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## **GEOTECHNICAL PRE-SALE APPRAISAL**

**321A HUIA ROAD  
TITIRANGI**

**MARK ERCEG**

**Reference:** GM140

**Prepared:** 25<sup>th</sup> February 2020

**Issued to:** mark\_erceg@hotmail.com

**Issued on:** 28<sup>th</sup> February 2020

## 1. INTRODUCTION

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This report presents the findings of a geotechnical pre-sale appraisal carried out on the land in general, and more specifically the existing filled platform area, at 321A Huia Road, Titirangi. The purpose of our appraisal was to inspect geotechnically relevant aspects of the site, carry out a preliminary assessment of the existing filled area and to provide comment on any matters of concern with respect to the possible future residential development of the property.

Our appraisal has been based on a visual walk over inspection, soil testing using hand auger boreholes and clinometer slope angle measurements through one cross section. It is not intended to be a detailed geotechnical investigation of the property and should not be relied upon in the processing of resource or building consents for the development of the property.

This pre-sale appraisal report has been prepared for Mark Erceg.

## 2. SITE DESCRIPTION

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The subject property (legally described as Lot 18, DP45060) is located on the western side of Huia Road accessed by a gravel driveway. It comprises an irregular shaped property with an area of 13,850 m<sup>2</sup>.

The property slopes gently to moderately down from the western boundary toward the Huia Road, is currently grass covered and contains a number of medium to large trees. An existing dwelling is located within the south eastern part of the property and close to the eastern boundary. An existing garage is attached to the southern side of the dwelling.

Overland flow paths, flood prone areas and flood plains are indicated on Auckland Council GeoMaps. Auckland Council GeoMaps indicates that public sanitary sewer pipes cross the site at the south eastern corner of the property and part of the pipes pass through the driveway.

## 3. GEOLOGICAL SETTING

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The Geological Map of Auckland<sup>1</sup> shows the subject site to be underlain by volcanogenic flysch – grey-brown, alternating, thick-bedded sandstone and thin-bedded mudstone - of the Cornwallis Formation, Waitemata Group of Miocene age. Weathering of these deposits close to the surface typically results in the formation of a mantle of residual soil comprising clays and silts of variable plasticity, with some interbedded sand layers, and typically of firm to very stiff strength.

## 4. SITE INVESTIGATION

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Our site investigation work comprised the following:

- A walk over visual appraisal of the site.
- The drilling of five hand auger boreholes to depths of between 1.0 m and 3.1 m.
- The measurement of groundwater levels in the boreholes.
- The measurement of a cross section by tape and clinometer.

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<sup>1</sup> *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*

The approximate locations of the boreholes are shown on our attached site plan drawing number GM140/1. The borehole logs 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 section is also attached as drawing number GM140/2 it is preliminary and issued for information only and should not be used for design or construction purposes.

## 5. SUBSOIL CONDITIONS

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

- **Topsoil (HA5 only) and Fill to between 200 mm and 2.7m depth**, consisting of stiff and very stiff orange brown and dark grey brown silts and clays with some sand and gravel, overlying:
- **Alluvial Deposits to between 1.0 m and 3.1 m depth**, consisting of very stiff bluish grey and dark grey silts and clays with undrained shear strengths of between 141 kPa and in excess of 220 kPa, overlying:
- **Cornwallis Formation Soils to the termination of borehole HA4**, consisting of very stiff light grey and orange brown silts with undrained shear strengths of between 101 kPa and 153 kPa.

Groundwater was not encountered in any of the hand auger boreholes during our time on site.

## 6. EXISTING GEOTECHNICAL INFORMATION

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

## 7. PROPOSED DEVELOPMENT

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We have not been supplied with any drawings in respect of possible future development of the site.

