REPORT ON: STAGE 6, LYNDHURST ROAD SUBDIVISION, FRIMLEY, HASTINGS (LOTS 45-63)

PROJECT: GEOTECHNICAL ASSESSMENT

CLIENT: GREENSTONE LAND DEVELOPMENTS LTD.

GREENSTONE LAND DEVELOPMENTS LTD. P O Box 1200 HASTINGS 4122



R_181090602_01

EXECUTIVE SUMMARY

Greenstone Land Developments Ltd. (Greenstone) engaged Resource Development Consultants Ltd (RDCL) to undertake a geotechnical assessment for Stage 6 Lyndhurst Road, Frimley in Hastings; including:

- Liquefaction assessment for the subdivision; and
- Site specific shallow testing for each of nineteen (19) proposed lots for subdivision and building consent.

Stage 6 of the development covers an area of approximately $13,500 \text{ m}^2$, with nineteen residential lots accessed by a new road branching off Mackay Close (Figure 1).

The site is surrounded by and comprises generally flat land. Site levels across the stage 6 development have been altered by minor cut (<0.3m in the southern corner) and fill (<1.0 m in the northeast end).

The results of shallow investigations suggest the site, including Lots 45-63, is generally underlain in the near surface by:

- Silty and clayey TOPSOIL to between 0.15-0.8 m bgl; overlying
- Firm to stiff SILT and medium-dense SAND, with
- lenses of soft clayey SILT and CLAY occurring below approximately 1.4-2.0 m bgl

Based on our liquefaction assessment, the site is considered to have:

- Low risk of liquefaction during a SLS earthquake event, and
- Very high risk of liquefaction during an ULS event; with
 - Expected vertical settlements on the order of 250 mm.

Based on the results of these investigations, we consider:

- All sites are suitable for residential development subject to specific design of foundations to account for:
 - Potential for liquefaction induced vertical settlements; and
 - Bearing capacity ≤ 200 kPa in some cases.



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1 OVERVIEW

Greenstone Land Developments Ltd. (Greenstone) engaged Resource Development Consultants Ltd (RDCL) to undertake a geotechnical assessment for Stage 6 of the Greenstone Subdivision on Lyndhurst Road in Hastings; including:

- Liquefaction assessment for the subdivision; and
- Site specific shallow testing for each of nineteen (19) proposed lots for subdivision and building consent.

1.1 **PURPOSE OF THIS REPORT**

The purpose of this report is to provide sufficient information to support subdivision and building consent at individual Lot Level.

A structural engineer will need to be engaged individually to undertake specific design to meet the requirements of this report.

1.2 UNDERSTANDING OF THE PROJECT

We understand the intent is to subdivide nineteen (19) residential lots from previously undeveloped land (Legal Description: LOT 400 DP 518970); comprising Lots 45-63 as indicated on Greenstone Land Developments Stage 6 Sale Plan, prepared by Zorn Surveying (Job No: 16-EQH; Plan No: S6 Sale, dated 25 January 2017).

The site is located in a zone of "high liquefaction vulnerability", as mapped by Hawke's Bay Emergency Management Group (2017); requiring assessment of liquefaction potential and likely ground settlements under seismic conditions.

RDCL has previously completed site specific shallow investigations for Stages 2-5 of the Greenstone development, comprising 48 residential lots in neighbouring sections on Arbuckle & Lyndhurst Roads. Those previous <u>RDCL</u> reports (R170602050_02, and R170602050_03) suggest:

- In situ near surface soils generally comprise soft silt and clay with ultimate bearing capacity ≤ 200 kPa; and
- The area is generally prone to liquefaction induced vertical settlements.



1.3 SCOPE OF WORK

Work was undertaken in general accordance with RDCL proposal 18109.1, dated 9 March 2018.

2 SITE DESCRIPTION

Stage 6 of the development covers an area of approximately $13,500 \text{ m}^2$, with nineteen residential lots accessed by a new road branching off Mackay Close (Figure 1).

The site is surrounded by and comprises generally flat land. Site levels across the stage 6 development have been altered by minor cut (<0.3m in the southern corner) and fill (<1.0 m in the northeast end).

Topsoil was stripped from the site prior to fill placement, and redistributed to surface the reshaped development area.

Fill materials, generally comprising SILT and silty SAND with minor gravel, were obtained from three local sources, including:

- Greenstone Stages 3-5, excavated from roadside service trenches;
- Lyndhurst Road, excavated for new storm water pipe installation; and
- Maraekakaho Road stockpile, originating from Railway Road water pipe excavations.

2.1 REGIONAL GEOLOGY

Regional geology maps indicate the site is underlain by Holocene river deposits; comprising poorly consolidated alluvial gravel, sand and mud (GNS Science, 2011).

2.1.1 ACTIVE FAULTS

The site is located approximately 2.5 km southeast of the active trace of the Awanui Fault, as identified in the GNS Science Active Faults Database (2016).



3 SUBSOIL INVESTIGATION

Site specific testing completed for each of the nineteen (19) lots comprised at a minimum:

- Engineering geological logging of materials recovered by hand auger; and
- Four (4) dynamic cone penetrometer (DCP) tests.

Subsurface investigations for the assessment of liquefaction potential across the Stage 6 development comprised:

• Three (3) Cone Penetration Tests (CPT) to 20 m bgl or refusal.

Results of subsurface investigations for individual lots are attached as Appendix A; with CPT Logs attached as Appendix B.

3.1 SUBSOIL CONDITIONS

The results of shallow investigations suggest the site, including Lots 45-63, is generally underlain in the near surface by:

- Silty and clayey TOPSOIL to between 0.15-0.8 m bgl; overlying
- Firm to stiff SILT and medium-dense SAND, with
- lenses of soft clayey SILT and CLAY occurring below approximately 1.4-2.0 m bgl

The results of CPT investigations suggest the site is generally underlain by

- Medium dense silty SAND and sandy SILT with lenses of clay to approximately 10 12 m bgl; underlain by
- Soft to firm CLAY with lenses of sand and silt to at least 15 m bgl.

3.2 SHALLOW BEARING

Dynamic Cone Penetrometer test results indicate variation in the bearing capacity of soils, laterally and with depth. In some test locations soft soils, with DCP blows of 0-3 blows per 100mm penetration, are present to depth on the order of 2 m bgl; while in other areas DCP blows are generally >3 per 100 mm penetration from depths on the order of 0.7 m bgl.

Further, interlayering of soft and firm soils are frequently observed; with localised decreases to DCP blows <3 per 100 mm penetration occurring at up to 2.2 m bgl, and on a \sim 0.5m scale in the upper 2 metres.



Correlation of DCP results (Stockwell, 1977) suggests:

- ≥200 kPa Ultimate Bearing Capacity is generally available on finished lots at a depth stripped of topsoil and/or unsuitable materials; with
- Some localised areas of lower bearing capacity are identified, particularly:
 - In the southern corner (Lots 50 & 51) where soft in situ soils exhibit reduced bearing capacity relative to near surface soils having undergone compaction.

4 LIQUEFACTION ASSESSMENT

4.1 SEISMIC SOIL CLASSIFICATION

The site is classified as site subsoil "Class D – Deep or Soft Soil Site" in accordance with NZS1170.5:2004, part 5: Earthquake Actions – New Zealand.

The sites subsoil class was determined based on conservative review of the Hawkes Bay well database.

- The Hawkes Bay well database indicates ground conditions are variable in the area, such that the site can be expected to be underlain by deep soils; specifically:
 - Well 2008 consists of clay to 14.6 m bgl, with silt to 19.8 m, interlayered gravel and clay 31 m and gravel to at least 40 m bgl;
 - Well 5554 consists of silty clay to 1.1 m, and clay to at least 5 m bgl;
 - Well 671 consists of clay to 29 m bgl, with gravel to 32 m bgl, and clay to 44 m bgl overlying gravel to at least 47 m bgl.
 - Well 10847 consists of sand and clay to 42 m bgl, overlying gravel to at least 44 m bgl; and
 - Well 8474 consists of silt to 4.6 m bgl, with clay and sand to 38 m bgl, overlying gravel and sand to at least 44 m bgl.

4.2 **GROUNDWATER**

Groundwater was not encountered at depths between 1.5-2.6 m bgl during shallow investigations.

Groundwater levels are expected to vary seasonally, and could be expected to be encountered at up to 1.0 m bgl in extreme wet seasons.



4.3 LIQUEFACTION ASSESSMENT

A liquefaction assessment was carried out on CPT results. The site is considered to have:

- Low risk of liquefaction during a SLS earthquake event, and
- Very high risk of liquefaction during an ULS event; with
 - Expected vertical settlements on the order of 250 mm.

Liquefaction potential and induced settlement results are summarised in Table 1; lateral displacements are not expected due to the generally flat relief across the site and surrounding area.

The output results of our liquefaction assessment are presented in Appendix C.

SLS Event	Liquefaction Potential Index	Estimated Vertical Settlement (mm)
181090602_CPT01	Low Risk	14
181090602_CPT02	Low Risk	30
181090602_CPT03	Low Risk	22
ULS Event	Liquefaction Potential Index	Estimated Vertical Settlement (mm)
181090602_CPT01	Very High Risk	199
181090602_CPT02	Very High Risk	278
181090602_CPT03	Very High Risk	253

TABLE 1: LIQUEFACTION POTENTIAL AND INDUCED SETTLEMENT

4.3.1 BASIS OF ASSESSMENT

The liquefaction analyses for the site were assessed using CLiq, accepted industry software package (Geoligismiki, 2014), CPT data of current ground conditions, soil logs from Test Pit investigations and the following input parameters (NZS1170.5 section 3.1.3, 2004):

- PGA = 0.11g (SLS) & 0.44g (ULS), with:
 - Magnitude (M) = 7.5 (SLS & ULS)
 - Z=0.39 (Hastings),
 - C=1.12 (Class D Soil), and
 - R=0.25 (SLS) & 1.3 (ULS).
- Ground water table 2.0 m bgl.

The design earthquake was chosen on the basis of probability of recurrence. The probability is based on historical earthquakes. A 7.5 magnitude earthquake for an importance level category 3 correlates with a 25 year return period (SLS) and 1000 year return period (ULS). A 50 year design life was assigned.



5 GEOTECHNICAL CONSIDERATIONS

Recommendations and opinions contained in this report are based on data from site investigations as outlined in Section 3. Inferences about the nature and continuity of subsurface geology and ground conditions are made but cannot be guaranteed.

5.1 SUITABILITY OF FILL FOR CONSTRUCTION

Site levels have been modified by minor placement of fill up to <1.0 m depth in the northeast end of the development, compacted by pneumatic tyre pressure from loaded truck traffic.

Suitability of materials proposed for reuse in engineered fill has been confirmed by RDCL based on:

- Visual inspection of stockpiles; and
- Laboratory testing of representative samples (completed by Opus) for particle size distribution, atterberg limits, and standard compaction testing (Appendix D).

The results of NDM testing (Appendix D) across the site, completed by Opus, suggest:

• Fill has achieved sufficient compaction in accordance with NZS4431:1989 – Earthfill for residential development.

5.2 SITE SPECIFIC ENGINEERING REQUIRED ON ALL LOTS

Based on the results of these investigations, we consider:

- All sites are suitable for residential development subject to specific design of foundations to account for:
 - Potential for liquefaction induced vertical settlements; and
 - Bearing capacity ≤ 200 kPa in some cases.

5.3 FOUNDATION RECOMMENDATIONS

For lightweight timber framed structures, we consider a suitable foundation solution to be:

- Enhanced rib-raft type foundations designed for:
 - Specific bearing capacity tested in each lot; and considering potential for
 - Liquefaction induced deformation.

Examples of appropriate foundation options and specifications are shown in figures 2 & 3.



The footprint of each foundation should be stripped of organic, loose and deleterious materials prior to construction.

Indicative depths likely required to strip unsuitable materials for each lot are presented in Table 2.

Lot Number	Available Ultimate Bearing Capacity	Indicative depth of strip	Lot Number	Available Ultimate Bearing Capacity	Indicative depth of strip
Lot 45	200 kPa	0.3 m	Lot 55	200 kPa	0.3 m
Lot 46	200 kPa	0.3 m	Lot 56	300 kPa	0.35 m
Lot 47	200 kPa	0.45 m	Lot 57	300 kPa	0.55 m
Lot 48	200 kPa	0.5 m	Lot 58	300 kPa	0.3 m
Lot 49	200 kPa	0.5 m	Lot 59	300 kPa	0.5 m
Lot 50*	150 kPa	0.25 m	Lot 60	200 kPa	0.2 m
Lot 51*	150 kPa	0.35 m	Lot 61	200 kPa	0.4 m
Lot 52	200 kPa	0.4 m	Lot 62	200 kPa	0.3 m
Lot 53	200 kPa	0.8 m	Lot 63	200 kPa	0.5 m
Lot 54	200 kPa	0.6 m			·

TABLE 2. INDICATIVE DEPTH TO 200KPA ULTIMATE BEARING CAPACITY, LOTS 45 - 63

*200 kPa generally available at 1.0 m depth.



6 REFERENCES

- GNS Science. (2004). Active Faults Database. *Institute of Geological and Nuclear Sciences*. GNS Science.
- GNS Science. (2011). HAWKE'S BAY. *Institute of Geological and Nuclear Sciences, 1:250,000 Geological Map 8*. (J. Lee, K. Bland, D. Townsend, & P. Kamp, Compilers) GNS Science.

Hastings District Council. (2014). Online GIS - IntraMaps.

Hawkes Bay Emergency Management Group. (2017). Online Mapping Site.

Langridge, R.M., Ries, W.F., Litchfield, N.J., Villamor, P., Van Dissen, R.J., Rattenbury, M.S., Barrell, D.J.A., Heron, D.W., Haubrock, S., Townsend, D.B., Lee, J.A., Cox, S., Berryman, K.R., Nicol, A., Stirling, M. (2016). The New Zealand active faults database: NZAFD250. accepted to New Zealand Journal of Geology and Geophysics 59 (1)

MBIE Guidance Version 3 (Dec 2012) Revised issue of Repairing and Rebuilding Houses Affected by the Canterbury Earthquakes. Part A: Technical Guidance (TC1 and TC2).

NZS1170.5. (2004, December 22). NZS1170.5:2004 - Structural Design Actions; Part 5: Earthquake actions - New Zealand. Standards New Zealand.

NZS3604. (2011). NZS3604:2011 - Timber-framed buildings. Standards New Zealand.

M.J. Stockwell, Determination of allowable bearing pressure under small structures, 15 June 1977, New Zealand Engineering, 32,6 p 132-135



7 LIMITATIONS

- This report has been prepared for the particular purpose outlined in the project scope and no responsibility is accepted for the use of any part in other contexts or for any other purpose.
- Ground conditions assessed in this report are inferred from published sources, site inspection and the investigation described. Variations from the interpreted conditions may occur, and special conditions relating to the site may not have been revealed by this investigation, and which are therefore not taken into account. No warranty is included either expressed or implied that the actual conditions will conform to the interpretation contained in this report.
- No responsibility is accepted by Resource Development Consultants Ltd for inaccuracies in data supplied by others. Where data has been supplied by others, it has been assumed that this information is correct.
- Groundwater conditions can vary with season or due to other events. Any comments on groundwater conditions are based on observation at the time.
- This report is provided for use by the client, section owners, and Hastings District Council and is confidential to the client and their professional advisors. No responsibility whatsoever for the contents of this report shall be accepted for any person other than the client.



8 CLOSURE

We trust this meets your current needs. Should you wish to discuss any aspect of the contents of this document please contact the undersigned on 06 877-1652.

Prepared by:

Reviewed by:

EA Cairns MSc Engineering Geologist

T Bunny BSc, PG Dip EngGeol Senior Engineering Geologist

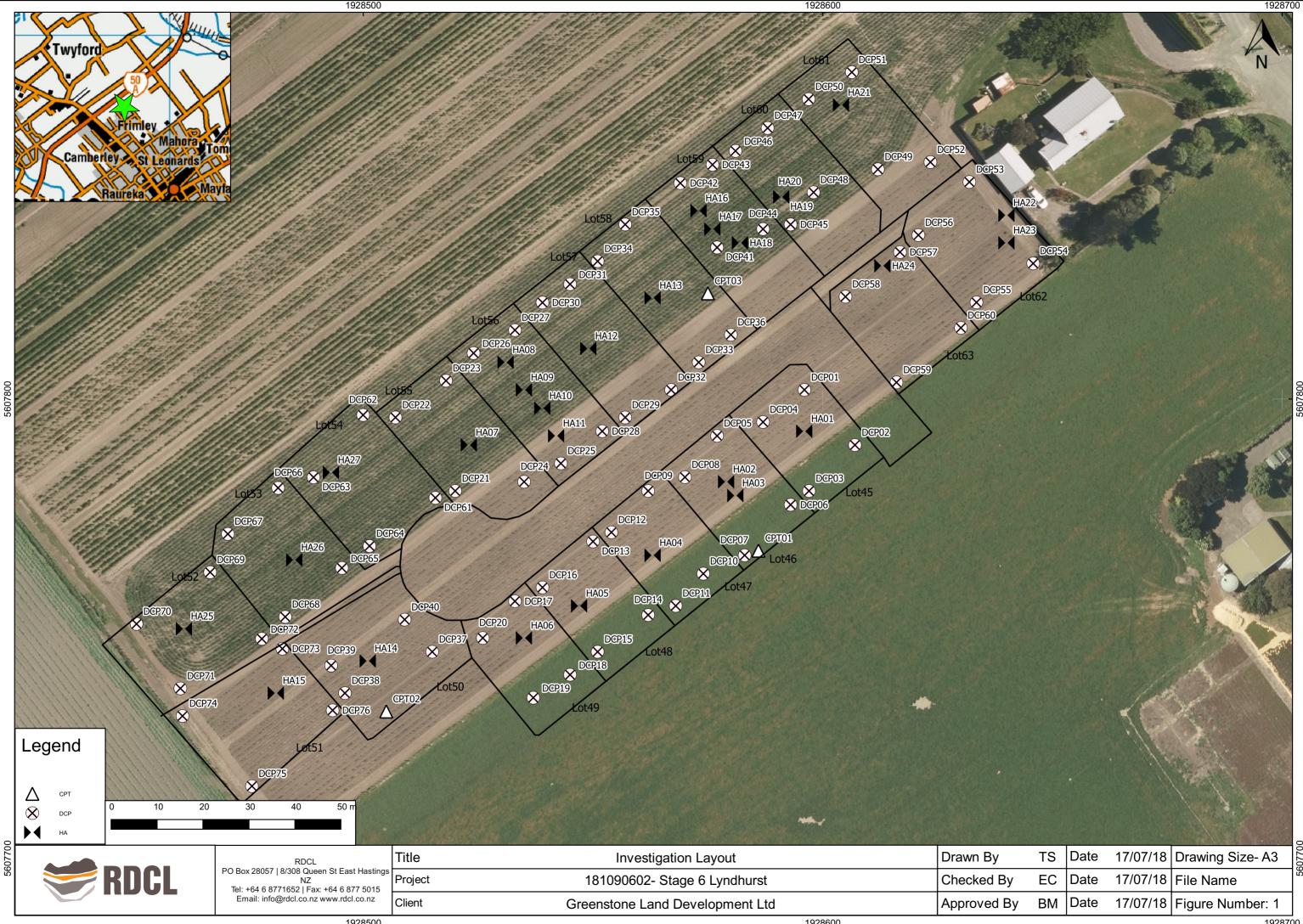
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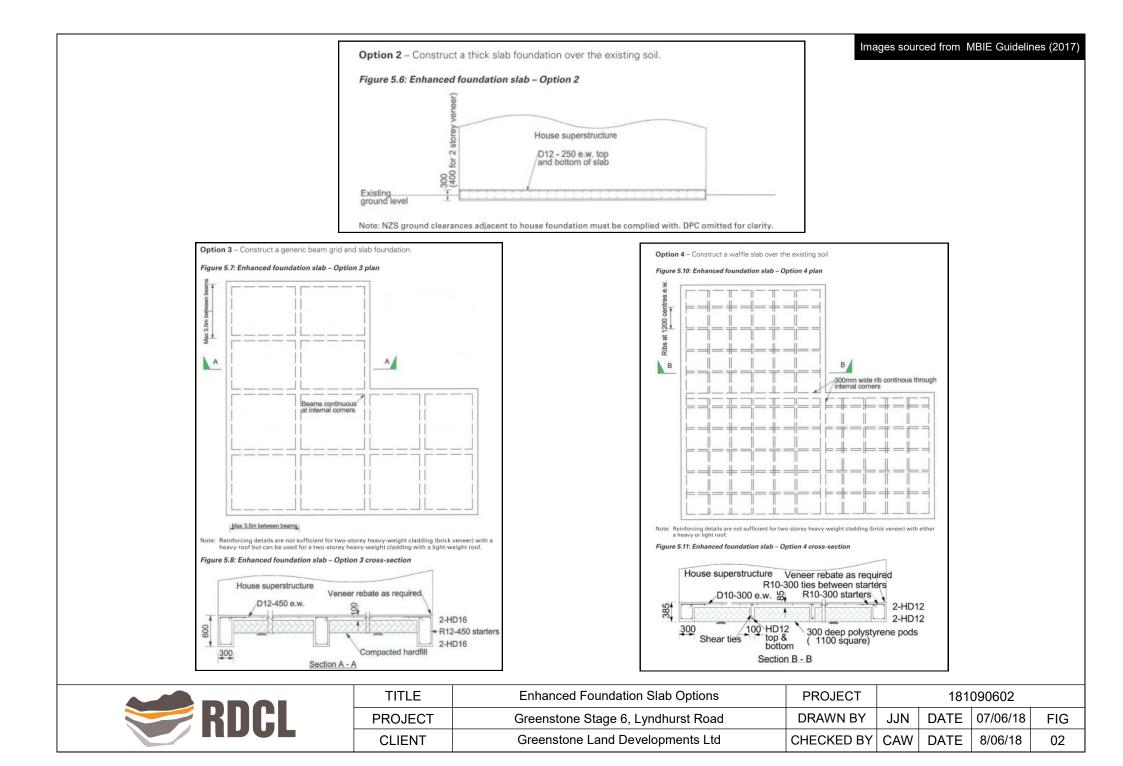
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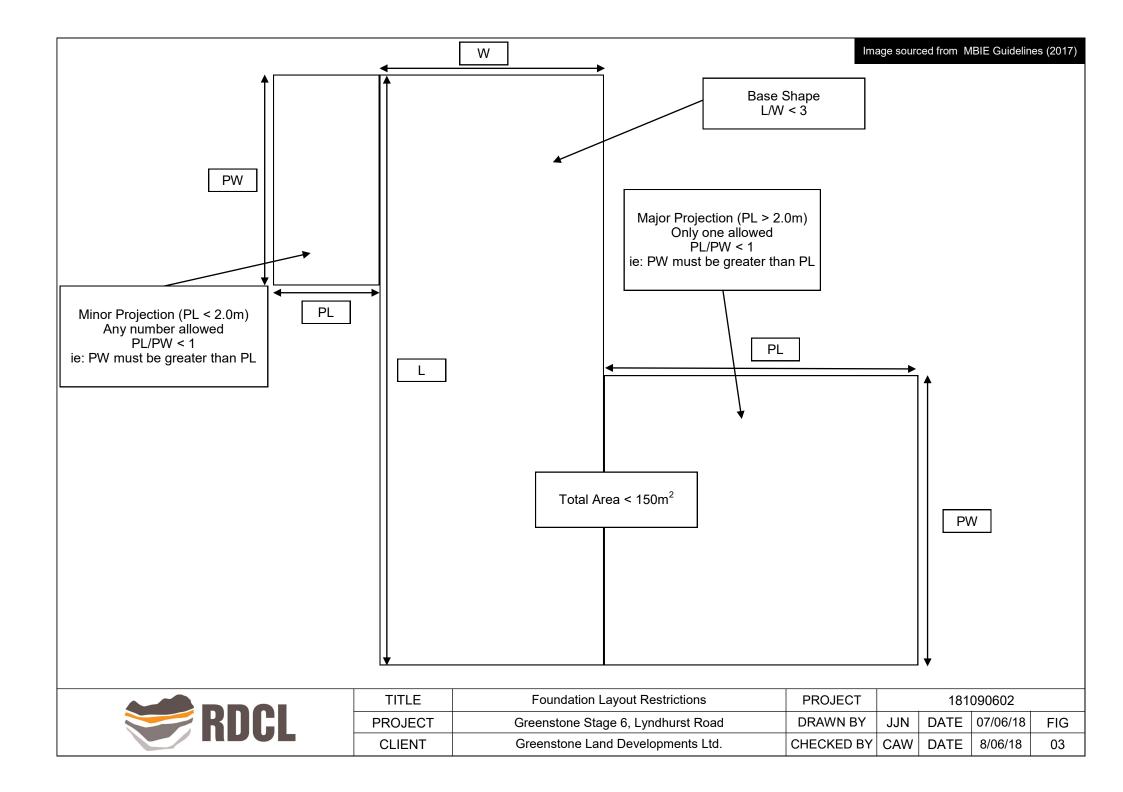


FIGURES









APPENDIX A – HAND AUGER & DCP LOGS





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				8/308 Queen St East, Hastings Ph: +64 6	RDC PO Box 280 8771652 En)57, ł	Have nfo@	lock rdcl.	Nort co.n	h 413 z	30 New Zealand		



													SHEET 5 OF 27
CLI	ENT:	Gre	ensto	ne Land Developments Ltd	PROJECTIO	DN: N	IZTM	1			LOCATION: Lyndf	urst R	oad Subdivision
PR	OJEC	CT:	18109	0602	EASTING:	19	2854	7.00			STARTED: 15/06	/2018	
LO	CATI	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHING	: 56	0775	5.00			FINISHED: 15/06	/2018	
					DATUM:						LOGGED BY: SI)/BB	DATE: 06/06/2018
OF	FICE	:	RDCL		ELEVATION	I: 0					CHECKED BY: SI	С	DATE: 04/07/2018
EN	GINE	ER:	тв		DIAMETER:	0m	nm				STATUS: Final da	ta	
со	NTR	АСТС	R:		OPERATOF	R: SD/	/BB						
							١,٢	NOI					
(m)		~	읮	ROCK / SOIL DESCRIPTION		MOISTURE	STENC	CLASSIFICATION	BLOWS		SAMPLES & TESTS	AC	DITIONAL REMARKS
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG			MOIST	CONSI	CLASS	DCP B				
-	-		24 15	Clayey silty TOPSOIL, with some sand; dark b	rown. Firm;				-				
-	-		$\frac{\Delta b}{b}$	low plasticity; moist; trace rootlets.									
- 0.5	- 0.5		<u>a</u> n <u>a</u>	-									
-				SILT, with trace sand; brown . Firm; low plastic									
-													
- 1.0				SILT, with some clay; brown, grey mottling. Fir	m; low								
			××	plasticity; moist.									
- 	- <u>1</u> .												
- 1.5			×	SILT, with some sand, with trace clay; brown,	grey mottling.	w	1						
			ř.	Firm; moderate plasticity; wet.		<u>⊢s</u>	1		+				
-2.0	-2.0			SILT, with some clay; brown, grey orange mott moderate plasticity; saturated.	ling. Firm;								
-				EOH: 1.80m									
- 2.5	-2.5												
-													
_													
-3.0	- 9. - 3.0												
- 3.5	.5												
-	- ကိ												
-4.0	- 4												
	E												
- 4.5	N												
-4.5	- 4												
	F												
				1						REN	MARKS		
											dwater at 1.8 m		
										SYN	IBOLS		
											Standing Water Level		
											Out flow In flow		
					RDC	L							
				8/308 Queen St East, Hastings Ph: +64 6		057, H	Have nfo@	lock rdcl.	Nort co.n	th 413 z	80 New Zealand		



