APPENDIX 1

Earthworks QA Documentation

- Core50 Engineers Report on Subdivision Earthworks & Recommendations for Building Development

CORE50
SOLUTIONS ENGINEERED

GREENHILL PARK RESIDENTIAL SUBDIVISION

STAGE 17 and 18a
Area LUK, Greenhill Park, Hamilton

GEOTECHNICAL COMPLETION REPORT ON SUBDIVISION EARTHWORKS AND RECOMMENDATIONS FOR BUILDING DEVELOPMENT

Our Ref: CR171738-S17&S18a-01 v3 (Contour Plan Update)

Prepared for: Chedworth Properties Limited

Date: July 2022

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1.0 Subdivision Development Earthworks

1.1 Introduction

Stage 17 and 18a of Greenhill Park is currently accessible from Webb Drive and Watkins Street. Stage 17 and 18a comprises 61 residential lots (numbered 481 to 535 and 8025 to 8030). The locations of these lots are shown on attached subdivision plan 19-30410-17-RC1 included in Appendix A.

Bulk earthworks have been completed to re-contour the previously agricultural landscape for Stage 17 and 18a of the Greenhill Park Residential Subdivision in Hamilton. Works have been carried out in accordance with Hamilton City Council's (HCC) Subdivision Resource Consent: 0011.2019.7140.003. Prior to commencement of earthworks, geotechnical investigations were carried out by Beca Ltd (Beca) in 2016 [1] and summaries in DBCE Preliminary Report for L&K&Eldone (December 2019).

The Regional Infrastructure Technical Specifications (RITS) for Waikato set out the minimum standards for design and construction of public infrastructure within Hamilton City. Section 2.1.6 of the *Earthworks and Geotechnical Requirements* of the RITS states that the developer shall appoint a geo-professional to carry out functions as described in NZS 4404[5] Section 2.2.4. RITS Section 2.3.4.1 states that a geotechnical completion report shall be submitted as per NZS 4404 Section 2.6 including a statement of professional opinion on the suitability of land for building construction [4]. The developer has appointed CORE50 Ltd as the geo-professional.

To satisfy the requirements of HCC's Resource Consent, the RITS and NZS 4404, this report summarizes the observations and testing undertaken during the development of the stage, discusses the suitability of the ground for the support of the proposed residential buildings and contains recommendations for the disposal of stormwater runoff generated on individual sites.

Included in Appendix A of this report is the proposed subdivision plan comprising the proposed new lots for Area LUK Stage 17 and 18a. The included earthworks plan shows the cut/fill extent of the earthworks undertaken, test positions, and road and lot locations.

1.2 Earthworks in the Subdivision

The earthworks for stage 17 and 18a of the subdivision development were undertaken between October 2020 and May 2022.

These earthworks comprised:

1. The stripping of surface topsoil to expose underlying natural soils.
2. Cut of up to 3.0m.
3. The placement of filling within majority of the stage.
4. Backfilling and raising the ground level with new fill to create uniform fill platforms.
5. The reinstatement of the surface topsoil cover and subsequent grassing.

The soils encountered during the formation of the site and road subgrades were a mixture of silty sands and sandy silts, typical of younger Hinuera deposits, overlying clayey silt and silty clay, typical of Walton group deposits. The Walton Subgroup rises out of the Hinuera deposits that formed a ridge line running through the greater LUK area. These soils were those that had been identified in pre-construction site investigations by the Beca Report 2016. The published geology indicates that Area LUK soils comprise Hinuera Formation alluvium at surface with Walton Subgroup overlain by Hamilton Ash in the gently sloping hill within the LUK area.

The filling work was undertaken using the Walton Subgroup soils gained from areas of cut within stages 16 to 18a and the larger Greenhill Subdivision. Filling was undertaken during the summers of 2020 to 2022 when drying back of the soils was possible to close to optimum moisture contents to achieve near maximum compaction densities and undrained shear strengths.

Upon completion of the earthworks, approximately 100 to 300 mm of topsoil was placed across the sites and the finished surfaces were grassed in accordance with Conditions of the Resource Consent. Areas where an initial grass strike did not take place were re-grassed. While the target topsoil depths after the earthworks were to be around 300 mm, no guarantee is implied or given that the topsoil on any part of any lot is 300 mm or less and it is recommended that future owners or designers or builders check topsoil depths when preparing site development plans and cost schedules.

1.3 Earthworks Standards

The earthworks in filling were undertaken using in situ Silty CLAY and Clayey SILT mixtures gained from areas of cut within stages 16 to 18a and across the larger subdivision. The standards for the placement of filling, as stated in the earthworks contract documents, were to comply with NZS 4431:1989 "Code of Practice for Earth fill for Residential Development" and the Council RITS. Filling placed to these standards may be considered as good ground in terms of NZS 3604:2011 "Timber Framed Structures".

The compaction of the filling placed was monitored and tested for compaction density using a hand-held shear vane and nuclear densometer in finer grained Clayey SILT and Silty CLAY. The compaction control criteria adopted for engineered fill on site were as follows:

- Air voids percentage average value less than 10 %.
- Air voids percentage maximum single value 12 %.
- Undrained shear strength average value not less than 140 kPa.
- Undrained shear strength minimum single value 110 kPa.
- Compaction percentage average value not less than 95%.
- Compaction percentage minimum single value 90%.

1.4 Filled Ground

During the placement of filling on the road subgrades and on areas intended for residential development, the contractor, OLC, stripped and removed all topsoil and other surface organic soils. Post construction testing was carried out to confirm the interface between the cut and fill. Filling was placed in discrete layers with compaction applied through sheepsfoot drum rollers.

Subgrade inspections were carried out by the contractor and by CORE50 for verification purposes. The CORE50 subgrade and fill testing included a site walkover by the geotechnical engineer and site testing by a Geo-technician. As most of the filling placed comprised Clayey SILT and Silty CLAY identified in the pre-subdivision boreholes, testing of the compaction achieved was undertaken with a handheld shear vane and NDM testing (Nuclear Density Meter). Testing was based on the required air voids ratio (averaging 10% and no individual value of over 12%). In our experience, oven tests for air void correction can vary the air void result in this material by up to 3%. Oven tests were typically used for any on field air void result ≥6%. Solid density values were based on the same value used in the lab testing (2800kg/m^3). This is a higher value that would typically be used but provides a conservative result so has been adopted without further question or testing.

The results indicate that the construction filling standards have been met. However due to the expansive nature of the fill material, unless stated otherwise, shallow or waffle foundations on all stage 17 and 18a lots must be designed to mitigate "M Class" expansive soils, i.e. NZS 3604:2011 foundations modified as per NZ Building Code B1/AS1 (28th November 2019) Section 7 or engineered waffle slabs constructed in compliance with AS2870-2011 Residential Slabs and Footings.

1.5 Areas of Cut

Areas partly developed in cut are shown on the cut fill plan (Appendix A). Lots 481 to 482 and 523 to 524 had between 100mm–3000mm of cut material. In these areas, the ground at formation levels was observed to comprise the same Clayey SILT and Silty CLAY that had been used for filling elsewhere in stages 16 to 18a and as identified by pre subdivision tests.

1.6 Test Results in Filling Placed

A summary of the tests undertaken by CORE50 is present in Appendix D.

The shear vane and nuclear densometer test results show that acceptable soil strengths had been developed in all fill areas tested.

1.7 Test Results in Areas of Cut and Natural Ground

Lots 481 to 482 and 523 to 524 were predominately reshaped in cut only areas. The natural ground under the respread topsoil comprised of silty clay and clayey silts as had been identified in the pre-subdivision investigation boreholes.

The results of the tests undertaken indicate that good ground strength is present, but with the likelihood of expansive soils.

1.8 Land Hazards

1.8.1 Land Stability

All lots across stages 17 and 18a have been graded as flat as possible with a desirable gradient of 0.5%. However, boundaries of various lots were battered to optimize use of fill material. Based on the competency of the inherent soils, there is a building restriction zone of 3m from the top of batter or any swale. Any lot bordering a stormwater swale has been identified as a Specific Engineering Design zone for foundations. The foundation design for these lots will also need to allow for appropriate setback or alternative design options (i.e. underpinning) where adjacent to the swales.

Standard good practice around small slopes of the site will be required. Buildings should be set back from the slopes and avoid either surcharging the slopes or undermining the slopes. All foundations within this area are subject to specific engineering design, and an assessment of the building location and earthworks should be carried out as a part of the engineering design/review of any section adjacent to a slope.

1.8.2 Flooding

The final lot levels have been set based on infrastructure requirements and freeboard from flood levels developed as part of the stormwater design for the larger subdivision. The means of disposal of stormwater runoff from lots in these stages of the subdivision are described in the catchment and overland flow assessments by Beca (interpretive Report Lot Levels Area LUK). In the report for area LUK, a 1% AEP flood event is identified for each swale system. A list of Minimum Lot Levels for Stage 17 and 18a is included in Appendix E.

Site grading during house construction must not lower finished levels below the minimum finished ground levels identified by S&L without further review of the impacts on flooding. Earthworks must not direct stormwater runoff to adjacent properties, or towards buildings, or create areas of localized ponding. All overland flow is to be towards the road frontage on each section, where falls will direct surface flow towards the swale system.

It is the responsibility of the building design professional to ensure that the requirements for mitigation for the hazard of flooding are met by the design prior to submitting to Council for consent. Confirmation of the swale construction and flood levels are excluded from the scope of this report and are to be covered separately with sign-off of infrastructure works.

1.8.3 Liquefaction

The potential for the hazard of liquefaction for Area LUK of the Greenhill Park Subdivision is discussed in the DBCE Preliminary Geotechnical Report. Geologically, stage 17 and 18a is a transition zone between younger Hinuera Deposits and older Walton Subgroup. The Hinuera deposits are considered liquefaction prone is subject to a seismic event coupled with a high groundwater. Zones of the subdivision that are in the low lying area will typically be subject to liquefaction effects during the ULS earthquake. Modelling using CLiq indicates that zones with less than 2m of fill over Stage 17 and 18a are considered TC2 unless further assessmetnis carried out. For lots with greater than 2m of fill added or sites on cohesive (i.e. Walton Group) deposits the riskis reduced and TC1 foundations are appropriate.

Note that updated liquefaction parameters (0.25g and M=5.9) have been used for checking the threshold, with LSN = 10 indicated for sites with 2m of fill added during subdivision earthworks. Additional fill/ground raising will reduce the risk of liquefaction triggering but increasing the non-liquefiable rafting layer.

Foundations near the top of the swales are subject to Specific Engineering Designs. The liquefaction summary plan is appended to this Completion report (Appendix A). Specifically, the requirements are:

- 0m – 1.5m no habitable dwellings to be built within 1.5 m of the swale crest.
- Lots adjacent to storm water swales to have specific engineered foundation designs, i.e., Lots 519 and 531.

1.8.4 Expansive Soils

Underlying soils within stages 17 and 18a are typically either Hinuera Formation based deposits, or Walton Subgroup. The Hinuera Formation is predominantly sand, and silt based and considered non expansive or slightly expansive. The Walton Subgroup has a much higher clay content and is considered slightly to moderately expansive. Given the volcanic origins, the expansive nature of the soils is generally non-recoverable i.e., shrinkage only. However, the relatively high shrinkage potential of the Walton Subgroup means it would be normal to classify this as moderately expansive in its in-situ state i.e., 20-39mm.

1.8.5 Subsidence (Consolidation Settlement)

The DBCE Preliminary Geotechnical Report has identified areas within stages 17 and 18a may experience settlement of fill through consolidation of underlying Hinuera deposits. A minimum 6 month holding period between completion of bulk filling and foundation construction should be observed for Lots 491-496, 501-510, 519-522, 525-535, and 8025-8030. Completion of the bulk earthworks has been completed by September 2021. At time of report May 2022, no building works have taken place. We consider this has provided sufficient time for settlement to have occurred. Residential development can proceed without further consolidation periods required.

2.0 Disposal of Stormwater

Greenhill Park has been designed with a swale network to limit peak flows from the subdivision to 80 % of the 1 % AEP pre-development rate. S&L have provided the stormwater design for the current stage of the subdivision. As a part of this design, 100% of the onsite stormwater (up to the allowable impermeable area) has been allowed for in the system design. As such, no at source on site stormwater measures are required as a part of the overall stormwater design. This allows for a centralized stormwater system which has been stated as preferred for long term maintenance by Council. The piped drainage network has been designed to convey the 10% AEP flows from roads and lots to the swale network, with each lot to be provided with a piped service connection. Flow volumes over this design event may run overland into the swale network as secondary flow.

We recommend that reduced onsite water efficiency measures such as catchpit filters and reuse tanks be encouraged to improve water efficiency and reduce the sediment load downstream. Such measures should be at the discretion of the end user on a case-by-case basis.

The above recommendations do not supersede any additional measures that Council may require of each individual lot. Any council requirements in addition to the subdivision design should be followed. Any such requirements should be confirmed from council for this area. Any lot coverage over the maximum permitted will require site specific stormwater management to offset the effects of added runoff volume.

3.0 Retaining Walls

Engineered timber pole retaining walls up to 3.2m height were constructed around the boundary of Lot 525 to retain cut and fill slopes and create a near level lot platform. CORE50 has designed and carried out multiple inspections to confirm that the walls were constructed as per design. A site plan showing the retaining walls on site is included in Appendix A and a producer statement (PS4) for the retaining walls, is included in Appendix F.

To prevent overloading or undermining the retaining walls along Lot 525, The following Building Restriction Zones (BRZ) and Excavation Restriction Zones (ERZ) apply:

a) BRZ: No buildings should be constructed within a minimum distance to the top of the wall equal to the height of the wall measured from the wall drainage system without engineering review of surcharge loading.
b) ERZ: No temporary service trench, foundation, or excavation ≥300mm should be carried out within a minimum distance to the toe of the wall =1.5m and/or equal to the walls retained height (which ever is the greater) without engineering review.

4.0 Preliminary Foundation Recommendations

Based on our post-completion investigations, observations during construction and understanding of the site's geology and geotechnical hazards, we believe suitable foundations will generally be either TC2, M Class, or SED.

The lot summary table in Appendix B provides a summary of the anticipated ground conditions and preliminary foundation recommendations for each lot. Further lot-specific testing will be required to confirm foundation requirements. This may include testing prior to consent applications or during foundation excavations. The timing of the testing will be subject to Council requirements.

5.0 Professional Opinion

It has been demonstrated in this Geotechnical Completion Report, that earthworks have been completed and building platforms have been constructed to comply with Council's RITS specifications and the New Zealand Building Code. Recommendations have been provided within the report for the disposal of stormwater from individual lots, for the ongoing development of the lots and for the mitigation of liquefaction risk where applicable.

In accordance with RITS Section 2.3.4.1, a statement of professional opinion is enclosed in Appendix II of this document. This statement is presented in the form of Checklist 2.2 of Council's Development Manual, Volume 4: Quality Systems for Land Development, and is accompanied by a *Summary of Geotechnical Data for Individual Lots* which summarizes the information and recommendations contained in this report.

6.0 Applicability

Recommendations contained in this document are based on data from observations of site earthworks, boreholes, and test results. Inferences about the nature and continuity of subsoils away from these locations are made but cannot be guaranteed.

In all circumstances, if variations in the subsoils occur which differ from those described or are assumed to exist, the site should be inspected by an engineer suitably qualified to make an informed judgement and provide advice on appropriate improvement measures.

This report has been prepared specifically for Stages 17 and 18a as shown for Lots: 481 to 535 and 8025 to 8030 of Area LUK, Stages 17 and 18a within the Greenhill Park Residential Subdivision. No responsibility is accepted by CORE50 Ltd for the use of any part of this report for other development sites without their written approval.

Report Prepared By: Aaron Kennedy Date: 31st May 2022

Civil Engineer

Report Revised and Approved By: Date: 14th July 2022

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Michael Richardson

Geotechnical Engineer CPEng

References

[1] Ruakura Land Development - LDP Geotechnical Factual Report by Beca, 15 April 2016.

[2] C. Hughes and K. Read, "Ruakura Development - Stage 1 Geotechnical Investigation – Liquefaction Potential Detailed Assessment," Opus International Consultants, Ltd., Hamilton, New Zealand, 2014.

[3] M. Hughes and L. Shuler, "Report on Preliminary Geotechnical Investigation, Ruakura Development, Hamilton," S&L Consultants, Ltd., Tauranga, New Zealand, 2015.

[4] "Section 2 Earthworks and Geotechnical Requirements," in *Regional Infrastructure Technical Specifications*, Waikato Local Authority Shared Services, May 2018.

[5] "NZS 4404 Land Development and Subdivision Infrastructure," in *New Zealand Standards*, Wellington, New Zealand, Standards New Zealand, 2010.

[6] "Greenhill Park - Geotechnical Interpretation and Design-Area 1" by Beca 28 October 2016.

[7] "Part 5: Earthquake Actions - New Zealand," in *NZS 1170.5:2004 Structural Design Actions*, Standards New Zealand, 2004.

[8] "Greenhill Park Design Report - Area I (Stage 5, 6, 7 & 8) by Beca 20 December 2016

[9] "Clause B1: Structure," in *Acceptable Solutions and Verification Methods For New Zealand Building Code*, Wellington, Ministry of Business, Innovation and Employment, 2014.

[10] "Part A: Technical Guidance," in *Repairing and rebuilding houses affected by the Canterbury earthquakes*, Wellington, Ministry of Business, Innovation and Employment, 2012.

[11] "Clause E1: Surface Water," in *Acceptable Solutions and Verification Methods For New Zealand Building Code*, Wellington, Ministry of Business, Innovation and Employment, 2014.

[12] *Regional Infrastructure Technical Specifications*, Waikato Local Authority Shared Services, May 2018.

[13] "Preliminary Geotechnical Report Area K, L & Eldone," DB Consulting Engineers, December 2019.

Appendix A *Reference Drawings*

Subdivision plan 19-30410-17-RC1
Cut/Fill Plan
DBCE Preliminary Subdivision Foundation Plan

STAGE	NUMBER OF LOTS (+ HIGHER DENSITY LOTS)
STAGE 16	31 (+25)
STAGE 17	55 (+6)
STAGE 18	45
STAGE 19	29 (+6)
STAGE 20	31 (+12)
STAGE 21	35 (+6)
STAGE 22	41 (+13)
STAGE 23	50
STAGE 24	43
STAGE 25A	(+28)
STAGE 25B	(+16)
STAGE 26A	TBC
STAGE 26B	TBC

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P.O. Box 231, Tauranga 3140
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NOTES:

1. THIS PLAN HAS BEEN PREPARED FOR THE PURPOSES OF SECTION 88 OF THE RESOURCE MANAGEMENT ACT 1991 AND SHOULD NOT BE RELIED ON FOR ANY OTHER PURPOSE.
2. AREAS AND DIMENSIONS ARE APPROXIMATE ONLY AND SUBJECT TO SURVEY.
3. ALL ROADS (LOTS 100-116) ARE TO BE VESTED IN HAMILTON CITY COUNCIL.
4. ALL RESERVES (LOT 300-324) ARE TO BE VESTED IN HAMILTON CITY COUNCIL.

LEGEND:

- LOT BOUNDARY
- PROPOSED CADASTRAL LAYOUT
- CONCEPT BOUNDARY
- STAGE BOUNDARY
- ABUTTALS
- EXISTING EASEMENTS
- MIXED USE LOTS
- HIGHER DENSITY LOTS
- RECREATION RESERVE
- STORMWATER RESERVE
- ROAD RESERVE

SEE 19-30410-LK-RC2 FOR SCHEDULES AND AMALGAMATION CONDITIONS

Rev	DESCRIPTION	DRN	CKD	APP	DATE
11	LOT LAYOUT UPDATED 92	JL	JL	NF	08/20
12	SCHEME DETAIL UPDATED	NP	JL	NF	08/20
13	STAGE 17 & 18 BDY UPDATE	NW	BP	BP	08/21
14	STAGE 17 & 18 BDY UPDATE	NP	BP	BP	10/21
15	STAGE BDY'S UPDATED	NP	BP	BP	10/21
16	STAGE 25 & 26	NW	GC	GC	11/21
17	LOT 531 UPDATED	NP	GC	GC	11/21

	NAME	DATE		NAME	DATE
SURVEYED			DESIGNED		

COORDINATE SYSTEM: NZGD 2000 (MOUNT EDEN)
ORIGIN OF COORDINATES:
HEIGHT DATUM: MOUTRIKI LVD 1953
ORIGIN OF HEIGHT:

TITLE

AREAS LU & K SCHEME PLAN

PREPARED FOR

Chedworth Properties Limited

GREENHILL PARK

AREAS LU & K

ORIGINAL SCALES @ A3: 1:3000
DO NOT SCALE DIMENSIONS

STATUS: FOR APPROVAL

DRAWING NO: 19-30410-LK-RC1

REVISION: 17

H:\0000 - H Drive\nparkinson\Autocad\19-30410-LK-RC1 - Scheme Plan\19-30410-01 - Scheme Plan.dwg - Plotted: 5/11/2021

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Received
PLANNING GUIDANCE
08 November 2021

LEGEND:

- LOT BOUNDARY
- PROPOSED CADASTRAL LAYOUT
- CONCEPT BOUNDARY
- STAGE BOUNDARY
- ABUTTALS
- FUTURE STAGES
- HIGHER DENSITY LOTS
- RECREATION RESERVE
- STORMWATER RESERVE
- ROAD RESERVE

Rev	DESCRIPTION	DRN	CKD	APP	DATE
2	HCC REQUIREMENTS	NW	JL	NF	02/20
3	LAYOUT AMENDED	NW	NF	NF	04/20
4	LAYOUT AMENDED	MP	NF	NF	09/20
5	STAGE BDY UPDATED	NW	BP	BP	08/21
6	LAYOUT AMENDED	NP	BP	GC	10/21
7	STAGE BDY'S UPDATED	NP	BP	GC	10/21
8	LOT 531 UPDATED	NP	GC	GC	11/21

	NAME	DATE		NAME	DATE
SURVEYED			DESIGNED		

COORDINATE SYSTEM: NZGD 2000 (MOUNT EDEN CIRCUIT)
ORIGIN OF COORDINATES:
HEIGHT DATUM: MOTURIKI LVD 1953
ORIGIN OF HEIGHT:

TITLE

AREAS LU & K SCHEME PLAN STAGE 17

PREPARED FOR

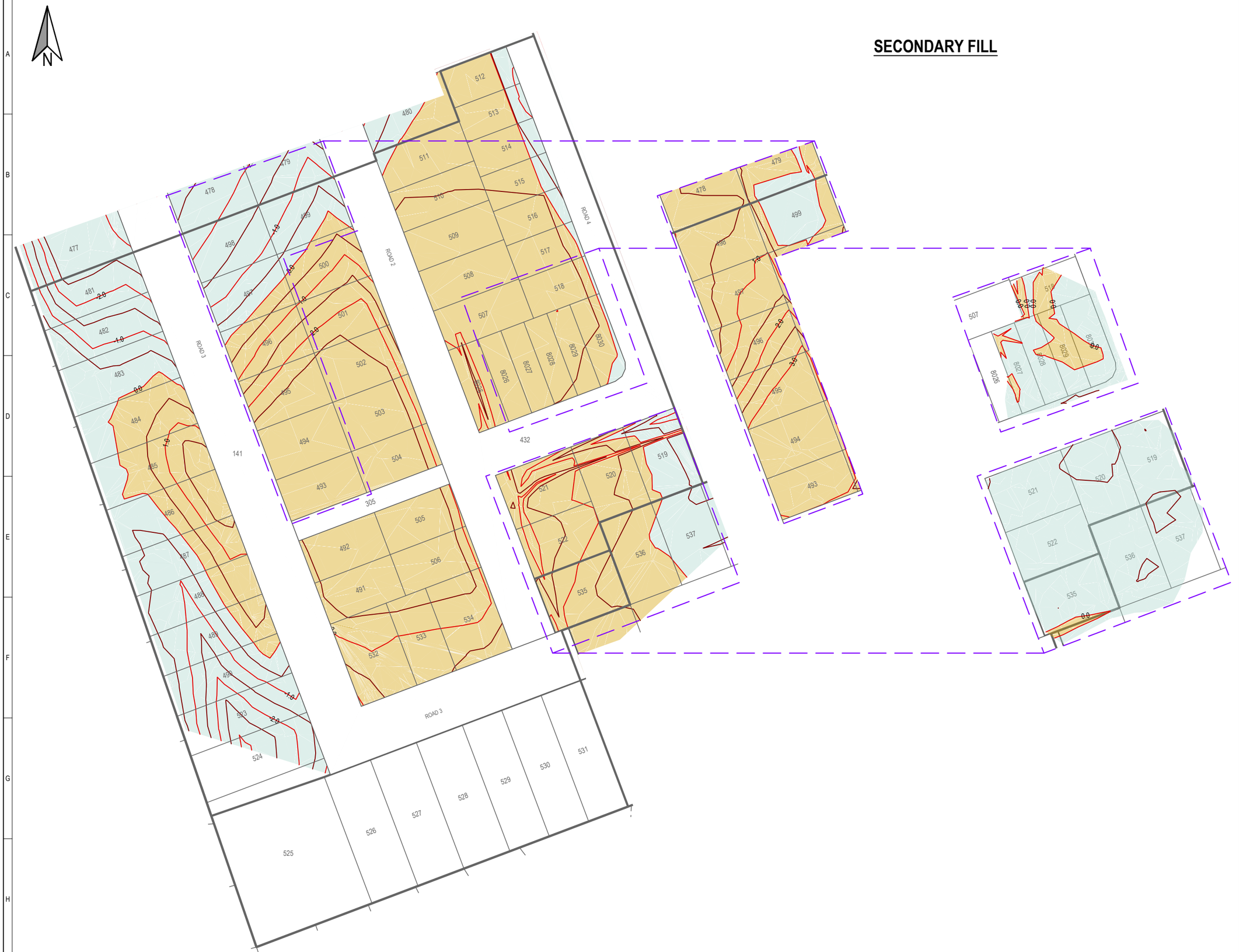
Chedworth

AREAS LU & K

ORIGINAL SCALES @ A3: 1:1500
DO NOT SCALE DIMENSIONS
STATUS: FOR APPROVAL
DRAWING NO: 19-30410-17-RC1
REVISION: 8

H:\0000 - H Drive\parkinsons\Autocad\19-30410-17-RC1 - Scheme Plan - Stage 17\19-30410-17-RC1 - Scheme Plan - Stage 17.dwg - Plotted: 5/11/2021

SECONDARY FILL



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LEGEND:

- CUT
- FILL
- MAJOR CONTOUR
- MINOR CONTOUR

CONTOURS SHOWN ARE AT 0.5m INTERVAL.