## 8. SITE OBSERVATIONS

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- The site is underlain by Cornwallis Formation soils of the Waitemata Group of Miocene age. It is expected that these soils become less weathered and of increasing strength with depth. Non-engineered fill was encountered in all hand auger boreholes.
- A non-engineered fill area is located within the middle of the eastern half of the site forming a levelled platform area. The non-engineered fill is not suitable to support building loads. The site slopes steeply away from the north eastern side of the fill platform. During our walk over inspection we observed no obvious indications of current instability at this part of the site, however, the sloping and/or filled ground should be subject to more detailed specific site investigation and design. In ground retention and/or piled foundations are likely to be required.
- The eastern part of the property slopes moderately down toward the eastern boundary and the existing dwelling is located at this part of the site. The existing dwelling is located approximately 15 to 20 m away from the south eastern side of the non-engineered fill platform. During our walk over inspection we observed no obvious indications of current instability at this part of the property,

however, due to the ground slope more detailed site investigation is required to assess the subsoil condition and stability of this part of the property should it be subject to future development.

- The ground surface across the balance of the site is gently sloping and shows no obvious visual signs indicating historical or presently active deep seated instability.
- A number of large trees are located within the property and generally closer to the eastern and northern boundaries. The presence of trees can exaggerate the depth to which seasonal soil shrink-swell effects are active. As trees mature, the demand for water and thus the depth of the root structure increases, resulting in potential building settlement due to localised ground shrinkage near the trees. Deeper pile foundations would likely be required if building in close proximity to the trees.

## 9. CONCLUSION

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Overall the property is considered to be generally satisfactory for residential development provided that adequate foundation and land retention measures and design are undertaken to filled and/or sloping land.

Due to presence of non-engineered fill beneath the level platform within the middle of the eastern half of the property, and the moderate slopes to the eastern part of the site, more substantial foundations and land retention measures are likely to be required to ensure adequate long term stability to this area. Any buildings on identified filled ground will require foundation piling to below the fill and likely site retention measures to ensure long term slope stability.

## 10. ADDITIONAL GEOTECHNICAL REQUIREMENTS

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Any residential development of the property, particularly within the filled platform area or sloping land, must be preceded by further detailed geotechnical site investigation, stability analysis and reporting. This work would assess the specific nature of the site sub soils at depth, determine current site stability conditions and provide design parameters and recommendations for slope stability improvement, dwelling foundations, retaining walls and the satisfactory development of the property in relation to a specific development proposal.

## 11. SITE PHOTOGRAPHS

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**Photograph 1:**

Looking northeast toward the existing non-engineered fill platform area.



**Photograph 2:**

Looking south toward the gravel driveway and the non-engineered fill platform area from the northwest side of the platform.

## 12. LIMITATIONS

This report has been prepared solely for the benefit of Mark Erceg as our client and his 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.

### GEOCONSULT

**Author:**           Vahid Nikouei  
**Geotechnical Engineer**

**Signed:** 

**Reviewed:**       Bryce Schou  
**Senior Geotechnical Engineer**

**Signed:** 

**Authorised:**     Phil Williams  
**Geotechnical Team Leader**

**Signed:** 

Project:	Preliminary Geotechnical Assessment of Filled Area	Project No:	GM140	Drilled:	JM
Location:	321A Huia Road, Titirangi	Date Drilled:	20-02-2020	Logged:	JM
Client:	Mark Erceg	Hole Type:	HA	Checked:	VN
Coords:	1744851.00 - 5909676.00	Level:	81.00 m AOD	Hole Diameter:	50mm
				Scale	1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA)			Scala Penetrometer (blows per 50mm)				Depth (m)	
						Peak	Remould	Soil Sensitivity	0	5	10	15		20
0		Clayey SILT, orange brown mottled dark brown. Hard, dry. [Non-engineered Fill]												
1		1-1.5m void.												
		1.5-1.8m one augur of sample, dark brown organics.												
		At 1.8m becoming bluish grey mottled dark brown, some organics.												
2	XXXX	SILT, trace clay, light bluish grey streaked dark brown and dark grey. Hard, dry to moist. [Alluvium]	1.90		79.10	220+								
		End of borehole at 2.20 m	2.20		78.80									
3														
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.



