GEOTECH REPORT
STAGE 1B AND STAGE 1C

Terrane Consultants Limited
PO Box 13-607, Tauranga 3110, New Zealand
T +64 7 579 9708 **E** admin@terrane.co.nz
www.terrane.co.nz

GEOTECHNICAL COMPLETION REPORT

RESIDENTIAL SUBDIVISION

(STAGE 2)

81 CITRUS AVENUE, WAIHI BEACH

Date: 18th June 2021

Revision: 3

File Reference: 4444.Stg2.GCR

Distribution:

Vibe Group Waihi Ltd	1 copy
Barr+Harris Surveyors Ltd	1 copy
Terrane Consultants Ltd	1 copy (file)

RESIDENTIAL SUBDIVISION (STAGE 2) – 81 CITRUS AVENUE, WAIHI BEACH
GEOTECHNICAL COMPLETION REPORT
TABLE OF CONTENTS

APPENDICES:

A: Statement of Suitability & Lot Summary Table

B: Drawings:

Geotechnical Plans: *(by Terrane Consultants Ltd)*

4444 – 50 : Geotechnical Plan	(Rev 0, dated May 2021)
4444 – 52 : Fill Test Locations	(Rev 0, dated May 2021)

Subdivision Plans: *(by Barr+Harris)*

2855-GCR201 – Finished Contour Plan	(Rev -, dated April 2021)
2855-GCR202 – Earthworks Cut/Fill Plan	(Rev -, dated April 2021)
2855-ASB205 – Minimum Floor Level Plan	(Rev A, dated June 2021)

C: Factual Data

D: Fill Test Results

1.0 INTRODUCTION

Terrane Consultants Ltd was engaged by Vibe Group Waihi Ltd as the Soils Engineer for the residential subdivision at 81 Citrus Avenue, Western Bay of Plenty.

The bulk earthworks and other works for Stage 2 of the subdivision have now been completed. This Geotechnical Completion Report (GCR) summarises the earthworks undertaken and provides an assessment of the geotechnical suitability for building development.

This report supersedes the previous GCR dated 11th May 2021.

In overall summary, it is considered that the completed works give due regard to land slope and foundation stability considerations, and the Lots are geotechnically suitable for building development, subject to the requirements and recommendations given in this report.

A Statement of Professional Opinion is included in Appendix A of this report.

The following abbreviations are used in this report:

BRL	Building Restriction Line
GCR	Geotechnical Completion Report

2.0 GENERAL

Stage 2 of the subdivision involves the creation of 16 residential Lots at 81 Citrus Avenue, Waihi Beach. There are existing residential subdivisions to the north and south, with lifestyle blocks to the east and on the far (western) side of the road.

The layout of the subdivision is shown on the Geotechnical Plan, Drawing 4444-50 included in Appendix B. The original house has been removed and earthworks have created stepped level building platforms across the site, which fall from a high point in the northeastern corner towards the west.

The geotechnical assessment for the subdivision was given in:

> *"Geotechnical Assessment Report – Proposed Residential Subdivision (Stage 2), 81 Citrus Avenue, Waihi Beach"*, prepared by Terrane Consultants Ltd for Vibe Group Waihi Ltd, dated 7th July 2020, reference 4444.2 GAR, rev A.

The investigations confirmed the site is situated on a coastal terrace of the Ocean View Formation, of Late Pleistocene age and consisting of interbedded clayey sands, sandy clays and paleosols. The airfall volcanic ash layer of the Rotoehu Ash is located within the upper part of the formation, giving it a minimum age of 60,000 years BP. The Formation is typically overlain by more recent primary volcanic airfall deposits.

The subdivisional earthworks for Stage 2 are now complete. Most of the northern half of the site has been downcut and the western and southern parts of the site have been filled. A stormwater pond has been formed within the reserve located in the middle of the subdivision, with tiered timber retaining walls along the northern side of the pond and gentle batters on the southern side.

The new lots are accessed by two private rights-of-way that lead from Citrus Avenue and Seafoam Place.

3.0 SUBDIVISION DEVELOPMENT

The design of Stage 2 was undertaken by Barr+Harris.

Construction was undertaken in 2020-21, with Beach Contractors Ltd undertaking the bulk earthworks, roading, retaining wall and services construction.

The finished lot boundaries and levels within Stage 2 have changed slightly since the original design. The changes include removing the existing house and splitting that larger Lot into two, thereby creating a new Lot (Lot 23). Minor changes to internal boundaries and retaining wall layouts were also made.

The finished subdivision comprises 16 new residential Lots (Lots 1 to 15 inclusive and Lot 23), along with a central stormwater reserve and accessways.

Supervision and certification of the road construction was carried out by Barr+Harris and is not included in this certification.

Excavation and backfilling of the service trenches was undertaken by Barr+Harris and is not included in this certification.

4.0 INVESTIGATIONS

The site investigations undertaken for the assessment and design of Stage 2 included:

- review of published and in-house geotechnical data, including air photographs;
- a detailed walkover inspection and engineering geological mapping;
- twenty two handauger boreholes to up to 4.2 metres depth;
- insitu strength measurements using a hand operated shear vane; and
- nine Cone Penetration Tests (CPT) to 12 metres depth.

Further investigations undertaken as part of detailed design and construction included:

- stripping and earthworks inspections during the 2020-21 earthworks season; and
- sixteen post-earthworks handauger boreholes.

The locations of the additional investigations are shown on Drawing 4444-50 in Appendix B of this report, while the factual results are included in Appendix C.

5.0 EARTHWORKS AND CONSTRUCTION

5.1 General

Construction of Stage 2 required a modest amount of bulk earthworks, with approximately 2,000 m^3 of cut and 1,100 m^3 of fill. Material was generally cut from the northern half of the site and placed as structural grade filling on the southern and western parts of the site. Any old horticultural fill (intermixed topsoil and silt) was removed from site. The earthworks resulted in cuts up to 800 mm deep and fills up to 400 mm thick. No significant earthworks were undertaken on Lots 11 and 12.

The earthworks were undertaken as a controlled operation and in accordance with the project specification, NZS4431:1989 "*Code of practice for earth fill for residential development*" and the Western Bay of Plenty Development Code (2009).

The compaction criteria for general cohesive filling were:

- Min undrained shear strength: single reading = 115 kPa, average = 140 kPa
- Max air voids: single reading ≈10%, average =8% (depending on pumice content).

Limits on water content were also used to control the quality of the fill. Additional inspections were undertaken to ensure that all the old horticultural fill was removed.

5.2 Inspections and Testing

More than ten inspections were undertaken by Terrane staff during the earthworks, including those for stripping operations, bulk earthworks and retaining walls.

Almost all of the bulk filling placed within Stage 2 was to structural grade requirements. The only filling not specifically checked was the backfill to the retaining walls and the backfill to the service trenches, both of which are offset from the approved building platforms.

Earthworks compaction testing was undertaken and directly supervised by Terrane.

During earthworks a buried septic tank was encountered. The tank was removed from site before the excavation was backfilled with imported clean sand. Terrane observed the excavation and the backfill was tested by Scala penetrometer and found to be satisfactory. The location of the septic tank backfilling is shown on Drawing 4444-52 included in Appendix B while the Scala results are included in Appendix D.

Upon completion of the bulk earthworks a handauger borehole was completed within each residential lot to confirm subgrade quality. The test results are consistent with observations made on site and confirm that the filling was placed and compacted in accordance with the project specification.

The results of the fill compaction and other control testing are included in Appendix D.

6.0 RETAINING WALLS

Two tiered timber pole retaining walls have been constructed within Stage 2. These walls were constructed in the stormwater reserve (Lot 21) and also near the southern boundary of Lot 7 and Lot 8. The as-built locations of the retaining walls are shown on Drawing 4444-50.

The retaining walls were designed by Terrane and subject to a building consent. Certification of the walls is provided under separate cover.

7.0 GROUND HAZARDS

The ground hazards were identified and analysis undertaken before subdivision construction began. Those details were included in the 2020 Geotechnical Assessment Report. The completed subdivision is consistent with that report.

Important hazards are summarised below.

- **Liquefaction Potential:** Liquefaction is the sudden loss of strength that can occur due to excessive pore pressures generated during earthquakes or other strong cyclic loading. Saturated loose granular soils (silts and sands) are the most at risk, while the presence of clay fines and/or soil cohesion reduces the liquefaction potential.

There is a 5.5 metre thick area wide crust of fine grained soils capping the potentially liquefiable sands. This crust can therefore be relied on to mitigate liquefaction risks. The residual risk of liquefaction induced settlement can be absorbed by the use of a standard (TC1) style waffle slab foundation;

- **Lateral spreading:** The presence of an open drain on the far side of Citrus Avenue means there is some theoretical risk of lateral spreading effecting the Lots closest to Citrus Avenue. This risk is reduced by factors such as the depth to liquifiable layers, multiple culverted driveways and the offset distance. The overall conclusion is that lateral spreading risks are within normally accepted levels for residential development;
- **Settlement:** The site soils are typical of the wider area, with generally low risk of settlement under light to moderate loadings. The boreholes did not identify any significant lateral variations in compressibility across the site. The filling is all structural grade and relatively consistent. The conclusion is that the subgrade is not at potential risk of adverse settlement under light to moderate loadings. Normal requirements apply;
- **Slope stability:** the building platforms are flat to gently sloping and are suitably offset from the stormwater pond excavation and the open drain on the western side of Citrus Avenue, therefore no elevated risk;
- **Active faulting**: The Active Fault Database administered by GNS Science indicates there are no active fault traces within the local area, nor is there any topographical evidence of potential faulting;
- **Groundwater flooding**: The groundwater table is more than 1.8 metres below the lowest building platform, therefore there is no elevated risk apparent; and
- **Internal erosion**: this is a process by which soil particles are removed from within a soil or rock mass, usually by flowing groundwater. The resulting cavities are collectively referred to as tomo. No indications of tomo or accelerated erosion were identified. Normal provisions for volcanic soils apply.

Tsunami and flooding are not ground risks and so were not included in this assessment.

8.0 SUITABILITY FOR DEVELOPMENT

8.1 General

The finished earthworks and retaining walls have resulted in flat to gently sloping building platforms on each of the lots. There are gentle to moderate sloping batters located within the side yards between some of the lots. The batters are generally less than 400 mm high and have a maximum gradient of 1V:2.5H (vertical to horizontal). The batters are relatively minor and can be dealt with as part of normal design and construction for dwellings.

Based on the inspections and testing undertaken during construction, it is considered that the completed works give due regard to land slope and foundation stability considerations and the Lots are geotechnically suitable for building development, subject to the requirements and recommendations given in this report.

Lots 7 and 8 require restrictions on building development due to presence of retaining walls. These are defined via BRL as shown on Drawing 4444-50 included in Appendix B of this report.

A Statement of Professional Opinion and a tabular summary of requirements for each Lot are included in Appendix A of this report.

8.2 Specific Requirements for Lots 7 and 8

Lots 7 and 8 are located north of the stormwater pond located on reserve Lot 21. The pond was excavated into the reserve and the northern side of the pond is formed by two tiered timber pole retaining walls, with one of the retaining walls located completely in the reserve and one of the walls located in Lot 7 and 8.

To avoid surcharging the retaining walls, there is a BRL 2.0 metres from the southern boundary on Lots 7 and 8. Any building foundations south of the BRL requires specific design. Any buildings on the northern side of the BRL and within 2.0 metres of the BRL will require a geotechnical check at building consent application stage. This check is to confirm that the proposed foundations and associated filling will not surcharge the walls.

8.3 Specific Requirements for Lots 11 and 12

Lots 11 and 12 are located at the eastern end of the site and these lots were not subject to the same extensive earthworks that occurred elsewhere onsite. Whilst the handauger boreholes did not encounter any old filling, there is the possibility that some old horticultural fill (typically a mixture of topsoil and orange silt) may be present. Accordingly, at building consent stage a check of the foundation subgrade should be undertaken by a suitably qualified Geo-Professional. Any indications of topsoil rich fill should be removed and replaced with structural grade fill.

8.4 Minimum Floor Levels

The minimum finished floor levels (FFL) for protection against surface flooding have been confirmed by Barr+Harris and WBOPDC and are shown on the attached Barr+Harris Drawing 2855-ASB205 (Rev A), dated June 2021.

The finished floor levels shown on that plan include a 200 mm geotechnical freeboard allowance as an extra level of protection in case of area wide liquefaction-induced settlement or ground settlement.