Rev	DESCRIPTION	DRN	CKD	APP	DATE
0	PRELIMINARY	NW	GC	GC	04/22
1	FINAL SURFACE UPDATE	NP	BP	PH	07/22

	NAME	DATE		NAME	DATE
SURVEYED			DESIGNED		

COORDINATE SYSTEM: NZGD 2000 - MOUNT EDEN
ORIGIN OF COORDINATES:
HEIGHT DATUM: MOTURIKI LVD 1953
ORIGIN OF HEIGHT:

TITLE

STAGE 17
CUT FILL PLAN

PREPARED FOR

Greenhill Chedworth Properties Limited

STAGE 17

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STATUS: AS-BUILT

DRAWING NO: 30410-01-S17-EW4
REVISION: 1

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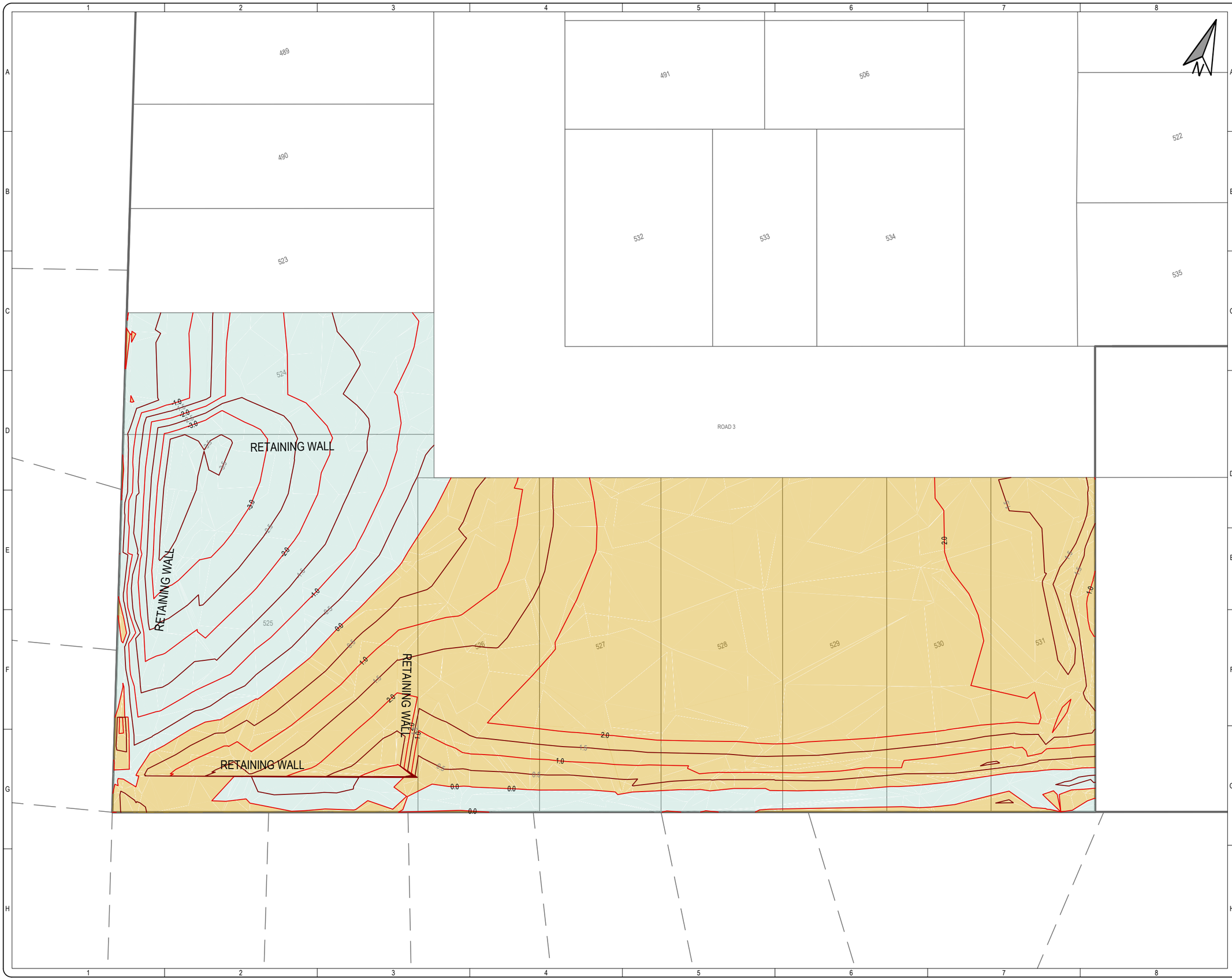

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LEGEND:

- MAJOR CONTOUR
- MINOR CONTOUR
- ABUTTALS
- FUTURE LOTS
- STAGE PERIMETER
- CUT AREA
- FILL AREA

CUT TO FILL FACTOR = 1.0

CONTOUR INTERVAL 0.5m

Rev	DESCRIPTION	DRN	CKD	APP	DATE
0	PRELIMINARY	NP	BP	PH	05/22
1	UPDATED FINAL SURFACE	NP	BP	PH	07/22

	NAME	DATE		NAME	DATE
SURVEYED			DESIGNED		

COORDINATE SYSTEM: NZGD 2000 - MOUNT EDEN
ORIGIN OF COORDINATES:
HEIGHT DATUM: MOTURIKI 1953
ORIGIN OF HEIGHT:

TITLE

CUT / FILL PLAN STAGE 18A

PREPARED FOR

Greenhill Chedworth Properties Limited

AREAS L,U & K

ORIGINAL SCALES @ A3	STATUS
1:400 DO NOT SCALE DIMENSIONS	AS-BUILT

DRAWING NO	REVISION
30410-01-S17-EW3	1

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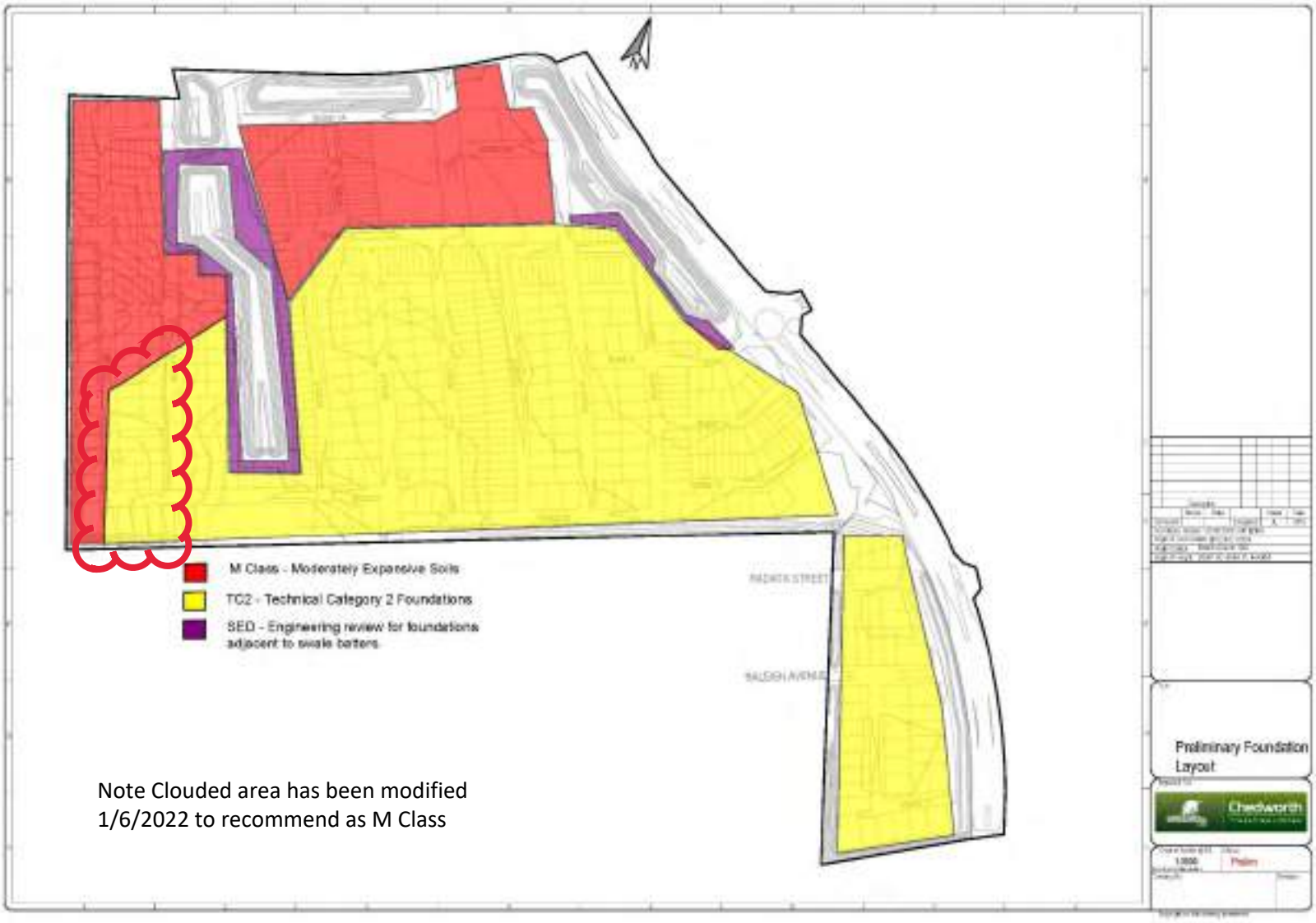
DBCE Preliminary Subdivision Foundation Plan

Job No: DB 171738-AREA-K&L&Eldone-01



Note Clouded area has been modified 1/6/2022 to recommend as M Class

Appendix B *Geotechnical Completion Forms*

Checklist 2.2 - Statement of Professional Opinion

Summary of Geotechnical Data for Individual Lots

NZS 4404: 2010 SCHEDULE2A (Checklist 2.2)

STATEMENT OF PROFESSIONAL OPINION AS TO SUITABILITY OF LAND FOR BUILDING CONSTRUCTION

Development: Greenhill Park LUK Stage 17 and 18a **Developer:** Chedworth Properties Limited

At Pardoa Boulevard, Chartwell, Hamilton (Mussel White Street and Earp Crescent)

I, Michael Richardson of CORE50 Ltd, PO Box 1123, Taupo

Hereby confirm that:

1.0 I am a geo-professional as defined in clause 1.2.2 of NZS 4404:2010 and was retained by the developer as the geo- professional on the above development.

2.0 The extent of my inspections during construction, and the results of all tests carried out are described in my geotechnical completion report for Greenhill Park Area LUK Stages 17 and 18a dated May 2022 (reference 171738-S17&S18a-01)

3.0 In my professional opinion, not to be construed as a guarantee, I consider that:

a. The completed works give due regard to land slope and foundation stability considerations.

b. The site ground affected by engineered certified filling is suitable for the erection thereon of buildings designed according to the report recommendations provided that:

i. Lots 507 to 522, 531, 535 and 8025 to 8030 are subject to specific engineering review of foundations addressing TC2 liquefaction ground damage for the ULS design case.

ii. Remainder of Lots are subject to engineering review of foundations addressing M Class foundation requirements.

iii. All lots are subject to an engineering inspection during foundation excavations in lieu of further soils testing. Construction supervision from an engineer shall be carried out to confirm the shallow ground conditions are in accordance with this report and suitable for NZS3604 foundations for bearing strength.

4.0 This professional opinion is furnished to Hamilton City Council and the developer for their purposes 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 of any dwelling.

5.0 This certificate shall be read in conjunction with my geotechnical completion report referred to in clause 2 above and shall not be copied or reproduced except in conjunction with the full geotechnical completion report.

Signed **……** **Date: 14 July 2022**

Michael Richardson

Chartered Professional Engineer (Geotechnical)

CPEng 1005467

Summary of Geotechnical Data for Individual Lots

DP No:	TB210C400	Property Address	Greenhill Park, Stage 17 & 18a, Hamilton	RC No:	11/2019/7140/003

Lot No:	Area (m^2)	Subsurface Data						Foundations		Building Restriction Line	S/W Specific Design	S/W Soakage	S/W Reticulated	Designated Building Platform	Minimum Building Platform	Compressible Soils	On-site Effluent Disposal	Consent Notice[6]	Comment
		Shear Strength (kPa)	Subdivision Filling		Natural Topography Unworked	Natural Topography Earth worked		Conventional Shallow Foundation to NZS 3604:2011	Specific Design										
			Y/N	Depth (m)	Y/N	Y/N	Depth (mm)	Y/N/NA	Y/N/NA										
481	377	117-205+	Y	0.3[2]	N	Y	2500[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
482	381	143-205+	Y	0.3[2]	N	Y	1500[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
483	450	130-205+	Y	0.3[2]	N	Y	1000[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
484	456	156-205+	Y	0.3-1.0[2]	N	Y	200[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
485	462	150-205+	Y	0.3-1.5[2]	N	Y	200[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
486	467	159-205+	Y	0.3-1.5[2]	N	Y	500[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
487	405	98-205+	Y	0.3-1.5[2]	N	Y	500[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
488	410	172-205+	Y	0.3-0.8[2]	N	Y	1000[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
489	414	143-202	Y	0.3-0.5[2]	N	Y	1500[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
490	418	127-205+	Y	0.3-0.6[2]	N	Y	2000[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
491	287	137-205+	Y	2.5-3.1[2]	N	Y	300[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
492	296	164-205+	Y	2.5-3.4[2]	N	Y	300[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
493	288	172-205+	Y	2.5-3.6[2]	N	Y	300[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
494	345	156-205+	Y	3.4-3.5[2]	N	Y	300[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
495	345	159-205+	Y	2.0-3.3[2]	N	Y	300[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
496	345	143-205+	Y	0.5-2.6[2]	N	Y	300[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
497	345	159-205+	Y	0.5-1.5[2]	N	Y	1500[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
498	345	140-205+	Y	0.5-0.8[2]	N	Y	2000[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
499	345	143-205	Y	0.3-0.7[2]	N	Y	1000[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
500	345	107-205+	Y	0.3-1.5[2]	N	Y	300[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
501	345	140-205+	Y	1.5-2.5[2]	N	Y	300[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
502	345	140-205+	Y	2.0-2.5[2]	N	Y	300[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
503	345	202-205+	Y	2.0-2.5[2]	N	Y	300[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
504	287	140-205+	Y	2.0-2.7[2]	N	Y	300[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
505	296	153-205+	Y	2.0-2.6[2]	N	Y	300[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
506	288	156-205+	Y	2.0-2.6[2]	N	Y	300[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
507	312	143-205+	Y	1.0-1.7[2]	N	Y	300[2]	N	Y[5]	Y	N[4]	N	N	N	Y	N	N	Y	
508	312	140-205+	Y	1.0-1.7[2]	N	Y	300[2]	N	Y[5]	Y	N[4]	N	N	N	Y	N	N	Y	
509	312	170-205+	Y	1.0-1.4[2]	N	Y	300[2]	N	Y[5]	Y	N[4]	N	N	N	Y	N	N	Y	

Summary of Geotechnical Data for Individual Lots

DP No:	TB210C400	Property Address	Greenhill Park, Stage 17 & 18a, Hamilton	RC No:	11/2019/7140/003

Lot No:	Area (m^2)	Subsurface Data						Foundations		Building Restriction Line	S/W Specific Design	S/W Soakage	S/W Reticulated	Designated Building Platform	Minimum Building Platform	Compressible Soils	On-site Effluent Disposal	Consent Notice[6]	Comment
		Shear Strength (kPa)	Subdivision Filling		Natural Topography Unworked	Natural Topography Earth worked		Conventional Shallow Foundation to NZS 3604:2011	Specific Design										
			Y/N	Depth (m)	Y/N	Y/N	Depth (mm)	Y/N/NA	Y/N/NA										
510	312	127-205+	Y	0.5-1.6[2]	N	Y	300[2]	N	Y[5]	Y	N[4]	N	N	N	Y	N	N	Y	
511	312	124-205+	Y	0.3-0.8[2]	N	Y	300[2]	N	Y[5]	Y	N[4]	N	N	N	Y	N	N	Y	
512	225	71-205+	Y	0.3-0.6[2]	N	Y	1000[2]	N	Y[5]	Y	N[4]	N	N	N	Y	N	N	Y	
513	210	79-190+	Y	0.3-0.6[2]	N	Y	1000[2]	N	Y[5]	Y	N[4]	N	N	N	Y	N	N	Y	
514	210	136	Y	0.3-0.6[2]	N	Y	500[2]	N	Y[5]	Y	N[4]	N	N	N	Y	N	N	Y	
515	210	149	Y	0.3-0.6[2]	N	Y	500[2]	N	Y[5]	Y	N[4]	N	N	N	Y	N	N	Y	
516	210	149	Y	0.3-0.9[2]	N	Y	300[2]	N	Y[5]	Y	N[4]	N	N	N	Y	N	N	Y	
517	210	190+	Y	0.3-0.9[2]	N	Y	300[2]	N	Y[5]	Y	N[4]	N	N	N	Y	N	N	Y	
518	230	190+	Y	0.3-0.9[2]	N	Y	300[2]	N	Y[5]	Y	N[4]	N	N	N	Y	N	N	Y	
519	362	133-190+	Y	0.3-0.9[2]	N	Y	1000[2]	N	Y[3]	Y	N[4]	N	N	N	Y	N	N	Y	SED – Foundations adjacent to swale batter.
520	362	149-190+	Y	0.3-1.1[2]	N	Y	300[2]	N	Y[5]	Y	N[4]	N	N	N	Y	N	N	Y	
521	379	125-190+	Y	1.0-2.5[2]	N	Y	300[2]	N	Y[5]	Y	N[4]	N	N	N	Y	N	N	Y	
522	345	149-176	Y	1.0-2.5[2]	N	Y	300[2]	N	Y[5]	Y	N[4]	N	N	N	Y	N	N	Y	
523	422	156-205+	Y	0.3[2]	N	Y	2500[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
524	498	156-205+	Y	0.3[2]	N	Y	3000[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
525	1512	140-205+	Y	0.3-3.2[2]	N	Y	3500[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
526	539	190-205+	Y	0.3-2.5[2]	N	Y	500[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
527	539	172-205+	Y	0.3-2.6[2]	N	Y	300[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
528	539	161-205+	Y	0.3-2.6[2]	N	Y	300[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
529	462	167-205+	Y	0.3-2.3[2]	N	Y	300[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
530	462	199-205+	Y	0.3-2.3[2]	N	Y	300[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
531	462	170-205+	Y	0.3-2.3[2]	N	Y	300[2]	N	Y[3]	Y	N[4]	N	N	N	Y	N	N	Y	SED – Lot currently adjacent to batter/SW drain.
532	425	170-205+	Y	1.0-2.7[2]	N	Y	300[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
533	300	159-205+	Y	1.5-2.5[2]	N	Y	300[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
534	425	170-205+	Y	1.5-2.5[2]	N	Y	300[2]	N	Y[1]	Y	N[4]	N	N	N	Y	N	N	Y	
535	380	122-190+	Y	0.5-2.3[2]	N	Y	300[2]	N	Y[5]	Y	N[4]	N	N	N	Y	N	N	Y	
8025	225	156-166	Y	1.0-1.5[2]	N	Y	300[2]	N	Y[5]	Y	N[4]	N	N	N	Y	N	N	Y	
8026	175	152-190+	Y	1.0-1.5[2]	N	Y	300[2]	N	Y[5]	Y	N[4]	N	N	N	Y	N	N	Y	
8027	175	190+	Y	0.5-1.3[2]	N	Y	300[2]	N	Y[5]	Y	N[4]	N	N	N	Y	N	N	Y	

Summary of Geotechnical Data for Individual Lots

DP No:	TB210C400	Property Address	Greenhill Park, Stage 17 & 18a, Hamilton	RC No:	11/2019/7140/003

Lot No:	Area (m^2)	Subsurface Data						Foundations		Building Restriction Line	S/W Specific Design	S/W Soakage	S/W Reticulated	Designated Building Platform	Minimum Building Platform	Compressible Soils	On-site Effluent Disposal	Consent Notice[6]	Comment
		Shear Strength (kPa)	Subdivision Filling		Natural Topography Unworked	Natural Topography Earth worked		Conventional Shallow Foundation to NZS 3604:2011	Specific Design										
			Y/N	Depth (m)	Y/N	Y/N	Depth (mm)	Y/N/NA	Y/N/NA										
8028	175	190+	Y	0.5-1.3[2]	N	Y	300[2]	N	Y[5]	Y	N[4]	N	N	N	Y	N	N	Y	
8029	175	152-190+	Y	0.5-0.9[2]	N	Y	300[2]	N	Y[5]	Y	N[4]	N	N	N	Y	N	N	Y	
8030	225	152-190+	Y	0.3-0.9[2]	N	Y	300[2]	N	Y[5]	Y	N[4]	N	N	N	Y	N	N	Y	

NOTES:
1) M Class Foundations Recommended.
2) This considers approximately 300mm of topsoil removal across all lots prior to subdivision filling.
3) Setback required for properties adjacent swales. SED type foundation to be adopted for all lots adjacent to swales. No foundations to be constructed <1.5m from top of slope. No specific engineer design required >3m from top of slope.
4) Soakage testing is not required on individual lots. On site stormwater runoff reduction measures encouraged, i.e.; Re-use tanks, filters, and catchpits.
5) TC2 Foundations Recommended.
6) Consent Notice relating to Stormwater Controls required on all lots.

Appendix C *Laboratory Testing*
Fill Material Lab Testing.

PLASTICITY INDEX FOR SOILS
TEST REPORT

Project :	Greenhill Park
Location :	Greenhill Park
Client :	DB Consulting Limited
Contractor :	-
Sampled by :	Client
Date sampled :	9/10/2020
Date received :	12/10/2020
Sampling method :	Bulk Sample
Sample condition :	As received

Project No :	2-68165.00
Lab Ref No :	HA6441_PI
Client Ref No :	

Test Results

Sample Lab Ref No :	HA6441	
Sample Location ID :	Not Stated	
Sample Depth (m) :	Not Stated	
Soil Fraction Tested :	-425µm	
Natural Water Content (%) :	50.8	
Liquid Limit :	111	
Plastic Limit :	50	
Plasticity Index :	61	
Sample Description :	HA6441_PI	CLAY with some silt and trace sand

Test Methods		Notes
Water Content	NZS 4402 : 1986, Test 2.1	Soil fraction tested as shown.
Liquid Limit	NZS 4402 : 1986, Test 2.2	
Plastic Limit	NZS 4402 : 1986, Test 2.3	
Plasticity Index	NZS 4402 : 1986, Test 2.4	

Date tested : 16/10/20
Date reported : 21/10/20

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.
This report may only be reproduced in full
All information supplied by Client

IANZ Approved Signatory

Designation : *Senior Civil Engineering Technician*
Date : 21/10/20

ACCREDITED IANZ TESTING LABORATORY

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

WSP
Hamilton (Fox St)
Quality Management Systems Certified to ISO 9001

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Hamilton, New Zealand

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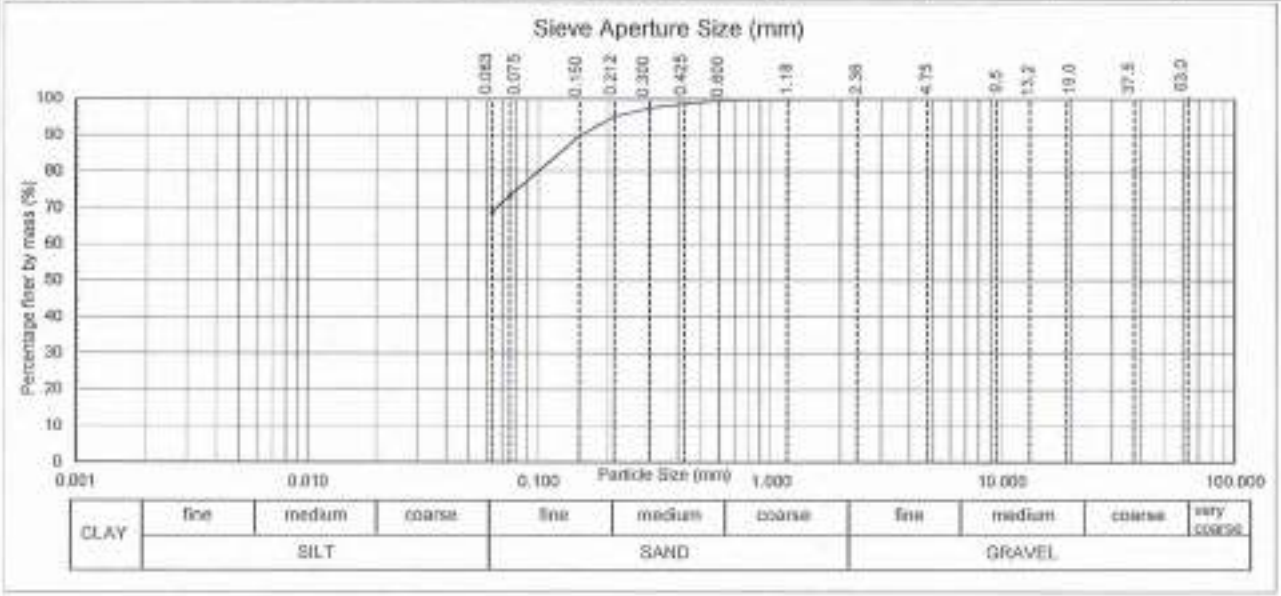
Website www.wsp.com/nz

PARTICLE SIZE ANALYSIS (WET SIEVE METHOD)
TEST REPORT

Project :	Greenhill Park
Location :	Greenhill Park
Client :	DB Consulting Limited
Client/Sample Ref :	Not Stated
Contractor :	-
Borehole No:	Not Stated Depth: Not Stated
Sampled by :	Client
Date received :	12/10/20
Sampling method :	Bulk Sample
Sample condition :	As received
Sample description :	Sandy CLAY/SILT
Solid Particle Density (t/m^3):	N/A
Water Content (as received):	38.8 %

Project No:	2-68165.00
Lab Ref No:	HA6441_PSD
Client Ref:	

Sieve Analysis						Hydrometer Analysis			
Sieve Size (mm)	Passing (%)	Sieve Size (mm)	Passing (%)	Sieve Size (mm)	Passing (%)	Particle Size (mm)	Passing (%)	Particle Size (mm)	Passing (%)
63.0	--	4.75	--	0.300	97	--	--	--	--
37.5	--	2.36	100	0.212	95	--	--	--	--
19.0	--	1.18	100	0.150	90	--	--	--	--
13.2	--	0.600	99	0.075	73	--	--	--	--
9.5	--	0.425	99	0.063	69	--	--	--	--
Note:	'--' denotes sieve not used and/or hydrometer analysis not tested					--	--		



Test Methods	Notes
Particle Size Analysis: NZS 4402:1986: Test 2.8.1 (Wet Sieve Method)	

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.

