

9 July 2020

Document Ref: AKL2019-0040AG Rev 1

Neil Construction Limited  
P.O. Box 8751  
Symonds Street  
Auckland 1150

Attention: Neil Pye

Dear Neil

**RE: SECTION 92 RESPONSE**

**69 TRIG ROAD, 151 & 155-157 BRIGHAM CREEK ROAD, WHENUAPAI**

## **1 INTRODUCTION**

CMW Geosciences (CMW) have been requested by Neil Construction to provide comments in response to Section 92 queries raised by Auckland Council in relation to the proposed development at 69 Trig Road and 151 & 155 – 157 Brigham Creek Road in Whenuapai.

CMW have undertaken site investigations and reporting across the property, as presented in our Geotechnical Investigation Report (GIR), Referenced AKL2019-0040AB, Rev 0, dated 29 March 2019.

## **2 SECTION 92 QUERIES**

The two queries CMW have been requested to respond to, as taken from the Section 92 letter, dated 03 February 2020, are:

- 1. Please provide geotechnical engineer's input (review and comments) on the location of Sediment Retention Ponds, assessing its location and identifying any risks in terms of the stability of the pond structure itself, due to presence of underlying soils (sic).*
- 2. Please provide revised slope stability assessment of cross section A-A considering post development cross section profile including proposed fill.*

## **3 SECTION 92 RESPONSES**

### **3.1 Sediment Retention Ponds**

We have been provided copies of the Sediment and Erosion Control plans showing the proposed locations of Sediment Retention Ponds (SRP) A, B and C (Drawings 447-01-BE-221 & 222).

In addition, we have been provided with sketched overlay of the pond locations in relation to the existing contours and cut/fill contours, with details of the proposed SRP levels and locations.

### 3.1.1 SRP A

This pond is located in the northern section of the site, within a small gully depression adjacent to the main watercourse. The top of the pond bund is proposed at RL20.0m and construction to this level is expected to require excavation of up to 0.5m on the upslope side and up to 1m of fill along the downslope edge.

Reference to hand auger HA10-19, which is located approximately 30m to the west of the pond, indicates the area is underlain by 2.9m depth of stiff to very stiff clayey silt / silty clay, which is underlain by at least 2m depth of sandy silt.

There are no signs of inherent instability in the immediate area. However, construction recommendations will include undercutting any soft/organic soil that may be present within the depression, as well as keying of the downslope bund into the natural soil and placement of compacted engineered fill to form this bund.

Inspection of the materials exposed in the pond excavation is recommended. Any sandy/silt materials encountered shall be undercut and replaced with clay rich materials to minimise the potential of piping through the sandy materials.

### 3.1.2 SRP B

This pond is located on a relatively flat area, at the junction of the boundaries for 151, 155-157 and 159 Brigham Creek Road, above a slope which drops into the main watercourse at gradients of up to 1 in 4 (V:H). The top of the pond bund is proposed at RL21.5m and construction to this level is expected to require excavation of between 0.5m and 1.5m.

Reference to hand auger HA11-19, located within the proposed pond, indicates the soils underlying the pond are likely to comprise up to 4m depth of stiff to very stiff clayey silt / silty clay, which is underlain by sandy silts.

There are no signs of inherent instability in this location, and the excavations required to form the pond will reduce the load on the slope below, increasing the stability of the immediate area.

Inspection of the materials exposed in the pond excavation is recommended. Although unlikely, any sandy/silt materials encountered shall be undercut and replaced with clay rich materials to minimise the potential of piping through the sandy materials.

### 3.1.3 SRP C

This pond is located at the southern end of the site, at the crest of a gully slope that drops down to the southern boundary. This gully is proposed to be filled as part of the earthworks development. The pond will straddle the cut/fill boundary and will require cuts and fills of up to 3m and 2m respectively to from the pond bund.

Hand auger HA01-19 is located in the centre of the pond and indicates the soils underlying the pond comprise at least 1.6m depth of non-engineered fill, predominantly made up of gravelly clays, although in this particular location the depth of fill was not able to be confirmed. Hand auger HA02-19, located downslope of the proposed pond, recorded non-engineered clay fill depths of 1.2m.