8.5 Building Foundations

The approved building platforms are typically flat to very gently sloping and are suitable for residential development.

Building foundations within the approved building platforms can be designed in general accordance with NZS3604:2011 *Timber Framed Buildings,* subject to the following:

- All building foundations to be waffle-slab type (minimum = TC1 type).
- The fill and natural brown ash subgrade soils are typical of those in the wider area and are generally suitable for light timber framed buildings. Foundations can be designed in accordance with NZS3604:2011 Timber Framed Buildings, subject to bearing capacities of:
    - Geotechnical ULS bearing capacity = 250 kPa
    - Factored ULS bearing capacity = 125 kPa.

  This reduction is to allow for sensitivity/strength loss within highly weathered volcanic ash soils.
- There is a retaining wall and BRL on Lots 7 and 8. Any building foundations south of the BRL requires specific design. Any buildings on the northern side of the BRL and within 2.0 metres of the BRL will require a geotechnical check at building consent application stage. This check is to confirm that the proposed foundations and associated filling will not surcharge the walls.

- Requirements for increased foundation embedment may apply where adjacent to sloping ground between lots, retaining walls or buried pipes.

The subgrade soils for building foundations and any retaining walls should be inspected and approved by a suitably experienced Chartered Professional Engineer familiar with the contents of this report. Any variation from the inferred subsurface model described herein should be referred to a geotechnical engineer to allow assessment of its significance.

8.6 Stormwater Disposal

The stormwater flows are to be disposed of via the new stormwater pond in the middle of the subdivision, from which the flows are piped to the open drain on the other side of Citrus Avenue. The near surface soils are fine grained and so there is relatively limited potential for soakage disposal.

Ponding of stormwater runoff should be avoided, including behind retaining walls.

8.7 Ground Retention

The ground conditions within the approved building platforms are suitable for conventional embedded and/or cantilever type retaining walls. Normal criteria apply, including the requirement for engineer design and certification.

8.8 Buried Services

The majority of buried services within Stage 2 are located within the road berms, however some are located between Lots. Council development guidelines require that foundations near buried pipelines extend at least 0.6 metres below a 45° zone of influence from the invert of the pipe (WBOPDC Development Code 2009, Drawing W553). This appears suitable for Stage 2.

9.0 APPLICABILITY

This Geotechnical Completion Report (GCR) has been prepared for Vibe Group Waihi Ltd with respect to the specific brief given to us, and should not be used in any other context, by any other party or for any other purpose without our prior review and written agreement.

Comments and recommendations given in this report relate to the specific development proposal described to us. Any significant change to the scope of development should be checked for any geotechnical issues arising.

If there is any doubt regarding the applicability of the report or its contents, or the site materials encountered are different from those described herein, it is essential that these issues are discussed with Terrane Consultants prior to proceeding with any work based on this document.

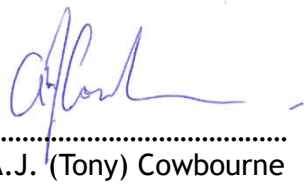
Terrane Consultants Ltd

Report prepared by:

.....

Bevan L. Marr
MEngNZ BA(Geog) NZDE(Civil)
CATEGORY 2 ENGINEERING GEOLOGIST

Authorised for release by:



.....

A.J. (Tony) Cowbourne
CPEng BE(Hons) MSc(Hons) BSc CMEngNZ
CATEGORY 1 GEO-PROFESSIONAL, DIRECTOR

4444.Stg.2 GCR.v0.1.docx
S: 18/06/21

APPENDIX A

STATEMENT OF SUITABILITY & LOT SUMMARY TABLE

STATEMENT OF PROFESSIONAL OPINION AS TO THE GEOTECHNICAL SUITABILITY OF LAND FOR BUILDING

Development: ..... *Residential Subdivision – Stage 2* .....

Owner: ..... *Vibe Group Waihi Ltd* .....

Location: ..... *81 Citrus Avenue, Waihi Beach, Western Bay of Plenty* .....

I ... *Anthony John Cowbourne* ..... of ... *Terrane Consultants Ltd* .....
..... *(full name)* .... *(name of firm)* .....

Hereby confirm that:

1. I am a professional person, appropriately qualified with experienced in geotechnical engineering to ascertain the suitability of the land for building development and was retained as the Soils Engineer for the above development.

2. An appropriate level of site investigation and construction supervision has been carried out under my direction and is described in my development evaluation report dated: *...18th June 2021, titled "Geotechnical Completion Report, Residential Subdivision (Stage 2) at 81 Citrus Avenue, Waihi Beach" (GCR), ref: 4444 Stg2·GCR·r3*

3. In my professional opinion, not to be construed as a guarantee, I consider that:
   a) The areas shown in my report dated ...*18th June 2021*... of each new allotment or on the development site are suitable for the erection thereon of the building types appropriate to the zoning of the land, provided that: *...refer GCR...*

   b. The completed works give due regard to all land slope and foundation stability considerations. *...refer GCR...*

   c. The earth fills shown on the attached Plan No ·· *2855-GCR202 titled "Earthworks Cut/Fill Plan", dated April 2021, by Barr Harris Surveyors* have been placed in accordance with the Subdivision and Development Code of Practice of the Western Bay of Plenty District Council *...refer GCR...*

   d. The filled ground is suitable for the erection thereon of residential buildings not requiring specific design in terms of NZS3604:2011 and related documents provided that*: ...refer GCR...*

   e. The original ground not affected by filling is suitable for the erection thereon of residential buildings not requiring specific design in terms of NZS 3604: 1999 and related documents provided that: *...refer GCR...*

4. This professional opinion is furnished to the Council and the owner for their purpose alone, on the express condition that it will not be relied upon by any other person and does not remove the necessity for the normal inspection of foundation conditions at the time of erection for any dwelling.

Signed: ..... Date: ... *18th June 2021* .....
CPEng BE(Hons) MSc(Hons) BSc CMEngNZ

GEOTECHNICAL DATA FOR INDIVIDUAL LOTS

NOTES:

1. To be read in conjunction with the GCR (Geotechnical Completion Report for Stage 2, 81 Citrus Avenue, Waihi Beach, prepared by Terrane Consultants Ltd, dated 18th June 2021, reference 4444.Stg.2.GCR.r3)
2. Format as per Form G3 of the Tauranga City Council " Infrastructure Development Code" (rev 1)
3. BRL are as given on Drawing 4444-50 (Rev 0).
4. Estimates of cut and fill are derived from the Barr Harris drawing titled "Earthworks Cut/Fill Plan", reference 2855-GCR202, dated April 2021.

F: 4444 Stage 2 Summary Table.xlsx

Lot Number	Area (m^2)	Subsurface Data						Building Foundations			Building Restriction Line	S/W Specific Design	S/W Soakage	S/W Detention	Designated Building Platform	Minimum Building Platform	Compressible Soils	On-Site Effluent Disposal	Consent Notice	NOTES
		Shear Strength (kPa)	Fill Depth (m)	Cut Depth (m)	Natural Topography Unworked (Y/N)	Natural Topography Earthworked (Y/N)	Natural Topography Earthworked Depth (m)	Conventional Shallow Foundations to NZS3604:2011	Foundations to NZS3604:2011 (with reduced bearing capacity of 125kPa)	Specific Design (Y/N/NA)										
1	-	100 +	0.3	-	No	Yes	-		✓	No										
2	-	100 +	0.4	0.4	No	Yes	-		✓	No										
3	-	100 +	0.4	0.2	No	Yes	-		✓	No										
4	-	90 +	0.4		No	Yes	-		✓	No										
5	-	100 +	0.4	0.2	No	Yes	-		✓	No										
6	-	100 +	0.4	0.2	No	Yes	-		✓	No										
7	-	100 +	0.2	0.4	No	Yes	-		✓	Yes	✓								✓	There is a BRL is located 2 metres from the southern boundary. •No building on the southern side of the BRL without Specific Design. •Any building within 2 metres of the BRL requires a geotechnical plan check.
8	-	100 +	-	0.8	No	Yes	-		✓	Yes	✓								✓	There is a BRL is located 2 metres from the southern boundary. •No building on the southern side of the BRL without Specific Design. •Any building within 2 metres of the BRL requires a geotechnical plan check.

GEOTECHNICAL DATA FOR INDIVIDUAL LOTS

NOTES:

1. To be read in conjunction with the GCR (Geotechnical Completion Report for Stage 2, 81 Citrus Avenue, Waihi Beach, prepared by Terrane Consultants Ltd, dated 18th June 2021, reference 4444.Stg.2.GCR.r3)
2. Format as per Form G3 of the Tauranga City Council " Infrastructure Development Code" (rev 1)
3. BRL are as given on Drawing 4444-50 (Rev 0).
4. Estimates of cut and fill are derived from the Barr Harris drawing titled "Earthworks Cut/Fill Plan", reference 2855-GCR202, dated April 2021.

F: 4444 Stage 2 Summary Table.xlsx

Lot Number	Area (m^2)	Subsurface Data						Building Foundations			Building Restriction Line	S/W Specific Design	S/W Soakage	S/W Detention	Designated Building Platform	Minimum Building Platform	Compressible Soils	On-Site Effluent Disposal	Consent Notice	NOTES
		Shear Strength (kPa)	Fill Depth (m)	Cut Depth (m)	Natural Topography Unworked (Y/N)	Natural Topography Earthworked (Y/N)	Natural Topography Earthworked Depth (m)	Conventional Shallow Foundations to NZS3604:2011	Foundations to NZS3604:2011 (with reduced bearing capacity of 125kPa)	Specific Design (Y/N/NA)										
9	-	100 +	-	0.6	No	Yes	-		✓	No										
10	-	100 +	0.2	0.8	No	Yes	-		✓	No										
11	-	100 +	-	0.4	No	Yes	-		✓	No									✓	No significant earthworks occurred on this Lot. There is a possibilty that some old horticultural fill remains. This should be checked at the time of building construction.
12	-	100 +	0.4	-	No	Yes	-		✓	No									✓	No significant earthworks occurred on this Lot. There is a possibilty that some old horticultural fill remains. This should be checked at the time of building construction.
13	-	100 +	0.4	0.2	No	Yes	-		✓	No										
14	-	100 +	0.4	0.2	No	Yes	-		✓	No										
15	-	100 +	0.4	-	No	Yes	-		✓	No										
23	-	100 +	0.2	0.6	No	Yes			✓	No										

APPENDIX B

DRAWINGS

NOTES:

1. Dimensions are in metres unless noted otherwise.
2. Coordinates are in terms of NZGD 2000 Mt Eden Circuit. Levels are in terms of the Auckland Vertical Datum 1946.
3. Proposed Lot boundaries, finished contours and retaining walls from Barr Harris Surveyors Ltd drawing, dated April 2021, ref: 2855-GCR201. Contours depict the finished ground surface and are at 200 mm intervals.
4. Stage 1 of the subdivision involved the creation of Lots 16, 17 and 18. For details, refer to the Terrane Consultants Ltd "Geotechnical Assessment Report - Proposed Residential Subdivision (Stage 1) at 81 Citrus Ave", dated 21st April 2020, ref 4444.1a GAR.
5. The timber pole retaining walls located on Lots 7, 8 and 21 are certified under separate cover.
6. To be read in conjunction with the Terrane Consultants Ltd "Geotechnical Completion Report (Stage 2) - Residential Subdivision at 81 Citrus Avenue, Waihi Beach", dated 18th May 2021, ref: 4444.Stg.2.GCR.r3.

KEY:

- HA — Handauger Borehole (Post-earthworks)
- Timber Pole Retaining Wall
- BRL — Building Restriction Line

Rev no	Revision note	Date	Issued By	Approved by
0	For Approval / Consent	11-May-2021	ajc	-
A	Minor updates	18-May-2021	ajc	

Terrane Consultants Ltd
PO Box 13-607 Tauranga 3110, New Zealand
T +64 7 579 9708 **E** Admin@terrane.co.nz
www.terrane.co.nz

Des: blm	File ref: 4444.3.dwg	Scale: 1:500 at A3 size
Dwg: blm	Date: June-2021	Rev: 0
Chk:		

Project:
VIBE GROUP WAIHI LTD
81 CITRUS AVENUE, WAIHI BEACH
RESIDENTIAL SUBDIVISION (STAGE 2)

Drawing:
4444 - 50

Title:
GEOTECHNICAL PLAN

2021-6-18 4444.3 Stg2.GCR.r3 - Copy.dwg

NOTES:

1. Dimensions are in metres unless noted otherwise.
2. Coordinates are in terms of NZGD 2000 Mt Eden Circuit.
3. Proposed subdivision boundaries, Lot numbering and cut fill contours from Barr Harris Surveyors Ltd drawing, dated April 2021, ref: 2855-GCR202.
4. Contours depict the cut and fill depths at 200 mm intervals. Depths shown are from the original ground surface to the top of finished ground (including topsoil).
5. Fill test locations are approximate. Refer Terrane "Fill Testing Summary" for test results.
6. During the initial earthworks stripping operations, some localised undercutting occurred to remove old horticultural filling. Fill Test 1 was located in the structural grade backfill to this.