													SHEE	T 6 OF 2	7
CLI	ENT:	Gre	ensto	ne Land Developments Ltd	PROJECTIC	DN: N	IZTM	l			LOCATION: Lynd	hurst Ro	ad Subd	ivision	
PR	OJEC	T:	18109	0602	EASTING:	19	2853	5.00			STARTED: 15/06	6/2018			
LOO	CATIO	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHING:	56	0774	8.00			FINISHED: 15/06	6/2018			
					DATUM:						LOGGED BY: SI	D/BB	DATE:	06/06/2	018
OF	FICE	.	RDCL		ELEVATION	l: 0					CHECKED BY: S	D	DATE:	04/07/2	018
EN	GINE	ER:	ТВ		DIAMETER:	0m	ım				STATUS: Final da	ita			
CO	NTRA	АСТО	R:		OPERATOR	: SD/	BB					1			
							7/	NO							
(F				ROCK / SOIL DESCRIPTION		MOISTURE CONDITION	ENC	CLASSIFICATION	MS		SAMPLES			REMARK	s
DEPTH (m)	_ ۳	ËR	DHIG			STUF	ISIST SITY	SSIF	BLOWS		& TESTS	7.01	Diffortive		5
DEP	RL (m)	WATER	GRAPHIC LOG			MOI	DEN	CLA	DCP						
-	_		<u>a</u> ∧ a ⊵ TS	TOPSOIL; dark brown. Firm; moist; trace rootle plastic.	ets; non										
-	_		$\frac{\Delta h}{h} = \frac{1}{\Delta h}$												
-0.5	-0.5		<u>44 4</u> * × ×	TOPSOIL; brown, grey mottling. Firm; moist; tra											
-	-		× ×	non plastic.											
-1.0			×												
د الم															
$= 1.5$ $= \frac{1}{7}$ $= \frac{1}{7}$ sand, fine.															
-	-		- X - X - X - X - X - X - X - X - X - X	SILT, with trace clay and sand; brown, grey and mottling. Firm; low plasticity; wet; Amorphous c		W	S								
	- 0		×	material.											
-	SILT, with some clay; brown, orange mottling. Soft; moderate plasticity; wet.														
-	_			Clayey SILT, with trace gravel; greyish brown,											
-2.5	-2.5			mottling. Firm; high plasticity; saturated; gravel, subround.	, tine,										
-	EOH: 1.95m														
- 3.0	- 3.0														
-	-														
-	-														
-3.5	-3.5														
-	_														
- 4.0	- 4.0														
-	- '														
-	-														
-4.5	- 4														
-	_														
-	-														
											/IARKS dwater at 1.95 m				
										SYN	ABOLS				
										T	Standing Water Level				
											Out flow				
											In flow				
				8/308 Queen St East, Hastings)57, H					80 New Zealand				
					8771652 En										



													SHEET 7 OF 27
CLI	ENT:	Gre	ensto	ne Land Developments Ltd	PROJECTIO	DN: N	IZTN	1			LOCATION: Lyndl	hurst Re	oad Subdivision
PR	OJEC	T:	18109	0602	EASTING:	19	2852	3.00			STARTED: 15/06	6/2018	
LO	CATIO	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHING	: 56	0779	0.00			FINISHED: 15/06	6/2018	
					DATUM:						LOGGED BY: SI	D/BB	DATE: 06/06/2018
OFI	FICE		RDCL		ELEVATION	I: 0					CHECKED BY: SI	D	DATE: 04/07/2018
EN	GINE	ER:	тв		DIAMETER:	: 0m	nm				STATUS: Final da	ita	
со	NTRA	АСТО	R:		OPERATOR	R: SD/	′DJ						
							_	z					
(L)			<u>ں</u>	ROCK / SOIL DESCRIPTION		MOISTURE	STENCY Y	CLASSIFICATION	BLOWS		SAMPLES & TESTS	AD	DITIONAL REMARKS
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG			MOIST	CONSIS	CLASSI	DCP BL				
-	-		<u>ал</u> тса <u>ал</u> тса <u>ал</u> а	TOPSOIL; dark brown. Firm; moist; non plastic rootlets.	; trace								
- - 0.5	-0.5		× × × × × ×	SILT, with trace clay and sand; brown, grey mo low plasticity; moist.	ttling. Firm;		FM						
-													
-	- 1.0		$\left \begin{array}{c} \lambda \\ \mathbf{x} \\ \mathbf{x} \\ \mathbf{x} \end{array} \right $			м							
- 1.0				Silty SAND; brown grey mottling. Medium dens	-								
				plastic; moist; sand, fine.		MD							
- 1.5				SAND, with some silt; brown, grey mottling. Me non-plastic; moist; sand, fine.	edium dense;								
- 2.0	-2.0		× × 、	SILT, with trace clay and sand; brown, grey and mottling. Firm; moderate plasticity; wet.		w	FM	-					
-				CLAY, with trace amorphous organic material a sand; brown, orange and grey mottling. Soft; hig moist.		м	s						
-2.5	- 5			CLAY, with trace amorphous organic material a		S							
-	-			sand; brown with orange and grey mottling. Sof plasticity; saturated.	t; high								
- 3.0	- 3.0			EOH: 2.60m									
-	- '												
-													
-3.5	- ~												
-	-												
- 4.0	- 4												
-	-												
-													
-4.5 -	- 4												
-	-												
-	-												
											MARKS udwater at 2.6 m		
										SYI	MBOLS		
										∎	Standing Water Level		
											Out flow		
											In flow		
				8/308 Queen St East, Hastings Ph: +64 6	RDC PO Box 28 8771652 Er	057, H	Have nfo@	lock rdcl.	Nort co.n	h 41: z	30 New Zealand		



	SHEET 8 OF 27 CLIENT: Greenstone Land Developments Ltd PROJECTION: NZTM LOCATION: Lyndhurst Road Subdivision													
CLI	ENT:	Gre	ensto	ne Land Developments Ltd	PROJECTIC	DN: N	IZTM	l			LOCATION: Ly	ndhurs	st Road Subdi	vision
PR	OJEC	T:	18109	0602	EASTING:	19	2853	1.00			STARTED: 15	6/06/20	18	
LOO	CATIO	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHING	: 56	0780	8.00			FINISHED: 15	6/06/20	18	
					DATUM:						LOGGED BY:	SD/B	B DATE:	06/06/2018
OF	-ICE:		RDCL		ELEVATION	I: 0					CHECKED BY:	SD	DATE:	04/07/2018
EN	GINE	ER:	тв		DIAMETER:	0m	ım				STATUS: Final	data		
CO	NTRA	АСТО	R:		OPERATOR	: SD/	/DJ							
							-	N						
-						шZ	CONSISTENCY / DENSITY	CLASSIFICATION	SN		SAMPLES			
۳) H	Ê	Ř	HIC	ROCK / SOIL DESCRIPTION	SIFIC	BLOWS		& TESTS		ADDITIONAL	REMARKS			
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG		DCP									
-	-		24 IS	TOPSOIL, with some gravel; dark brown. Soft;	wet; gravel,	w	s							
-	-		<u>an</u> .	fine; low plasticity. 		<u> </u>								
-0.5	-0.5			Termination: HA refusal on gravel	I	/								
-	-													
-	- 0													
- 1.0	-1.0													
-	-													
- 1.5	- 1.5													
-	-													
-	-2.0													
-2.0	- 9													
-2.5	-2.5													
-	_													
-3.0	-3.0													
-	-													
- 3.5	-3.5													
-	-													
	- 4.0													
-4.0	- 7													
E	_													
-4.5	- 4 .5													
	-													
	_													
										REN	MARKS			
										SYN	MBOLS			
										T	Standing Water Leve	el		
											Out flow			
											In flow			
				8/308 Queen St East, Hastings	RDC		lave	lock I	Nort	h 41?	30 New Zealand			
				Ph: +64 6	8771652 En	nail: ir	nfo@	rdcl.o	co.n	z				



											SHEET 9 OF 27				
CLI	ENT:	Gre	ensto	ne Land Developments Ltd	PROJECTIC	DN: N	IZTM				LOCATION: Lyndl	hurst F	Road Subdivision		
PR	OJEC	CT:	18109	0602	EASTING:	19	2853	5.00			STARTED: 15/06	6/2018			
LO	CATI	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHING	: 56	0780	2.00			FINISHED: 15/06	6/2018			
					DATUM:						LOGGED BY: SI	D/BB	DATE: 06/06/2018		
OFI	FICE	:	RDCL		ELEVATION	I: 0					CHECKED BY: SI	D	DATE: 04/07/2018		
		ER:			DIAMETER:		ım				STATUS: Final da				
		АСТС			OPERATOR										
								z							
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION		MOISTURE CONDITION	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS		SAMPLES & TESTS	AI	DDITIONAL REMARKS		
-	-		<u>2</u> 4 : ⊵ TS <u>34</u>	TOPSOIL, with trace gravel; dark brown. Firm; fine, subround; non plastic.	moist; gravel,	м	FM								
- 0.5 -	-0.5		<u> </u>	EOH: 0.35m Termination: HA refusal on gravel		\square									
-	-														
- 1.0 - -	-1.0														
- - - 1.5 -	-1.5														
- 2.0	-2.0														
- 	- 1														
- - - 3.0	-3.0														
- - -															
- 3.5 - -	- ຕິ														
-4.0	- 4														
- 	4.5														
-	-									RFI	MARKS				
										SYN	/BOLS				
											Standing Water Level				
										1	Out flow				
											In flow				
				8/308 Queen St East, Hastings	RDC		lave		Nort	h /11	30 New Zealand				
				Ph: +64 6	8771652 En	nail: ii	nfo@	rdcl.c	co.n	. Z					



	SHEET 10 OF 27															
CLIENT: Greenstone Land Developments Ltd PROJECTION: NZTM LOCATION: Lyndhurst R											urst Road	Subdi	vision			
PR	OJEC	CT:	18109	0602	EASTING:	19	28539	9.00			STARTED:	15/06/2	2018			
LO	CATI	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHING:	56	0779	8.00			FINISHED:	15/06/2	2018			
					DATUM:						LOGGED BY	: SD/	/BB [DATE:	06/06/20)18
OF	FICE		RDCL		ELEVATION: 0						CHECKED B	Y: SD	[DATE:	04/07/20)18
EN	GINE	ER:	тв		DIAMETER: 0mm STATUS: Final							nal data	a			
CO	NTR	ACTC	R:		OPERATOR	: SD/	DJ									
							12	NO								
Ē						щZ	ENC	CATI	MS		SAMPLES					_
L H	Ê	К	HIC	ROCK / SOIL DESCRIPTION		DITIC	SIST SITY	SIFI	BLOWS		& TESTS		ADDIT	IONAL	REMARKS	,
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG			MOISTURE CONDITION		CLASSIFICATION	DCP							
-	-		<u>s</u> ∕n s	TOPSOIL, with trace gravel. Firm; moist; non p	lastic.				-							
-	-		<u></u>	EOH: 0.35m		м	FM									
-0.5	-0.5			∜ermination: HA refusal on gravel	1	1										
-	-															
-	-															
-1.0 -	- 1-															
-	-															
- 	-1.5															
-	-															
-	-2.0															
-2.0	- 9															
-	-															
-2.5	-2.5															
-	-															
-	-															
-3.0	-3.0															
-	-															
- 3.5	-3.5															
-	-															
-	- 4															
-4.0	- 4															
-																
-4.5	- 4															
-																
-	-															
										RE	MARKS					
	SYMBOLS															
	▼ Standing Water Level															
											Out flow					
											In flow					
				8/308 Queen St East, Hastings	RDC	L)57. F	lavel	lock I	Nort	h 413	30 New Zeala	nd				
				Ph: +64 6	8771652 Em	nail: ir	nfo@	rdcl.c	co.n	z						



											SHEET 11 OF 27	
CLI	ENT	Gre	ensto	ne Land Developments Ltd	l		LOCATION: Lyndhurst Road Subdivision					
PR	DJEC	CT:	18109	0602	EASTING:	19	2854	2.00		STARTED: 15/06	6/2018	
LOO	CATI	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHING:	56	0779	2.00		FINISHED: 15/06	6/2018	
					DATUM:					LOGGED BY: S	D/BB DATE: 06/06/2018	
OF	FICE	:	RDCL		ELEVATION	: 0				CHECKED BY: S	D DATE: 04/07/2018	
EN	GINE	ER:	ТΒ		DIAMETER:	0m	m			STATUS: Final da	ata	
CO	NTR	АСТО	R:		OPERATOR: SD/DJ							
							2	NO				
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION		MOISTURE CONDITION	CONSISTENC) DENSITY	CLASSIFICATION	DCP BLOWS	SAMPLES & TESTS	ADDITIONAL REMARKS	
-	-		24 TS	TOPSOIL; dark brown. Firm; moist; non plastic.		м	FM					
-	-		<u></u>	SILT, with some gravel, with trace sand; brown	. Firm; non-							
- 0.5 	-0.5			plastic; moist; gravel, fine, subangular. EOH: 0.25m Termination: HA refusal on gravel								
- - 	- 1.0											
- - 1.5	- 1.5											
- - 2.0	-2.0											
- - 	-2.5											
- - - - 3.0	-3.0											
-	-											
3.5 - -	3.5											
- 	- 4											
- - - -4.5	4.5											
-												
		I	1	I			I	I		REMARKS		
	SYMBOLS											
										▼ Standing Water Level		
										l>→ In flow		
	RDCL 8/308 Queen St East, Hastings PO Box 28057, Havelock North 4130 New Zealand											
				۵/۵0% Queen St East, Hastings Ph: +64 6	PO Box 280 8771652 Em	າວ7, H nail: ir	ave∩ nfo@	rdcl.o	vort	n 4 i 30 New Zealand Z		



													SHEET 12 OF 27
CLI	ENT:	Gre	ensto	ne Land Developments Ltd	PROJECTIC	DN: N	IZTM	I			LOCATION: Lyndl	nurst R	oad Subdivision
PR	OJEC	CT:	18109	0602	EASTING:	19	2854	9.00			STARTED: 15/06	6/2018	
LO	CATIO	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHING	56	0781	1.00			FINISHED: 15/06	5/2018	
					DATUM:						LOGGED BY: SI	D/BB	DATE: 06/06/2018
OF	FICE:		RDCL		ELEVATION	I: 0					CHECKED BY: SI	D	DATE: 04/07/2018
		ER:			DIAMETER:		nm				STATUS: Final da		
					OPERATOR								
			1		01 2101101			7					
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION		MOISTURE	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS		SAMPLES & TESTS	AD	DDITIONAL REMARKS
Clayey TOPSOIL; brown . Firm; low plasticity; moist;													
- 0.5	Clayey TOPSOIL; dark brown. Firm; low plasticity; moist;												
-	-			SILT, with trace clay and sand; brown, grey and mottling. Stiff; low plasticity; wet.	w								
-1.0	-1.0		× ×	SILT, with some sand; brown, grey mottling. St plastic; moist.	liff; non-		SF						
- 	-1.5					м							
-				SILT, with trace sand; brown, grey mottling. Fir plasticity; moist.	m; low		FM						
- 2.0	-2.0		× ×	SILT, with trace sand. Soft; moderate plasticity	; wet.	w	S						
-	-			SILT, with trace amorphous organic material ar gravel; brown with orange mottling. Firm; mode plasticity; moist; gravel, fine, subround.	id clay and rate	M S	FM						
-2.5				SILT, with trace amorphous organic material an gravel; brown with orange mottling. Firm; mode	id clay and rate								
	3.0			EOH: 2.40m									
-													
- 3.5 -	-3.5												
-													
-4.0 -	- 4												
- 	4.5												
						1		1	1	REM	IARKS	L	
										Groue	dwater at 2.4 m		
										SYN	IBOLS		
										•	Standing Water Level		
											Out flow		
L											In flow		
				8/308 Queen St East, Hastings	RDC)57, ł	lave	lock	Nort	h 413	0 New Zealand		
				Ph: +64 6	8771652 En	nail: İi	nto@	rdcl.o	co.n	Z			



													SHEET 13 OF 27
CLI	ENT:	Gre	ensto	ne Land Developments Ltd	PROJECTIC	DN: N	IZTM	l			LOCATION: Lyndl	hurst R	oad Subdivision
PR	OJEC	CT:	18109	0602	EASTING:	19	2856	3.00			STARTED: 15/06	6/2018	
LO	CATI	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHING	56	0782	2.00			FINISHED: 15/06	6/2018	
					DATUM:						LOGGED BY: SI	D/BB	DATE: 06/06/2018
OF	FICE		RDCL		ELEVATION	1: 0					CHECKED BY: SI	D	DATE: 04/07/2018
		ER:			DIAMETER:		m				STATUS: Final da		
		ACTO			OPERATOR								
					0. 2.0.00	Г		7					
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION		MOISTURE	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS		SAMPLES & TESTS	AD	DITIONAL REMARKS
-	-		<u>⊴</u> ∆ ⊵ TS <u>⊴⊬</u>	Clayey TOPSOIL; dark brown. Firm; moist.			FM						
SAND, with trace silt; greyish brown. Medium dense; non- plastic; moist; sand, fine.													
SILT, with trace gravel; brown . Firm; non-plastic; moist; gravel, fine, subround.													
	- 1-		xîx, xû	SILT; brown . Firm; low plasticity; moist.			FM						
-	-		l î x			м							
-	-		x x										
- 1.5	-1.5		l î x										
-	-		×	SILT, with some clay; greyish brown, grey and	orange	1		-					
- 2.0	-2.0			mottling. Stiff; moderate plasticity; moist.			SF						
	-			Clavey SILT with trace conductovich brown E	irm :	-							
_			8 <u> </u>	Clayey SILT, with trace sand; greyish brown. F moderate plasticity; moist.	irm;		FM						
- 2.5	-2.5			SILT, with trace amorphous organic material an gravel; greyish brown, grey and orange mottling plasticity; saturated; gravel, fine, subround.	d clay and . Firm; high	S							
				EOH: 2.50m									
-3.0	-3.0				,								
-3.5	-3.5												
_	_												
- 4.0	- 4-												
- 4.0	-												
_	L												
-4.5	- 4-												
-	-												
	-												
											MARKS udwater at 2.5 m		
										Giul	advator at 2.0 III		
										SYI	MBOLS		
										•	Standing Water Level		
											Out flow		
L									_		In flow		
				8/308 Queen St East, Hastings				look	Nort	h 44	30 New Zooland		
				Ph: +64 6	8771652 En	nail: ir	iavel 1fo@	rdcl.	co.n	. 1 4 1. Z	ou linew zealand		



													SHEET 14 OF 27
CLIENT: Greenstone Land Developments Ltd PROJECTION: NZTM LOCATION: Lyndhurst F PROJECT: 181090602 EASTING: 1928501.00 STARTED: 19/06/2018												irst Road Subdivision	
PRO	DJEC	T:	18109	0602	EASTING:	19	2850	1.00			STARTED:	19/06/2	2018
LOC	CATIO	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHING	56	0774	3.00			FINISHED:	19/06/2	2018
					DATUM:						LOGGED B	Y: SD	DATE: 19/06/2018
OFF	FICE:		RDCL		ELEVATION	: 0					CHECKED I	BY: SD	DATE: 04/07/2018
ENG	GINE	ER:	ТВ		DIAMETER:	0m	nm				STATUS: F	inal data	1
CO	NTR/	АСТО	R:		OPERATOR	: SD/	/BR						
							7	NO					
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION		MOISTURE CONDITION	DNSISTENC ENSITY	CLASSIFICATION	DCP BLOWS		SAMPLES & TESTS		ADDITIONAL REMARKS
ä	R	Ň	59 15	TOPSOIL; dark brown. Firm; moist; rootlets, no	on plastic.	žΰ	öä	Ū	ă				
-	-		46	SILT, with trace clay; brown with grey and oran		-							
0.5	-0.5		× ×,	Firm; low plasticity; moist.	ge mouiing.		FM						
-	- '		× un × x (м							
-	-		n j x										
-1.0	- 1-			SILT, with some clay; brown with grey and orar Stiff; moderate plasticity; moist.	nge mottling.		SF						
-	-		X	SAND, with trace silt; brown. Medium dense; n	on-plastic;	1	MD						
- 1.5	-1.5		× × × ×	moist, sand, fine to medium. SILT, with some sand; brown. Firm; low plastic	ity; moist;	w	FM						
-	-		×	sand, fine. SILT, with some clay, with trace sand; brown. I	Firm [.]	vv							
	-5.0			moderate plasticity; wet; orange and grey mottl	ing.	s	S		-				
-	- 1			CLAY, with some silt, with trace amorphous org and sand; brown with orange mottling. Soft; hig saturated.	ganic material h plasticity;								
- 2.5	-2.5			EOH: 1.95m									
-					·								
-	- - 0.												
-3.0 -	- ෆ઼́												
-	-												
- 3.5	-3.5												
-	-												
-	- 0.												
-4.0	- 1 -												
-	-												
-4.5	- 4-												
-	-												
	-												
											MARKS Idwater at 1.95 m		
	SYMBOLS												
											Standing Water I	_evel	
											Out flow		
					RDC						In flow		
				8/308 Queen St East, Hastings Ph: +64 6)57, H					30 New Zeala	and	



						SHEET 15							
CL	ENT:	Gre	ensto	ne Land Developments Ltd	PROJECTIC	DN: N	IZTN	I		nurst F	Road Subdivision		
PR	OJEC	CT:	18109	0602	EASTING:	19	2848	1.00			STARTED: 19/06	;/2018	1
LO	CATI	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHING	: 56	0773	6.00			FINISHED: 19/06	j/2018	•
					DATUM:						LOGGED BY: SI	C	DATE: 19/06/2018
OF	FICE		RDCL		ELEVATION	I: 0					CHECKED BY: SI	С	DATE: 04/07/2018
EN	GINE	ER:	тв		DIAMETER:	0m	nm				STATUS: Final da	ta	
со	NTR/	АСТО	R:		OPERATOR	: SD/	/BR						
							_	z					
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION		DISTURE NDITION	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS		SAMPLES & TESTS	А	DDITIONAL REMARKS
DE													
-	TOPSOIL; dark brown. Stiff; moist; non plastic, trace rootlets.												
-													
-0.5	0.5 \vec{q} SILT, with some sand; brown with grey and orange mottling. Stiff; non-plastic; moist; sand, fine.												
-	-		K x în										
	- 1.0		> ×										
-	,		× × ×	SILT, with trace clay; brown. Firm; low plasticit grey and orange mottling.	ty; moist;								
-	-			Sandy SILT; brown with orange mottling. Firm;	non-plastic;		FM						
-1.5	-1:5		ат — 57 16 16	wet.		W							
-	-		× × ×	SILT, with some clay, with trace sand; brown w orange mottling. Soft; moderate plasticity; wet;	vith grey and sand fine	s	s						
	-2.0			Clayey SILT; brown with orange mottling. Soft;									
-2.0				plasticity; saturated; orange mottling.									
-	-			EOH: 1.80m									
-2.5	-2.5												
-	-												
-	- 0.												
-3.0	- ო -												
-	ŀ												
- 3.5	-3.5												
-	- '												
-													
-4.0	- 4												
-	-												
- -4.5	+.5 -												
	- 4												
-	L												
	L		I	1			I	1		RE	MARKS	L	
											udwater at 1.75 m		
	SYMBOLS												
										T	Standing Water Level		
											Out flow		
											In flow		
				8/308 Queen St East, Hastings	RDC PO Box 280)57, H	Have	lock	Nort	h 41:	30 New Zealand		
				Ph: +64 6	8771652 En	nail: ir	nfo@	rdcl.o	co.n	z			



	SHEET 16 OF 27													
CLIENT: Greenstone Land Developments Ltd PROJECTION: NZTM LOCATION: Lyndh												Lyndh	urst Road Subdivi	sion
PR	DJEC	CT:	18109	0602	EASTING:	19	2857	3.00			STARTED:	19/06/	2018	
LOO	CATI	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHING:	56	0784	1.00			FINISHED:	19/06/	2018	
					DATUM:	JM: LOGGED BY: SD							DATE: 1	9/06/2018
OF	FICE	:	RDCL		ELEVATION: 0						CHECKED E	BY: SD	DATE: 0	4/07/2018
EN	GINE	ER:	ТВ		DIAMETER: 0mm STATUS							nal data	а	
CO	NTR/	АСТС	R:		OPERATOR: SD/BR									
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION		MOISTURE CONDITION	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS		SAMPLES & TESTS		ADDITIONAL RI	EMARKS
_	-		<u>⊴</u> ≉ _2 ⊵ TS	Silty TOPSOIL; dark brown. Firm; moist; non pl rootlets.	astic, some									
	_		$\frac{\Delta b}{b} = \frac{\Delta b}{\Delta b}$			м	FM							
-0.5	-0.5		<u>44 d</u>	SILT, with some gravel; brown. Stiff; low plastic	city: moist:	-	SF	-						
			N X X	gravel, fine, subround.		<u> </u>								
- 				EOH: 0.70m Termination: HA refusal on gravel										
- - 1.5	- 1													
	-2.0													
- - 	-2.5													
-	-3.0													
3.0 - - -	-													
3.5 	3.5													
- 4.0 -	- 4													
- 	- 4.5													
-	-									REN	MARKS			
	SYMBOLS													
	▼ Standing Water Level													
											Out flow			
	D In flow													
				8/308 Queen St East, Hastings Ph: +64 6	RDC PO Box 280 8771652 Em)57, H	Have	lock I rdcl.c	Nort	h 413 z	30 New Zeala	Ind		



	CLIENT: Greenstone Land Developments Ltd PROJECTION: NZTM LOCATION: Lyndhurst Road Subdivision													
CLI	ENT:	Gre	ensto	ne Land Developments Ltd			LOCATION: Lyndhurst Road Subdivision							
PR	DJEC	CT:	18109	0602	EASTING:	192	2857	6.00			STARTED: 19/06	/2018		
LOO	CATI	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHING:	560	0783	7.00			FINISHED: 19/06	/2018		
					DATUM:	LOGGED BY:						C	DATE: 19/06/20	18
OF	FICE		RDCL		ELEVATION	: 0					CHECKED BY: SE	DATE: 04/07/20	18	
EN	GINE	ER:	тв		DIAMETER:	0m	m				STATUS: Final da	ta		
CO	NTR	АСТС	R:		OPERATOR	: SD/	BR							
							۲۱	NO						
Ê						щZ	ENC	CATI	SN		SAMPLES			
ΓH (n	Ê	н	UHC	ROCK / SOIL DESCRIPTION	DCP BLOWS		& TESTS	AL	DITIONAL REMARKS					
DEPT	DEPTH (m) RL (m) WATER GRAPHIC LOG MOISTURE CONDITION CONSISTENCY / DENSIFICATION CLASSIFICATION													
- Jan Stranger - Jan														
-	-		$\begin{bmatrix} \underline{\Delta L} \\ \underline{\Delta L} \end{bmatrix}$			м	FM							
- -0.5	-0.5			SAND, with some silt and gravel; brown with gr	ey mottling.		MD							
-				Medium dense; non-plastic; moist; gravel, fine.										
-	-			EOH: 0.50m Termination: HA refusal on gravel										
-1.0 -	-1.0													
-	-													
- 	-1.5													
-	-													
-	-													
-2.0	-2.0													
-	-													
- 	-2.5													
-	-													
-	-													
-3.0 -	-3.0													
-	-													
- 3.5	-3.5													
-	-													
-	-													
-4.0 -	- 4													
-	-													
- 4.5	- 4													
-	-													
-	-													
										RE	MARKS			
	SYMBOLS													
	▼ Standing Water Level													
										1	Out flow			
	_										In flow			_
				8/209 Queen St Fast Hasting			10.1-			h 111	RO Now Zooland			
				8/308 Queen St East, Hastings Ph: +64 6	PO Box 280 8771652 Em	າວ7, F nail:ir	navel nfo@	ock I rdcl.c	vorti	n 413 Z	oo ∣ inew ∠ealand			