Although there are no signs of instability noted in this area, the presence of non-engineered fill will require close observation of the pond construction to ensure that the downslope bund is adequately keyed into competent material, with compacted engineered fill placed to form the bund. In addition, batter slopes above the proposed pond should be cut back to no steeper than 1 in 3.

Dependent on the materials exposed in the pond excavation, it may be necessary to undercut and replace any materials unlikely to provide a sufficiently low permeability. This should be assessed and advised by the Geotechnical Engineer during initial pond excavations.

### 3.2 Cross Section AA

We have updated Cross Section AA to show the proposed cuts and fills, including possible future development loads of up to 20kPa, and undertaken additional stability analyses to check the factors of safety for the proposed works. We note that the underlying ground model has also been modified from the original analyses to better represent the expected transition through the Waitemata Group soils as well as the likely extent of alluvial deposits.

The stability analysis results are appended to this letter report and are summarised in Table 1 below:

Table 1: Slope Stability Analyses Results				
Location		Slope Stability Factor of Safety		
		Prevailing Groundwater	High Groundwater	Seismic Event
Geological Section A	Existing Conditions	2.5	1.5	1.6
	Proposed Development	2.8	2.1	1.4

## 4 LIMITATION

This report has been prepared for use by our client Neil Construction Limited, their Consultants and Auckland Council. Liability for its use is limited to these parties and to the scope of work for which it was prepared as it may not contain sufficient information for other parties or for other purposes.

It should be noted that factual data for this report has been obtained from discrete locations using normal geotechnical investigation techniques. As such investigation methods by their nature only provide information about a relatively small volume of subsoils, there may be special conditions pertaining to this site which have not been disclosed by the investigation and which have not been taken into account in the report. If variations in the subsoils occur from those described or assumed to exist, then the matter should be referred back to CMW immediately.

## 5 CLOSURE

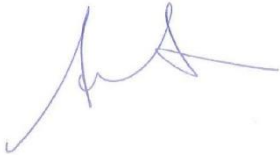
We trust this assessment meets your current requirements.

Should you require any further information or clarification regarding our report, please do not hesitate to contact the undersigned.

Tables and photographs inserted directly below body text without any additional unnecessary spaces inserted between the two.

**For and on behalf of CMW Geosciences**

Prepared by:



Andrew Linton  
Principal Geotechnical Engineer

Reviewed and authorised by:



