GREENHILL PARK RESIDENTIAL SUBDIVISION

STAGE 9
Area M, Greenhill Park

HAMILTON

REPORT ON SUBDIVISION EARTHWORKS AND RECOMMENDATIONS FOR BUILDING DEVELOPMENT

Our Ref: DB 171738.08

Prepared for: Chedworth Properties Limited

Date: May 2019

Contents

Appendices

Appendix I — *Reference Drawings*
Cut/Fill Plan 21879-S9-CF1

Appendix II — *Geotechnical Completion Forms*
Checklist 2.2 - Statement of Professional Opinion Summary of Geotechnical Data for Individual Lots

Appendix III — *Pre-Construction Assessment (exerts)*
BECA Area M Liquefaction Assessment Summary Plan

Appendix IV — *Post-Construction Test Results*
Tests by DCBE Ltd

Appendix V — *Stormwater Management*
On-lot Water Efficiency Measures
Lot Levels (Minimum Lot Levels)

1.0 Subdivision Development Earthworks

1.1 Introduction

In accordance with Hamilton City Council's (HCC) Subdivision Resource Consent "011.2018.00006632.001", covering Stage 9 and Stage 10 of the Greenhill Park Development. Bulk earthworks have been completed to re- contour the previously agricultural landscape for Stage 9 of the Greenhill Park Residential Subdivision in Hamilton. Prior to commencement of earthworks, geotechnical investigations were carried out by Beca Ltd (Beca) in 2016 [1].

Stages 9 of Greenhill Park is currently accessed from Pardoa Boulevard. Stage 9 comprises 58 residential lots (numbered 185 to 242). The locations of these lots are shown on attached *Cut/Fill Plan*, drawing 21879-S9-CF1 included in Appendix I.

HCC's Infrastructure Technical Specifications (ITS) set out the minimum standards for design and construction of public infrastructure within Hamilton City. Section 2.1.5 of the *Earthworks and Geotechnical Requirements* of the ITS states that the developer shall appoint a geo-professional to carry out functions as described in NZS 4404[5] Section 2.2.4. ITS Section 2.3.3.1 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 DB Consulting Engineers (DBCE) Ltd as the geoprofessional.

To satisfy the requirements of HCC's Resource Consent, the ITS and NZS 4404, this report summarises the observations and testing undertaken during the development of the stages, 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 I of this report is the proposed subdivision plan comprising Lots 185-242,501,608 & 702 DP 534481 and the proposed new lots for Area M Stage 9. 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 Sstage 9 of the subdivision development were undertaken between January 2018 and January 2019.

These earthworks comprised

- The stripping of surface topsoil to expose underlying natural soils
- The placement of filling within all lots, with the exclusion of lots 203 to 205

- Undertaking areas of cut of up to 1.5 m deep to reduce original ground levels within lots 193 to 207, 210 to 211, 223 to 225 and 228 to 231
- Backfilling and raising the ground level with new fill to create uniform fill platforms
- The cleaning out and infilling of old farm drains
- 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 silts, sands and pumiceous gravels, typical of Hinuera formation deposits/soils in this area of Hamilton. These soils were those that had been identified in pre-construction site investigations by the Beca Report.

The filling work was undertaken using these site soils gained from areas of cut on other stages from within the larger Greenhill Subdivision. Filling was undertaken during summer 2018 when drying back of the soils was possible to close to optimum moisture contents to achieve near maximum compaction densities.

In the deep fills within the old drain, initial filling was with compacted undifferentiated brown rock over a geofabric underlay. The stabilised filling was placed over the brown rock.

Upon completion of the earthworks, approximately 200 to 300 mm of topsoil was placed across the sites and the finished surfaces were grassed in accordance with Condition 20 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 actually 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 insitu silts and sands and silty sand mixtures gained from areas of cut across the larger subdivision and already used for the earlier stages of the development. 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 Earthfill for Residential Development” and the Council ITS. 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 by the use of a Scala penetrometer in sand based soils and a hand held shear vane in finer grained silts and clayey silts. Adequate strengths would be achieved when blow counts recorded with a Scala penetrometer were to be 5 or more per 100 mm of penetration in the sand based filling or when an undrained shear strength of 100 kPa or more had been developed in silts and clays.

Materials used where the same basic strata as being used for the previous 8 Stages of works, which a high level of consistency based on previous test results.

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 and smooth drum rollers.

As most of the filling placed comprised the silty sands identified in the pre-subdivision boreholes. Testing of the compaction achieved was mostly undertaken with a Scala penetrometer.

OLC undertook their own Scala penetrometer testing throughout the contract works to verify that the filling had been placed with adequate compactive effort. DBCE then carried out additional completion testing following the completion of earthworks. The results indicate that the construction filling standards have been met. Foundations may therefore be detailed to NZS 3604:2011 where a timber framed subfloor containing shallow piles, bearers and joists is contemplated. Concrete floors designed to NZS3604 can be used on most lots where they are not immediately adjacent to a stormwater swale.

Notwithstanding the comments above, restriction from ground hazards (refer section 1.8.3) still apply to some lots.

1.5 Areas of Cut

Areas developed in cut are shown on 21879-S9-CF1 (Appendix I). In these areas, the ground at formation levels was observed to comprise the same silts and sands that had been used for filling elsewhere and as identified by pre subdivision tests. Only limited areas within the roadway comprise areas of cut.

1.6 Test Results In Filling Placed

A summary of the tests undertaken by DBCE is present in Appendix IV. The test positions are shown on 21879-S9-CF1 (Appendix I) and the test results are in Appendix IV.

The Scala 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

The natural ground at the finished ground surface or under the filling comprised silty sands and sands as had been identified in the pre-subdivision investigation boreholes.

The results of the tests undertaken indicate that “good ground” as defined in NZS3604:2011 is

present. No areas that were tested will require any future ground improvement work for buildings supported.

1.8 Land Hazards

1.8.1 Land Stability

There are no landform stability issues within Stage 9 of the Greenhill Park Subdivision. The specification from the developer for the site earthworks was that the lots were to be graded as flat as possible with a desirable gradient of 0.5%. Swale 4 at the northern end of Stage 4 was assessed in the Beca report and is discussed further in 1.8.3 below.

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 this stage of the subdivision are described in the catchment and overland flow assessments by Beca. In the report for area I, a 1% AEP flood event is identified for each swale system. The two relevant swales for Stage 9 are Swale 3 (R.L. 35.94 1% Flood level) and Swale 1 (37.24 flood level). A flood level of 36.10 R.L. has been used in assessing the flood risk in stage 9. This equates to minimum lot levels of 36.380m to 37.941m R.L. across the stage (with low being the north end and high being the south end). A list of Lot Levels for Stage 9 is included in Appendix V.

Site grading during house construction must not lower finished levels below the minimum finished ground levels identified by Beca without further review of the impacts on flooding. Earthworks must not direct stormwater runoff to adjacent properties, or towards buildings, or create areas of localised ponding. All overland flow is to be towards the road frontage on each section, where falls will direct surface flow towards the north and Swale 3.

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 M of the Greenhill Park Subdivision is discussed in "Greenhill Park Geotechnical Interpretation and Design - Area M" by Beca and dated 13 July 2018. Foundations within 5m of the top of the swales are classed as TC2 like foundations. Lots affected include Lots 198-205. The

liquefaction summary plan is appended to this Completion report. Specifically, the requirements are:

- 0m – 1.5m no habitable dwellings to be built within 1.5 m of the swale crest.
- 1.5 – 5m adopt an enhanced TC2 _like foundation
- Beyond 5m of swale crest no specific requirements to mitigate liquefaction effects.

The Beca report refers to zones adjacent to the swales being in a TC2 type area as is defined in guidelines published by the Ministry of Business, Innovation and Employment (MBIE). MBIE recommends that TC2 type foundations should typically include 'an enhanced foundation slab' as is currently being installed for new houses in Christchurch. Alternatively, MBIE advises that houses may be supported on timber piles and a timber framed subfloor as detailed in NZS 3604 to meet a Type A construction as described in their guidelines.

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, and 90 % of the 10 % and 50 % AEP pre-development rates (Beca Ltd. [2016] *Greenhill Park - Stormwater Design*, for Chedworth Properties Ltd, 29 June 2016). Area M has been designed to include roadside swales flowing in an approximately east to west direction. Stage 9 includes part of swale 4A (Lot 501) – located adjacent to Pardoa Boulevard and behind lots 198 to 205 – that will collect runoff from roads within stage 9. The depth of the swales has been designed to accommodate the fall and cover depth required of the piped drainage system. The piped drainage network has been designed to convey the 50 % AEP flows from roads and lots to the swale network, with each lot to be provided with a piped service connection. The stormwater plan is presented in the S&L Drawing '*Stormwater As Built DWGs 21879 – AB4, AB5, AB6*', Rev 0, June 2019.

All lots will require on-site stormwater efficiency measures as per the District Plan requirements (Rule 25.13.4.5 Water Efficiency Measures). These include:

1. Detention of stormwater to 80% of pre-development runoff by an appropriate means. This has largely been achieved by the swale network for events greater than the 50 % AEP storm. For the 50 % AEP and smaller events, the stormwater efficiency measures are expected to provide sufficient additional mitigation to achieve this requirement.
2. Permeable surfaces protected to achieve at least 20% above the minimum standard

of the zone (i.e. 40 % site permeability).

   a. Sites within the Ruakura Medium Density Residential Zone require a minimum permeability of 20 % (Rule 4.6.5) and are limited to 50 % site coverage (Rule 4.6.6).

3. Rainwater tank for non-potable reuse system
4. Other equivalent feature

Stormwater management must ensure that the rate of stormwater discharge offsite is at or below pre-development rates. Stormwater management measures shall be implemented, as appropriate, in accordance with the following drainage hierarchy:

1. Retention for reuse
2. Soakage techniques
3. Detention and gradual release to a watercourse
4. Detention and gradual release to stormwater reticulation.

Section 42 of the Subdivision Resource Consent (SRC) relating to Stages 9-15 state that "*Each residential lot shall be provided with a means for disposal of stormwater, with no private stormwater pipes or soakage systems crossing from one lot to another except where covered by an easement*"

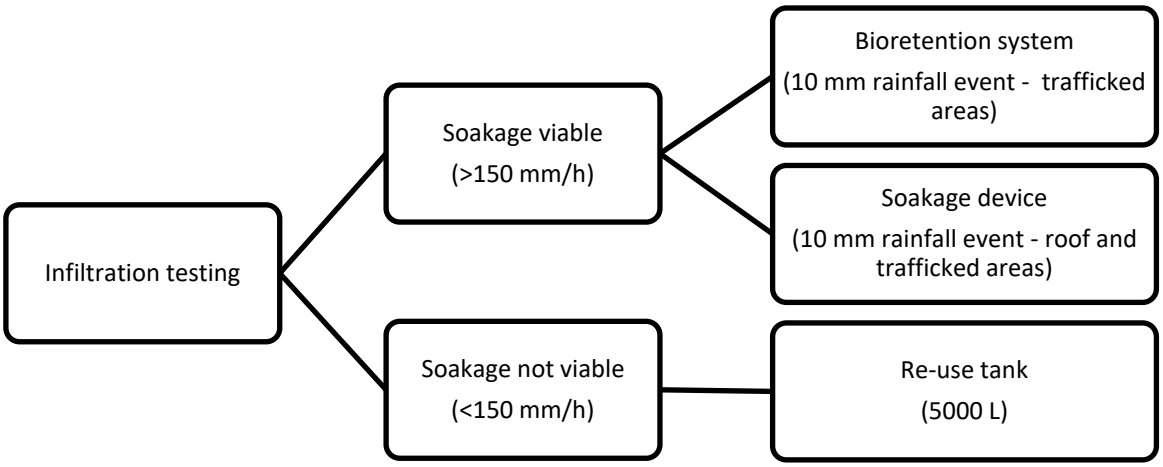
Section 43 of the SRC states that water efficiency measures for the individual residential lots are to be detailed for each subdivision stage. "*Where retention for reuse tanks is proposed they shall be a minimum of 5,000L to ensure they are effective or where the lot is less than 300m^2 should be appropriately designed considering the specific site constraints. The required stormwater efficiency measure is to be implemented at the building consent stage and maintained on an on-going basis at the owners' expense*".

Section 44 of the SRC requires a consent notice on each title advising of the required water efficiency measures to be implemented and maintained on an ongoing basis.

Section 55 of the SRC states the requirement for lot development to be undertaken in general accordance with the recommendations in the report: *Greenhill Park Geotechnical Interpretation and Design – Area M*, prepared by Beca Ltd., 13 July 2018.

In the Stage 9 development area, each site is to be tested for soakage capability by the property owners. For those sites that have a sufficient soakage capability, disposal of stormwater is to be undertaken onsite using soakage and/or bioretention systems with overflow to the lot stormwater service connection. Those sites that are not soakage viable are to retain stormwater for reuse by way of a Slimline Rain Tank or other similar type water tank. The size of the tank is to be 5000 litres and the tank is to be plumbed into the house for use as a non-potable water supply including for garden irrigation and in general accordance with the

HCC guidelines for the Implementation of Water Efficiency Measures. The Slimline rain tank system is described in Appendix V. This requirement will be advised to purchasers and will be implemented through the building consent process by HCC. A consent notice is to be registered on the certificates of titles for each lot which describes these investigation and design requirements.



Details of the required stormwater measures are included in Appendix V, sourced from the *Greenhill Park Design Guidelines.*

3.0 Retaining Walls

There are no retaining walls that were constructed by the developer within stage 9.

4.0 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 ITS 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 ITS Section 2.3.3.1, 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.

Specifically for Stage 9, Lot 195 and Lot 205 will require further site specific assessment. The remainder of the lots do not require any additional testing subject to an onsite inspection of the subgrade/foundations soils during construction.

5.0 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 Area M Stage 9 as shown on DP 534481 within the Greenhill Park Residential Subdivision and no responsibility is accepted by DB Consulting Engineers Ltd for the use of any part of this report for other development sites without their written approval.

