.*				136	34	4		2
	At 2.3m becoming light grey.				199	27	7		
	At 2.6m minor fine sand becoming orange brown.								
	At 2.7m some fine sand.								
	At 2.9m trace fine sand becoming light grey streaked orange brown.								
3					210+				3
	At 3.4m becoming moist to wet.				210+				
	At 3.6m becoming dark grey mottled dark orange.								
4					UTP				4
	End of borehole at 4.40 m	4.40		75.70					

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
No groundwater encountered.
End of borehole, too hard to auger further.

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BOREHOLE LOG

Borehole No **HA23**

Sheet 1 of 2

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: JM
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: JM
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734604.16 - 5961405.77	Level: 78.80 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
	TOPSOIL.	0.15		78.65					
	SILT, trace fine sand, orange brown. Very stiff, moist. [Pakiri Formation]				190+				
	Clayey SILT, orange brown streaked light grey. Very stiff, moist to wet, low plasticity. [Pakiri Formation]	0.60		78.20					
	SILT, orange brown streaked light grey. Very stiff, wet. [Pakiri Formation]	0.90		77.90					
1					114	33	3		1
					164	34	5		
	At 1.6m becoming light grey streaked orange brown.								
2					175	46	4		2
					195	40	5		
3					185	36	5		3
					175	43	4		
4					171	46	4		4
	At 4.4m becoming orange brown mottled dark orange and grey, some fine sand.				178	31	6		

Continued on next sheet

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
No groundwater encountered.
End of borehole at target depth.

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BOREHOLE LOG

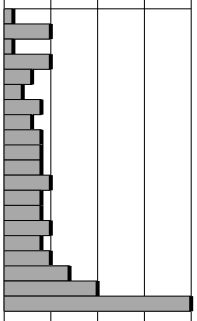
Geoconsult GEOTECHNICAL CONSULTANTS

Borehole No **HA23**

Sheet 2 of 2

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: JM
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: JM
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734604.16 - 5961405.77	Level: 78.80 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
		At 4.6m trace fine limonite gravel.								
		At 4.8m becoming orange brown streaked light grey, gravel absent, trace sand.								
5		End of borehole at 5.00 m	5.00		73.80	150	46	3		5
6										6
7										7
8										8
9										9



Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
No groundwater encountered.
End of borehole at target depth.

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BOREHOLE LOG

Geoconsult GEOTECHNICAL CONSULTANTS

Borehole No **HA24**

Sheet 1 of 1

Project:	Proposed Rural Subdivision		Project No:	GL225	Drilled: ZM
Location:	Lot 2 DP 349782 Komokoriki Hill Road, Komokoriki		Date Drilled:	19-06-2019	Logged: ZM
Client:	BK & MC Scott Farms Limited		Hole Type:	HA	Checked: MA
Coords:	1734623.06 - 5961370.97	Level: 63.00 m AOD	Hole Diameter:	50mm	Scale 1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA) Peak	Remould	Soil Sensitivity	Scala Penetrometer (blows per 50mm) 0 5 10 15 20	Depth (m)
		TOPSOIL.	0.10		62.90					
		SILT trace fine sand, orange brown. Very stiff, moist. [Pakiri Formation]								
		Clayey SILT, orange brown streaked light grey. Very stiff, moist to wet, low plasticity. [Pakiri Formation]	0.50		62.50	114	40	3		
1						121	28	4		1
		SILT minor fine sand, orange brown mottled light grey and light brown. Very stiff, moist. [Pakiri Formation]	1.40		61.60	190+				
2		Clayey SILT, minor fine sand and fine limonite gravel, orange brown mottled grey and light brown. Very stiff, wet, low plasticity. [Pakiri Formation]	2.00		61.00	190+				2
		At 2.5m minor ground water seepage.				190+				
		Sandy SILT fine to medium, brown mottled orange brown and black. [Pakiri Formation]	2.60		60.40					
3						188	26	7		3
						188	14	13		
		At 3.8m becoming fine to coarse sand, dark orange brown mottled orange brown, dark grey and brown.								
4		*At 4m hard.*				UTP				4
		At 4.1m becoming dark grey.								
		End of borehole at 4.20 m	4.20		58.80	UTP				

Remarks: Coordinates and levels are derived from Auckland Council GIS and are considered approximate only.
Groundwater measured at 3.8m on completion of borehole
End of borehole, too hard to auger further.

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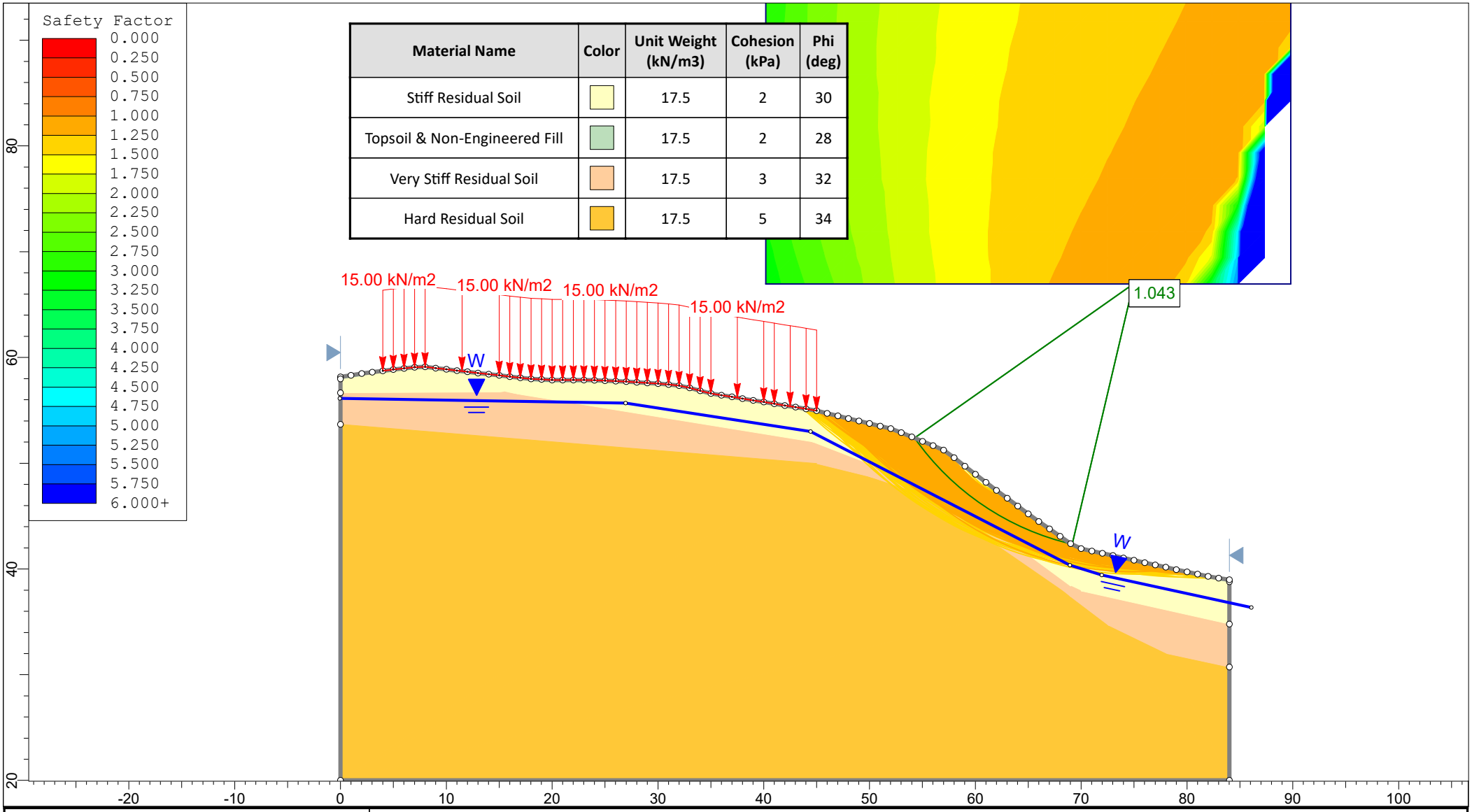
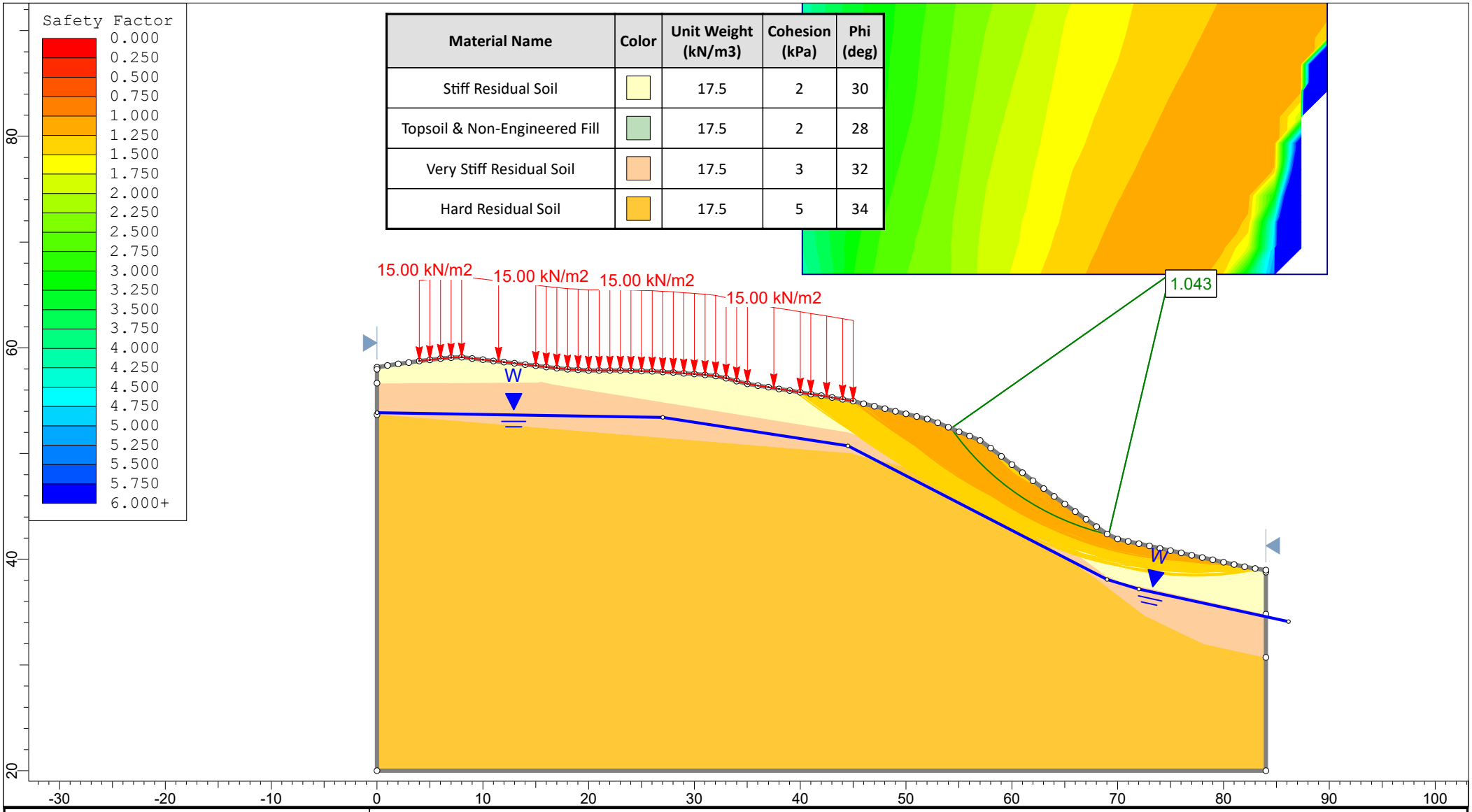


Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)
Stiff Residual Soil		17.5	2	30
Topsoil & Non-Engineered Fill		17.5	2	28
Very Stiff Residual Soil		17.5	3	32
Hard Residual Soil		17.5	5	34

Project	GL225: Proposed Rural Subdivision		
Analysis Description	Section 1: Extreme Groundwater Conditions		
Drawn By MA	*Scale* 1:500	*Company* Geoconsult	
Date 26/06/2019, 3:22:03 PM		*File Name* SEC 1 Extreme.slim	

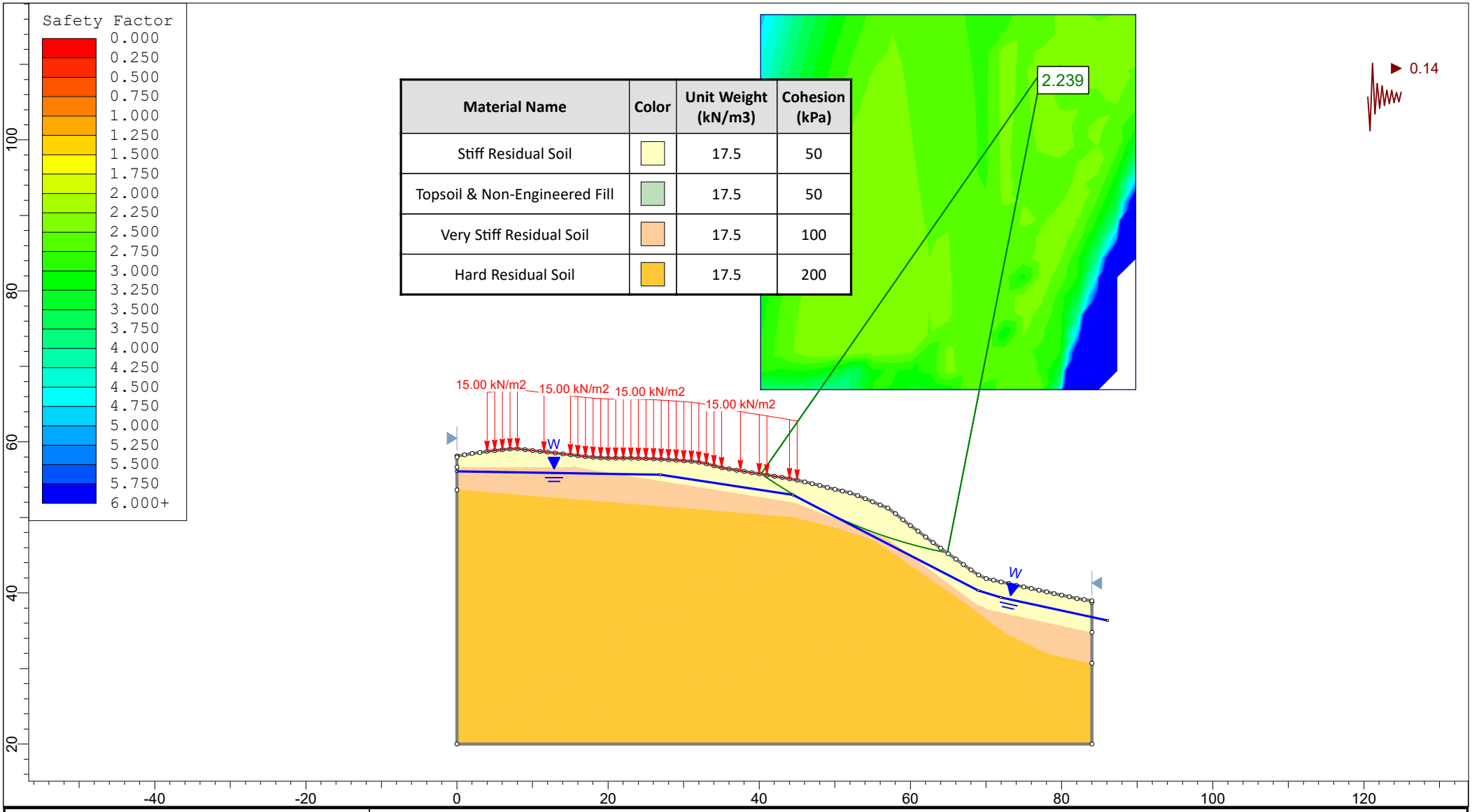
SLIDEINTERPRET 6.039



Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)
Stiff Residual Soil		17.5	2	30
Topsoil & Non-Engineered Fill		17.5	2	28
Very Stiff Residual Soil		17.5	3	32
Hard Residual Soil		17.5	5	34

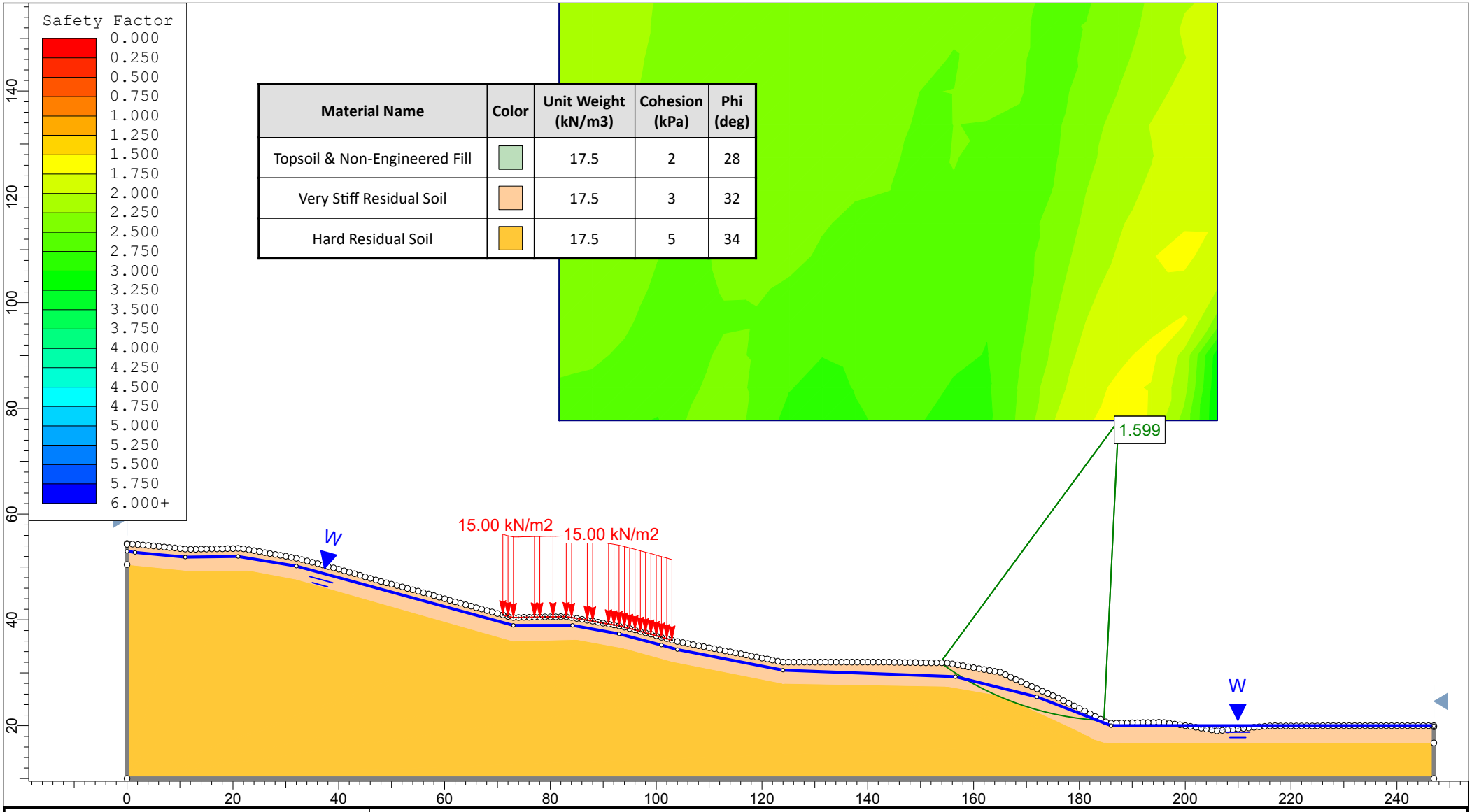
Project	GL225: Proposed Rural Subdivision		
Analysis Description	Section 1: Normal Groundwater Conditions		
Drawn By MA	*Scale* 1:500	*Company* Geoconsult	
Date 26/06/2019, 3:22:03 PM		*File Name* SEC 1 Normal.slim	

