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coffey.com

11 July 2018

Our ref: GENZTAUC13086AR-AF

The Lakes (2012) Ltd C/- Harrison Grierson Consultants Ltd Level 1 Harrison Grierson House 141 Cameron Road Tauranga

Attention: Simon Maxwell

Dear Simon

The Lakes Stages 2U – Foley Grove Re-Subdivision Rev1

1. Introduction

As requested, Coffey Services (NZ) Ltd (Coffey) has prepared this report and attached information to assist builders and designers working on Lots 1 to 32, Foley Grove, Tauranga.

This area was previously referred to as Stage 2U of the Lakes Subdivision. Coffey presented a Geotechnical Completion Report (GCR) for Stage 2U in June 2017¹ which included specific design recommendations for the lots in this stage. Since the issue of the GCR the Stage 2U area has been re-subdivided to form a total of 32 new residential lots with associated reserve and road areas. This report presents excerpts from the GCR and updated information relevant to the new lots. It is to be provided to builders and designers working in this area.

The new lot layout is shown on the S&L Consultants Ltd Land Transfer Plan appended as Attachment 1 of this report. The original site plans for the Lakes subdivision are also appended as Attachments 2 to 6. An updated Lot Summary Table is provided as Attachment 7.

¹ Coffey Services (NZ) Ltd, '*The Lakes Stages 2UV – Geotechnical Completion Report*', ref: GENZTAUC13086AR-AD, dated 16 June 2017.

2. Limitation

While this letter presents a summary of the geotechnical conditions for this area it does not provide a complete discussion of geotechnical issues affecting the Lakes Stage 2U area or previous earthworks undertaken on the site. It is therefore recommended that designers working on the new lots are also familiar with the contents of the original Stage 2U GCR¹.

It should be understood that this document does not represent a full geotechnical assessment report of the Foley Grove properties. Coffey has not been provided with, and has not reviewed, plans or details of the specific developments on each lot. It is recommended that a geotechnical professional is contacted if ground or development conditions differ from those described herein.

This report has been prepared for the use of our client, The Lakes (2012) Limited, their professional advisors and designers or builders in relation to the specific project described herein. No liability is accepted in respect of its use for any other purpose or by any other person or entity. All future owners of this property should seek professional geotechnical advice to satisfy themselves as to its ongoing suitability for their intended use.

This document should always be read in its entirety and is not to be split for further distribution.

3. Building Restriction Lines

Three Building Restriction Lines (BRL's) were placed on lots within Stage 2U. The BRL's are shown on Attachment 1 and Attachment 6 and affect the following new lots:

- Lots 1 to 17 These lots are located above an up to 1V:3H batter which was formed around the western and northern boundaries of Stage 2U. This batter partly consists of previous engineered filling and partly of non-engineered landscape fill. The BRL on these lots is located along the crest of the batter and is intended to restrict development on the slope due to the potential for shallow slope movement and/or variable subgrade materials within the batter itself.
- Lot 17 In addition to the BRL along the slope crest mentioned above, an up to 0.7m high
 retaining wall was constructed inside the property's boundary with Takitimu Drive. As this wall
 was not engineered designed, a BRL has been placed on this lot extending 2.0m inside the
 property boundary adjacent to the wall.
- Lots 22 to 26 & 32 The boundaries of these lots with Takitimu Drive and Kennedy Road are supported by an up to 1.3m high retaining wall. This wall was engineer designed but this design did not allow for building loads. A BRL has therefore been located 1.5m inside the property boundary on the affected lots. On lot 32 the setback distance tapers off to 0m where the retaining wall ends.

3.1. Development on Lots with a BRL

The existence of the BRL on a lot does not explicitly preclude development in the restricted area. Any works within the BRL would however be subject to the following requirements:

- The foundations of any building, and or any proposed filling or retaining walls within the BRLs along the crest of the batter on Lots 1 to 17 would need to be assessed by a Tauranga City Council Category 1 Geo-Professional.
- The foundations of any dwelling or any proposed filling within the BRLs along the retaining walls on lots 17, 22 to 26 & 32 must be assessed by a chartered engineer (CPEng) with consideration given to the zone of influence of the adjacent retaining walls.