DB Consulting Engineers Ltd

Report prepared by Michael Richardson
CPEng 1005467
Geotechnical Engineer

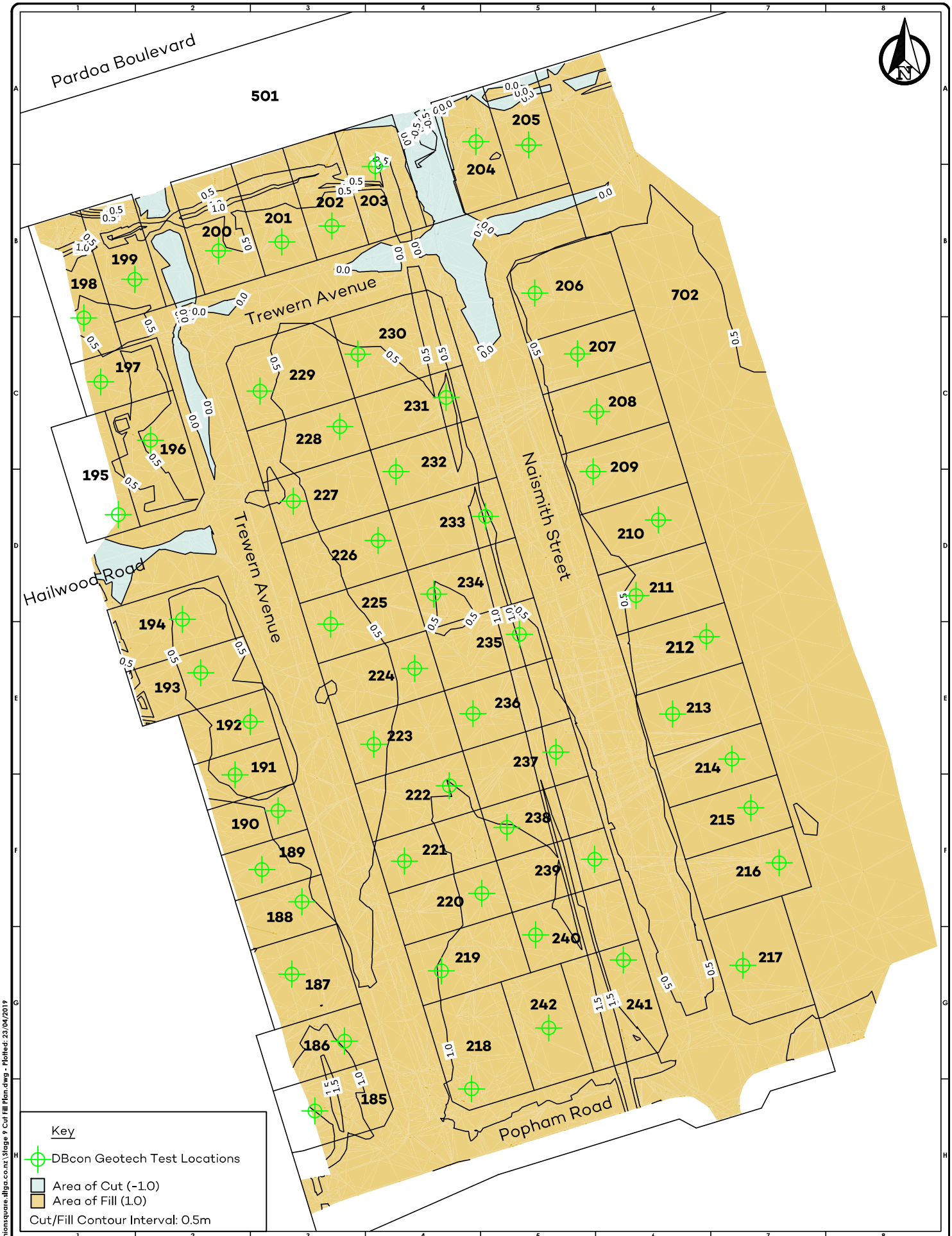
May 2019

Appendices

Appendix I	*Reference Drawings* Cut/ Fill Plan 21879-S9-CF1 Title Plan - LT 534481
Appendix II	*Geotechnical Completion Forms* Checklist 2.2 - Statement of Professional Opinion Summary of Geotechnical Data for Individual Lots
Appendix III	*Pre-Construction Assessment (exerts)* BECA Area M Liquefaction Assessment Summary Plan
Appendix IV	*Post-Construction Test Results* Tests by DCBE Ltd
Appendix V	*Stormwater Management* Slimline Rain Tank Installation Detail Lot Levels (Minimum Lot Levels)

Appendix I *Reference Drawings*

Cut/Fill Plan 21879-S9-CF1



S&L
Land Development and Design Specialists
Ph. 07 577 6069
Email: info@sltga.co.nz
36 Kereiti Street, Mt Maunganui, Tauranga 3116
P.O. Box 231, Tauranga 3140
www.sltga.co.nz

Title

Chedworth Properties Ltd
Greenhill Park Stage 9
Cut / Fill Plan

CKD BY	REV No.	DESCRIPTION	DATE

	NAME	DATE	SIGNED
Surveyed			
Designed			
Drawn	NP	04/19	
Checked			
Approved			

References

Original Scales @ A3: 1:750
Do Not Scale Dimensions
Date: 04/19
Drawing No: 21879-S9-CF1
Revision: 1

\\dc-fp1\Workingfiles\nparkinson\unionsquare.sltga.co.nz\Stage 9 Cut Fill Plan.dwg - Plotted: 23/04/2019

Title Plan - LT 534481

Survey Number	LT 534481
Surveyor Reference	21879 - Stage 9
Surveyor	Scott Rodney Carley
Survey Firm	S & L Consultants Ltd
Surveyor Declaration	

Survey Details

Dataset Description	Lots 185 - 242, 501, 608 & 702 Being a Subdivision of Lot 700 DP 527229		
Status	Initiated		
Land District	South Auckland	**Survey Class**	Class A
Submitted Date		**Survey Approval Date**	
		Deposit Date	

Territorial Authorities

Hamilton City

Comprised In

RT 849212

Created Parcels

Parcels	Parcel Intent	Area	RT Reference
Lot 185 Deposited Plan 534481	Fee Simple Title	0.0349 Ha	881079
Lot 186 Deposited Plan 534481	Fee Simple Title	0.0313 Ha	881080
Lot 187 Deposited Plan 534481	Fee Simple Title	0.0368 Ha	881081
Lot 188 Deposited Plan 534481	Fee Simple Title	0.0230 Ha	881082
Lot 189 Deposited Plan 534481	Fee Simple Title	0.0210 Ha	881083
Lot 190 Deposited Plan 534481	Fee Simple Title	0.0210 Ha	881084
Lot 191 Deposited Plan 534481	Fee Simple Title	0.0210 Ha	881085
Lot 192 Deposited Plan 534481	Fee Simple Title	0.0230 Ha	881086
Lot 193 Deposited Plan 534481	Fee Simple Title	0.0349 Ha	881087
Lot 194 Deposited Plan 534481	Fee Simple Title	0.0381 Ha	881088
Lot 195 Deposited Plan 534481	Fee Simple Title	0.0335 Ha	881089
Lot 196 Deposited Plan 534481	Fee Simple Title	0.0418 Ha	881090
Lot 197 Deposited Plan 534481	Fee Simple Title	0.0243 Ha	881091
Lot 198 Deposited Plan 534481	Fee Simple Title	0.0384 Ha	881092
Lot 199 Deposited Plan 534481	Fee Simple Title	0.0312 Ha	881093
Lot 200 Deposited Plan 534481	Fee Simple Title	0.0364 Ha	881094
Lot 201 Deposited Plan 534481	Fee Simple Title	0.0312 Ha	881095
Lot 202 Deposited Plan 534481	Fee Simple Title	0.0312 Ha	881096
Lot 203 Deposited Plan 534481	Fee Simple Title	0.0348 Ha	881097
Lot 204 Deposited Plan 534481	Fee Simple Title	0.0313 Ha	881098
Lot 205 Deposited Plan 534481	Fee Simple Title	0.0313 Ha	881099
Lot 206 Deposited Plan 534481	Fee Simple Title	0.0450 Ha	881100
Lot 207 Deposited Plan 534481	Fee Simple Title	0.0300 Ha	881101
Lot 208 Deposited Plan 534481	Fee Simple Title	0.0349 Ha	881102

Title Plan - LT 534481

Created Parcels

Parcels	Parcel Intent	Area	RT Reference
Lot 209 Deposited Plan 534481	Fee Simple Title	0.0349 Ha	881103
Lot 210 Deposited Plan 534481	Fee Simple Title	0.0349 Ha	881104
Lot 211 Deposited Plan 534481	Fee Simple Title	0.0349 Ha	881105
Lot 212 Deposited Plan 534481	Fee Simple Title	0.0349 Ha	881106
Lot 213 Deposited Plan 534481	Fee Simple Title	0.0349 Ha	881107
Lot 214 Deposited Plan 534481	Fee Simple Title	0.0300 Ha	881108
Lot 215 Deposited Plan 534481	Fee Simple Title	0.0300 Ha	881109
Lot 216 Deposited Plan 534481	Fee Simple Title	0.0348 Ha	881110
Lot 217 Deposited Plan 534481	Fee Simple Title	0.0450 Ha	881111
Lot 218 Deposited Plan 534481	Fee Simple Title	0.0450 Ha	881112
Lot 219 Deposited Plan 534481	Fee Simple Title	0.0349 Ha	881113
Lot 220 Deposited Plan 534481	Fee Simple Title	0.0300 Ha	881114
Lot 221 Deposited Plan 534481	Fee Simple Title	0.0300 Ha	881115
Lot 222 Deposited Plan 534481	Fee Simple Title	0.0335 Ha	881116
Lot 223 Deposited Plan 534481	Fee Simple Title	0.0349 Ha	881117
Lot 224 Deposited Plan 534481	Fee Simple Title	0.0349 Ha	881118
Lot 225 Deposited Plan 534481	Fee Simple Title	0.0349 Ha	881119
Lot 226 Deposited Plan 534481	Fee Simple Title	0.0349 Ha	881120
Lot 227 Deposited Plan 534481	Fee Simple Title	0.0349 Ha	881121
Lot 228 Deposited Plan 534481	Fee Simple Title	0.0300 Ha	881122
Lot 229 Deposited Plan 534481	Fee Simple Title	0.0462 Ha	881123
Lot 230 Deposited Plan 534481	Fee Simple Title	0.0460 Ha	881124
Lot 231 Deposited Plan 534481	Fee Simple Title	0.0300 Ha	881125
Lot 232 Deposited Plan 534481	Fee Simple Title	0.0349 Ha	881126
Lot 233 Deposited Plan 534481	Fee Simple Title	0.0349 Ha	881127
Lot 234 Deposited Plan 534481	Fee Simple Title	0.0349 Ha	881128
Lot 235 Deposited Plan 534481	Fee Simple Title	0.0349 Ha	881129
Lot 236 Deposited Plan 534481	Fee Simple Title	0.0349 Ha	881130
Lot 237 Deposited Plan 534481	Fee Simple Title	0.0335 Ha	881131
Lot 238 Deposited Plan 534481	Fee Simple Title	0.0300 Ha	881132
Lot 239 Deposited Plan 534481	Fee Simple Title	0.0300 Ha	881133
Lot 240 Deposited Plan 534481	Fee Simple Title	0.0349 Ha	881134
Lot 241 Deposited Plan 534481	Fee Simple Title	0.0450 Ha	881135
Lot 242 Deposited Plan 534481	Fee Simple Title	0.0349 Ha	881136
Lot 501 Deposited Plan 534481	Vesting on Deposit for Local Purpose Reserve	0.6390 Ha	881137
Lot 608 Deposited Plan 534481	Vesting on Deposit for Road	0.8876 Ha	
Lot 702 Deposited Plan 534481	Fee Simple Title	12.8600 Ha	881138
Area F Deposited Plan 534481	Easement		
Area G Deposited Plan 534481	Easement		
Total Area		16.3441 Ha	

Land Registration District
South Auckland

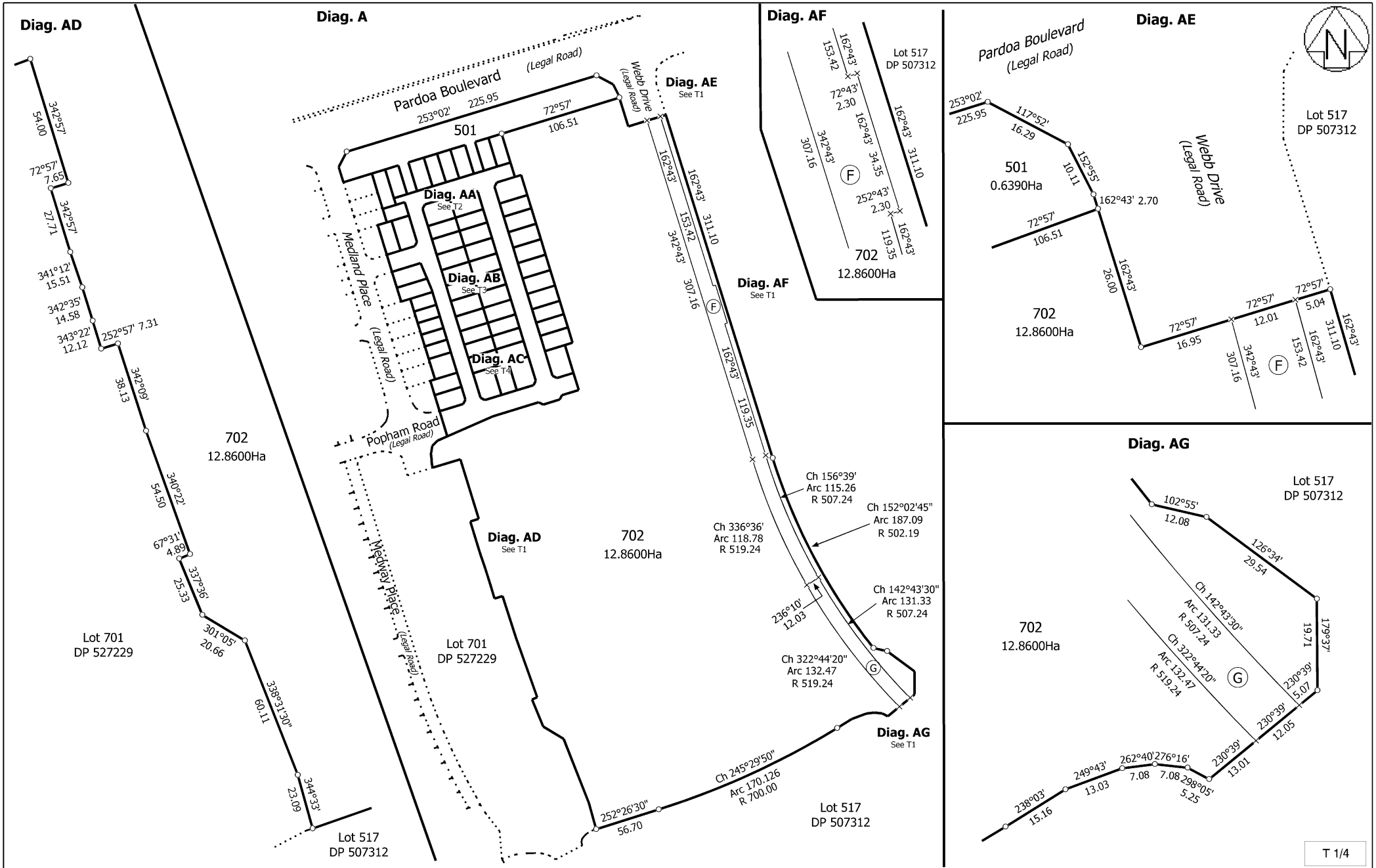
Survey Number
LT 534481

Territorial Authority (the Council)
Hamilton City

Schedule of Existing Easements in Gross

Last Edited: 02 May 2019 10:55:51

Purpose	Shown	Servient Tenement (Burdened Land)	Creating Document Reference
Right to convey electricity, telecommunications	F	Lot 702	EI 10700635.2
	G	Lot 702	EI 10700635.1