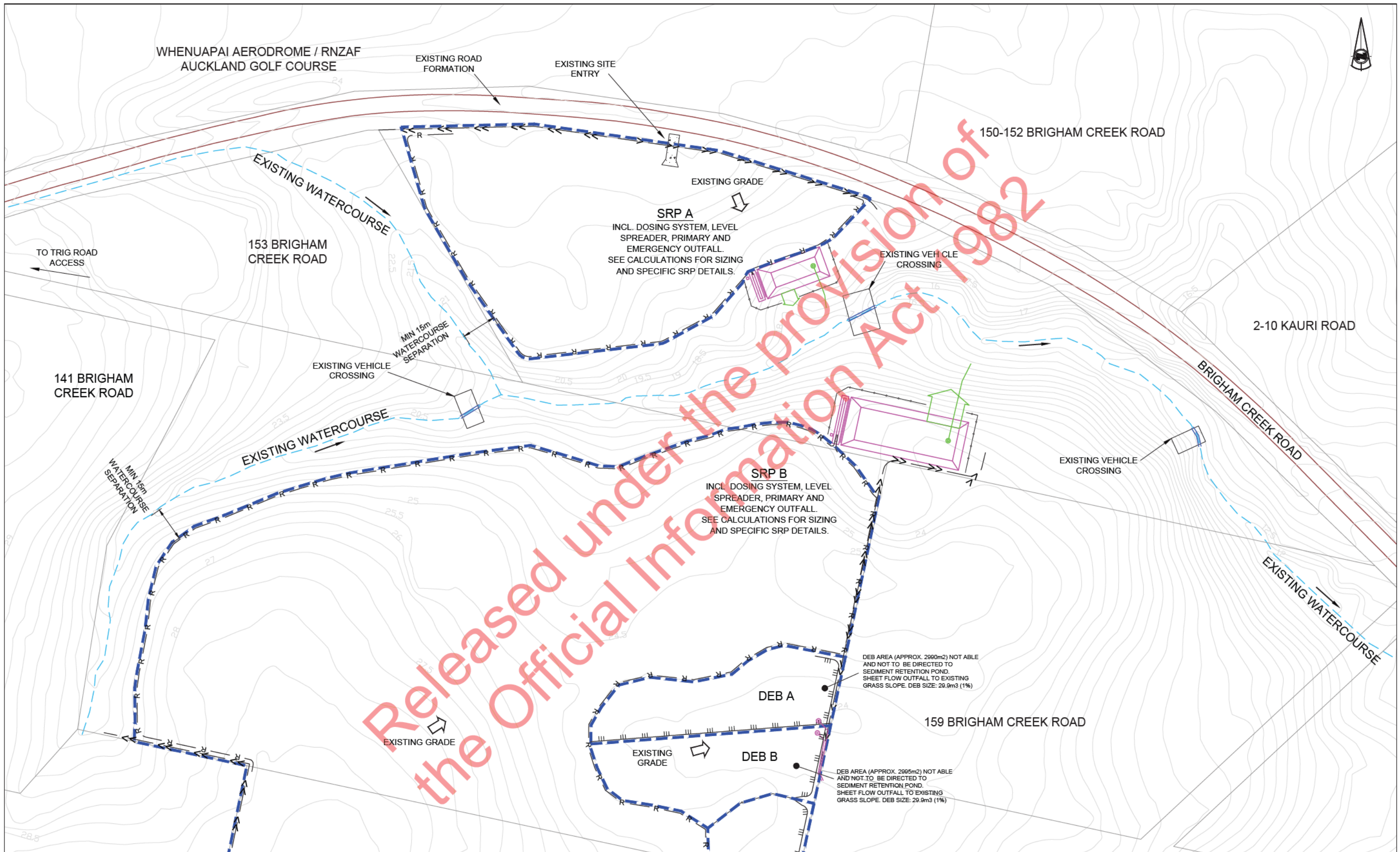
Richard Knowles  
Principal Geotechnical Engineer, CPEng

Distribution: 1 electronic copy to Neil Construction Ltd via email  
Original held at CMW Geosciences

Attachments: Drawings 447-01-BE-221 & 222  
Pond overlay sketch  
Stability analysis outputs