Rev no	Revision note	Date	Issued By
0	Completion Report	11-May-2021	ajc
A	Sceptic tank notes added	15-June-2021	ajc
B	Minor updates	18-June-2021	ajc

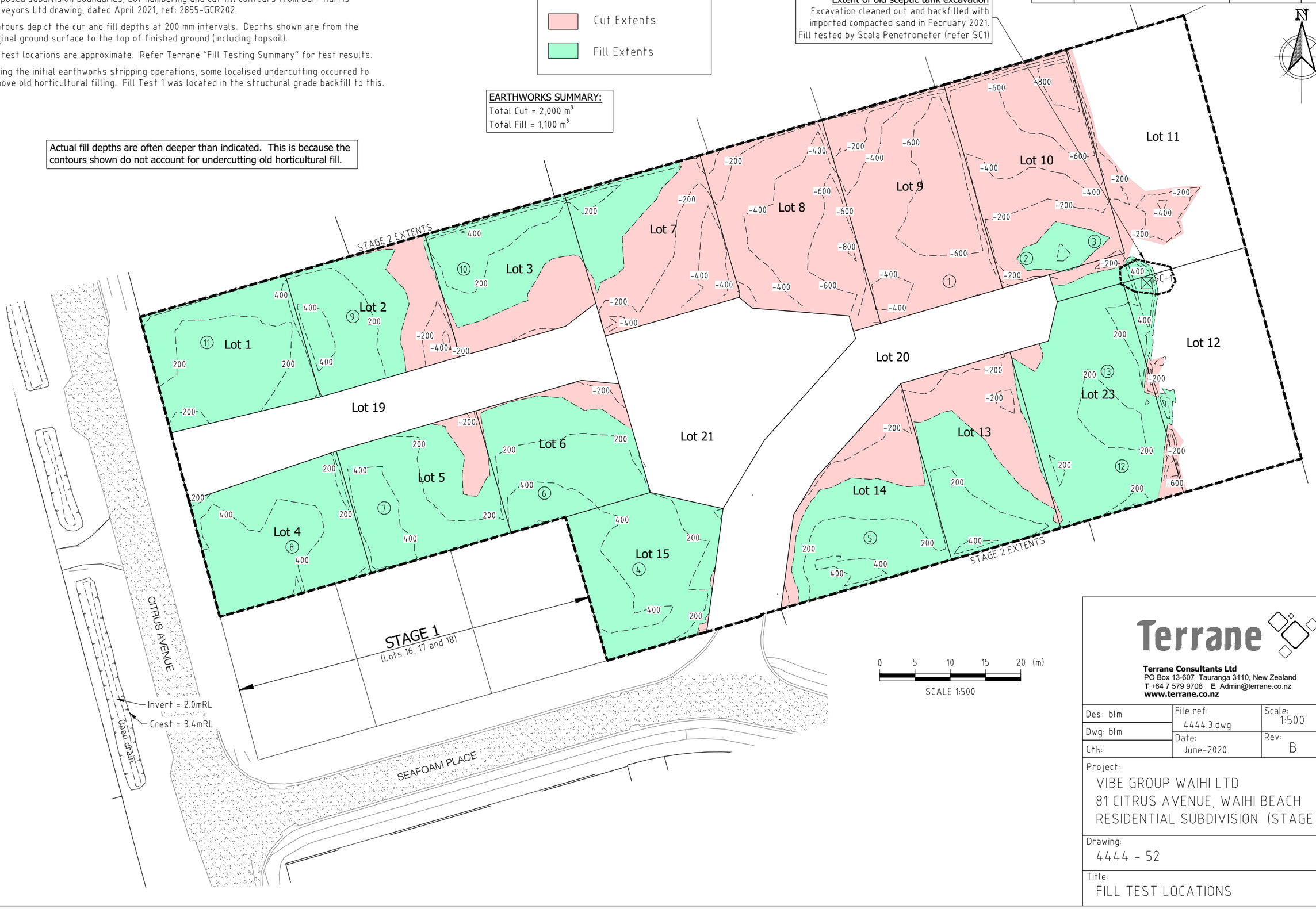
KEY:

- (1) Location of fill test
- Cut Extents
- Fill Extents

EARTHWORKS SUMMARY:
Total Cut = 2,000 m³
Total Fill = 1,100 m³

Extent of old sceptic tank excavation
Excavation cleaned out and backfilled with imported compacted sand in February 2021. Fill tested by Scala Penetrometer (refer SC1)

Actual fill depths are often deeper than indicated. This is because the contours shown do not account for undercutting old horticultural fill.



Terrane Consultants Ltd
PO Box 13-607 Tauranga 3110, New Zealand
T +64 7 579 9708 **E** Admin@terrane.co.nz
www.terrane.co.nz

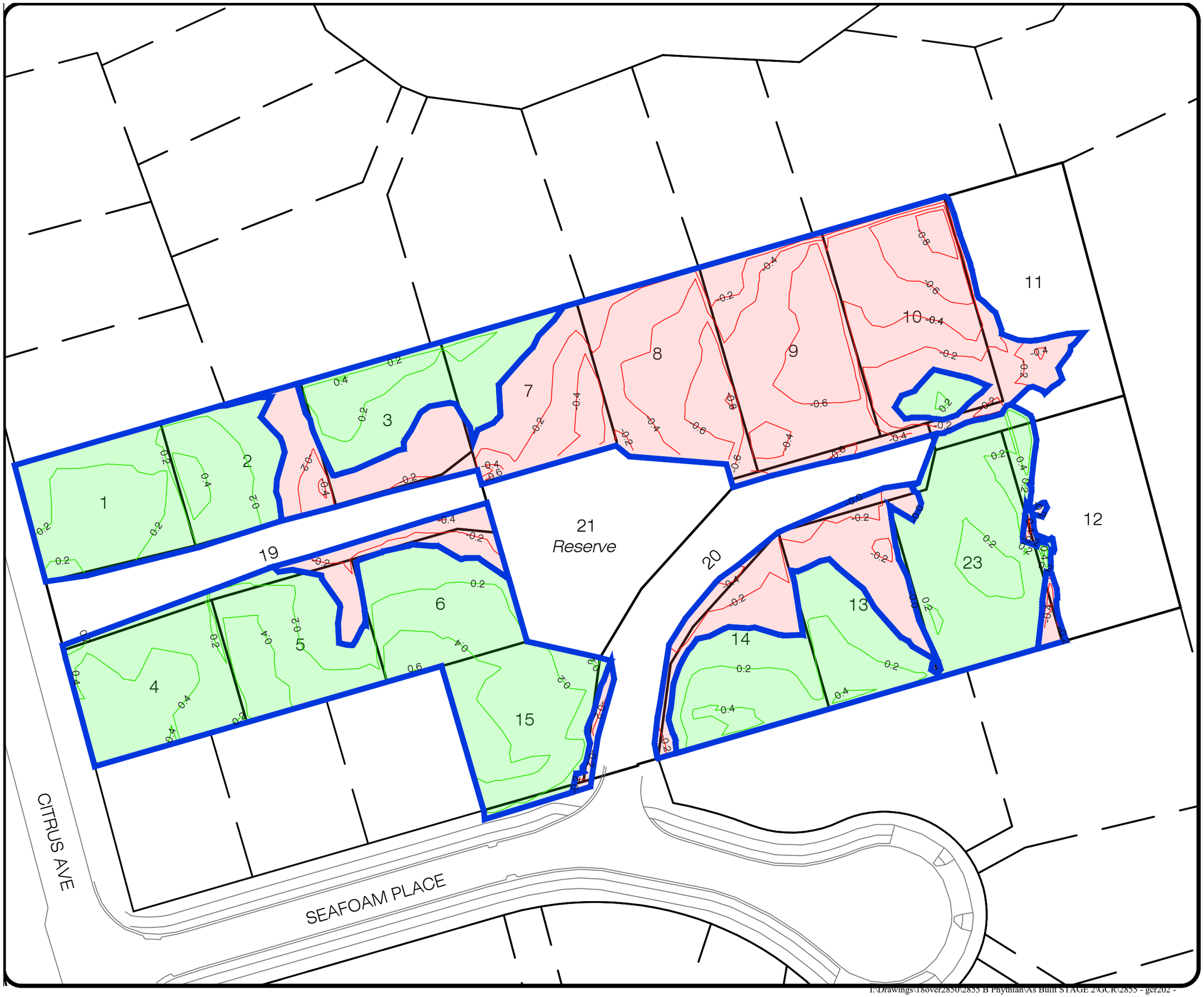
Des: blm	File ref: 4444.3.dwg	Scale: 1:500 at A3 size
Dwg: blm	Date: June-2020	Rev: B
Chk:		

Project:
VIBE GROUP WAIHI LTD
81 CITRUS AVENUE, WAIHI BEACH
RESIDENTIAL SUBDIVISION (STAGE 2)

Drawing:
4444 - 52

Title:
FILL TEST LOCATIONS

2021-6-18 4444.3 Stg2 GCR.r3 - Copy.dwg



I:\Drawings\18over2850\2855 B Phythian\As Built STAGE 2\GCR\2855 - gcr202 - Earthworks Cut Fill Plan.dwg

BARR + HARRIS
SURVEYORS LIMITED

Matamata Telephone 07 888 8777
124 Broadway, P.O.Box 112 Facsimile 07 888 8484
Putaruru Telephone 07 883 3050
Waihi Beach Telephone 07 863 6622
P.O.Box 47 Telephone 07 863 6622

NOTE:

- Coordinates are in terms of NZGD 2000 Mt Eden circuit.
- Levels are in terms of the Auckland Vertical Datum 1946.
- Depths shown are from exisitng natural ground to top of finished ground (including topsoil).
- Drawing prepared for GCR purposes. Lot 19, 20, 21 were incomplete at time of topographical survey

LEGEND

Cut contours at 0.2m intervals

Fill contours at 0.2m intervals

Zero cut/fill line

REF	AMENDMENT	BY	DATE

I:\Drawings\18over2850\2855 B Phythian\As Built STAGE 2\GCR\2855 - gcr202 - Earthworks Cut Fill Plan.dwg

N W E S

Design.	A Holroyd
Drawn.	M Bellamy
Checked.	A Holroyd
Approved.	
Date.	April 2021

Job Title.