Land District: South Auckland Digitally Generated Plan Generated on: 02/05/2019 3:52pm Page 4 of 7	Lots 185 - 242, 501, 608 & 702 Being a Subdivision of Lot 700 DP 527229	Surveyor: Scott Rodney Carley Firm: S & L Consultants Ltd	Title Plan LT 534481 DRAFT

Land District: South Auckland Digitally Generated Plan Generated on: 02/05/2019 3:52pm Page 5 of 7	Lots 185 - 242, 501, 608 & 702 Being a Subdivision of Lot 700 DP 527229	Surveyor: Scott Rodney Carley Firm: S & L Consultants Ltd	Title Plan LT 534481 DRAFT

Land District: South Auckland Digitally Generated Plan Generated on: 02/05/2019 3:52pm Page 6 of 7	Lots 185 - 242, 501, 608 & 702 Being a Subdivision of Lot 700 DP 527229	Surveyor: Scott Rodney Carley Firm: S & L Consultants Ltd	Title Plan LT 534481 DRAFT

T 4/4

Land District: South Auckland Digitally Generated Plan Generated on: 02/05/2019 3:52pm Page 7 of 7	Lots 185 - 242, 501, 608 & 702 Being a Subdivision of Lot 700 DP 527229	Surveyor: Scott Rodney Carley Firm: S & L Consultants Ltd	Title Plan LT 534481 DRAFT

NZS 4404: 2010 SCHEDULE2A (Checklist 2.2)

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

Development: Greenhill Park Stage 9 **Developer:** Chedworth Properties Limited

At Pardoa Boulevard, Chartwell, Hamilton

I, Michael Richardson of DB Consulting Engineers, 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 dated May 2019 (reference 171738.08).**

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 195 and 205 are subject to site specific investigations based on NZS3604 requirements.**
  - **ii.** **Lots 185-194, 196-204, 206-242 are subject to an engineering inspection during foundation excavations in lieu of further soils testing**
  - **iii.** **Construction supervision from an engineer be carried out to confirm the ground conditions are in accordance with this report and suitable for NZS3604 foundations.**

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: 28 May 2019**

Michael Richardson

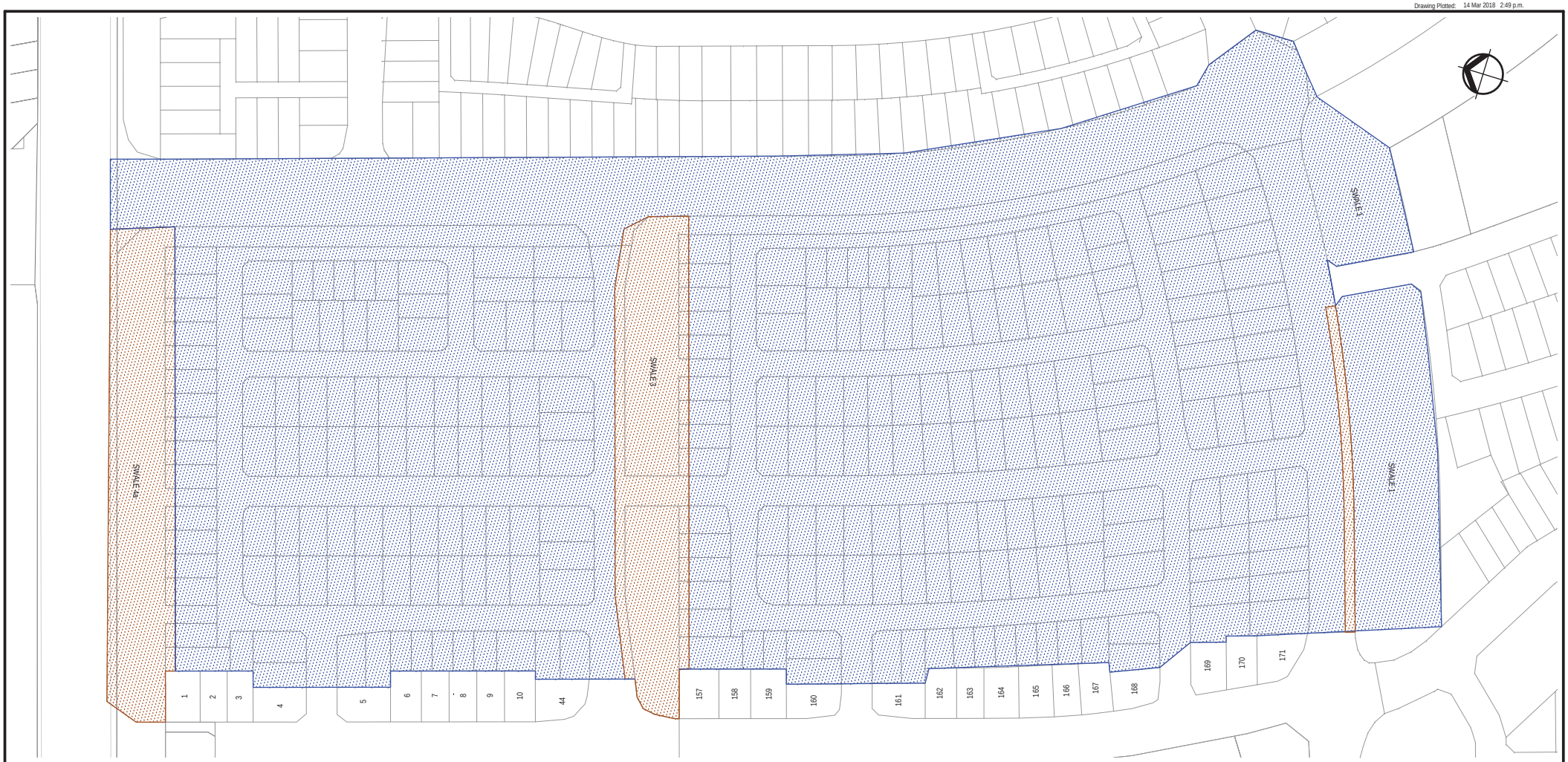
Chartered Professional Engineer (Geotechnical)

CPEng 1005467

Appendix III *Pre-Construction Assessment (exerts)*

BECA Area M Liquefaction Assessment Summary Plan

Drawing Plotted: 14 Mar 2018 2:49 p.m.



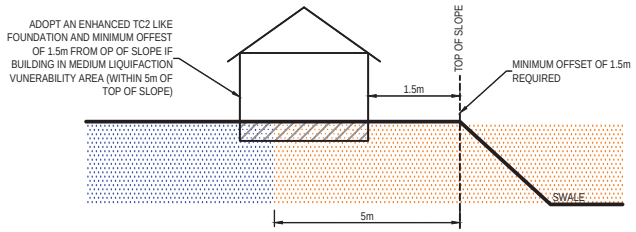
KEY

EXTENT OF AREA M

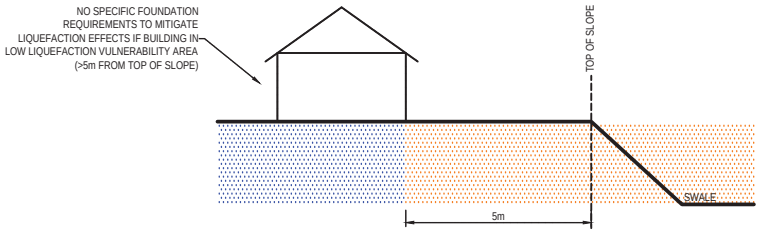
MEDIUM LIQUEFACTION VULNERABILITY
- MINOR TO MODERATE LIQUEFACTION-INDUCED GROUND DAMAGE IN 500 YEAR EARTHQUAKE
- TO MITIGATE LIQUEFACTION AND SEISMIC SLOPE INSTABILITY EFFECTS ADOPT LIQUEFACTION MITIGATION OPTION 1 OR 2.

LOW LIQUEFACTION VULNERABILITY
- NONE TO MINOR LIQUEFACTION-INDUCED GROUND DAMAGE IN 500 YEAR EARTHQUAKE.
- NO SPECIFIC REQUIREMENTS TO MITIGATE LIQUEFACTION EFFECTS.

LIQUEFACTION MITIGATION OPTION 1:



LIQUEFACTION MITIGATION OPTION 2:



FOR INFORMATION
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
A	FOR INFORMATION	SM	MP	PR	12.03.18

Drawing Originator:

Original Scale (A1) 1:3000
Reduced Scale (A3) 1:6000

Design	MLP	27.09.16	Approved For Construction*
Drawn	SM	12.03.18	
Dsg Verifier	EAR	12.03.18	
Dwg Check			Date

* Refer to Revision 1 for Original Signature

Client: Chedworth Properties Limited

Project: Greenhill Park

Title: AREA M LIQUEFACTION ASSESMENT SUMMARY PLAN

Discipline: GEOTECHNICAL

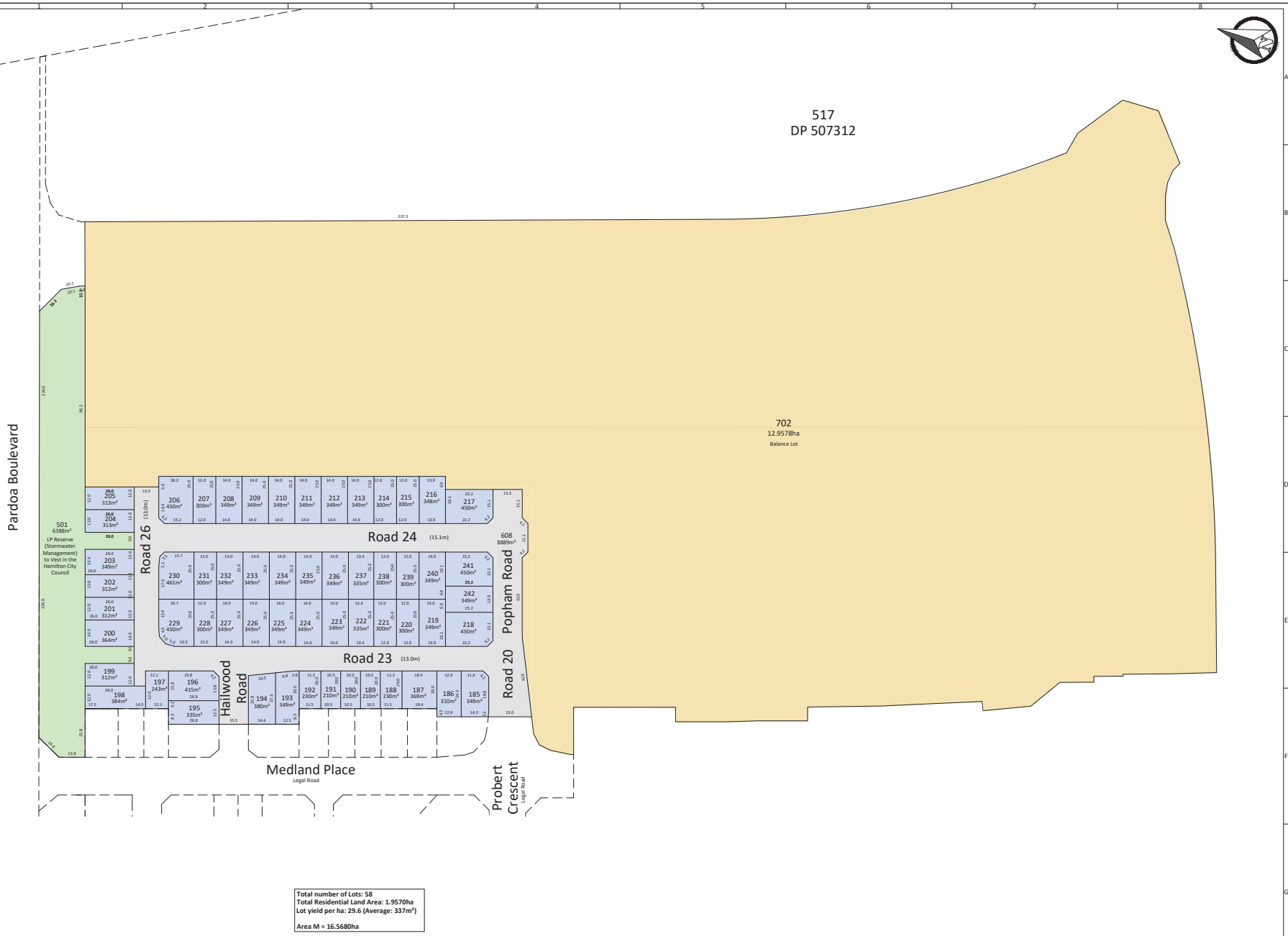
Drawing No.: 3411915-GC-K068 Rev: A

Document No.: 3411915-GC-K068.DWG

DO NOT SCALE

IF IN DOUBT ASK.

Appendix IV *Post-Construction Test Results*
Tests by DCBE Ltd



Total number of Lots: 58
Total Residential Land Area: 1.9570ha
Lot yield per ha: 29.6 (Average: 337m²)

Area M = 16.5680ha

Areas and dimensions are approximate only and subject to survey.

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.