Rev	Description	By	Date
A	FOR BULK EARTHWORKS APPROVAL	CK	11/19

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LAND DEVELOPERS

THE NEIL GROUP LIMITED  
LEVEL 3, BUILDING B  
8 NUGENT STREET  
GRAFTON

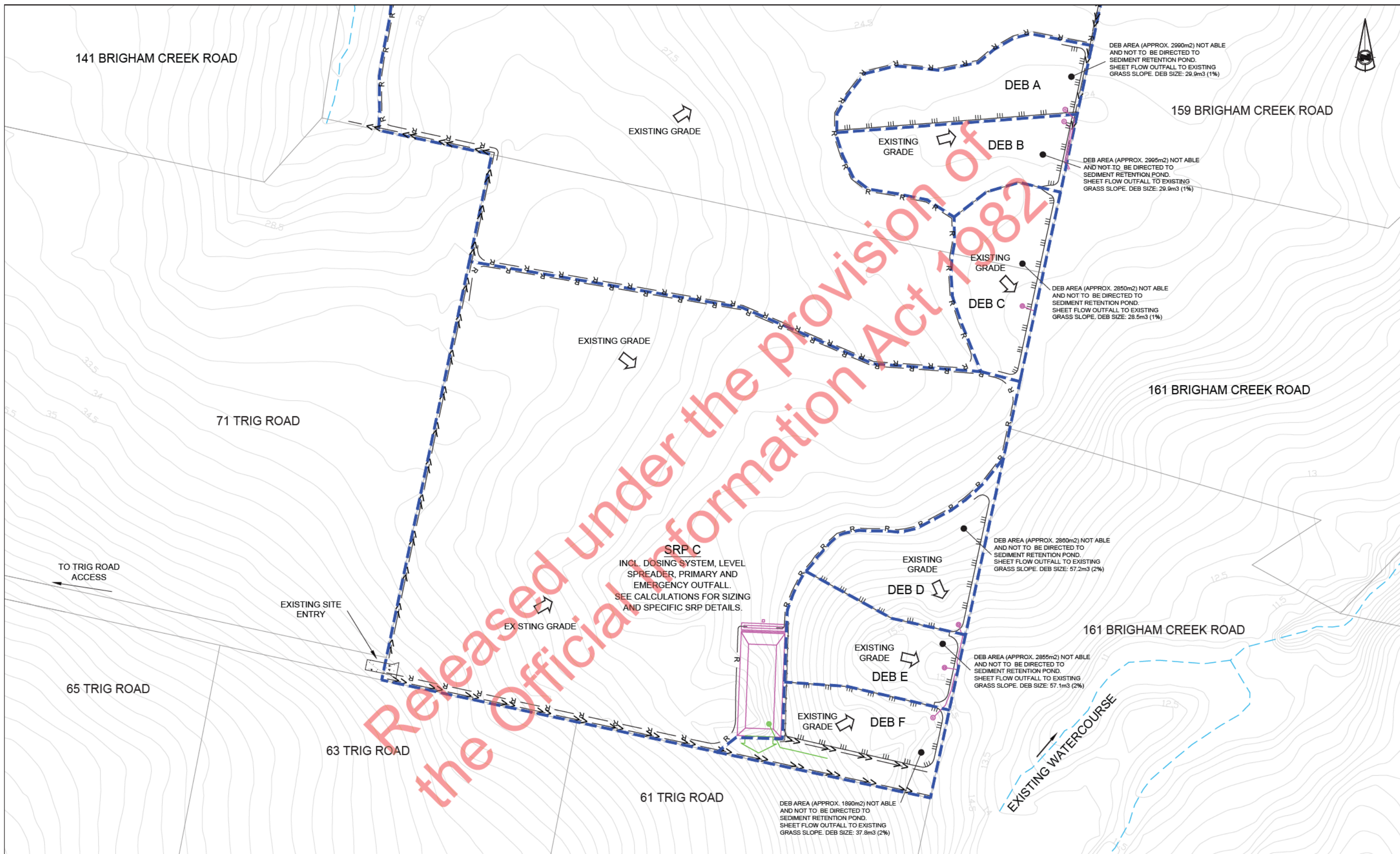
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AUCKLAND, NEW ZEALAND  
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Job Title  
**BRIGHAM CREEK & TRIG ROAD  
WHENUAPAI**

Drawing Title  
**BULK EARTHWORKS  
SEDIMENT AND EROSION  
CONTROL**

By	Date	Scale	Job No.	Rev
Surveyed: DS		1:1500@A3	Drawing No.	
Designed: CK			<b>447-01-BE-221</b>	<b>A</b>
Drawn: CK	11/19			
Approved: CK				
CAD FILE F:\PROJECTS\BRIGHAM CREEK TRIGG\DWG\ENG\BULK EW\447-01-EW-220.dwg				