Date Tested: 19/10/20

Date Reported: 21/10/20

IANZ Approved Signatory

Designation : Senior Civil Engineering Technician

Date : 21/10/20

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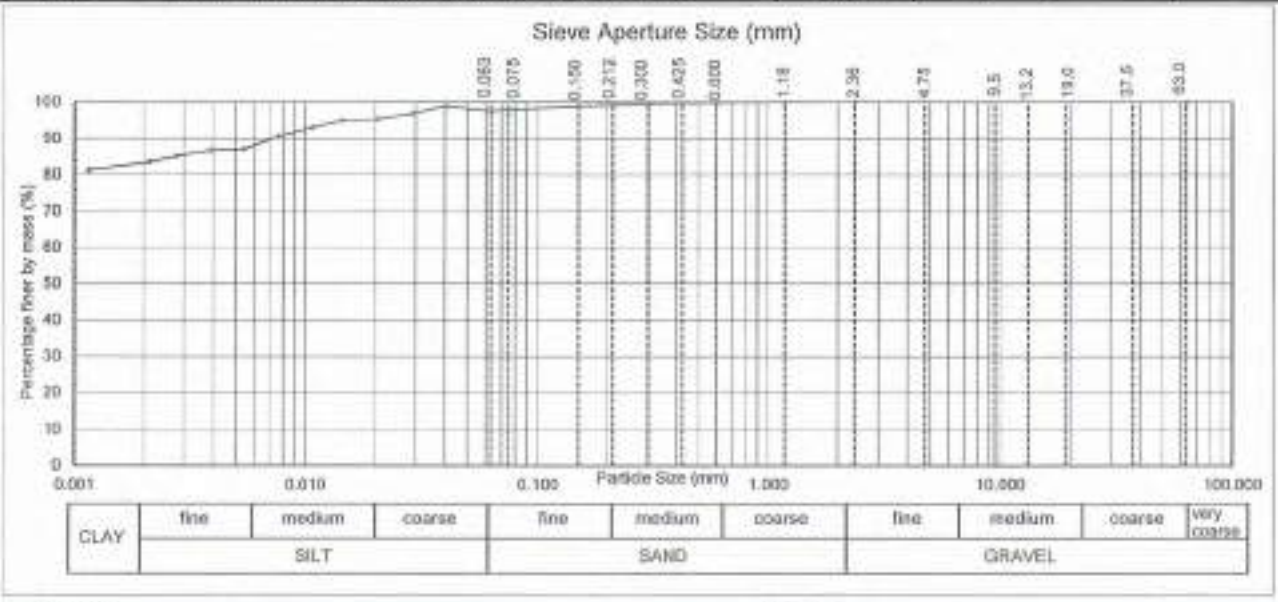
PARTICLE SIZE ANALYSIS (HYDROMETER METHOD)
TEST REPORT

Project:	Greenhill Park
Location:	Greenhill Park
Client:	DB Consulting Limited
Client/Sample Ref:	Not Stated
Contractor:	-
Borehole No:	Not Stated Depth: Not Stated
Sampled by:	Client
Date received:	12/10/20
Sampling method:	Bulk Sample
Sample condition:	As received
Sample description:	CLAY with some silt and trace sand
Solid Particle Density (t/m^3):	2.80 Assumed
Water Content (as received):	50.8 %

Project No:	2-68165.00
Lab Ref No:	HA644I_PSA
Client Ref:	

Sieve Analysis						Hydrometer Analysis			
Sieve Size (mm)	Passing (%)	Sieve Size (mm)	Passing (%)	Sieve Size (mm)	Passing (%)	Particle Size (mm)	Passing (%)	Particle Size (mm)	Passing (%)
63.0	--	4.75	--	0.300	99	0.0403	99	0.0054	87
37.5	--	2.36	100	0.212	99	0.0288	97	0.0039	87
19.0	--	1.18	100	0.150	99	0.0205	95	0.0028	85
13.2	--	0.600	100	0.075	98	0.0145	95	0.0021	84
9.5	--	0.425	100	0.063	98	0.0107	93	0.0012	81
Note: "--" denotes sieve not used and/or hydrometer analysis not tested						0.0077	91		



Test Methods	Notes
Particle Size Analysis: NZS 4402:1986: Test 2.8.4 (Washed Grading & Hydrometer Method)	pH of suspension : 8.0 (Whatmans Full Range pH Indicator paper) All information supplied by Client

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.

Date Tested: 20/10/20

Date Reported: 21/10/20

IANZ Approved Signatory

Designation: Senior Civil Engineering Technician

Date: 21/10/20

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LINEAR SHRINKAGE FOR SOILS
TEST REPORT

Project :	Greenhill Park
Location :	Greenhill Park
Client :	DB Consulting Engineers Ltd
Contractor :	-
Sampled by :	Client
Date sampled :	09/10/20
Date received :	12/10/20
Sampling method :	Bulk Sample
Sample condition :	As received

Project No :	2-68165.00
Lab Ref No :	HA6441_LS
Client Ref No :	

Test Results

Sample Lab Ref No :	HA6441
Location ID :	Not Stated
Sample Depth (m) :	Not Stated
Soil Fraction Tested :	-425µm
Sample History :	Natural
Water Content as Rec'd (%) :	50.8
Water Content at LS test (%) :	110.4
Linear Shrinkage (%) :	**24**

Sample Description : HA6441 CLAY with some silt and trace sand

Test Methods		Notes
Water Content	NZS 4402 : 1986, Test 2.1	
Linear Shrinkage	NZS 4402 : 1986, Test 2.6	

Date tested : 20/10/20
Date reported : 21/10/20

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.
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All information supplied by Client

IANZ Approved Signatory

Designation : *Senior Civil Engineering Technician*
Date : 21/10/20

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Website www.wsp.com/nz

DRY DENSITY / WATER CONTENT RELATIONSHIP
STANDARD COMPACTION

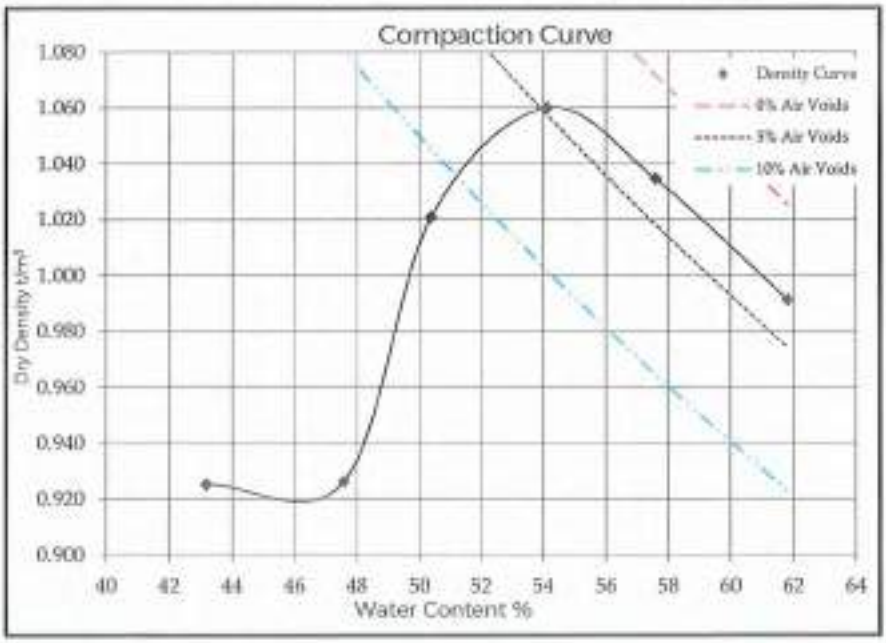
Project :	Greenhill Park
Location :	Greenhill Park
Client :	DB Consulting Engineers Ltd
Contractor :	-
Sampled by :	Client
Date sampled :	9/10/20
Sampling method :	Bulk Sample
Sample description :	CLAY with some silt and trace sand. Reddish brown
Sample condition :	As received
Solid density :	2.80 t/m³ (Assumed)
Source:	Not Stated

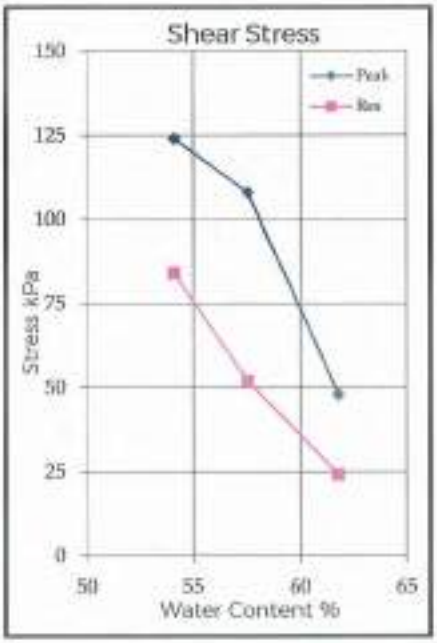
Project No :	2-68165.00
Lab Ref No :	HA6441/2_MDD
Client Ref No :	

Test Results

Maximum dry density	1.06 t/m³		Natural water content	50.4 %		
Optimum water content	54 %		Fraction tested	100% Passing 19mm sieve		

Sample ID	-120	-60	Nat	60	120	180
Bulk density t/m³	1.325	1.367	1.535	1.634	1.631	1.604
Water content %	43.2	47.6	50.4	54.1	57.6	61.8
Dry density t/m³	0.925	0.926	1.021	1.060	1.035	0.991
Sample condition	Hard Dry	Hard Moist	V.Stiff Moist	Stiff Moist	Firm Moist-wet	Soft Wet
Peak stress kPa	U.T.P	U.T.P	>192	124	108	48
Remoulded stress kPa	-	-	>192	84	52	24





Test Methods		Notes
Compaction	NZS 4402 : 1986 Test 4.1.1 (Standard)	All information supplied by Client
Shear Strength using a Hand Held Shear Vane, NZ Geotechnical Soc Inc 8/2001		

Date tested : 21/10/20
Date reported : 27/10/20

Sampling is not covered by IANZ Accreditation. Results apply only to sample tested.
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IANZ Approved Signatory

Designation : Senior Civil Engineering Technician
Date : 27/10/20

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All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

WSP
Hamilton (Fox St)
Quality Management Systems Certified to ISO 9001

4 Fox Street
Private Bag 3057, Waikato Mail Centre, 3240,
Hamilton, New Zealand

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Appendix D *Post Construction Test Results*
Soil Tests by CORE50
NDMs

CORE50
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Soil Testing

CORE50
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Project Name		Job Ref.
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01
Tested by	Date	Sheet No.	Lot No.
AK	12/04/2022	1	481

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100			Good Ground / Result	TOPSOIL with some clay and silt; dark brown; dry.	
200					
300					
400	190/50			CLAY SILT with traces of fine pumiceous material and mica; light yellow brown mottled orange; very stiff; low moisture; high plasticity; low dilatancy; sensitive.	
500					
600					
700	172/47			700mm: Becoming cream yellow brown.	
800					
900					
1000	>205/63			1000mm: Becoming SILT with some clay.	
1100				1100mm: Traces of fine pumiceous material.	
1200					
1300	124/47				
1400				1400mm: Becoming moist.	
1500				1500mm: Becoming cream brown mottled orange.	
1600	117/42				
1700					
1800				1800mm: Becoming SILT with minor fine sands and minor clay with traces of carbonaceous material; Light grey brown speckled black; moist; very stiff; high plasticity.	
1900	127/28				
2000					
2100				EOB at 2.0m, Target Borehole Depth.	
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					

Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01
Tested by	Date	Sheet No.	Lot No.
AK	12/04/2022	2	482

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100			Good Ground / Results	TOPSOIL with some clay and silt; dark brown; dry.	
200					
300				300mm: Becoming clayey.	
400	186/53			CLAY SILT with traces of fine pumiceous material and mica; light yellow brown mottled orange; very stiff; low moisture; high plasticity; low dilatancy; sensitive.	
500					
600					
700	>205/75				
800				800mm: Becoming SILT with minor clay.	
900					
1000	161/53			1000mm: Becoming yellow brown mottled orange.	
1100					
1200					
1300	>205/				
1400				1400mm: Becoming CLAY SILT.	
1500					
1600	164/69				
1700					
1800				1800mm: Becoming SILT with some clay.	
1900	146/50				
2000					
2100				EOB at 2.0m, Target Borehole Depth.	
2200	143/33				
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					

Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

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CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01
Tested by	Date	Sheet No.	Lot No.
AK	12/04/2022	3	483

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100			Good ground / Result	TOPSOIL with some clay and silt; dark brown; dry.	
200					
300					
400	>205/			CLAY SILT with traces of fine pumiceous material and mica; orange brown; hard; low moisture; high plasticity; low dilatancy.	
500					
600					
700	>205/			700mm: Becoming CLAY minor silt; brown mottled orange.	
800					
900					
1000	130/75			1000mm: Becoming very stiff; moderately sensitive.	
1100				1100mm: Becoming orange brown.	
1200					
1300	175/53				
1400				SILT with minor clay and traces of fine pumiceous material and mica; yellow brown mottled red and orange; very stiff to hard; low moisture; high plasticity; low dilatancy.	
1500					
1600	>205/				
1700					
1800					
1900	>205/				
2000					
2100				EOB at 2.0m, Target Borehole Depth.	
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					

Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01
Tested by	Date	Sheet No.	Lot No.
AK	12/04/2022	4	484

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100			Result / Good Ground	TOPSOIL with some clay and silt; dark brown; dry.	
200					
300					
400	175/50			ENGINEERED FILL: CLAY SILT; brown mix; very stiff; low moisture; high plasticity; low dilatancy.	
500					
600				CLAY with some silt and traces of fine pumiceous material and mica; brown mottled orange; very stiff; low moisture; high plasticity; low dilatancy; moderately sensitive.	
700	172/47				
800					
900					
1000	156/63			600mm: Becoming CLAY SILT.	
1100				800mm: Becoming brown.	
1200					
1300	>205/				
1400					
1500					
1600	170/50			1300mm: Becoming dark brown; CLAY minor silt.	
1700					
1800				1500mm: Minor carbonaceous material.	
1900	159/50				
2000					
2100				EOB at 2.0m, Target Borehole Depth.	
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					

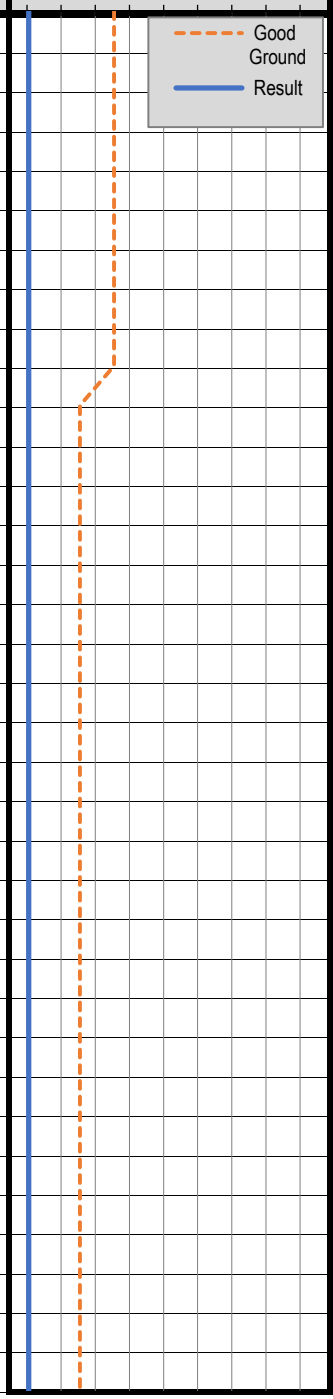
Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	12/04/2022	5	485

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100			TOPSOIL with some clay and silt; dark brown; dry.	
200				
300				
400			ENGINEERED FILL: CLAY SILT with minor fine sands and traces of fine pumiceous material and mica; mixture of various browns; hard; low moisture; high plasticity; low dilatancy.	
500	>205/			
600				
700				
800	150/69		CLAY SILT with traces of fine pumiceous material and mica; yellow brown mottled red and orange; very stiff; low moisture; high plasticity; low dilatancy; moderately sensitive.	
900				
1000				
1100	161/66			
1200				
1300				
1400	>205/			
1500				
1600				
1700	186/111			
1800			1800mm: Becoming dark brown speckled black; traces of carbonaceous material.	
1900				
2000	172/93			
2100			EOB at 2.0m, Target Borehole Depth.	
2200				
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				



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3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

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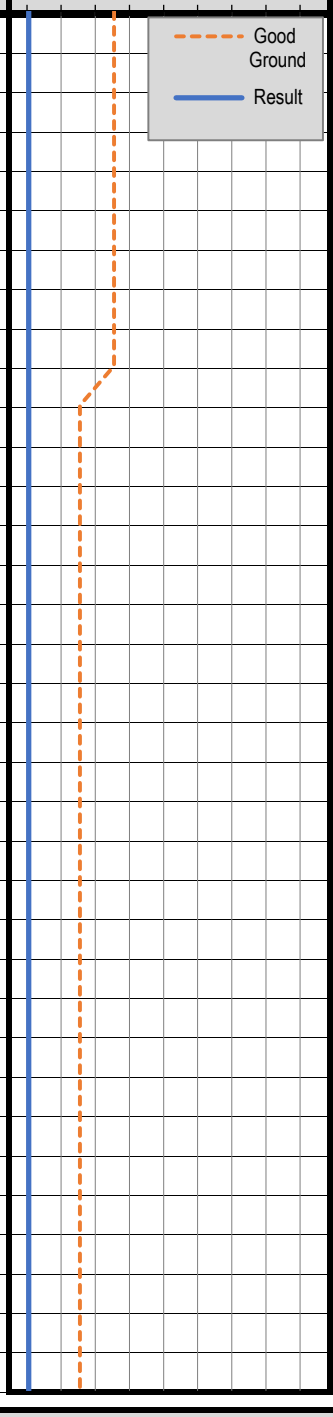
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	12/04/2022	6	486

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100			TOPSOIL with some clay and silt; dark brown; dry.	
200				
300				
400	>205/		CLAY SILT with traces of fine pumiceous material and mica; orange brown; hard; low moisture; high plasticity; low dilatancy.	
500				
600				
700	>205/			
800			800mm: Becoming dark brown speckled black; traces of carbonaceous material.	
900				
1000	199/66		1000mm: Becoming very stiff; moderately sensitive.	
1100				
1200			1200mm: Becoming orange brown.	
1300	186/117			
1400				
1500			1500mm: Becoming yellow brown mottled orange.	
1600	159/69		1600mm: Becoming SILT with some clay and traces of fine pumiceous material and mica; yellow brown mottled orange; very stiff to hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
1700				
1800				
1900	>205/			
2000				
2100			EOB at 2.0m, Target Borehole Depth.	
2200				
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				



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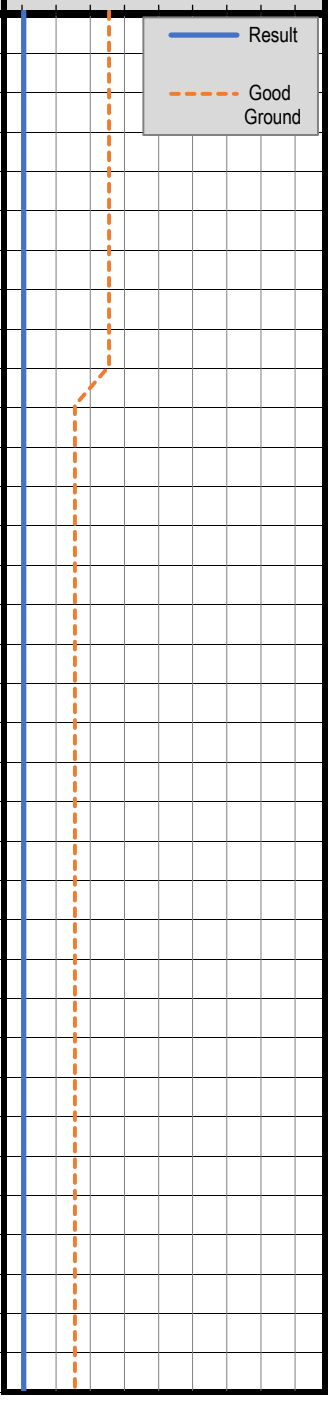
1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	12/04/2022	7	487

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100			TOPSOIL with some clay and silt; dark brown; dry.	
200				
300				
400	>205/		ENGINEERED FILL: CLAY minor silt with traces of carbonaceous material; dark orange brown mix speckled black; hard; low moisture; high plasticity; low dilatancy.	
500				
600				
700	>205/			
800			CLAY SILT with traces of fine pumiceous material and mica; yellow brown mottled red and orange; hard; low moisture; high plasticity; low dilatancy.	
900				
1000	>205/			
1100				
1200			1200mm: Becoming CLAY minor silt, carbonaceous material.	
1300	172/101		1300mm: Becoming dark brown speckled black.	
1400				
1500				
1600	98/47			
1700			1700mm: Becoming orange brown mottled red.	
1800				
1900	172/72			
2000				
2100			EOB at 2.0m, Target Borehole Depth.	
2200				
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				



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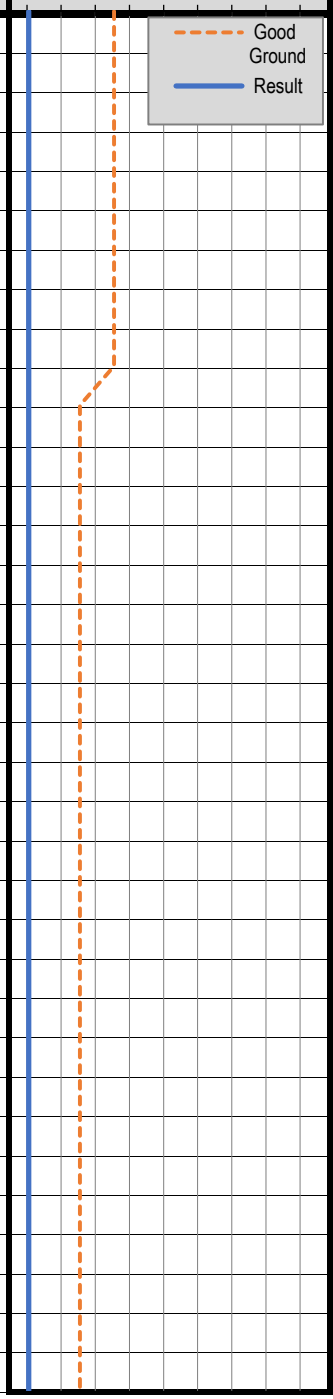
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	12/04/2022	8	488

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100			TOPSOIL with some clay and silt; dark brown; dry.	
200				
300				
400	172/53		CLAY SILT with traces of fine pumiceous material and mica; orange brown mottled red; very stiff to hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
500				
600				
700	>205/			
800			800mm: Becoming yellow brown mottled red and orange.	
900			900mm: Becoming clayey SILT.	
1000	175/53			
1100			1100mm: Becoming SILT with some clay.	
1200				
1300	>205/			
1400				
1500			1500mm: Becoming clayey SILT.	
1600	199/93			
1700				
1800				
1900	175/81			
2000				
2100			EOB at 2.0m, Target Borehole Depth.	
2200				
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				



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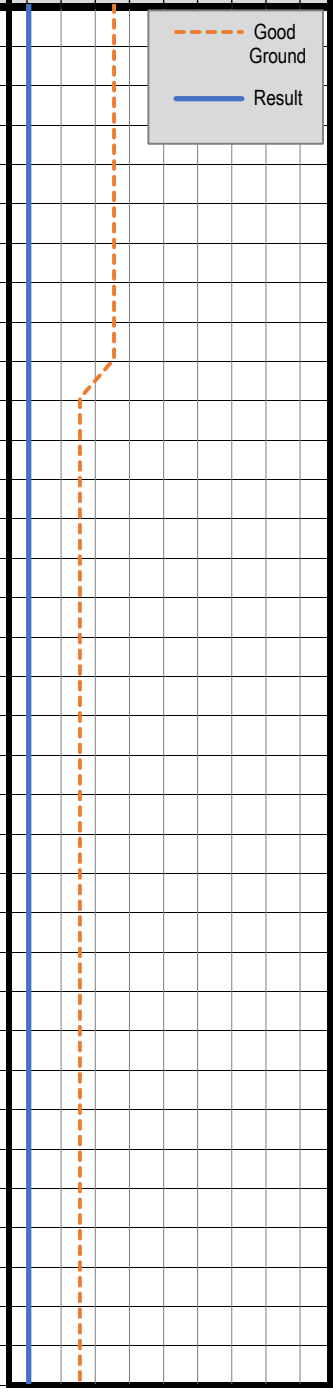
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	12/04/2022	9	489

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100				TOPSOIL with some clay and silt; dark brown; dry.	
200					
300					
400	202/60			CLAY SILT with traces of fine pumiceous material and mica; yellow brown mottled red and orange; very stiff to hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
500					
600					
700	143/69			800mm: Becoming clayey SILT.	
800					
900					
1000	172/42			1000mm: Becoming sensitive.	
1100				1100mm: Becoming SILT some clay.	
1200				1200mm: Becoming yellow brown.	
1300	172/79				
1400					
1500					
1600	183/81				
1700					
1800					
1900	172/81				
2000					
2100				EOB at 2.0m, Target Borehole Depth.	
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					

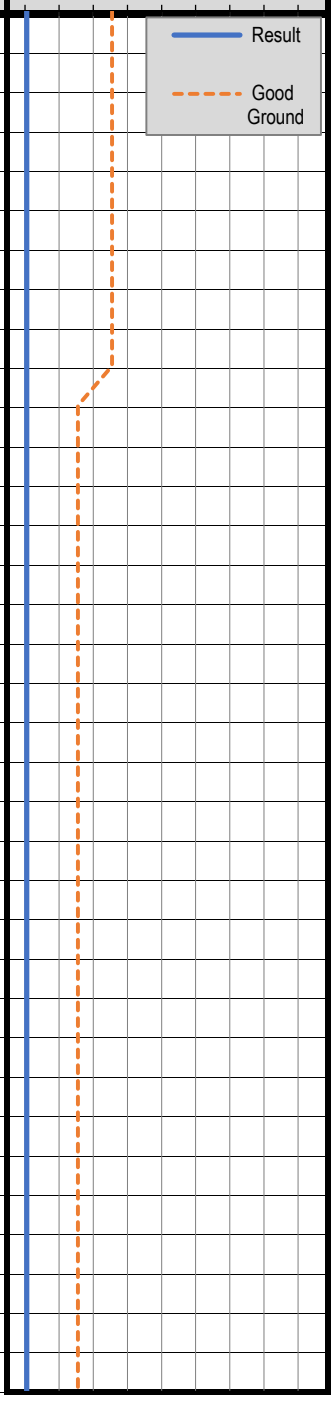
Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	12/04/2022	10	490

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm
100	UTP	
200		
300		
400	>205/66	
500		
600		
700	186/79	
800		
900		
1000	170/53	
1100		
1200		
1300	186/63	
1400		
1500		
1600	127/36	
1700		
1800		
1900	143/50	
2000		
2100		
2200		
2300		
2400		
2500		
2600		
2700		
2800		
2900		
3000		
3100		
3200		
3300		
3400		
3500		



Soil Description

(No topsoil at time of PCHA)

CLAY SILT with traces of fine pumiceous material and mica; brown mottled orange; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.