All Roads are to vest in the Hamilton City Council

- Stage 9 (58 Lots)
- Local Purpose (SW Management) Reserve
- Balance Lot
- Roads

checked by.	Rev. No.	Description	DATE

	NAME	DATE	SIGNED
Surveyed	8		
Designed			
Drawn	NP	03/18	
Checked	CR	03/18	
Approved	TMB	03/18	

REFERENCES

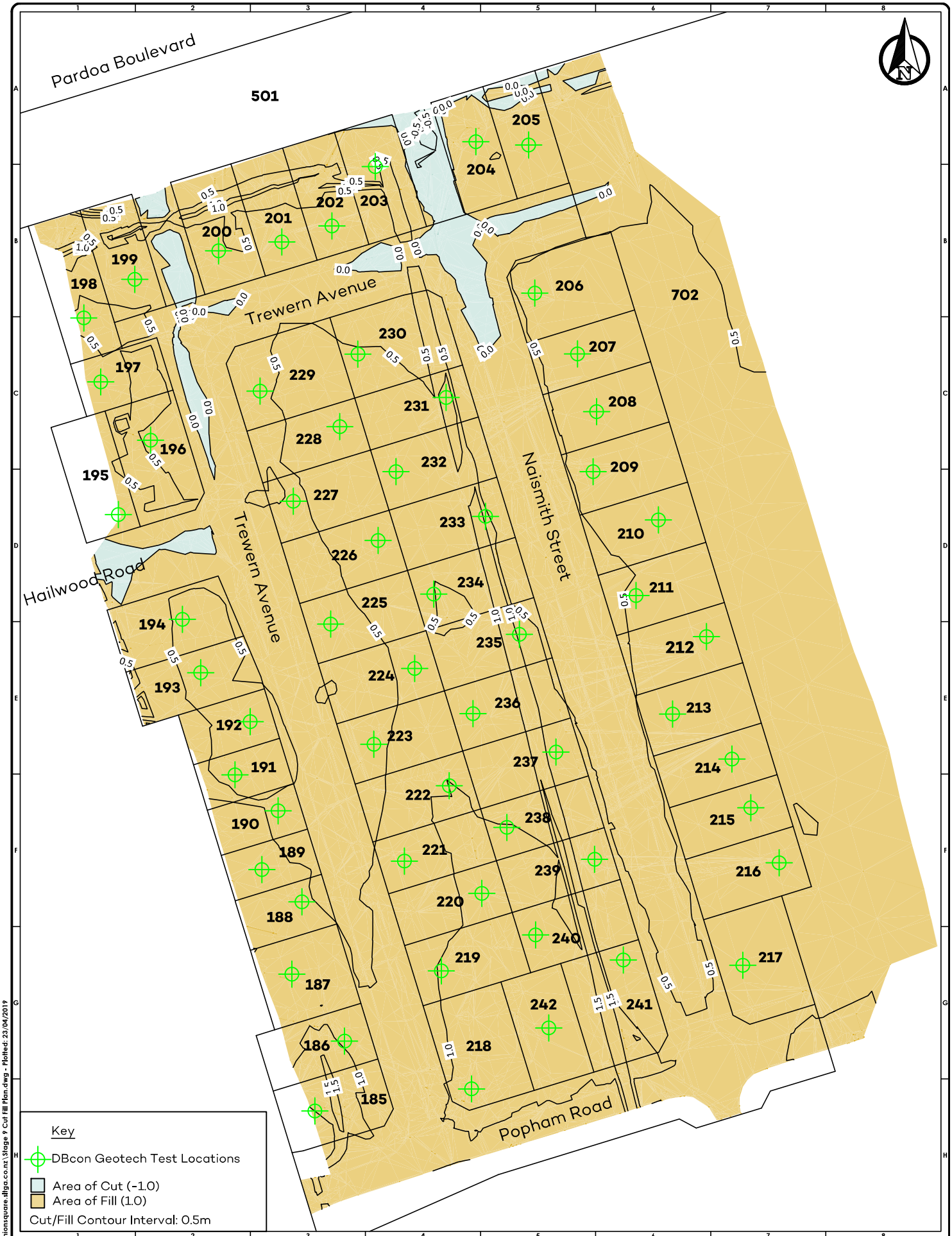
S & L CONSULTANTS LTD
SURVEYORS - ENGINEERS - PLANNERS
36 Kerelti Street, Mt Maunganui, New Zealand
P.O. Box 231 Ph.(07)577-6069
Fax(07)577-6065
Email: slconsultants@sltga.co.nz
Web Site: www.sltga.co.nz

Title
Proposed Subdivision of Lot 605 DP 516275 CT 804519 Greenhill Park Area M Stage 9

Chedworth Properties Limited

Original Scales @ A1	Date
1:1000 (Approx. 1:2000 @ A3)	03/18
Do Not Scale Dimensions	
Drawing No: 21879 - M9	Revision: 10

H:\21000 - 21999\21800 - 21899\21879 - Chedworth Properties Ltd - Greenhill Park Area M - Pardoa Boulevard\Drawings\Scheme\21879 - M9 - Area M Stage 9 Scheme - R10.dwg - Plotted: 20/06/2018



S&L
Land Development and Design Specialists
Ph. 07 577 6069
Email: info@sltga.co.nz
36 Kereiti Street, Mt Maunganui, Tauranga 3116
P.O. Box 231, Tauranga 3140
www.sltga.co.nz

Title

Chedworth Properties Ltd
Greenhill Park Stage 9
Cut / Fill Plan

CKD BY	REV No.	DESCRIPTION	DATE

	NAME	DATE	SIGNED
Surveyed			
Designed			
Drawn	NP	04/19	
Checked			
Approved			

References

Original Scales @ A3: 1:750
Do Not Scale Dimensions
Date: 04/19
Drawing No: 21879-S9-CF1
Revision: 1

\\dc-fp1\Workingfiles\nparkinson\unionsquare.sltga.co.nz\Stage 9 Cut Fill Plan.dwg - Plotted: 23/04/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		1
Element			Date
Lot 185			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	2			
200	4			
300	4			
400	10			
500	15		(engineer controlled) FILL, sands, silt, some fine gravels	
600	20+		minor topsoil, mixed brown, moist	
700				
800				
900				
1000	16			
1100	12			
1200	10			
1300	7			
1400	10		Interbedded silty fine SANDS and fiine sandy SILTS,	
1500	12		light grey-brown, moist	
1600	6			
1700	17			
1800	18			
1900	20			
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		2
Element			Date
Lot 186			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	5			
200	6			
300	12			
400	20		(engineer controlled) FILL, sands, silt, some fine gravels	
500	20+		minor topsoil, mixed brown, moist	
600				
700				
800				
900				
1000	20+			
1100				
1200				
1300				
1400				
1500			Interbedded silty fine SANDS and fiine sandy SILTS,	
1600			light grey-brown, moist	
1700				
1800				
1900				
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		3
Element			Date
Lot 187			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	5			
200	6			
300	15			
400	20+			
500			(engineer controlled) FILL, sands, silt, some fine gravels	
600			minor topsoil, mixed brown, moist	
700				
800				
900				
1000	4			
1100	4			
1200	7		EOB @ 1100mm	
1300	7		Refusal - Gravels	
1400	8			
1500	10			
1600	9			
1700	8			
1800	8			
1900	8			
2000				
2100				
2200				
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm

2 No Ground water was detected

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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		4
Element			Date
Lot 188			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	3			
200	6			
300	15			
400	20+		____ Machine Augered to 900mm BGL___ FILL____?	
500				
600				
700				
800				
900				
1000	4			
1100	8			
1200	6			
1300	5			
1400	5			
1500	8			
1600	6			
1700	12			
1800	17			
1900	20+			
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm

2 No Ground water was detected

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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		5
Element			Date
Lot 189			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	5			
200	7			
300	16			
400	15		____ Machine Augered to 900mm BGL___ FILL____?	
500	16			
600	8			
700	9			
800	8			
900	12		SILT, creamy light brown, trace orange mottling, moist	
1000	5			
1100	6			
1200	6			
1300	9			
1400	8			
1500	4			
1600	5			
1700	5			
1800	5		SANDS, silt, light grey-brown, minor orange mottling, moist	
1900	7			
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		6
Element			Date
Lot 190			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	4			
200	20+			
300				
400			____ Machine Augered to 900mm BGL___ FILL____?	
500				
600				
700			(engineer controlled) FILL, Sands, silt, minor gravels	
800			mixed brown, moist	
900				
1000	8			
1100	6		minor topsoil at 1100mm	
1200	6			
1300	6			
1400	5			
1500	6		SILT, grey-brown, moist	
1600	4			
1700	4			
1800	4			
1900	4			
2000	0			
2100	0			
2200	2		SANDS, minor silt, grey-brown, moist	
2300	1			
2400	1			
2500	2			
2600	2			
2700	2		SILT, minor fine sands, light grey-brown, moist	
2800	2		becoming wet	
2900	3			
3000				
3100			EOB @ 3.0m	
3200			Target Depth	
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		7
Element			Date
Lot 191			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Sample / Temperature
100	3			
200	8			
300	20+			
400			____ Machine Augered to 900mm BGL___ FILL____?	
500				
600				
700				
800				
900				
1000	9		SILT, minor fine sands, creamy light-brown	
1100	7		trace orange mottling, moist	
1200	7			
1300	8			
1400	7			
1500	6			
1600	6			
1700	7			
1800	9		SANDS, silt, creamy light-brown, moist	
1900	8			
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		8
Element			Date
Lot 192			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	6			
200	6			
300	6			
400	20+			
500			____ Machine Augered to 900mm BGL___ FILL____?	
600				
700				
800				
900			SANDS, silt, creamy light-grey, moist	
1000	8			
1100	8			
1200	4			
1300	10			
1400	8		SILT, minor sands, grey, moist	
1500	8			
1600	9			
1700	7			
1800	6		SANDS, minor silt, grey-brown, wet	
1900	9			
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		9
Element			Date
Lot 193			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	3			
200	4			
300	6			
400	20+		____ Machine Augered to 900mm BGL___ FILL____?	
500				
600				
700				
800				
900				
1000	6		SILT, minor fine sands, creamy light brown	
1100	9		trace orange mottling, moist	
1200	7			
1300	6			
1400	7			
1500	7		SANDS, silt, creamy light brown, moist	
1600	6		becoming trace orange mottling	
1700	7		SANDS, silt, creamy light brown, moist	
1800	10			
1900	13			
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		10
Element			Date
Lot 194			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	4			
200	5			
300	20+			
400				
500			____ Machine Augered to 900mm BGL___ FILL____?	
600				
700				
800				
900			SANDS, some silt, light brown	
1000	7		trace orange staining, moist	
1100	6			
1200	5			
1300	4			
1400	3			
1500	4			
1600	5			
1700	3			
1800	2			
1900	3		Silty SANDS, grey, moist	
2000				
2100			EOB @ 2.0 m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		11
Element			Date
Lot 195			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	2			
200	4			
300	2		FILL, sands, silt, minor gravels, brown, moist	
400	2			
500	1			
600	3			
700	3			
800	3			
900	4			
1000			SANDS, silt, grey-brown, moist	
1100				
1200				
1300				
1400				
1500				
1600				
1700			Interbedded fine sandy SILT and silty SANDS	
1800			light grey-brown, moist	
1900				
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		12
Element			Date
Lot 196			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	4			
200	5			
300	11		FILL, sands, silt, minor gravels, brown, moist	
400	20+			
500				
600				
700				
800				
900				
1000			SANDS, silt, grey-brown, moist	
1100				
1200				
1300				
1400				
1500				
1600				
1700			Interbedded fine sandy SILT and silty SANDS	
1800			light grey-brown, moist	
1900				
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		13
Element			Date
Lot 197			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	7		Respread Topsoil, gravels	
200	7			
300	12			
400	20+			
500			SANDS, some silt, light brown, moist	
600				
700				
800		187 / 28	SILT, light yellow-brown, moist	
900				
1000				
1100				
1200			Interbedded silty fine SANDS and fine sandy SILTS	
1300			creamy light-brown, moist	
1400				
1500				
1600				
1700				
1800				
1900				
2000			Coarse SANDS, minor silt, grey-brown, moist	
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		14
Element			Date
Lot 198			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Sample / Temperature
100	10		Respread Topsoil, gravels	
200	8			
300	20			
400	15			
500	7		SANDS, minor silt, creamy light brown, moist	
600	4			
700	5			
800	2			
900	1			
1000	4			
1100	3		Interbedded silty fine SANDS and fine sandy SILTS,	
1200	2		creamy light yellow-brown,moist	
1300	2			
1400	2			
1500	3		grading to light grey	
1600	4		becoming wet	
1700	3			
1800	3			
1900	7		SANDS, some coarse pumiceous materials, dark brown	
2000			(organic staining), grading to grey, wet	
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		15
Element			Date
Lot 199			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	4		Respread Topsoil, gravels	
200	13			
300	6	UTP	SILT, minor sands, creamy light-brown, moist	
400	8			
500	9			
600	9	-	SANDS, minor silt, creamy light-brown, moist	
700	3			
800	2		SILT, creamy light brown	
900	4	193 / 19	minor orange mottling, moist	
1000				
1100				
1200				
1300				
1400			Interbedded silty fine SANDS and fine sandy SILT	
1500			creamy light-brown, minor orange mottling	
1600				
1700				
1800			minor organic staining 17001750mm (dark grey-brown)	
1900				
2000	3			
2100	5			
2200	4		SANDS, light grey-brown, moist	
2300	4			
2400	4		grading to grey	
2500	5		becoming minor pumiceous materials	
2600	4			
2700	6			
2800	6		becoming wet	
2900	7			
3000		Watertable		
3100			EOB @ 3.0m	
3200			Target Depth	
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 3.0m Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		16
Element			Date
Lot 200			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	4			
200	13		FILL, sands, silt, angular gravels, light-brown, moist	
300	14			
400	10			
500	4		Interbedded silty fine SANDS and fine sandy SILT	
600	6		creamy light-brown, moist	
700	5			
800	3			
900	3	79 / 16		
1000	4			
1100	4			
1200	2		SILT, minor fine sands, creamy light-brown, moist	
1300	2			
1400	1		some interbedded silty fine Sands	
1500	3			
1600	2			
1700	2			
1800	3			
1900	8		SANDS, silt, organic staining, dark grey-brown, wet	
2000			becoming minor silt, brown	
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		17
Element			Date
Lot 201			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	17			
200	20+		FILL, sands, silt, angular gravels, light-brown, moist	
300				
400				
500			SANDS, silt, light brown, moist	
600				
700				
800			some interbedded SILTS and fine sandy SILT	
900		139 / 19		
1000	4			
1100	3			
1200	6	130 / 19	SILT, minor fine sands, creamy light-brown, moist	
1300	7			
1400	4			
1500	2		becoming coarse Sands, minor silt	
1600	3		organic staining (dark grey-brown) 1500-1600mm	
1700	7		grading to brown, becoming minor fine gravels	
1800	9			
1900	7		grading to light grey	
2000				
2100			EOB @ 2.0 m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		18
Element			Date
Lot 202			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	20+			
200			FILL, silt, sands, some angular gravels	
300				
400				
500			Interbedded silty fine SANDS and fine sandy SILT	
600			creamy light-brown, moist	
700				
800				
900		155 / 9		
1000	3		SILT, minor fine sands, light-brown	
1100	6		trace orange-mottling, moist	
1200	7	95 / 12		
1300	5			
1400	4			
1500	3			
1600	3		SANDS, minor silt, creamy light-brown,	
1700	4		trace orange mottling, moist	
1800	6		becoming medium to coarse Sands, mixed browns	
1900	6		grading to light grey	
2000			becoming minor pumiceous materials, wet	
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		19
Element			Date
Lot 203			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	7			
200	11		FILL, silt, sands, some angular gravels	
300	20+			
400				
500				
600				
700			Silty SANDS, creamy light-brown, minor orange staining, moist	
800				
900				
1000	5			
1100	5			
1200	9	101 / 12		
1300	8		SILT, minor fine sands, light brown, minor orange mottling, moist	
1400	4			
1500	3		minor interbedded silty Sands	
1600	1			
1700	6			
1800	8		Silty fine SANDS, organic staining dark grey-brown	
1900	9		moist becoming wet	
2000			SANDS, minor silt, grey, wet	
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		20
Element			Date
Lot 204			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	7			
200	12		FILL, silt, sands, some angular gravels	
300	8			
400	4			
500	10			
600	8		SILT, some fine sands, light-brown, moist	
700	3			
800	3		some interbedded silty Sands	
900	5	165 / 16		
1000	4			
1100	3			
1200	3	98 / 19		
1300	5			
1400	3			
1500	3			
1600	3			
1700	8		SANDS, some silt, light grey-brown, moist	
1800	8		becoming minor silt	
1900	8		becoming mixed brown and orange-brown	
2000	3		Fine to medium SANDS, minor silt, grey-brown, moist	
2100	4		EOB @ 2.0m	
2200	4		Target Depth	
2300	3			
2400	4			
2500	4			
2600	5			
2700	5			
2800	6			
2900	4			
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		21
Element			Date
Lot 205			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Sample / Temperature
100	2		Respread Topsoil, gravels	
200	11			
300	10			
400	2			
500	2			
600	1		Silty SANDS, light grey-brown, moist	
700	1			
800	1		becoming minor interbedded sandy Silts	
900	4			
1000	3			
1100	2			
1200	2	161 / 35		
1300	1		SILT, creamy light-brown, trace orange mottling, moist	
1400	3			
1500	3			
1600	9			
1700	12		SANDS, minor silt, light grey-brown, moist	
1800	13			
1900	9		Fine to medium SANDS, minor silt, grey-brown, moist	
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		22
Element			Date
Lot 206			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	4			
200	4		Respread TOPSOIL, minor fine gravels	
300	4			
400	11		FILL, silt, sands, some gravels, brown, moist	
500	18			
600	14			
700	14			
800	14			
900	11		SANDS, silt, dark brown, moist	
1000	8			
1100	2			
1200	5	218+ / -	SILT, brown, moist	
1300	6			
1400	7			
1500	4		Silty fine SANDS, creamy brown, moist	
1600	4		becoming minor silt	
1700	4		becoming some orange staining	
1800	5			
1900	8			
2000			SILT, minor fine sands, light grey-brown, moist	
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		23
Element			Date
Lot 207			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	4			
200	8		Respread TOPSOIL, some angular gravels	
300	7			
400	20+			
500			____ Machine Auger _____?	
600				
700				
800				
900		152 / 9	SILT, minor fine sands, light grey-brown, moist	
1000	3			
1100	7			
1200	5			
1300	5			
1400	5			
1500	5		Silty SANDS, light grey-brown, moist	
1600	5			
1700	6		becoming some interbedded fine sandy Silts	
1800	7			
1900	5			
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		24
Element			Date
Lot 208			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	2		Respread TOPSOIL, some gravels	
200	6			
300	7			
400	13			
500	20+		____ Machine Auger _____?	
600				
700				
800				
900			SANDS, silt, brown, moist	
1000	4			
1100	4			
1200	6	218+ / -		
1300	2			
1400	2		SILT, light grey-brown, moist	
1500	3			
1600	3			
1700	4			
1800	4		SANDS, silt, light grey-brown, moist	
1900	9		becoming minor silt	
2000			grading to light grey	
2100			EOB @ 2.0 m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		25
Element			Date
Lot 209			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	5			
200	8		Respread TOPSOIL, some angular gravels	
300	3			
400	4			
500	13			
600	12		____ Machine Auger _____?	
700	9			
800	6			
900	5	104 / 13	SILT, trace fine sands, light grey-brown, moist	
1000	4			
1100	7			
1200	4	218+ / -		
1300	6			
1400	8			
1500	8			
1600	8		SANDS, silt, light grey-brown	
1700	7		trace orange mottling, moist	
1800	8		becoming minor silt, grading to dark brown	
1900	9		becoming wet	
2000	3			
2100	5		some interbedded Silt, light grey-brown	
2200	5			
2300	5		becoming trace silt	
2400	5			
2500	4			
2600	4			
2700	3		becoming some silt, grading to light grey-brown	
2800	2			
2900	3			
3000			becoming saturated	
3100			EOB @ 3.0m	
3200			Target Depth	
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		26
Element			Date
Lot 210			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	5			
200	5		Respread TOPSOIL, some angular gravels	
300	5			
400	13			
500	20+			
600			____ Machine Auger _____?	
700				
800				
900		108 / 13	SILT, minor sands, dark orange-brown, moist	
1000	2			
1100	2		grading to grey-brown	
1200	3	85 / 19		
1300	2			
1400	3		grading to light grey-brown, trace orange mottling	
1500	3			
1600	3			
1700	5			
1800	7		Fine SANDS, silt, creamy light-brown, moist to wet	
1900	6		becoming fine to medium Sands, light grey	
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		27
Element			Date
Lot 211			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	6			
200	7		Respread TOPSOIL, some angular gravels	
300	10			
400	8			
500	5		____ Machine Auger _____?	
600	4			
700	5			
800	4			
900	5		SANDS, trace silt, dark orange-brown, moist	
1000	4			
1100	4		grading to light grey-brown	
1200	5			
1300	4			
1400	4			
1500	3			
1600	3			
1700	4		becoming silty fine Sands, minor orange mottling	
1800	2			
1900	4			
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		28
Element			Date
Lot 212			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Sample / Temperature
100	5		Respread Topsoil, gravels	
200	4			
300	4			
400	8			
500	7		____ Machine Auger _____?	
600	8			
700	5			
800	7			
900	10			
1000	5		SANDS, silt, light grey, moist	
1100	7			
1200	5			
1300	4		SILT, minor fine sands, creamy light-brown, moist	
1400	4			
1500	4			
1600	4		Silty fine SANDS, creamy light brown, moist	
1700	4		becoming minor silt, some medium sands	
1800	3			
1900	4		some interbedded Silt with trace orange mottling	
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		29
Element			Date
Lot 213			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	5			
200	16		Respread TOPSOIL, minor fine gravels	
300	11			
400	11			
500	11		____ Machine Auger _____?	
600	5			
700	8			
800	10			
900	5		SILT, minor fine sands, cramy light grey, moist	
1000	5			
1100	8			
1200	6	139 / 9		
1300	4			
1400	4			
1500	4			
1600	6		SANDS, minor silt, light-grey, moist	
1700	6		some interbedded Silt, creamy light-brown	
1800	7			
1900	5			
2000			SILT, light-brown, moist	
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		30
Element			Date
Lot 214			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	4		Respread TOPSOIL, minor fine gravels	
200	7			
300	5			
400	20+			
500				
600			(engineer controlled) FILL, sands, silt, some gravels	
700			minor topsoil, mixed dark-brown, moist	
800				
900				
1000	6			
1100	4			
1200	6	212 / 28		
1300	4		SILT, trace fine sands, light grey, moist	
1400	7			
1500	8			
1600	7		SANDS, silt, light brown trace orange mottling, moist	
1700	4		some interbedded fine sandy Silt	
1800	7			
1900	8		SILT, minor sands, light grey-brown,	
2000			trace orange mottling, moist	
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		31
Element			Date
Lot 215			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	2			
200	7		Respread TOPSOIL, minor fine gravels	
300	20+			
400				
500				
600			(engineer controlled) FILL, sands, silt, some gravels	
700			minor topsoil, mixed dark-brown, moist	
800				
900				
1000	8			
1100	8		EOB @ 1000mm	
1200	5		Refusal - Gravels	
1300	3			
1400	4			
1500	5			
1600	5			
1700	5			
1800	5			
1900	6			
2000				
2100				
2200				
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		32
Element			Date
Lot 216			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	5			
200	4			
300	11			
400	20+			
500				
600				
700			(engineer controlled) FILL, sands, silt, minor angular gravels	
800			mixed brown, moist	
900		155 / 9		
1000	12			
1100	7			
1200	7	95 / 12	minor topsoil at 1200mm	
1300	5			
1400	5		SANDS, silt, creamy light-brown	
1500	3		minor orange mottling, moist	
1600	4		becoming interbedded Silts	
1700	4		1500-1600mm organic staining - dark grey-brown	
1800	6			
1900	9			
2000	3		SILT, minor fine sands, light grey-brown, moist	
2100	3			
2200	3			
2300	4			
2400	4		SANDS, some silt, light-grey, moist	
2500	4			
2600	5			
2700	6			
2800	3		becoming coarse Sands, some pumiceous materials	
2900	1			
3000			becoming silty Sands	
3100				
3200			Organic SILT, dark grey, wet	
3300				
3400			Silty SANDS, dark grey, wet	
3500			EOB @ 3400mm	

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		33
Element			Date
Lot 217			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	7			
200	8		FILL, silt, sands, some angular gravels	
300	5			
400	5			
500	9			
600	16			
700	20+		(engineer controlled) FILL, sands, silt, trace topsoil	
800			mixed dark brown, moist	
900				
1000	5			
1100	6			
1200	5	152 / 9	SILT, trace fine sands, light grey-brown, moist	
1300	6			
1400	4			
1500	6		SANDS, some silt, creamy light-brown, moist	
1600	4			
1700	4			
1800	6			
1900	7			
2000			SILT, trace fine sands, light grey-brown, moist	
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		34
Element			Date
Lot 218			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	4			
200	5		FILL, silt, sands, some angular gravels	
300	6			
400	6			
500	14			
600	11			
700	8		(engineer controlled) FILL, sands, silt, trace topsoil	
800	8		mixed dark brown, moist	
900	11			
1000	9			
1100	11			
1200	10			
1300	6			
1400	5		SILT, minor fine sands, light-brown some orange mottling, moist	
1500	5			
1600	6			
1700	6			
1800	6		SANDS, silt, light yellow-brown, moist	
1900	9			
2000	4			
2100	4		becoming some interbedded fine sandy Silts	
2200	10		creamy light-brown minor orange mottles	
2300	8			
2400	6			
2500	5			
2600	8		2600-2700mm, some organic staining - dark grey-brown	
2700	6			
2800	7			
2900	7		SILT, minor fine sands, light grey, moist	
3000				
3100			2900-3000mm, some interbedded Sands,	
3200				
3300			EOB @ 3200mm	
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		35
Element			Date
Lot 219			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Sample / Temperature
100	5		Respread Topsoil, gravels	
200	5			
300	4			
400	20+			
500				
600				
700				
800			(engineer controlled) FILL, sands, silt, minor angular gravels	
900			mixed brown, moist	
1000	8			
1100	12			
1200	5			
1300	5		some topsoil	
1400	4			
1500	4			
1600	4			
1700	4		SILT, grey-brown, moist	
1800	6		becoming minor fine sands, trace orange mottling	
1900	7			
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm

2 No Ground water was detected

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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		36
Element			Date
Lot 220			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	4			
200	5		Respread TOPSOIL, minor fine gravels	
300	4			
400	8			
500	12			
600	14		(engineer controlled) FILL, silt, sands, minor topsoil, mixed brown, moist	
700	12			
800	11			
900	12			
1000	10		minor fine to medium gravels	
1100	9			
1200	15		SILT, dark brown, moist	
1300	8		grading to light brown	
1400	9			
1500	10			
1600	9		Silty fine SANDS, creamy light-grey, moist	
1700	7			
1800	14		becoming some interbedded fine sandy Silt	
1900	15		becoming trace orange mottling	
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		37
Element			Date
Lot 221			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	4		Respread TOPSOIL, minor fine gravels	
200	5			
300	4			
400	10			
500	18			
600	20+			
700			(engineer controlled) FILL, silt, sands, minor topsoil, mixed brown, moist	
800				
900				
1000	5			
1100	6			
1200	4			
1300	7		buried wood fragments retrieved	
1400	6			
1500	5		SILT, light grey-brown trace orange mottling, moist	
1600	5			
1700	5			
1800	7		SANDS, silt, light grey-brown trace orange mottling, moist	
1900	6		some interbeded fine sandy Silt	
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		38
Element			Date
Lot 222			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	0			
200	5		Respread TOPSOIL, minor fine gravels	
300	4			
400	12			
500	14			
600	15		(engineer controlled) FILL, silt, sands, minor topsoil, mixed brown, moist	
700	8			
800	10			
900	10			
1000	3			
1100	2	UTP	some topsoil	
1200	3			
1300	4		SILT, trace fine sands, light grey-brown, moist	
1400	3			
1500	3		becoming minor fine sands, trace orange mottling	
1600	4			
1700	6			
1800	10		Silty fine SANDS, light grey-brown trace mottling, moist	
1900	10			
2000			SILT, minor fine sands, light grey-brown, moist to wet	
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		39
Element			Date
Lot 223			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	8			
200	5			
300	7			
400	14			
500	20+			
600			____ Machine Auger _____?	
700				
800				
900		218+ / -	SILT, creamy light brown, moist	
1000	5			
1100	3		becoming minor fine sands	
1200	4	149 / 13		
1300	3			
1400	4			
1500	4			
1600	3			
1700	4		Silty fine SANDS, creamy light-brown, moist	
1800	5			
1900	5		some interbedded fine sand Silt, becoming trace orange mottling	
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		40
Element			Date
Lot 224			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	4			
200	4		FILL, silt, sands, some angular gravels	
300	5			
400	4			
500	6			
600	15		____ Machine Auger _____?	
700	10			
800	4			
900	5		Silty fine SANDS, creamy light grey, moist	
1000	6	104 / 19		
1100	6			
1200	4	133 / 16		
1300	5		SILT, minor fine sands, light grey-brown, moist	
1400	4			
1500	4			
1600	3		becoming trace orange mottling	
1700	3			
1800	6			
1900	6			
2000			Silty fine SANDS, light grey-brown, moist	
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		41
Element			Date
Lot 225			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	4			
200	5		FILL, silt, sands, some angular gravels	
300	20+			
400				
500				
600				
700			____ Machine Auger _____?	
800				
900			Silty fine SANDS, creamy light grey-brown, moist	
1000	10			
1100	9			
1200	7			
1300	7			
1400	6		SANDS, minor silt, some pumiceous materials, light grey, moist	
1500	5			
1600	5		becoming trace silt	
1700	3			
1800	4		becoming trace orange mottling, trace fine gravels	
1900	6			
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		42
Element			Date
Lot 226			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Sample / Temperature
100	2		Respread Topsoil, gravels	
200	6			
300	5			
400	6			
500	20+		____ Machine Auger _____?	
600				
700				
800				
900				
1000	9		SILT, trace fine sands, light grey-brown, moist	
1100	6			
1200	2	187 / 28		
1300	2			
1400	4			
1500	4			
1600	6		Silty fine SANDS, light grey-brown minor orange mottling, moist	
1700	4			
1800	15			
1900	13		SANDS, minor silt, light grey-brown, moist	
2000			grading to dark grey-brown (organic staining)	
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		43
Element			Date
Lot 227			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	4			
200	5		Respread TOPSOIL, minor fine gravels	
300	5			
400	11			
500	20+		____ Machine Auger _____?	
600				
700				
800				
900		95 / 13		
1000	3		SILT, trace fine sands, grey-brown, minor orange mottling, moist	
1100	2			
1200	2	82 / 16		
1300	2			
1400	3			
1500	3			
1600	3			
1700	6			
1800	7		SANDS, minor silt, grey-brown, moist	
1900	9		becoming trace silt, minor orange mottling	
2000			becoming minor fine gravels	
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		44
Element			Date
Lot 228			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	4		Respread TOPSOIL, minor fine gravels	
200	5			
300	4			
400	10			
500	8		____ Machine Auger _____?	
600	10			
700	9			
800	9			
900	4		SILT, some fine sands, light grey-brown, minor orange mottling, moist	
1000	3			
1100	3			
1200	3	89 / 16		
1300	3			
1400	3			
1500	3			
1600	6			
1700	7			
1800	10		SANDS, some silt, light grey-brown, moist	
1900	9		becoming trace silt	
2000			becoming minor fine gravels	
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		45
Element			Date
Lot 229			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	7			
200	5		Respread TOPSOIL, minor fine gravels	
300	10			
400	10			
500	10			
600	7		____ Machine Auger _____?	
700	4			
800	3			
900	4			
1000	3		SILT, some sands, creamy light grey-brown	
1100	2		minor orange mottling, moist	
1200	2			
1300	2			
1400	3			
1500	7			
1600	20+			
1700			SANDS, some silt, grey-brown, moist	
1800			becoming minor silt	
1900			becoming trace fine gravels and pumiceous materials	
2000	9			
2100	7		grading to grey	
2200	8			
2300	4			
2400	5			
2500	4			
2600	4			
2700	5		becoming coarse Sands, some fine pumiceous materials	
2800	6			
2900	7			
3000				
3100			EOB @ 3.0m	
3200			Target Depth	
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		46
Element			Date
Lot 230			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	5			
200	4		Respread Topsoil, some gravels	
300	4			
400	6			
500	4			
600	3		____ Machine Auger _____?	
700	6			
800	7			
900	4	76 / 13	SILT, trace fine sands, light grey-brown	
1000	2		minor orange mottling, moist	
1100	3			
1200	3	114 / 19		
1300	2			
1400	2			
1500	3			
1600	3			
1700	3		becoming minor fine Sands	
1800	5			
1900	5			
2000			SANDS, minor silt, dark grey-brown, moist becoming wet	
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		47
Element			Date
Lot 231			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	4			
200	4		FILL, silt, sands, some angular gravels	
300	9			
400	10			
500	6			
600	4		____ Machine Auger _____?	
700	5			
800	4			
900	3		SILT, organic staining, minor fibrous roots	
1000	4		dark brown, moist	
1100	2		grading to light grey-brown, minor orange mottling	
1200	2			
1300	3			
1400	4			
1500	3			
1600	3		becoming minor fine Sands	
1700	8			
1800	11		SANDS, minor silt, dark grey-brown, moist	
1900	11		becoming trace fine gravels, grading to light grey	
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		48
Element			Date
Lot 232			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	2			
200	4		FILL, silt, sands, some angular gravels	
300	5			
400	5			
500	9			
600	10			
700	5		____ Machine Auger _____?	
800	4			
900	3	117 / 19		
1000	4		SILT, grey-brown, moist	
1100	3			
1200	3	104 / 6		
1300	3		becoming some fine sands	
1400	4			
1500	3			
1600	4			
1700	3			
1800	6		SANDS, silt, grey-brown, moist becoming wet	
1900	10		minor orange mottling	
2000				
2100				
2200				
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		49
Element			Date
Lot 233			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Sample / Temperature
100	8		Respread Topsoil, gravels	
200	9			
300	6			
400	8			
500	8		____ Machine Auger _____?	
600	12			
700	9			
800	9			
900	5	152 / 9	SILT, dark grey-brown, moist	
1000	5			
1100	3		grading to light grey-brown trace orange mottling	
1200	3	101 / 9		
1300	3		becoming minor fine Sands	
1400	4			
1500	3			
1600	3			
1700	3			
1800	3			
1900	6		SANDS, minor silt, light grey-brown minor orange mottling, moist	
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		50
Element			Date
Lot 234			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	5			
200	4		Respread TOPSOIL, minor fine gravels	
300	6			
400	20+			
500			____ Machine Auger _____?	
600				
700				
800				
900		165 / 13	SILT, dark orange-brown, moist	
1000	3			
1100	2			
1200	2	123 / 6		
1300	3			
1400	4		Silty fine SANDS, light-brown, moist	
1500	4			
1600	6			
1700	7			
1800	7		SANDS, trace silt, light grey-yellow, moist	
1900	7			
2000	3			
2100	3			
2200	0			
2300	1			
2400	0			
2500	2		SILT, minor sands, grey-brown, moist to wet	
2600	2		becoming organic staining (dark grey-brown)	
2700	2			
2800	2		2700-2800mm, organic Silt, dark brown	
2900	2		grading to grey	
3000				
3100			EOB @ 3.0m	
3200			Target Depth	
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		51
Element			Date
Lot 235			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	2		Respread TOPSOIL, minor fine gravels	
200	3			
300	5			
400	9			
500	14			
600	13		FILL, silt, sands, angular gravels, mixed brown, moist	
700	12			
800	12			
900	8			
1000	6			
1100	6			
1200	7			
1300	8			
1400	20			
1500	20+			
1600			SANDS, fine to medium gravels, mixed greys, moist	
1700				
1800				
1900			EOB @ 1800mm	
2000			Refusal - Gravels	
2100				
2200				
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		52
Element			Date
Lot 236			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	3			
200	5		Respread TOPSOIL, minor fine gravels	
300	5			
400	16			
500	11			
600	17		____ Machine Auger _____?	
700	13			
800	5			
900	4	174 / 13	SILT, grey-brown trace orange mottling, moist	
1000	3			
1100	5			
1200	5	161 / 9	becoming minor fine sands	
1300	6			
1400	5			
1500	4		becoming trace orange mottling	
1600	4			
1700	4			
1800	6			
1900	6		Silty fine SANDS, light grey-brown	
2000			trace orange mottling, moist becoming wet	
2100				
2200				
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		53
Element			Date
Lot 237			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	9			
200	7		Respread TOPSOIL, minor fine gravels	
300	5			
400	12			
500	18			
600	13			
700	12			
800	11		(engineer controlled) FILL, silt,sands, some angular gravels	
900	9		mixed brown and orange-brown, moist	
1000	12			
1100	14			
1200	12			
1300	12			
1400	8			
1500	5			
1600	4			
1700	4			
1800	10			
1900	11		SILT, minor fine sands, creamy light-brown, moist	
2000	6			
2100	7		trace orange mottling	
2200	6			
2300	8			
2400	11			
2500	10		Silty SANDS, light grey-brown, trace orange mottling, moist	
2600	3		grading to grey, becoming minor silt	
2700	2			
2800	2			
2900	3		Organic SILT, dark brown, moist becoming wet	
3000				
3100			Silty SANDS, grey, wet	
3200				
3300			EOB @ 3200mm	
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		54
Element			Date
Lot 238			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	3			
200	4		FILL, silt, sands, some angular gravels	
300	6			
400	20+			
500				
600				
700			(engineer controlled) FILL, silt, sands, minor fine gravels	
800			mixed brown, moist	
900				
1000	4			
1100	4			
1200	3	152 / 19		
1300	3			
1400	2			
1500	3			
1600	3		SILT, creamy grey-brown, moist	
1700	4		becoming some fine Sands, trace orange mottling	
1800	5			
1900	7			
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		55
Element			Date
Lot 239			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	13			
200	8		FILL, silt, sands, some angular gravels	
300	5			
400	16			
500	20+			
600				
700			(engineer controlled) FILL, sands, silt, minor gravels	
800			minor topsoil, mixed brown, moist	
900				
1000	4			
1100	4			
1200	9			
1300	8			
1400	6			
1500	5		SILT, minor fine sands, light grey-brown, moist	
1600	5		becoming minor orange mottling	
1700	6		becoming some interbedded silty fine Sands	
1800	8			
1900	7			
2000				
2100			EOB @2.0m	
2200			Target Depth	
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		56
Element			Date
Lot 240			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Sample / Temperature
100	4		Respread Topsoil, gravels	
200	3			
300	4			
400	8			
500	12			
600	11		(engineer controlled) FILL, silt, sands, minor topsoil	
700	10		mixed brown, moist	
800	9			
900	10			
1000	10			
1100	7			
1200	4	130 / 13	SILT, minor fine sands, light grey-brown, moist	
1300	3			
1400	4			
1500	4			
1600	4			
1700	5		SANDS, silt, grey-brown minor orange mottling, moist	
1800	7			
1900	7			
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm

2 No Ground water was detected

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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		57
Element			Date
Lot 241			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	8			
200	7		Respread TOPSOIL, minor fine gravels	
300	8			
400	20			
500	20+		____ Machine Auger _____?	
600				
700				
800				
900				
1000	4			
1100	5			
1200	5			
1300	4			
1400	6			
1500	4			
1600	6			
1700	8			
1800	10			
1900	7			
2000				
2100			EOB @ 2.0m	
2200			Target Depth	
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

DB CONSULTING ENGINEERS

0800 23 22 66

www.dbcon.co.nz

Project			Job ref
Subdiv. Completion Test Reporting, Area M Stage 9 Greenhill Park			171738.08
Drawing ref	calculations by	revision	sheet no
	Get Geotech		58
Element			Date
Lot 242			Feb-19

Depth	Scala (blows/100mm)	Shear Vane (kPa)	Soil Description	Percolation Test
100	2		Respread TOPSOIL, minor fine gravels	
200	5			
300	5			
400	6			
500	13			
600	15			
700	10		(engineer controlled) FILL, sands, silt, some fine gravels	
800	10		minor topsoil, mixed brown, moist	
900	9			
1000	12			
1100	11			
1200	7			
1300	7		grading to orange-brown	
1400	8		some coarse Sands, fine to medium gravels	
1500	5			
1600	6			
1700	4		EOB @ 1600mm	
1800	6		Refusal - Gravels	
1900	9			
2000				
2100				
2200				
2300				
2400				
2500			UTP *Unable To Penetrate*	
2600				
2700				
2800				
2900				
3000				
3100				
3200				
3300				
3400				
3500				

Notes:

1 Weather was fine and warm
2 No Ground water was detected
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 S/No. 2086, Cert. No. 712289, Calibration date 04/02/2019

Appendix V *Stormwater Management*
On-lot Water Efficiency Measures
Lot Levels (Minimum Lot Levels)

ON-LOT WATER EFFICIENCY MEASURES

WATER SUPPLY AND WASTEWATER DISPOSAL

The efficiency of taps, showers and toilets contribute to how much water we use. A reduction in the use of potable water by each house directly relates to the amount of wastewater generated (i.e. reduced water use results in reduced wastewater generation). To reduce potable water demand and the amount of wastewater generated, as a minimum, each house is required to install low demand fittings for kitchen, bathroom and laundry facilities.

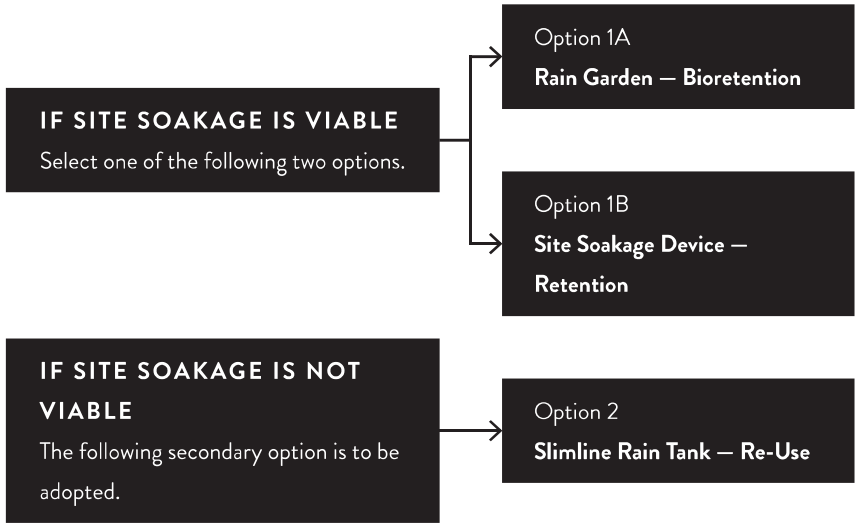
All household fittings are required to have a minimum 3 Star Rating.