SLIDEINTERPRET 6.039



Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)
Stiff Residual Soil		17.5	50
Topsoil & Non-Engineered Fill		17.5	50
Very Stiff Residual Soil		17.5	100
Hard Residual Soil		17.5	200

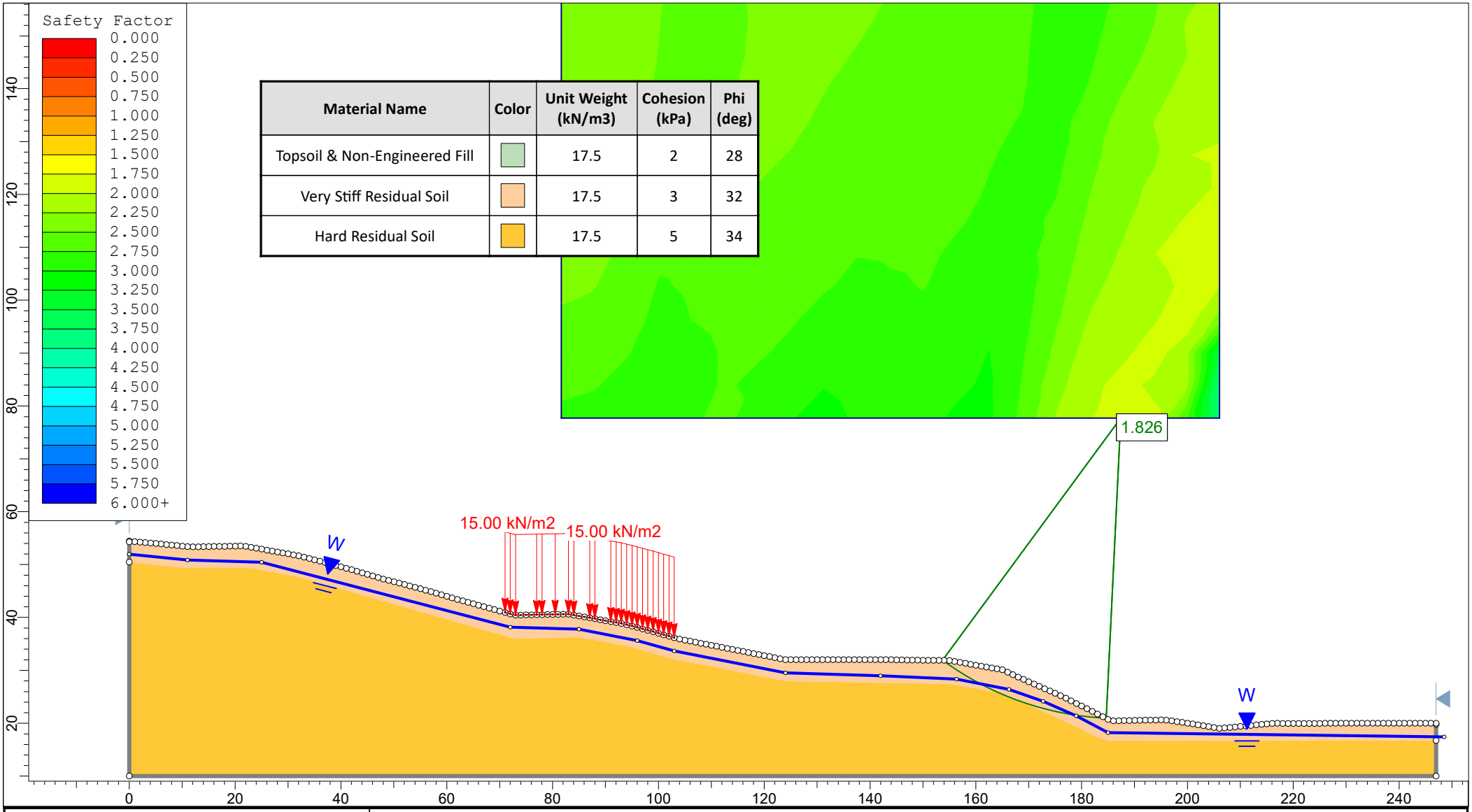
SLIDEINTERPRET 6.039	*Project*	GL225: Proposed Rural Subdivision		
	Analysis Description	Section 1: Siesmic Conditions		
	Drawn By	MA	*Scale* 1:700	*Company* Geoconsult
	Date	26/06/2019, 3:22:03 PM		*File Name* SEC 1 Siesmic.slim



Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)
Topsoil & Non-Engineered Fill		17.5	2	28
Very Stiff Residual Soil		17.5	3	32
Hard Residual Soil		17.5	5	34

Project	GL225: Proposed Rural Subdivision		
Analysis Description	Section 2: Extreme Groundwater Conditions		
Drawn By	MA	*Scale* 1:1000	*Company* Geoconsult
Date	26/06/2019, 3:22:03 PM	*File Name*	SEC 2 Extreme.slim