4. Erosion Protection

The batter to the west and north of Lots 1 to 9 was covered with a layer of 'Grassroots' (registered trademark) synthetic matting provided by Geofabrics Ltd to reduce the risk of erosion or scour of this slope as a result of flooding along the Kopurererua Stream. The Grassroots matting extends up to the 1 in 100 year flood level as shown on Attachment 6.

The Grassroots matting extends approximately 3m to 8m inside the boundaries of Lots 1 to 9. The owners of these lots will need to ensure that continuous grass cover is maintained within this area and that the integrity of the erosion matting is not compromised by future development or landscaping in this area.

5. Minimum Floor Levels

The original lots within Stage 2U were subject to minimum floor level restrictions imposed by Tauranga City Council (TCC) due possible flooding of the nearby Kopurererua Stream. The corresponding minimum levels for the new lots are summarised on Table 1 below. Levels are given in terms of RL (reduced level) to the Moturiki Datum, 1953 and are to be measured to the underside of the floor slab or floor joists per section DS-5.4.5 of the TCC IDC.

The original minimum levels provided by TCC are shown on attachment 8.

Table 1: Minimum Floor Levels

Lot #	Minimum Floor Level (m RL)	Lot #	Minimum Floor Level (m RL)
1	11.0	17	10.75
2	10.75	18	10.75
3	10.75	19	10.75
4	10.75	20	10.75
5	10.75	21	10.75
6	10.75	22	11.0
7	10.5	23	11.0
8	10.5	24	11.0
9	10.25	25	11.0
10	10.25	26	11.0
11	10.25	27	10.75
12	10.5	28	10.75
13	10.5	29	10.75
14	10.5	30	10.75
15	10.5	31	11.0
16	10.75	32	11.0

6. Foundation Design & Bearing Capacity

Soils below the new lots may at least partially liquefy during a strong earthquake leading to possible vertical and horizontal ground movement. The dwellings on these lots should therefore be supported by specifically designed 'enhanced' waffle slab type foundations such as those developed for the 'TC2' zone of the Christchurch rebuild. A geotechnical ultimate bearing capacity of 300kPa may be assumed for these lots as they are entirely underlain by engineered filling.

7. Variable Ground Conditions

It should be understood that due to the volcanic nature of the natural soils on the elevated terraces, it is possible that local soil conditions may vary from those discussed above. It is therefore important that any potentially soft or unsuitable soils encountered in the foundation excavations are brought to the attention of a geotechnical professional.

For and on behalf of Coffey

Rob Telford Associate Engineering Geologist

Letter reviewed by:

David Sullivan, BSc, MBA, CE (Calif.), MIPENZ, CPEng, TCC Category 1 Geotechnical Engineer Principal Geotechnical Engineer CPEng No. 1025183

Attachments Important information about your Coffey report Attachment 1 – S&L Land Transfer Plan Attachments 2 to 6 – Site plans from original Stage 2U GCR Attachment 7 – Updated Lot Summary Table

Attachment 8 – TCC Minimum Floor Levels



Important information about your Coffey Report

As a client of Coffey you should know that site subsurface conditions cause more construction problems than any other factor. These notes have been prepared by Coffey to help you interpret and understand the limitations of your report.

Your report is based on project specific criteria

Your report has been developed on the basis of your unique project specific requirements as understood by Coffey and applies only to the site investigated. Project criteria typically include the general nature of the project; its size and configuration; the location of any structures on the site; other site improvements; the presence of underground utilities; and the additional risk imposed scope-of-service by limitations imposed by the client. Your report should not be used if there are any changes to the project without first asking Coffey to assess how factors that changed subsequent to the date of the report affect the report's recommendations. Coffey cannot accept responsibility for problems that may occur due to changed factors if they are not consulted.

Subsurface conditions can change

Subsurface conditions are created by natural processes and the activity of man. For example, water levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions which existed at the time of subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult Coffey to be advised how time may have impacted on the project.