# BOREHOLE LOG

Borehole No

**HA2**

Sheet 1 of 1

Project:	Preliminary Geotechnical Assessment of Filled Area	Project No:	GM140	Drilled:	VN
Location:	321A Huia Road, Titirangi	Date Drilled:	20-02-2020	Logged:	VN
Client:	Mark Erceg	Hole Type:	HA	Checked:	VN
Coords:	1744861.00 - 5909667.00	Level:	81.00 m AOD	Hole Diameter:	50mm
				Scale	1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA)			Scala Penetrometer (blows per 50mm)				Depth (m)	
						Peak	Remould	Soil Sensitivity	0	5	10	15		20
0		Clayey SILT, dark grey brown streaked mixed black and grey. Stiff, moist, low plasticity. [Non-engineered Fill]												
0.5-0.6m		0.5-0.6m tree roots.				89	28	3						
0.8m		At 0.8m trace of fine gravel.				62	23	3						1
1.2-1.35m		1.2-1.35m void.				58	28	2						
1.5m		At 1.5m becoming orange brown streaked grey and mixture of dark grey and black.				72	34	2						2
2.5-2.7m		2.5-2.7m wood fragments.												
2.70		Silty CLAY, dark grey. Very stiff, moist to wet, high plasticity. [Alluvium]	2.70		78.30									
3.10		End of borehole at 3.10 m	3.10		77.90	158	76	2						3
4														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.



# BOREHOLE LOG

Borehole No

**HA3**

Sheet 1 of 1

Project:	Preliminary Geotechnical Assessment of Filled Area	Project No:	GM140	Drilled:	VN
Location:	321A Huia Road, Titirangi	Date Drilled:	20-02-2020	Logged:	VN
Client:	Mark Erceg	Hole Type:	HA	Checked:	VN
Coords:	1744850.00 - 5909659.00	Level:	82.50 m AOD	Hole Diameter:	50mm
				Scale	1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA)			Scala Penetrometer (blows per 50mm)				Depth (m)	
						Peak	Remould	Soil Sensitivity	0	5	10	15		20
		GRAVEL. [Non-engineered Fill]												
		Clayey SILT, some medium sand, orange brown mixed dark grey and black. Stiff, dry to moist. [Non-engineered Fill]	0.20		82.30									
1						69	28	2						
		<i>At 1.1m becoming dark grey.</i>				96	41	2						1
		Clayey SILT, dark grey occasional light orange brown. Very stiff, moist, high plasticity. [Alluvium]	1.20		81.30	127	55	2						
		End of borehole at 1.50 m	1.50		81.00	124	62	2						
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 at target depth.





Project:	Preliminary Geotechnical Assessment of Filled Area	Project No:	GM140	Drilled:	JM
Location:	321A Huia Road, Titirangi	Date Drilled:	20-02-2020	Logged:	JM
Client:	Mark Erceg	Hole Type:	HA	Checked:	VN
Coords:	1744836.00 - 5909663.00	Level:	83.50 m AOD	Hole Diameter:	50mm
				Scale	1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA)			Scala Penetrometer (blows per 50mm)				Depth (m)	
						Peak	Remould	Soil Sensitivity	0	5	10	15		20
		SILT, trace fine to medium gravel, orange brown mottled dark brown and bluish grey. Hard, dry. [Non-engineered Fill]												
		Clayey SILT, light grey mottled orange brown and brown, trace organics. Very stiff, dry to moist, low plasticity. [Non-engineered Fill]	0.40		83.10	128	32	4						
		SILT, dark brown, some rootlets. Dry to moist. [Alluvium]	0.80		82.70									
1		Clayey SILT, light bluish grey streaked orange brown. Very stiff, moist, low plasticity. [Alluvium]	0.90		82.60	141	48	3						1
		SILT, trace clay, trace fine sand, light grey streaked orange brown speckled white. Very stiff, moist. [Cornwallis Formation]	1.20		82.30									
		At 1.6m becoming moist to wet, minor fine sand.				101	16	6						
2		End of borehole at 2.00 m	2.00		81.50	153	24	6						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 at target depth.