600mm: Becoming clayey SILT; yellow brown mottled orange.

700mm: Becoming very stiff.

1400mm: Becoming yellow brown.

EOB at 2.0m, Target Borehole Depth.

Water Table

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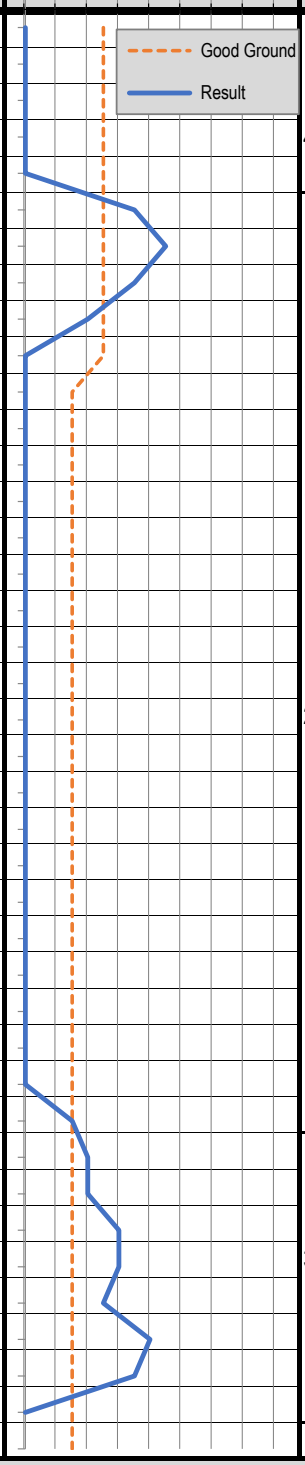
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50 SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	28/04/2022	11	491

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100			TOPSOIL with some clay and silt; dark brown; dry.	
200				
300				
400			400mm: Becoming silty some clay.	
500				
600		7	ENGINEERED FILL: CLAY SILT with traces of fine pumice and sands; brown mix; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
700		9		
800	UTP	7		
900		4		
1000				
1100	167/69		1100mm: Becoming very stiff.	
1200				
1300				
1400	>205/		1400mm: Becoming hard.	
1500				
1600				
1700	>205/			
1800				
1900				
2000	137/56		2000mm: Becoming very stiff.	
2100				
2200				
2300	153/50			
2400				
2500				
2600	159/69			
2700				
2800				
2900	180/81			
3000				
3100		3	SILT with minor fine sands and traces of clay; light grey mottled orange; very stiff, medium dense; low moisture; low plasticity.	
3200		4		
3300		4		
3400		6		
3500		6	3500mm: Becoming sandy.	
3600		5		
3700		8		
3800		7		
3900				
4000			EOB at 4.0m, Target Borehole Depth.	



Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

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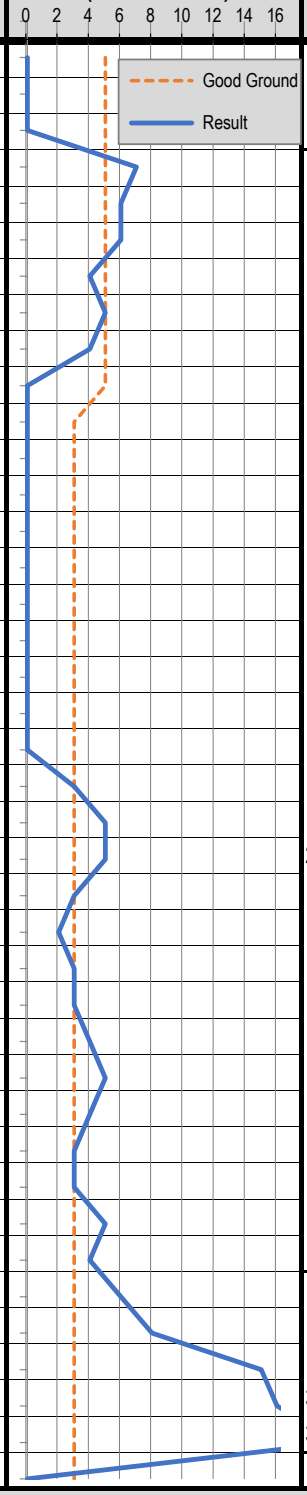
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	28/04/2022	12	492

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100			TOPSOIL with some clay and silt; dark brown; dry.	
200				
300				
400		7	ENGINEERED FILL: CLAY SILT with traces of fine pumice and sands; brown mix; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
500		6		
600	>205/	6		
700		4		
800		5		
900	>205/81	4		
1000				
1100				
1200	>205/			
1300				
1400				
1500	159/66		1500mm: Becoming very stiff; moderately sensitive.	
1600				
1700			1700mm: Moist.	
1800	159/79			
1900				
2000				
2100		3		
2200		5		
2300		5	2300mm: Light grey streaks.	
2400		3		
2500	172/81	2		
2600		3		
2700		3		
2800		4		
2900		5		
3000	164/81	4		
3100		3		
3200		3		
3300		5		
3400		4		
3500		6	Fine sandy SILT with traces of fine pumice; light grey mottled yellow; medium dense; low moisture; low plasticity; high dilatancy.	
3600		8		
3700		15		
3800		16	3600mm: Becoming dense.	
3900		20	3900mm: Becoming very dense.	
4000			EOB at 4.0m, Target Borehole Depth.	



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5 Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

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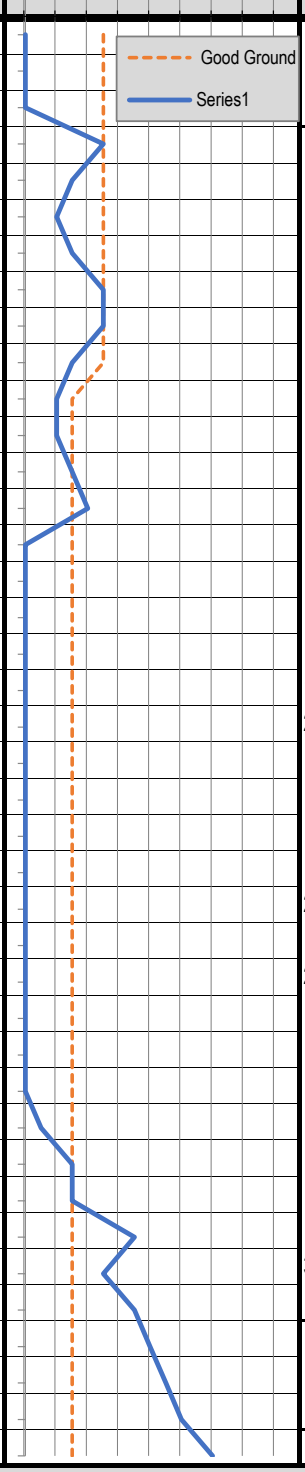
Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	28/04/2022	13	493

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100			TOPSOIL with some clay and silt; dark brown; dry.	
200				
300				
400		5	ENGINEERED FILL: CLAY SILT with traces of fine pumice and sands; brown mix; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
500	UTP	3		
600		2		
700		3		
800	>205/	5		
900		5		
1000		3		
1100	172/66	2	1100mm: Becoming very stiff.	
1200		2		
1300		3		
1400	>205/63	4		
1500				
1600				
1700	172/66			
1800				
1900			1900mm: Some light brown streaks.	
2000	>205/		2000mm: Becoming hard.	
2100				
2200				
2300				
2400	>205/			
2500			2500mm: moist.	
2600				
2700			2700mm: Some sandy SILT.	
2800	>205/			
2900				
3000				
3100		1		
3200	>205/	3		
3300		3		
3400		7		
3500	175/81	5	3500mm: Becoming very stiff.	
3600		7		
3700		8	SILT minor fine sands and traces of clay; light grey mottled yellow; dense; low moisture; low plasticity; high dilatancy.	
3800		9		
3900		10		
4000		12	EOB at 4.0m, Target Borehole Depth.	

Scala Penetrometer (Blows/100mm)



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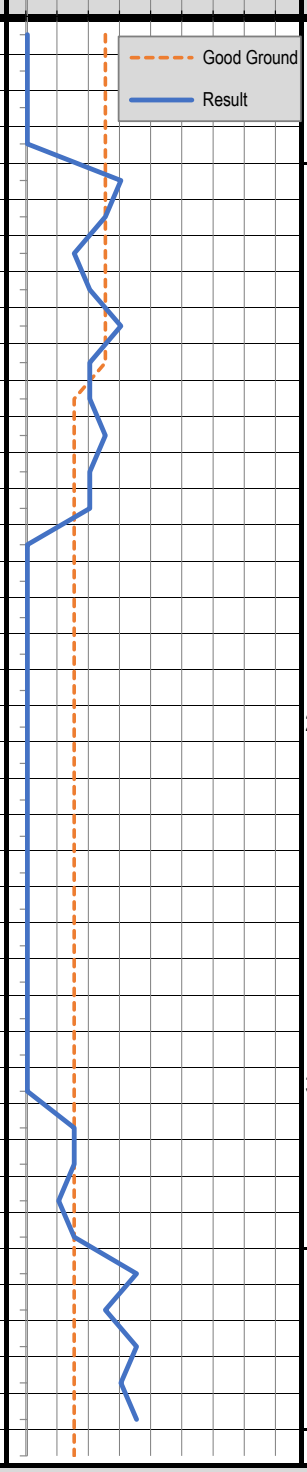
SOLUTIONS ENGINEERED

Project Name		Job Ref.
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01
Tested by	Date	Sheet No.	Lot No.
AK	28/04/2022	14	494

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100			TOPSOIL with some clay and silt; dark brown; dry.	
200				
300				
400				
500	>205/	6	ENGINEERED FILL: CLAY SILT with traces of fine pumice and sands; brown mix; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
600		5		
700		3		
800	>205/	4		
900		6		
1000		4		
1100	172/63	4	1100mm: Becoming very stiff.	
1200		5		
1300		4	1300mm: Moist; Pinkish streaks.	
1400	>205/	4	1400mm: Becoming hard.	
1500				
1600				
1700	>205/			
1800				
1900				
2000	156/69		2000mm: Becoming very stiff.	
2100				
2200				
2300				
2400	170/79			
2500				
2600				
2700				
2800	161/84			
2900				
3000			3000mm: Moist.	
3100		3		
3200	159/81	3		
3300		2		
3400		3		
3500	>205/	7	SILT with some fine sands and traces of clay; light grey mottled yellow; medium dense; low moisture; low plasticity; high dilatancy.	
3600		5		
3700		7		
3800		6		
3900	175/36	7		
4000			EOB at 4.0m, Target Borehole Depth.	



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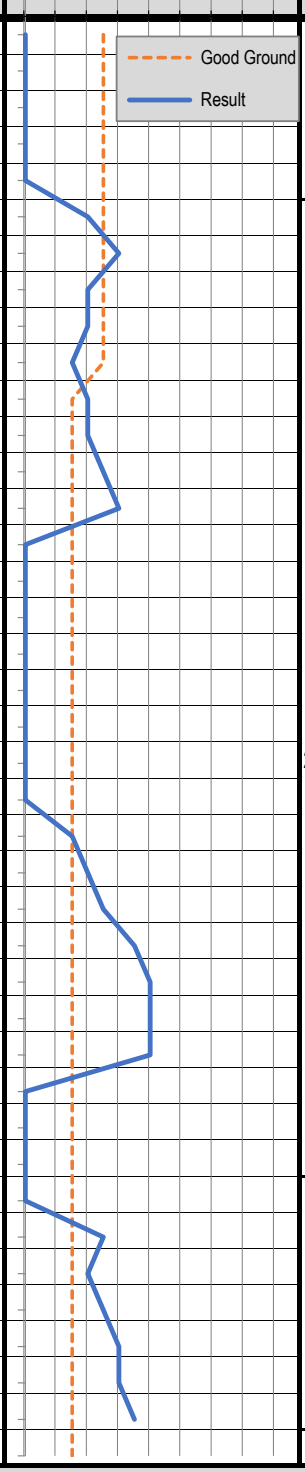
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	28/04/2022	15	495

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100			TOPSOIL with some clay and silt; dark brown; dry.	
200				
300				
400				
500				
600	UTP	4	ENGINEERED FILL: CLAY SILT with traces of fine pumice and sands; brown mix; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
700		6		
800		4		
900	UTP	4		
1000		3		
1100		4		
1200		4		
1300	>205/	5		
1400		6		
1500			1500mm: Moist.	
1600				
1700	202/66		1700mm: Light brown streaks.	
1800				
1900				
2000				
2100	161/81		2100mm: Becoming very stiff.	
2200				
2300	172/50	3		
2400		4		
2500		5		
2600		7		
2700		8		
2800		8		
2900		8		
3000				
3100	159/36			
3200				
3300				
3400		5	SILT with some fine sands and traces of clay; light grey mottled yellow; medium dense; low moisture; low plasticity; high dilatancy.	
3500		4		
3600		5		
3700		6		
3800		6		
3900		7		
4000			EOB at 4.0m, Target Borehole Depth.	



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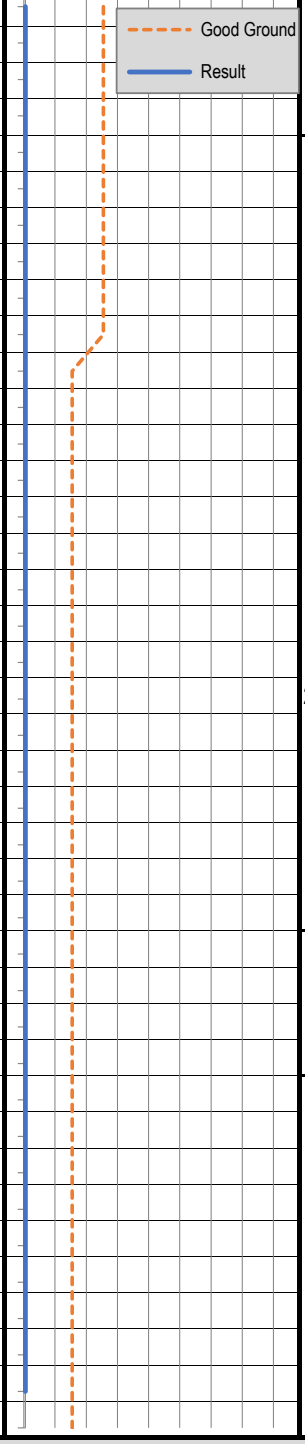
CORE50 SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	29/04/2022	16	496

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100				TOPSOIL with some clay and silt; dark brown; dry.	
200					
300					
400					
500	UTP			ENGINEERED FILL: CLAY SILT with traces of fine pumice and sands; brown mix; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
600					
700					
800	>205/				
900					
1000					
1100	186/69			1100mm: Becoming very stiff.	
1200					
1300					
1400	183/50				
1500					
1600					
1700	202/66			1700mm: Becoming hard.	
1800					
1900					
2000	167/66			2000mm: Becoming very stiff.	
2100					
2200					
2300					
2400	186/81				
2500					
2600					
2700	143/75			CLAY SILT with traces of fine pumice and mica; brown; very stiff; low moisture; high plasticity; moderately sensitive; low dilatancy.	
2800					
2900					
3000	172/84			EOB at 3.0m, Target Borehole Depth.	
3100					
3200					
3300					
3400					
3500					
3600					
3700					
3800					
3900					
4000					



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Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	12/04/2022	17	497

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100			Result / Good Ground	TOPSOIL with some clay and silt; dark brown; dry.	
200					
300				300mm: Becoming clayey; hard.	
400					
500					
600	159/47			ENGINEERED FILL: CLAY SILT with traces of fine pumice and sands, traces of mica; mix of various brown; very stiff to hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
700					
800	205/66				
900					
1000					
1100	>205/				
1200					
1300				CLAY SILT with traces of fine pumice and mica; creamy yellow brown mottled orange; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
1400	202/79				
1500					
1600					
1700	202/66			1800mm: Becoming SILT with some clay; yellow brown.	
1800					
1900					
2000	170/69				
2100				EOB at 2.0m, Target Borehole Depth.	
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					

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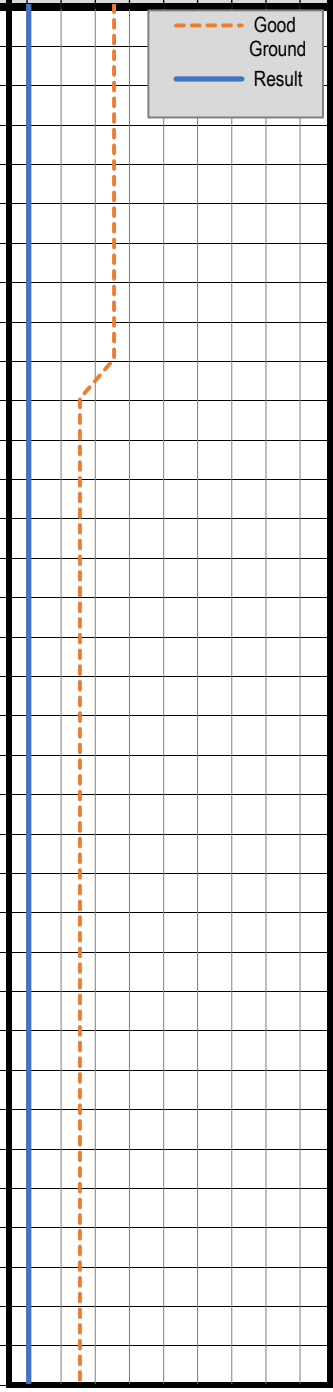
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	12/04/2022	18	498

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100				TOPSOIL with some clay and silt; dark brown; dry.	
200					
300				300mm: Becoming clayey and silty; hard.	
400					
500					
600	UTP			ENGINEERED FILL: CLAY SILT with traces of fine pumice and sands; brown mix; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
700					
800					
900	183/45			CLAY SILT with traces of fine pumice and mica, creamy yellow brown mottled orange; very stiff; low moisture; high plasticity; low dilatancy; moderately sensitive.	
1000					
1100					
1200	170/69			1200mm: Becoming SILT with some clay.	
1300					
1400					
1500	190/69			1500mm: Becoming yellow brown.	
1600					
1700					
1800	146/53				
1900					
2000					
2100	140/50			EOB at 2.0m, Target Borehole Depth.	
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					

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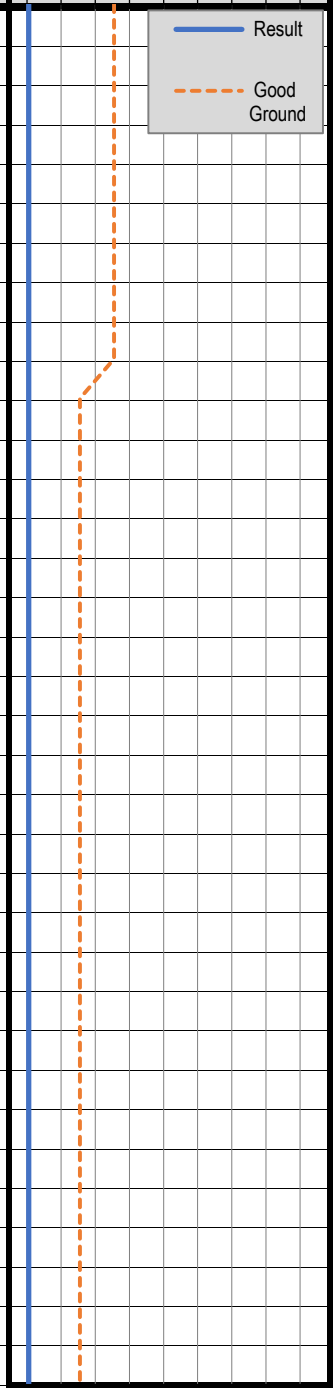
Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	12/04/2022	19	499

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100				TOPSOIL with some clay and silt; dark brown; dry.	
200					
300				300mm: Becoming clayey and silty; hard.	
400					
500				ENGINEERED FILL: CLAY SILT with traces of fine pumice and sands; brown mix; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
600	>205/				
700					
800				Silty CLAY with traces of pumice and mica; orange brown; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
900	205/84				
1000					
1100				SILT with some clay and traces of fine pumice; brown; very stiff; low moisture to moist; high plasticity; low dilatancy; moderately sensitive.	
1200	159/69				
1300					
1400					
1500	143/50				
1600					
1700				1700mm: Becoming clayey SILT; yellow brown mottled orange.	
1800	>205/				
1900					
2000					
2100	150/53			EOB at 2.0m, Target Borehole Depth.	
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					

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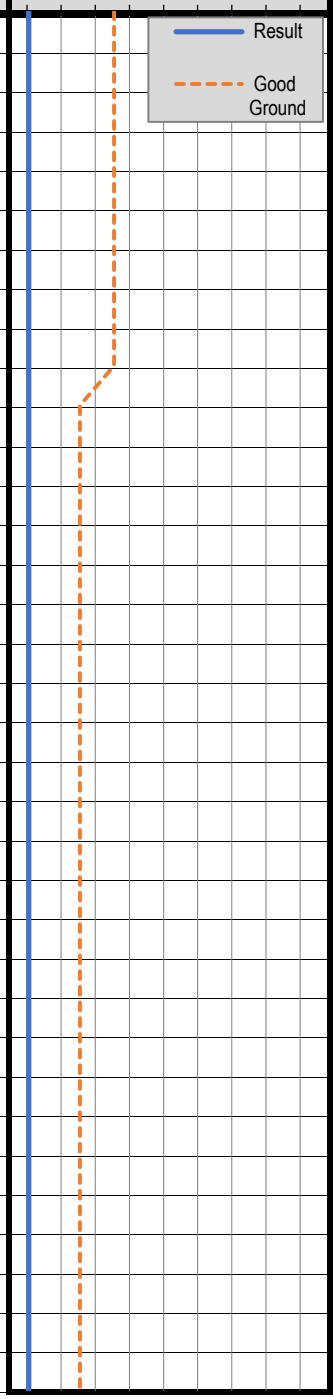
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	29/04/2022	20	500

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100			TOPSOIL with some clay and silt; dark brown; dry.	
200				
300				
400	UTP		ENGINEERED FILL: CLAY SILT with traces of fine pumice and sands; brown mix; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
500				
600				
700	>205/			
800				
900			SILT with some clay and traces of fine pumice; brown; hard; low moisture to moist; high plasticity; low dilatancy; moderately sensitive. 1300mm: Becoming very stiff.	
1000	>205/			
1100				
1200				
1300	127/50			
1400				
1500				
1600	159/63			
1700				
1800				
1900	107/36			
2000				
2100			EOB at 2.0m. Target Borehole Depth.	
2200				
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				



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SOLUTIONS ENGINEERED

Project Name		Job Ref.
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01
Tested by	Date	Sheet No.	Lot No.
AK	29/05/2022	21	501