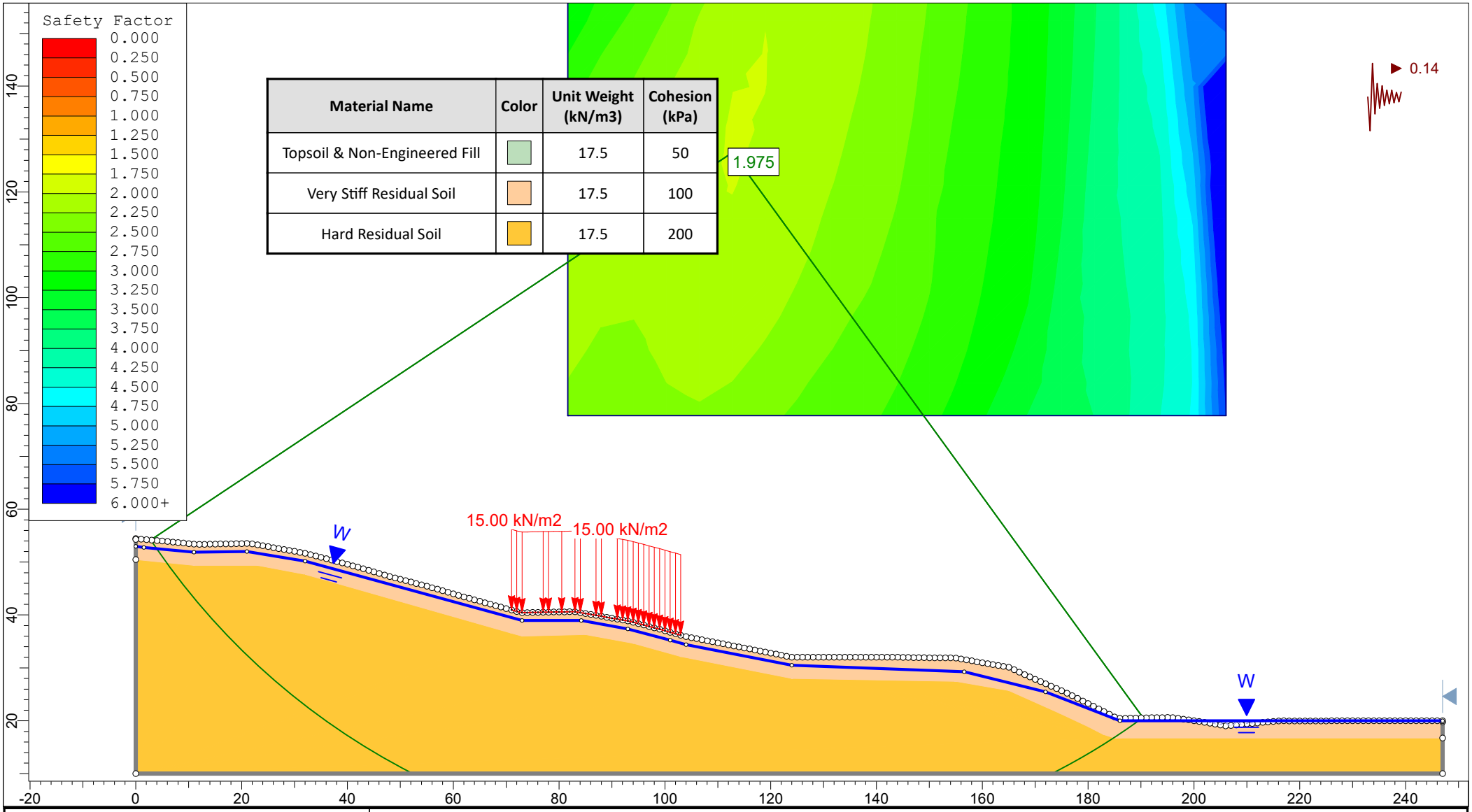
SLIDEINTERPRET 6.039



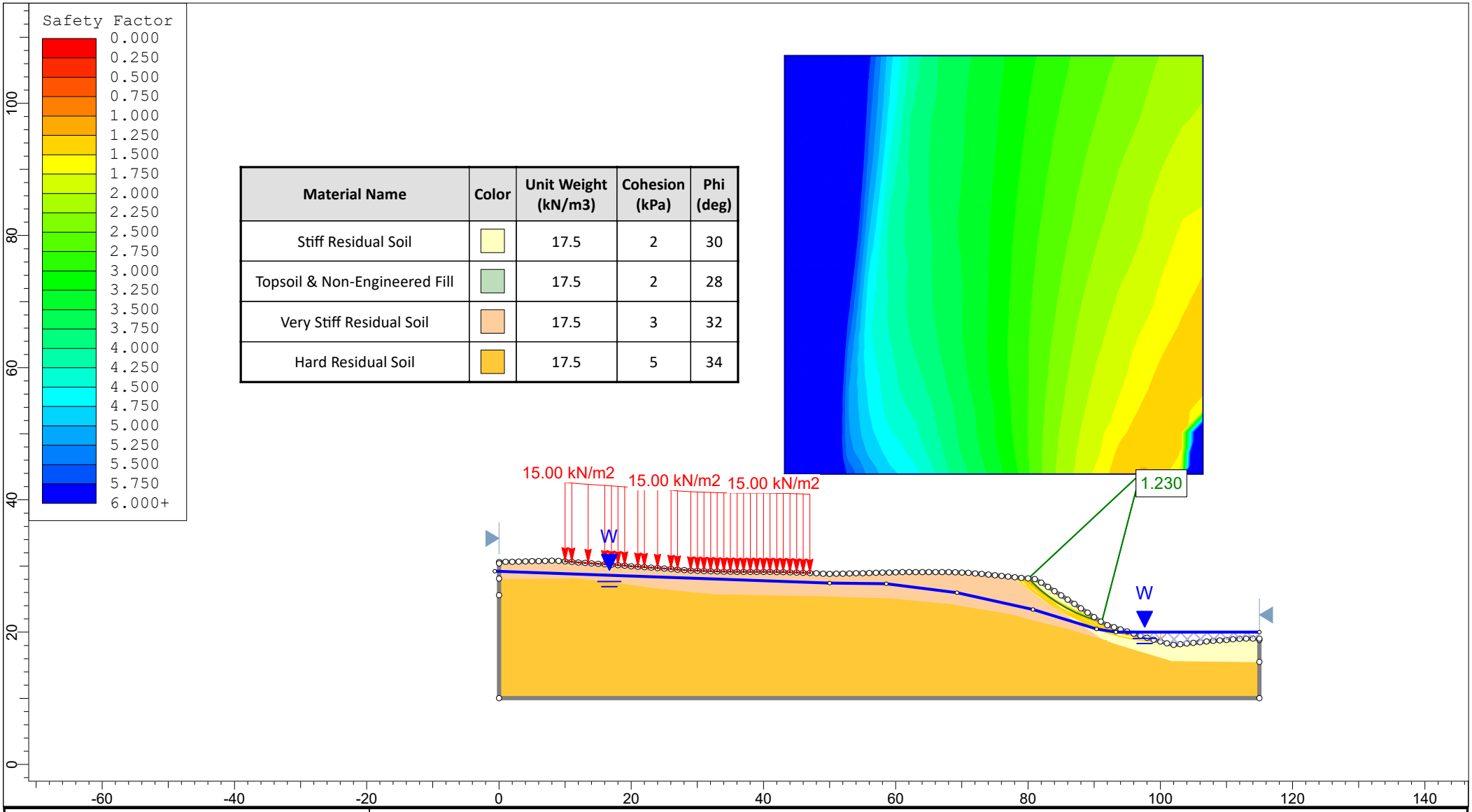
Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)
Topsoil & Non-Engineered Fill		17.5	2	28
Very Stiff Residual Soil		17.5	3	32
Hard Residual Soil		17.5	5	34

Project	GL225: Proposed Rural Subdivision		
Analysis Description	Section 2: Normal Groundwater Conditions		
Drawn By MA	*Scale* 1:1000	*Company* Geoconsult	
Date 26/06/2019, 3:22:03 PM		*File Name* SEC 2 Normal.slim	

SLIDEINTERPRET 6.039

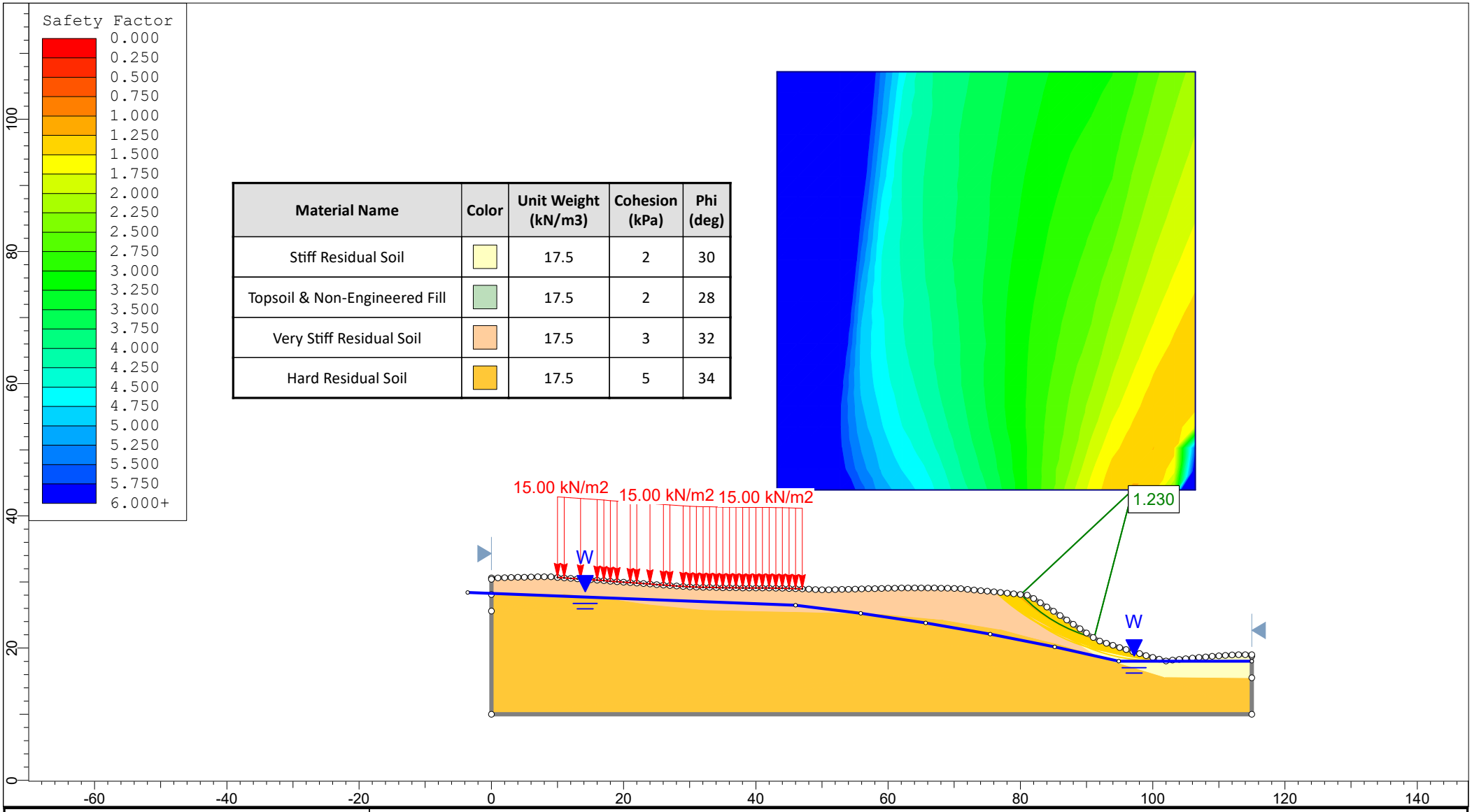


	Project	GL225: Proposed Rural Subdivision	
	Analysis Description	Section 2: Seismic Conditions	
	Drawn By: MA	Scale: 1:1000	Company: Geoconsult
SLIDEINTERPRET 6.039	Date: 26/06/2019, 3:22:03 PM		File Name: SEC 2 Siesmic.slim



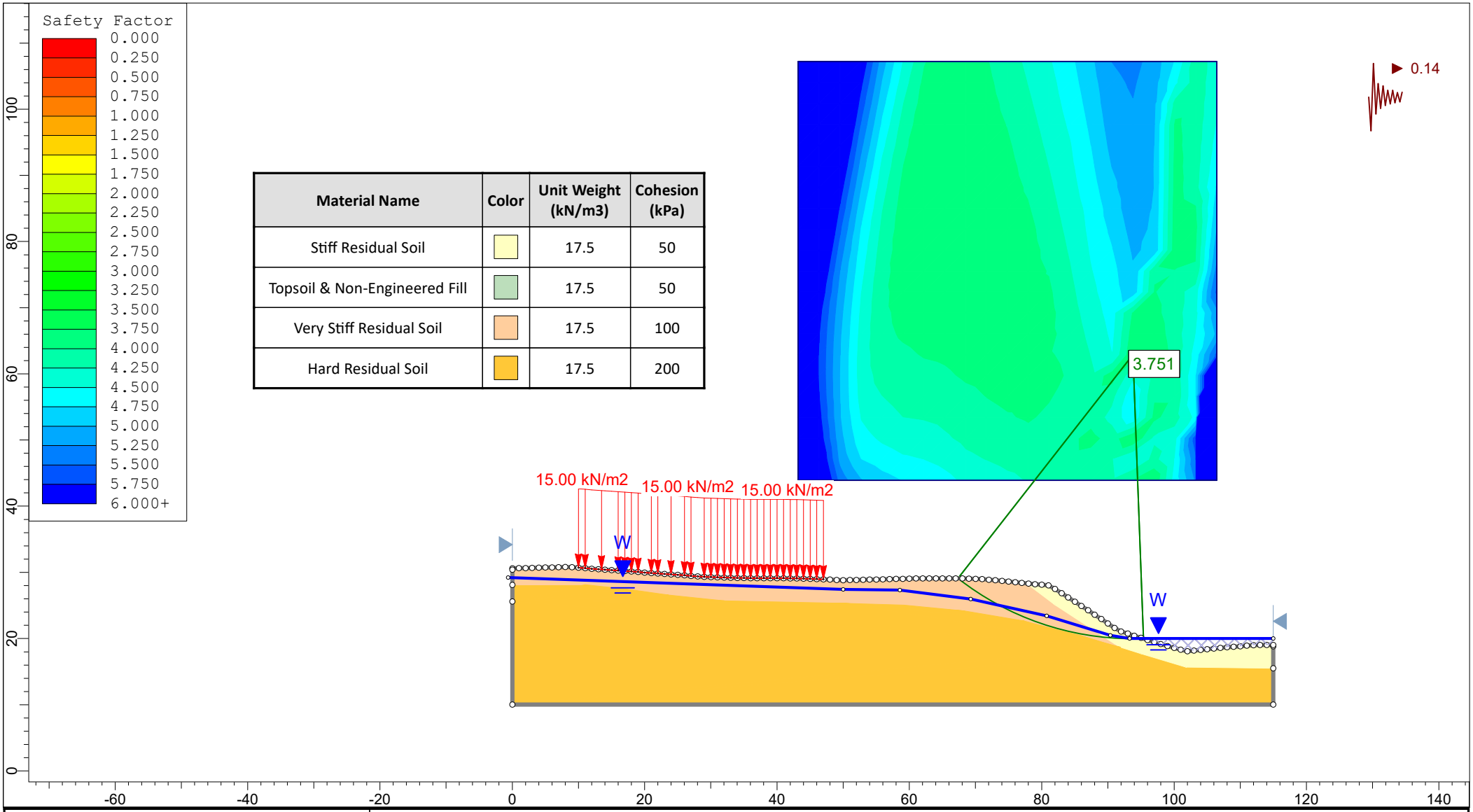
Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)
Stiff Residual Soil		17.5	2	30
Topsoil & Non-Engineered Fill		17.5	2	28
Very Stiff Residual Soil		17.5	3	32
Hard Residual Soil		17.5	5	34