STORMWATER DISPOSAL

Each lot is required to adopt an on-lot stormwater efficiency measure to ensure that surface water runoff is appropriately managed.

First, the suitability of the site for soakage needs to be assessed. Soakage is the process of helping stormwater soak into the ground using specially designed soakage devices. Soakage allows for the infiltration of stormwater into the soil which recharges the groundwater table below.

A site infiltration test is mandatory for all lots to confirm the in-situ soils are capable of achieving the minimum percolation rates. Refer to Hamilton City Council 'Three Waters Practice Note HCC 03: Soakage' for guidance on soil testing.



* Other alternative stormwater efficiency options will also be considered subject to approval by Greenhill Park and Hamilton City Council.

The selected option is to be designed by a suitably qualified Engineer and approved by the Hamilton City Council Building Control Unit. Refer to page 33 to 36 of these guidelines for further information of the design requirements for Options 1A, 1B & 2.

Hamilton City Council also encourages the installation of multiple stormwater efficiency options within a property, where practical.

Option 1A

RAIN GARDEN — BIORETENTION

Design to provide minimum 'live storage' retention for runoff from a 10mm rainfall event for trafficked hardstand areas.

The following table outlines indicative storage volumes and estimated rain garden areas for a range of lot sizes.

Lot Area (m^2)	**Live Storage Volume** (m^3)	**Rain Garden Area** (m^2)
300	0.8	4.1
350	0.9	4.7
400	1.1	5.4
450	1.2	6.1
500	1.4	6.8
550	1.5	7.4

Based on hardstand coverage equal to 30% of total lot area

KEY REQUIREMENTS

- Rain garden to be located to capture runoff from main hardstand areas within the lot (as much as practical).
- Maximum live storage depth to be 300mm (safety requirements to be considered when device is at maximum storage capacity).
- A channel and grate to be installed across vehicle entrance to capture hardstand run off and direct it to rain garden.
- Rain garden to be integrated with garden design (refer to page 34 for details).
- Overflow to be connected to stormwater connection provided.

FOR MORE INFORMATION

Refer to Hamilton City Council 'Three Waters Practice Note — HCC04 — Bio-retention (Rain Gardens)' for information on typical design requirements.

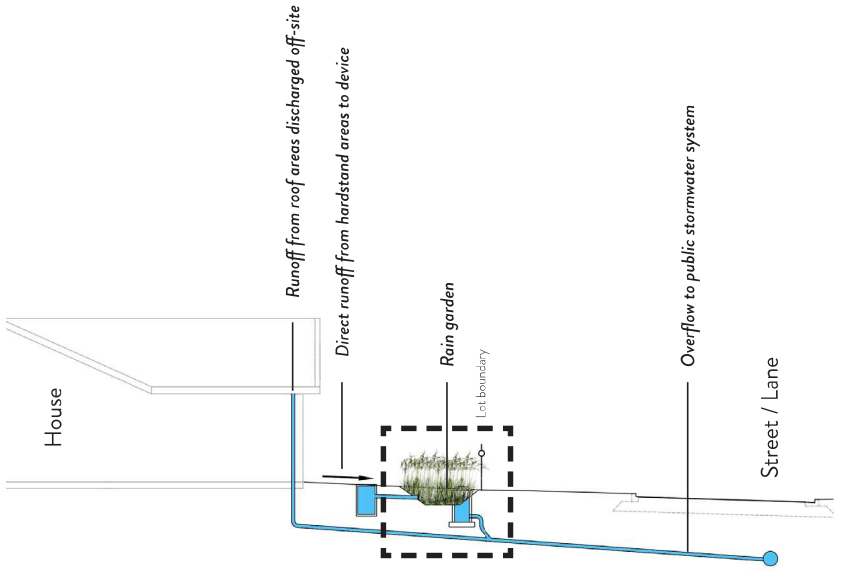


DIAGRAM — **7**
Rain Garden — Bioretention

GREENHILL PARK RAIN GARDEN PLANT LIST

Native plants are encouraged, but other exotic plant species which complement your front yard planting design could be used. Deciduous plants should not be used as their leaf-fall can block the outflow.

The plants selected need to —

- Be able to tolerate short periods of inundation and longer dry periods
- Be perennial rather than annual
- Have deep fibrous root systems and a spreading growth form
- Form a dense, weed-suppressing cover

Botanical Name	**Common Name**
Apodasmia similis	oioi
Blechnum penna-marina	alpine hard fern
Libertia ixioides	mikoikoi
Carex dipsacea	teasel sedge
Carex secta	purei
Carex virgata	pukio
Dianella nigra	turutu
Libertia grandiflora	mikoikoi
Lobelia angulata	panakenake
Pimelea prostrata	pinatoro

All rain garden plants to be a minimum grade of Pb 8 at the time of planting. * Other plant species can be approved at the discretion of the Design Review Panel.

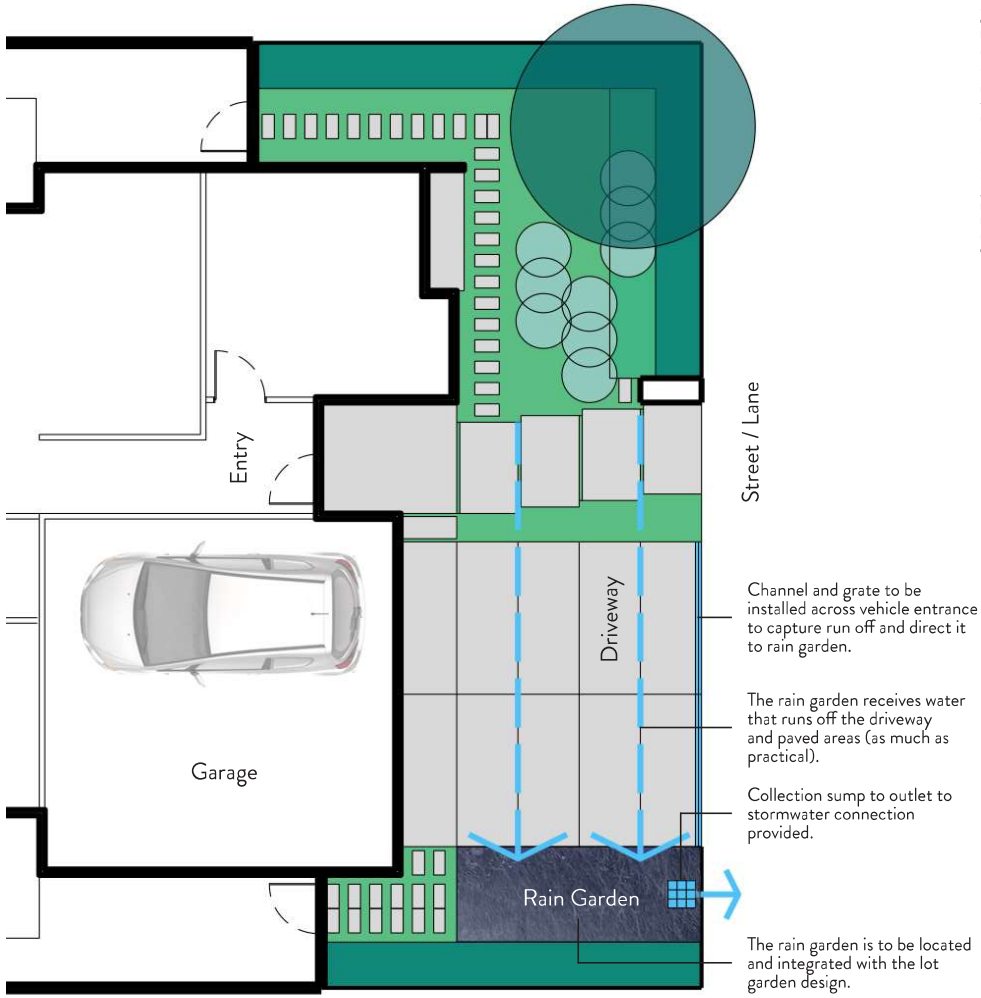


DIAGRAM — **8**

Rain Garden Typical Location

Option 1B

SITE SOAKAGE DEVICE – RETENTION

Design to provide minimum 'live storage' retention for runoff from a 10mm rainfall event for roof and trafficked hardstand areas.

The following table outlines indicative storage volumes for a range of lot sizes.

Lot Area (m^2)	**Live Storage Volume** (m^3)
300	2.2
350	2.6
400	3.0
450	3.4
500	3.7
550	4.1

Based on 80% site coverage (roof and hardstand areas)

KEY REQUIREMENTS

- Soakage device(s) to be located to capture runoff from roof downpipes and hardstand areas (as much as practical).
- A channel and grate to be installed across vehicle entrance to capture hardstand run off and direct it to soakage device.
- Soakage device to be integrated with garden design.
- Overflow to be connected to stormwater connection provided.

FOR MORE INFORMATION

Refer to Hamilton City Council 'Three Waters Practice Note HCC 03: Soakage' for information on typical design requirements.

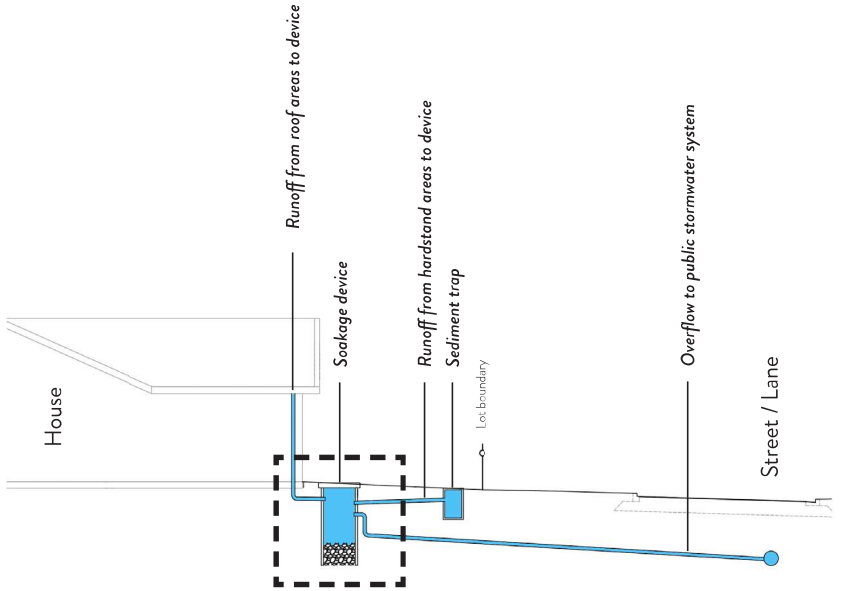


DIAGRAM – **9**
Site Soakage Device – Retention

Option 2

SLIMLINE RAIN TANK — RE-USE

The slimline rain tank is to be connected to a separate grey-water household re-use system with a minimum capacity of 5,000L.

KEY REQUIREMENTS

- Rain tank to be connected into a fully integrated grey-water re-use system within the main dwelling with connections to toilets, laundry and irrigation systems.
- All roof run-off is to be captured by rain tanks and available for re-use. Run-off from hardstand areas (driveways and paving) can be discharged directly into stormwater connection provided.
- A maximum of two (2) tanks may be used to achieve the required storage and align with downpipe locations.
- Overflow to be connected to stormwater connection provided.

LOCATION AND INSTALLATION

Slimline rain tanks should be placed in the rear or side yard of the lot as unobtrusively as possible. Care should be taken, where tanks are placed next to the house, to ensure they are placed adjacent to a blank wall and not infront of a window.

COLOUR

The colour of all rain tanks should match the colour of the homes exterior wall cladding adjacent to the tank.

* Colours that do not match but are complementary to the design and materials of the house can be approved at the discretion of the Design Review Panel.

FOR MORE INFORMATION

Refer to Hamilton City Council 'Three Waters Practice Note — HCC02 —Rainwater Re-use Systems (Rain Tanks)' for information on design requirements.

APPROVED RAIN TANK PRODUCTS

Tanksalot® Slimline Tank www.tanksalot.co.nz

ThinTanks™ NZ Slimline Rainwater Poly Tank www.thintanks.co.nz

* Other rain tank products will also be considered subject to approval by Greenhill Park.

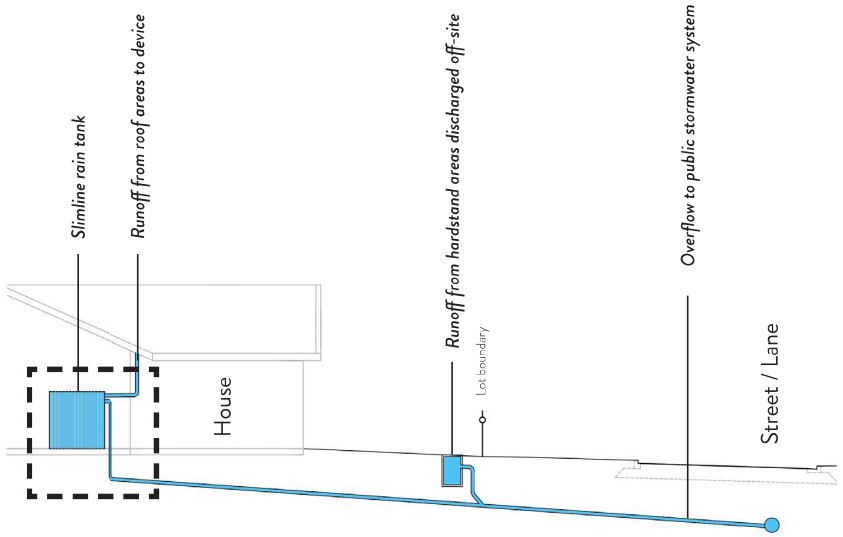


DIAGRAM — **10**

Slimline Rain Tank — Re-use

Lot Levels Area M

Lot	Stage	Minimum Lot Level (mRL)	1% AEP Flood Level (mRL)	Flood Level Reference	Calculated Freeboard (to Lot Level)
185	9	37.700	36.10	Swale 4A	1.600
186	9	37.600	36.10	Swale 4A	1.500
187	9	37.474	36.10	Swale 4A	1.374
188	9	37.393	36.10	Swale 4A	1.293
189	9	37.320	36.10	Swale 4A	1.220
190	9	37.246	36.10	Swale 4A	1.146
191	9	37.172	36.10	Swale 4A	1.072
192	9	37.090	36.10	Swale 4A	0.990
193	9	37.000	36.10	Swale 4A	0.900
194	9	36.800	36.10	Swale 4A	0.700
195	9	36.610	36.10	Swale 4A	0.510
196	9	36.850	36.10	Swale 4A	0.750
197	9	36.790	36.10	Swale 4A	0.690
198	9	36.842	36.10	Swale 4A	0.742
199	9	36.380	36.10	Swale 4A	0.280
200	9	36.452	36.10	Swale 4A	0.352
201	9	36.538	36.10	Swale 4A	0.438
202	9	36.596	36.10	Swale 4A	0.496
203	9	36.598	36.10	Swale 4A	0.498
204	9	36.600	36.10	Swale 4A	0.500
205	9	36.605	36.10	Swale 4A	0.505
206	9	37.710	36.10	Swale 4A	1.610
207	9	37.077	36.10	Swale 4A	0.977
208	9	37.140	36.10	Swale 4A	1.040
209	9	37.215	36.10	Swale 4A	1.115
210	9	37.289	36.10	Swale 4A	1.189
211	9	37.363	36.10	Swale 4A	1.263
212	9	37.437	36.10	Swale 4A	1.337
213	9	37.512	36.10	Swale 4A	1.412
214	9	37.586	36.10	Swale 4A	1.486
215	9	37.649	36.10	Swale 4A	1.549
216	9	37.714	36.10	Swale 4A	1.614
217	9	37.787	36.40	Swale 3A	1.387
218	9	37.750	36.40	Swale 3A	1.350
219	9	37.653	36.10	Swale 4A	1.553
220	9	37.569	36.10	Swale 4A	1.469
221	9	37.485	36.10	Swale 4A	1.385
222	9	37.391	36.10	Swale 4A	1.291