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Designed: CK	11/19		<b>447-01-BE-222</b>	<b>A</b>
Drawn: CK				
Approved: CK				
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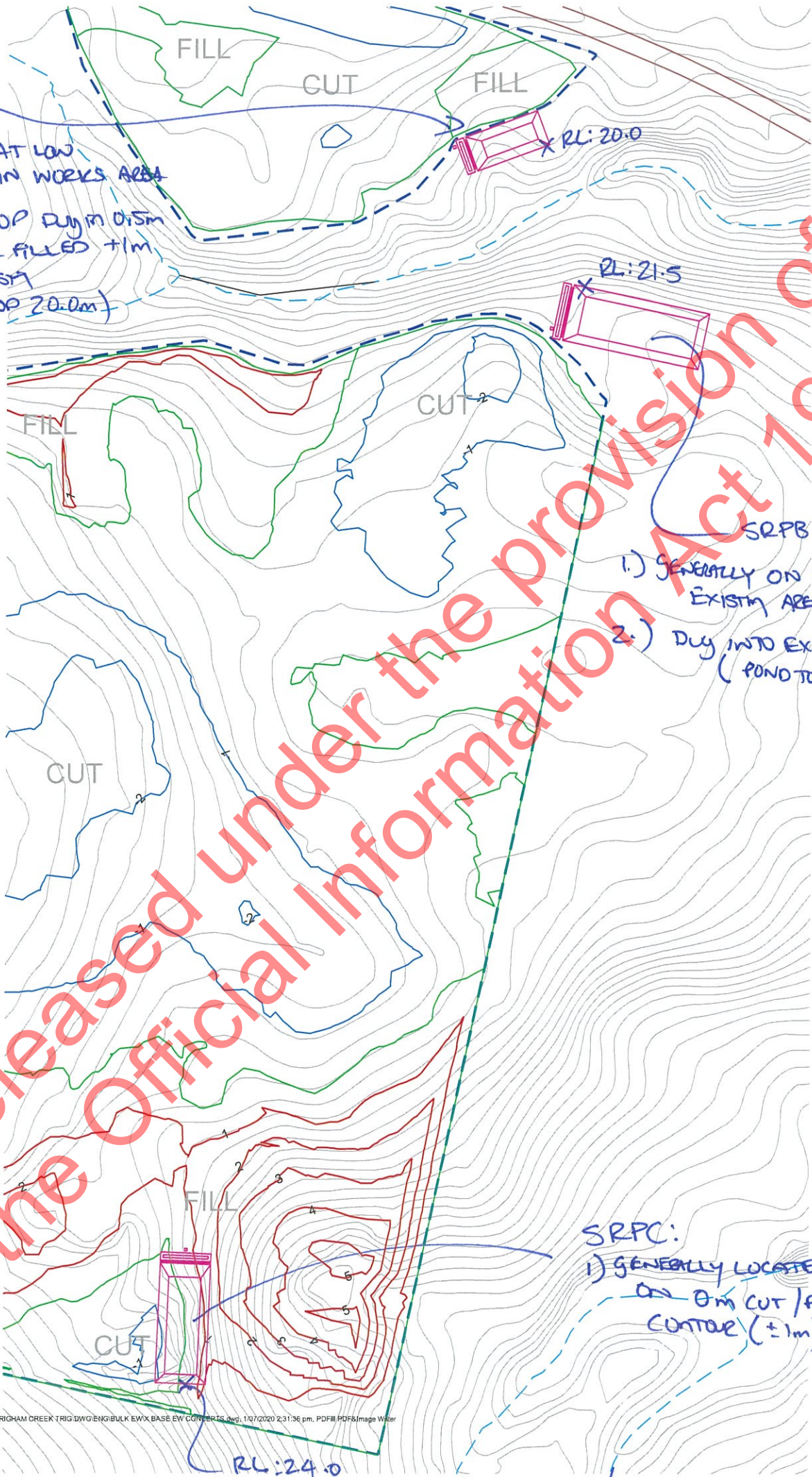


N  
N.T.S

11/7/20 BEW  
BRYAN  
CMW/CK.

SRPA:

- 1.) LOCATED AT LOW POINT IN WORKS AREA
- 2.) POND TOP DUG IN 0.5m AND/OR FILLED +1m TO EXIST (POND TOP 20.0m)