SLIDEINTERPRET 6.039	*Project*	GL225: Proposed Rural Subdivision	
	Analysis Description	Section 3: Extreme Groundwater Conditions	
	Drawn By MA	*Scale* 1:800	*Company* Geoconsult
	Date 26/06/2019, 3:22:03 PM		*File Name* SEC 3 Extreme.slim



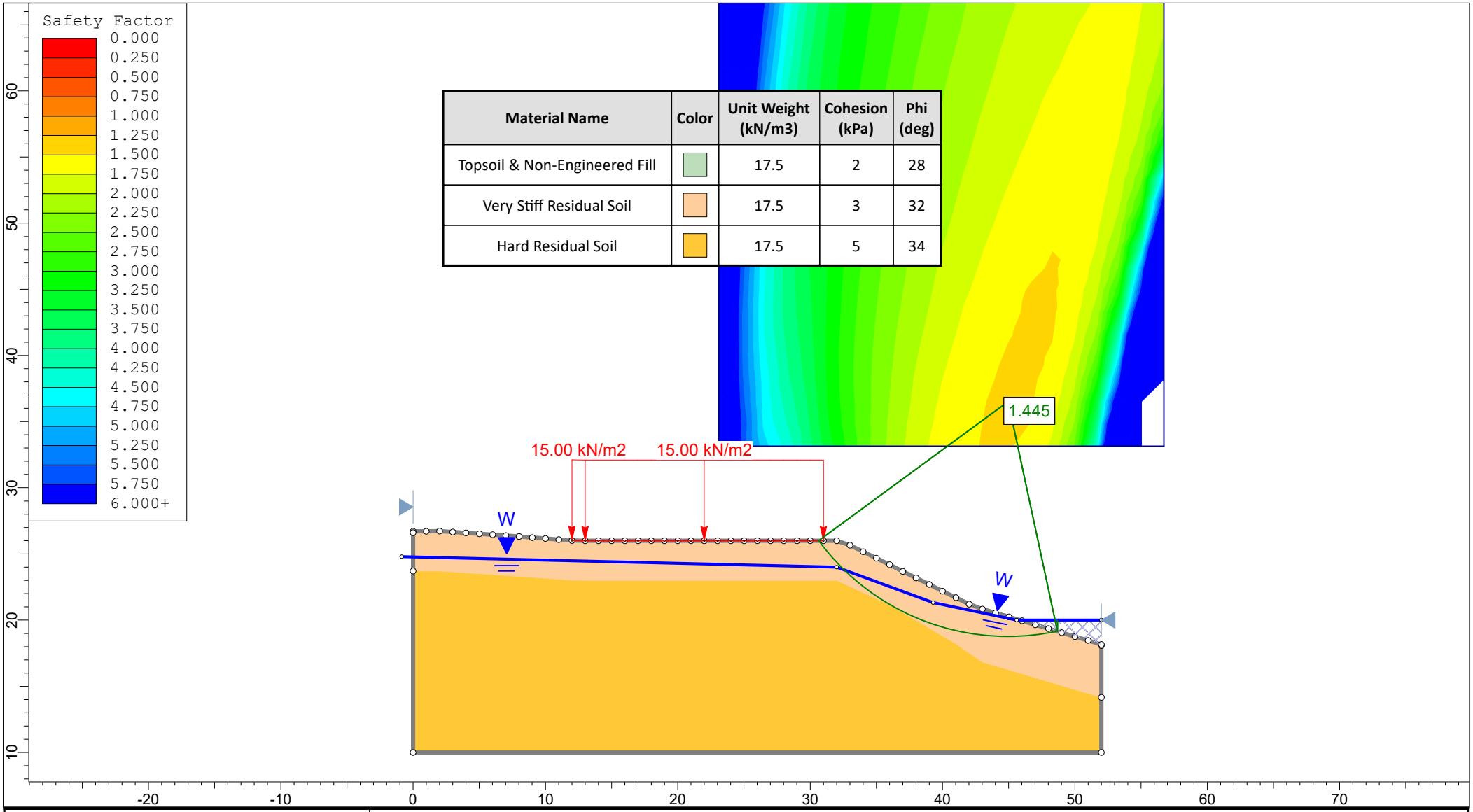
Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)
Stiff Residual Soil		17.5	2	30
Topsoil & Non-Engineered Fill		17.5	2	28
Very Stiff Residual Soil		17.5	3	32
Hard Residual Soil		17.5	5	34

	Project	GL225: Proposed Rural Subdivision		
	Analysis Description	Section 3: Normal Groundwater Conditions		
	Drawn By	MA	*Scale* 1:800	*Company* Geoconsult
SLIDEINTERPRET 6.039	*Date*	26/06/2019, 3:22:03 PM	*File Name*	SEC 3 Normal.slim



Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)
Stiff Residual Soil		17.5	50
Topsoil & Non-Engineered Fill		17.5	50
Very Stiff Residual Soil		17.5	100
Hard Residual Soil		17.5	200

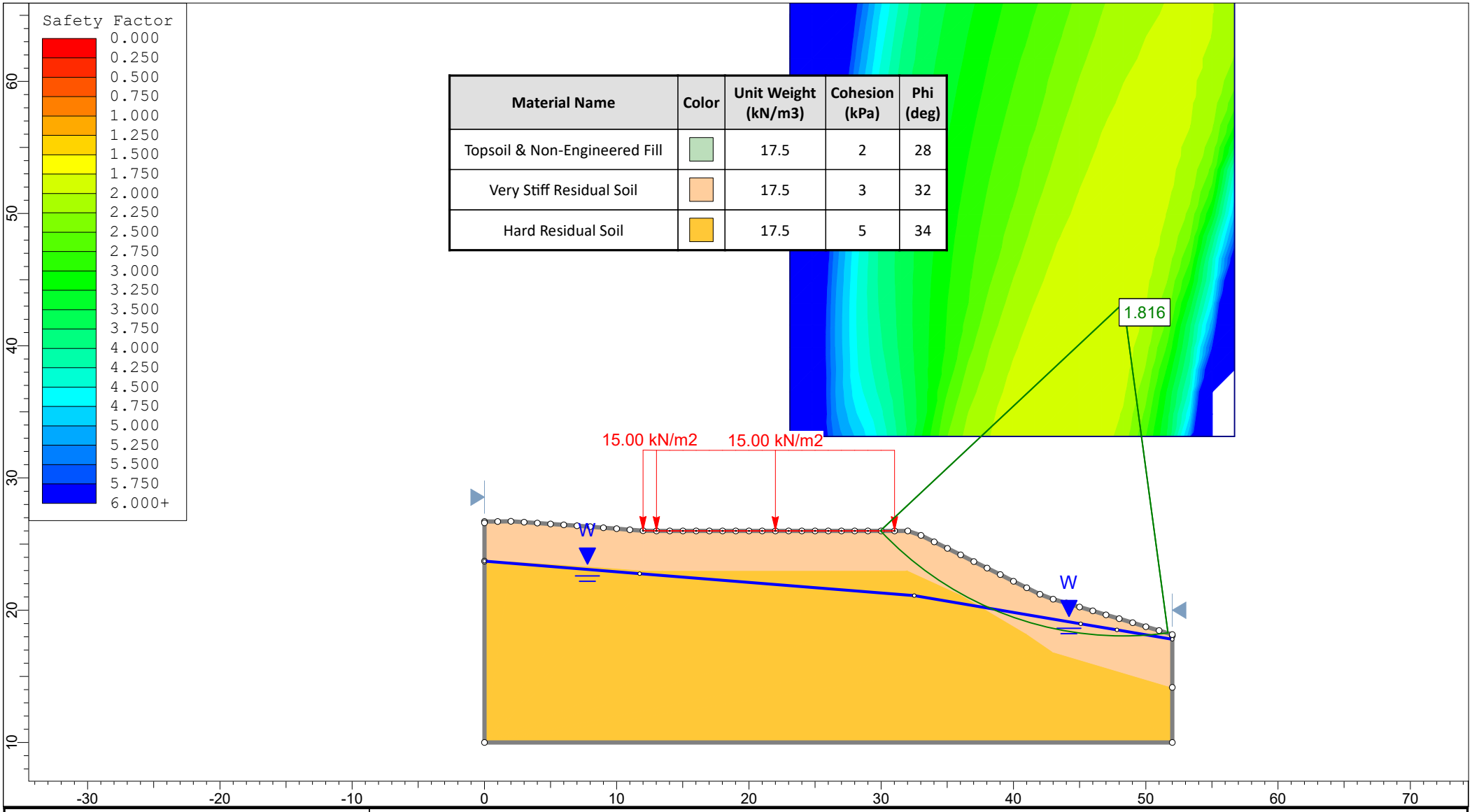
SLIDEINTERPRET 6.039	*Project*	GL225: Proposed Rural Subdivision		
	Analysis Description	Section 3: Seismic Conditions		
	Drawn By	MA	*Scale* 1:800	*Company* Geoconsult
	Date	26/06/2019, 3:22:03 PM		*File Name* SEC 3 Siesmic.slim



Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)
Topsoil & Non-Engineered Fill		17.5	2	28
Very Stiff Residual Soil		17.5	3	32
Hard Residual Soil		17.5	5	34

Project	GL225: Proposed Rural Subdivision		
Analysis Description	Section 4: Extreme Groundwater Conditions		
Drawn By MA	*Scale* 1:400	*Company* Geoconsult	
Date 26/06/2019, 3:22:03 PM		*File Name* SEC 4 Extreme.slim	