Interpretation of factual data

Site assessment identifies actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from literature and external data source review, sampling and subsequent laboratory testing are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, can reveal what is hidden by earth, rock and time.

The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, owners should retain the services of Coffey through the development stage, to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site.

Your report will only give preliminary recommendations

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has therefore commenced and vour report recommendations can only be regarded as preliminary. Only Coffey, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered as the project develops. another party undertakes lf the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Coffey cannot be held responsible for such misinterpretation.

Your report is prepared for specific purposes and persons

To avoid misuse of the information contained in your report it is recommended that you confer with Coffey before passing your report on to another party who may not be familiar with the background and the purpose of the report. Your report should not be applied to any project other than that originally specified at the time the report was issued.



Important information about your Coffey Report

Interpretation by other design professionals

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain Coffey to work with other project design professionals who are affected by the report. Have Coffey explain the report implications to design professionals affected by them and then review plans and specifications produced to see how they incorporate the report findings.

Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way.

Logs, figures, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These logs etc. should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Geoenvironmental concerns are not at issue

Your report is not likely to relate any findings, conclusions, or recommendations about the potential for hazardous materials existing at the site unless specifically required to do so by the client. Specialist equipment, techniques, and personnel are used to perform a geoenvironmental assessment. Contamination can create major health, safety and environmental risks.

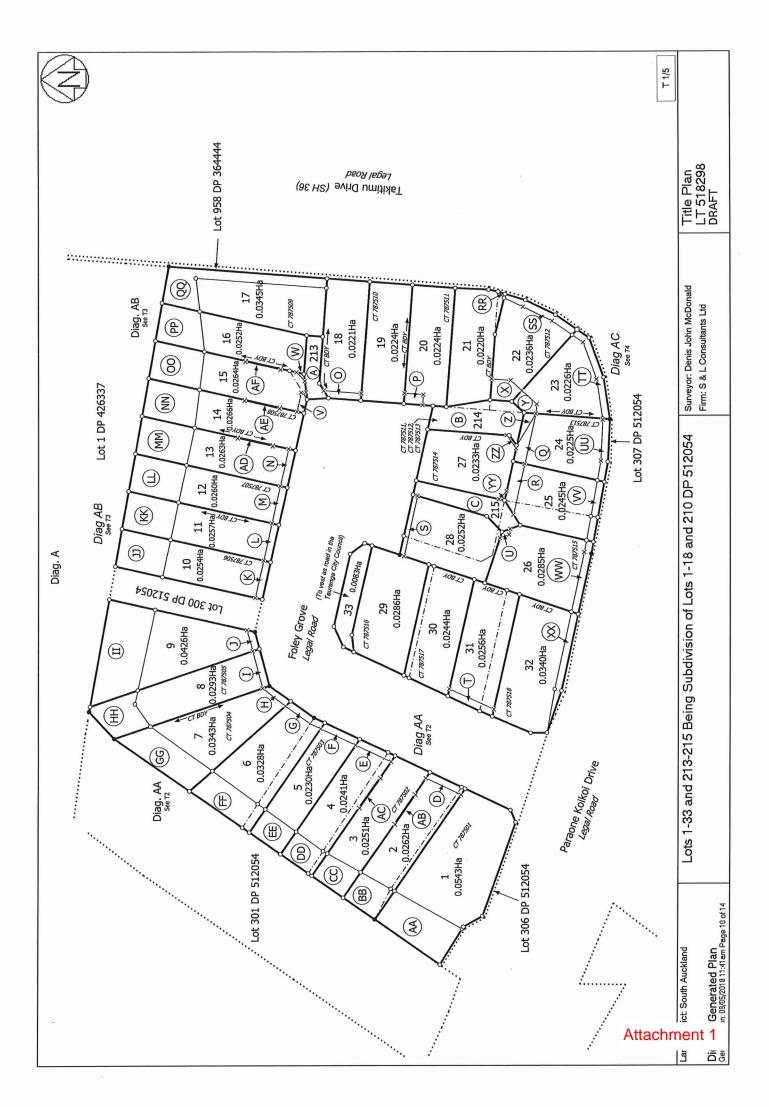
If you have no information about the potential for your site to be contaminated or create an environmental hazard, you are advised to contact Coffey for information relating to geoenvironmental issues.