SHEET 18 OF 27

CL	IENT	Gre	ensto	ne Land Developments Ltd	PROJECTION: NZTM						LOCATION: Lyndhurst Road Subdivision		
PR	OJEC	CT:	18109	0602	EASTING:	19	2858	2.00			STARTED: 19/06	6/2018	
LO	CATI	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHING	: 56	0783	4.00			FINISHED: 19/06	6/2018	
					DATUM:						LOGGED BY: S	D DATE: 19/06/2018	
OF	FICE	:	RDCL		ELEVATION	I: 0					CHECKED BY: S	D DATE: 04/07/2018	
EN	GINE	ER:	тв		DIAMETER:	0m	۱m				STATUS: Final da	ata	
СС	NTR	ACTC	R:		OPERATOR	R: SD	/BR				I		
							~	Z					
							NCY	ATIC	ß		SAMPLES		
E T		۲ ۲	일	ROCK / SOIL DESCRIPTION		URE I OI	ISTE T	SIFIC	BLOWS		& TESTS	ADDITIONAL REMARKS	
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG			LSIO	CONSISTENCY / DENSITY	CLASSIFICATION	DCP B				
	R	3	07	Clayey TOPSOIL; dark brown. Firm; low plastic	city: moist	ΣŬ	δā	ō	ă				
F	F		<u>26</u> 2 <u>6</u> TS <u>36</u> -		oity, moist.		FM						
F	2		<u>la dila</u>	CAND with some sild and success harves. Madi		-	MD	-					
-0.5	- ợ -			SAND, with some silt and gravel; brown. Mediu -plastic; moist; gravel, fine, subround.	im dense; non	A	FM						
-	-		x x	SILT, with some organic silt, with trace gravel; brown with brown mottling. Firm; low plasticity;	greyish	м							
- 1.0	-1.0			gravel, fine.	moist,		SF						
	ţ.			SILT, with some gravel, with trace sand; brown plastic; moist; gravel, fine to medium, subround									
-	È.		× ×	SILT, with trace clay and sand; brown with grey		-	-						
- 1.5	-1.5		× × ×	mottling. Firm; low plasticity; moist.		\vdash	1						
	L		×××	SILT, with some clay; brown with grey and oran Firm; moderate plasticity; wet.	nge mottling.	w	FM						
- 20	-2.0		- ×	Clayey SILT, with trace sand; brown with grey	and orange	S	-						
-2.0				mottling. Firm; high plasticity; saturated.									
F	F			EOH: 2.05m	i	/							
-2.5	-2.5												
-	F												
F													
-3.0	-3.0												
Ę	ļ												
- 3.5	- 3.5												
-	ţ.												
L.	-												
-4.0	- 4												
L	L												
- -4.5	- 2.1												
4.5	- 4												
-	-												
-	ſ									RE	MARKS		
											udwater at 2.05 m		
									SYN	MBOLS			
									T	Standing Water Level			
									Out flow				
										In flow			
			RDC		Have		Nort	h /11	30 New Zealand				
				8/308 Queen St East, Hastings Ph: +64 6	8771652 En								



HA19

			_										SHEET 19 OF 27
CL	ENT:	Gre	ensto	ne Land Developments Ltd	PROJECTIC	N: N	IZTM				LOCATION: Lyndf	nurst R	oad Subdivision
PR	OJEC	CT:	18109	0602	EASTING:	19	2859	1.00			STARTED: 19/06	/2018	
LO	CATIO	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHING:	56	07844	4.00			FINISHED: 19/06	/2018	
					DATUM:						LOGGED BY: SI	C	DATE: 19/06/2018
	FICE		RDCL		ELEVATION	: 0					CHECKED BY: SI		DATE: 04/07/2018
-		ER:			DIAMETER:						STATUS: Final da	ta	
со	NTRA		R:		OPERATOR	: SD/	BR			1			
							CY /	CLASSIFICATION					
(E			υ	ROCK / SOIL DESCRIPTION		R N	CONSISTENCY / DENSITY	FICA.	BLOWS		SAMPLES & TESTS	AD	DITIONAL REMARKS
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG			NDIT	NSIS	ASSI	P BL				
В	Ъ	A V	RO			¥8 8		С	DCP				
-	-		24 2 2 TS	TOPSOIL, with trace gravel; dark brown. Firm; plasticity.	moist; low		FM	-					
-				SAND, with some gravel, with trace silt; greyish Medium dense; non-plastic; moist; sand, fine; g	n brown.	м	MD						
-0.5 -	- ở			subangular.	ji avei,								
-	-		 K	SILT, with some gravel, with trace sand; brown	. Stiff; non-	<u> </u>	SF						
- 	- 1-			plastic; moist.									
-	-			EOH: 0.80m Termination: HA refusal on gravel									
-	- 10												
- 1.5													
-	-												
-2.0	-2.0												
-	[
- 2.5	-2.5												
- 2.5													
-	-												
-3.0	-3.0												
_	-												
- 3.5	-3.5												
-													
-													
-4.0 -	- 4												
-	-												
- 	- 4.												
-	-												
-	-												
				•						REN	MARKS		
										SYN	MBOLS		
										∎	Standing Water Level		
											Out flow		
					RDC						In flow		
				8/308 Queen St East, Hastings Ph [.] +64 6)57, H					30 New Zealand		



HA20

													SHEET 20 OF 27
CLI	ENT:	Gre	ensto	ne Land Developments Ltd	PROJECTIC	DN: N	IZTM	l			LOCATION: Lyndr	urst l	Road Subdivision
PR	OJEC	CT:	18109	0602	EASTING:	19	2859	1.00			STARTED: 19/06	/2018	3
LO	CATI	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHING	56	0784	4.00			FINISHED: 19/06	/2018	3
					DATUM:						LOGGED BY: SI	2	DATE: 19/06/2018
OFI	FICE		RDCL		ELEVATION	l: 0					CHECKED BY: SI	C	DATE: 04/07/2018
EN	GINE	ER:	тв		DIAMETER:	0m	nm				STATUS: Final da	ta	
со	NTR	АСТО	R:		OPERATOR	: SD/	/BR						
							-	Z					
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION		MOISTURE	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS		SAMPLES & TESTS	4	ADDITIONAL REMARKS
_	-		20 - 2 2 - 2 - 2 2 - 2 - 2	Clayey TOPSOIL; dark brown. Firm; low plastic	city; moist;		FM						
[-			SILT; brown. Firm; low plasticity; moist.		1						ĺ	
-0.5	-0.5			SAND, with some gravel, with trace silt; greyisl	h brown.	м	MD					ĺ	
F	-			Medium dense; non-plastic; moist; gravel, fine	to medium.							ĺ	
- 1.0			× × ,	SILT, with some gravel, with trace sand; brown plasticity; moist; gravel, fine, subround; sand, f	i. Stiff; low]	SF					 	
-1.0				EOH: 0.95m		A							
E				Termination: HA refusal on gravel									
- 1.5	-1.5												
-	-												
- 2.0	- 5.0												
-	-												
-	- <u>-</u>												
-2.5	- ?i -												
-3.0	-3.0												
_													
- 3.5	-3.5												
-													
-	_												
-4.0	- 4												
-	-												
- 4.5	- 4 .0												
-	-											ĺ	
-	-											ĺ	
										RE	MARKS		
										SYN	MBOLS		
										•	Standing Water Level		
											Out flow		
									_	L⊳	In flow		
				8/308 Queen St East, Hastings			Howe		Nort	h /1	30 New Zooland		
				Ph: +64 6	8771652 En	nail: i	nfo@	rdcl	co.n:	11 4 13 7	OUT INCW CEDIAIIU		



													SHEET 21 OF 27
CLI	ENT:	Gre	eensto	ne Land Developments Ltd	PROJECTIC	DN: N	IZTM	l			LOCATION: Lynd	hurst	Road Subdivision
PR	OJEC	CT:	18109	0602	EASTING:	19	2860	4.00			STARTED: 28/06	3/2018	3
LO	CATIO	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHING	: 56	0786	4.00			FINISHED: 28/06	3/2018	3
					DATUM:						LOGGED BY: S	D/BR	DATE: 28/06/2018
OF	FICE		RDCL		ELEVATION	I: 0					CHECKED BY: S	D	DATE: 04/07/2018
EN	GINE	ER:	ТВ		DIAMETER:	0m	nm				STATUS: Final da	ata	
со	NTRA	АСТС	R:		OPERATOR	: SD/	′BR						
							11	NO					
Ē						щZ	CONSISTENCY / DENSITY	CLASSIFICATION	SW		SAMPLES		
TH (n	Ê	КШ	DHIC	ROCK / SOIL DESCRIPTION		DITIC	SIST SITY	SSIFI	BLO		& TESTS		ADDITIONAL REMARKS
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG			MOIS	DEN	CLAS	DCP BLOWS				
-	-	-	<u>s</u> ∧_s ⊵ TS	Silty TOPSOIL; dark brown. Firm; non-plastic; r	noist; trace			-					
-	-		<u>56</u> <u>6</u> <u>56</u>	rootlets.		M	FM						
-0.5	-0.5			SAND, with trace gravel; dark grey. Medium de sand, fine; gravel, fine, subround; non plastic.	nse; wet;	w	MD					0.4m ·	- 1.0m: HA grinding
-	- - -			SILT, with some sand, with trace gravel; brown plastic; moist; sand, fine; gravel, fine, subround				_					
- 1.0			× × × ×	SILT, with trace sand; brown. Stiff; low plasticities sand, fine.	y; moist;	1	SF						
-	-		××	sand, line.									
- 1.5	- 1.5			SILT, with trace sand; brown. Firm; low plastic sand, fine.	ty; moist;	1							
F	-		××			м	FM						
	0		$\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} x \\ y \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix}$	SILT, with trace clay and gravel; brown. Soft; n plasticity; moist; gravel, fine, subround.	noderate								
-2.0	- ^c i		\times \times	plasticity, most, graver, mile, subjound.			s						
F			× × >×										
-2.5	-2.5		$\sim 10^{-10}$										
				Clayey SILT, with trace sand; greyish brown wi mottling. Firm; moderate plasticity; moist.	th orange	\vdash	-						
- 3.0	-3.0			Clayey SILT, with some sand; brown with orang Firm; high plasticity; wet; sand, fine to coarse.	ge mottling.	w s	FM						
	-			Clayey SILT, with some sand; brown with dark mottling. Firm; high plasticity; saturated; sand,	brown fine to								
- 3.5	-3.5			coarse.									
-	- '			EOH: 3.20m	1								
-													
-4.0 -	- 4												
-	-												
- 	- 4 .0												
-	-												
-	-												
	•							•			MARKS		
										Grou	idwater at 3.2 m		
										SYN	MBOLS		
										∎	Standing Water Level		
											Out flow		
											In flow		
				8/308 Queen St East, Hastings	RDC PO Box 280		lave	lock	Nort	h 413	30 New Zealand		
					8771652 En								



HA22

			_										SH	IEET 22 OF	- 27
CLI	ENT:	Gre	ensto	ne Land Developments Ltd	PROJECTIC	N: N	IZTM				LOCATION:	Lyndhu	urst Road S	Subdivision	
PR	OJEC	T:	18109	0602	EASTING:	19	2864	0.00			STARTED:	28/06/2	2018		
LO	CATIO	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHING:	56	0784	0.00			FINISHED:	28/06/2	2018		
					DATUM:						LOGGED B	Y: SD	/BR DA	ATE: 28/06	3/2018
OF	FICE:		RDCL		ELEVATION	: 0					CHECKED E	BY: SD	DA	ATE: 04/07	'/2018
		ER:			DIAMETER:						STATUS: F	nal data	а		
со	NTRA	АСТО	R:		OPERATOR	: SD/	BR								
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION		MOISTURE CONDITION	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS		SAMPLES & TESTS		ADDITIC	DNAL REMA	રહ
-	-		⊴~ _⊴ ⊵ TS	Clayey TOPSOIL, with trace gravel. Firm; mode plasticity; moist; gravel, fine, subround.	erate		FM								
-	-		- 44 	SAND, with trace silt and gravel; dark grey with		1		-							
-0.5	-0.5			mottling. Medium dense; non-plastic; moist; gra subround.	avel, fine,	м	MD								
	-			SILT, with some sand and gravel; brown. Firm; moist; gravel, fine.	non-plastic;		FM								
-1.0				EOH: 0.95m Termination: HA refusal on gravel											
-															
- 1.5 -															
-	-2.0														
-2.0	- ?														
-	2														
-2.5	-2.5														
-															
-3.0	-3.0														
_															
-3.5	-3.5														
-	-														
-4.0	- 4														
- -4.5	- 4.5														
-	-														
	-														
										REN	IARKS				
										SYM	IBOLS				
										T	Standing Water L	evel			
										4	Out flow				
											In flow				
				8/308 Queen St East, Hastings Ph: +64 6	RDC PO Box 280 8771652 Em)57, H	Havel ∩fo@	lock rdcl /	Norti	h 413 z	80 New Zeala	and			



HA23

													SHEET 23 OF 27
CLI	ENT:	Gre	ensto	ne Land Developments Ltd	PROJECTIC	N: N	IZTM				LOCATION: Lyndl	hurst F	Road Subdivision
PR	OJEC	T:	18109	0602	EASTING:	19	2864	0.00			STARTED: 28/06	6/2018	
LO	CATIO	ON:	Lvndh	urst Road Subdivision Stage 6	NORTHING:	56	0783	4.00			FINISHED: 28/06	5/2018	
			,	5	DATUM:						LOGGED BY: SI		DATE: 28/06/2018
0.5						•							
	FICE		RDCL		ELEVATION						CHECKED BY: SI		DATE: 04/07/2018
		ER:			DIAMETER:						STATUS: Final da	ita	
CO	NTR/	АСТО	R:	1	OPERATOR	: SD/	BR						
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION		MOISTURE CONDITION	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS		SAMPLES & TESTS	A	DDITIONAL REMARKS
-	-		<u>⊿∧</u> ⊵ TS	Clayey TOPSOIL. Firm; moderate plasticity; m	oist.		FM						
- - 0.5	-0.5			SAND, with trace gravel; greyish brown with gr Medium dense; moist; gravel, fine, subround.	ey mottling.	м	MD						
-	-		× ` × , × `	SILT, with some gravel, with trace sand; brown plastic; moist; gravel, fine.	. Stiff; non-		SF						
- 1.0	- 1-			EOH: 0.90m Termination: HA refusal on gravel	1	1							
L													
-	-1.5												
- 1.5 -													
-	-												
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L	F												
										RF	MARKS		
										SYN	MBOLS		
											Standing Water Level Out flow		
											In flow		
<u> </u>					RDC	L							
				8/308 Queen St East, Hastings Ph [.] +64 6)57, H					30 New Zealand		



													SHEET 24 OF 27
CL	IENT:	Gre	ensto	ne Land Developments Ltd	PROJECTIC	N: N	IZTM	l			LOCATION: Lyndł	hurst R	Road Subdivision
PR	OJEC	CT:	18109	0602	EASTING:	19	2861	3.00			STARTED: 28/06	6/2018	
LO	CATI	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHING	56	0782	9.00			FINISHED: 28/06	6/2018	
				-	DATUM:						LOGGED BY: SI	D/BR	DATE: 28/06/2018
OF	FICE		RDCL		ELEVATION	· 0					CHECKED BY: SI		DATE: 04/07/2018
		ER:			DIAMETER:		m				STATUS: Final da		
		ACTO			OPERATOR							ita	
			'N.		OPERATOR	. 30/		_					
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION		MOISTURE	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS		SAMPLES & TESTS	AI	DDITIONAL REMARKS
-	-		<u>2/</u> _2 ∠ TS	Silty TOPSOIL; dark brown with light brown mo	ttling. Firm;				+-				
	È.		$\underline{\Delta E}$.	low plasticity; moist; some rootlets.		м	FM						
- 0.5	-0.5		<u>b</u> <u>db</u> <u>d</u> b <u>d</u> T p										
- 0.5	ļ			SAND, with some silt, with trace gravel; drak g	reyish brown lasticity: wet:	w	MD						
F	F			with light brown mottling. Medium dense; low pl gravel, fine, subround.		м	SF						
-1.0	- 1-			SILT, with trace sand and gravel; light brown win mottling. Stiff; low plasticity; moist.	ith orange								
-	Ē			EOH: 1.05m		A							
-	- ci			termination: HA refusal on gravel; no recovery									
- 1.5													
F	F												
-2.0	-2.0												
F	F												
-													
-2.5	- ?i												
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	-3.0												
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-3.5	-3.5												
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-4.0	- 4												
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-4.5	4.5												
-	F												
F	F												
				1						RE	MARKS		
										SYN	MBOLS		
											Standing Water Level		
											Out flow		
<u> </u>					RDC						In flow		
				8/308 Queen St East, Hastings Ph [.] +64 6)57, ł	Have	lock rdcl/	Nort	h 413	30 New Zealand		
1				F11. +04 0		1a11. 11	$m \cup (u)$	າ ບບາ.(JU.II	<u>~</u>			



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													SHEET 25 OF 27
CLI	ENT:	Gre	ensto	ne Land Developments Ltd	PROJECTIC	DN: N	IZTM				LOCATION: Lynd	hurst F	Road Subdivision
PR	OJEC	T:	18109	0602	EASTING:	19	2846	1.00			STARTED: 28/06	6/2018	}
LO	CATI	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHING	56	0775	0.00			FINISHED: 28/06	5/2018	}
				Ĵ	DATUM:						LOGGED BY: SI		
	FICE		RDCL		ELEVATION	ι. <u>Λ</u>							DATE: 04/07/2018
											CHECKED BY: S		DATE: 04/07/2018
		ER:			DIAMETER:						STATUS: Final da	ita	
CO	NTR/	АСТО	R:	1	OPERATOR	: SD/	BR	1				1	
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG			MOISTURE CONDITION	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS		SAMPLES & TESTS	A	ADDITIONAL REMARKS
-	-		200 - 2 20 TS 200 20 - 200	TOPSOIL; dark brown. Firm; moist; non plastic fibrous organic material.	; some								
-0.5	0.5			SILT, with trace clay and sand; light brown with orange mottling. Firm; low plasticity; moist.	n grey and		FM						
- 	- 1.0					м							
-	F			Sandy SILT; brown with grey and orange mottlin	ng. Stiff: non-	-	SF	1					
-	- rò			plastic; moist; sand, fine.		1	MD						
- 1.5 -			×××	mottling. Medium dense; non-plastic; moist; sa	nd, fine.	1							
	-2.0		××	SILT, with some sand; brown with grey and ora Stiff; low plasticity; moist.	nge mottling.		SF						
-2.0	- 9			Clayey SILT, with some sand; brown with orang Soft; high plasticity; wet.	/	W S	s						
- 2.5	-2.5			Clayey SILT, with trace sand; brown with orang Soft; high plasticity; saturated.	ge mottling.								
-	- '			EOH: 2.20m									
	- <u>3</u> .0												
-	-												
- 3.5	-3.5												
-	-												
-4.0	- 4												
-	-												
-4.5	- 4 - 5												
-	-												
-	ľ.									RE	MARKS		
											idwater at 2.1 m		
										CVA	MBOLS		
											Standing Water Level		
											Out flow In flow		
					RDC						III IIOW		
				8/308 Queen St East, Hastings Ph: +64 6)57, H					30 New Zealand		



HA26

SHEET 26 OF 27

CLI	ENT:	Gr	eensto	ne Land Developments Ltd	PROJECTIO	N: N	IZTN	I			LOCATION: Lyndl	hurst Road	Subdivision
PR	DJEC	T:	18109	90602	EASTING:	19	2848	5.00			STARTED: 28/06	6/2018	
LOO	CATIO	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHING:	56	0776	5.00			FINISHED: 28/06	6/2018	
					DATUM:						LOGGED BY: SI	D/BR I	DATE: 28/06/2018
OF	FICE:		RDCL		ELEVATION	: 0					CHECKED BY: SI	D I	DATE: 04/07/2018
EN	SINE	ER:	ΤВ		DIAMETER:	0m	nm				STATUS: Final da	ita	
CO	NTRA	٩СТ	DR:		OPERATOR	: SD/	'BR						
							-	N					
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION		NDITION	CONSISTENCY / DENSITY	CLASSIFICATION	P BLOWS		SAMPLES & TESTS	ADDIT	IONAL REMARKS
B	RL	W/	E G			Σö	88	Ъ	DCPI				
-	-		$\frac{\Delta^{h}}{\Delta^{h}}$ TS	Silty TOPSOIL; dark brown. Stiff; non-plastic; n rootlets.	noist; trace								
-	-		<u>6</u> <u>6</u> <u>5</u> 6				SF						
-0.5	-0.5		⊵ TS.										
-	-		$\frac{\Delta b}{b} = \frac{\Delta b}{\Delta b}$	-									
- 	- 1-		() ×	SILT, with some sand; brown. Firm; low plastic sand, fine.	city; moist;		FM	_					
-	-			SILT, with trace clay; brown. Stiff; low plasticit	y; moist.	М	SF						
-	-		×	SAND, with trace silt; brown with grey mottling	. Medium		MD						
-1.5	-1.5		× ×	dense; non-plastic; moist.	and orange	1	SF						
-	-			SILT, with some sand; greyish brown with grey mottling. Stiff; low plasticity; moist; sand, fine.	1	1							
- 2.0	-2.0			SILT, with some sand; greyish brown with grey mottling. Firm; moderate plasticity; moist; sand	and orange I, fine.		FM						
-	-			Silty CLAY, with trace sand; brown. Firm; high saturated; sand, coarse.	plasticity;	s			-				
- 2.5	-2.5			EOH: 2.25m									
-	_												
-	-												
-3.0	-3.0												
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-3.5	- ņ												
-	-												
-4.0	- 4												
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											MARKS Idwater at 2.1 m		
										SYN	MBOLS		
										T	Standing Water Level		
											Out flow		
											In flow		
				8/308 Queen St East, Hastings)57, ł					30 New Zealand		
				Ph: +64 6	8771652 Em	nail: ir	nfo@	rdcl.o	co.n	z			



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													SHEET 27 OF 27
CLI	ENT:	Gre	ensto	ne Land Developments Ltd	PROJECTIC	N: N	IZTM	l			LOCATION: Lyndl	nurst R	oad Subdivision
PR	DJEC	T:	18109	0602	EASTING:	19	2849	3.00			STARTED: 28/06	i/2018	
LOO	CATIO	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHING	56	0778	4.00			FINISHED: 28/06	5/2018	
					DATUM:						LOGGED BY: SI	D/BR	DATE: 28/06/2018
OF	FICE:		RDCL		ELEVATION	: 0					CHECKED BY: SI	D	DATE: 04/07/2018
		ER:	тв		DIAMETER:		ım				STATUS: Final da		
		ACTO			OPERATOR								
								z					
(m)			⊔ ⊔	ROCK / SOIL DESCRIPTION		MOISTURE CONDITION	stencγ. Υ	CLASSIFICATION	BLOWS		SAMPLES & TESTS	AD	DITIONAL REMARKS
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG				CONSIS	CLASSI	DCP BL				
-	-		24 2 ⊵ TS	Silty TOPSOIL; dark brown with brown mottling. plasticity; moist; trace rootlets.	. Firm; low								
-	-		$\frac{\Delta L}{L} = \frac{\Delta L}{\Delta L}$				FM						
-0.5	-0.5		l⊴A ⊴ ⊵ TS										
-	-		×,	SILT, with trace sand; brown. Stiff; low plasticit	ty; moist.	1							
-	-		×				SF						
- 1.0 - -			× × > ×	SILT, with trace sand; brown with grey and orar Stiff; moderate plasticity; moist.		м							
- 	- 1.5			SAND; brownish grey with brown mottling. Med moist; non plastic.	ium dense;		MD						
-	-							_					
- - 2.0	-2.0		× ×	SILT, with trace sand; brown with orange mottli plasticity; moist.	ng. Firm; Iow		FM						
-	-		× z	Clayey SILT, with trace amorphous organic mat	terial and	S	-						
- - 2.5	-2.5			sand and gravel; greyish brown with grey and or mottling. Firm; moderate plasticity; saturated; g subangular.	range								
-				EOH: 2.25m									
-	-				1								
- 3.0	-3.0												
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- 3.5	-3.5												
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				I		1		1		REI	MARKS	L	
										Grou	udwater at 2.1 m		
										SYN	MBOLS		
										•	Standing Water Level		
											Out flow		
											In flow		
				8/308 Queen St East, Hastings	RDC PO Box 280)57, H	Have	lock	Nort	, h 41:	30 New Zealand		
				Ph: +64 6	8771652 En	nail: ir	nfo@	rdcl.	co.n	z			



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														SHEE	T 1 OF 76
CLI	ENT:	Gre	ensto	ne La	nd Developme	nts Ltd		PROJECT	ION	: NZTM	LO	CATION: L	yndhurst F	Road Subdi	ivision
PRO	DJEC	CT:	18109	0602				EASTING	:	1928596.00	ST	ARTED: 0	1/06/2018		
LOC	CATIO	ON:	Lyndh	urst F	Road Subdivisio	n Stage 6		NORTHIN	G:	5607802.00	FI	NISHED: 0	1/06/2018		
								DATUM:	NZ∖	/D2016	LO	GGED BY:	SD/BB	DATE:	06/06/2018
OFF	FICE	:	RDCL					ELEVATIO	DN:		CH	IECKED B	: SD	DATE:	04/07/2018
ENG	GINE	ER:	тв					AZUMITH	: 0°	PLUNGE: 90	° ∣s⊤	ATUS: Fin	al data		
CO	NTRA	ACTO	R:				MACH	IINE:			OF	PERATOR:	SD/BB		
(SAMPLES					
H (m	~	к	ЭH			DCP BLO	NS			& TESTS		Al	DDITIONAL	REMARKS	
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	DATA	5	10	15	20							
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Lot 4	5										▼ Stand	ding Water Le	vel		
											▷ In flo	w			
					0/200	LIGOR CHE-	et Hacting		0CL	7, Havelock North	1120 1	low Zoolor	d		
					0/308 6	UCCI OL EA	Ph: +64 6	3 F U BOX 2 3 8771652	Emai	il: info@rdcl.co.nz	4130 ľ	vew zealan	iu -		