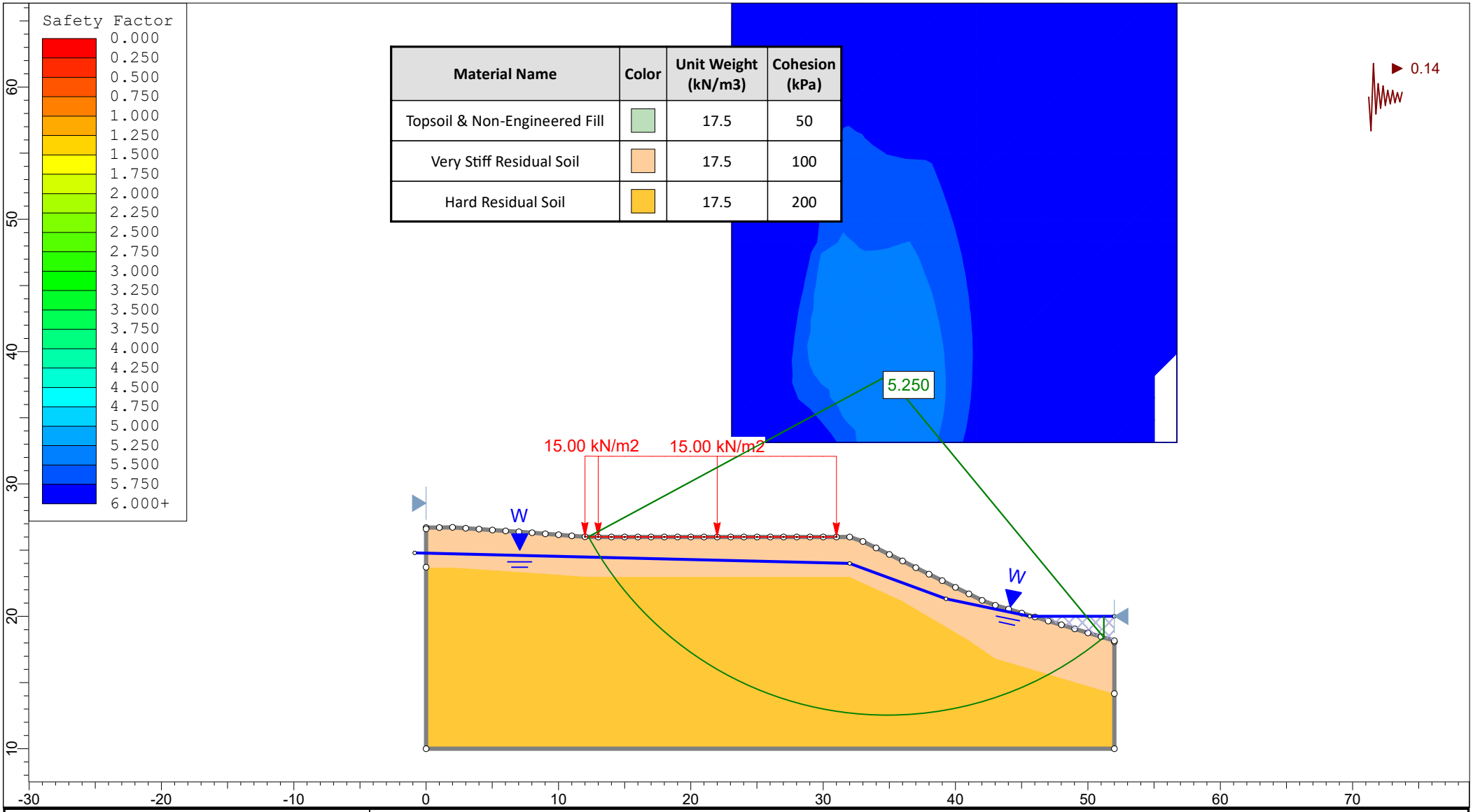
SLIDEINTERPRET 6.039



Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)
Topsoil & Non-Engineered Fill		17.5	2	28
Very Stiff Residual Soil		17.5	3	32
Hard Residual Soil		17.5	5	34

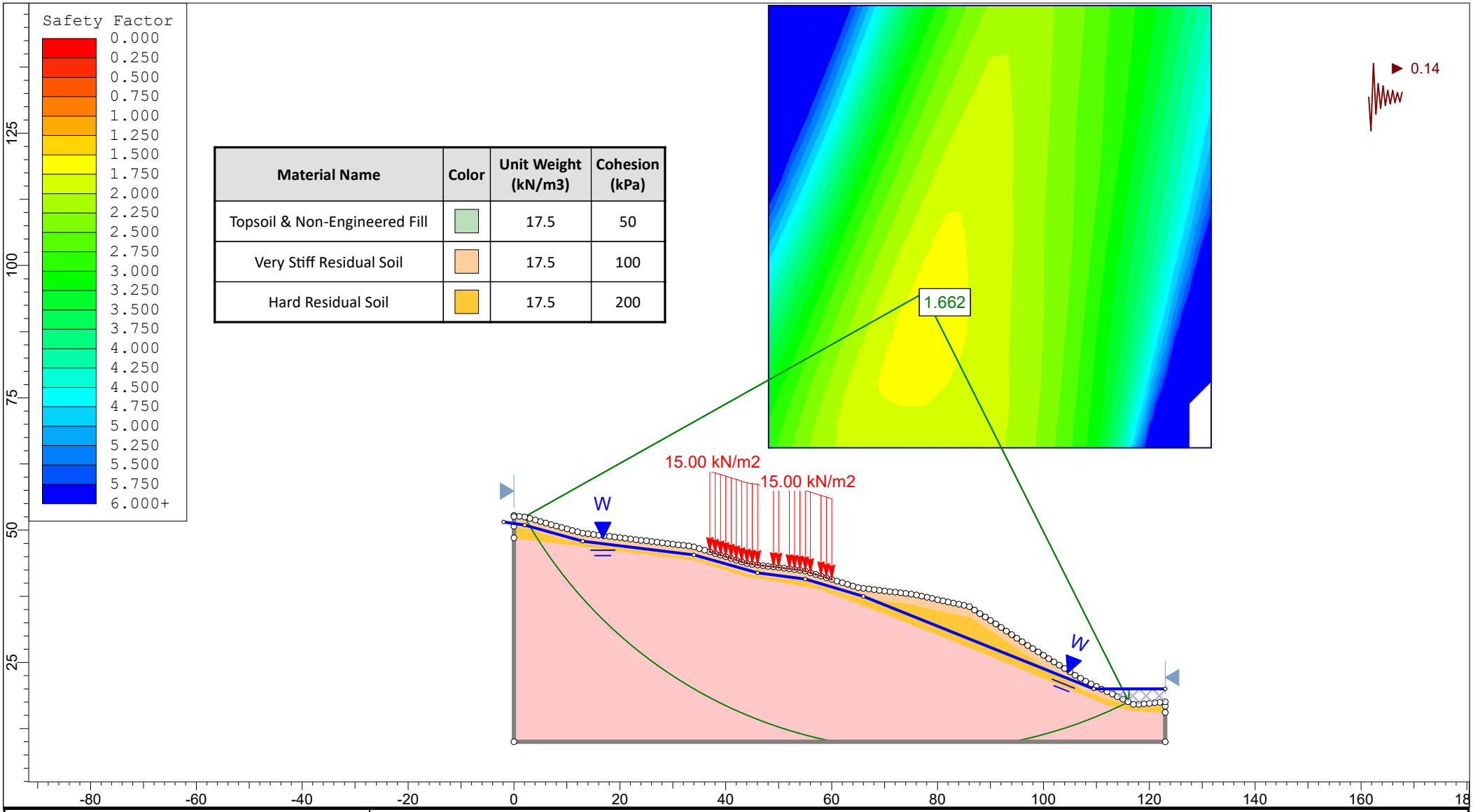
Project	GL225: Proposed Rural Subdivision		
Analysis Description	Section 4: Normal Groundwater Conditions		
Drawn By	MA	*Scale* 1:400	*Company* Geoconsult
Date	26/06/2019, 3:22:03 PM	*File Name*	SEC 4 Normal.slim

SLIDEINTERPRET 6.039



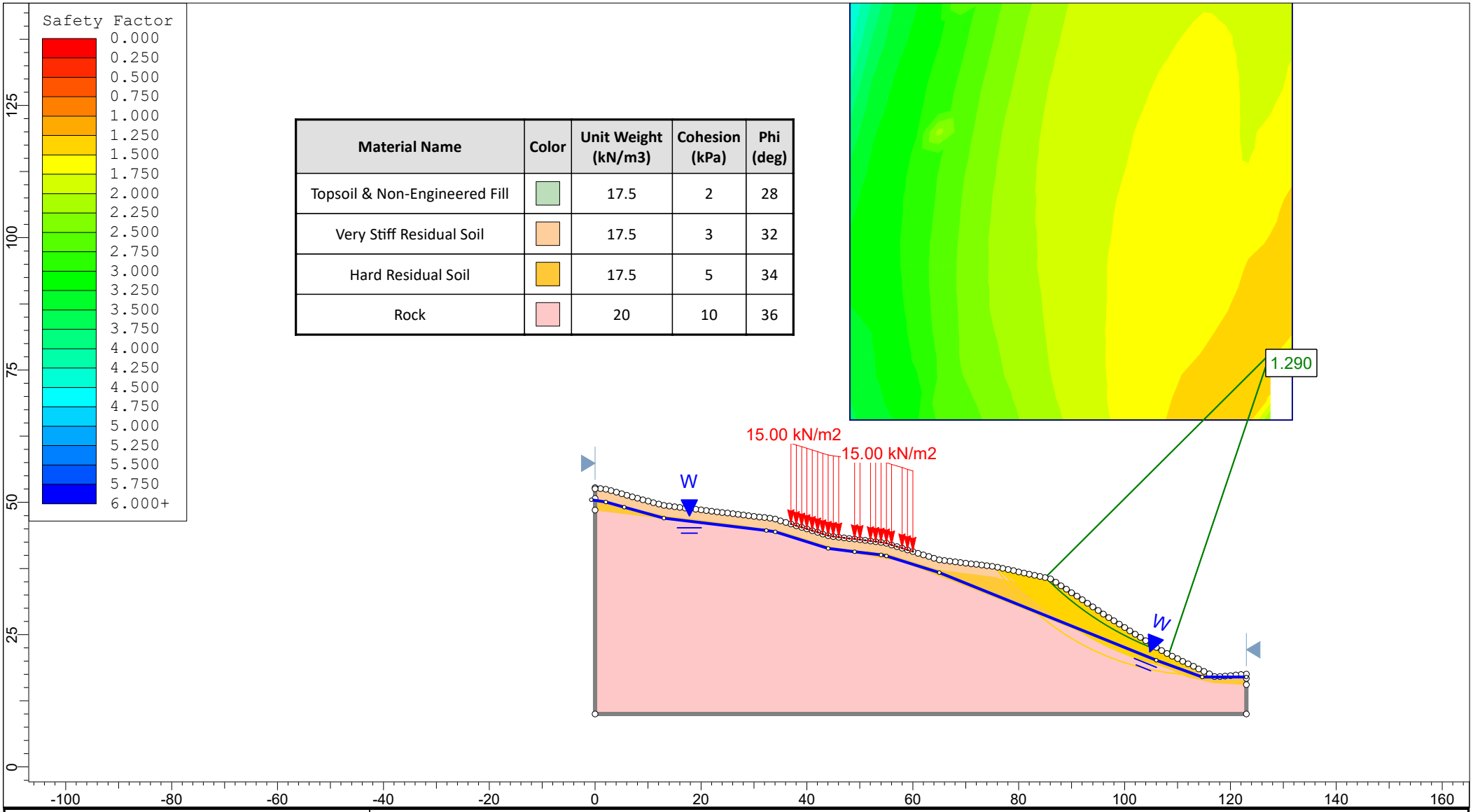
Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)
Topsoil & Non-Engineered Fill		17.5	50
Very Stiff Residual Soil		17.5	100
Hard Residual Soil		17.5	200