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100			Good Ground / Result	TOPSOIL with some clay and silt; dark brown; dry.	
200					
300					
400	UTP			ENGINEERED FILL: CLAY SILT with traces of fine pumice and sands; brown mix; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
500					
600					
700	>205/				
800					
900					
1000	175/79			1000mm: Becoming very stiff.	
1100					
1200				1200mm: Light brown streaks.	
1300	186/75				
1400					
1500				1500mm: Reddish brown.	
1600	159/60			1600mm: Moist.	
1700					
1800					
1900	140/47				
2000					
2100					
2200					
2300		5		SILT with some fine sands; light grey mottled yellow; medium dense; low moisture; low plasticity; high dilatancy.	
2400		4			
2500		5			
2600		6		2600mm: Carbonaceous material; Brown speckled black.	
2700		5			
2800		5		2800mm: Becoming some clay.	
2900		4			
3000	186/33				
3100				EOB at 3.0m. Target Borehole Depth.	
3200					
3300					
3400					
3500					

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SOLUTIONS ENGINEERED

Project Name		Job Ref.
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01
Tested by	Date	Sheet No.	Lot No.
AK	29/05/2022	22	502

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100			Good Ground / Results	TOPSOIL with some clay and silt; dark brown; dry.	
200					
300					
400					
500	UTP			ENGINEERED FILL: CLAY SILT with traces of fine pumice and sands; brown mix; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
600					
700					
800	202/81				
900				900mm: Red mottling.	
1000					
1100	199/79			1100mm: Becoming very stiff.	
1200					
1300					
1400	159/60			1400mm: Light brown streaks.	
1500					
1600				1600mm: Moist.	
1700	190/75				
1800					
1900					
2000	140/69				
2100					
2200					
2300	>205/			2300mm: Becoming hard.	
2400					
2500					
2600	>205/			SILT with minor fine sand; light grey mottled yellow; hard; low moisture; low plasticity; high dilatancy.	
2700					
2800					
2900	>205/				
3000					
3100				EOB at 3.0m. Target Borehole Depth.	
3200					
3300					
3400					
3500					

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CORE50 SOLUTIONS ENGINEERED

Project Name		Job Ref.
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01
Tested by	Date	Sheet No.	Lot No.
AK	29/05/2022	23	503

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100			Good ground / Result	TOPSOIL with some clay and silt; dark brown; dry.	
200					
300					
400	UTP			ENGINEERED FILL: CLAY SILT with traces of fine pumice and sands; brown mix; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
500					
600					
700					
800	>205/				
900				900mm: Pinkish brown.	
1000					
1100	>205/				
1200				1200mm: Light grey streaks.	
1300				1300mm: Brown.	
1400	>205/				
1500					
1600					
1700	202/81			1700mm: Moist.	
1800					
1900					
2000					
2100	202/98				
2200					
2300					
2400	>205/96				
2500		5		Fine sandy SILT with traces of fine pumice; Light grey mottled yellow; medium dense; low moisture; low plasticity; high dilatancy.	
2600		5			
2700		4			
2800		6			
2900		6			
3000					
3100				EOB at 3.0m. Target Borehole Depth.	
3200					
3300					
3400					
3500					

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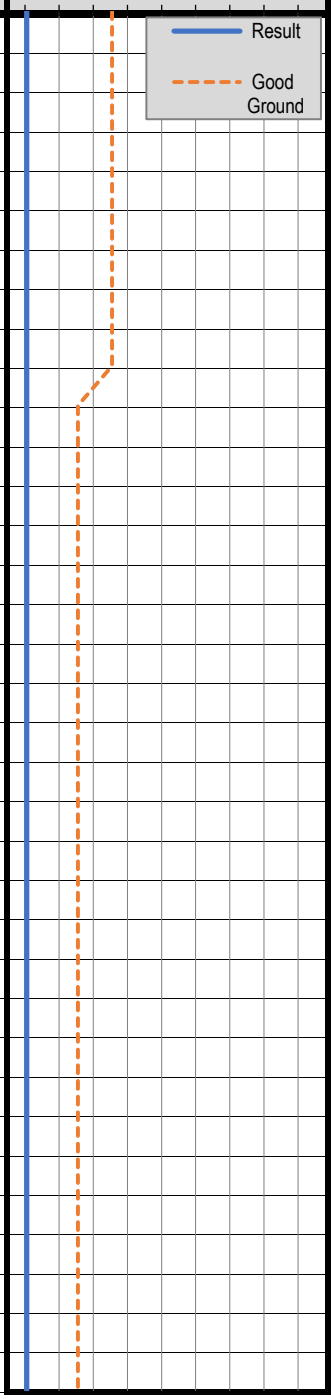
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50 SOLUTIONS ENGINEERED

Project Name		Job Ref.
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01
Tested by	Date	Sheet No.	Lot No.
AK	29/05/2022	24	504

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100			TOPSOIL with some clay and silt; dark brown; dry.	
200				
300				
400				
500	UTP		ENGINEERED FILL: CLAY SILT with traces of fine pumice and sands; brown mix; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
600				
700	>205/			
800				
900				
1000	186/39		1000mm: Becoming very stiff.	
1100				
1200			1200mm: Light grey streaks.	
1300				
1400	140/66		1400mm: Red mottling.	
1500				
1600				
1700			1700mm: Dark brown.	
1800	153/72		1800mm: Moist.	
1900				
2000				
2100				
2200	175/63			
2300				
2400			2400mm: Light brown streaks.	
2500	159/66			
2600				
2700				
2800			SILT with some fine sands and traces of clay; light grey mottled yellow; hard; low moisture; low plasticity; high dilatancy.	
2900	>205/			
3000				
3100			EOB at 3.0m. Target Borehole Depth.	
3200				
3300				
3400				
3500				

Scala Penetrometer (Blows/100mm)



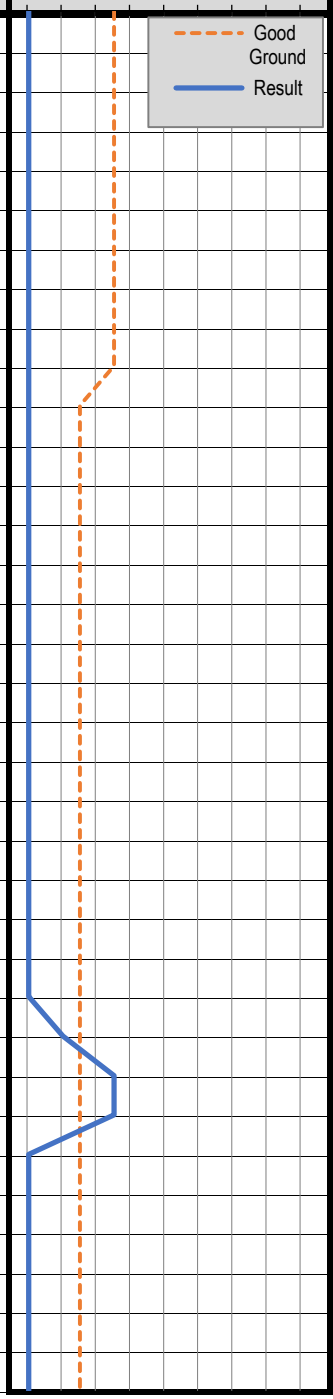
Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	29/05/2022	25	505

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100			TOPSOIL with some clay and silt; dark brown; dry.	
200				
300				
400				
500				
600	UTP		ENGINEERED FILL: CLAY SILT with traces of fine pumice and sands; brown mix; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
700				
800				
900	153/72		900mm: Cream streaks.	
1000				
1100				
1200	>205/			
1300				
1400			1400mm: Orange mottling.	
1500	>205/			
1600				
1700				
1800				
1900	>205/93			
2000				
2100				
2200				
2300				
2400	205/93			
2500				
2600				
2700		2	Fine sandy SILT with traces of clay and pumice; light grey mottled orange and yellow; medium dense; moist; low plasticity; high dilatancy.	
2800		5		
2900		5		
3000				
3100			EOB at 3.0m. Target Borehole Depth.	
3200				
3300				
3400				
3500				



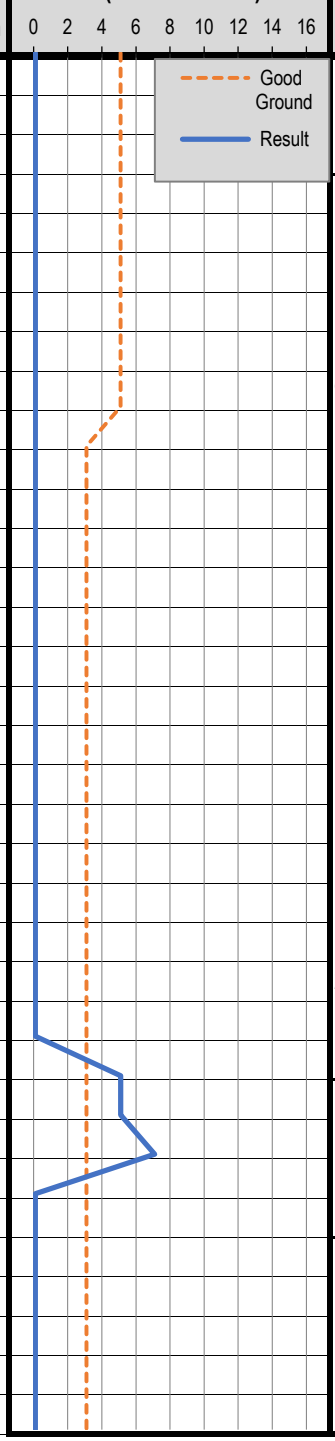
Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	2/05/2022	26	506

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100			TOPSOIL with some clay and silt; dark brown; dry.	
200				
300				
400			ENGINEERED FILL: CLAY SILT with traces of fine pumice and sands; brown mix; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
500	>205/			
600				
700				
800	>205/			
900			900mm: Light brown streaks.	
1000				
1100	180/47			
1200				
1300				
1400	>205/			
1500				
1600			1600mm: Pinkish streaks.	
1700	>205/			
1800			1800mm: Cream streaks.	
1900				
2000	>205/			
2100				
2200				
2300	>205/79			
2400			2400mm: Becoming moist.	
2500				
2600	156/72			
2700		5	Fine sandy SILT; light grey mottled yellow and orange; medium dense; low moisture; low plasticity; high dilatancy.	
2800		5		
2900		7		
3000				
3100			EOB at 3.0m. Target borehole depth.	
3200				
3300				
3400				
3500				

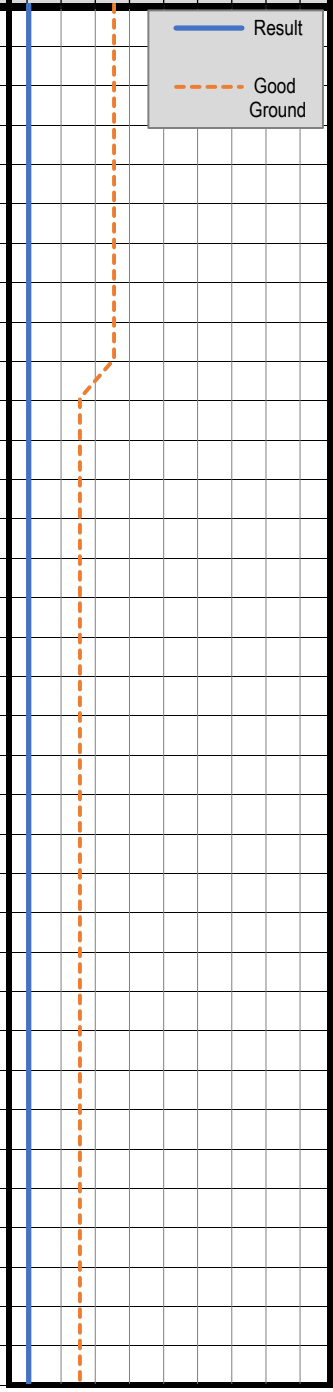


Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	7/04/2022	27	507

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100				TOPSOIL with some clay and silt; dark brown; dry.	
200					
300	205/39			ENGINEERED FILL: CLAY SILT with traces of fine sand, fine pumiceous material and mica; light brown and brown mixture mottled orange, pink and light grey; very stiff to hard; low moisture; high plasticity; low dilatancy; sensitive.	
400					
500					
600	159/42				
700					
800	193/72				
900				900mm: Becoming orange brown.	
1000	>205/			1000mm: Becoming creamy light brown.	
1100					
1200					
1300	>205/			1300mm: Becoming yellow brown mottled orange.	
1400					
1500					
1600	>205/			1600mm: Becoming cream light brown.	
1700				1700mm: Becoming some clay	
1800				SILT with traces of fine sands and carbonaceous material; light grey mottled yellow speckled black; very stiff, medium dense; low moisture; low plasticity; high dilatancy; sensitive.	
1900	143/24				
2000					
2100				EOB at 2.0m. Target Borehole Depth.	
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					

Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

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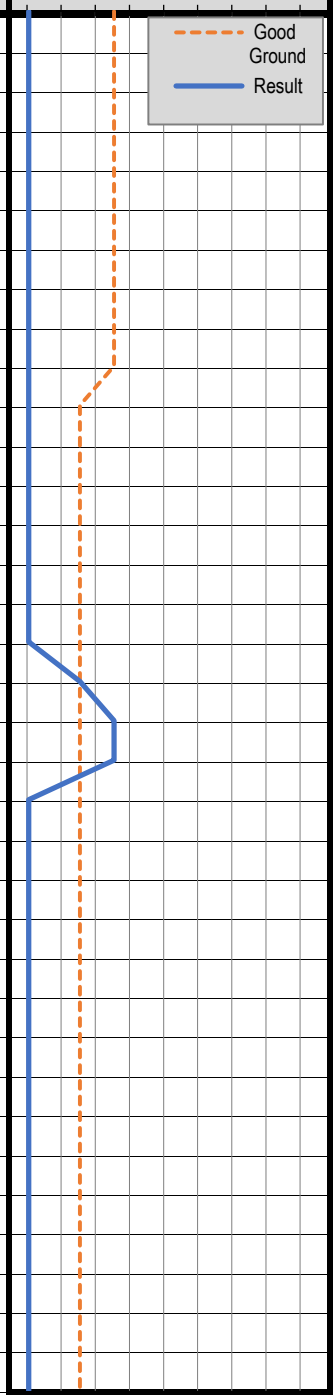
Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	7/04/2022	28	508

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100			TOPSOIL with some clay and silt; dark brown; dry.	
200				
300				
400	>205/		ENGINEERED FILL: CLAY SILT with traces of fine sand and fine pumiceous material, some mica; orange brown, brown mix; very stiff to hard; low moisture; high plasticity; low dilatancy; sensitive.	
500				
600	150/39			
700				
800	143/36		800mm: Becoming SILT with some clay and fine sands.	
900			900mm: Becoming low plasticity.	
1000			1000mm: Becoming silty CLAY; brown.	
1100	>205/			
1200			1200mm: Traces of carbonaceous material; cream speckled black.	
1300				
1400	>205/		1400mm: Becoming SILT minor CLAY.	
1500			1500mm: Becoming interbedded light and orange brown.	
1600				
1700	140/36			
1800		3	Medium to coarse silty SAND with traces of fine pumiceous material; grey brown mottled orange; medium dense; low moisture; well graded.	
1900		5		
2000	186/24	5		
2100			EOB at 2.0m. Target Borehole Depth.	
2200				
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				



Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

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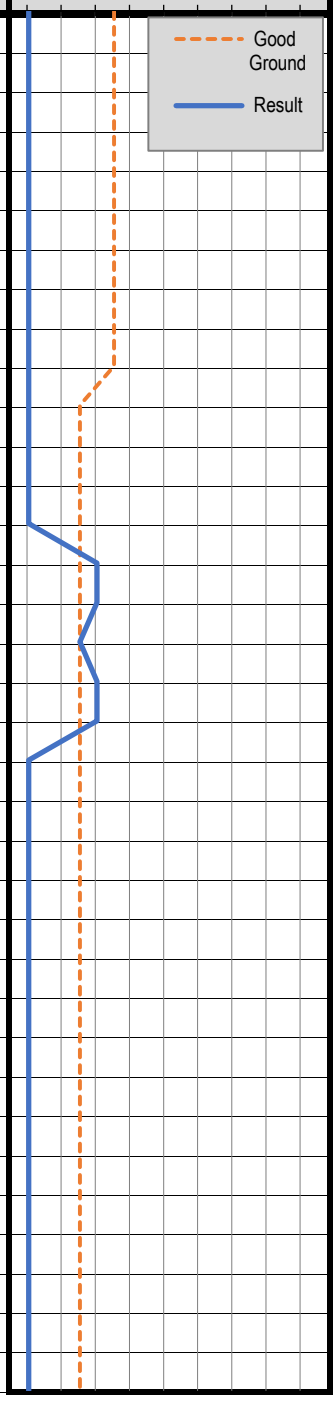
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	7/04/2022	29	509

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100			TOPSOIL with some clay and silt; dark brown; dry.	
200				
300	170/36		ENGINEERED FILL: CLAY SILT and traces of fine sand and pumiceous material, minor mica; mixture of light brown, grey brown, brown; very stiff; low moisture; high plasticity; low dilatancy; sensitive.	
400				
500				
600	183/50			
700				
800				
900	190/69			
1000				
1100				
1200	>205/			
1300				
1400			1400mm: Becoming orange brown.	
1500	161/42	4	SILT with traces of fine sands and carbonaceous material; light grey mottled yellow speckled black; very stiff, medium dense; low moisture; low plasticity; high dilatancy; sensitive.	
1600		4		
1700		3		
1800	>205/	4		
1900		4		
2000				
2100	>205/		EOB at 2.0m. Target Borehole Depth.	
2200				
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

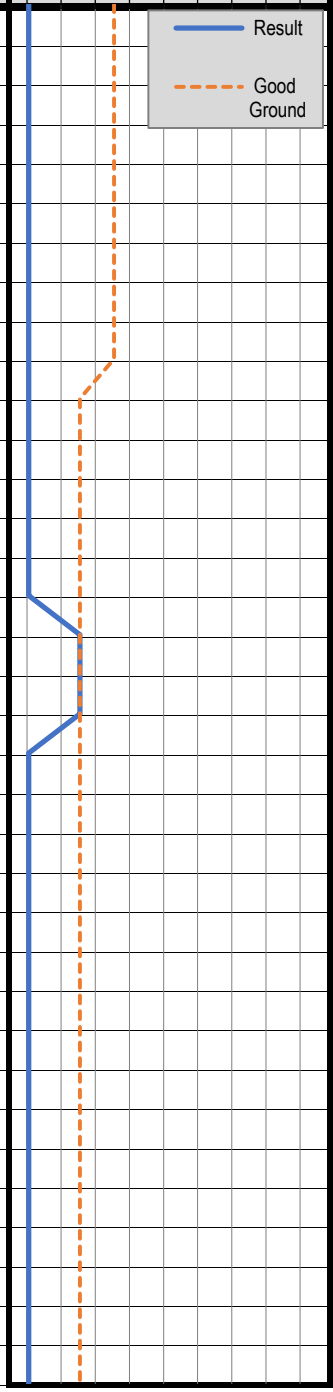


Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	7/04/2022	30	510

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100				TOPSOIL with some clay and silt; dark brown; dry.	
200					
300					
400	202/50			ENGINEERED FILL: CLAY SILT with minor fine sands traces of fine pumiceous material and minor mica; mixture of various browns; very stiff to hard; low moisture; high plasticity; low dilatancy; sensitive.	
500					
600					
700	186/45				
800				800mm: Becoming dark brown.	
900					
1000	>205/				
1100				1100mm: Becoming creamy light brown with pink streaks.	
1200					
1300	159/60				
1400					
1500				1500mm: Becoming orange brown.	
1600	127/33				
1700		3		SILT with traces of fine sand and pumiceous material and carbonaceous material; Light grey speckled black; very stiff, medium dense; low moisture; low plasticity; high dilatancy; sensitive.	
1800		3			
1900	172/39	3			
2000					
2100				EOB at 2.0m. Target Borehole Depth.	
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					

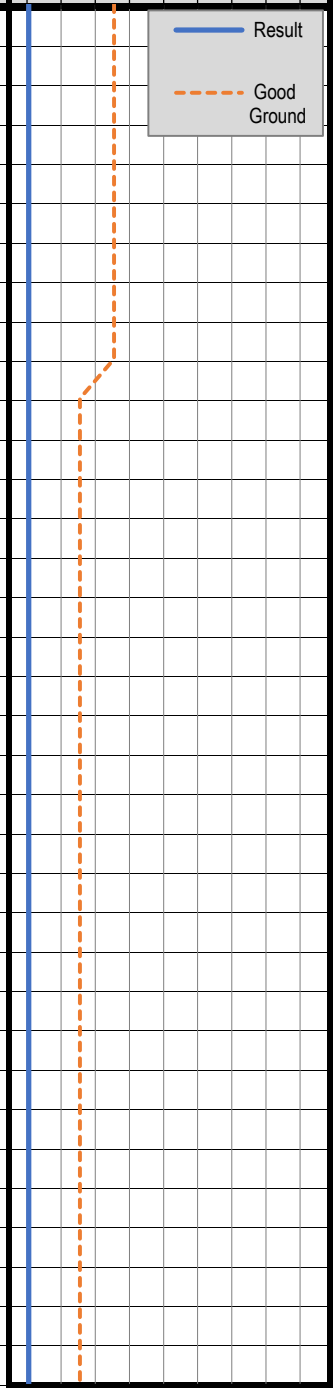
Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	7/04/2022	31	511

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100			TOPSOIL with some clay and silt; dark brown; dry.	
200				
300			300mm: Becoming Clayey.	
400				
500	>205/		ENGINEERED FILL: CLAY SILT with minor fine sands and pumiceous material and traces of mica; mix of various browns mottled orange; hard; low moisture; high plasticity; low dilatancy.	
600				
700	>205/			
800				
900			CLAY with some silt and traces of pumiceous material and mica; orange brown; very stiff to hard; low moisture; high plasticity; low dilatancy; sensitive.	
1000	>205/			
1100				
1200				
1300	159/39		1300mm: Becoming very stiff.	
1400				
1500			1500mm: Becoming moist.	
1600	156/42		1600mm: Becoming grey speckled black; minor carbonaceous material.	
1700				
1800				
1900	124/33		1900mm: Traces of rootlets.	
2000				
2100	156/47		EOB at 2.0m. Target Borehole Depth.	
2200				
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

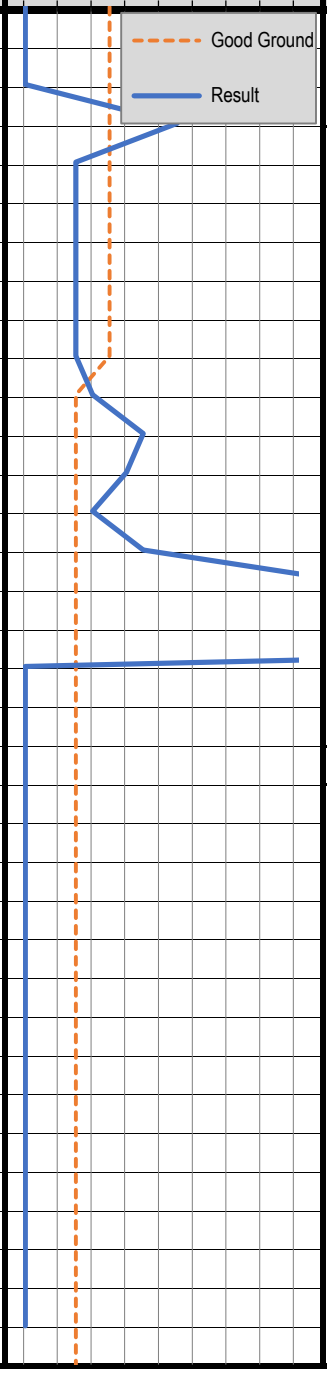


Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50 SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		**171738-S17&S18a-01**	
Tested by	Date	Sheet No.	Lot No.
Jessel Ladwa	**2/05/2022**	**32**	**512**

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100				TOPSOIL with minor clay silt and traces of sand and gravels; dark brown; dry. Becoming silty and clayey at 300mm	
200					
300					
400	190+	9			
500		3			
600	UTP	3		Fine Sandy SILT with traces of fine pumiceous material; light grey mottled orange/yellow; medium dense; low moisture; low plasticity; sensitive; high dilatancy	
700		3			
800		3			
900	UTP	3			
1000		3			
1100		4			
1200	71/21	7		Becomes Silty SAND	
1300		6			
1400		4			
1500		7			
1600		22			
1700		UTP			
1800				Streaked green	
1900					
2000				**EOB @ 2.0m**	
2100					
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					

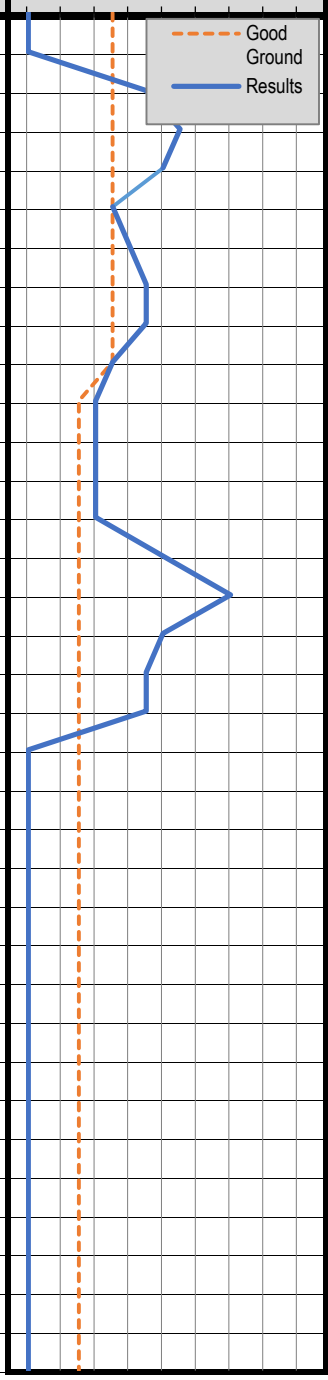
Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 3252 Exp. Date: 13/07/2022

CORE50 SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		**171738-S17&S18a-01**	
Tested by	Date	Sheet No.	Lot No.
Jessel Ladwa	**2/05/2022**	**33**	**513**

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm
100		
200		
300	82/55	7
400		9
500		8
600	136/28	5
700		6
800		7
900	190+	7
1000		5
1100		4
1200	79/25	4
1300		4
1400		4
1500	116/18	8
1600		12
1700		8
1800	136/28	7
1900		7
2000		
2100		
2200		
2300		
2400		
2500		
2600		
2700		
2800		
2900		
3000		
3100		
3200		
3300		
3400		
3500		



Soil Description

TOPSOIL with minor clay silt and traces of sand and gravels; dark brown; dry.