															SHEET 2 OF 76
CLIE	NT:	Gre	ensto	ne Lanc	Develo	opmen	ts Ltd			PROJEC	TION	NZTM		LOCATION: Lyndhurst F	Road Subdivision
PRO	JEC	T:	18109	0602						EASTING	6:	1928607.00		STARTED: 01/06/2018	
LOC	ATIC	DN:	Lyndh	urst Ro	ad Subo	divisio	n Stage 6			NORTHI	IG:	5607790.00		FINISHED: 01/06/2018	
										DATUM:	NZV	D2016		LOGGED BY: SD/BB	DATE: 06/06/201
OFFI	CE:		RDCL							ELEVATI	ON:			CHECKED BY: SD	DATE: 04/07/201
ENG	INE	ER:	тв							AZUMITH	l: 0°	PLUNGE	: 90°	STATUS: Final data	
CON	TRA	СТС	R:					M	ACHIN	IE:				OPERATOR: SD/BB	
2												SAMPLES			
DEPTH (m)	ç	Ш	GRAPHIC LOG	-			DCP BLC	JW5				& TESTS		ADDITIONAL	REMARKS
DEP	RL (m)	WATER	GRAI	DATA	5	5	10	15	2	20					
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REMA Lot 45	٩KK	3												MBOLS	
														✓ Standing Water Level ├- Out flow	
														⊢ In flow	
										R	DCL			130 New Zealand	



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CLIENT	T: Gr	eensto	one Land	d Developme	ents Ltd		PROJECT	ION	NZTM		LOCATION: Lyndhurst	Road Subc	ivision
PROJE							EASTING	:	1928597.00		STARTED: 01/06/201	8	
LOCAT	ION:	Lynd	nurst Ro	ad Subdivisi	on Stage 6		NORTHIN	IG:	5607780.00		FINISHED: 01/06/201	8	
							DATUM:	NZV	′D2016		LOGGED BY: SD/BB	DATE	06/06/201
OFFICE	E:	RDC	L				ELEVATIO	ON:			CHECKED BY: SD	DATE	04/07/201
ENGINE							AZUMITH	: 0°	PLUNGE: 9	0°	STATUS: Final data		
CONTR		DR:				MACH	IINE:				OPERATOR: SD/BB		
DEPTH (m) RL (m)	WATER	GRAPHIC LOG	DATA	5	DCP BLO	NS 15	20		SAMPLES & TESTS		ADDITIONA	L REMARKS	
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ot 45													
											Out flow		
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- - - REMARI				8/308 C	Queen St Eas	st, Hastings Ph: +64 6	s PO Box 2	DCL 2805 Emai	7, Havelock North	▼ \$	n flow		



								SHEET 4 OF 76
CLIE	ENT:	Gre	eensto	ne Land Developments Ltd	PROJECT	ION: NZTM	LOCATION: Lyndhurst R	oad Subdivision
			18109		EASTING:	1928587.00	STARTED: 01/06/2018	
LOC	ATIC	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHIN	G: 5607795.00	FINISHED: 01/06/2018	
						NZVD2016	LOGGED BY: SD/BB	DATE: 06/06/201
	ICE:		RDCL		ELEVATIO		CHECKED BY: SD	DATE: 04/07/201
		ER:			AZUMITH:	0° PLUNGE: 90°	STATUS: Final data	
CON	NTRA	АСТО	DR:	MA	CHINE:		OPERATOR: SD/BB	
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	DCP BLOWS 5 10 15	20	SAMPLES & TESTS	ADDITIONAL	REMARKS
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F		Groundwater Not Encountered		6				
		t Enco		5				
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l				4				
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REM	ARK	l S			:		MBOLS	
Lot 45							Standing Water Level	
							- Out flow	
							- In flow	



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CLI	ENT:	Gre	ensto	ne La	and Develo	opments	Ltd		PROJECTI	ON:	NZTM	LOC	CATION: L	yndhurst l	Road Subd	ivision
PRO	DJEC	:T:	18109	0602	2				EASTING:		1928577.00	STA	ARTED: 0	1/06/2018	3	
LOC	CATIO	ON:	Lyndh	urst l	Road Sub	division S	Stage 6		NORTHING	9: s	5607792.00	FIN	ISHED: 0	1/06/2018	3	
									DATUM: N	٧Z٧	D2016	LOC	GGED BY:	SD/BB	DATE:	06/06/2018
OFF	ICE:	l	RDCL						ELEVATIO	N:		СН	ECKED BY	: SD	DATE:	04/07/2018
ENC	SINE	ER:	ТВ						AZUMITH:	0°	PLUNGE: 90	° STA	ATUS: Fina	al data		
CO	NTR/	АСТО	R:					MACHI	INE:			OPI	ERATOR:	SD/BB		
<u> </u>						,	DCP BLOWS				SAMPLES				REMARKS	
E	Ê	ЕR	PHIC	4		L	JCF BLOWS				& TESTS		AL	DITIONAL	REWARKS	
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	DATA	Ę	5	10 15	5	20							
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REN Lot 46	IARK	S										SYMBOL				
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												SHEE	T 6 OF 76
CLIENT	: Gr	eensto	ne Land Dev	velopmer	nts Ltd		PROJECT	ION	: NZTM		LOCATION: Lyndhurst	Road Subc	livision
PROJE	CT:	18109	0602				EASTING	:	1928593.00		STARTED: 01/06/201	8	
LOCAT	ION:	Lyndh	urst Road S	ubdivisio	on Stage 6		NORTHIN	G:	5607777.00		FINISHED: 01/06/201	8	
							DATUM:	NZ∖	/D2016		LOGGED BY: SD/BE	DATE	: 06/06/201
OFFICE	Ξ:	RDCL					ELEVATIO	DN:			CHECKED BY: SD	DATE	: 04/07/201
ENGINE	EER:	тв					AZUMITH	: 0°	PLUNGE: 9	0°	STATUS: Final data		
CONTR	ACTO	DR:				MACH	INE:				OPERATOR: SD/BB		
Ê					DCP BLC				SAMPLES			L REMARKS	
DEPTH (m) RL (m)	ER	HIG	4		DOI DEC	<i>w</i>			& TESTS		Abbilliona		
DEPTH RL (m)	WATER	GRAPHIC LOG	DATA	5	10	15	20						
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REMARI	KS									SYME	BOLS		
Lot 46											anding Water Level		
										⇔ O ⊳ In	ut flow		
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												SHEET 7 OF 76
CLIENT: Greenstone Land Developments Ltd PROJECTION: NZTM LOCATION: Lyndhurst Roa											Road Subdivision	
PRO	JEC	T:	18109	0602				EAST	NG:	928583.00	STARTED: 01/06/201	8
LOCA	TIC	DN:	Lyndh	urst Road	d Subdivisi	on Stage 6	6	NORT	HING: \$	607766.00	FINISHED: 01/06/201	8
								DATU	M: NZV	D2016	LOGGED BY: SD/BE	B DATE: 06/06/201
OFFI	CE:		RDCL					ELEV	ATION:		CHECKED BY: SD	DATE: 04/07/201
ENGI	NEE	ER:	тв					AZUM	ITH: 0°	PLUNGE: 90)° STATUS: Final data	
CON	TRA	СТО	R:				MA	CHINE:			OPERATOR: SD/BB	
(E)			<u>0</u>			DCP BL	.OWS			SAMPLES & TESTS	ADDITIONA	L REMARKS
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	DATA	5	10	15	20				
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Lot 46	u vrVs											
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													SHEE	T 8 OF 76
CLI	ENT:	Gre	ensto	ne L	and Developme	ents Ltd		PROJECT	ION	: NZTM		LOCATION: Lyndhurst	Road Subd	livision
			18109					EASTING:		1928570.00		STARTED: 01/06/201	3	
LO	CATIO	ON:	Lyndh	nurst	Road Subdivisi	on Stage 6		NORTHIN	G:	5607783.00		FINISHED: 01/06/201	3	
								DATUM:	NZ۱	/D2016		LOGGED BY: SD/BB	DATE	06/06/2018
OFI	FICE:	:	RDCL	-				ELEVATIC	N:			CHECKED BY: SD	DATE	04/07/2018
EN	GINE	ER:	тв					AZUMITH:	0°	PLUNGE: 90)°	STATUS: Final data		
со	NTRA	АСТО	R:				MACH	INE:				OPERATOR: SD/BB		
<u> </u>										SAMPLES				
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DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	DATA	5	10	15	20						
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Lot 4	6											tanding Water Level		
												out flow		
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					8/308 0	Queen St Ea	st, Hastings	RD s PO Box 2	805	7, Havelock North	4130	New Zealand		
					8/308 0	Queen St Ea	st, Hastings Ph: +64 6	s PO Box 2 8771652 E	805 Ema	7, Havelock North il: info@rdcl.co.nz	4130	New Zealand		



											SHEET 9 OF 76
CLIE	NT:	Gre	ensto	ne Land Developm	ents Ltd		PROJECTI	ON:	NZTM	LOCATION: Lyndhurst	Road Subdivision
PRO	JEC	CT:	18109	0602			EASTING:		1928562.00	STARTED: 01/06/2018	3
LOC	ATIC	ON:	Lyndh	urst Road Subdivis	ion Stage 6		NORTHING	G:	5607780.00	FINISHED: 01/06/2018	3
							DATUM: I	NZV	D2016	LOGGED BY: SD/BB	DATE: 06/06/201
OFF	ICE:		RDCL				ELEVATIO	N:		CHECKED BY: SD	DATE: 04/07/201
ENG	INE	ER:	ТВ				AZUMITH:	0°	PLUNGE: 90°	STATUS: Final data	
CON	ITRA	АСТО	R:	1	N	ACHIN	NE:			OPERATOR: SD/BB	
(ш			<u></u>		DCP BLOWS				SAMPLES & TESTS	ADDITIONAL	REMARKS
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	DATA 2	10 15	2	20				
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REM										Standing Water Level	
REM										↓ Out flow	



		_						SHEET 10 OF 76
				e Land Developments Ltd		ON: NZTM	LOCATION: Lyndhurst F	
			18109		EASTING:		STARTED: 01/06/2018	
LOCA	ATIC	DN:	Lyndh	rrst Road Subdivision Stage 6		G: 5607762.00	FINISHED: 01/06/2018	
OFFI			RDCL		DATUM: I		LOGGED BY: SD/BB CHECKED BY: SD	DATE: 06/06/201 DATE: 04/07/201
ENG					AZUMITH:			DATE: 04/07/201
CON				МА	CHINE:		OPERATOR: SD/BB	
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	DCP BLOWS	20	SAMPLES & TESTS	ADDITIONAL	REMARKS
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REMA Lot 47	٩RK	S					SYMBOLS	
							✓ Standing Water Level ← Out flow	
							└── In flow	



											SHEET 11 OF 76
CLIENT:	Gre	enstor	ne Land De	evelopme	nts Ltd		PROJEC	TION:	NZTM	LOCATION: Lyndhurst	Road Subdivision
PROJEC	T:	18109	0602				EASTING	6: Ý	928568.00	STARTED: 01/06/2018	3
LOCATIO	ON:	Lyndh	urst Road	Subdivisio	on Stage 6		NORTHI	NG: 8	607755.00	FINISHED: 01/06/2018	3
							DATUM:		D2016	LOGGED BY: SD/BB	
OFFICE:		RDCL					ELEVATI			CHECKED BY: SD	DATE: 04/07/201
ENGINE							AZUMITH	l: 0°	PLUNGE: 90		
CONTRA	АСТС)R: ⊤				MAC	HINE:	1		OPERATOR: SD/BB	
DEPTH (m) RL (m)	MATER WATER MATER MATER MATER DCP BLOWS DCP BLOWS 10 15			OWS			SAMPLES & TESTS	ADDITIONAL	REMARKS		
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Lot 47										✓ Standing Water Level ← Out flow	
										<⊢ Out now	
								DCL		4130 New Zealand	



									SHEET 12 OF 76
				ne Land Developme	nts Ltd		ION: NZTM	LOCATION: Lyndhurst R	oad Subdivision
			18109			EASTING		STARTED: 01/06/2018	
LOC	CATIO	ON:	Lyndh	urst Road Subdivisio	n Stage 6		G: 5607771.00	FINISHED: 01/06/2018	
							NZVD2016	LOGGED BY: SD/BB	DATE: 06/06/201
	ICE:		RDCL			ELEVATIO		CHECKED BY: SD	DATE: 04/07/201
		ER:					: 0° PLUNGE: 90°		
COI	NTRA	асто	R:		MAC	HINE:		OPERATOR: SD/BB	
DEPTH (m)	(m)	WATER	GRAPHIC LOG	DATA 2	DCP BLOWS		SAMPLES & TESTS	ADDITIONAL F	REMARKS
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		Groundwater Not Encountered		5					
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	IARK	ś		· · · ·			s	YMBOLS	
Lot 47	7							Standing Water Level	
								<⊢ Out flow ≻ In flow	
						Dr	OCL		



										SHEET 13 OF 76
				ne Land Developmer	nts Ltd		JECTION:		LOCATION: Lyndhurst F	Road Subdivision
			18109					928550.00	STARTED: 07/06/2018	
LOC	CATIO	ON:	Lyndh	urst Road Subdivisio	n Stage 6		THING: 5		FINISHED: 07/06/2018	
							UM: NZVE	2016	LOGGED BY: SD/BB	DATE: 06/06/2018
	FICE		RDCL				ATION:		CHECKED BY: SD	DATE: 04/07/201
		ER:					MITH: 0°	PLUNGE: 90°		
CO	NTR/	АСТО	R:		М	ACHINE:			OPERATOR: SD/BR	
DEPTH (m)	(m)	WATER	GRAPHIC LOG	DATA 2	DCP BLOWS			SAMPLES & TESTS	ADDITIONAL	REMARKS
DE	RL	A W	щС	2 5	10 15	20				
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	_	untere		4						
	-	Groundwater Not Encountered		6						
1.5	-1.5	ater No		4 5						
	-	awpun		4 4						
	_	Go		4						
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	-			4						
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									✓ Standing Water Level ⊲- Out flow	
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													SHEET 14 OF 76
				ne Land Dev	elopme	ents Ltd		PROJE				OCATION: Lyndhurst	
			18109			_		EASTIN		1928562.00		TARTED: 07/06/2018	
LOC	ATIC	DN:	Lyndh	urst Road S	ubdivisi	on Stage 6	i			5607753.00		INISHED: 07/06/2018	
	~-							DATUM		D2016		OGGED BY: SD/BB	
OFFI ENG			RDCL					ELEVA AZUMI		PLUNGE: 9		HECKED BY: SD	DATE: 04/07/20 ⁻
CON							MAG	CHINE:	п. 0	FLUNGE. 9		PERATOR: SD/BR	
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	TA		DCP BL	OWS			SAMPLES & TESTS		ADDITIONAL	REMARKS
B	R	MA	RÖ	DATA	5	10	15	20					
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REMA Lot 48	AKK	3									SYMB		
											v Sta	nding Water Level t flow	
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									-		SHEET 15 OF 76
				ne Land Developme	nts Ltd		PROJEC			LOCATION: Lyndhurs	
			18109		_		EASTING		1928551.00	STARTED: 07/06/20	
LOC	ATIC	ON:	Lyndh	urst Road Subdivisio	on Stage 6				5607745.00	FINISHED: 07/06/20	
	~-						DATUM:		D2016	LOGGED BY: SD/BI	
OFFI ENG			RDCL				AZUMITH			CHECKED BY: SD STATUS: Final data	DATE: 04/07/201
CON						MACH		1. 0	PLUNGE: 90	OPERATOR: SD/BR	
		1010	//. 			WIAOI					
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	DATA 2	DCP BLOW				SAMPLES & TESTS	ADDITION/	AL REMARKS
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F		Groundwater Not Encountered		4 4							
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_ot 48										✓ Standing Water Level <⊢ Out flow	
										<⊢ Out now ▷─ In flow	
							RI	DCL		1 4130 New Zealand	



		_										SHEET 16 OF 76	
				ne Land Developm	ents Ltd		PROJEC				•	Road Subdivision	
			18109				EASTING		1928539.00		: 07/06/2018		
LOC	CATIO	ON:	Lyndh	urst Road Subdivis	ion Stage 6				5607759.00		: 07/06/2018		
e -			DF				DATUM:		/D2016		BY: SD/BB	DATE: 06/06/201	
	FICE:		RDCL				ELEVATI			CHECKED		DATE: 04/07/201	
		ER: ACTC				MACU		: 0*	PLUNGE: 90				
COI	NIRA					MACH	INE:			OPERATO	JR: SD/BR		
DEPTH (m)	(۱	R	GRAPHIC LOG	_	DCP BLOW	/S			SAMPLES & TESTS		ADDITIONAL	REMARKS	
DEP	RL (m)	WATER	GRAI	DATA 2	10	15	20						
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Lot 48	3									Standing Wate	r Level		
										<- Out flow			
								ייי		├─ In flow			
				8/308	Queen St Eas		s PO Box 2		7, Havelock North il: info@rdcl.co.nz	4130 New Zea	aland		



								SHEET 17 OF 76	
				ne Land Developments Ltd		ION: NZTM	LOCATION: Lyndhurst R	oad Subdivision	
			18109		EASTING:		STARTED: 07/06/2018		
LOC	ATIC	ON:	Lyndh	urst Road Subdivision Stage 6		G: 5607756.00	FINISHED: 07/06/2018		
						NZVD2016	LOGGED BY: SD/BB	DATE: 06/06/201	
OFF			RDCL		ELEVATIO		CHECKED BY: SD	DATE: 04/07/2018	
		ER:			AZUMITH:	0° PLUNGE: 90°	STATUS: Final data		
CON		АСТС		MA	CHINE:		OPERATOR: SD/BR		
DEPTH (m)	(m	WATER	GRAPHIC LOG	DCP BLOWS		SAMPLES & TESTS	ADDITIONAL F	REMARKS	
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Lot 49)						Standing Water Level		
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					SHEET 18 OF 76	
CLIENT: Greenstone Land Developmen	ts Ltd		ON: NZTM	LOCATION: Lyndhurst R	oad Subdivision	
PROJECT: 181090602		EASTING:	1928545.00	STARTED: 07/06/2018		
LOCATION: Lyndhurst Road Subdivisior	n Stage 6		G: 5607740.00	FINISHED: 07/06/2018		
		DATUM: N		LOGGED BY: SD/BB	DATE: 06/06/201	
OFFICE: RDCL		ELEVATIO		CHECKED BY: SD	DATE: 04/07/201	
ENGINEER: TB		AZUMITH:	0° PLUNGE: 90°	STATUS: Final data		
CONTRACTOR:	MAC	HINE:		OPERATOR: SD/BR		
DEPTH (m) RL (m) WATER GRAPHIC LOG DATA DATA	DCP BLOWS		SAMPLES & TESTS	ADDITIONAL REMARKS		
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REMARKS				/MBOLS		
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0/200	een St East Hasting	RD(CL 3057, Havelock North 41	130 New Zealand		
8/308 QU	Ph: +64	јз PO Box 28 6 8771652 Е	mail: info@rdcl.co.nz	130 New Zealand		



								SHEET 19 OF 76		
			ne Land Development	ts Ltd		FION: NZTM	LOCATION: Lyndhurst Ro	oad Subdivision		
PROJE					EASTING	: 1928537.00	STARTED: 07/06/2018			
LOCAT	TION:	Lyndh	urst Road Subdivision	stage 6	NORTHIN	IG: 5607735.00	FINISHED: 07/06/2018			
					DATUM:	NZVD2016	LOGGED BY: SD/BB	DATE: 06/06/20		
OFFIC	E:	RDCL			ELEVATI	ON:	CHECKED BY: SD	DATE: 04/07/20		
ENGIN	IEER:	ТВ			AZUMITH	: 0° PLUNGE: 90°	STATUS: Final data	STATUS: Final data		
CONT	RACTO	DR:		MA	CHINE:		OPERATOR: SD/BR			
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											SHEET 20 OF 76		
				ne Land Developme	ents Ltd		PROJEC			LOCATION: Lyndhurst F			
PROJ							EASTING		1928526.00	STARTED: 07/06/2018			
LOCA	ATIC	DN:	Lyndh	urst Road Subdivis	on Stage 6				5607748.00	FINISHED: 07/06/2018			
							DATUM:		D2016	LOGGED BY: SD/BB	DATE: 06/06/201		
OFFIC			RDCL				ELEVATI			CHECKED BY: SD	DATE: 04/07/201		
ENGI								H: 0°	PLUNGE: 90				
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												SHEET 21 OF 76
CLI	ENT:	Gre	ensto	ne L	and Developme	ents Ltd		PROJEC	TION	: NZTM	LOCATION: Lyndhurst	Road Subdivision
PR	OJEC	CT:	18109	90602	2			EASTING	:	1928520.00	STARTED: 14/06/2018	3
LOO	CATI	ON:	Lyndh	nurst	Road Subdivisi	on Stage 6	6	NORTHIN	IG:	5607780.00	FINISHED: 14/06/2018	3
								DATUM:	NΖV	/D2016	LOGGED BY: SD/BB	DATE: 06/06/2018
OF	FICE	:	RDCL	-				ELEVATI	ON:		CHECKED BY: SD	DATE: 04/07/2018
		ER:						AZUMITH	l: 0°	PLUNGE: 90°	STATUS: Final data	
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Lot 5	5										Standing Water Level	
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					8/308 0	Queen St E	ast, Hastin	gs PO Box 2	2805	7, Havelock North	130 New Zealand	
1							Ph: +64	6 8771652	Emai	il: info@rdcl.co.nz		



															SHEET 22 OF 76
CLIEN	CLIENT: Greenstone Land Developments Ltd PROJECT: 181090602									PROJECT	ION	: NZTM		LOCATION: Lyndhurst F	Road Subdivision
										EASTING	:	1928507.00		STARTED: 14/06/2018	
LOCA	TIC	DN:	Lyndh	urst R	oad Subo	divisio	n Stage	6		NORTHIN	IG:	5607796.00		FINISHED: 14/06/2018	
										DATUM:	NZ∖	/D2016		LOGGED BY: SD/BB	DATE: 06/06/201
OFFIC	CE:		RDCL							ELEVATIO	DN:			CHECKED BY: SD	DATE: 04/07/201
ENGI	NE	ER:	ТВ							AZUMITH	: 0°	PLUNGE: 9	90°	STATUS: Final data	
CONT	TRA	СТО	R:					M	ACHI	NE:				OPERATOR: SD/BR	
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														SHEE	F 23 OF 76
CLI	OJECT: 181090602 EASTING								PROJECT	FION:	NZTM		LOCATION: Lyndhurst	Road Subd	ivision
PR	DJEC	T:	18109	0602					EASTING	: 1	928518.00		STARTED: 14/06/201	3	
LOC	CATIO	ON:	Lyndh	urst F	Road Su	bdivision	Stage 6		NORTHIN	IG: 5	607804.00		FINISHED: 14/06/201	3	
									DATUM:	NZV	02016		LOGGED BY: SD/BB	DATE	06/06/2018
OFF	ICE:		RDCL						ELEVATIO	ON:			CHECKED BY: SD	DATE	04/07/2018
ENG	SINE	ER:	ТΒ						AZUMITH	: 0°	PLUNGE: 90	0°	STATUS: Final data		
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										SHEET 24 OF 76
				ne Land Developmen	ts Ltd		TION: NZ		LOCATION: Lyndhurst Ro	bad Subdivision
			18109			EASTING		535.00	STARTED: 14/06/2018	
LOC	ATIC	ON:	Lyndh	urst Road Subdivisior	n Stage 6		NG: 5607		FINISHED: 14/06/2018	
							NZVD20	16	LOGGED BY: SD/BB	DATE: 06/06/201
OFF			RDCL			ELEVATI			CHECKED BY: SD	DATE: 04/07/201
		ER:				AZUMITH	1: 0°	PLUNGE: 90°	STATUS: Final data	
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											SHEET 25 OF 76
CLI	ENT:	Gre	eensto	ne L	and Developments Lto	1	NZTM	LOCATION: Lyndhurst R	load Subdivision		
PRO	OJEC	CT:	18109	90602	2		EASTING:	1	928543.00	STARTED: 14/06/2018	
LOC	CATIO	ON:	Lyndh	urst	Road Subdivision Sta	ge 6	NORTHIN	G: 5	607786.00	FINISHED: 14/06/2018	
							DATUM:	NZVI	D2016	LOGGED BY: SD/BB	DATE: 06/06/2018
OFF	FICE	:	RDCL				ELEVATIO	N:		CHECKED BY: SD	DATE: 04/07/2018
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					8/308 00000	St Fact Hactin	RD	CL	Havelock North 4	130 New Zealand	
					o/SUO QUEEN	Ph ⁻ +64	93 FO BOX 2 6 8771652 F	-0007 Fmail	, Havelock North 4 ² : info@rdcl.co.nz	ISU INEW Zealand	



											SHEET 26 OF 76	
				Land Developmer	nts Ltd		PROJECT	FION:	NZTM	LOCATION: Lyndhurst F	load Subdivision	
PROJ							EASTING		1928524.00	STARTED: 14/06/2018		
LOCA	TION	I: Lyr	dhurs	t Road Subdivisio	n Stage 6				5607810.00	FINISHED: 14/06/2018		
							DATUM:		D2016	LOGGED BY: SD/BB	DATE: 06/06/201	
OFFIC		RD	CL				ELEVATIO			CHECKED BY: SD	DATE: 04/07/201	
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CLI	ENT:	Gre	ensto	ne La	and Developments Lto	ł	: NZTM	LOCATION: Lyndhurst	Road Subdivision		
PR	OJEC	CT:	18109	0602	2		EASTING		1928533.00	STARTED: 14/06/2018	3
LO	CATIO	ON:	Lyndh	urst	Road Subdivision Sta	ge 6	NORTHIN	G:	5607815.00	FINISHED: 14/06/2018	3
							DATUM:		/D2016	LOGGED BY: SD/BB	DATE: 06/06/2018
	FICE		RDCL				ELEVATIO			CHECKED BY: SD	DATE: 04/07/2018
		ER:					AZUMITH	: 0°	PLUNGE: 90°		
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Lot 5										Standing Water Level	
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					orsoo Queen	רבמסו, המסווחט Ph⁺ +64 (6 8771652	-ooo Emai	/, Havelock North 4 il: info@rdcl.co.nz	TIOU INCW ZEAIAIIU	