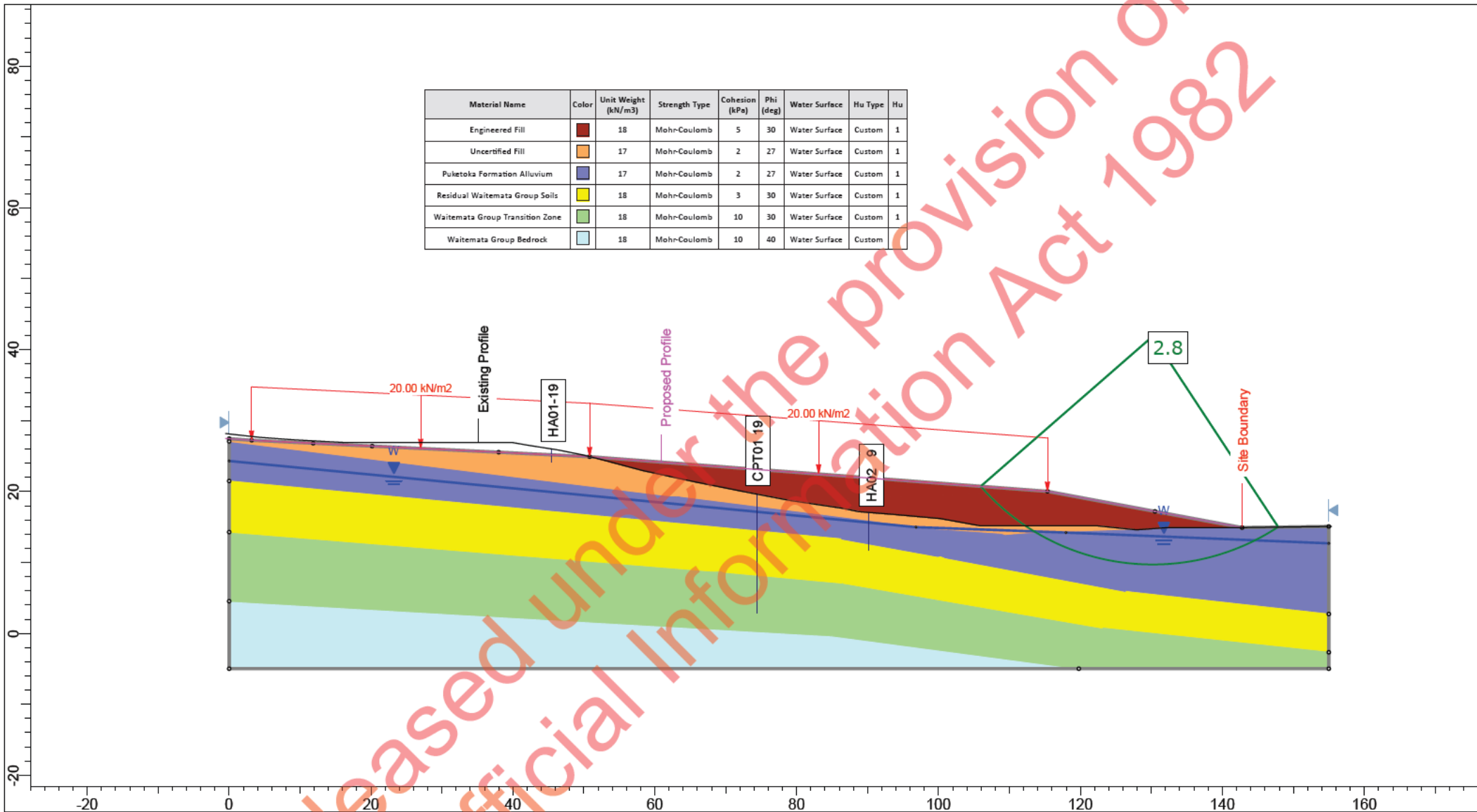


SRPB:

- 1.) GENERALLY ON FLAT EXISTING AREA.
- 2.) DUG INTO EXISTING (POND TOP RL: 21.5)