SILT, some fine sand with traces of fine pumiceous material; light grey mottled orange/yellow; medium dense to dense; low moisture; low plasticity; sensitive; high dilatancy

Becomes Silty SAND

Becomes Clayey SILT

Becoming dense.

EOB @ 2.0m

Water Table

Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 3252 Exp. Date: 13/07/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		**171738-S17&S18a-01**	
Tested by	Date	Sheet No.	Lot No.
Jessel Ladwa	**2/05/2022**	**34**	**514**

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100			Good ground / Result	TOPSOIL with minor clay silt and traces of sand and gravels; dark brown; dry	
200					
300					
400		7		Fine Sandy SILT with traces of fine pumiceous material; light grey mottled orange/yellow; medium dense; low moisture; low plasticity; sensitive; high dilatancy	
500	136/28	10			
600		7			
700		7			
800		4			
900		5		Becomes fine SAND minor silt	
1000		4			
1100		4			
1200		4			
1300		5			
1400		6			
1500		5		Becomes fine-medium brown SAND	
1600		6			
1700		4			
1800		8			
1900		7			
2000				**EOB @ 2.0m**	
2100					
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					

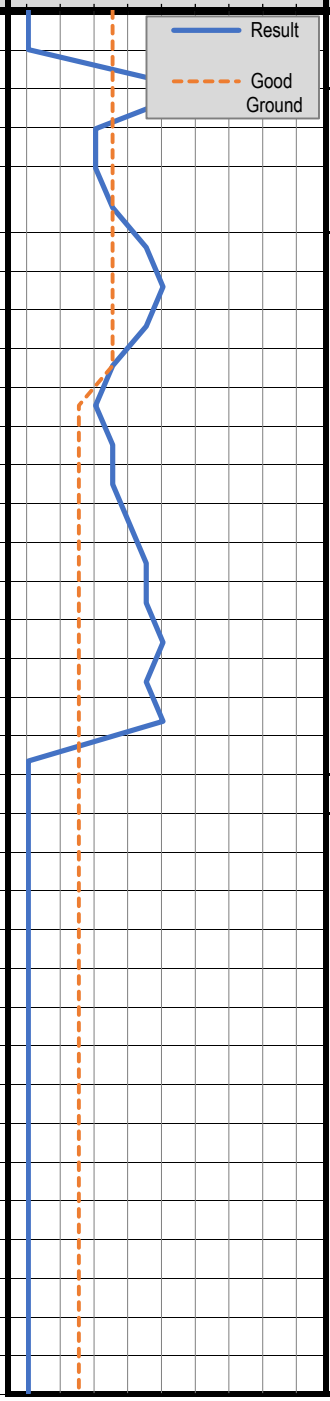
Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 3252 Exp. Date: 13/07/2022

CORE50 SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
Jessel Ladwa	2/05/2022	35	515

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100				TOPSOIL with minor clay silt and traces of sand and gravels; dark brown; dry	
200					
300		10		ENGINEERED FILL: CLAY SILT with traces of fine sand, fine pumiceous material and mica; light brown and brown mixture (mottled orange/yellow/ speckled black); very stiff to hard; low moisture; high plasticity; moderately sensitive; low dilatancy	
400	149/61	4			
500		4			
600		5		Fine SAND, minor silt with traces of fine pumiceous material; light grey mottled orange/yellow; medium dense; low moisture; low plasticity; sensitive; high dilatancy	
700		7			
800		8			
900		7			
1000		5			
1100		4		Becomes brown SAND	
1200		5			
1300		5			
1400		6			
1500		7			
1600		7			
1700		8			
1800		7			
1900		8			
2000				**EOB @ 2.0m**	
2100					
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					



Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 3252 Exp. Date: 13/07/2022

CORE50 SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		**171738-S17&S18a-01**	
Tested by	Date	Sheet No.	Lot No.
Jessel Ladwa	**2/05/2022**	**36**	**516**

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100			Good Ground / Result	TOPSOIL with minor clay silt and traces of sand and gravels; dark brown; dry	
200					
300					
400				Becoming clayey silt.	
500		6		ENGINEERED FILL: CLAY SILT with traces of fine sand, fine pumiceous material and mica; light brown and brown mixture (mottled orange/yellow/ speckled black); very stiff; low moisture; high plasticity; moderately sensitive; low dilatancy	
600		3			
700	149/55	2			
800		3			
900		3			
1000		3		Fine Sandy SILT with traces of fine pumiceous material; light grey mottled orange/yellow; medium dense; low moisture; low plasticity; sensitive; high dilatancy	
1100		4			
1200		5			
1300		5			
1400		6			
1500		7			
1600		8			
1700		7			
1800		6		Becomes moist	
1900		6			
2000				**EOB @ 2.0m**	
2100					
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					

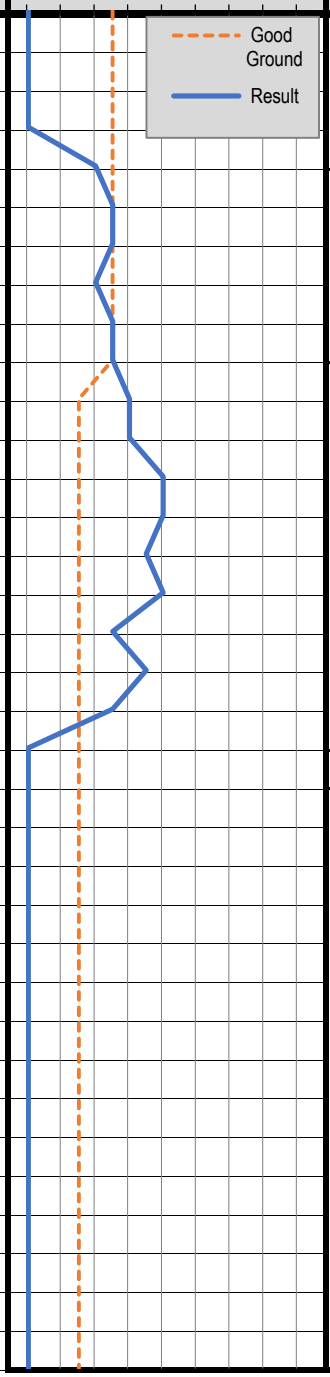
Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 3252 Exp. Date: 13/07/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		**171738-S17&S18a-01**	
Tested by	Date	Sheet No.	Lot No.
Jessel Ladwa	**3/05/2022**	**37**	**517**

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100				TOPSOIL with minor clay silt and traces of sand and gravels; dark brown; dry	
200					
300					
400				Becoming clayey silt.	
500		4		ENGINEERED FILL: CLAY SILT with traces of fine sand, fine pumiceous material and mica; light brown and brown mixture (mottled orange/yellow/ speckled black); very stiff; low moisture; high plasticity; moderately sensitive; low dilatancy	
600	190+	5			
700		5			
800		4			
900		5			
1000		5		Fine Sandy SILT with traces of fine pumiceous material; light grey mottled orange/yellow; medium dense; low moisture; low plasticity; sensitive; high dilatancy	
1100		6			
1200		6			
1300		8			
1400		8			
1500		7			
1600		8			
1700		5			
1800		7		Becomes moist	
1900		5			
2000				**EOB @ 2.0m**	
2100					
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					



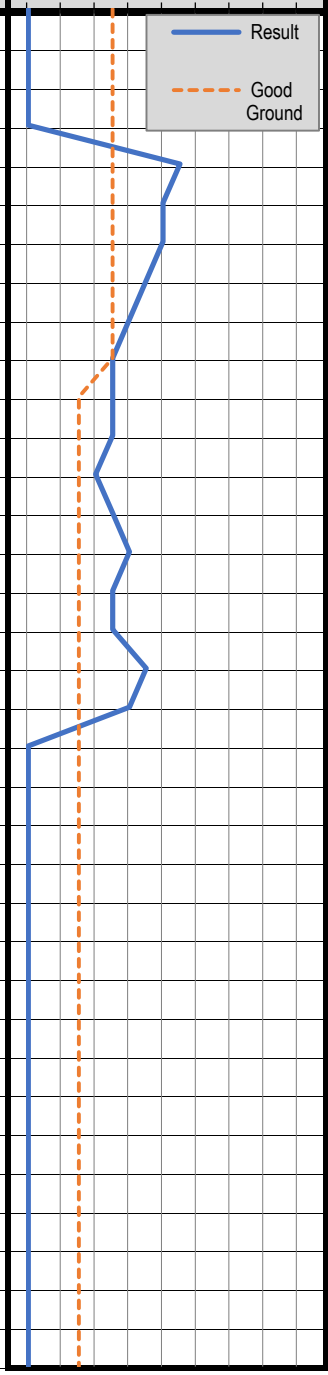
Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 3252 Exp. Date: 13/07/2022

CORE50 SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		**171738-S17&S18a-01**	
Tested by	Date	Sheet No.	Lot No.
Jessel Ladwa	**3/05/2022**	**38**	**518**

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100				TOPSOIL with minor clay silt and traces of sand and gravels; dark brown; dry	
200					
300					
400				Becoming silty.	
500		9		ENGINEERED FILL: CLAY SILT with traces of fine sand, fine pumiceous material and mica; light brown and brown mixture (mottled orange/yellow/ speckled black); hard; low moisture; high plasticity; low dilatancy	
600		8			
700	UTP	8			
800		7			
900		6			
1000		5		Fine Sandy SILT with traces of fine pumiceous material; light grey mottled orange/yellow; medium dense; low moisture; low plasticity; sensitive; high dilatancy	
1100		5			
1200		5			
1300		4			
1400		5			
1500		6			
1600		5			
1700		5			
1800		7		Becomes moist	
1900		6			
2000				**EOB @ 2.0m**	
2100					
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					



Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 3252 Exp. Date: 13/07/2022

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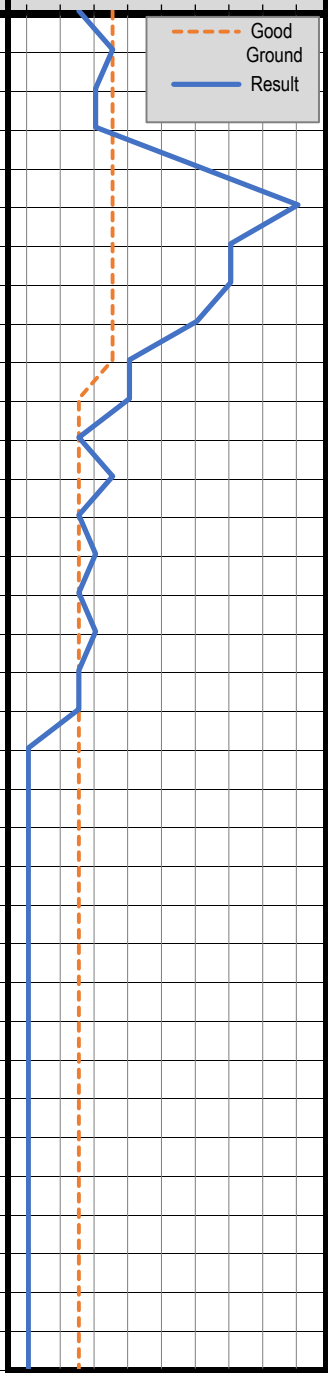
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		**171738-S17&S18a-01**	
Tested by	Date	Sheet No.	Lot No.
Jessel Ladwa	**4/05/2022**	**39**	**519**

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100		3		*(No topsoil at time of PCHA)*	
200		5		ENGINEERED FILL: CLAY SILT with traces of fine sand, fine pumiceous material and mica; light brown and brown mixture; hard; low moisture; high plasticity; moderately sensitive; low dilatancy	
300	UTP	4			
400		4		Becoming gravelly at 400mm. Difficult auguring.	
500		10			
600	133/46	16			
700		12			
800		12			
900		10			
1000		6		Fine Sandy SILT with traces of fine pumiceous material; light grey mottled orange/yellow; medium dense; low moisture; low plasticity; sensitive; high dilatancy.	
1100		6			
1200		3		Becomes SILT, trace sand	
1300		5			
1400		3			
1500		4		Becomes SILT	
1600		3			
1700		4			
1800		3			
1900		3			
2000				**EOB @ 2.0m**	
2100					
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					



Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 3252 Exp. Date: 13/07/2022

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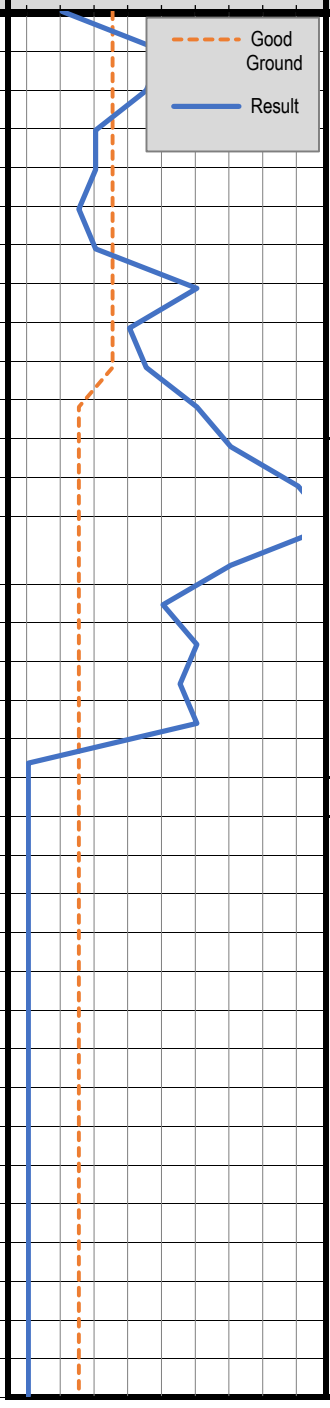
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
Jessel Ladwa	4/05/2022	40	520

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100		2		*(No topsoil at time of PCHA)*	
200		8		ENGINEERED FILL: CLAY SILT with traces of fine sand, fine pumiceous material and mica; light brown and brown mixture (mottled orange/yellow/ speckled black); very stiff to hard; low moisture; high plasticity; moderately sensitive; low dilatancy.	
300	149/41	7			
400		4			
500		4			
600	UTP	3			
700		4			
800		10			
900		6			
1000	UTP	7			
1100		10			
1200		12		Fine sandy SILT with traces of fine pumiceous material; light grey mottled orange/yellow; dense; low moisture/moist; low plasticity; sensitive; high dilatancy.	
1300		16			
1400		18			
1500	190+	12		Becomes moist	
1600		8			
1700		10			
1800		9			
1900		10			
2000				**EOB @ 2.0m**	
2100					
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					



Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 3252 Exp. Date: 13/07/2022

CORE50 SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		**171738-S17&S18a-01**	
Tested by	Date	Sheet No.	Lot No.
Jessel Ladwa	**4/05/2022**	**41**	**521**

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100		3	Result / Good Ground	*(No topsoil at time of PCHA)*	
200		4		ENGINEERED FILL: CLAY SILT with traces of fine sand, fine pumiceous material and mica; light brown and brown mixture; very stiff to hard; low moisture; high plasticity; moderately sensitive; low dilatancy	
300	UTP	5			
400		5			
500		4			
600	125/44	4		Becomes brown	
700		3			
800		5			
900		4			
1000	190+				
1100					
1200					
1300					
1400	190+			Light grey streaks	
1500					
1600					
1700					
1800					
1900	190+				
2000					
2100				Dark brown speckled black	
2200					
2300					
2400	157/52				
2500					
2600		3		Fine Sandy SILT with traces of fine pumiceous material; light grey mottled orange/yellow; medium dense; low moisture; low plasticity; sensitive; high dilatancy.	
2700	UTP	4			
2800		4			
2900		4			
3000				**EOB @ 3.0m**	
3100					
3200					
3300					
3400					
3500					

Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 3252 Exp. Date: 13/07/2022

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Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		**171738-S17&S18a-01**	
Tested by	Date	Sheet No.	Lot No.
Jessel Ladwa	**4/05/2022**	**42**	**522**

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100			Result / Good Ground	TOPSOIL with minor clay silt and traces of sand and gravels; dark brown; dry	
200					
300					
400					
500					
600	156/37			ENGINEERED FILL: CLAY SILT with traces of fine sand, fine pumiceous material and mica; light brown and brown mixture (mottled orange/yellow/ speckled black); very stiff; low moisture; high plasticity; moderately sensitive; low dilatancy	
700					
800					
900					
1000	149/34				
1100					
1200					
1300					
1400	176/41				
1500					
1600					
1700					
1800	171/38				
1900					
2000					
2100					
2200					
2300	159/34				
2400					
2500					
2600				SILT, some fine sand with traces of fine pumiceous material; light grey mottled orange/yellow; medium dense; low moisture; low plasticity; sensitive; high dilatancy.	
2700		3			
2800		3			
2900		3			
3000				**EOB @ 3.0m**	
3100					
3200					
3300					
3400					
3500					

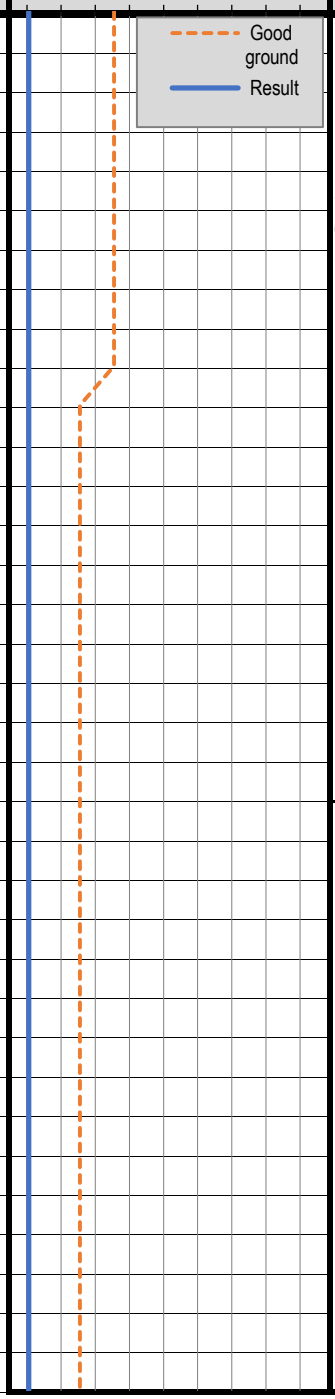
Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 3252 Exp. Date: 13/07/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	12/04/2022	43	523

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100	UTP		*(No topsoil at time of PCHA)*	
200			CLAY SILT with traces of fine pumiceous material and mica; brown; hard; dry; high plasticity; low dilatancy.	
300				
400	UTP			
500			500mm: Becoming clayey SILT; yellow brown mottled orange.	
600				
700	199/63		700mm: Becoming very stiff; moderately sensitive.	
800				
900				
1000	>205/81		1000mm: Becoming hard.	
1100				
1200				
1300	156/63		1300mm: Becoming very stiff; moderately sensitive.	
1400			1400mm: Becoming creamy brown.	
1500				
1600	186/79			
1700				
1800			1800mm: Becoming CLAY minor silt; cream light brown.	
1900	>205/			
2000				
2100			EOB at 2.0m, Target Borehole Depth.	
2200				
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				



Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50 SOLUTIONS ENGINEERED

Project Name		Job Ref.
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01
Tested by	Date	Sheet No.	Lot No.
AK	12/04/2022	44	524

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100	UTP		Result / Good Ground	*(No topsoil at time of PCHA)*	
200				CLAY SILT with traces of fine pumiceous material and mica; brown; hard; dry to low moisture; high plasticity; low dilatancy.	
300					
400	>205/				
500					
600					
700	>205/			700mm: Becoming silty CLAY; brown.	
800					
900					
1000	156/79			1000mm: Becoming very stiff; moderately sensitive.	
1100					
1200					
1300	>205/			SILT with some clay and minor fine sands and mica; creamy light grey mottled orange; hard; low moisture; high plasticity; low dilatancy.	
1400					
1500					
1600	>205/			SILT minor clay traces of fine sand and carbonaceous material; cream light grey speckled black; hard; high plasticity.	
1700					
1800				SILT with minor clay and traces of fine sand, pumice and carbonaceous material; orange brown speckled black; hard; low moisture; high plasticity.	
1900	>205/				
2000					
2100				EOB at 2.0m, Target Borehole Depth.	
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					

Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50
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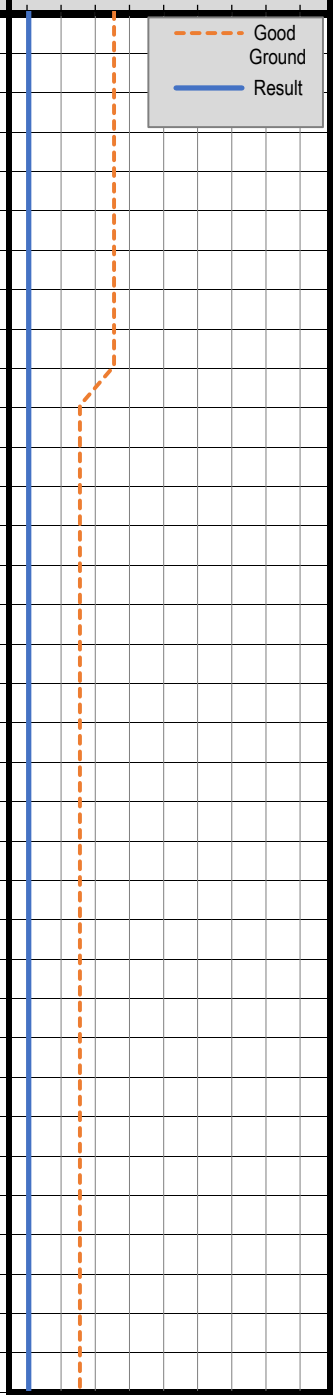
Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	2/05/2022	45	525

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm
100	UTP	
200		
300		
400	159/33	
500		
600		
700	175/42	
800		
900		
1000		
1100	143/33	
1200		
1300		
1400		
1500	143/36	
1600		
1700		
1800	161/47	
1900		
2000	140/31	
2100		
2200		
2300		
2400		
2500		
2600		
2700		
2800		
2900		
3000		
3100		
3200		
3300		
3400		
3500		



(No topsoil at time of PCHA)

SILT with minor clay and traces of fine sand and pumice; light brown mottled orange; very stiff; low moisture; high plasticity; low dilatancy; sensitive.

600mm: White streaks.

700mm: Becoming CLAY SILT; light grey brown mottled orange.

1000mm: Becoming moist.

1300mm: Becoming some clay.

1500mm: Becoming pale brown.

EOB at 2.0m, Target Borehole Depth.