	Project	GL225: Proposed Rural Subdivision	
	Analysis Description	Section 4: Seismic Conditions	
	Drawn By MA	*Scale* 1:400	*Company* Geoconsult
SLIDEINTERPRET 6.039	*Date* 26/06/2019, 3:22:03 PM		*File Name* SEC 4 Seismic.slim



Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)
Topsoil & Non-Engineered Fill		17.5	50
Very Stiff Residual Soil		17.5	100
Hard Residual Soil		17.5	200

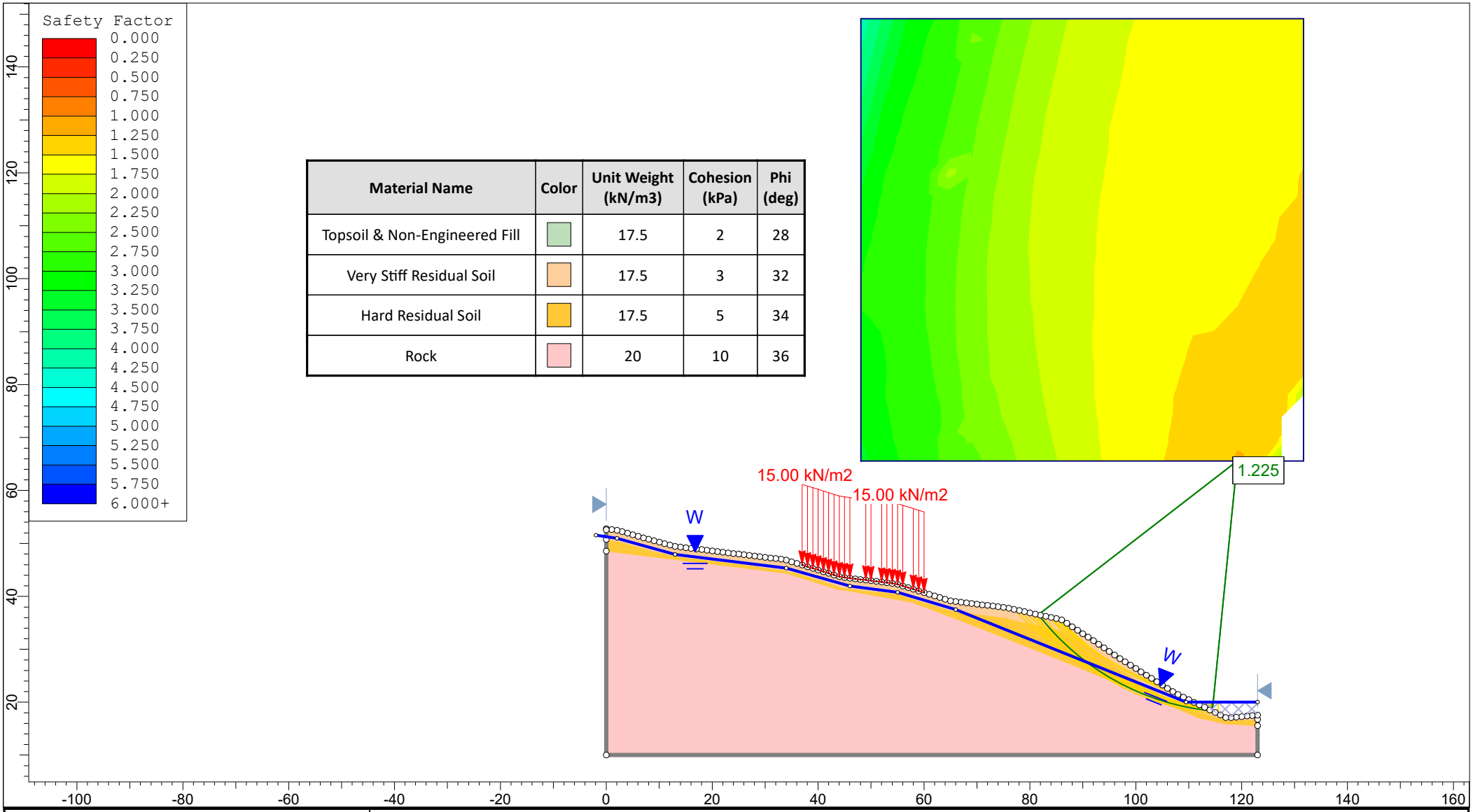
	Project	GL225: Proposed Rural Subdivision	
	Analysis Description	Section 5: Siesmic Conditions	
	Drawn By MA	*Scale* 1:1000	*Company* Geoconsult
SLIDEINTERPRET 6.039	*Date* 26/06/2019, 3:22:03 PM		*File Name* SEC 5 Seismic.slim



Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)
Topsoil & Non-Engineered Fill		17.5	2	28
Very Stiff Residual Soil		17.5	3	32
Hard Residual Soil		17.5	5	34
Rock		20	10	36

Project	GL225: Proposed Rural Subdivision		
Analysis Description	Section 5: Normal Groundwater Conditions		
Drawn By MA	*Scale* 1:1000	*Company* Geoconsult	
Date 26/06/2019, 3:22:03 PM		*File Name* SEC 5 Normal.slim	

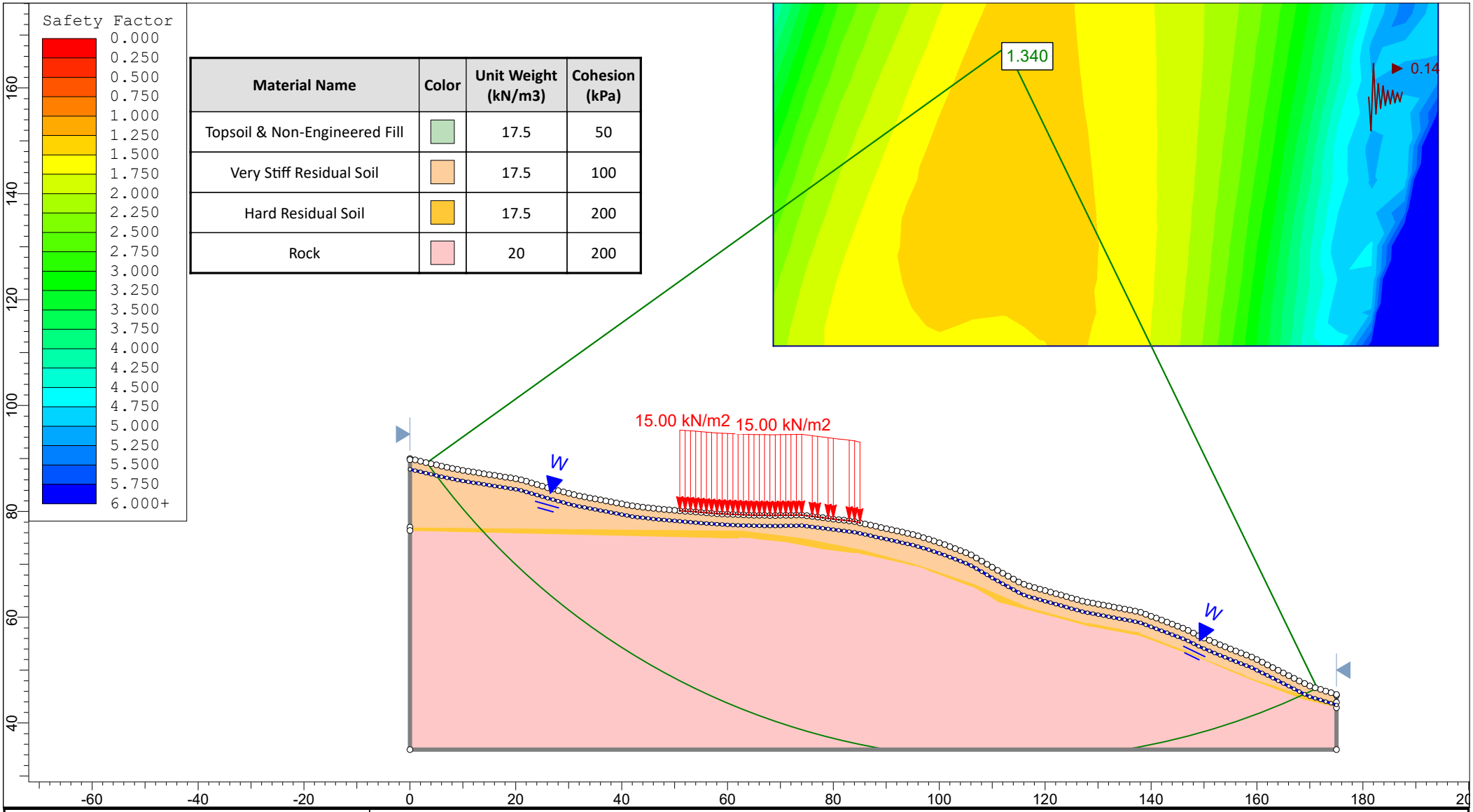
SLIDEINTERPRET 6.039



Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)
Topsoil & Non-Engineered Fill		17.5	2	28
Very Stiff Residual Soil		17.5	3	32
Hard Residual Soil		17.5	5	34
Rock		20	10	36