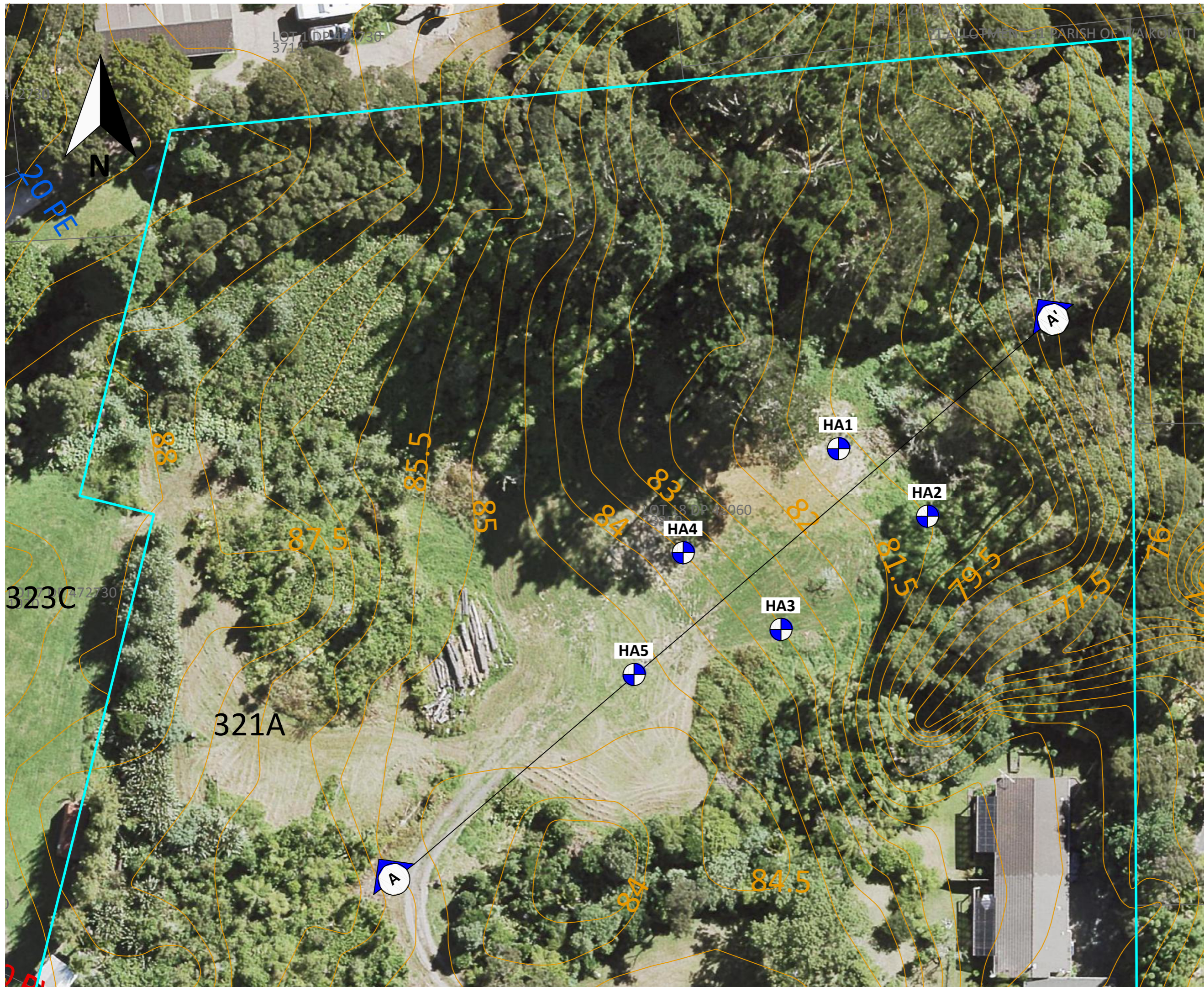


Project:	Preliminary Geotechnical Assessment of Filled Area	Project No:	GM140	Drilled:	JM
Location:	321A Huia Road, Titirangi	Date Drilled:	20-02-2020	Logged:	JM
Client:	Mark Erceg	Hole Type:	HA	Checked:	VN
Coords:	1744832.00 - 5909654.00	Level:	84.50 m AOD	Hole Diameter:	50mm
				Scale	1:25