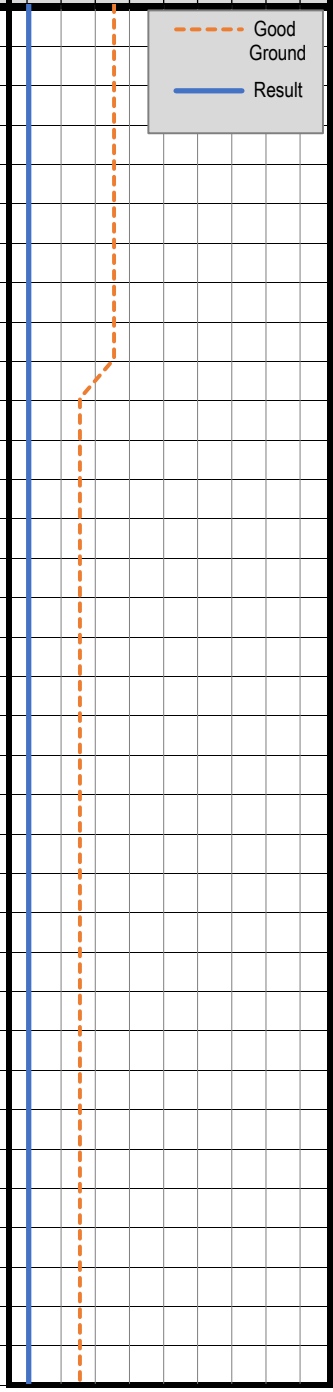
Water Table

Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50 SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	9/05/2022	46	526

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100				TOPSOIL with some clay and silt; dark brown; dry.	
200					
300					
400					
500	UTP			ENGINEERED FILL: CLAY SILT with traces of fine pumice and sands; brown mix; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
600					
700					
800	199/53			800mm: Becoming light brown mix.	
900					
1000					
1100	>205/			Silty CLAY with traces of fine pumice, carbonaceous material and mica; brown speckled black; very stiff to hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
1200					
1300					
1400	190/96			1400mm: Becoming pale brown speckled black.	
1500				1500mm: Becoming orange brown mottled orange.	
1600					
1700	>205/				
1800					
1900					
2000	>205/			EOB at 2.0m. Target Borehole Depth.	
2100					
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					

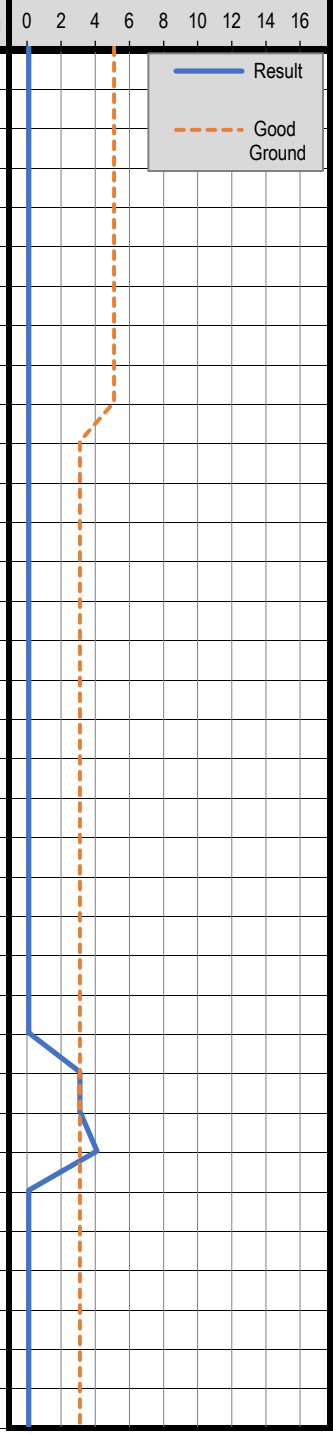
Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	9/05/2022	47	527

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100			TOPSOIL with some clay and silt; dark brown; dry.	
200				
300				
400				
500	UTP		ENGINEERED FILL: CLAY SILT with traces of fine pumice and sands; brown mix; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
600				
700				
800	172/63			
900			800mm: Becoming light brown mix.	
1000				
1100	>205/			
1200				
1300				
1400	186/81		1400mm: Very stiff.	
1500				
1600				
1700	>205/		1700mm: Becoming hard.	
1800				
1900				
2000	>205/			
2100				
2200	205/66			
2300				
2400				
2500	>205/			
2600				
2700		3	Fine sandy SILT with traces of fine pumice; light grey mottled yellow; medium dense; low moisture; low plasticity; high dilatancy.	
2800		3		
2900		4		
3000				
3100			EOB at 3.0m. Target Borehole Depth.	
3200				
3300				
3400				
3500				



Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	9/05/2022	48	528

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100			Good Ground / Result	TOPSOIL with some clay and silt; dark brown; dry.	
200					
300					
400				400mm: Becoming clayey silty.	
500					
600	161/47			ENGINEERED FILL: CLAY SILT with traces of mica, fine pumice and sands; brown mix; very stiff to hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
700					
800					
900	>205/			900mm: Streaks of light brown.	
1000					
1100					
1200	>205/				
1300					
1400					
1500	>205/79			1500: Becoming yellow brown mix.	
1600					
1700					
1800	>205/				
1900					
2000					
2100	>205/				
2200					
2300					
2400	>205/				
2500					
2600					
2700		3		Fine sandy SILT with traces of fine pumice; light grey mottled yellow; medium dense; low moisture; low plasticity; high dilatancy.	
2800		3			
2900		5			
3000					
3100				EOB at 3.0m. Target Borehole Depth.	
3200					
3300					
3400					
3500					

Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

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2. Ground water was not encountered during testing
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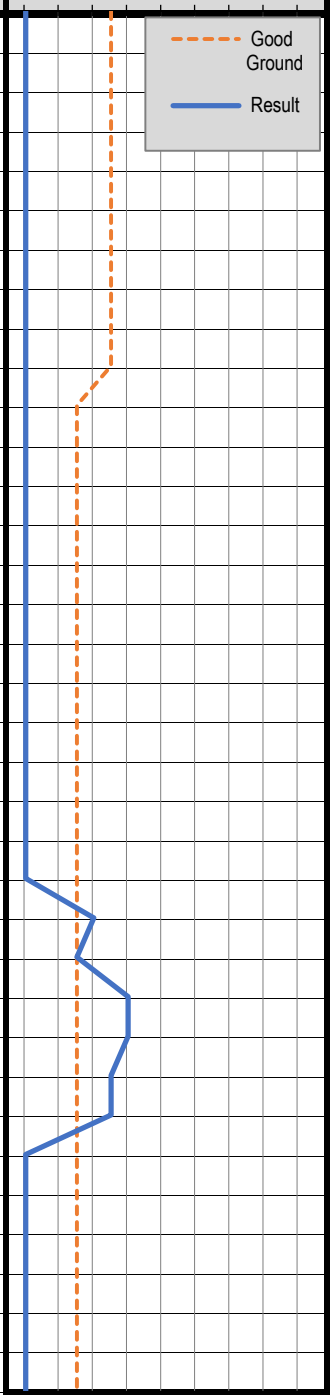
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	9/05/2022	49	529

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100			TOPSOIL with some clay and silt; dark brown; dry.	
200				
300				
400				
500				
600	UTP		ENGINEERED FILL: CLAY SILT with traces of fine pumice and sands; brown mix; very stiff to hard; low moisture; high plasticity; low dilatancy; sensitive.	
700				
800	167/31			
900				
1000	205/36		1000mm: Light grey streaks.	
1100				
1200				
1300	>205/			
1400				
1500	205/63			
1600				
1700				
1800	186/81		1800mm: Very stiff.	
1900				
2000				
2100	205/79			
2200				
2300			Fine sandy SILT with traces of fine pumice; light grey mottled yellow; medium dense; low moisture; low plasticity; high dilatancy.	
2400		4		
2500		3		
2600		6		
2700		6		
2800		5		
2900		5		
3000				
3100			EOB at 3.0m. Target Borehole Depth.	
3200				
3300				
3400				
3500				

Scala Penetrometer (Blows/100mm)



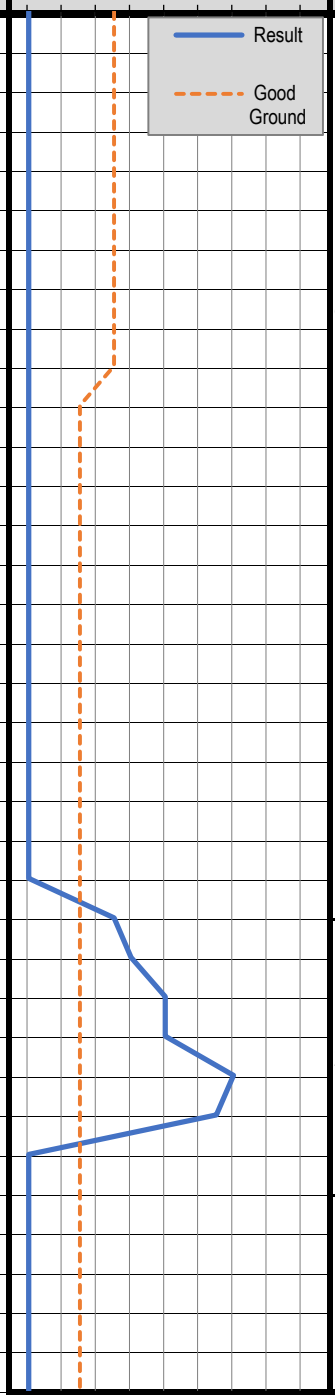
Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	3/05/2022	50	530

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100	UTP		*(No topsoil at time of PCHA)*	
200			ENGINEERED FILL: CLAY SILT with traces of fine pumice, sand and mica; brown mix; very stiff to hard; low moisture; high plasticity; low dilatancy.	
300				
400	202/66			
500				
600				
700	199/69			
800			800mm: Light grey streaks.	
900				
1000	199/47		1000mm: Dark brown streaks.	
1100			1100mm: Traces of carbonaceous material.	
1200				
1300	>205/			
1400				
1500				
1600	205/36			
1700			1700mm: Pink streaks.	
1800				
1900	>205/		1900mm: Creamy streaks.	
2000				
2100				
2200	>205/			
2300				
2400		5	Fine sandy SILT with traces of fine pumice; light grey mottled yellow; medium dense; low moisture; low plasticity; high dilatancy.	
2500		6		
2600		8		
2700		8	2700mm: Becoming very dense.	
2800		12		
2900		11		
3000				
3100			EOB at 3.0m. Target Borehole Depth.	
3200				
3300				
3400				
3500				



Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
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5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

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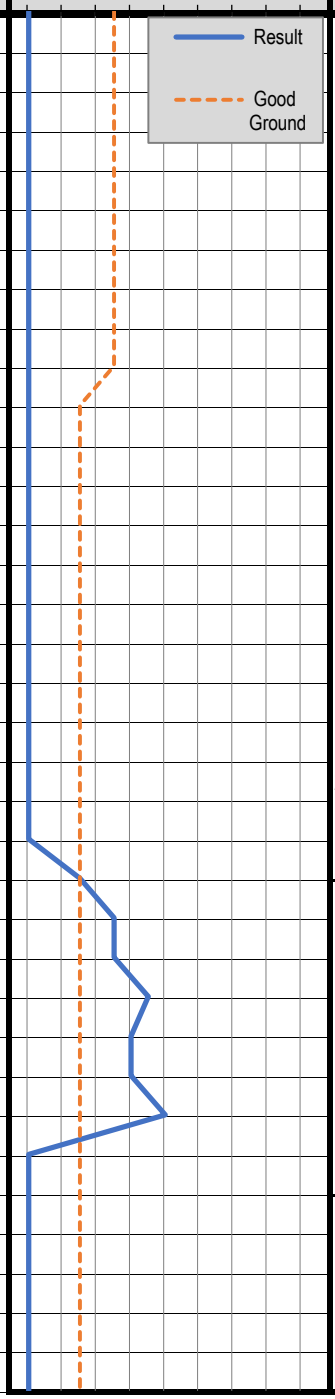
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	3/05/2022	51	531

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100	UTP		*(No topsoil at time of PCHA)*	
200				
300	>205/		ENGINEERED FILL: CLAY SILT with traces of fine pumice, sand and mica; brown mix; very stiff to hard; low moisture; high plasticity; low dilatancy.	
400				
500				
600	>205/50			
700				
800			800mm: Light brown mix.	
900	175/36			
1000				
1100				
1200	170/36			
1300				
1400				
1500	>205/		1500mm: Becoming SILT minor clay.	
1600			1600mm: Becoming pale yellow mottled pink and orange.	
1700				
1800	175/75		1800mm: Becoming CLAY SILT, traces fine pumice.	
1900				
2000			200mm: Becoming creamy light brown mix.	
2100	172/81			
2200				
2300		3	Fine sandy SILT with traces of fine pumice; light grey mottled yellow; medium dense; low moisture; low plasticity; high dilatancy.	
2400		5		
2500		5		
2600		7		
2700		6		
2800		6		
2900		8		
3000				
3100			EOB at 3.0m. Target Borehole Depth.	
3200				
3300				
3400				
3500				



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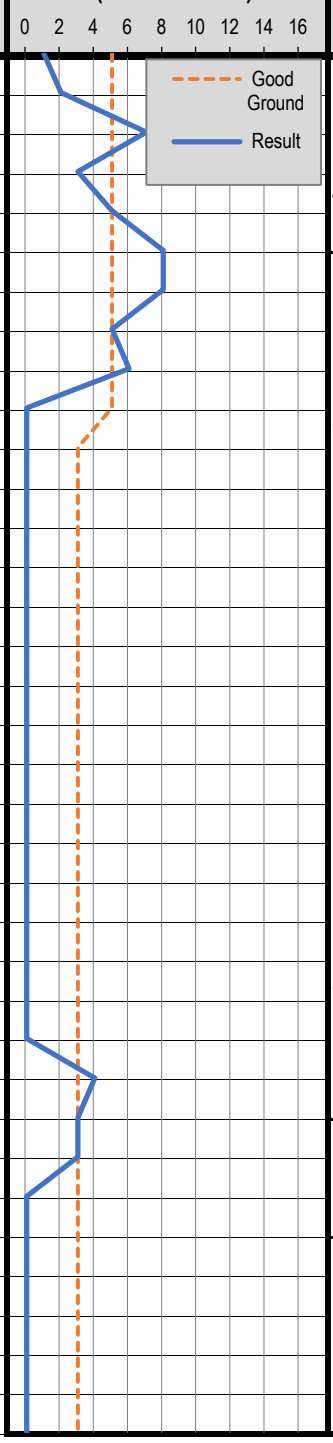
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	28/04/2022	52	532

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100		1	TOPSOIL with some clay and silt; dark brown; dry.	
200		2		
300		7		
400		3	400mm: Becoming clayey silty.	
500		5		
600	UTP	8	ENGINEERED FILL: CLAY SILT with traces of fine pumice and sands; brown mix; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
700		8		
800		5		
900	UTP	6		
1000			900mm: Traces of carbonaceous material.	
1100				
1200	170/66		1200mm: Becoming very stiff.	
1300				
1400				
1500	>205/		1500mm: Becoming hard.	
1600				
1700				
1800	>205/			
1900				
2000				
2100	>205/			
2200				
2300				
2400	186/66		2400mm: Becoming very stiff.	
2500				
2600				
2700		4		
2800		3	SILT minor fine sands with traces of pumice; light grey mottled yellow; medium dense; low moisture; low plasticity; high dilatancy; sensitive.	
2900		3		
3000				
3100			EOB at 3.0m, Target Borehole Depth.	
3200				
3300				
3400				
3500				



Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
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5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

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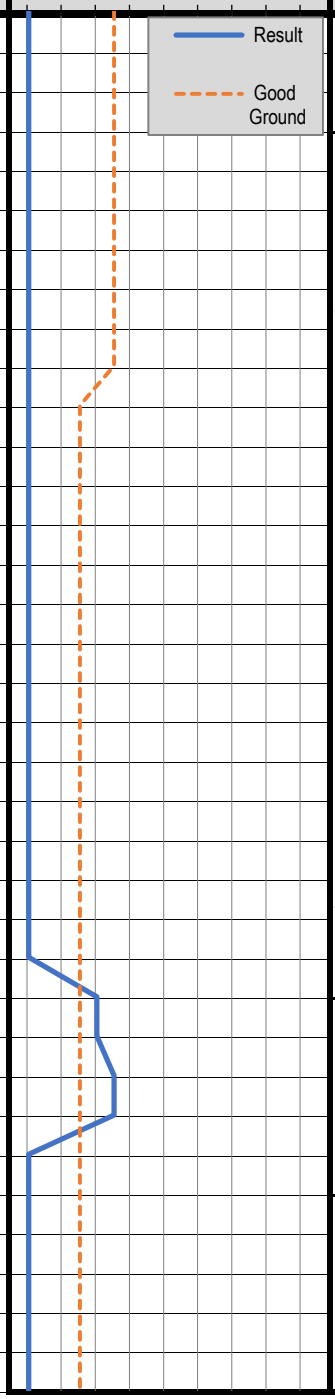
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	2/05/2022	53	533

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100			TOPSOIL with some clay and silt; dark brown; dry.	
200				
300				
400	UTP		ENGINEERED FILL: CLAY SILT with traces of fine pumice and sands; brown mix; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
500				
600				
700	>205/			
800			800mm: Light brown streaks.	
900				
1000	>205/			
1100				
1200				
1300	159/50		1300mm: Becoming very stiff.	
1400				
1500				
1600	175/36			
1700			1700mm: Becoming moist.	
1800				
1900				
2000	159/66			
2100				
2200				
2300			2300mm: Becoming yellow brown.	
2400	199/72			
2500				
2600		4	Fine sandy SILT with traces of pumice; light grey mottled orange; medium dense; low moisture; low plasticity; high dilatancy.	
2700		4		
2800		5		
2900		5		
3000				
3100			EOB at 3.0m. Target Borehole Depth.	
3200				
3300				
3400				
3500				



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1. Weather leading up to testing was: Fine
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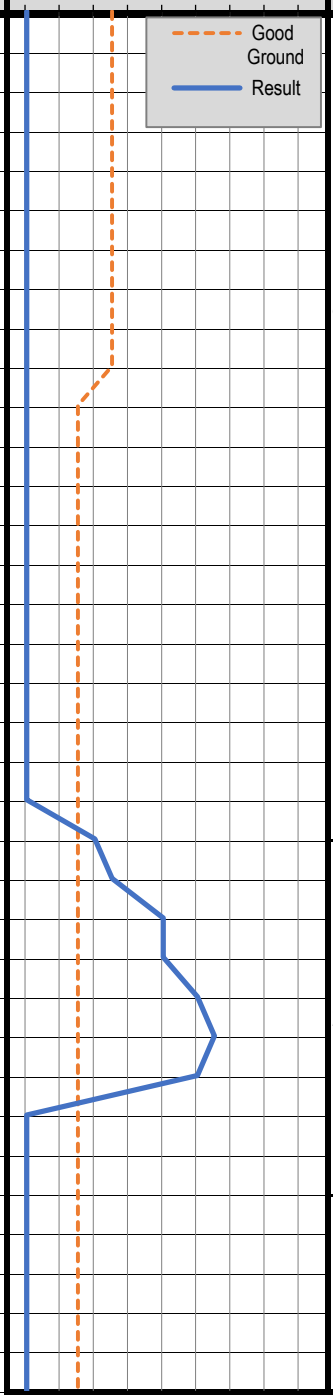
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50 SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		171738-S17&S18a-01	
Tested by	Date	Sheet No.	Lot No.
AK	2/05/2022	54	534

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Soil Description	Water Table
100	UTP		*(No topsoil at time of PCHA)*	
200				
300			ENGINEERED FILL: CLAY SILT with traces of fine pumice and sands; brown mix; hard; low moisture; high plasticity; low dilatancy; moderately sensitive.	
400				
500	>205/			
600				
700				
800	>205/		800mm: Light brown streaks.	
900				
1000				
1100				
1200	202/66			
1300				
1400			1400mm: Becoming yellow brown.	
1500				
1600	175/93			
1700				
1800				
1900				
2000	170/66			
2100				
2200		4	Fine sandy SILT with traces of fine pumice; light grey mottled yellow and orange; medium dense; low moisture; low plasticity; high dilatancy.	
2300		5		
2400		8		
2500		8		
2600		10	2600mm: Becoming silty SAND.	
2700		11		
2800		10		
2900				
3000				
3100			EOB at 3.0m. Target Borehole Depth.	
3200				
3300				
3400				
3500				



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4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 1471 Exp. Date: 15/11/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		**171738-S17&S18a-01**	
Tested by	Date	Sheet No.	Lot No.
Jessel Ladwa	**3/05/2022**	**55**	**535**

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100		5	Good Ground / Result	*(No topsoil at time of PCHA)*	
200	UTP	3		ENGINEERED FILL: CLAY SILT with traces of fine sand, fine pumiceous material and mica; light brown and brown mixture (mottled orange/yellow/ speckled black); very stiff to hard; low moisture; high plasticity; moderately sensitive; low dilatancy	
300		5			
400		3			
500	163/49	3			
600		5			
700		4			
800	130/38	4			
900		5			
1000		3			
1100				1100mm: Dark brown streaks	
1200	190+			1200mm: Becoming light creamy brown.	
1300				1300mm: Becoming Clayey SILT with minor fine sands and traces of carbonaceous material and mica.	
1400				1400mm: Speckled black.	
1500	163/52			1600mm: Becoming CLAY SILT trace pumice; Brown.	
1600					
1700					
1800	174/49				
1900					
2000					
2100	122/57				
2200					
2300					
2400	149/57				
2500		3		SILT, some fine sand with traces of fine pumiceous material; light grey mottled orange/yellow; medium dense; low moisture; low plasticity; sensitive; high dilatancy.	
2600		4			
2700		4			
2800		3			
2900		3			
3000				**EOB @ 3.0m**	
3100					
3200					
3300					
3400					
3500					

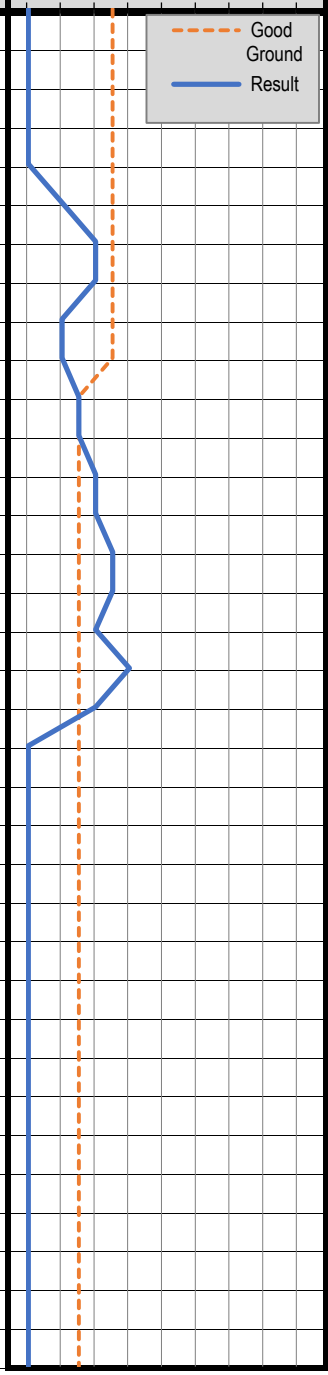
Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 3252 Exp. Date: 13/07/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		**171738-S17&S18a-01**	
Tested by	Date	Sheet No.	Lot No.
Jessel Ladwa	**3/05/2022**	**56**	**8025-8026**

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm)	Soil Description	Water Table
100				TOPSOIL with minor clay silt and traces of sand and gravels; dark brown; dry	
200					
300					
400					
500					
600		2		ENGINEERED FILL: CLAY SILT with traces of fine sand, fine pumiceous material and mica; light brown and brown mixture (mottled orange/yellow/ speckled black); very stiff; low moisture; high plasticity; moderately sensitive; low dilatancy.	
700		4			
800	166/34	4			
900		2			
1000		2			
1100		3			
1200	156/28	3			
1300		4			
1400		4			
1500		5			
1600		5		Fine Sandy SILT with traces of fine pumiceous material; light grey mottled orange/yellow; medium dense; low moisture; low plasticity; sensitive; high dilatancy	
1700		4			
1800		6			
1900		4			
2000				**EOB @ 2.0m**	
2100					
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					



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4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 3252 Exp. Date: 13/07/2022

CORE50
SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		**171738-S17&S18a-01**	
Tested by	Date	Sheet No.	Lot No.
Jessel Ladwa	**3/05/2022**	**57**	**8027-8028**

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100			Result / Good Ground	TOPSOIL with minor clay silt and traces of sand and gravels; dark brown; dry	
200					
300					
400					
500		6		ENGINEERED FILL: CLAY SILT with traces of fine sand, fine pumiceous material and mica; light brown and brown mixture (mottled orange/yellow/ speckled black); very stiff; low moisture; high plasticity; moderately sensitive; low dilatancy.	
600	176/34	4			
700		4			
800		3			
900	152/33	3			
1000		3			
1100		4			
1200	UTP	4			
1300		5			
1400		5		Fine Sandy SILT with traces of fine pumiceous material; light grey mottled orange/yellow; medium dense; low moisture; low plasticity; sensitive; high dilatancy.	
1500		5			
1600		6			
1700		4			
1800		5			
1900		5			
2000				**EOB @ 2.0m**	
2100					
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					

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5. Shear Vane Serial No.: 3252 Exp. Date: 13/07/2022

CORE50 SOLUTIONS ENGINEERED

Project Name		Job Ref.	
Subdivision Test & Report Area LUK; Stage 17 & 18a, Greenhill Park, Hamilton		**171738-S17&S18a-01**	
Tested by	Date	Sheet No.	Lot No.
Jessel Ladwa	**3/05/2022**	**58**	**8029-8030**

Depth (mm)	Undrained Shear (kPa)	No of blows /100mm	Scala Penetrometer (Blows/100mm) 0 2 4 6 8 10 12 14 16	Soil Description	Water Table
100			Good Ground / Result	TOPSOIL with minor clay silt and traces of sand and gravels; dark brown; dry; difficult to auger past 300mm.	
200					
300					
400		8		ENGINEERED FILL: CLAY SILT with traces of fine sand, fine pumiceous material and mica; light brown and brown mixture (mottled orange/yellow/ speckled black); hard; low moisture; high plasticity; moderately sensitive; low dilatancy.	
500		6			
600		6			
700	UTP	4			
800		4			
900		2			
1000		2		Silty fine SAND with traces of fine pumiceous material; light grey mottled orange/yellow; loose to medium dense; low moisture; low plasticity; sensitive; high dilatancy.	
1100		2			
1200		3			
1300		3			
1400		5			
1500		6			
1600		5			
1700		5			
1800		6			
1900		5			
2000				**EOB @ 2.0m**	
2100					
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100					
3200					
3300					
3400					
3500					

Notes: **EOB = End Of Borehole** **UTP = Unable To Penetrate** **UTE = Unable To Extract**

1. Weather leading up to testing was: Fine
2. Ground water was not encountered during testing
3. Shear Vane readings are converted readings, as per calibration Certificate. (Values are undrained shear strength)
4. Shear Vane records include Re-moulded values where possible
5. Shear Vane Serial No.: 3252 Exp. Date: 13/07/2022

Coffey Testing NZ
3 Titoki Place
Mount Maunganui

EARTHWORKS FILL REPORT

Test Methods : Shear Strength (using field Shear vane in accordance with NZGS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:1991 Test 4.2.1): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b))

Project No: 773-TAUR00030

Page: 1 of 1

Client: D B Consulting Engineers
42 Tawn Place
Pukete, Hamilton

Principal: Ranjan Ghiloria

c.c. to: -

Project: Green Hill Park

Project Location: Carrs Road
-

Tests indicated as not accredited are outside the scope of the laboratory's accreditation

Approved Signatory: Eric Paton

Approved Signatory Signature:

Date of Issue: 15/01/2021

IANZ Accredited Laboratory Number:1352

Date	Work Order :	Tested By	Test No.	Wet Density (t/m^3)	Oven Water Content (%)	Dry Density (t/m^3)	Solid Density (t/m^3)	Air Voids %	Field Shear Strength in kPa (UTP = Unable to penetrate)				Test Location	Easting	Northing	RL (m)	Material Tested	Comments
13/01/2021	TAUR21W00022	GY	**7**	1.61	56.9	1.03	2.8	4.7	NT	NT	NT	NT	-	-	-	-	Silty CLAY	-
13/01/2021	TAUR21W00022	GY	**8**	1.67	57.0	1.06	2.8	1.5	NT	NT	UTP	NT	-	-	-	-	Silty CLAY	
13/01/2021	TAUR21W00022	GY	**9**	1.65	49.6	1.10	2.8	5.8	NT	NT	NT	NT	-	-	-	-	Silty CLAY	
13/01/2021	TAUR21W00022	GY	**10**	1.71	46.0	1.17	2.8	4.5	NT	NT	NT	NT	-	-	-	-	Silty CLAY	
13/01/2021	TAUR21W00022	GY	**11**	1.63	46.7	1.11	2.8	8.4	NT	NT	NT	NT	-	-	-	-	Silty CLAY	
13/01/2021	TAUR21W00022	GY	**12**	1.72	38.9	1.24	2.8	7.5	NT	NT	NT	NT	-	-	-	-	Silty CLAY	