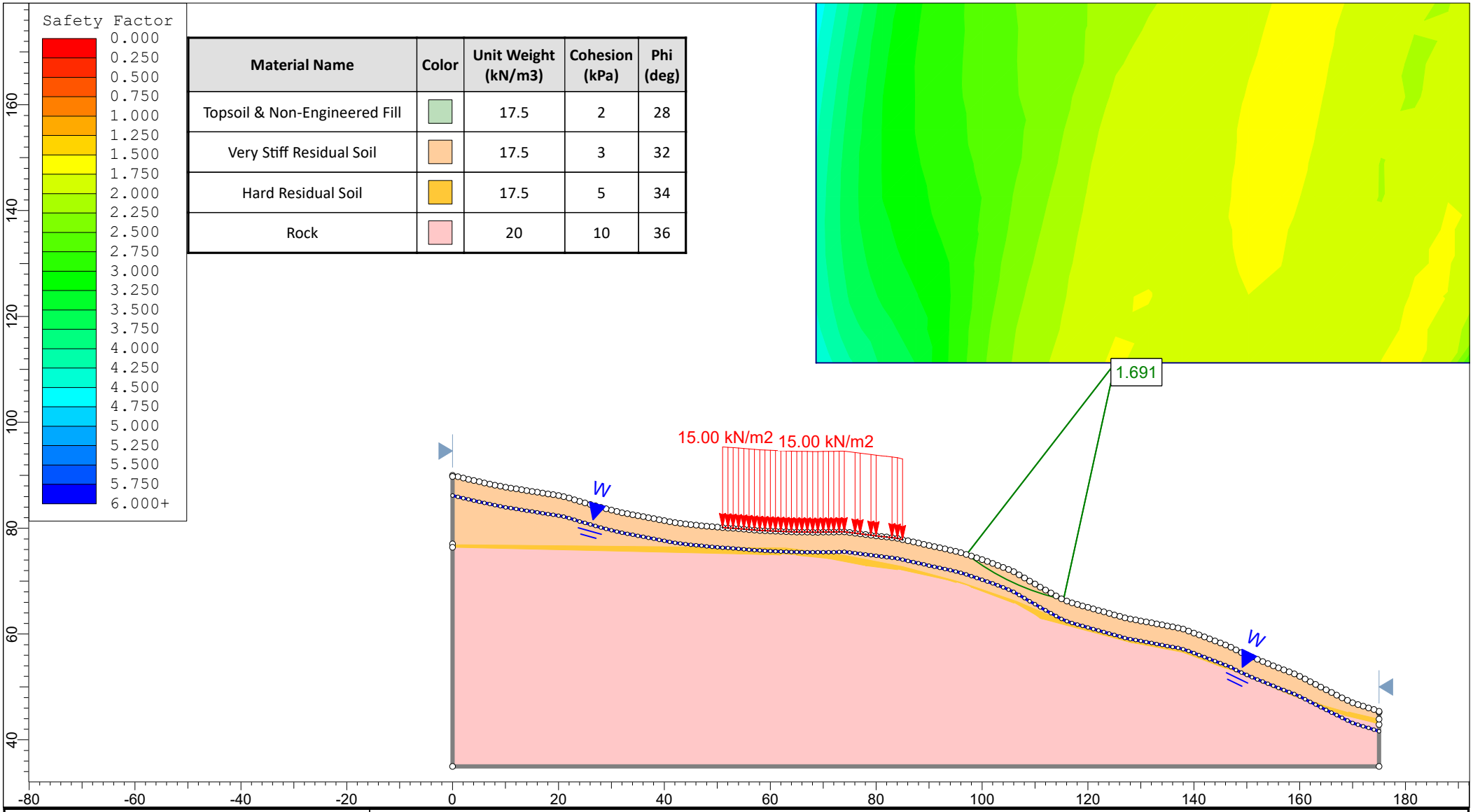
Project	GL225: Proposed Rural Subdivision		
Analysis Description	Section 5: Extreme Groundwater Conditions		
Drawn By MA	*Scale* 1:1000	*Company* Geoconsult	
Date 26/06/2019, 3:22:03 PM		*File Name* SEC 5 Extreme.slim	

SLIDEINTERPRET 6.039



Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)
Topsoil & Non-Engineered Fill		17.5	50
Very Stiff Residual Soil		17.5	100
Hard Residual Soil		17.5	200
Rock		20	200

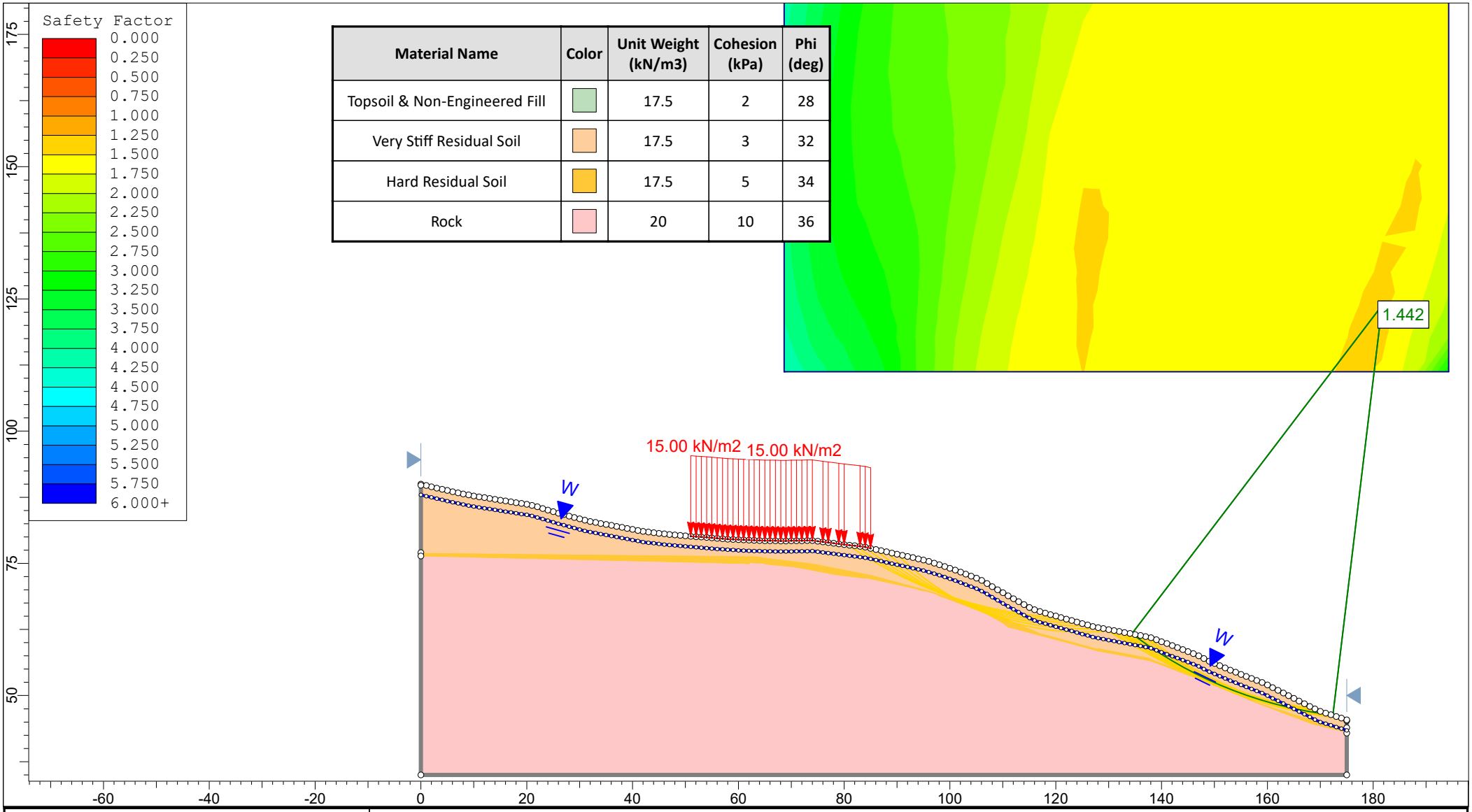
SLIDEINTERPRET 6.039	*Project*	GL225: Proposed Rural Subdivision		
	Analysis Description	Section 6: Siesmic Conditions		
	Drawn By	MA	*Scale* 1:1000	*Company* Geoconsult
	Date	26/06/2019, 3:22:03 PM		*File Name* SEC 6 Seismic.slim



Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)
Topsoil & Non-Engineered Fill		17.5	2	28
Very Stiff Residual Soil		17.5	3	32
Hard Residual Soil		17.5	5	34
Rock		20	10	36

Project	GL225: Proposed Rural Subdivision		
Analysis Description	Section 6: Normal Groundwater Conditions		
Drawn By	MA	*Scale* 1:1000	*Company* Geoconsult
Date	26/06/2019, 3:22:03 PM	*File Name*	SEC 6 Normal.slim

SLIDEINTERPRET 6.039



Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)
Topsoil & Non-Engineered Fill		17.5	2	28
Very Stiff Residual Soil		17.5	3	32
Hard Residual Soil		17.5	5	34
Rock		20	10	36

Project	GL225: Proposed Rural Subdivision		
Analysis Description	Section 6: Extreme Groundwater Conditions		
Drawn By	MA	*Scale* 1:1000	*Company* Geoconsult
Date	26/06/2019, 3:22:03 PM	*File Name*	SEC 6 Extreme.slim

SLIDEINTERPRET 6.039