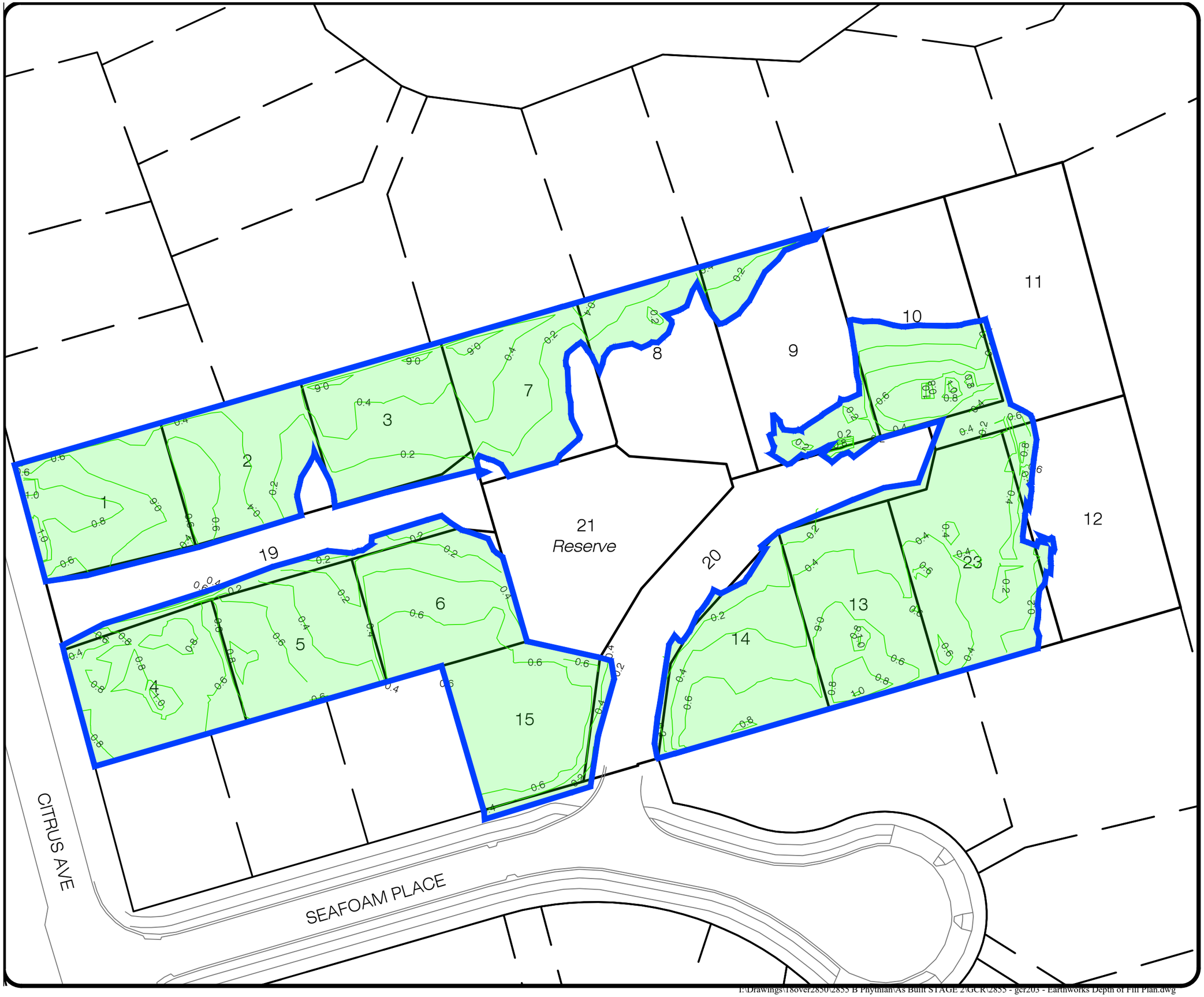
Vibe Group Waihi Ltd
81 Citrus Ave - Waihi Beach

Drawing Title.

EARTHWORKS CUT/FILL PLAN

Scale.	Revision.
@A3 1:500	–

Job ID.	Drawing No.
18/2855	2855 - gcr202



BARR + HARRIS
SURVEYORS LIMITED

Matamata Telephone 07 888 8777
124 Broadway, P.O.Box 112 Facsimile 07 888 8484
Putaruru Telephone 07 883 3050
Waihi Beach Telephone 07 863 6622
P.O.Box 47

NOTE:

- Coordinates are in terms of NZGD 2000 Mt Eden circuit.
- Levels are in terms of the Auckland Vertical Datum 1946.
- Depths shown are from stripped ground to top of topsoil at finished ground so include a nominal topsoil depth of 200-300mm.
- Drawing prepared for GCR purposes. Lot 19, 20, 21 were incomplete at time of topographical survey

LEGEND

- Depth of fill at 0.2m intervals. (depth includes thickness of topsoil)
- Fill area
- Zero cut/fill line

DRAFT

REF	AMENDMENT	BY	DATE

I:\Drawings\18over2850\2855 B Phythian\As Built STAGE 2\GCR\2855 - gcr203 - Earthworks Depth of Fill Plan.dwg

N W E S

Design.	A Holroyd
Drawn.	M Bellamy
Checked.	A Holroyd
Approved.	
Date.	April 2021

Job Title.

Vibe Group Waihi Ltd
81 Citrus Ave - Waihi Beach

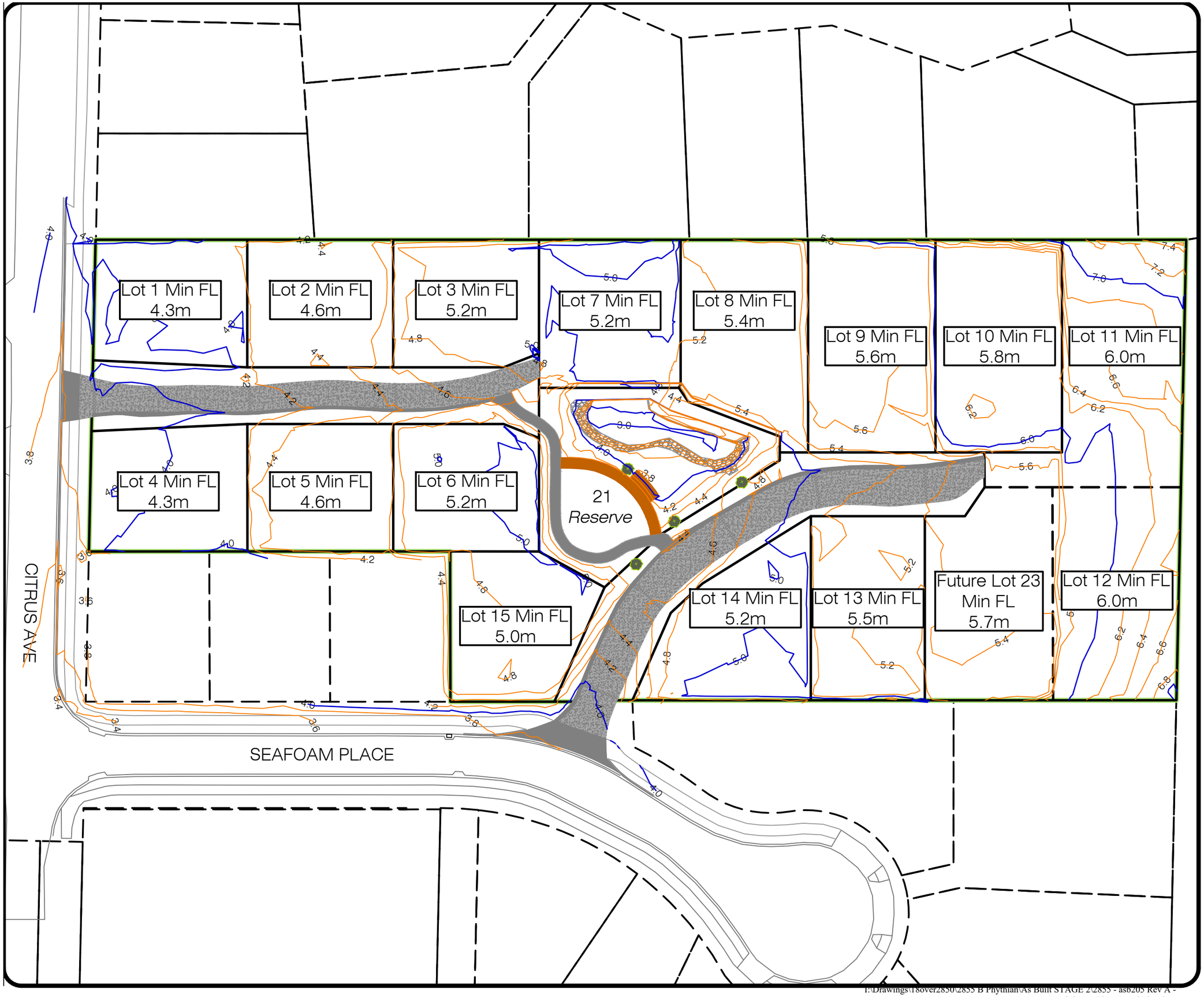
Drawing Title.

EARTHWORKS DEPTH OF FILL PLAN

Scale.	Revision.
@A3 1:500	–

Job ID.	Drawing No.
18/2855	2855 - asb203

I:\Drawings\18over2850\2855 B Phythian\As Built STAGE 2\GCR\2855 - gcr203 - Earthworks Depth of Fill Plan.dwg



BARR + HARRIS
SURVEYORS LIMITED

Matamata Telephone 07 888 8777
124 Broadway, P.O.Box 112 Facsimile 07 888 8484
Putaruru Telephone 07 883 3050
Waihi Beach Telephone 07 863 6622
P.O.Box 47

NOTE:

- Coordinates are in terms of NZGD 2000 Mt Eden circuit.
- Levels are in terms of the Auckland Vertical Datum 1946.
- Minimum floor levels shown are to be verified by way of the on site survey control shown on drawing 2855 - asb206
- Minimum floor levels shown do not take the separation requirements of the building code into consideration. Any floor level should comply with both the minimum levels shown in this drawing and the requirements of the building code.
- The minimum floor levels are based on ponding in the reserve in the 50 year event and the ground contour at the formed building platforms.

LEGEND

Finished ground major contours at 1.0m intervals

Finished ground minor contours at 0.2m intervals

REF	AMENDMENT	BY	DATE
A	Floor levels on Lots 13 and 15 amended	AVH	June 2021

I:\Drawings\18over2850\2855 B Phythian\As Built STAGE 2\2855 - asb205 Rev A - Minimum Floor Level Plan.dwg

Design.	A Holroyd
Drawn.	M Bellamy
Checked.	A Holroyd
Approved.	
Date.	May 2021

Job Title.

VIBE GROUP WAIHI LTD
81 CITRUS AVE - WAIHI BEACH

Drawing Title.

MINIMUM FLOOR LEVEL PLAN

Scale.	Revision.
@A3 1:500	A

Job ID.	Drawing No.
18/2855	2855 - asb205

I:\Drawings\18over2850\2855 B Phythian\As Built STAGE 2\2855 - asb205 Rev A - Minimum Floor Level Plan.dwg

APPENDIX C

FACTUAL DATA

HAND AUGER BOREHOLE LOG

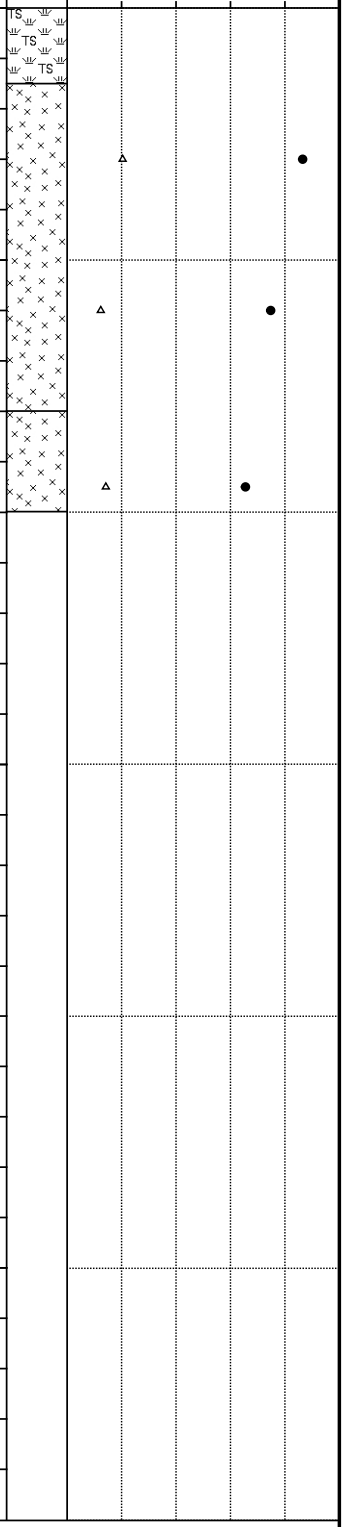
CLIENT: **Vibe Group Waihi Ltd**
HOLE NO.: **HA-A1**
PROJECT: **Proposed Residential Subdivision**
PAGE: **1 of 1**
LOCATION: **81 Citrus Ave, Waihi**
JOB NO.: **4444**

Terrane
Terrane Consultants Ltd
Ph: +64 7 579 9708
www.terrane.co.nz

GEOLOGY Soil / Rock Type Stratigraphy	DESCRIPTION OF SOIL
Topsoil	SILT, black, moist, organic
Fill	SILT, light brown, very stiff, low plasticity, moist
Airfall Ashes	SILT, grey with orange streaks, very stiff, low plasticity, moist END OF HOLE at 1.00m