							_				SHEET 28 OF 76
CLIEN	NT:	Gre	enstor	e Land Developme	nts Ltd		PROJEC	TION:	NZTM	LOCATION: Lyndhurst F	Road Subdivision
			18109				EASTING		1928552.00	STARTED: 14/06/2018	
LOCA	ATIC	ON:	Lyndh	urst Road Subdivisi	on Stage 6		NORTHIN	NG:	5607793.00	FINISHED: 14/06/2018	
							DATUM:	NZV	D2016	LOGGED BY: SD/BB	DATE: 06/06/201
OFFI	CE:		RDCL				ELEVATI	ON:		CHECKED BY: SD	DATE: 04/07/201
ENGI	NEE	ER:	ТВ				AZUMITH	l: 0°	PLUNGE: 90°	STATUS: Final data	
CON	TRA	АСТО	R:			MAC	HINE:	-		OPERATOR: SD/BR	
DEPTH (m)	(m)	WATER	GRAPHIC LOG	٩	DCP BLO	WS			SAMPLES & TESTS	ADDITIONAL	REMARKS
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										SHEET 29 OF 76
CLIENT	T: Gre	eensto	ne Land Developme	ents Ltd		PROJECT	TION	NZTM	LOCATION: Lyndhurst	
PROJE	CT:	18109	0602			EASTING	:	1928557.00	STARTED: 14/06/2018	3
LOCAT	ION:	Lyndh	urst Road Subdivisi	on Stage 6		NORTHIN	IG:	5607796.00	FINISHED: 14/06/2018	3
						DATUM:	NZV	D2016	LOGGED BY: SD/BB	DATE: 06/06/201
OFFICE	Ξ:	RDCL				ELEVATIO	ON:		CHECKED BY: SD	DATE: 04/07/201
ENGINE	EER:	ТВ				AZUMITH	: 0°	PLUNGE: 90	° STATUS: Final data	
CONTR	RACTO	DR:			MACH	INE:			OPERATOR: SD/BR	
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													SHEET 30 OF 76
					l Developn	nents L	_td		PROJEC		: NZTM	LOCATION: Lyndhurst	
			18109						EASTING		1928539.00	STARTED: 14/06/201	
LOC	CATI	ON:	Lyndh	urst Roa	ad Subdivi	sion St	tage 6				5607821.00	FINISHED: 14/06/201	
									DATUM:		/D2016	LOGGED BY: SD/BB	
			RDCL	-					ELEVATI			CHECKED BY: SD	DATE: 04/07/2018
		ER:						MAG		1: 0°	PLUNGE: 90		
COI		асто)R:					MACH	IINE:			OPERATOR: SD/BR	
DEPTH (m)	(m)	WATER	GRAPHIC LOG	A		D	CP BLOW	S			SAMPLES & TESTS	ADDITIONA	L REMARKS
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															SHEET	51 OF 76
CLI	ENT:	Gre	ensto	ne La	and Devel	opment	s Ltd		PI	ROJECT	ION	: NZTM		LOCATION: Lyndhurst I	Road Subd	ivision
			18109						E	ASTING:		1928545.00		STARTED: 14/06/2018	;	
LOC	CATIO	ON:	Lyndh	nurst I	Road Sub	division	Stage 6		N	ORTHIN	G:	5607825.00		FINISHED: 14/06/2018	5	
									D	ATUM:	NZV	′D2016		LOGGED BY: SD/BB	DATE	06/06/2018
	FICE		RDCL	-						LEVATIC				CHECKED BY: SD	DATE	04/07/2018
		ER:								ZUMITH:	0°	PLUNGE: 9	0°	STATUS: Final data		
CO	NTR/		R:					MA	CHINE	:				OPERATOR: SD/BR		
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										SHEET 32 OF 76
			ne Land Developme	nts Ltd		PROJEC			LOCATION: Lyndhurst R	oad Subdivision
PROJEC						EASTING		928567.00	STARTED: 14/06/2018	
LOCATI	ON:	Lyndh	urst Road Subdivisio	on Stage 6		NORTHI	NG: 5	607802.00	FINISHED: 14/06/2018	
						DATUM:	NZVI	02016	LOGGED BY: SD/BB	DATE: 06/06/20
OFFICE	:	RDCL				ELEVAT	ON:		CHECKED BY: SD	DATE: 04/07/20
ENGINE	ER:	ТВ				AZUMITI	H: 0°	PLUNGE: 90	° STATUS: Final data	
CONTR	ACTO	R:			MAC	HINE:	-		OPERATOR: SD/BR	
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OJECT: 181090602 CATION: Lyndhurst Road Subdivision Stage 6								TING:		928573.00		STARTED: 14/06/2018	
ATIC	DN:	Lyndh	urst F	Road Subdivisio	n Stage 6							FINISHED: 14/06/2018	
										D2016			DATE: 06/06/201
CE:													DATE: 04/07/201
								MITH:	0°	PLUNGE: 90	0°		
TRA	СТО	R:				MAC	CHINE:					OPERATOR: SD/BR	
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PLUNGE: 9 IRACTOR: MACHINE: Image: 100 million of the second of the sec</td><td>CE: RDCL ELEVATION: ZUMITH: 0° PLUNGE: 90° IRACTOR: DCP BLOWS SAMPLES & TESTS 00 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0</td><td>DATUM: NZVD2018 LOGGED BY: SD/BB DEEX: TB AZUMITH: 0' PLUNGE: 00' STATUS: Final data STATUS: Final data TRACTOR: MACHINE: OPERATOR: SD/BR U U DCP BLOWS STATUS: SI/BR DEP BLOWS STATUS: Final data ADDITIONAL F 01 U DCP BLOWS STATUS: SD/BR 02 U U DCP BLOWS STATUS: SD/BR 02 U U DCP BLOWS STATUS: SD/BR 02 U U DCP BLOWS STATUS: SD/BR 03 U DCP BLOWS STATUS: SD/BR 04 U U STATUS: SD/BR 04 U U U 05 U U U 07 U U U 08 U U U 07 U U U 08 U U U 09 U U U 01 U U 02 U U 03 U U 04 U U 04 U U 05 U U <td< td=""></td<></td></td<></td></td>	4.5 -1.0 -0.5 RL (m) -1.5 -1.0 -0.5 RL (m) -1.5 -1.0 -0.5 RL (m) -1.6 -0.5 RL (m) -0.5 -1.6 -0.5 R.1 -0.5 -1.7 -0.5	4.5 4.0 -3.5 -1.0 -0.5 RL (m) INACTOR: -1.0 -0.5 RL (m) -0.5 RL (m) INACTOR: -0.1 -0.5 RL (m) -0.5 RL (m) -0.5 INACTOR: -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 INACTOR: -0.1 <td>CE: RDCL NEER: TB TRACTOR: (U) 9 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>CE: RDCL NEER: TB TRACTOR: (III) 1 (III) 1</td> <td>CE: RDCL NEER: TB TRACTOR: MAX</td> <td>DAT NEER: RDCL NEER: TRACTOR: 01 0 01 0 02 0 01 0 02 0 03 0 04 0 1 0</td> <td>CE: RDCL NEER: TRACTOR: MACHINE TRACTOR: MACHINE OP OP OP OP</td> <td>CE: RDCL NEER: TB TRACTOR: DCP BLOWS OP OP 01 0 <td< td=""><td>CE: RDCL ELEVATION: ZUMITH: 0° PLUNGE: 9 IRACTOR: MACHINE: Image: 100 million of the second of the sec</td><td>CE: RDCL ELEVATION: ZUMITH: 0° PLUNGE: 90° IRACTOR: DCP BLOWS SAMPLES & TESTS 00 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0</td><td>DATUM: NZVD2018 LOGGED BY: SD/BB DEEX: TB AZUMITH: 0' PLUNGE: 00' STATUS: Final data STATUS: Final data TRACTOR: MACHINE: OPERATOR: SD/BR U U DCP BLOWS STATUS: SI/BR DEP BLOWS STATUS: Final data ADDITIONAL F 01 U DCP BLOWS STATUS: SD/BR 02 U U DCP BLOWS STATUS: SD/BR 02 U U DCP BLOWS STATUS: SD/BR 02 U U DCP BLOWS STATUS: SD/BR 03 U DCP BLOWS STATUS: SD/BR 04 U U STATUS: SD/BR 04 U U U 05 U U U 07 U U U 08 U U U 07 U U U 08 U U U 09 U U U 01 U U 02 U U 03 U U 04 U U 04 U U 05 U U <td< td=""></td<></td></td<></td>	CE: RDCL NEER: TB TRACTOR: (U) 9 0 0 0 0 0 0 0 0 0 0 0 0 0	CE: RDCL NEER: TB TRACTOR: (III) 1 (III) 1	CE: RDCL NEER: TB TRACTOR: MAX	DAT NEER: RDCL NEER: TRACTOR: 01 0 01 0 02 0 01 0 02 0 03 0 04 0 1 0	CE: RDCL NEER: TRACTOR: MACHINE TRACTOR: MACHINE OP OP OP OP	CE: RDCL NEER: TB TRACTOR: DCP BLOWS OP OP 01 0 1 0 <td< td=""><td>CE: RDCL ELEVATION: ZUMITH: 0° PLUNGE: 9 IRACTOR: MACHINE: Image: 100 million of the second of the sec</td><td>CE: RDCL ELEVATION: ZUMITH: 0° PLUNGE: 90° IRACTOR: DCP BLOWS SAMPLES & TESTS 00 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 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													SHEET 34 OF 76
CLIEN	NT:	Gre	enstor	e Land Deve	lopment	ts Ltd		PROJE	CTION:	NZTM		LOCATION: Lyndhurst F	Road Subdivision
PROJ	IECT	: '	18109	0602				EASTIN	IG: ´	928551.00		STARTED: 14/06/2018	
LOCA	TIO	N: I	_yndh	urst Road Sul	bdivisior	Stage 6		NORTH	ling: {	607830.00		FINISHED: 14/06/2018	
								DATUN	1: NZV	D2016		LOGGED BY: SD/BB	DATE: 06/06/20
OFFIC	CE:	F	RDCL					ELEVA	TION:			CHECKED BY: SD	DATE: 04/07/20
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									SHEET 35 OF 76
			ne Land Development	s Ltd	PROJE	CTION:		LOCATION: Lyndhurst F	load Subdivision
PROJEC					EASTI		928557.00	STARTED: 14/06/2018	
LOCATI	ON:	Lyndh	urst Road Subdivision	Stage 6			607838.00	FINISHED: 14/06/2018	
						1: NZVI	02016	LOGGED BY: SD/BB	DATE: 06/06/2018
OFFICE		RDCL			ELEVA			CHECKED BY: SD	DATE: 04/07/2018
ENGINE					AZUMI	TH: 0°	PLUNGE: 90°		
CONTR	ACTC	DR:		Μ	IACHINE:			OPERATOR: SD/BR	
DEPTH (m) RL (m)	WATER	GRAPHIC LOG	DATA 2	DCP BLOWS	20		SAMPLES & TESTS	ADDITIONAL	REMARKS
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		18109	0602							
ATIC	NI.					EASTING		1928580.00	STARTED: 14/06/20	
	JN:	Lyndh	urst Road Subdivisio	n Stage 6				5607814.00	FINISHED: 14/06/20	
						DATUM:		′D2016	LOGGED BY: SD/BI	
ICE:		RDCL				ELEVATIO			CHECKED BY: SD	DATE: 04/07/201
	ER:					AZUMITH	: 0°	PLUNGE: 90		
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												SHEET	37 OF 76
CLI	ENT:	Gre	eensto	ne Land Developme	ents Ltd		PROJECT	ΓΙΟΝ	: NZTM	LOCATION: Ly	/ndhurst F	Road Subdi	vision
PR	OJEC	CT:	18109	0602			EASTING	:	1928515.00	STARTED: 19	9/06/2018		
LOC	CATI	ON:	Lyndh	urst Road Subdivisi	on Stage 6		NORTHIN	IG:	5607745.00	FINISHED: 19	9/06/2018		
							DATUM:	NΖ\	/D2016	LOGGED BY:	SD/BR	DATE:	21/06/2018
OFF	FICE	:	RDCL				ELEVATIO	ON:		CHECKED BY	: SD	DATE:	04/07/2018
ENG	GINE	ER:	тв				AZUMITH	: 0°	PLUNGE: 90°	STATUS: Fina	l data		
CO	NTR	ACTC	R:			MACH	INE:			OPERATOR: E	BR		
(SAMPLES				
DEPTH (m)	_ ج	۲.	GRAPHIC LOG	-	DCP BLOWS	0			& TESTS	AD	DITIONAL	REMARKS	
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				8/308 (Jueen St East, F	Ph: +64 6	5 PO Box 4 5 8771652	2805 Ema	7, Havelock North 4 il: info@rdcl.co.nz	130 New Zealand	1		



		-								SHEET 38 OF 76
				ne Land Developments Ltd		PROJECT	ION: NZT	М	LOCATION: Lyndhurst Ro	oad Subdivision
			18109			EASTING:		96.00	STARTED: 19/06/2018	
LOC	CATIO	ON:	Lyndh	urst Road Subdivision Stage 6	;	NORTHIN			FINISHED: 19/06/2018	
						DATUM:		6	LOGGED BY: SD/BR	DATE: 21/06/201
	ICE:		RDCL			ELEVATIC			CHECKED BY: SD	DATE: 04/07/201
		ER:				AZUMITH:	0° P	LUNGE: 90°	STATUS: Final data	
CO	NIR/	ACTC	DR:		MACHI	NE:			OPERATOR: BR	
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	DCP BL		20		MPLES TESTS	ADDITIONAL F	EMARKS
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REIV Lot 50		10							MBOLS	
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									- In flow	



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CLIE	NT:	Gre	ensto	ne Land Developmer	nts Ltd		PROJECT	ION:	NZTM	LOCATION: Lyndh	nurst Road Subdivision
PRO	JEC	T:	18109	0602			EASTING	:	1928493.00	STARTED: 19/06/	/2018
LOC	ΑΤΙΟ	DN:	Lyndh	urst Road Subdivisio	n Stage 6		NORTHIN	G: ;	5607742.00	FINISHED: 19/06/	/2018
							DATUM:	NZV	D2016	LOGGED BY: BF	R DATE: 21/06/20
OFF	ICE:		RDCL				ELEVATIO	DN:		CHECKED BY: SE	D DATE: 04/07/20
ENG	INE	ER:	ТΒ				AZUMITH	: 0°	PLUNGE: 90	° STATUS: Final dat	ta
CON	ITRA	СТО	R:			MACI	HINE:			OPERATOR: BR	
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							SHEET 40 OF 76
CLIENT	Gre	ensto	ne Land Developments Ltd	PROJECT	ION: NZTM	LOCATION: Lyndhurst R	oad Subdivision
PROJEC	CT:	18109	0602	EASTING:	1928509.00	STARTED: 19/06/2018	
LOCATI	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHIN	G: 5607752.00	FINISHED: 19/06/2018	
				DATUM:	NZVD2016	LOGGED BY: BR	DATE: 21/06/201
OFFICE	:	RDCL		ELEVATIO	N:	CHECKED BY: SD	DATE: 04/07/201
ENGINE	ER:	ТВ		AZUMITH:	0° PLUNGE: 90°	STATUS: Final data	
CONTR	ACTC	R:	Ν	IACHINE:		OPERATOR: BR	
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CLI	ENT:	Gre	ensto	ne L	and Deve	lopments	Ltd		PROJECT	TION	I: NZTM		LOCATION: Lyndhurst F	Road Subd	ivision
PR	OJEC	CT:	18109	90602	2				EASTING	:	1928577.00		STARTED: 21/06/2018		
LO	CATIO	ON:	Lyndh	urst	Road Sub	odivision S	Stage 6		NORTHIN	IG:	5607833.00		FINISHED: 21/06/2018		
									DATUM:	NZ\	/D2016		LOGGED BY: BR	DATE:	21/06/2018
OFI	FICE	:	RDCL						ELEVATIO	ON:			CHECKED BY: SD	DATE:	04/07/2018
EN	GINE	ER:	ТВ						AZUMITH	: 0°	PLUNGE: 9	0°	STATUS: Final data		
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					0/			Ph: +64 6	877165 <u>2</u>	Ema	il: info@rdcl.co.nz	2			



IECT	: 1	81090	ne Land Developme 0602	ents Ltd		PROJEC	FION:	NZTM	LOCATION: Lyndhurst	Road Subdivision
			0602			1				
TIOI	NE L					EASTING		1928569.00	STARTED: 21/06/2018	
	IN. L	.yndhu	urst Road Subdivisi	on Stage 6				5607847.00	FINISHED: 21/06/2018	8
						DATUM:		D2016	LOGGED BY: BR	DATE: 21/06/201
CE:		RDCL				ELEVATI			CHECKED BY: SD	DATE: 04/07/201
	R: T						: 0°	PLUNGE: 90		
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											SHEET 43 OF 76
CLIE	ENT:	Gre	ensto	ne Land Developme	ents Ltd		PROJEC	TION:	NZTM	LOCATION: Lyndhurst F	Road Subdivision
PRC	DJEC	CT:	18109	0602			EASTING	G: 1	928576.00	STARTED: 21/06/2018	
LOC	ATIC	ON:	Lyndh	urst Road Subdivisi	on Stage 6		NORTHI	NG: 5	607851.00	FINISHED: 21/06/2018	
							DATUM:	NZVI	02016	LOGGED BY: SD/BR	DATE: 21/06/201
OFF	ICE:		RDCL				ELEVAT	ON:		CHECKED BY: SD	DATE: 04/07/201
ENG	SINE	ER:	тв				AZUMITI		PLUNGE: 90°	STATUS: Final data	
		АСТО				MAC	HINE:			OPERATOR: SD/BR	
Ê			0		DCP BLC	ows			SAMPLES	ADDITIONAL	REMARKS
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												SHEET 44 OF 76
CLI	ENT:	Gre	ensto	ne Land Develo	opments Ltd		PROJEC	TION:	NZTM	I	LOCATION: Lyndhurst F	Road Subdivision
PR	DJEC	CT:	18109	0602			EASTIN	G: 19	928587.00	:	STARTED: 21/06/2018	
LOC	CATIO	ON:	Lyndh	urst Road Subo	division Stage	e 6	NORTH	NG: 5	607837.00		FINISHED: 21/06/2018	
							DATUM	NZVD	2016		LOGGED BY: SD/BR	DATE: 21/06/201
OFF	FICE		RDCL				ELEVAT	ION:			CHECKED BY: SD	DATE: 04/07/201
ENG	GINE	ER:	ТВ				AZUMIT	H: 0°	PLUNGE: 9	90° (STATUS: Final data	
CO	NTRA	АСТО	R:			MA	CHINE:			(OPERATOR: SD/BR	
(m)			U		DCP	BLOWS			SAMPLES & TESTS		ADDITIONAL	REMARKS
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CLI	ENT:	Gre	ensto	ne Land D	evelopmer	nts Ltd		PROJE	CTION:	NZTM		LOCATION: Lyndhurst F	Road Subdivision
PRO	DJEC	CT:	18109	0602				EASTIN	IG:	928593.00		STARTED: 21/06/2018	
LOC	CATIO	ON:	Lyndh	urst Road	Subdivisio	n Stage 6	6	NORTH	IING: {	607838.00		FINISHED: 21/06/2018	
								DATUN	I: NZV	D2016		LOGGED BY: SD/BR	DATE: 21/06/20
OFF	FICE:	:	RDCL					ELEVA	TION:			CHECKED BY: SD	DATE: 04/07/20
ENC	GINE	ER:	тв					AZUMI	ΓΗ: 0°	PLUNGE: 9	90°	STATUS: Final data	
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CLIEN	T: G	reenste	one L	and Developments	s Ltd		PROJECT	ION	NZTM	LOCATION: Lyndhurst F	Road Subdivision
PROJE	ECT:	1810	9060	2			EASTING	:	1928581.00	STARTED: 21/06/2018	
LOCAT	FION:	Lynd	hurst	Road Subdivision	Stage 6		NORTHIN	G:	5607854.00	FINISHED: 21/06/2018	
							DATUM:	NΖV	′D2016	LOGGED BY: SD/BR	DATE: 21/06/201
OFFICE		RDC	L				ELEVATIO			CHECKED BY: SD	DATE: 04/07/201
ENGIN							AZUMITH	: 0°	PLUNGE: 90°		
CONTR	RACT	OR:				MACH	INE:			OPERATOR: SD/BR	
DEPTH (m) RL (m)	WATER	GRAPHIC I OG	DATA		DCP BLOWS				SAMPLES & TESTS	ADDITIONAL	REMARKS
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													SHEET 47	7 OF 76
CLIEN	IT:	Gre	ensto	ne L	and Developme	ents Ltd		PROJEC	TION	: NZTM	LOCATION: Lyr	ndhurst F	Road Subdivis	ion
PROJE	EC	T:	18109	0602	2			EASTING	6:	1928588.00	STARTED: 21/	06/2018		
LOCA	TIO	DN:	Lyndh	urst	Road Subdivisi	on Stage 6	6	NORTHIN	IG:	5607859.00	FINISHED: 21/	06/2018		
								DATUM:	NZ۱	/D2016	LOGGED BY:	SD/BR	DATE: 2	1/06/201
OFFIC	CE:	I	RDCL					ELEVATI	ON:		CHECKED BY:	SD	DATE: 0	4/07/201
ENGIN	NEE	ER:	ТВ					AZUMITH	l: 0°	PLUNGE: 90	STATUS: Final	data		
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				ne Land Developments Ltd	PROJECT	ION: NZTM	LOCATION: Lyndhurst F	load Subdivision
			18109		EASTING:		STARTED: 21/06/2018	
LOC	CATIO	ON:	Lyndh	urst Road Subdivision Stage 6	NORTHIN	G: 5607845.00	FINISHED: 21/06/2018	
					DATUM:	NZVD2016	LOGGED BY: SD/BR	DATE: 21/06/201
	FICE		RDCL		ELEVATIO		CHECKED BY: SD	DATE: 04/07/201
		ER:			AZUMITH:	0° PLUNGE: 90°	STATUS: Final data	
COI	NTRA	ACTO	R:	MA	CHINE:		OPERATOR: SD/BR	
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	DCP BLOWS 5 10 15	20	SAMPLES & TESTS	ADDITIONAL	REMARKS
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Lot 60							Standing Water Level	
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0.5	-0.5	Groundwater Not Encountered		1 2 1 5 4 5 5 13				1							
DEPTH (m)	RL (m)	ed WATER	GRAPHIC LOG	0	5		10	15	20			& TESTS			
	NTRA	ACTO					CP BLC		ACHINE	Ξ:		SAMPLES		OPERATOR: BB/BR	
ENC		ER:							A	LEVATI(ZUMITH		PLUNGE: 90	° S	CHECKED BY: SD	DATE: 04/07/20
					oad Subd	ivision S	tage 6		D	ATUM:	NZV	5607850.00 ′D2016	L	INISHED: 27/06/2018 OGGED BY: BB/BR	DATE: 27/06/20
			18109							ASTING		1928612.00		STARTED: 27/06/2018	



	NT:	Gre	ensto	ne Land Developn	nents Ltd		PROJEC				
				-			1110020	11014.	INZ I IVI		Road Subdivision
			18109				EASTING	i:	1928596.92	STARTED: 27/06/201	8
LOC	ATIC	ON:	Lyndh	urst Road Subdivi	sion Stage 6		NORTHIN	IG:	5607865.28	FINISHED: 27/06/201	8
							DATUM:	NZV	D2016	LOGGED BY: BB/BR	
OFF			RDCL				ELEVATI			CHECKED BY: SD	DATE: 04/07/2018
ENG							AZUMITH	l: 0°	PLUNGE: 90		
CON	TRA	АСТО	R:			MAC	HINE:			OPERATOR: BB/BR	
4 (m)		ſŕ	일		DCP BLC	ows			SAMPLES & TESTS	ADDITIONA	L REMARKS
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	DATA 2	10	15	20				
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										├─ In flow	



													SHEET 51 OF 76
					and Developme	ents Ltd		PROJEC				LOCATION: Lyndhurst F	Road Subdivision
			18109					EASTING	6:	1928606.32		STARTED: 27/06/2018	
LO	CATI	ON:	Lyndh	urst	Road Subdivisi	on Stage 6		NORTHI	NG:	5607871.14		FINISHED: 27/06/2018	
								DATUM:	NZ۱	/D2016		LOGGED BY: BB/BR	DATE: 27/06/2018
OFI	FICE	:	RDCL					ELEVATI	ON:			CHECKED BY: SD	DATE: 04/07/2018
EN	GINE	ER:	ТВ					AZUMITH	l: 0°	PLUNGE: 9	0°	STATUS: Final data	
СО	NTR/		R:				MAC	HINE:				OPERATOR: BB/BR	
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	DATA	5	DCP BLC	OWS 15	20		SAMPLES & TESTS		ADDITIONAL	REMARKS
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Lot 6	1										1	Standing Water Level	
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									DO '			- In flow	
					8/308 0	Queen St E	ast, Hastin	gs PO Box	DCL 2805	7, Havelock Nort	h 41	30 New Zealand	
							Ph: +64	6 8771652	Ema	il: info@rdcl.co.n	z		



										SHEET 52 OF 76
			ne Land Developmer	nts Ltd		PROJECT			LOCATION: Lyndhurst R	oad Subdivision
PROJE						EASTING		1928623.43	STARTED: 27/06/2018	
LOCAT	FION:	Lyndh	urst Road Subdivisio	n Stage 6				5607851.57	FINISHED: 27/06/2018	
						DATUM:		D2016	LOGGED BY: BB/BR	DATE: 27/06/201
OFFIC		RDCL				ELEVATIO			CHECKED BY: SD	DATE: 04/07/201
ENGIN						AZUMITH	: 0°	PLUNGE: 90°		
CONTR	RACTC	DR:			MACH	INE:			OPERATOR: BB/BR	
DEPTH (m) RL (m)	WATER	GRAPHIC LOG	TA -	DCP BLOWS				SAMPLES & TESTS	ADDITIONAL F	REMARKS
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Lot 61									Standing Water Level	
									<⊢ Out flow	
]	≻ In flow	



										SHEET 53 OF 76
			ne Land Developm	ents Ltd		PROJECT	ION:	NZTM	LOCATION: Lyndhurst F	load Subdivision
PROJEC						EASTING		1928631.91	STARTED: 27/06/2018	
LOCATI	ON:	Lyndh	urst Road Subdivis	ion Stage 6				5607847.25	FINISHED: 27/06/2018	
						DATUM:		D2016	LOGGED BY: BB/BR	DATE: 27/06/201
OFFICE		RDCL				ELEVATIO			CHECKED BY: SD	DATE: 04/07/201
ENGINE						AZUMITH	: 0°	PLUNGE: 90°	STATUS: Final data	
CONTR	ACTC	DR:			MACHI	INE:			OPERATOR: BB/BR	
DEPTH (m) RL (m)	ER	GRAPHIC LOG	4	DCP BLOWS				SAMPLES & TESTS	ADDITIONAL	REMARKS
DEPTH RL (m)	WATER	GRA LOG	DATA 2	10 1	5	20				
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REMARK	KS					:		SY	/MBOLS	
Lot 62									Standing Water Level	
								<	├ Out flow	
									⊢ In flow	



												SHEET 54 OF 76
CLIEN	IT: C	Greenst	one Land [Developmer	nts Ltd		PROJEC	TION:	NZTM		LOCATION: Lyndhurst R	oad Subdivision
PROJ	ECT:	1810	90602				EASTING	6: <i>^</i>	928645.79		STARTED: 27/06/2018	
LOCA	TION	: Lynd	hurst Road	d Subdivisio	on Stage 6		NORTHIN	NG: 8	607829.52		FINISHED: 27/06/2018	
							DATUM:	NZV	D2016		LOGGED BY: BB/BR	DATE: 27/06/201
OFFIC	E:	RDC	L				ELEVATI	ON:			CHECKED BY: SD	DATE: 04/07/201
ENGIN	NEER	: ТВ					AZUMITH: 0° PLUNGE: 90°				STATUS: Final data	
CONT	RAC	TOR:				MAC	HINE:				OPERATOR: BB/BR	
Ê					DCP BLO	NS			SAMPLES		ADDITIONAL F	PEMARKS
DEPTH (m)		L DIHA	A		DOI DEOI				& TESTS		ABBIHIONAL I	
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REMA	RKS									SYN	IBOLS	
										T	Standing Water Level	
Lot 62												
											Out flow In flow	