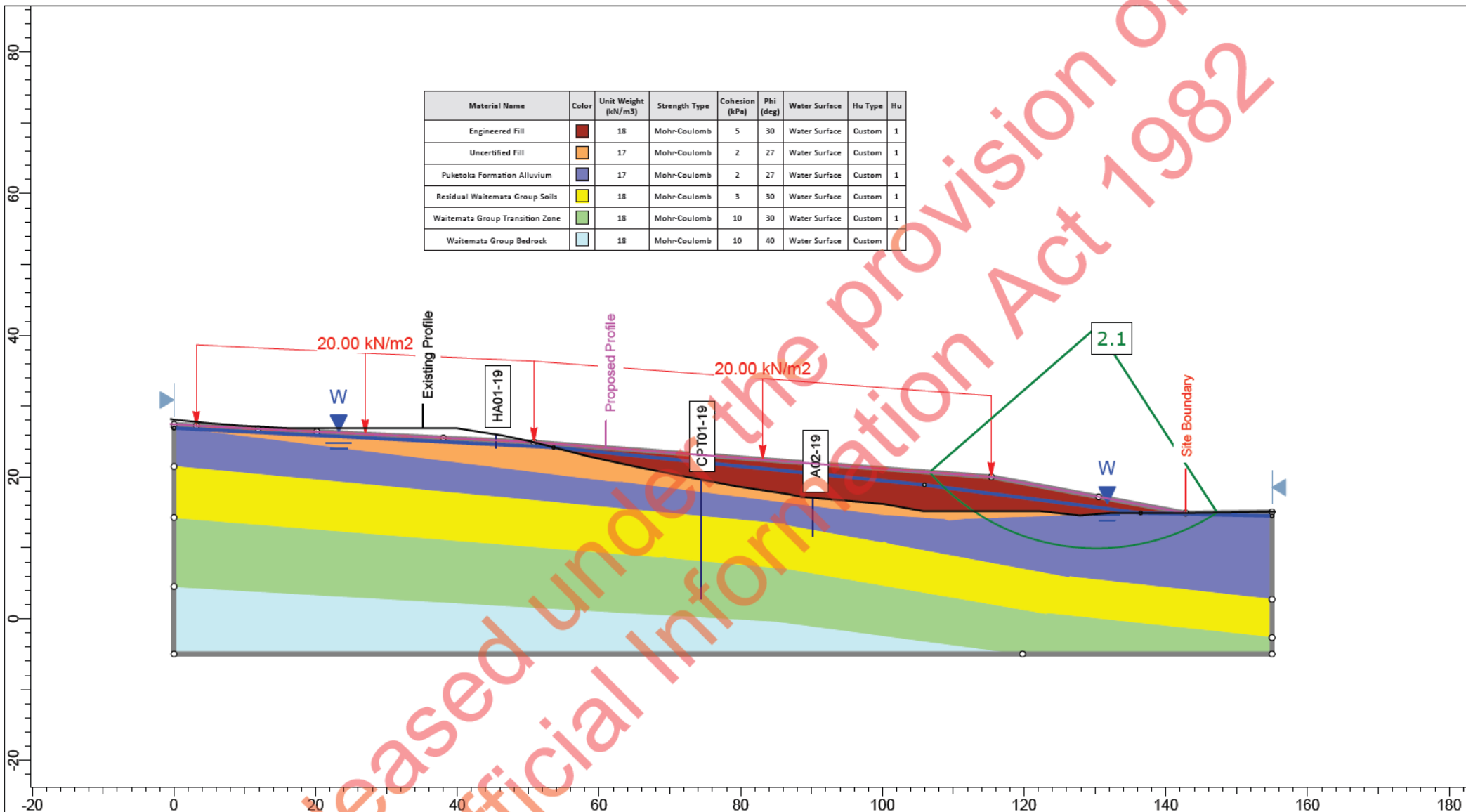
SRPC:


- 1.) GENERALLY LOCATED ON 0m CUT/FILL CONTOUR (±1m)



Project		Trig & Brigham Creek Road			
Analysis Description		Section A - Proposed Profile, Circular, Normal Groundwater			
Drawn By	TG	Date:	8/07/2020	Scale	1:750
Figure No	-	Job No	AKL2019-0040	Company	Neil Construcion Ltd
				File Name	AKL2019-0040_AA'_PR_CA_NGW_080720