GROUNDWATER: Groundwater Not Encountered

DEPTH (m) / GRAPHIC LOG



SHEAR VANE TEST RESULTS

REMARKS
- Groundwater not encountered
- Lot 1

DATE: **30-4-21**
DRILLED BY: **jwh**
LOGGED BY: **jwh**

Generated with CORE-GS by Geroc - Hand Auger Borehole - 11-May-21 2:44:35 PM

Log scale at A4 - 1:15

HAND AUGER BOREHOLE LOG

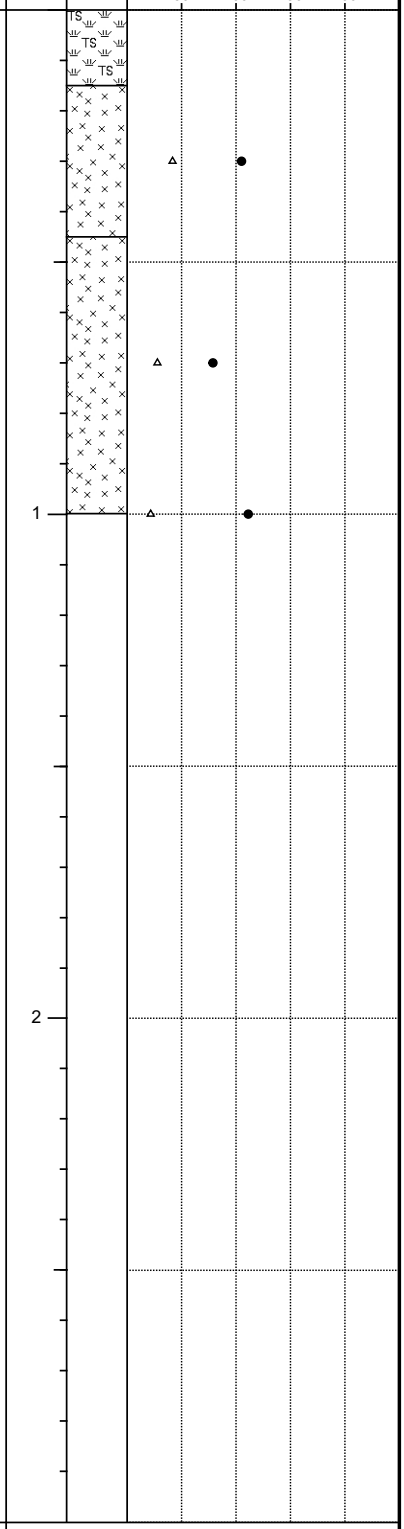
CLIENT: **Vibe Group Waihi Ltd**
HOLE NO.: **HA-A2**
PROJECT: **Proposed Residential Subdivision**
PAGE: **1 of 1**
LOCATION: **81 Citrus Ave, Waihi**
JOB NO.: **4444**

Terrane
Terrane Consultants Ltd
Ph: +64 7 579 9708
www.terrane.co.nz

GEOLOGY (Soil / Rock Type Stratigraphy)	DESCRIPTION OF SOIL
Topsoil	SILT, black, moist, organic
Fill	SILT, light brown/orange, stiff, low plasticity, moist
Airfall Ashes	SILT, light grey and orange, stiff, low plasticity, moist END OF HOLE at 1.00m

GROUNDWATER: Groundwater Not Encountered

DEPTH (m) / GRAPHIC LOG



SHEAR VANE TEST RESULTS

REMARKS
- Groundwater not encountered
- Lot 2

DATE: **30-4-21**
DRILLED BY: **jwh**
LOGGED BY: **jwh**

Generated with CORE-GS by Geroc - Hand Auger Borehole - 11-May-21 2:44:39 PM

Log scale at A4 - 1:15

HAND AUGER BOREHOLE LOG

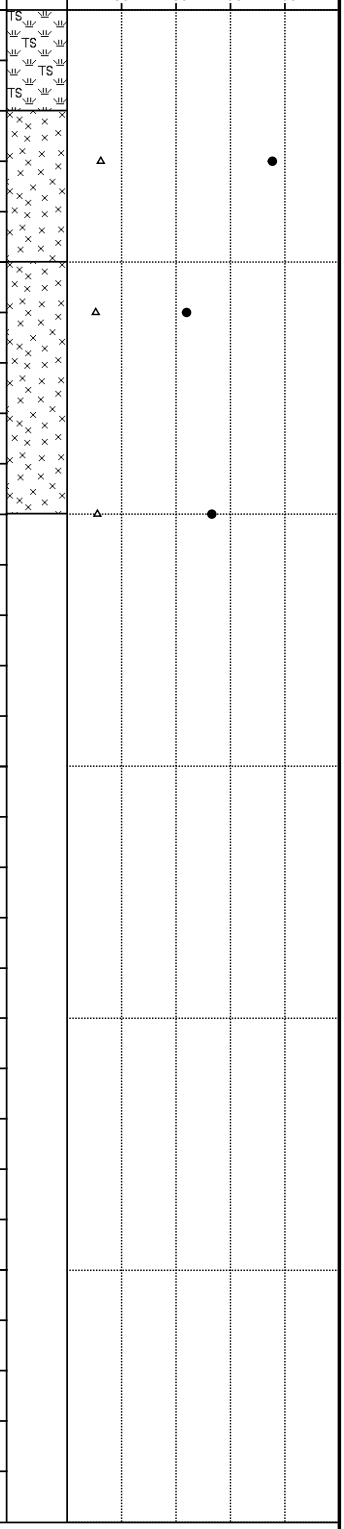
CLIENT: **Vibe Group Waihi Ltd**
HOLE NO.: **HA-A3**
PROJECT: **Proposed Residential Subdivision**
PAGE: **1 of 1**
LOCATION: **81 Citrus Ave, Waihi**
JOB NO.: **4444**

Terrane
Terrane Consultants Ltd
Ph: +64 7 579 9708
www.terrane.co.nz

GEOLOGY Soil / Rock Type Stratigraphy	DESCRIPTION OF SOIL
Topsoil	SILT, black, moist, organic
Fill	SILT, light brown, very stiff, low plasticity, moist
Airfall Ashes	SILT, orange-brown, very stiff, low plasticity, moist END OF HOLE at 1.00m

GROUNDWATER: Groundwater Not Encountered

DEPTH (m) / GRAPHIC LOG



REMARKS
- Groundwater not encountered
- Lot 3

DATE: **30-4-21**
DRILLED BY: **jwh**
LOGGED BY: **jwh**

Generated with CORE-GS by Geroc - Hand Auger Borehole - 11-May-21 2:44:40 PM

Log scale at A4 - 1:15

HAND AUGER BOREHOLE LOG

CLIENT: **Vibe Group Waihi Ltd** HOLE NO.: **HA-A4**

PROJECT: **Proposed Residential Subdivision** PAGE: **1 of 1**

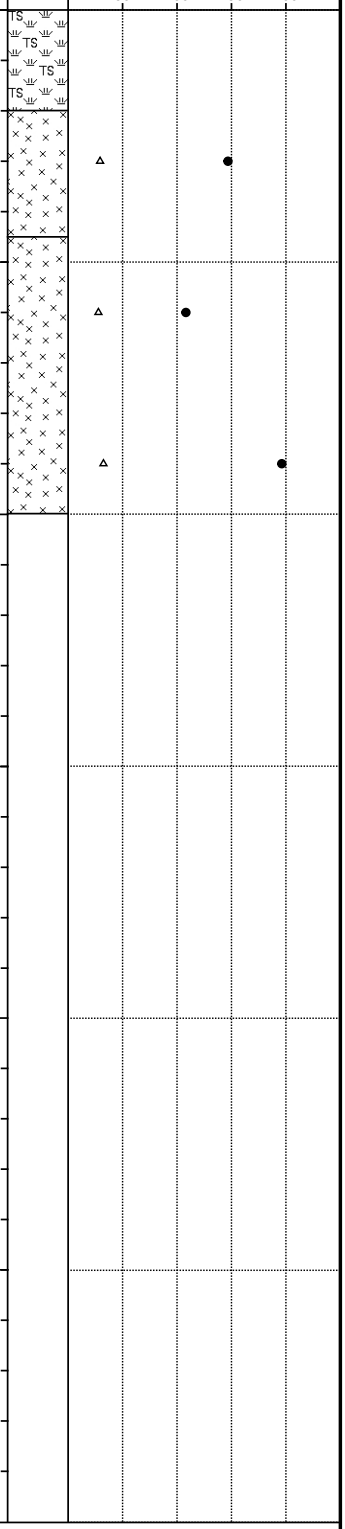
LOCATION: **81 Citrus Ave, Waihi** JOB NO.: **4444**

Terrane Consultants Ltd
Ph: +64 7 579 9708
www.terrane.co.nz

GEOLOGY (Soil / Rock Type Stratigraphy)	DESCRIPTION OF SOIL
Topsoil	SILT, black, moist, organic
Fill	SILT, light brown, very stiff, low plasticity, moist
Airfall Ashes	SILT, orange and brown, very stiff, low plasticity, moist
	END OF HOLE at 1.00m

GROUNDWATER: Groundwater Not Encountered

DEPTH (m) / GRAPHIC LOG



SHEAR VANE TEST RESULTS

REMARKS
- Groundwater not encountered
- Lot 7

DATE: **30-4-21**

DRILLED BY: **jwh**

LOGGED BY: **jwh**

Log scale at A4 - 1:15

HAND AUGER BOREHOLE LOG

CLIENT: **Vibe Group Waihi Ltd** HOLE NO.: **HA-A5**

PROJECT: **Proposed Residential Subdivision** PAGE: **1 of 1**

LOCATION: **81 Citrus Ave, Waihi** JOB NO.: **4444**

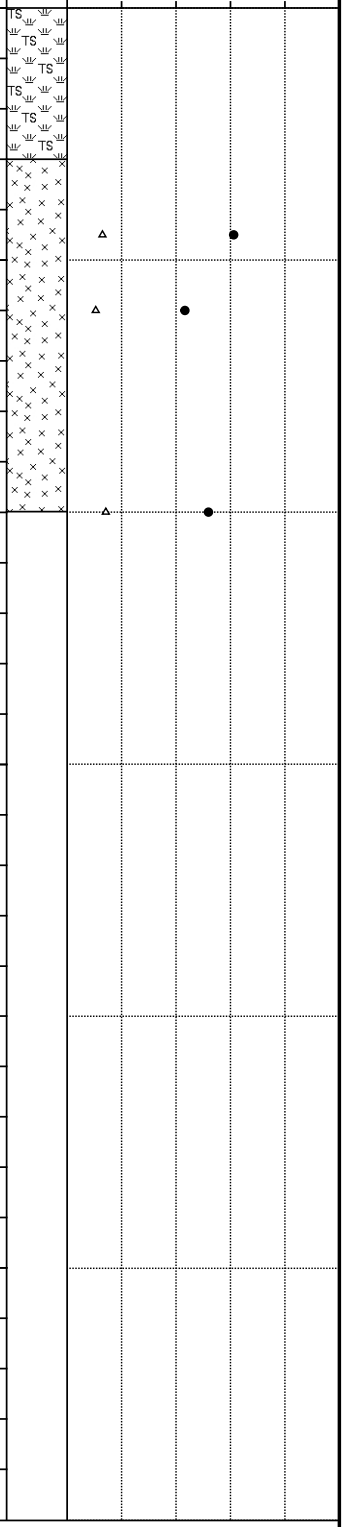
Terrane Consultants Ltd
Ph: +64 7 579 9708
www.terrane.co.nz

GEOLOGY (Soil / Rock Type Stratigraphy)	DESCRIPTION OF SOIL
Topsoil	SILT, black, moist, organic
Airfall Ashes	SILT minor fine sand, light brown, very stiff, low plasticity, moist, sand pumiceous - -becomes silt with no sand, orange-brown END OF HOLE at 1.00m

GROUNDWATER: Groundwater Not Encountered

DEPTH (m) / GRAPHIC LOG

SHEAR VANE TEST RESULTS
● Peak (kPa)
△ Residual (kPa)
50 100 150 200



REMARKS
- Groundwater not encountered
- Lot 8

DATE: **30-4-21**

DRILLED BY: **jwh**

LOGGED BY: **jwh**

Log scale at A4 - 1:15

HAND AUGER BOREHOLE LOG

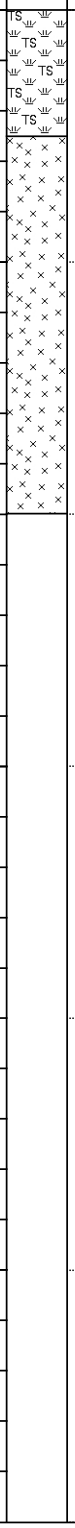
CLIENT: **Vibe Group Waihi Ltd**
HOLE NO.: **HA-A6**
PROJECT: **Proposed Residential Subdivision**
PAGE: **1 of 1**
LOCATION: **81 Citrus Ave, Waihi**
JOB NO.: **4444**