														SHEET 55 OF 76
					d Develo	opmer	nts Ltd				NZTM		LOCATION: Lyndhurst Ro	ad Subdivision
			18109				01 0		EASTI		1928633.45		STARTED: 27/06/2018	
LOC	AIIC	JN:	Lynan	urst Ro	ad Subo	aivisio	n Stage 6				5607821.04		FINISHED: 27/06/2018	DATE: 27/06/201
OFF			RDCL						ELEVA	M: NZ∖	D2016		LOGGED BY: BB/BR CHECKED BY: SD	DATE: 27/06/201 DATE: 04/07/201
		ER:								TH: 0°	PLUNGE:	90°	STATUS: Final data	
		АСТО						MA	CHINE:				OPERATOR: BB/BR	
											SAMPLES			
DEPTH (m)	<u> </u>	ER	PHIC	4			DCP BL	ows			& TESTS		ADDITIONAL R	EMARKS
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														SHEET 56 OF 76
					Developr	nents Ltd	l		PROJEC				LOCATION: Lyndhurst Ro	ad Subdivision
			18109				c.		EASTING		1928620.81		STARTED: 27/06/2018	
LOC	ATIC	DN:	Lyndh	urst Roa	ad Subdivi	ision Stag	ge 6				5607835.69		FINISHED: 27/06/2018	
									DATUM:		D2016		LOGGED BY: BB/BR	DATE: 27/06/201
OFFI									ELEVAT		DUUNOE	000	CHECKED BY: SD	DATE: 04/07/201
ENG								MAG		H: 0°	PLUNGE:	90°	STATUS: Final data	
CON		CTO	R:					MACH					OPERATOR: BB/BR	
(m) H		£	HIC			DCF	BLOWS				SAMPLES & TESTS		ADDITIONAL R	EMARKS
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	DATA	5	10	1	5	20					
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REMA Lot 62	ARK	S											MBOLS	
													Standing Water Level Out flow	
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															SHEET 57 OF 76
CLIE	ENT:	Gre	ensto	ne La	and De	velopm	ents Lt	td		PROJE	CTION	NZTM		LOCATION: Lyndhurst F	Road Subdivision
PRC	DJEC	CT:	18109	0602	2					EASTIN	IG:	1928616.81		STARTED: 27/06/2018	
LOC	CATIO	ON:	Lyndh	urst I	Road S	Subdivis	ion Sta	age 6		NORTH	IING:	5607831.99		FINISHED: 27/06/2018	
										DATUN	1: NZ\	/D2016		LOGGED BY: BB/BR	DATE: 27/06/201
OFF	ICE:	:	RDCL							ELEVA	TION:			CHECKED BY: SD	DATE: 04/07/201
ENG	SINE	ER:	ТВ							AZUMI	TH: 0°	PLUNGE:	90°	STATUS: Final data	
CON	NTRA	АСТО	R:						MAC	HINE:				OPERATOR: BB/BR	
Ê							DC	CP BLOV	vs			SAMPLES		ADDITIONAL	REMARKS
DEPTH (m)	٦ ب	ËR	HIG	∢			50	DECT				& TESTS			
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Lot 63														Standing Water Level	
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													SHEET 58 OF 76
CLI	ENT:	Gre	ensto	ne Land D)evelopme	ents Ltd		PROJECT	ION:	NZTM	LOCATIO	DN: Lyndhurst F	Road Subdivision
PR	DJEC	CT:	18109	0602				EASTING	: 1	928604.94	STARTE	D: 27/06/2018	
LOC	CATIO	ON:	Lyndh	urst Road	Subdivisio	on Stage 6		NORTHIN	G: 5	607822.28	FINISHE	D: 27/06/2018	
								DATUM:	NZVI	02016	LOGGED	BY: BB/BR	DATE: 27/06/20
OFF	FICE	:	RDCL					ELEVATION:			CHECKE	D BY: SD	DATE: 04/07/20
ENG	GINE	ER:	ТВ					AZUMITH	: 0°	PLUNGE: 90	° STATUS	: Final data	
CO	NTRA	АСТО	R:				MACI	HINE:			OPERAT	OR: BB/BR	
(m) H	_	۲ ۲	HIC			DCP BLO	WS			SAMPLES & TESTS		ADDITIONAL	REMARKS
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	DATA	5	10	15	20					
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											⊳ In flow		
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										SHEET 59 OF 76
			ne Land Developme	ents Ltd		PROJEC			LOCATION: Lyndhurst R	oad Subdivision
PROJE				_		EASTING		1928616.04	STARTED: 27/06/2018	
LOCAT	ION:	Lyndh	urst Road Subdivisi	on Stage 6				5607803.63	FINISHED: 27/06/2018	
						DATUM:		D2016	LOGGED BY: BB/BR	DATE: 27/06/201
OFFICE		RDCL				ELEVATI			CHECKED BY: SD	DATE: 04/07/201
ENGIN						AZUMITH	l: 0°	PLUNGE: 90°		
CONTR		DR:			MACI	HINE:			OPERATOR: BB/BR	
DEPTH (m) RL (m)	ER	GRAPHIC LOG	۲	DCP BLOWS	S			SAMPLES & TESTS	ADDITIONAL I	REMARKS
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Lot 63									Standing Water Level	
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											SHEET 60 OF 76
				e Land Develo	opments Ltd		PROJEC			LOCATION: Lyndhurst R	oad Subdivision
PROJ						•	EASTIN		1928630.06	STARTED: 27/06/2018	
LOCA	ION	N: Ly	yndhu	rst Road Subo	division Stage	6			5607815.50	FINISHED: 27/06/2018	
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OFFIC							ELEVAT			CHECKED BY: SD	DATE: 04/07/201
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			·.			IVIAC				OPERATOR. BB/BR	
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REMA	RKS					:	:		s	YMBOLS	
Lot 63										Standing Water Level	
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JENT: Greenstone Land Developments Ltd PROJECTION: NZTM LOCATION: Lyndhurst Road Subdivision QAECT: 181090602 EASTING: 1928515.69 STARTED: 2706/2018 DATION: Lyndhurst Road Subdivision Stage 6 NORTHING: 5607778.50 FilNISHED: 2706/2018 FTICE: RDCL AZUMITH: 0* PLUNGE: 90* STATUS: Final data ONTRACTOR: MACHINE: OPERATOR: BB/BR OPERATOR: BB/BR NTRACTOR: MACHINE: OPERATOR: BB/BR ADDITIONAL REMARKS V V V V V SAMPLES ADDITIONAL REMARKS V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V <td< th=""></td<>
DATION: Lyndhurst Road Subdivision Stage 6 NORTHING: 5607778.50 DATUM: NZVD2016 ELEVATION: AZUMITH: 0' PLUNGE: 90' STATUS: Final data DNTRACTOR: MACHINE: OPERATOR: BB/BR DCP BLOWS SAMPLES & TESTS ADDITIONAL REMARKS
FFICE: RDCL. DATUM: NZVD2016 LOGGED BY: BB/BR DATE: 20/07/20 NTRACTOR: MACHINE: OPERATOR: BB/BR DATE: 0/07/20 NTRACTOR: DCP BLOWS SAMPLES ADDITIONAL REMARKS
EFICE: RDCL MGINEER: TB ELEVATION: AZUMITH: 0° CHECKED BY: SD STATUS: Final data DATE: 04/07/20 STATUS: Final data DNTRACTOR: MACHINE: OPERATOR: BB/BR DCP BLOWS SAMPLES & TESTS ADDITIONAL REMARKS 0 1 2 2 2 3 3 3 3 3 2 2 2 4 3 3 3 3 3 3 3 3
NUMBER: TB AZUMITH: 0° PLUNGE: 90° STATUS: Final data DNTRACTOR: MACHINE: OPERATOR: BB/BR DCP BLOWS SAMPLES & TESTS ADDITIONAL REMARKS Y Y Y Y Y Y Y Y Y Y
DNTRACTOR: MACHINE: OPERATOR: BB/BR
OCP BLOWS SAMPLES & TESTS ADDITIONAL REMARKS Image: Stress of the stres
BUCK BUCK A TESTS ADDITIONAL REMARKS 0 0 5 10 15 20 1 2 3 7 4 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 1 3 2 2 3 1 2 2 3 3 2 2 2 2 1 3 3 3 3 3 3 2 2 4 3 3 3 4 3 3 4 3 3 4 4 3 3 4 5 5 5 5 5
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MARKS SYMBOLS
54 Standing Water Level
✓ Statisting water Leven
▷ In flow
RDCL
8/308 Queen St East, Hastings PO Box 28057, Havelock North 4130 New Zealand Ph: +64 6 8771652 Email: info@rdcl.co.nz



													SHEET 62 OF 76
CLIEN	NT:	Gre	ensto	ne Land D	evelopme	nts Ltd		PROJE	CTION:	NZTM	L	OCATION: Lyndhurst	Road Subdivision
PROJ	JEC	T:	18109	0602				EASTIN	IG:	1928499.96	5	STARTED: 27/06/2018	3
LOCA	ATIC	ON:	Lyndh	urst Road	Subdivisio	on Stage 6		NORTH	IING:	5607796.53	F	FINISHED: 27/06/2018	3
								DATUN	I: NZV	D2016	L	OGGED BY: BB/BR	DATE: 27/06/20
OFFIC	CE:		RDCL					ELEVA	TION:			CHECKED BY: SD	DATE: 04/07/20
ENGI								AZUMI	TH: 0°	PLUNGE: 9		STATUS: Final data	
CONT	TRA	СТО	R:				MAG	CHINE:				OPERATOR: BB/BR	
DEPTH (m)	(m)	WATER	GRAPHIC LOG	Z.		DCP BLC	ows			SAMPLES & TESTS		ADDITIONAL	. REMARKS
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Lot 54	u vi v											anding Water Level	
									RDCL			flow	



										SHEET 63 OF 76
CLIENT	: Gre	eensto	one Land Devel	lopments Lt	d	PROJE	CTION:	NZTM	LOCATION: Lyndhurst	Road Subdivision
PROJE	CT:	18109	90602			EASTIN	G : 1	928489.17	STARTED: 27/06/2018	3
LOCAT	ION:	Lyndr	nurst Road Sub	division Sta	ige 6	NORTH	ING: 5	607782.97	FINISHED: 27/06/2018	3
						DATUM	: NZV	02016	LOGGED BY: BB/BR	DATE: 27/06/201
OFFICE	Ξ:	RDCL	-			ELEVAT	ION:		CHECKED BY: SD	DATE: 04/07/201
ENGINE	EER:	тв				AZUMIT	H: 0°	PLUNGE: 90)° STATUS: Final data	
CONTR	ACTO	DR:			MA	CHINE:			OPERATOR: BB/BR	
Ê		0		DC	P BLOWS			SAMPLES & TESTS	ADDITIONAL	REMARKS
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						F	RDCL			



													SHEET 64 OF 76
CLI	ENT:	Gre	ensto	ne Land Dev	elopmer	nts Ltd		PROJE	CTION:	NZTM		LOCATION: Lyndhurst R	toad Subdivision
PR	OJEC	CT:	18109	0602				EASTIN	G: 1	928501.35		STARTED: 27/06/2018	
LO	CATIO	ON:	Lyndh	urst Road Su	ubdivisio	n Stage 6		NORTH	ING: 5	607768.02		FINISHED: 27/06/2018	
								DATUM	: NZVI	02016		LOGGED BY: BB/BR	DATE: 27/06/201
OFI	FICE	:	RDCL					ELEVA	FION:			CHECKED BY: SD	DATE: 04/07/201
EN	GINE	ER:	ТВ					AZUMI	H: 0°	PLUNGE:	90°	STATUS: Final data	
CO	NTRA	АСТО	R:				MAC	CHINE:				OPERATOR: BB/BR	
۲						DCP BLO	WS			SAMPLES		ADDITIONAL I	REMARKS
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													SHEET 65 OF 76
CLI	ENT:	Gre	ensto	ne Lan	d Developm	ents Ltd		PROJ	ECTION:	NZTM		LOCATION: Lyndhurst R	oad Subdivision
PRO	DJEC	CT:	18109	0602				EAST	NG:	928495.34		STARTED: 27/06/2018	
LOC	CATIO	ON:	Lyndh	iurst Ro	ad Subdivis	sion Stage	6	NORT	HING:	607763.24		FINISHED: 27/06/2018	
								DATU	M: NZV	D2016		LOGGED BY: BB/BR	DATE: 27/06/201
	FICE:		RDCL						ATION:			CHECKED BY: SD	DATE: 04/07/201
		ER:							ITH: 0°	PLUNGE: 9		STATUS: Final data	
COI	NTRA		R:				MA	CHINE:				OPERATOR: BB/BR	
DEPTH (m)	(m)	WATER	GRAPHIC LOG	A		DCP B	LOWS			SAMPLES & TESTS		ADDITIONAL I	REMARKS
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		ne Land De	evelopmen	nts Ltd		PROJECT		NZTM			and Cubdivinian
ECT:	10100						1011.			LOCATION: Lyndhurst F	Koad Subdivision
ROJECT: 181090602 EASTING: 1928- OCATION: Lyndhurst Road Subdivision Stage 6 NORTHING: 5607'										STARTED: 27/06/2018	
FION:	Lyndł	urst Road S	Subdivisio	n Stage 6		NORTHIN	G: ;	5607780.66		FINISHED: 27/06/2018	
						DATUM:	NZV	D2016		LOGGED BY: BB/BR	DATE: 27/06/201
E:		-								CHECKED BY: SD	DATE: 04/07/201
RACT	OR:				MACH	IINE:				OPERATOR: BB/BR	
TER	APHIC	¥.		DCP BLOV	vs			SAMPLES & TESTS		ADDITIONAL	REMARKS
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													SHEET 67 OF 76
CLIE	NT:	Gre	ensto	ne Land D	evelopme	nts Ltd		PROJEC	TION:	NZTM	LOCATION:	Lyndhurst R	oad Subdivision
PRO	JEC	T:	18109	0602				EASTIN	G: [,]	928470.52	STARTED:	27/06/2018	
LOC	ATIC	ON:	Lyndh	urst Road	Subdivisio	on Stage 6		NORTH	NG: {	607770.64	FINISHED:	27/06/2018	
								DATUM:	NZV	D2016	LOGGED BY	: BB/BR	DATE: 27/06/207
OFF	ICE:		RDCL					ELEVAT	ION:		CHECKED B	SY: SD	DATE: 04/07/201
ENG								AZUMIT	H: 0°	PLUNGE: 90			
CON	ITRA	СТО	R:				MAC	ACHINE:			OPERATOR	: BB/BR	
DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	LA		DCP BLC	ows			SAMPLES & TESTS	,	ADDITIONAL F	REMARKS
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Lot 53											Standing Water L	evel	
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													SHEET 68 OF 76	
				d Developn	nents Ltd			PROJECT			LOCATION:	Lyndhurst F	Road Subdivision	
			090602					EASTING		1928483.01	STARTED:			
LOCA	TION	l: Lyno	dhurst Ro	ad Subdivi	sion Stag	ge 6		NORTHIN	IG:	5607752.60	FINISHED:			
								DATUM:		D2016	LOGGED BY		DATE: 27/06/201	
OFFIC		RDC	L					ELEVATIO			CHECKED E		DATE: 04/07/201	
ENGIN								AZUMITH	: 0°	PLUNGE: 90				
CONT	RAC	TOR:					MACHI	NE:			OPERATOR	: BB/BR		
DEPTH (m) RI (m)		WALEK GRAPHIC	A		DCP	BLOWS				SAMPLES & TESTS		ADDITIONAL REMARKS		
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				SHEET 69 OF 76
CLIENT: Greenstone Land Develop		TION: NZTM	LOCATION: Lyndhurst Ro	oad Subdivision
PROJECT: 181090602	EASTING		STARTED: 27/06/2018	
LOCATION: Lyndhurst Road Subdiv		NG: 5607762.31	FINISHED: 27/06/2018	
		NZVD2016	LOGGED BY: BB/BR	DATE: 27/06/201
OFFICE: RDCL	ELEVAT		CHECKED BY: SD	DATE: 04/07/201
ENGINEER: TB	AZUMITI	H: 0° PLUNGE: 90°	STATUS: Final data	
CONTRACTOR:	MACHINE:		OPERATOR: BB/BR	
Ê U	DCP BLOWS	SAMPLES	ADDITIONAL F	EMARKS
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REMARKS		SY	MBOLS	
Lot 52			Standing Water Level	
			- Out flow - In flow	



							1				SHEET 70 OF 76
				ne Land Developme	ents Ltd		PROJEC			LOCATION: Lyndhurst Ro	ad Subdivision
			18109 		01 0		EASTING		1928450.64	STARTED: 27/06/2018	
LOC	ATIC	DN:	Lyndh	urst Road Subdivisi	on Stage 6				5607751.06	FINISHED: 27/06/2018	
OFFI			RDCL				DATUM:		D2016	LOGGED BY: BB/BR CHECKED BY: SD	DATE: 27/06/2018 DATE: 04/07/2018
ENG							AZUMITH		PLUNGE: 9	STATUS: Final data	
CON						MACH				OPERATOR: BB/BR	
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02										tanding Water Level Out flow	
							R	DCL) New Zealand	



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												SHEET 71 OF 76
CLI	ENT:	Gre	ensto	ne Land	Developm	ents Ltd		PROJEC	TION:	NZTM	LOCATION: Lyndhurst	Road Subdivision
PRO	DJEC	: т:	18109	0602				EASTIN	G: 1	928460.19	STARTED: 27/06/2018	3
LOC	CATIO	ON: I	Lyndh	urst Roa	ad Subdivis	ion Stage 6	5	NORTH	NG: 5	607737.03	FINISHED: 27/06/2018	3
								DATUM:	NZVE	2016	LOGGED BY: BB/BR	DATE: 27/06/2018
OFF	FICE:	: I	RDCL					ELEVAT	ION:		CHECKED BY: SD	DATE: 04/07/2018
ENC	GINE	ER:	ТВ					AZUMIT	H: 0°	PLUNGE: 90	STATUS: Final data	
COI	NTRA	асто	R:				MA	CHINE:			OPERATOR: BB/BR	
<u> </u>							0.4/6			SAMPLES		DEMARKS
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-: 1 N: L R	8109(.yndhu	ne Land Developme 0602 urst Road Subdivisio			PROJECT EASTING:				LOCATION: Lyndhurst Re	oad Subdivision	
N: L R	.yndhu		on Stago 6		EASTING:		1000177 00		OTADTED 07/00/0040		
R		urst Road Subdivisio	on Staga 6				1928477.92		STARTED: 27/06/2018		
			JII Stage 0		NORTHIN	G:	5607747.82		FINISHED: 27/06/2018		
					DATUM:	NZV	D2016		LOGGED BY: BB/BR	DATE: 27/06/201	
р. т	RDCL				ELEVATIC	DN:			CHECKED BY: SD	DATE: 04/07/201	
R: T					AZUMITH:	0°	PLUNGE: 90)°	STATUS: Final data		
CTOF	र:			MACHI	NE:				OPERATOR: BB/BR		
WATER	GRAPHIC LOG	A T	DCP BLOWS				SAMPLES & TESTS		ADDITIONAL REMARKS		
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										-	1	SHEET 73 OF 76
				ne Land Dev	velopme	ents Ltd				: NZTM	LOCATION: Lyndhurst	
PROJ								EASTIN		1928482.39	STARTED: 27/06/201	
LOCA	TIO	DN:	Lyndh	urst Road S	ubdivisi	on Stage 6				5607745.67	FINISHED: 27/06/201	
								DATUM		′D2016	LOGGED BY: BB/BF	
OFFIC			RDCL					ELEVA			CHECKED BY: SD	DATE: 04/07/201
ENGI									H: 0°	PLUNGE: 90		
CONT	RA	СТО	R:				MAC	CHINE:			OPERATOR: BB/BR	
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Lot 51											▼ Standing Water Level	
											< - Out flow	
											├── In flow	



		_													SHEET 74 OF 76	
					d Deve	elopme	ents Ltd					: NZTM		LOCATION: Lyndhurst		
PROJ							<u>.</u>	0		EASTIN		1928460.6		STARTED: 27/06/2018		
LOCA	TIO	N: I	Lyndh	urst Ro	oad Su	bdivisi	on Stage	96				5607731.0)2	FINISHED: 27/06/2018		
		_								DATUM		/D2016		LOGGED BY: BB/BR		
OFFIC										ELEVA			00°	CHECKED BY: SD STATUS: Final data	DATE: 04/07/201	
ENGII CONT									MACH		H: U	PLUN	GE: 90°	OPERATOR: BB/BR		
									111/101							
DEPTH (m)	KL (m)	WATER	GRAPHIC LOG	DATA		_		BLOWS	_	SAMPLES & TESTS				ADDITIONAL REMARKS		
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REMA	RKS	3	1										SI	/MBOLS		
Lot 51														Standing Water Level		
														Դ Out flow ← In flow		
											RDCL					



			SHEET 75 OF 76		
CLIENT: Greenstone Land Developments Ltd	PROJECTION: NZTM		dhurst Road Subdivision		
PROJECT: 181090602	EASTING: 192847				
LOCATION: Lyndhurst Road Subdivision Stage 6	NORTHING: 560771				
	DATUM: NZVD2016	LOGGED BY:			
OFFICE: RDCL ENGINEER: TB	ELEVATION: AZUMITH: 0° PLU	JNGE: 90° STATUS: Final of			
	CHINE:	OPERATOR: BB			
DCP BLOWS MATER MATER DCP BLOWS DCP BLOWS 15 10 15		PLES ADDI	ADDITIONAL REMARKS		
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4.0 - 4					
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REMARKS		SYMBOLS			
ot 51		▼ Standing Water Level			
		<⊢ Out now			
8/308 Queen St East, Hast	RDCL				



											SHEET 76 OF 76
CLIENT: Greenstone Land Developments Ltd						PROJEC		NZTM		ATION: Lyndhurst	
PROJECT: 181090602					EASTING	EASTING: 1928493.33			STARTED: 27/06/2018		
LOCATION: Lyndhurst Road Subdivision Stage 6					NORTHI	NORTHING: 5607732.26			FINISHED: 27/06/2018		
					DATUM:	NZV	D2016	LOG	GED BY: BB/BR	DATE: 27/06/20	
OFFICE		RDCL				ELEVAT				CKED BY: SD	DATE: 04/07/20
ENGINE						AZUMIT	H: 0°	PLUNGE: 9		US: Final data	
CONTRA	ACTO	R:			MAC	HINE:			OPEI	RATOR: BB/BR	
DEPTH (m) RL (m)	WATER	GRAPHIC LOG	A	DCP BI	OWS			SAMPLES & TESTS		ADDITIONAL	. REMARKS
DEPTH RL (m)	MA	Lo GR	E DATA 2	10	15	20					
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-0.5 - 0.5			1								
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-			1								
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2	Groundwater Not Encountered		2								
י <u>מ</u> 1.5 - ד	vater 1		2								
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-											
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- L											
-3.5 - ຫຼື											
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4.0 7											
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-4.5 - 1											
Ę											
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-											
REMARK Lot 51	S								SYMBOLS		
										g Water Level	
									<⊢ Out flow └── In flow		
						P	DCL				