Lot	Stage	Minimum Lot Level (mRL)	1% AEP Flood Level (mRL)	Flood Level Reference	Calculated Freeboard (to Lot Level)
223	9	37.294	36.10	Swale 4A	1.194
224	9	37.196	36.10	Swale 4A	1.096
225	9	37.100	36.10	Swale 4A	1.000
226	9	37.000	36.10	Swale 4A	0.900
227	9	36.900	36.10	Swale 4A	0.800
228	9	36.814	36.10	Swale 4A	0.714
229	9	36.710	36.10	Swale 4A	0.610
230	9	36.986	36.10	Swale 4A	0.886
231	9	37.133	36.10	Swale 4A	1.033
232	9	37.143	36.10	Swale 4A	1.043
233	9	37.218	36.10	Swale 4A	1.118
234	9	37.292	36.10	Swale 4A	1.192
235	9	37.366	36.10	Swale 4A	1.266
236	9	37.440	36.10	Swale 4A	1.340
237	9	37.514	36.10	Swale 4A	1.414
238	9	37.586	36.10	Swale 4A	1.486
239	9	37.650	36.10	Swale 4A	1.550
240	9	37.713	36.10	Swale 4A	1.613
241	9	37.788	36.40	Swale 3A	1.388
242	9	37.941	36.40	Swale 3A	1.541
243	10	37.713	36.46	Swale 3B	1.253
244	10	37.586	36.46	Swale 3B	1.126
245	10	37.531	36.10	Swale 4A	1.431
246	10	37.483	36.10	Swale 4A	1.383
247	10	37.435	36.10	Swale 4A	1.335
248	10	37.379	36.10	Swale 4A	1.279
249	10	37.323	36.10	Swale 4A	1.223
250	10	37.267	36.10	Swale 4A	1.167
251	10	37.211	36.10	Swale 4A	1.111
252	10	37.155	36.10	Swale 4A	1.055
253	10	37.100	36.10	Swale 4A	1.000
254	10	37.090	36.10	Swale 4A	0.990
255	10	37.155	36.10	Swale 4A	1.055
256	10	36.610	36.10	Swale 4A	0.510
257	10	36.617	36.10	Swale 4A	0.517
258	10	36.623	36.10	Swale 4A	0.523
259	10	36.629	36.10	Swale 4A	0.529
260	10	36.634	36.10	Swale 4A	0.534
261	10	36.640	36.10	Swale 4A	0.540
262	10	36.645	36.10	Swale 4A	0.545
263	10	36.650	36.10	Swale 4A	0.550

Lot	Stage	Minimum Lot Level (mRL)	1% AEP Flood Level (mRL)	Flood Level Reference	Calculated Freeboard (to Lot Level)
264	10	36.886	36.10	Swale 4A	0.786
265	10	37.109	36.10	Swale 4A	1.009
266	10	37.216	36.10	Swale 4A	1.116
267	10	37.322	36.10	Swale 4A	1.222
268	10	37.428	36.10	Swale 4A	1.328
269	10	37.535	36.10	Swale 4A	1.435
270	10	37.650	36.10	Swale 4A	1.550
271	10	37.587	36.10	Swale 4A	1.487
272	10	37.410	36.10	Swale 4A	1.310
273	10	37.347	36.10	Swale 4A	1.247
274	10	37.298	36.10	Swale 4A	1.198
275	10	37.251	36.10	Swale 4A	1.151
276	10	37.197	36.10	Swale 4A	1.097
277	10	37.034	36.10	Swale 4A	0.934
278	10	37.005	36.10	Swale 4A	0.905
279	10	37.660	36.10	Swale 4A	1.560
280	10	37.763	36.10	Swale 4A	1.663
281	10	37.576	36.10	Swale 4A	1.476
282	10	37.627	36.10	Swale 4A	1.527
283	10	37.683	36.10	Swale 4A	1.583
284	10	37.739	36.46	Swale 3B	1.279
285	10	37.777	36.46	Swale 3B	1.317
286	10	37.630	36.46	Swale 3B	1.170
287	11	38.161	36.46	Swale 3B	1.701
288	11	38.150	36.46	Swale 3B	1.690
289	11	38.218	36.40	Swale 3A	1.818
290	11	38.178	36.40	Swale 3A	1.778
291	11	38.139	36.40	Swale 3A	1.739
292	11	38.095	36.40	Swale 3A	1.695
293	11	38.054	36.40	Swale 3A	1.654
294	11	38.000	36.40	Swale 3A	1.600
295	11	38.456	36.40	Swale 3A	2.056
296	11	38.464	36.40	Swale 3A	2.064
297	11	38.168	36.40	Swale 3A	1.768
298	11	38.061	37.24	Swale 1	0.821
299	11	38.252	37.24	Swale 1	1.012
300	11	38.534	36.40	Swale 3A	2.134
301	11	38.826	36.40	Swale 3A	2.426
302	11	38.964	36.40	Swale 3A	2.564
303	11	39.081	36.40	Swale 3A	2.616
304	11	39.020	36.40	Swale 3A	2.669

Lot	Stage	Minimum Lot Level (mRL)	1% AEP Flood Level (mRL)	Flood Level Reference	Calculated Freeboard (to Lot Level)
305	11	38.948	36.40	Swale 3A	2.722
306	11	38.878	36.40	Swale 3A	2.774
307	11	38.806	36.40	Swale 3A	2.826
308	11	38.737	36.40	Swale 3A	2.770
309	11	38.678	36.40	Swale 3A	2.278
310	11	38.662	36.40	Swale 3A	2.262
311	11	38.365	36.40	Swale 3A	1.965
312	11	38.467	36.40	Swale 3A	2.067
313	11	38.557	36.40	Swale 3A	2.157
314	11	38.648	36.40	Swale 3A	2.248
315	11	38.744	36.40	Swale 3A	2.344
316	11	38.841	36.40	Swale 3A	2.441
317	11	38.936	36.40	Swale 3A	2.536
318	11	39.021	36.40	Swale 3A	2.621
319	11	39.042	36.40	Swale 3A	2.642
320	11	38.944	36.40	Swale 3A	2.544
321	11	38.845	36.40	Swale 3A	2.445
322	11	38.730	36.40	Swale 3A	2.330
323	11	38.645	36.40	Swale 3A	2.245
324	11	38.561	36.40	Swale 3A	2.161
325	11	38.463	36.40	Swale 3A	2.063
326	11	38.250	36.40	Swale 3A	1.850
327	12	38.169	36.46	Swale 3B	1.709
329	12	38.082	36.46	Swale 3B	1.622
330	12	38.191	36.46	Swale 3B	1.731
331	12	38.298	36.46	Swale 3B	1.838
332	12	38.406	36.46	Swale 3B	1.946
333	12	38.581	36.46	Swale 3B	2.121
334	12	38.712	36.46	Swale 3B	2.252
335	12	38.806	36.46	Swale 3B	2.346
336	12	39.003	36.46	Swale 3B	2.543
337	12	38.766	36.46	Swale 3B	2.306
338	12	38.814	36.46	Swale 3B	2.354
339	12	38.896	36.46	Swale 3B	2.436
340	12	38.977	36.46	Swale 3B	2.517
341	12	39.065	36.46	Swale 3B	2.605
342	12	38.987	36.46	Swale 3B	2.527
343	12	38.902	36.46	Swale 3B	2.442
344	12	38.835	36.46	Swale 3B	2.375
345	12	38.804	36.46	Swale 3B	2.344
346	12	38.803	36.46	Swale 3B	2.343

Lot	Stage	Minimum Lot Level (mRL)	1% AEP Flood Level (mRL)	Flood Level Reference	Calculated Freeboard (to Lot Level)
347	12	38.703	36.46	Swale 3B	2.243
348	12	38.700	36.46	Swale 3B	2.240
349	12	38.751	36.46	Swale 3B	2.291
350	12	39.039	36.46	Swale 3B	2.579
351	12	39.109	36.46	Swale 3B	2.649
352	12	39.179	36.46	Swale 3B	2.719
353	12	39.248	36.46	Swale 3B	2.788
354	12	39.317	36.46	Swale 3B	2.857
355	12	39.393	36.46	Swale 3B	2.933
356	12	39.486	36.46	Swale 3B	3.026
357	13	38.000	38.00	Swale 1D	0.000
358	13	38.100	38.00	Swale 1D	0.100
359	13	38.263	38.00	Swale 1D	0.263
360	13	38.444	38.00	Swale 1D	0.444
361	13	38.670	38.00	Swale 1D	0.670
362	13	38.696	38.00	Swale 1D	0.696
363	13	38.925	38.00	Swale 1D	0.925
364	13	38.802	38.00	Swale 1D	0.802
365	13	38.681	38.00	Swale 1D	0.681
366	13	38.610	38.00	Swale 1D	0.610
367	13	39.145	38.00	Swale 1D	1.145
368	13	39.300	38.00	Swale 1D	1.300
369	13	39.448	38.00	Swale 1D	1.448
370	13	39.571	38.00	Swale 1D	1.571
371	13	39.713	38.00	Swale 1D	1.713
372	13	39.845	38.00	Swale 1D	1.845
373	13	39.987	38.00	Swale 1D	1.987
374	13	40.120	36.46	Swale 3B	3.660
375	14	39.017	37.24	Swale 1	1.777
376	14	39.095	37.24	Swale 1	1.855
377	14	39.170	36.40	Swale 3A	2.770
378	14	39.226	36.40	Swale 3A	2.826
379	14	39.174	36.40	Swale 3A	2.774
380	14	39.122	36.40	Swale 3A	2.722
381	14	39.069	36.40	Swale 3A	2.669
382	14	39.016	36.40	Swale 3A	2.616
383	14	39.162	36.40	Swale 3A	2.762
384	14	39.223	36.40	Swale 3A	2.823
385	14	39.305	36.40	Swale 3A	2.905
386	14	39.366	36.40	Swale 3A	2.966
387	14	39.427	36.40	Swale 3A	3.027

Lot	Stage	Minimum Lot Level (mRL)	1% AEP Flood Level (mRL)	Flood Level Reference	Calculated Freeboard (to Lot Level)
388	14	39.428	38.00	Swale 1D	1.428
389	14	39.316	38.00	Swale 1D	1.316
390	14	39.191	38.00	Swale 1D	1.191
391	14	39.419	38.00	Swale 1D	1.419
392	14	39.409	38.00	Swale 1D	1.409
393	14	39.325	36.40	Swale 3A	2.925
394	14	39.214	36.40	Swale 3A	2.814
395	14	39.130	36.40	Swale 3A	2.730
396	15	39.127	36.40	Swale 3A	2.727
397	15	39.222	36.40	Swale 3A	2.822
398	15	39.318	36.40	Swale 3A	2.918
399	15	39.429	38.00	Swale 1D	1.429
400	15	39.414	38.00	Swale 1D	1.414
401	15	38.923	38.00	Swale 1D	0.923
402	15	39.946	38.00	Swale 1D	1.946
403	15	39.233	38.00	Swale 1D	1.233
404	15	39.309	38.00	Swale 1D	1.309
405	15	39.278	38.00	Swale 1D	1.278
406	15	38.925	38.00	Swale 1D	0.925
407	15	39.339	38.00	Swale 1D	1.339
408	15	39.607	38.00	Swale 1D	1.607
409	15	39.358	36.46	Swale 3B	2.898
410	15	39.288	36.46	Swale 3B	2.828
411	15	39.215	36.46	Swale 3B	2.755
412	15	39.138	36.46	Swale 3B	2.678
413	15	39.057	36.46	Swale 3B	2.597
414	15	39.151	36.46	Swale 3B	2.691
415	15	39.231	36.46	Swale 3B	2.771
416	15	39.311	36.46	Swale 3B	2.851
417	15	39.391	36.46	Swale 3B	2.931
418	15	39.471	36.46	Swale 3B	3.011
419	15	39.544	38.00	Swale 1D	1.544
420	15	39.811	38.00	Swale 1D	1.811
421	15	39.930	35.46	Swale 3B	4.470
422	15	39.825	36.46	Swale 3B	3.365
423	15	39.741	36.46	Swale 3B	3.281
424	15	39.657	37.46	Swale 3B	2.197
425	15	39.571	38.46	Swale 3B	1.111
426	15	40.020	38.00	Swale 1D	2.020
427	15	39.908	38.00	Swale 1D	1.908
428	15	39.748	38.00	Swale 1D	1.748

Lot	Stage	Minimum Lot Level (mRL)	1% AEP Flood Level (mRL)	Flood Level Reference	Calculated Freeboard (to Lot Level)
429	15	39.696	38.00	Swale 1D	1.696
430	15	39.589	38.00	Swale 1D	1.589
431	15	39.472	38.00	Swale 1D	1.472
432	15	39.320	38.00	Swale 1D	1.320
433	15	39.144	38.00	Swale 1D	1.144