Terrane
Terrane Consultants Ltd
Ph: +64 7 579 9708
www.terrane.co.nz

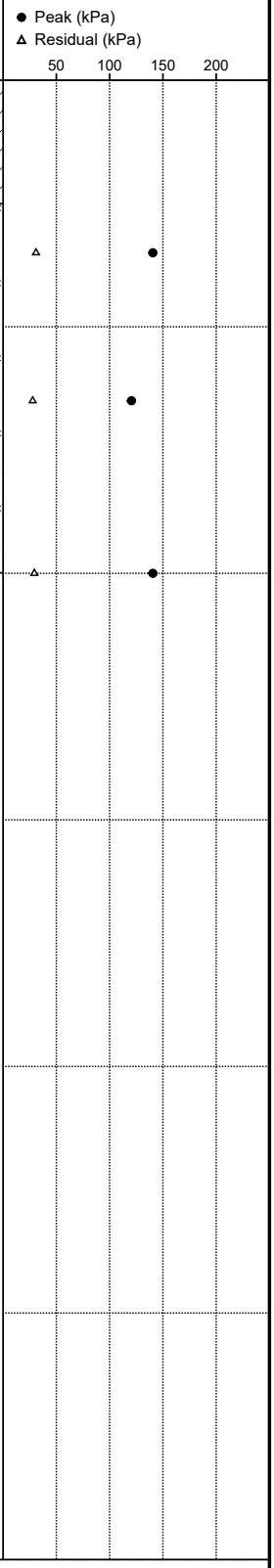
GEOLOGY Soil / Rock Type Stratigraphy	DESCRIPTION OF SOIL
Topsoil	SILT, black, moist, organic
Airfall Ashes	SILT, light brown, very stiff, low plasticity, moist - becomes sandy END OF HOLE at 1.00m

GROUNDWATER: Groundwater Not Encountered

DEPTH (m) / GRAPHIC LOG



SHEAR VANE TEST RESULTS



REMARKS
- Groundwater not encountered
- Lot 9

DATE: **30-4-21**
DRILLED BY: **jwh**
LOGGED BY: **jwh**

Log scale at A4 - 1:15

HAND AUGER BOREHOLE LOG

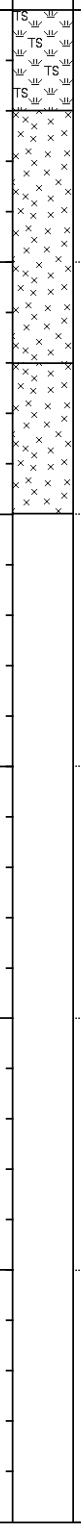
CLIENT: **Vibe Group Waihi Ltd**
HOLE NO.: **HA-A7**
PROJECT: **Proposed Residential Subdivision**
PAGE: **1 of 1**
LOCATION: **81 Citrus Ave, Waihi**
JOB NO.: **4444**

Terrane
Terrane Consultants Ltd
Ph: +64 7 579 9708
www.terrane.co.nz

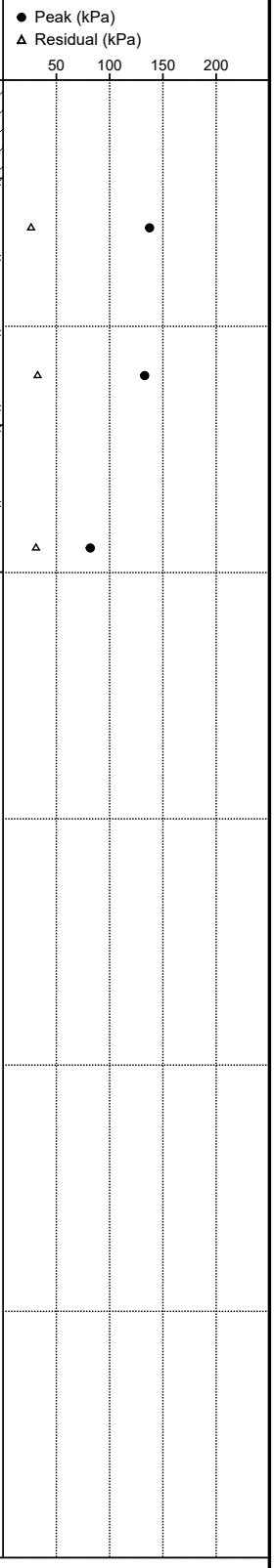
GEOLOGY Soil / Rock Type Stratigraphy	DESCRIPTION OF SOIL
Topsoil	SILT, black, moist, organic
Fill	SILT, light brown, very stiff, low plasticity, moist
Airfall Ashes	SILT, orange-brown with grey streaks, very stiff, low plasticity, moist - -becomes slightly sandy END OF HOLE at 1.00m

GROUNDWATER: Groundwater Not Encountered

DEPTH (m) / GRAPHIC LOG



SHEAR VANE TEST RESULTS



REMARKS
- Groundwater not encountered
- Lot 10

DATE: **30-4-21**
DRILLED BY: **jwh**
LOGGED BY: **jwh**

Log scale at A4 - 1:15

HAND AUGER BOREHOLE LOG

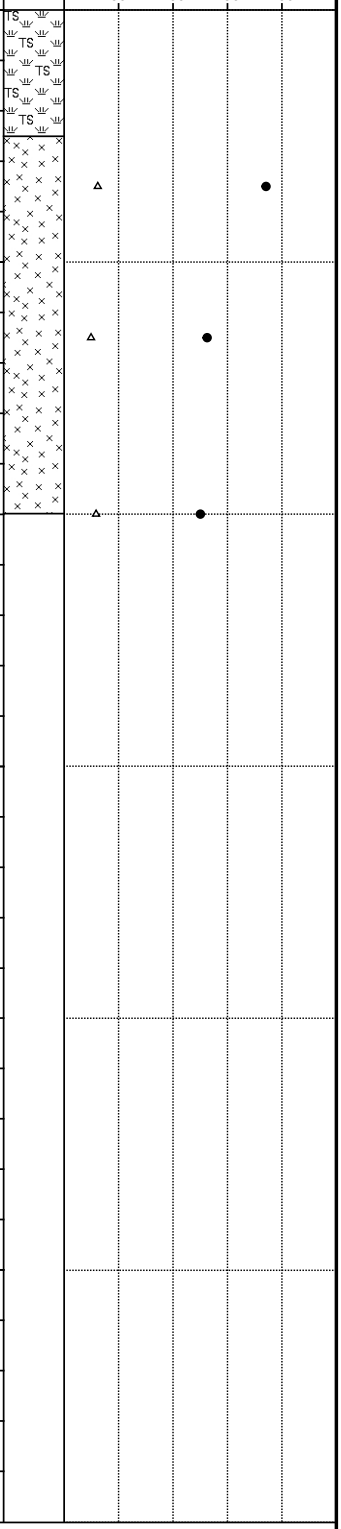
CLIENT: **Vibe Group Waihi Ltd**
HOLE NO.: **HA-A8**
PROJECT: **Proposed Residential Subdivision**
PAGE: **1 of 1**
LOCATION: **81 Citrus Ave, Waihi**
JOB NO.: **4444**

Terrane Consultants Ltd
Ph: +64 7 579 9708
www.terrane.co.nz

GEOLOGY Soil / Rock Type Stratigraphy	DESCRIPTION OF SOIL
Topsoil	SILT, black, moist, organic
Fill	SILT, light brown, very stiff, low plasticity, moist - becomes brown, very stiff END OF HOLE at 1.00m

GROUNDWATER: Groundwater Not Encountered

DEPTH (m) / GRAPHIC LOG



SHEAR VANE TEST RESULTS

● Peak (kPa)
△ Residual (kPa)

REMARKS
- Groundwater not encountered
- Lot 4

DATE: **30-4-21**
DRILLED BY: **jwh**
LOGGED BY: **jwh**

Log scale at A4 - 1:15

HAND AUGER BOREHOLE LOG

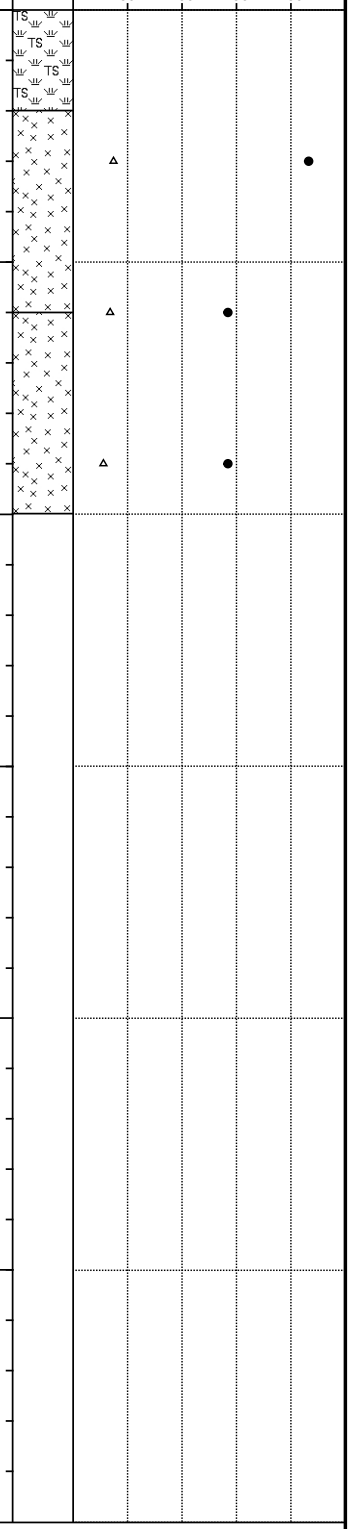
CLIENT: **Vibe Group Waihi Ltd**
HOLE NO.: **HA-A9**
PROJECT: **Proposed Residential Subdivision**
PAGE: **1 of 1**
LOCATION: **81 Citrus Ave, Waihi**
JOB NO.: **4444**

Terrane
Terrane Consultants Ltd
Ph: +64 7 579 9708
www.terrane.co.nz

GEOLOGY Soil / Rock Type Stratigraphy	DESCRIPTION OF SOIL
Topsoil	SILT, black, moist, organic
Fill	SILT, light brown, very stiff, low plasticity, moist
Airfall Ashes	SILT minor sand, light brown with orange streaks, very stiff, low plasticity, moist END OF HOLE at 1.00m

GROUNDWATER: Groundwater Not Encountered

DEPTH (m) / GRAPHIC LOG



SHEAR VANE TEST RESULTS

REMARKS
- Groundwater not encountered
- Lot 5
- 0.3m Shear Vane Test Peak >140

DATE: **30-4-21**
DRILLED BY: **jwh**
LOGGED BY: **jwh**

Generated with CORE-GS by Geroc - Hand Auger Borehole - 11-May-21 2:44:42 PM

Log scale at A4 - 1:15

HAND AUGER BOREHOLE LOG

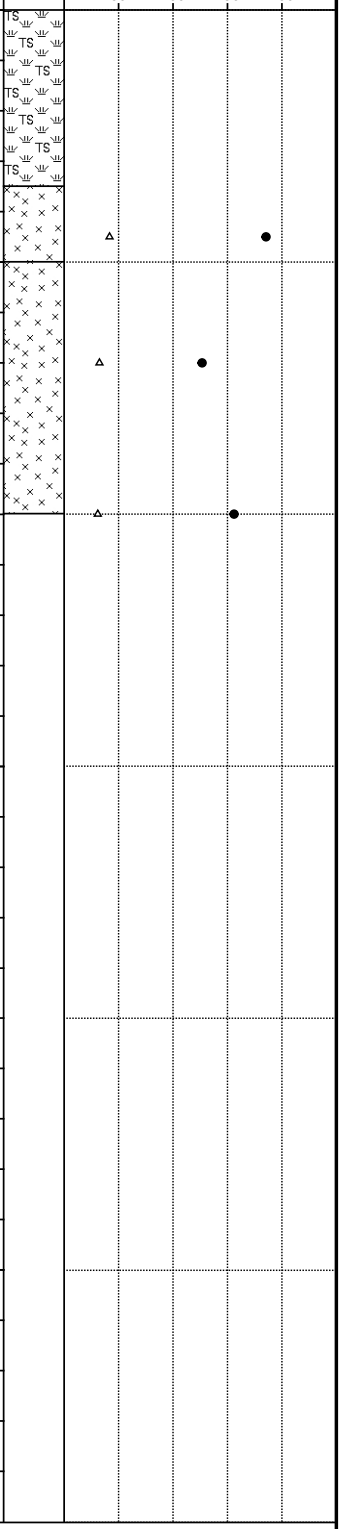
CLIENT: **Vibe Group Waihi Ltd**
HOLE NO.: **HA-A10**
PROJECT: **Proposed Residential Subdivision**
PAGE: **1 of 1**
LOCATION: **81 Citrus Ave, Waihi**
JOB NO.: **4444**