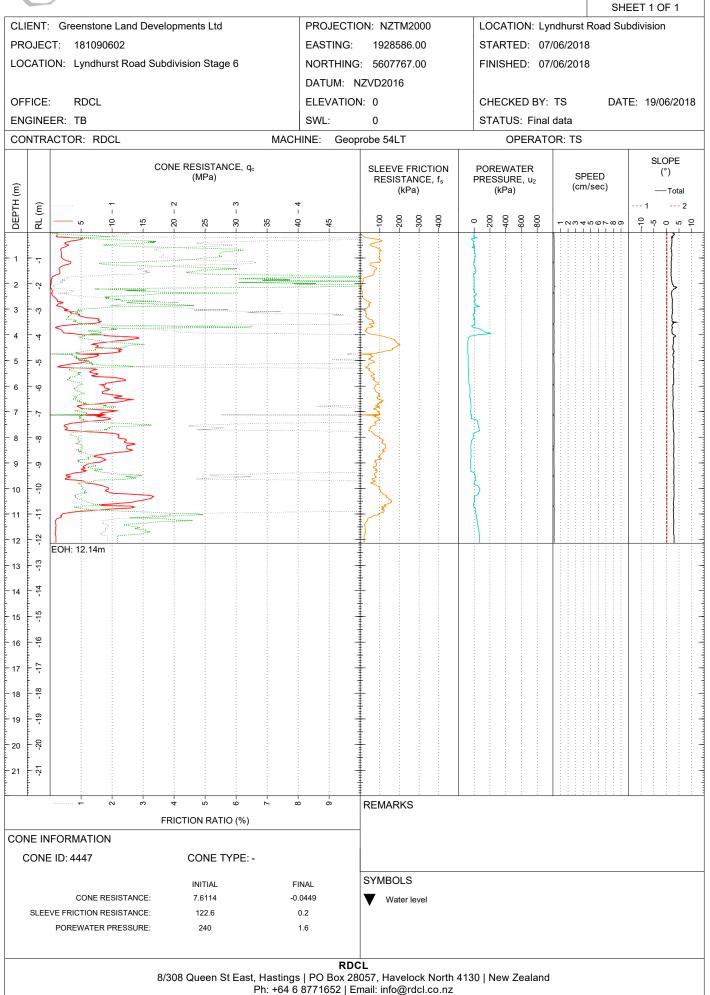
APPENDIX B – CPT LOGS





CONE PENETRATION TEST LOG

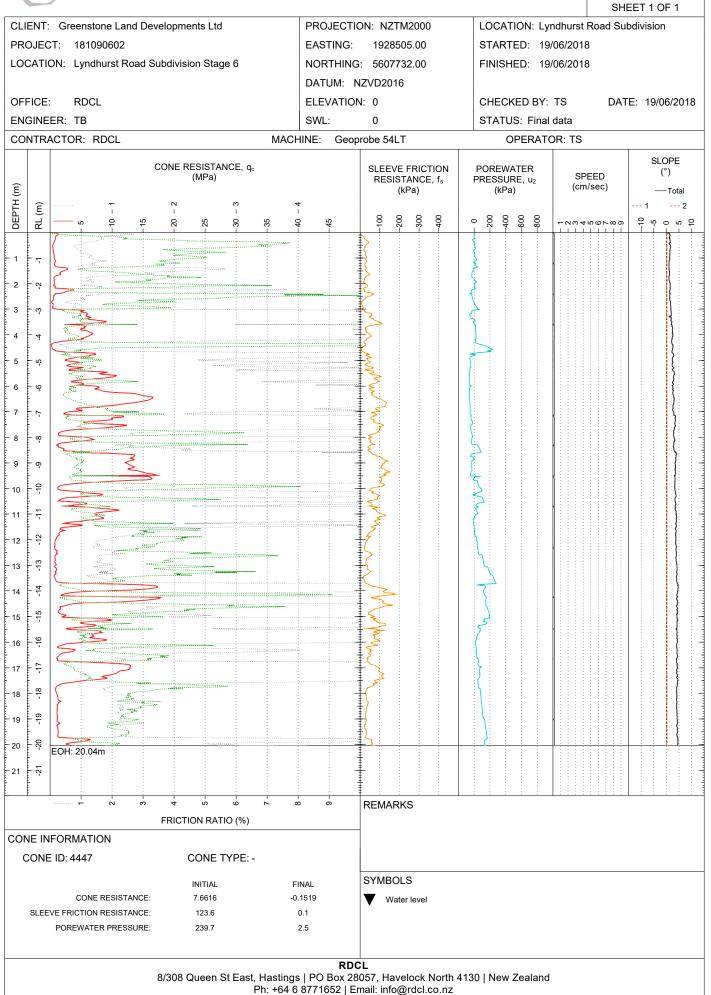
CPT01





CONE PENETRATION TEST LOG

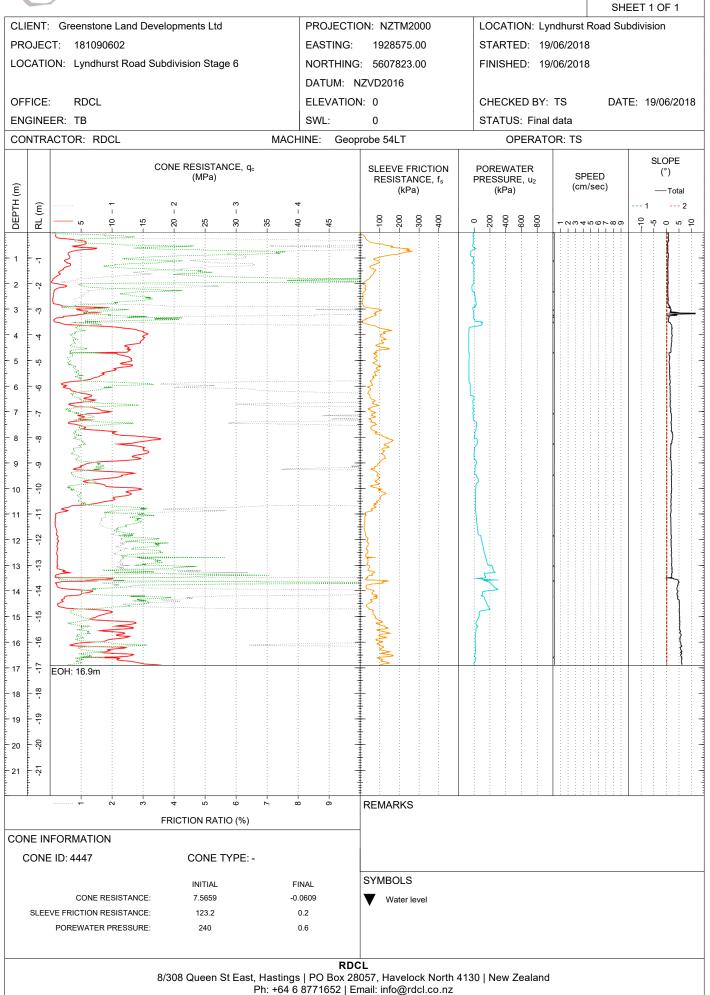
CPT02





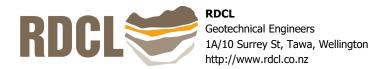
CONE PENETRATION TEST LOG

CPT03



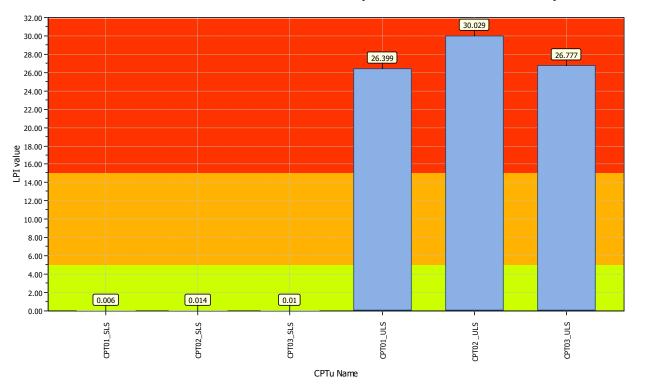
APPENDIX C – LIQUEFACTION ASSESSMENT OUTPUTS





Project title : 181090602 Lyndhurst Arbuckle Subdivision - Stage 6

Location : Hastings

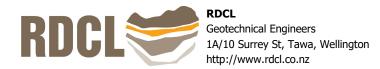






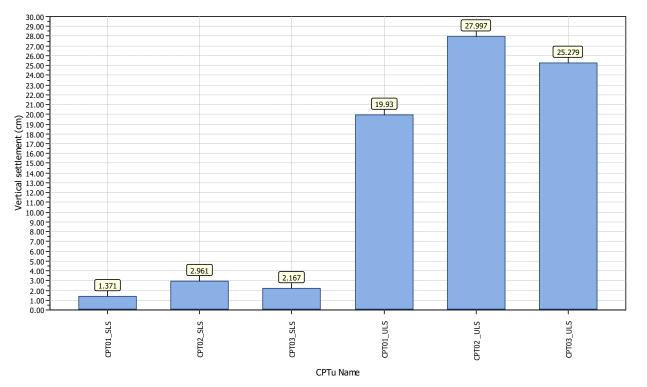
Basic statistics

Total CPT number: 6 50.00% low risk 0.00% high risk 50.00% very high risk



Project title : 181090602 Lyndhurst Arbuckle Subdivision

Location : Hastings



Overall vertical settlements report



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Ic cut-off value:

LIQUEFACTION ANALYSIS REPORT

Location : Hastings

Project title : 181090602 Lyndhurst Arbuckle Subdivision

B&I (2014)

B&I (2014)

7.50

Based on Ic value

CPT file : CPT01_SLS

Input parameters and analysis data

Analysis method: Fines correction method: Points to test: Earthquake magnitude M_w: Peak ground acceleration:

0.5

1

1.5

2

2.5

3

3.5

4

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5.5

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6.5

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8.5

9

9.5

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10.5

11.5

11

12

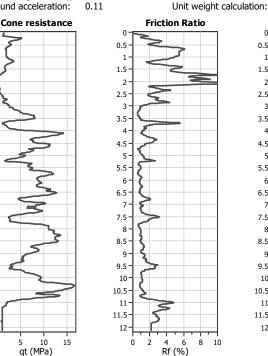
0 5 10 15

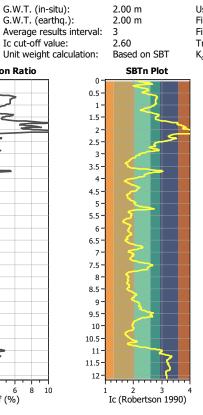
qt (MPa)

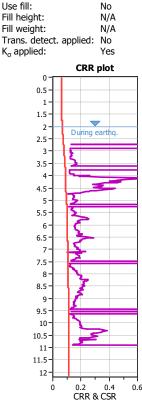
8

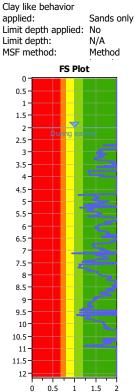
Depth (m)

5



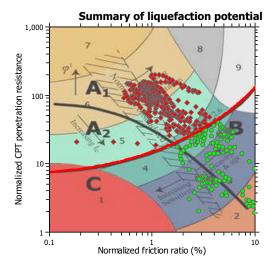






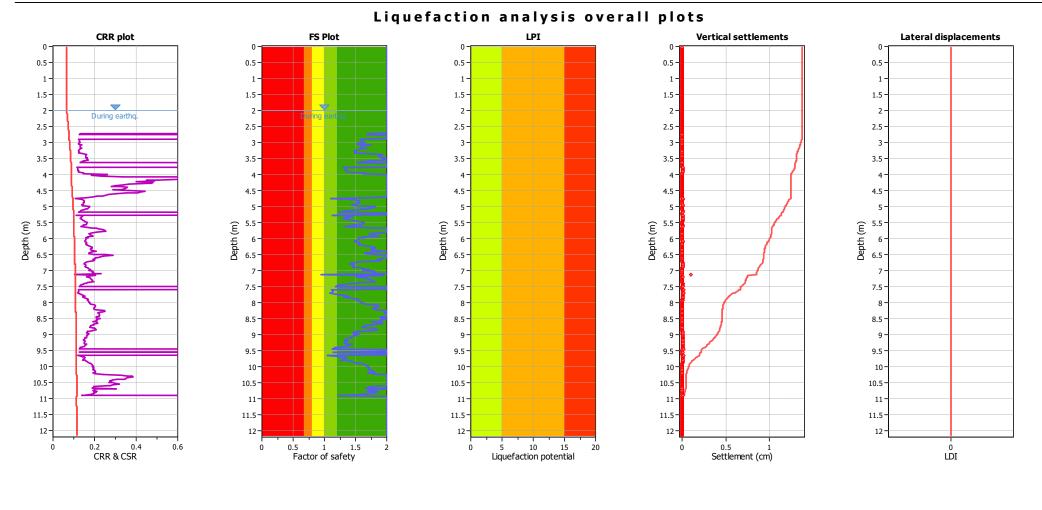


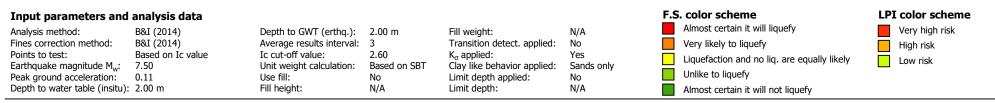
M_w=7^{1/2}, sigma[']=1 atm base curve 0.8 Liquefaction 0.7 0.6 Cyclic Stress Ratio* (CSR*) 0.5 0.4 0.3 0.2 0.1 No Liquefaction 0 140 160 180 0 20 40 60 80 100 120 200 qc1N,cs



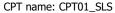
Zone A1: Cyclic liquefaction likely depending on size and duration of cyclic loading Zone A₂: Cyclic liquefaction and strength loss likely depending on loading and ground geometry

Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry





CLiq v.2.2.0.37 - CPT Liquefaction Assessment Software - Report created on: 2/07/2018, 4:31:35 PM Project file: C:\Users\jneeson\Documents\Working\Raw CPT Data\181090602_Lindhurst stage 6.clq





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Ic cut-off value:

LIQUEFACTION ANALYSIS REPORT

2.00 m

Project title : 181090602 Lyndhurst Arbuckle Subdivision

B&I (2014)

B&I (2014)

7.50

Based on Ic value

Location : Hastings

CPT file : CPT02_SLS

Input parameters and analysis data

Analysis method: Fines correction method: Points to test: Earthquake magnitude M_w: Peak ground acceleration:

0

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17

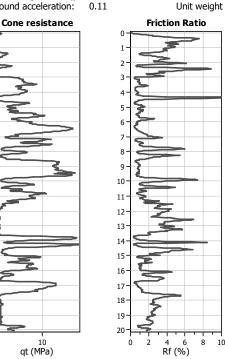
18

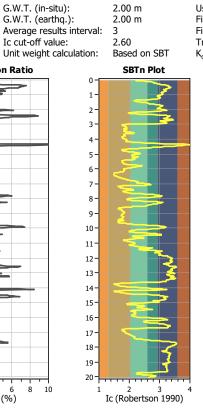
19

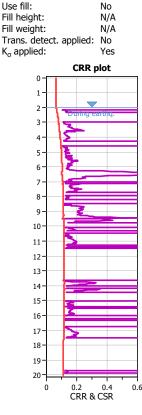
20

0

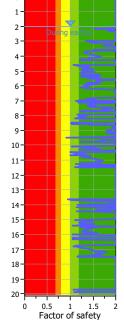
Depth (m)









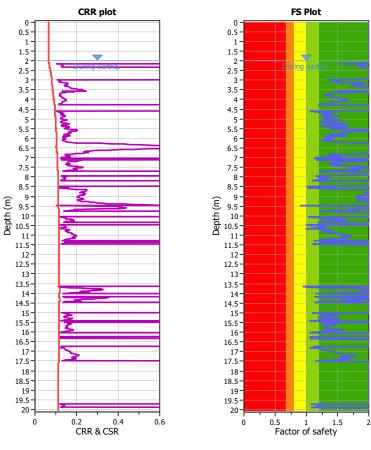


M_w=7^{1/2}, sigma[']=1 atm base curve 0.8 Liquefaction 0.7 0.6 Cyclic Stress Ratio* (CSR*) 0.5 0.4 0.3 0.2 0.1 No Liquefaction 0 160 180 0 20 40 60 80 100 120 140 200 qc1N,cs

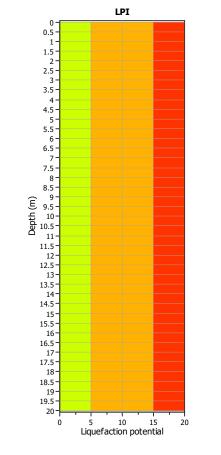
Summary of liquefaction potential 1,000 8 Normalized CPT penetration resistance 9 100 10 -1 0.1 10 Normalized friction ratio (%)

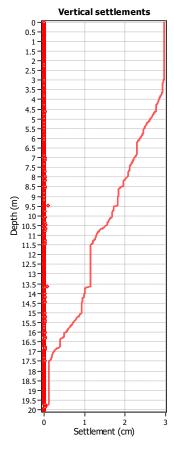
Zone A1: Cyclic liquefaction likely depending on size and duration of cyclic loading Zone A2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry

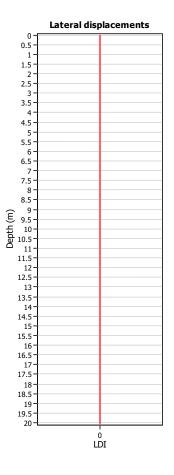
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry



Liquefaction analysis overall plots







	F.S. color scheme
Analysis method: B&I (2014) Depth to GWT (erthq.): 2.00 m Fill weight: N/A	Almost certain it will liquefy
Fines correction method: B&I (2014) Average results interval: 3 Transition detect. applied: No	Very likely to liquefy
Points to test:Based on Ic valueIc cut-off value:2.60 K_{σ} applied:Yes	Liquefaction and no liq. are equally likely
Earthquake magnitude M _w : 7.50 Unit weight calculation: Based on SBT Clay like behavior applied: Sands only	Unlike to liquefy
Peak ground acceleration: 0.11 Use fill: No Limit depth applied: No Depth to water table (insitu): 2.00 m Fill height: N/A Limit depth: N/A	Almost certain it will not liquefy

CLiq v.2.2.0.37 - CPT Liquefaction Assessment Software - Report created on: 2/07/2018, 4:31:36 PM Project file: C:\Users\jneeson\Documents\Working\Raw CPT Data\181090602_Lindhurst stage 6.clg





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G.W.T. (in-situ): G.W.T. (earthq.):

Ic cut-off value:

10

LIQUEFACTION ANALYSIS REPORT

Location : Hastings

Project title : 181090602 Lyndhurst Arbuckle Subdivision

Based on Ic value

B&I (2014)

B&I (2014)

7.50

0.11

CPT file : CPT03_SLS



Analysis method: Fines correction method: Points to test: Earthquake magnitude M_w: Peak ground acceleration:

0

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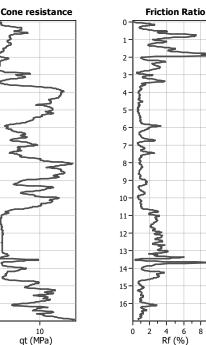
14

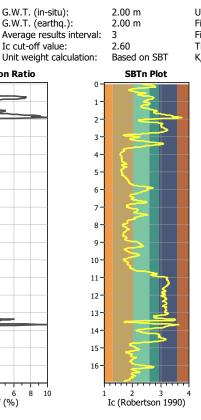
15

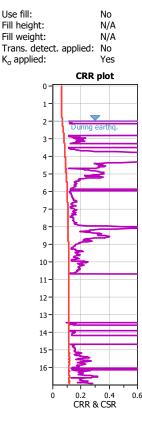
16

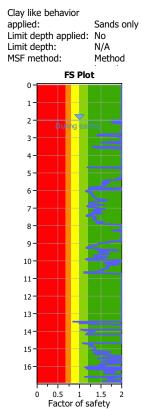
0

Depth (m) 8

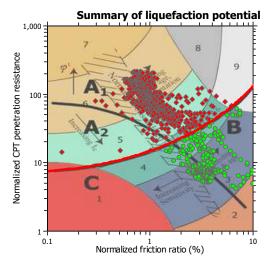






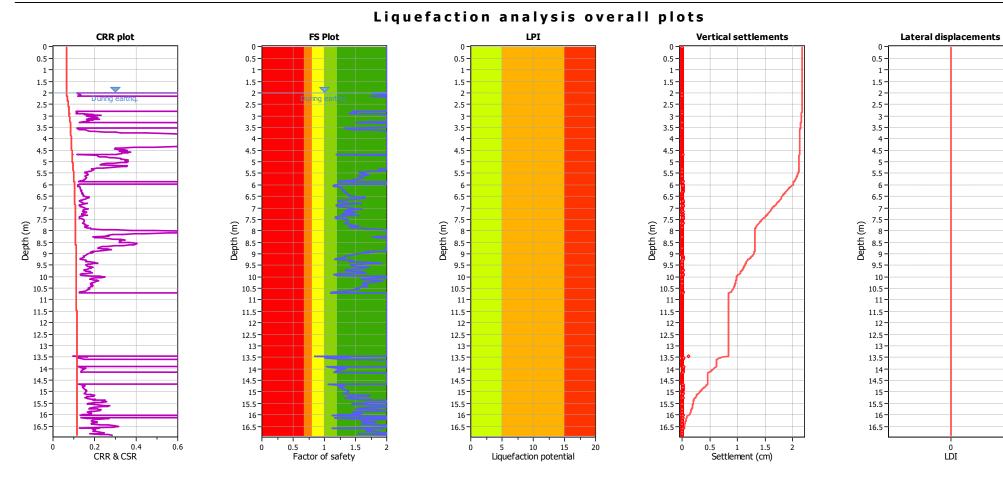


M_w=7^{1/2}, sigma[']=1 atm base curve 0.8 Liquefaction 0.7 0.6 Cyclic Stress Ratio* (CSR*) 0.5 0.4 0.3 0.2 0.1 No Liquefaction 0 160 180 0 20 40 60 80 100 120 140 200 qc1N,cs



Zone A1: Cyclic liquefaction likely depending on size and duration of cyclic loading Zone A2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry

Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry



F.S. color scheme LPI color scheme Input parameters and analysis data Almost certain it will liquefy Very high risk Analysis method: B&I (2014) Depth to GWT (erthq.): 2.00 m Fill weight: N/A Fines correction method: B&I (2014) Average results interval: 3 Transition detect. applied: No Very likely to liquefy High risk Based on Ic value Ic cut-off value: K_{α} applied: Points to test: 2.60 Yes Liquefaction and no liq. are equally likely Low risk Unit weight calculation: Based on SBT Clay like behavior applied: Sands only Earthquake magnitude M_w: 7.50 Unlike to liquefy Peak ground acceleration: Use fill: No Limit depth applied: 0.11 No Depth to water table (insitu): 2.00 m Fill height: N/A Limit depth: N/A Almost certain it will not liquefy

CLiq v.2.2.0.37 - CPT Liquefaction Assessment Software - Report created on: 2/07/2018, 4:31:37 PM Project file: C:\Users\jneeson\Documents\Working\Raw CPT Data\181090602_Lindhurst stage 6.clq





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G.W.T. (in-situ): G.W.T. (earthq.):

Ic cut-off value:

LIQUEFACTION ANALYSIS REPORT

Project title : 181090602 Lyndhurst Arbuckle Subdivision

B&I (2014)

B&I (2014)

7.50

Based on Ic value

Location : Hastings

CPT file : CPT01_ULS



Analysis method: Fines correction method: Points to test: Earthquake magnitude M_w: Peak ground acceleration:

0.5

1

1.5

2

2.5

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3.5

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4.5

5.5

6

7

7.5

8.5

9

9.5

10

10.5

11.5

11

12

0 5 10 15

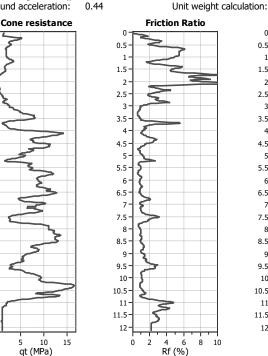
qt (MPa)

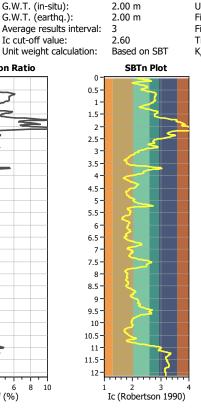
8

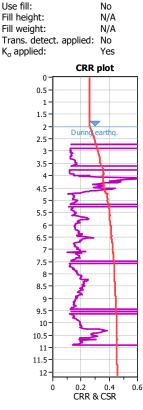
6.5

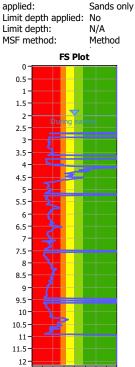
Depth (m)

5



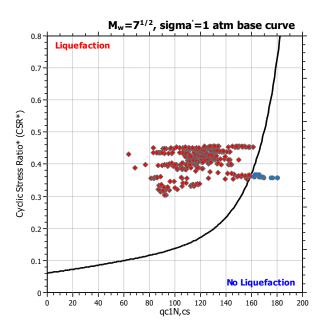


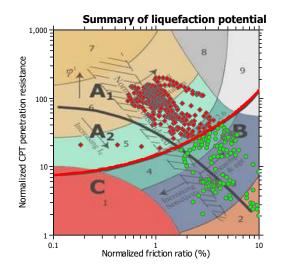




Clay like behavior

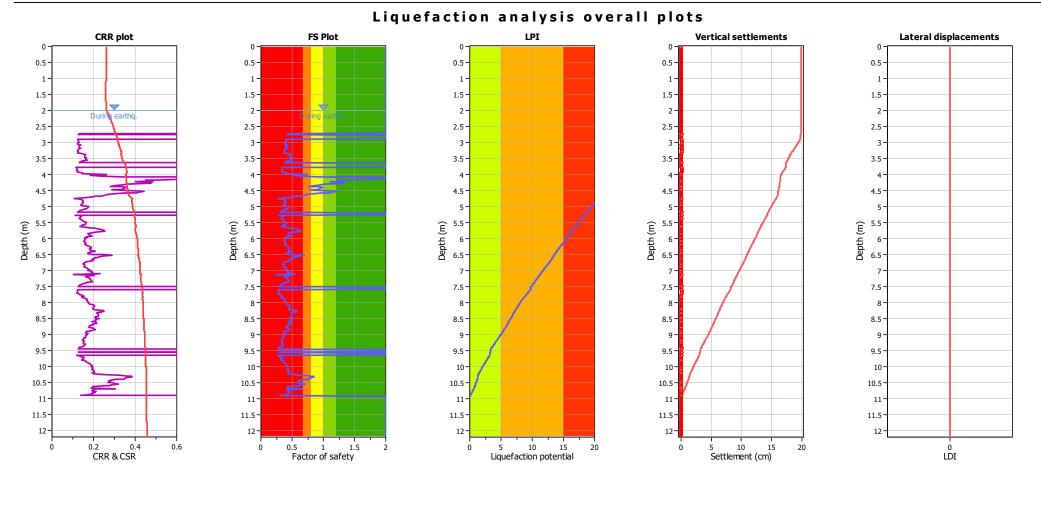
0 5 1.5 0 Factor of safety

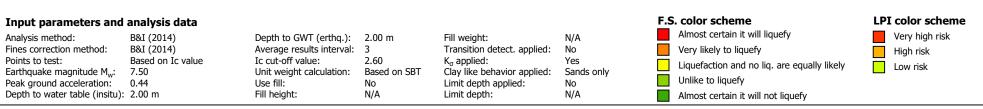




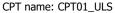
Zone A1: Cyclic liquefaction likely depending on size and duration of cyclic loading Zone A2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry

Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry





CLiq v.2.2.0.37 - CPT Liquefaction Assessment Software - Report created on: 2/07/2018, 4:31:38 PM Project file: C:\Users\jneeson\Documents\Working\Raw CPT Data\181090602_Lindhurst stage 6.clq





RDCL

Geotechnical Engineers 1A/10 Surrey St, Tawa, Wellington http://www.rdcl.co.nz

Ic cut-off value:

LIQUEFACTION ANALYSIS REPORT

Location : Hastings

Project title : 181090602 Lyndhurst Arbuckle Subdivision

Based on Ic value

B&I (2014)

B&I (2014)

7.50

CPT file : CPT02 _ULS

Input parameters and analysis data

Analysis method: Fines correction method: Points to test: Earthquake magnitude M_w: Peak ground acceleration:

0

8

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10

11

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15

16

17

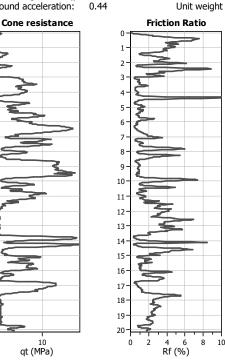
18

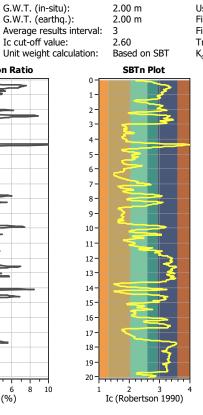
19

20

0

Depth (m)





Use fill: No Fill height: N/A Fill weight: N/A Trans. detect. applied: No K_{σ} applied: Yes CRR plot 0 2 3 5 6 7 8

9

10

11

12

13

14

15

16

17

18

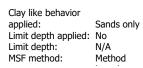
19

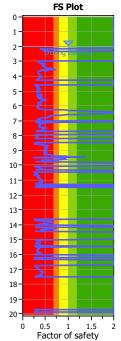
20

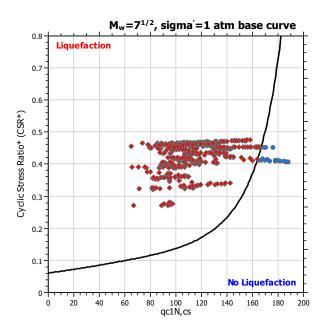
0

0.2 0.4 CRR & CSR

0.6



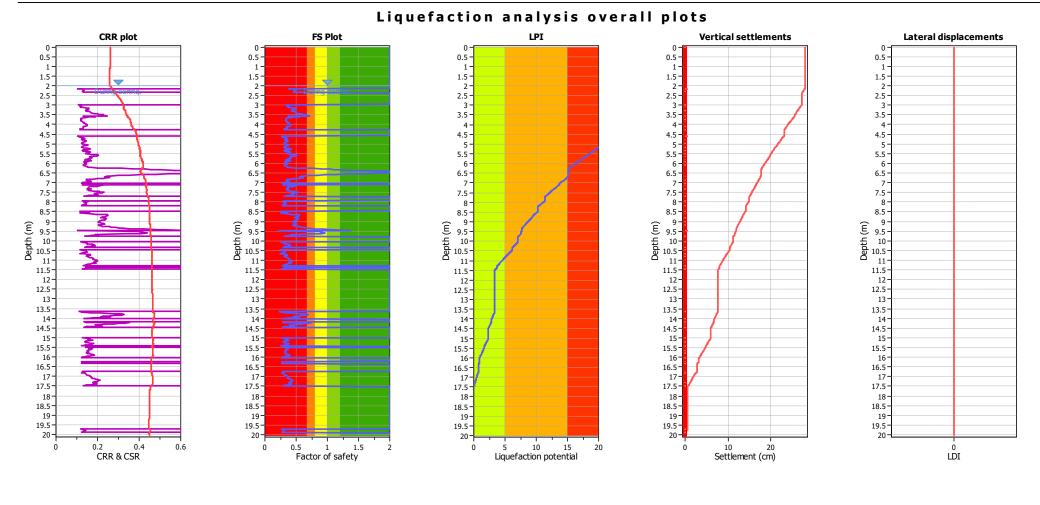




Summary of liquefaction potential 1,000 8 Normalized CPT penetration resistance 9 100 10 -1 0.1 10 Normalized friction ratio (%)

Zone A1: Cyclic liquefaction likely depending on size and duration of cyclic loading Zone A2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry

Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry



F.S. color scheme LPI color scheme Input parameters and analysis data Almost certain it will liquefy Very high risk Analysis method: B&I (2014) Depth to GWT (erthq.): 2.00 m Fill weight: N/A Fines correction method: B&I (2014) Average results interval: 3 Transition detect. applied: No Very likely to liquefy High risk Based on Ic value Ic cut-off value: K_{α} applied: Points to test: 2.60 Yes Liquefaction and no liq. are equally likely Low risk Unit weight calculation: Based on SBT Clay like behavior applied: Sands only Earthquake magnitude M_w: 7.50 Unlike to liquefy Peak ground acceleration: 0.44 Use fill: No Limit depth applied: No Depth to water table (insitu): 2.00 m Fill height: N/A Limit depth: N/A Almost certain it will not liquefy

CLiq v.2.2.0.37 - CPT Liquefaction Assessment Software - Report created on: 2/07/2018, 4:31:40 PM Project file: C:\Users\jneeson\Documents\Working\Raw CPT Data\181090602_Lindhurst stage 6.clq



RDCL

Geotechnical Engineers 1A/10 Surrey St, Tawa, Wellington http://www.rdcl.co.nz

Ic cut-off value:

8 10

LIQUEFACTION ANALYSIS REPORT

Location : Hastings

Project title : 181090602 Lyndhurst Arbuckle Subdivision

Based on Ic value

B&I (2014)

B&I (2014)

7.50

0.44

CPT file : CPT03_ULS

Input parameters and analysis data

Analysis method: Fines correction method: Points to test: Earthquake magnitude M_w: Peak ground acceleration:

0

2

3

4

5

6

7

9

10

11

12

13

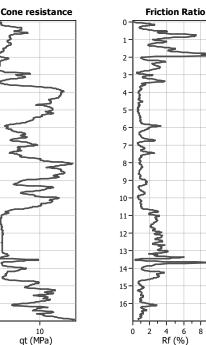
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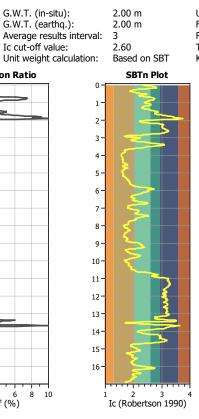
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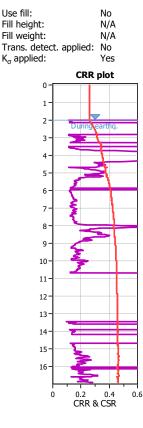
16

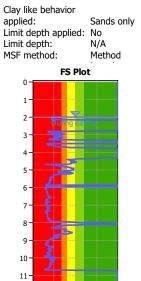
0

Depth (m) 8









12.