Depth (m)	Legend	Soil Description	Depth (m)	Groundwater	RL (m AOD)	Vane Shear Strength (kPA)			Scala Penetrometer (blows per 50mm)				Depth (m)	
						Peak	Remould	Soil Sensitivity	0	5	10	15		20
		Topsoil/Fill. [Non-engineered Fill]												
		SILT, trace clay, orange brown mottled light grey brown. Hard, dry to moist. [Alluvium]	0.20		84.30									
						220+								
		<i>At 0.6m clay absent, trace fine sand, light grey streaked orange brown, friable.</i>												
		<i>At 0.8m minor fine sand.</i>												
		<i>At 0.9m becoming dry to moist.</i>												
1		End of borehole at 1.00 m	1.00		83.50	180	48	4						1
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 at target depth.







**Notes:**

1. LOCATIONS OF ALL FEATURES ARE APPROXIMATE ONLY.
2. THIS DRAWING IS BASED ON AUCKLAND COUNCIL GIS PHOTOGRAPHY.
3. DRAWING NOT TO BE USED FOR CONSTRUCTION PURPOSES.

**Key:**

-  HAND AUGER BOREHOLE LOCATION
-  CROSS SECTION

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

**STATUS: NOT FOR CONSTRUCTION**



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**PROJECT:** MARK ERCEG  
 PRELIMINARY GEOTECHNICAL  
 ASSESSMENT OF FILLED AREA

**SITE:** 321A HUIA ROAD  
 TITIRANGI

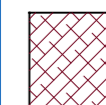
**TITLE:** SITE PLAN

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
1 : 400	FEB 2020	VN	PW
SHEET NO:	DRAWING NO:	REVISION:	
1 OF 2	GM140/1	-	

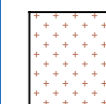
Notes:

1. THIS DRAWING IS BASED ON A TAPE AND CLINOMETER SURVEY AND IS APPROXIMATE ONLY.
2. THE SUBSOIL PROFILE HAS BEEN INFERRED FROM THE BOREHOLE INFORMATION. ACTUAL CONDITIONS MAY VARY DUE TO THE INHERENT VARIABILITY OF SOIL DEPOSITS.
3. DRAWING NOT TO BE USED FOR CONSTRUCTION PURPOSES.

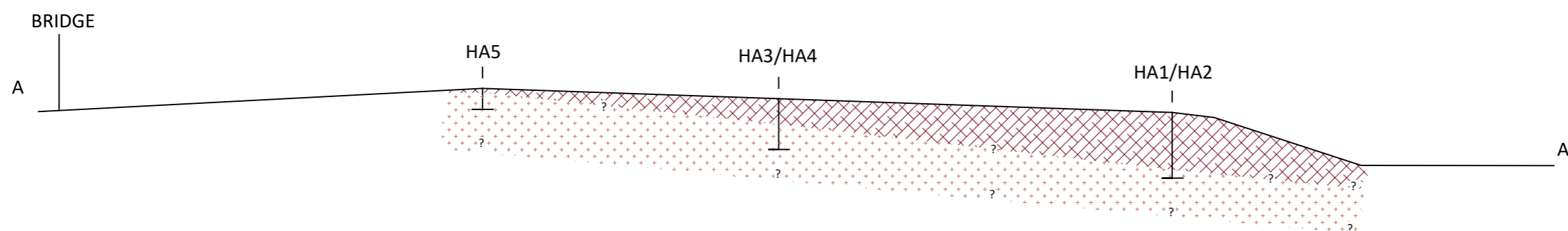
Key:



NON-ENGINEERED FILL



STIFF TO VERY STIFF SOILS  
ALLUVIUM AND  
CORNWALLIS FORMATION



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

STATUS: **NOT FOR CONSTRUCTION**



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PROJECT:  
MARK ERCEG  
PRELIMINARY GEOTECHNICAL  
ASSESSMENT OF FILLED AREA

SITE:  
321A HUIA ROAD  
TITIRANGI

TITLE:  
CROSS SECTION A-A'

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
1 : 250	FEB 2020	VN	PW

SHEET NO:	DRAWING NO:	REVISION:
2 OF 2	GM140/2	-