Terrane
Terrane Consultants Ltd
Ph: +64 7 579 9708
www.terrane.co.nz

GEOLOGY (Soil / Rock Type Stratigraphy)	DESCRIPTION OF SOIL
Topsoil	SILT, black, moist, organic
Fill	SILT, light brown, very stiff, low plasticity, moist
Airfall Ashes	SILT, orange-brown, very stiff, low plasticity, moist END OF HOLE at 1.00m

GROUNDWATER: Groundwater Not Encountered

DEPTH (m) / GRAPHIC LOG



REMARKS
- Groundwater not encountered
- Lot 6

DATE: **30-4-21**
DRILLED BY: **blm**
LOGGED BY: **jwh**

Generated with CORE-GS by Geroc - Hand Auger Borehole - 11-May-21 2:44:36 PM

Log scale at A4 - 1:15

HAND AUGER BOREHOLE LOG

CLIENT: **Vibe Group Waihi Ltd** HOLE NO.: **HA-A11**

PROJECT: **Proposed Residential Subdivision** PAGE: **1 of 1**

LOCATION: **81 Citrus Ave, Waihi** JOB NO.: **4444**

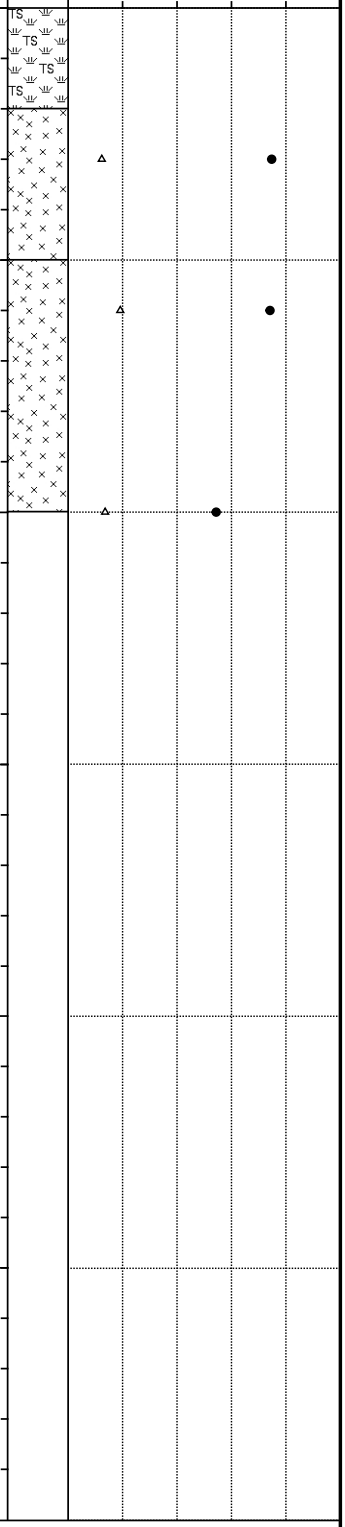
Terrane Consultants Ltd
Ph: +64 7 579 9708
www.terrane.co.nz

GEOLOGY (Soil / Rock Type Stratigraphy)	DESCRIPTION OF SOIL
Topsoil	SILT, black, moist, organic
Fill	SILT, light brown, very stiff, low plasticity, moist
Airfall Ashes	SILT, orange-brown, very stiff, low plasticity, moist
	END OF HOLE at 1.00m

GROUNDWATER: Groundwater Not Encountered

DEPTH (m) / GRAPHIC LOG

SHEAR VANE TEST RESULTS
● Peak (kPa)
△ Residual (kPa)
50 100 150 200



REMARKS
- Groundwater not encountered
- Lot 15

DATE: **30-4-21**

DRILLED BY: **jwh**

LOGGED BY: **jwh**

Log scale at A4 - 1:15

HAND AUGER BOREHOLE LOG

CLIENT: **Vibe Group Waihi Ltd** HOLE NO.: **HA-A12**

PROJECT: **Proposed Residential Subdivision** PAGE: **1 of 1**

LOCATION: **81 Citrus Ave, Waihi** JOB NO.: **4444**

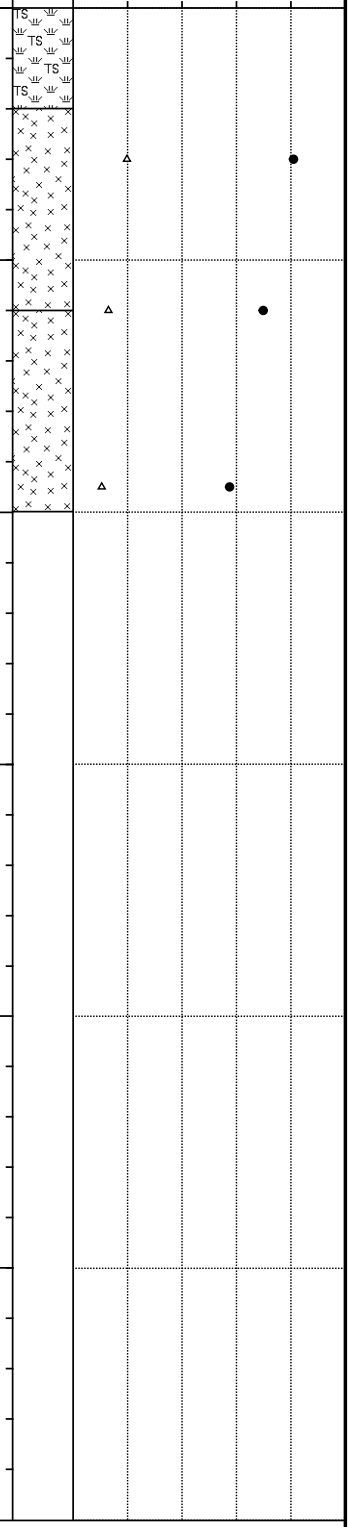
Terrane Consultants Ltd
Ph: +64 7 579 9708
www.terrane.co.nz

GEOLOGY (Soil / Rock Type Stratigraphy)	DESCRIPTION OF SOIL
Topsoil	SILT, black, moist, organic
Fill	SILT, light brown, very stiff, low plasticity, moist
Airfall Ashes	SILT trace fine sand, orange brown, very stiff, low plasticity, moist END OF HOLE at 1.00m

GROUNDWATER: Groundwater Not Encountered

DEPTH (m) / GRAPHIC LOG

SHEAR VANE TEST RESULTS
● Peak (kPa)
△ Residual (kPa)
50 100 150 200



REMARKS
- Groundwater not encountered
- Lot 14

DATE: **30-4-21**

DRILLED BY: **jwh**

LOGGED BY: **jwh**

Log scale at A4 - 1:15

HAND AUGER BOREHOLE LOG

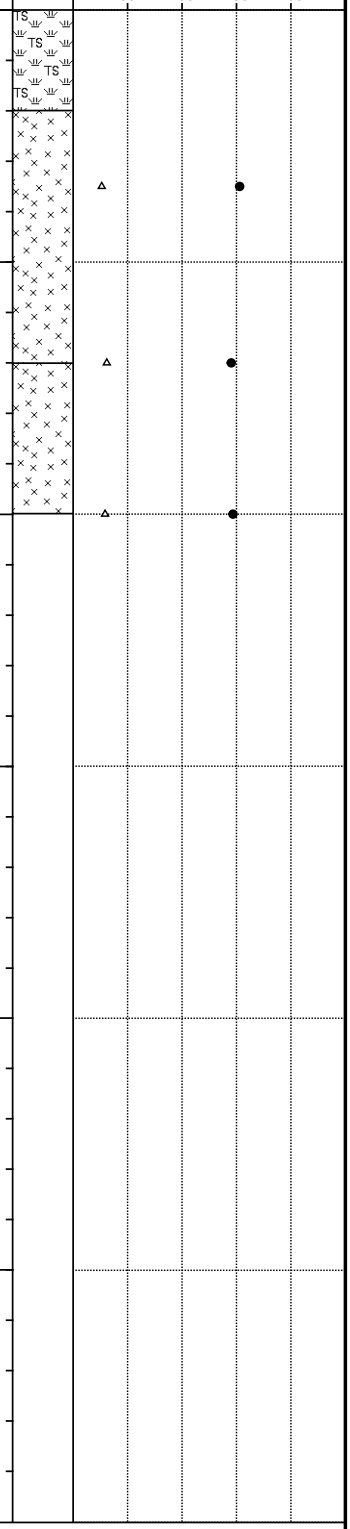
CLIENT: **Vibe Group Waihi Ltd**
HOLE NO.: **HA-A13**
PROJECT: **Proposed Residential Subdivision**
PAGE: **1 of 1**
LOCATION: **81 Citrus Ave, Waihi**
JOB NO.: **4444**

Terrane
Terrane Consultants Ltd
Ph: +64 7 579 9708
www.terrane.co.nz

GEOLOGY Soil / Rock Type Stratigraphy	DESCRIPTION OF SOIL
Topsoil	SILT, black, moist, organic
Fill	SILT, light brown, very stiff, low plasticity, moist
Airfall Ashes	SILT, orange brown, very stiff, low plasticity, moist, trace fine pumice sand END OF HOLE at 1.00m

GROUNDWATER: Groundwater Not Encountered

DEPTH (m) / GRAPHIC LOG



REMARKS
- Groundwater not encountered
- Lot 13

DATE: **30-4-21**
DRILLED BY: **jwh**
LOGGED BY: **jwh**

Log scale at A4 - 1:15

HAND AUGER BOREHOLE LOG

CLIENT: **Vibe Group Waihi Ltd** HOLE NO.: **HA-A14**

PROJECT: **Proposed Residential Subdivision** PAGE: **1 of 1**

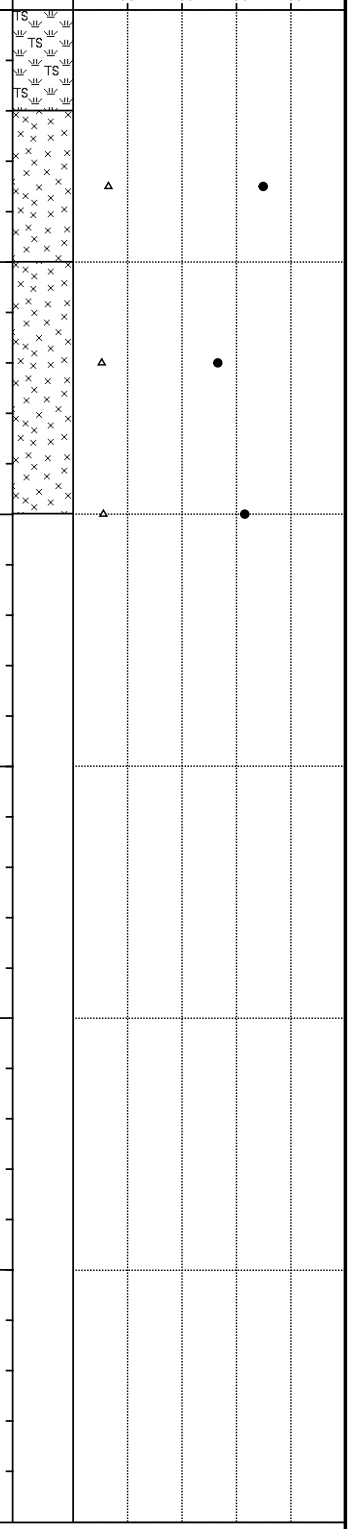
LOCATION: **81 Citrus Ave, Waihi** JOB NO.: **4444**

Terrane Consultants Ltd
Ph: +64 7 579 9708
www.terrane.co.nz

GEOLOGY (Soil / Rock Type Stratigraphy)	DESCRIPTION OF SOIL
Topsoil	SILT, black, moist, organic
Fill	SILT, light brown, very stiff, low plasticity, moist
Airfall Ashes	SILT, orange brown, very stiff, low plasticity, moist END OF HOLE at 1.00m