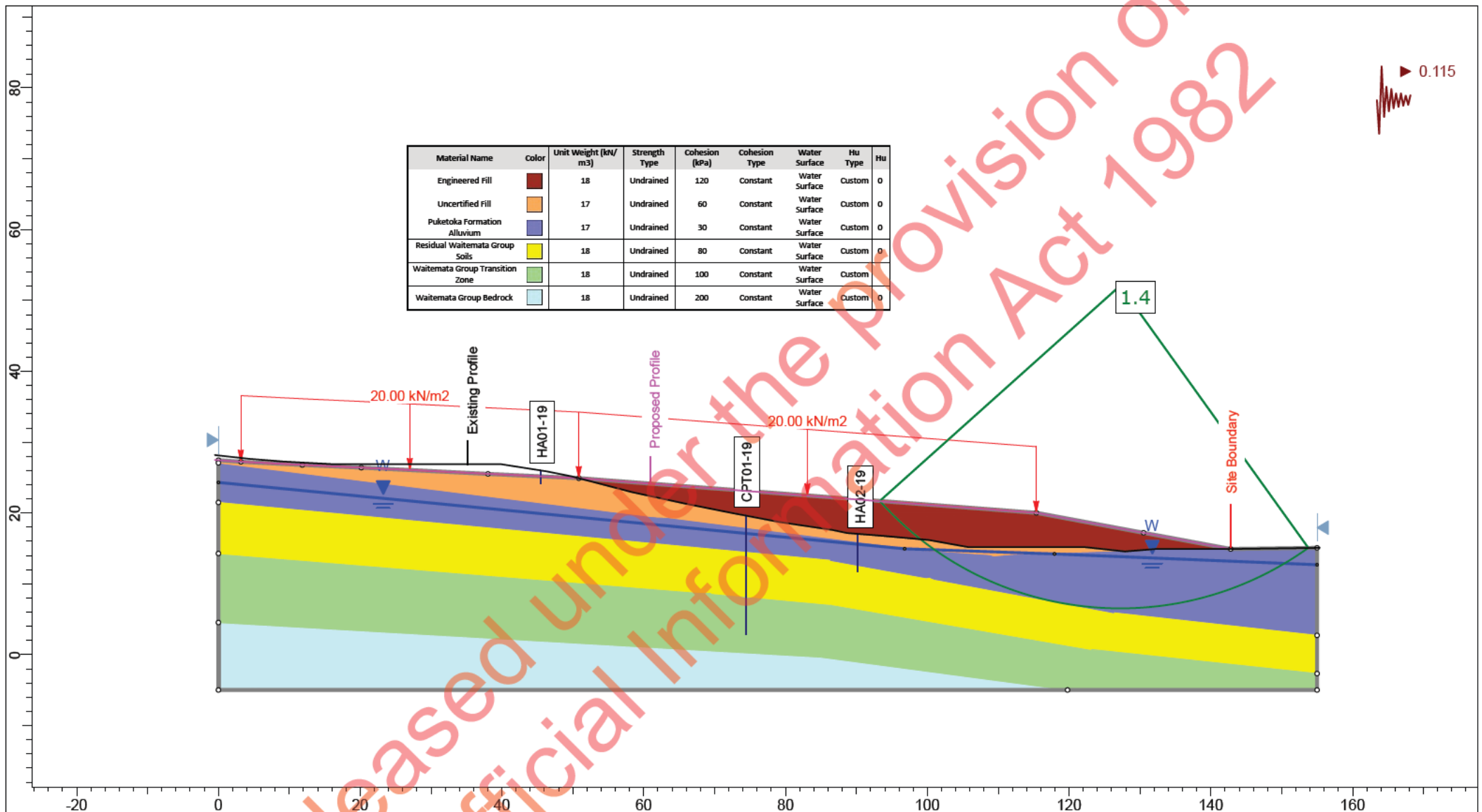







SLIDE 10 OF 10  
MET 8.029

Project		Trig & Brigham Creek Road			
Analysis Description		Section A - Proposed Profile, Circular, High Groundwater (Drainage Failure)			
Drawn By	TG	Date:	8/07/2020	Scale	1:750
Company		Neil Construction Ltd			
Figure No	-		Job No	AKL2019-0040	
File Name			AKL2019-0040_AA' PR_CA_HGW_080720 (Drainage Failure)		



	Project		Trig & Brigham Creek Road			
	Analysis Description		Section A - Proposed Profile, Circular, Seismic			
	Drawn By	TG	Date:	8/07/2020	Scale	1:750
	Company		Neil Constructon Ltd			
Figure No		-		Job No	AKL2019-0040	
				File Name	AKL2019-0040_AA'_PR_CA_SEIS_080720	