13-

14

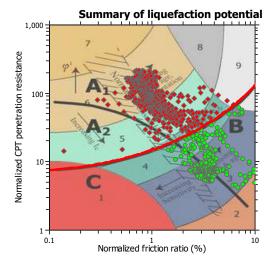
15

16

0 05 1.5

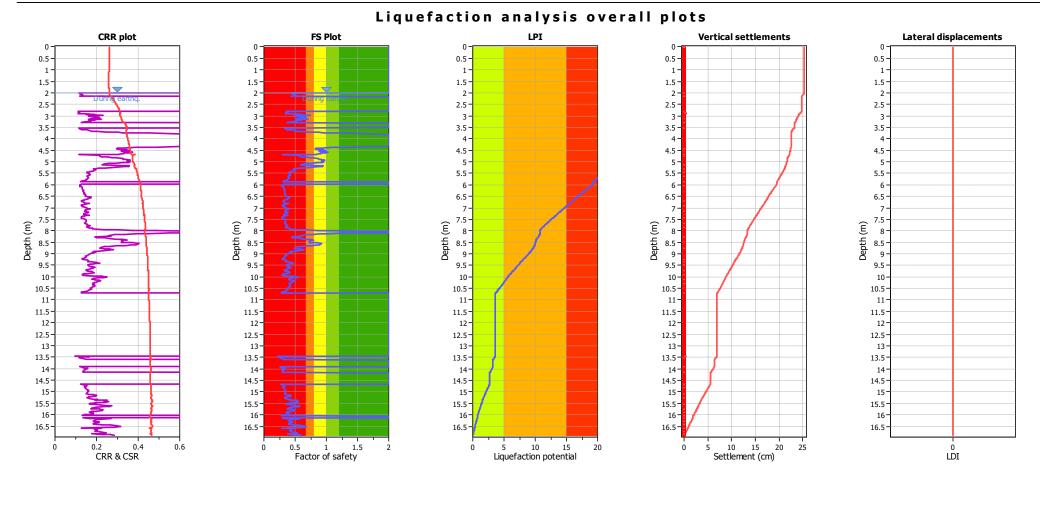
Factor of safety

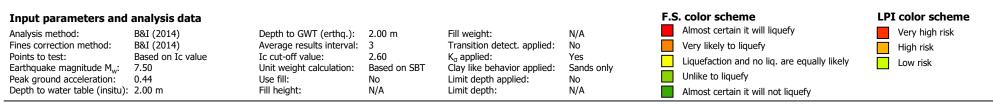
M_w=7^{1/2}, sigma[']=1 atm base curve 0.8 Liquefaction 0.7 0.6 Cyclic Stress Ratio* (CSR*) 0.5 0.4 0.3 0.2 0.1 No Liquefaction 0 140 160 180 0 20 40 60 80 100 120 200 qc1N,cs



Zone A1: Cyclic liquefaction likely depending on size and duration of cyclic loading Zone A_2 : Cyclic liquefaction and strength loss likely depending on loading and ground geometry

Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry





CLiq v.2.2.0.37 - CPT Liquefaction Assessment Software - Report created on: 2/07/2018, 4:31:41 PM Project file: C:\Users\jneeson\Documents\Working\Raw CPT Data\181090602_Lindhurst stage 6.clq

APPENDIX D – OPUS LABORATORY TEST RESULTS



WET SIEVE ANALYSIS TEST REPORT

115		O	PUS
	1		05

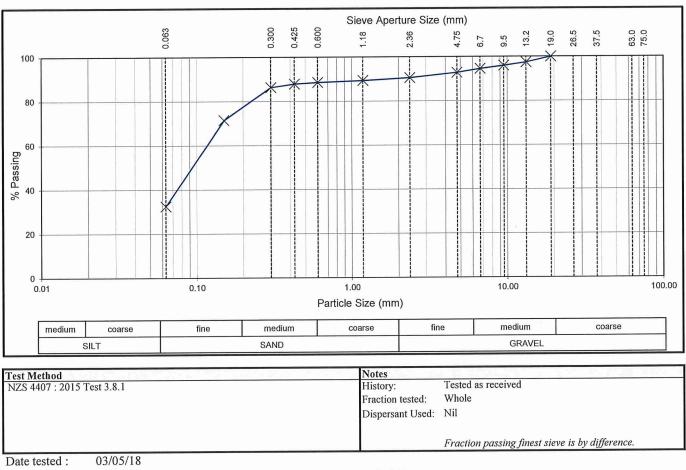
NA 1581 O/N 4453

Project :	Lyndhurst - Arbuckl	e / Stage 6 Subdivision						
Location :	Hastings	Hastings						
Client :	T. Bunny, PO Box 28	T. Bunny, PO Box 28057, Hastings						
Contractor :	Resource Development Consultants Ltd							
Sampled by :	Tim Wilkins							
Date sampled :	2/05/2018	ж,						
Sampling method :	Unknown							
Sample description :	Silty Sand with mino	r gravel						
Sample condition	Tested as received							
		Project No :	2-S4686.00					

	Sieve Analysis								
Size (mm)	% Passing	Size (mm)	% Passing	Size (mm)	% Passing	Size (mm)	% Passing		
75.00	-	19.00	100	4.75	93	0.425	88		
63.00	-	13.20	97	2.36	91	0.300	86		
37.50	-	9.50	96	1.18	89	0.150	71		
26.50	-	6.70	95	0.600	89	0.063	32		

Lab Ref No :

Client Ref No:



Date reported : 03/05/18

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Approved

J

J.Cuch.

Designation : Date : J Crichton Assistant Laboratory Manager 04/05/18

PF-LAB-099 (20/03/2018)

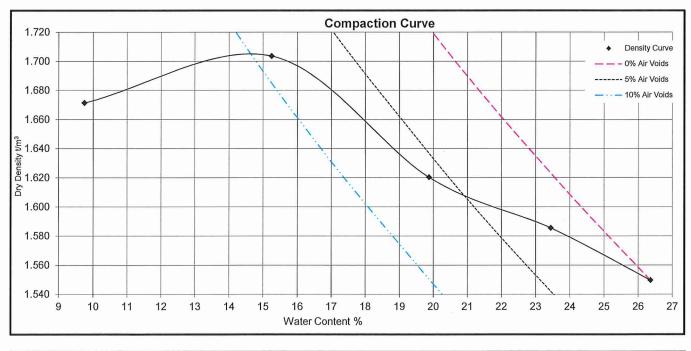
WSP Opus Napier Laboratory Quality Management Systems Certified to ISO 9001 90 Prebensen Drive Private Bag 6019, Hawkes Bay Mail Centre, Napier 4142, New Zealand Page 1 of 1

Telephone +64 6 833 5590 Website www.wsp-opus.co.nz

11 **OPUS**

Project :	Lyndhurst Arbuckle / Stage 6 Subdivision						
Location :	Hastings						
Client :	T. Bunny, PO Box 28057, Hastings						
Contractor :	Resource Development Consultants Ltd						
Sampled by :	Tim Wilkins						
Date sampled :	02/05/18						
Sampling method :	Contractor sampled						
Sample description :	Silty Sand with minor gravel						
Sample condition :	Damp	Project No :	2-S4686.00				
Solid density :	2.62 t/m^3 (Assumed)	Lab Ref No :	NA1581				
Source :	Fulton HoganClient Ref No :PO 4453						

Test Results								
Maximum dry density Optimum water content		1.70 15			Natural water content Fraction tested		19.9 Whole soil	%
Sample ID	er and	1	2	Nat	3	4		1. de - 1. de
Bulk density	t/m³	1.834	1.963	1.942	1.957	1.958		
Water content	%	9.7	15.2	19.9	23.4	26.4		
Dry density	t/m³	1.671	1.704	1.620	1.586	1.550		
Sample condition		Dry	Moist	Moist	Wet	Wet		
		Stiff	Stiff	Firm	Soft	Soft		



Test Methods Notes Compaction NZS 4402 : 1986 Test 4.1.1 (Standard)

03/05/18 Date tested : Date reported :

04/05/18

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Approved

J Crichton

ind

Date :

Designation :

Assistant Laboratory Manager 04/05/18

PF-LAB-026 (19/03/2018)

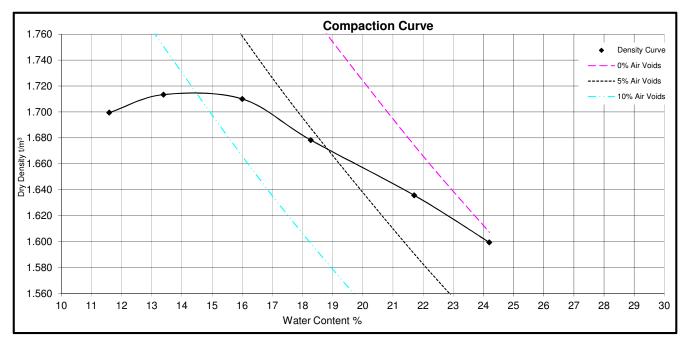
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Project :	Site Development - Lyndhurst Rd / Stage 6						
Location :	Hastings						
Client :	Resource Development Consultants Ltd						
Contractor :	Santo Drain	age & Contracting	Ltd				
Sampled by :	Santo Drainage & Contracting Ltd						
Date sampled :	14/03/18						
Sampling method :	Contractor	sampled					
Sample description :	Silt with Mi	nor Gravel					
Sample condition :	Damp		Project No :	2-S4686.00			
Solid density :	2.63	t/m ³ (Assumed)	Lab Ref No :	NA1406 / A			
Source :	Fulton Hogan SiteClient Ref No :PO 4310						

	Test Results								
Maximum dry den	•	1.71	t/m³		Natural water		-	%	
Optimum water co	ontent	15	%		Fraction teste	d	Whole soil		
Sample ID		-4	-2	0	NAT	3	6		
Bulk density	t/m³	1.897	1.943	1.983	1.985	1.991	1.986		
Water content	%	11.6	13.4	16.0	18.3	21.7	24.2		
Dry density	t/m³	1.700	1.713	1.710	1.678	1.636	1.599		
Sample condition									



Test Methods Compaction

Date tested : 22/03/18 Date reported : 28/03/18

Approved

PF-LAB-026 (19/03/2018)

WSP Opus

A.Ching

Designation : Laboratory Manager 28/03/18 Date :

AChmg

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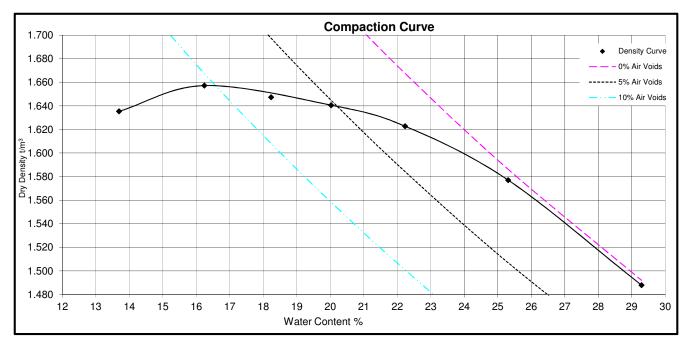
Napier Laboratory Quality Management Systems Certified to ISO 9001

NZS 4402 : 1986 Test 4.1.1 (Standard)



Project :	Site Development - Lyndhurst Rd / Stage 6						
Location :	Hastings						
Client :	Resource Development Consultants Ltd						
Contractor :	Santo Drainage & Contracting	Ltd					
Sampled by :	Santo Drainage & Contracting Ltd						
Date sampled :	14/03/18						
Sampling method :	Contractor sampled						
Sample description :	Silt						
Sample condition :	Damp	Project No :	2-S4686.00				
Solid density :	2.65 t/m ³ (Assumed)	Lab Ref No :	NA1406				
Source :	Santo SiteClient Ref No :PO 4310						

Test Results									
Maximum dry den	sity	1.66	t/m³		Natural water	content	22.2	%	
Optimum water content		18	%		Fraction teste	d	Whole soil		
Sample ID		0	0	-4	-2	Nat	2	4	
Bulk density	t/m³	1.859	1.926	1.948	1.969	1.984	1.976	1.924	
Water content	%	13.7	16.2	18.2	20.0	22.2	25.3	29.3	
Dry density	t/m³	1.635	1.657	1.647	1.641	1.623	1.577	1.488	
Sample condition									



Test Methods Compaction

Date tested : 22/03/18 Date reported : 28/03/18

Approved

A.Ching

NZS 4402 : 1986 Test 4.1.1 (Standard)

Designation : Laboratory Manager 28/03/18 Date :

Ching

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PF-LAB-026 (19/03/2018)

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PLASTICITY INDEX FOR SOILS TEST REPORT



Project :	Resource Development Consultants Ltd
Location :	Lyndhurst Road Stage 6
Client :	Resource Development Consultants Ltd
Contractor :	NA
Sampled by :	C Goss, Santo
Date sampled :	13/03/18
Sampling method :	Unknown
Sample description :	See below
Sample condition :	As received, sealed, moist.

Project No :	2-84686.00
Lab Ref No :	NA1406 (Report WA1)
Client Ref No :	

	Test Res	sults	
Sample :	Fulton Hogan Site	Santo Site	
Description :	SILT, minor gravel; greyish brown	SILT; brown	
Liquid Limit :	34	37	
Plastic Limit :	24	25	
Plasticity Index :	10	12	
As Received Water Content (%)	20.3	23.0	

Test Methods		Notes	
Liquid Limit	NZS 4402 : 1986, Test 2.2	Materials used: Minus 0.425 mm, rubbed.	
Plastic Limit	NZS 4402 : 1986, Test 2.3		
Plasticity Index	NZS 4402 : 1986, Test 2.4		
Water Content	NZS 4402 : 1986, Test 2.1		

Date tested : 19/03/18 Date reported : 22/03/18

19/03/18 - 21/03/18 22/03/18 Sampling is not covered by IANZ Accreditation. Results apply only to sample tested. This report may only be reproduced in full.

IANZ Approved Signatory R Jones Designation : Laboratory Manager 23/03/18 Date :

PF-LAB-101 (30/05/2013)

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

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ONE POINT - DYNAMIC COMPACTION TEST REPORT



Project :	Lyndhurst Stage 6
Location :	Hastings
Client :	T. Santo, PO Box 123, Waipukurau
Contractor :	Santo Drainage and Contracting Ltd
Sampled by :	J Crichton
Date sampled :	26/04/18

Formation:

Silt, Some Gravel

Project No :	2-L042.09	
Lab Ref No :	Terry	
Client Ref No :		

		Test Results		
NDM sample location:	Lot 56 Back	Lot 60 Back	Lot 62 Front	
Material Type:		Silt, Some Gravel		
Sample condition:	Moist	Moist	Moist	
Fraction tested:	Tha	t passing 19.00mm test s	sieve	
Water Content %:	12.4	20.3	14.3	
Compacted Dry Density : t/m³	1.69	1.65	1.70	
Test Method: Dry Densit Water Cont	y/Water Content tent	NZS4402:1986 - 7 NZS4402:1986 - 7		
Date tested : 26/04/18				
Date reported : $01/05/18$	This 1	eport may only be reproduc	ed in full	

05/18

Approved

Designation : Date :

J. Coch. J Crichton Assistant Laboratory Manager 01/05/18

PF-LAB-004 (30/05/2013)

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NS) OPUS

2-L042.09 Terry

Project :	Lyndhurst	Stage 6	
Location :	Hastings		
Client :	T. Santo, I	PO Box 123,	Waipukurau
Contractor :	Santo Dra	inage and C	ontracting Ltd
Tested by :	J Crichton		
Date tested :	26/04/18		
Sample description :	Silt, some	gravel	
Sample condition :	Moist, Cor	npact	
Nuclear densometer no :	27668		
Solid Density (assumed) :	2.65	t/m ³	Project No :
Dry Density :	1.70	t/m³	Lab Ref No :
Water Content :	14.3	%	Client Ref No :

Nuclear Densometer Test Results								
Lot Number	62	62	63	63	61	61		
Test Position	Front	Back	Front	Back	Front	Back		
Test Probe Depth (mm)	300	300	300	300	300	300		
Wet Density (t/m ³)	1.89	1.92	1.89	1.92	1.97	1.98		
Dry Density (t/m ³)	1.67	1.69	1.67	1.70	1.66	1.73		
Water Content (%)	13.5	13.5	12.9	13.2	18.7	14.5		
Air Voids (%)	14.7	13.3	15.2	13.6	6.3	9.7		
% of DD	98	100	98	100	98	102		

	Oven Corrected Test Results				
Dry Density (t/m ³)					
Water Content (%)	Results have not been oven dry corrected				
Air Voids (%)					
% of DD					

Test Method	Notes
Insitu Density : NZS 4407 : 2015, Test 4.2 for Direct Transmission Mode	Approximately 400mm compacted fill placed



Date reported : 01/05/18

Approved

Date :

C J Crichton Designation : Assistant Laboratory Manager 01/05/18

PF-LAB-032 (19/03/2018)

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Page 1 of 1

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NSD OPUS

2-L042.09 Terry

Project :	Lyndhurs	t Stage 6		
Location :	Hastings	b		
Client :	T. Santo, PO Box 123, Waipukurau			
Contractor :	Santo Dra	inage and C	Contracting Ltd	
Tested by :	J Crichtor	1		
Date tested :	26/04/18			
Sample description :	Silt, some	gravel		
Sample condition :	Moist, Con	mpact		
Nuclear densometer no :	27668			
Solid Density (assumed) :	2.65	t/m³	Project No :	
Max Dry Density :	1.66	t/m³	Lab Ref No :	
Optimum Water Content :	18	%	Client Ref No :	

Nuclear Densometer Test Results							
Lot Number	60	60					
Test Position	Front	Back					
Test Probe Depth (mm)	300	300					
Wet Density (t/m ³)	1.92	1.94					
Dry Density (t/m ³)	1.69	1.61					
Water Content (%)	13.5	20.4					
Air Voids (%)	13.3	6.3					
% of MDD	102	97					

	Oven Corrected Test Results				
Dry Density (t/m ³)					
Water Content (%)	Results have not been oven dry corrected				
Air Voids (%)					
% of MDD					

Test Method	Notes
Insitu Density : NZS 4407 : 2015, Test 4.2 for Direct Transmission Mode	A

Approximately 400mm compacted fill placed



Date reported : 01/05/18

Approved

Designation : Assistant Date : 01/05/18

J Crichton Assistant Laboratory Manager 01/05/18

PF-LAB-032 (19/03/2018)

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NSJ) OPUS

2-L042.09 Terry

Project : Lyndhurst Stage 6	
Location : Hastings	
Client : T. Santo, PO Box 123, Waipukurau	
Contractor : Santo Drainage and Contracting Ltd	
Tested by : J Crichton	
Date tested : 26/04/18	
Sample description : Silt, some gravel	
Sample condition : Moist, Compact	
Nuclear densometer no : 27668	
Solid Density (assumed) : 2.65 t/m ³ Project No :	
Dry Density : 1.69 t/m ³ Lab Ref No :	
Water Content :12.4%Client Ref No :	v

Nuclear Densometer Test Results							
Lot Number	59	59	58	58	57	57	
Test Position	Front	Back	Front	Back	Front	Back	
Test Probe Depth (mm)	300	300	300	300	300	300	
Wet Density (t/m ³)	1.96	2.02	2.02	2.02	1.98	1.95	
Dry Density (t/m ³)	1.71	1.73	1.71	1.73	1.71	1.68	
Water Content (%)	14.5	17.0	18.0	16.5	16.0	16.0	
Air Voids (%)	10.6	5.5	4.6	6.0	8.3	9.7	
% of DD	101	102	101	103	101	99	

	Oven Corrected Test	Results			222465
Dry Density (t/m ³)					
Water Content (%)	Results have not been oven dry corrected				
Air Voids (%)					
% of DD					

Test Method	Notes
Insitu Density : NZS 4407 : 2015, Test 4.2 for Direct Transmission Mode	Finish level of structual fill



Date reported : 01/05/18

Approved

Designation : Date :

J Crichton J. Crock Assistant Laboratory Manager 01/05/18

PF-LAB-032 (19/03/2018)

90 Prebensen Drive Private Bag 6019, Hawkes Bay Mail Centre, Napier 4142, New Zealand

NSD OPUS

2-L042.09 Terry

Project :	Lyndhu	rst Stage 6	
Location :	Hasting	5	
Client :	T. Santo	, PO Box 1	23, Waipukurau
Contractor :	Santo D	rainage and	d Contracting Ltd
Tested by :	J Cricht	on	
Date tested :	26/04/18	1	
Sample description :	Silt, som	ie gravel	
Sample condition :	Moist, C	Compact	
Nuclear densometer no :	27668		
Solid Density (assumed) :	2.65	t/m³	Project No :
Dry Density :	1.69	t/m³	Lab Ref No :
Water Content :	12.4	%	Client Ref No :

Nuclear Densometer Test Results							
Lot Number	56	56	55	55			
Test Position	Front	Back	Front	Back			
Test Probe Depth (mm)	300	300	300	300			
Wet Density (t/m ³)	1.98	1.95	1.96	1.91			
Dry Density (t/m ³)	1.66	1.71	1.71	1.65			
Water Content (%)	19.0	14.0	14.5	16.0			
Air Voids (%)	5.6	11.5	10.6	11.5			
% of DD	98	101	101	97			

	Oven Corrected Test Results				
Dry Density (t/m ³)					
Water Content (%)	Results have not been oven dry corrected				
Air Voids (%)					
% of DD					

Test Method	Notes
Insitu Density : NZS 4407 : 2015, Test 4.2 for Direct Transmission Mode	Finish level of structual fill



Date reported : 01/05/18

Approved

J Crichton J. Crichton Designation : Assistant Laboratory Manager Date : 01/05/18

J.C

PF-LAB-032 (19/03/2018)

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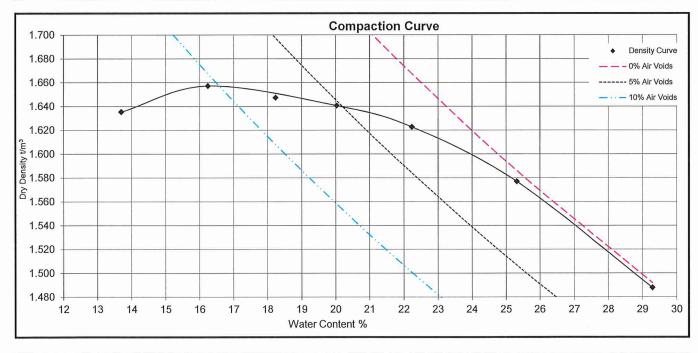
Page 1 of 1

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\\SD **OPUS**

Project :	Site Development - Lyndhurst Rd / Stage 6						
Location :	Hastings						
Client :	Resource Development Consult	ants Ltd					
Contractor :	Santo Drainage & Contracting	Ltd					
Sampled by :	Santo Drainage & Contracting Ltd						
Date sampled :	14/03/18						
Sampling method :	Contractor sampled						
Sample description :	Silt						
Sample condition :	Damp	Project No :	2-S4686.00				
Solid density :	2.65 t/m ³ (Assumed) Lab Ref No : NA1406						
Source :	Santo Site	Client Ref No :	PO 4310				

		H. M. M. M.	1	Fest Results				
Maximum dry den Optimum water co	•	1.66 18	t/m³ %		Natural water Fraction tester		22.2 Whole soil	%
Sample ID		0	0	-4	-2	Nat	2	4
Bulk density	t/m³	1.859	1.926	1.948	1.969	1.984	1.976	1.924
Water content	%	13.7	16.2	18.2	20.0	22.2	25.3	29.3
Dry density	t/m³	1.635	1.657	1.647	1.641	1.623	1.577	1.488
Sample condition								



Test Methods Notes NZS 4402 : 1986 Test 4.1.1 (Standard) Compaction

Date tested : 22/03/18 Date reported :

28/03/18

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Approved A.Ching

Laboratory Manager Designation : 28/03/18 Date :

PF-LAB-026 (19/03/2018)

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Important Information about This Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you - assumedly a client representative - interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civilworks constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnicalengineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled*. No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated*.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnicalengineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full*.

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmationdependent recommendations if you fail to retain that engineer to perform construction observation*.

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnicalengineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnicalengineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, *proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration*. Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. *Geotechnical engineers are not buildingenvelope or mold specialists*.



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