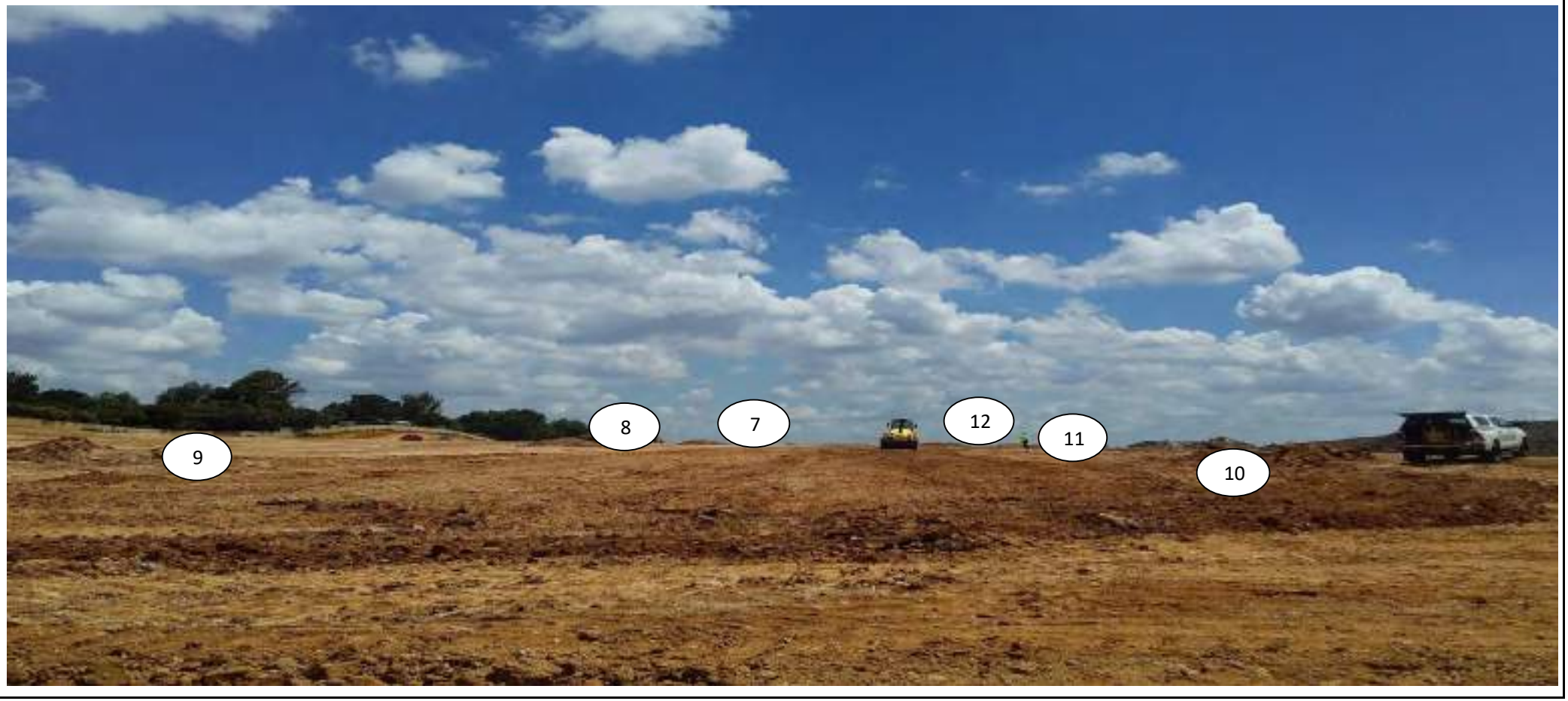
(Please note that Air Void calculations are not IANZ endorsed as part of this report)

Project: Greenhill Park

Location: Carrs Road Hamilton

Tested by: GY

Date tested: 13.01.21



NDM Direct Transmission

CORE50 SOLUTIONS ENGINEERED

171738-LUK-SI: Stage 17 & 18a, Area LUK of Greenhill Park, Hamilton - Earthworks

Soil Material: CLAY SILT

Solid Density kg/m^3: 2800 *(Assumed)*

Maximum Dry Density kg/m^3: 1060 *Report# HA6441/2*

Optimum Moisture Content: 54.0 %

Average Field Moisture Content: 42.1 %

Site Tech: AK

Targets	Average	Min	Max
Compaction PR%:	≥ 95	90	-
Air Voids AV%:	≤ 10	-	12
Shear Strength kPa:	≥ 140	110	-
Degree of Saturation:	-	-	-

Test Average	
Compaction PR%	112
Air Voids AV%	7
Shear Strength kPa	202
Degree of Saturation	-

Test Methods : Shear Strength (Shear vane NZGS 2001): Nuclear Densometer Testing (NZS 4407:2015 Test 4.2)

NDM S/N: 79159, Exp Date: 24/05/2023

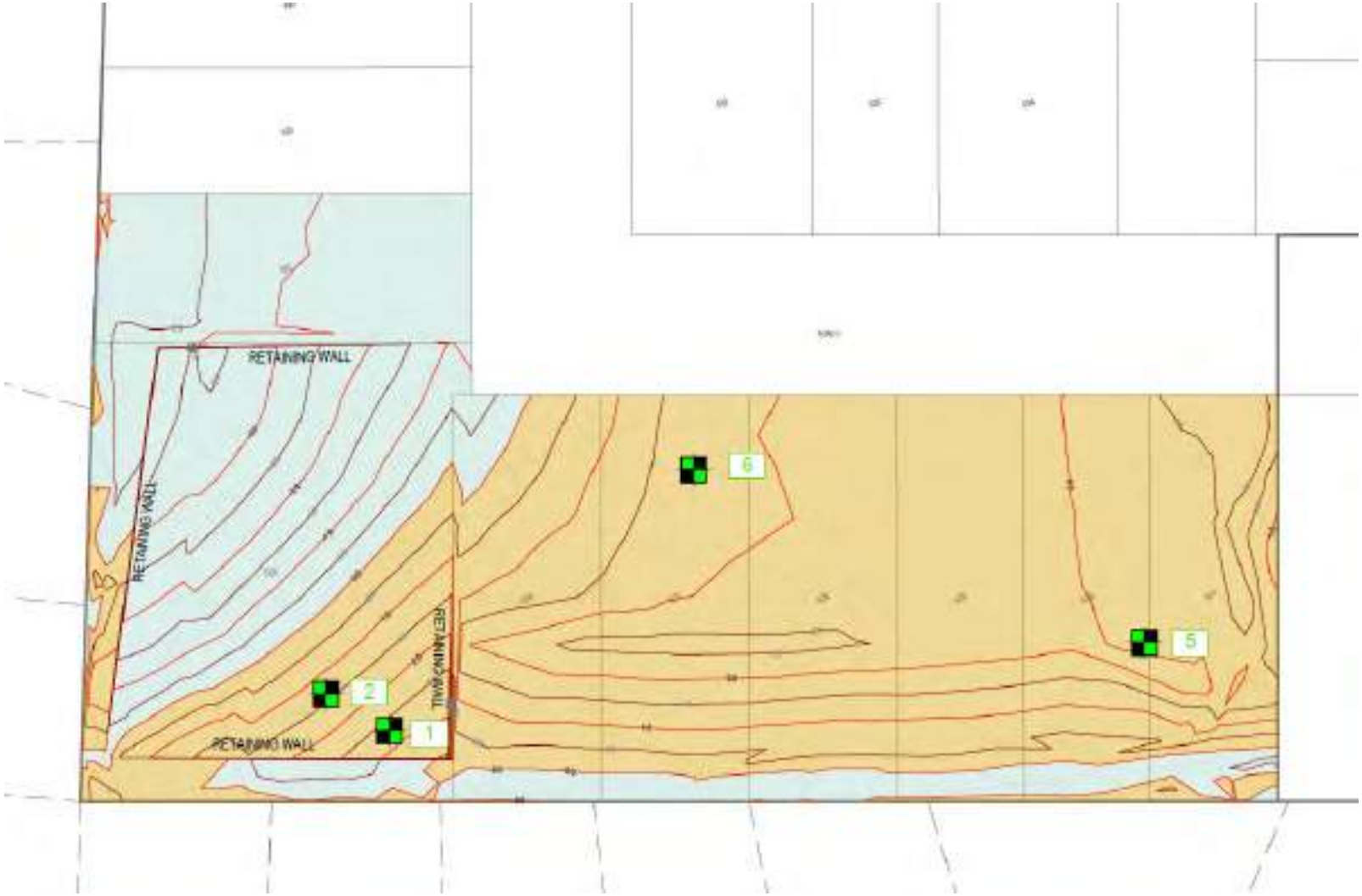
Test#	Test Location: Refer Sketch RL	Test Date	Layer Thickness mm	Probe Depth mm	Wet Density kg/m^3	Oven Moisture Content MC%	Dry Density kg/m^3	Degree of Saturation DOS	Air Voids AV%	Compaction PR%	Field Shear Strength (kPa). Shear Vane S/N: 1471 Test A	Test B	Test C	Test D (probe hole)	Average kPa
1	42.200	26/04/22	500	300	1659	40.6	1180	83	10	111	138	141	150	156	146
2	43.000	2/05/22	500	300	1634	41.0	1159	81	11	109	UTP	UTP	210	210	210
3	42.100	3/05/22	500	300	1704	48.0	1151	94	4	109	210	210	210	210	210
4	40.820	3/05/22	500	300	1711	45.2	1178	92	5	111	UTP	UTP	UTP	210	210
5	40.580	3/05/22	500	300	1724	40.8	1224	89	6	116	UTP	UTP	UTP	210	210
6	41.800	3/05/22	500	300	1687	41.1	1196	86	8	113	UTP	UTP	UTP	210	210
7	40.530	4/05/22	500	300	1725	39.8	1234	88	7	116	UTP	UTP	UTP	210	210
8	40.900	4/05/22	500	300	1704	40.6	1212	87	8	114	UTP	UTP	UTP	210	210

NDM Direct Transmission

171738-LUK-SI: Stage 17 & 18a, Area LUK of Greenhill Park, Hamilton - Earthworks

NDM Direct Transmission

171738-LUK-SI: Stage 17 & 18a, Area LUK of Greenhill Park, Hamilton - Earthworks



Appendix E *Stormwater Management*
Minimum Lot Levels

LOT NUMBER	LOWEST LEVEL	MINIMUM FINISHED FLOOR LEVEL (FFL)
481	43.36	43.51
482	43.27	43.42
483	43.27	43.42
484	43.04	43.19
485	42.96	43.11
486	42.88	43.03
487	42.95	43.10
488	43.17	43.32
489	43.15	43.30
490	43.02	43.17
491	42.74	42.89
492	42.60	42.75
493	42.51	42.66
494	42.61	42.76
495	42.70	42.85
496	42.82	42.97
497	42.96	43.11
498	43.09	43.24
499	41.54	41.69
500	41.46	41.61
501	41.41	41.56
502	41.31	41.46
503	41.28	41.43
504	41.28	41.43
505	41.43	41.58
506	41.42	41.57
507	41.08	41.23
508	41.12	41.27
509	41.10	41.25
510	41.10	41.25
511	41.09	41.24
512	39.14	39.29
513	39.14	39.29
514	39.20	39.35
515	39.24	39.39
516	39.29	39.44
517	39.33	39.48
518	39.36	39.51
519	39.10	39.25
520	39.87	40.02
521	40.46	40.61
522	40.74	40.89
523	42.88	43.03
524	42.88	43.03
525	43.17	43.32
526	41.98	42.13
527	41.65	41.80
528	41.26	41.41
529	41.09	41.24
530	40.95	41.10
531	41.20	41.35
532	41.95	42.10
533	41.54	41.69
534	41.25	41.40
535	39.89	40.04
8025	40.92	41.07
8026	40.63	40.78
8027	40.36	40.51
8028	39.69	39.84
8029	39.52	39.67
8030	39.43	39.58

SHRIMPTON & LIPINSKI
LAND DEVELOPMENT & DESIGN SPECIALISTS
Ph. 07 577 6069
Email: info@sltga.co.nz
P.O. Box 231, Tauranga 3140
www.sltga.co.nz

LEGEND:

- 38.2 — SPOT HEIGHT GROUND LEVEL*
- SLOPE ARROW
- TOP OF BANK
- BOTTOM OF BANK
- BOTTOM OF WALL
- MAJOR CONTOUR
- MINOR CONTOUR

CONTOUR INTERVAL = 0.20m

*GROUND LEVELS ARE NOT TO BE USED FOR BUILDING DESIGN.

Rev	DESCRIPTION	DRN	CKD	APP	DATE
0	PRELIMINARY	NW	BP	BP	05/22
1	ISSUED TO GEOTECH	NW	BP	BP	05/22
2	AS-BUILT UPDATED	NP	BP	PH	07/22

	NAME	DATE		NAME	DATE
SURVEYED			DESIGNED		

COORDINATE SYSTEM: NZGD 2000 - MOUNT EDEN
ORIGIN OF COORDINATES:
HEIGHT DATUM: MOTURIKI LVD 1953
ORIGIN OF HEIGHT:

TITLE

SECTIONS LEVELS AND FLOW - GEOTECHNICAL REQUIREMENT

PREPARED FOR

Greenhill / Chedworth Properties Limited

STAGE 17

ORIGINAL SCALES @ A3: 1:1000 DO NOT SCALE DIMENSIONS
STATUS: AS-BUILT
DRAWING NO: 30410-01-S17-G1
REVISION: 2

R:\Project Files\30410-01-1901 Drawing Presentation Files\19-30410-01 - Stage 17 Geotech Requirement Levels and Flow.dwg - Plotted: 4/07/2022

Appendix F Retaining Wall Producer Statement (PS4)

Job Number: 171738-AREA-LUK-S18-L525-SI

Building Code Clause(s): B1

PRODUCER STATEMENT – PS4 – CONSTRUCTION REVIEW

ISSUED BY CORE50 Limited
(Construction Review Firm)

TO Chedworth Properties Limited / Chedworth Properties Limited
(Owner/Developer)

TO BE SUPPLIED TO Hamilton City Council
(Building Consent Authority)

IN RESPECT OF TIMBER RETAINING WALL INSPECTION
(Description of Building Work)

AT Lot 525, Stage 18, Greenhill Park
(Address)

Town/City Hamilton **LOT** 525 of Lot 2 **DP** 534384 **SO**
(Address)

We CORE50 Limited have been engaged by Chedworth Properties Limited
(Construction Review Firm)

To Provide [ ] CM1 [✓] CM2 [ ] CM3 [ ] CM4 [ ] CM5 Engineering Categories OR [ ] Observation as per agreement

with owner/developer Chedworth Properties Limited / Chedworth Properties Limited

or [✓] Other TIMBER RETAINING WALL INSPECTION services
(Extent of Engagement)

In respect of clause(s) B1 of the Building Code for the building work described in

documents relating to Building Consent No 007.2021.00042864.001 and those relating to

Building Consent Amendment(s) Nos. N.A Issued during the course of the work. We have sighted these Building Consents and the conditions of attached to them.

Authorised instructions/variations(s) No. N.A (copies attached)

or by the attached Schedule [ ] have been issued during the course of the works.

On the basis of [✓] this review [ ] these review(s) and information supplied by the contractor during the course

Of the works and **on behalf of the firm** undertaking this Construction Review, I believe on reasonable grounds that

[ ] All or [✓] Part only of the building works have been completed in accordance with the relevant requirement of the

Building Consent and Building Consent Amendments identified above, with respect to clause(s) B1

of the Building Code. **I also believe on reasonable grounds** that the persons who have undertaken this construction review have the necessary competency to do so.

I, Jeet Singh am: [✓] CPEng# 1011588
(Name of Construction Review Professional)

I am a Member of: [✓] Engineering New Zealand and hold the following qualifications: BE Civil, MEngSt.

The Construction Review Firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than $200,000.*

SIGNED BY Jeet Singh (Signature)
(Name of Construction Review Professional)

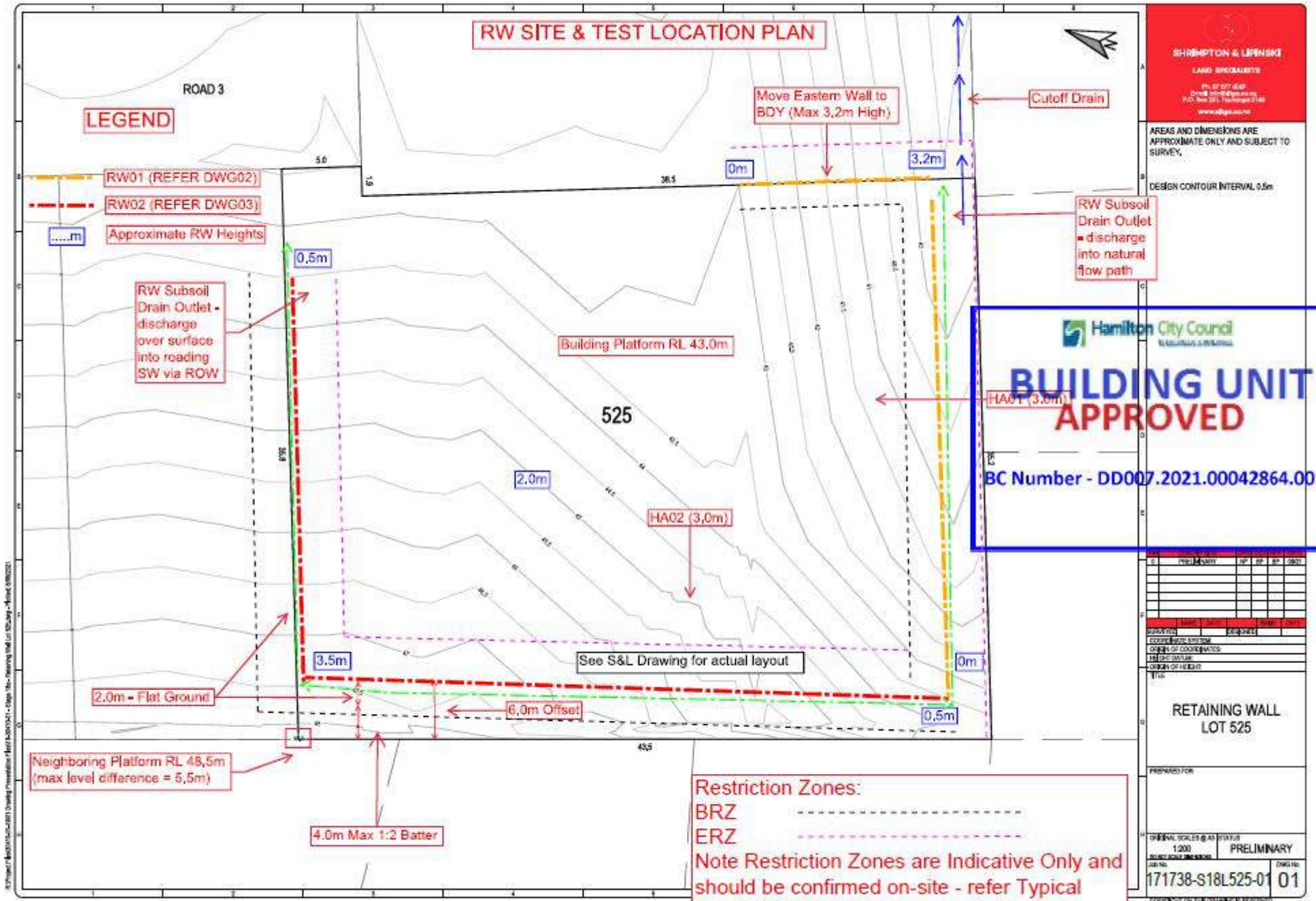
ON BEHALF OF CORE50 Limited Date 12/04/2022
(Construction Review Firm)

Note: This statement shall only be relied upon by the Building Consent Authority named above. Liability under this statement accrues to the Design Firm only. The total maximum amount of damages payable arising from this statement and all other statements provided to the Building Consent Authority in relation to this building work, whether in contract, tort or otherwise (including negligence), is limited to the sum of $200,000.*

This form is to accompany **Forms 6 or 8 of the Building (Form) Regulations 2004** for the issue of a Code Compliance Certificate.

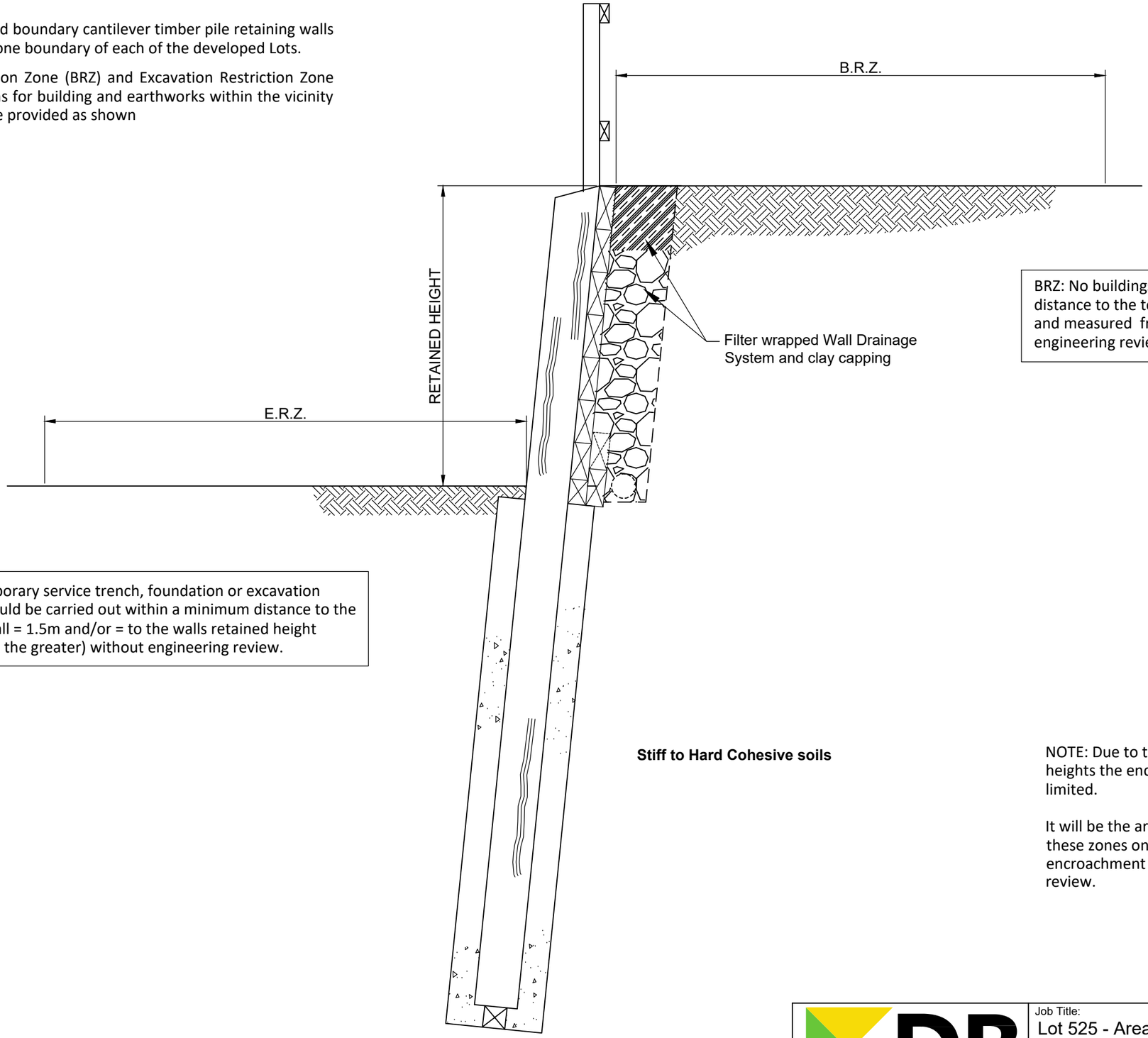
This form is only an extract from the complete PS4 document issued on the 12th of April, numbered: CR171738-AREA-LUK-S18-L525-SI. For the complete PS4 document, please contact administration@core50.nz.

RW SITE & TEST LOCATION PLAN



Engineer designed boundary cantilever timber pile retaining walls support at least one boundary of each of the developed Lots.

Building Restriction Zone (BRZ) and Excavation Restriction Zone recommendations for building and earthworks within the vicinity of these walls are provided as shown



BRZ: No buildings should be constructed within a minimum distance to the top of the wall equal to the height of the wall and measured from the wall drainage system, unless engineering review of the surcharge loading is carried out.

ERZ: No temporary service trench, foundation or excavation ≥300mm should be carried out within a minimum distance to the toe of the wall = 1.5m and/or = to the walls retained height (whichever is the greater) without engineering review.

NOTE: Due to the building to boundary restrictions and low wall heights the encroachment of these zones' are expected to be limited.

It will be the architects/draftsman responsibility to demarcate these zones on the applicable building consent drawings where encroachment occurs and notify their nominated engineer to review.

CONSULTING ENGINEERS
dbcon.co.nz **0800 23 22 66**

Job Title: Lot 525 - Area LU & K, Greenhill Park, Hamilton	Designer: ES	Drawn By: ES	Date: 18/11/2021
	Issue: 1	Scale: NTS	Sheet Size: A3
Drawing Title: Cantilever Timber Retaining Wall Typical BRZ & ERZ Detail	Job Number: 171738-S18L525-01		Sheet No. 05