GROUNDWATER: Groundwater Not Encountered

DEPTH (m) / GRAPHIC LOG



SHEAR VANE TEST RESULTS

● Peak (kPa)
△ Residual (kPa)

REMARKS
- Groundwater not encountered

DATE: **30-4-21**

DRILLED BY: **jwh**

LOGGED BY: **jwh**

Log scale at A4 - 1:15

HAND AUGER BOREHOLE LOG

CLIENT: **Vibe Group Waihi Ltd**
HOLE NO.: **HA-A15**
PROJECT: **Proposed Residential Subdivision**
PAGE: **1 of 1**
LOCATION: **81 Citrus Ave, Waihi**
JOB NO.: **4444**

Terrane
Terrane Consultants Ltd
Ph: +64 7 579 9708
www.terrane.co.nz

GEOLOGY (Soil / Rock Type Stratigraphy)	DESCRIPTION OF SOIL
Topsoil	SILT, dark brown, stiff, low plasticity, moist
Airfall Ashes	SILT, orange-brown, very stiff, low plasticity, moist - -becomes slightly sandy
	SAND minor silt, grey, loose, moist, pumiceous, well graded
	SILT minor clay, brown, very stiff, low plasticity, moist END OF HOLE at 2.00m

GROUNDWATER: Groundwater Not Encountered

DEPTH (m): 1, 2

GRAPHIC LOG

SHEAR VANE TEST RESULTS
● Peak (kPa)
△ Residual (kPa)
50 100 150 200

REMARKS
- Groundwater not encountered
- Lot 12

DATE: **29-4-21**
DRILLED BY:
LOGGED BY: **blm**

Generated with CORE-GS by Geroc - Hand Auger Borehole - 11-May-21 2:44:38 PM

Log scale at A4 - 1:15

HAND AUGER BOREHOLE LOG

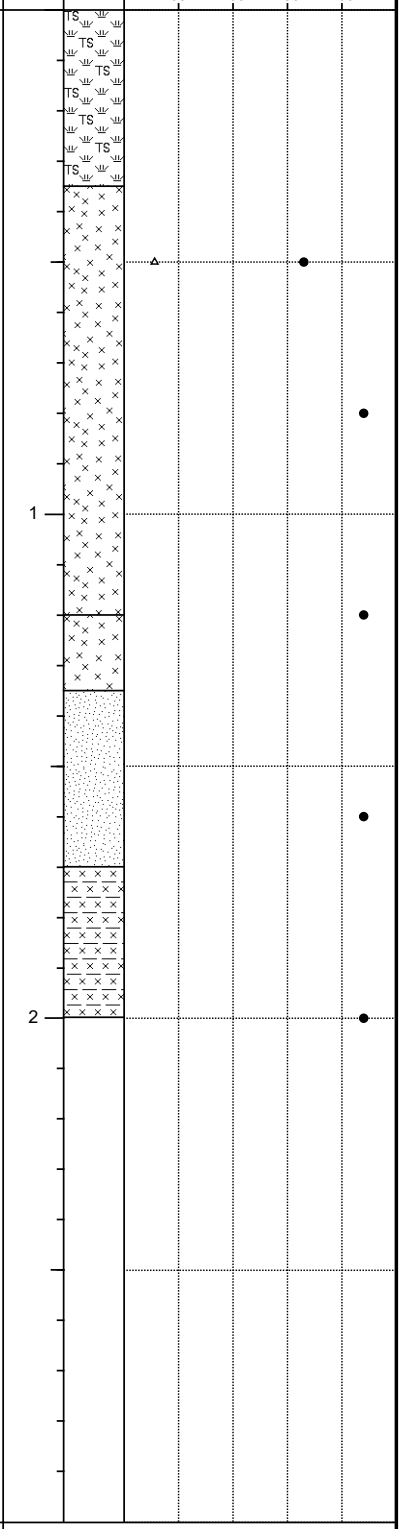
CLIENT: **Vibe Group Waihi Ltd**
HOLE NO.: **HA-A16**
PROJECT: **Proposed Residential Subdivision**
PAGE: **1 of 1**
LOCATION: **81 Citrus Ave, Waihi**
JOB NO.: **4444**

Terrane
Terrane Consultants Ltd
Ph: +64 7 579 9708
www.terrane.co.nz

GEOLOGY (Soil / Rock Type Stratigraphy)	DESCRIPTION OF SOIL
Topsoil	SILT, dark brown, stiff, low plasticity, moist, organic
Airfall Ashes	SILT, orange-brown, very stiff, low plasticity, moist
	SILT minor sand, light brown, very stiff, low plasticity, moist
	SAND minor silt, grey-brown, loose, moist, pumiceous, fine to medium grained.
	SILT minor clay, dark brown, very stiff, moderate plasticity, moist END OF HOLE at 2.00m

GROUNDWATER: Groundwater Not Encountered

DEPTH (m) / GRAPHIC LOG



REMARKS
- Groundwater not encountered
- Lot 11

DATE: **29-4-21**
DRILLED BY: **blm**
LOGGED BY: **blm**

Log scale at A4 - 1:15

APPENDIX D

FILL TEST RESULTS

FILL TESTING SUMMARY

Terrane

24 Tenth Ave, Tauranga Ph (07) 579 9708

Client: Vibe Group Waihi Ltd
Project: Residential Subdivision
Location: 81 Citrus Avenue, Waihi Beach, Western Bay of Plenty

Job: 4444
Date: 4th May 2021
Rev: 0

Date (sampled)	Test number	Location	Material Type	Water Content (%)	Dry Density (t/m^3)	Air Voids (%)	Shear Vane (kPa)						Pass/ Fail	Notes
							1	2	3	4	Mean	Range		
2-Nov-20	1	See Plan	SILT, light brown and dark brown, very stiff, low plasticity, dry	46.3	1.03	9.8	226	226	197	226	219	29	Pass	
	2	See Plan	SILT, dark brown and grey, very stiff, low plasticity, dry	50.6	1.04	7.5	UTP	226	226	226	226	0	Pass	
	3	See Plan	SILT, trace sand, brown, very stiff, low plasticity, moist	43.0	1.12	9.3	222	180	197	203	201	42	Pass	
18-Nov-20	4	See Plan	SILT, orange brown, dry, trace fine pumice sand	47.2	1.06	9.2	222	222	222	222	222	0	Pass	
	5	See Plan	SILT, orange brown, dry, trace fine pumice sand	53.7	1.03	5.4	UTP	UTP	UTP	UTP	226	0	Pass	
7-Dec-20	6	See Plan	SILT, orange brown, very stiff, dry	58.9	0.94	8.2	UTP	UTP	UTP	UTP	226	0	Pass	
	7	See Plan	SILT, orange brown and dark brown, very stiff, dry	59.8	0.93	9.1	UTP	UTP	UTP	UTP	226	0	Pass	
14-Dec-20	8	See Plan	SILT, orange and yellow, very stiff, dry	55.4	0.99	7.6	UTP	UTP	UTP	UTP	226	0	Pass	
17-Dec-20	9	See Plan	SILT, orange brown, very stiff, low plasticity, moist	57.3	0.97	7.3	UTP	UTP	UTP	UTP	226	0	Pass	
	10	See Plan	SILT, orange brown, very stiff, low plasticity, moist	58.7	0.93	9.7	UTP	UTP	UTP	UTP	226	0	Pass	
	11	See Plan	SILT, orange brown, very stiff, low plasticity, moist	61.7	0.91	9.0	UTP	UTP	UTP	UTP	226	0	Pass	
19-Mar-21	12	See Plan	SILT, orange brown, very stiff, low plasticity, moist	49.3	1.06	7.4	UTP	UTP	UTP	UTP	226	0	Pass	
	13	See Plan	SILT, orange brown, very stiff, low plasticity, moist	50.8	1.04	7.1	UTP	UTP	UTP	UTP	226	0	Pass	

NOTES:
1. UTP = Unable To Penetrate (indicates undrained shear strength is greater than 226 kPa)
2. Assumed solid density of soil particles = 2.61t/m3
3.

SCALA PENETROMETER TEST

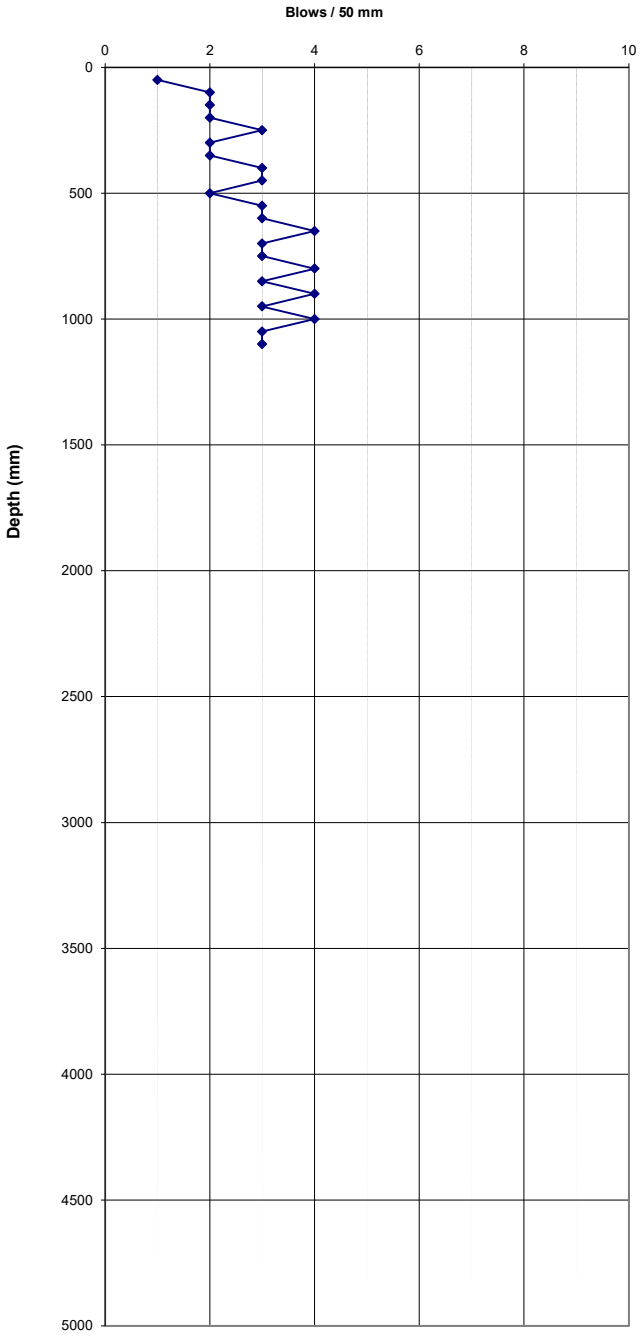
Client:	Vibe Group Waihi Ltd		
Project:	Residential Subdivision		
Location:	81 Citrus Ave, Waihi Beach	Job: 4444	**Test:** SC1
		Date: 18/02/2021	Page: 1 of 1

Reduced Level (RL):	near finished grade
Ground Level (GL):	
Depth to Start of Test (mm):	

Scala test located in middle of sceptic tank backfill zone on proposed Lot 12

mm Depth	No. of Blows
50	1
100	2
150	2
200	2
250	3
300	2
350	2
400	3
450	3
500	2
550	3
600	3
650	4
700	3
750	3
800	4
850	3
900	4
950	3
1000	4
1050	3
1100	3
1150	
1200	
1250	
1300	
1350	
1400	
1450	
1500	
1550	
1600	
1650	
1700	
1750	
1800	
1850	
1900	
1950	
2000	
2050	
2100	
2150	
2200	
2250	
2300	
2350	
2400	
2450	
2500	

mm Depth	No. of Blows
2550	
2600	
2650	
2700	
2750	
2800	
2850	
2900	
2950	
3000	
3050	
3100	
3150	
3200	
3250	
3300	
3350	
3400	
3450	
3500	
3550	
3600	
3650	
3700	
3750	
3800	
3850	
3900	
3950	
4000	
4050	
4100	
4150	
4200	
4250	
4300	
4350	
4400	
4450	
4500	
4550	
4600	
4650	
4700	
4750	
4800	
4850	
4900	
4950	
5000	



Test Method: NZS 4402:1988 Test 6.5.2 Dynamic Cone Penetrometer

Tested by:	blm
Logged by:	blm
Checked by:	

Notes: After penetrating to 900mm depth, the Scala was augered out before continuing.