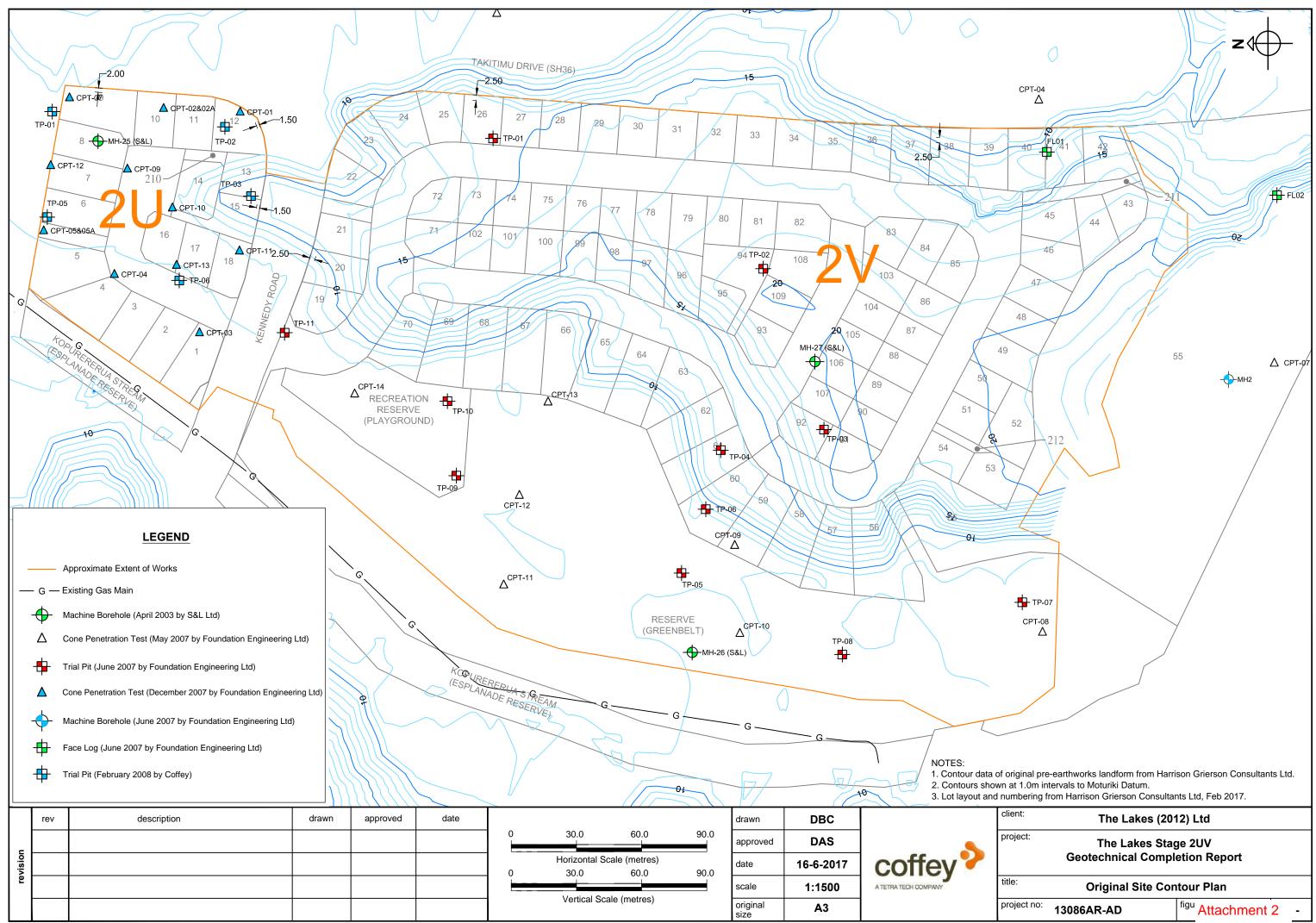
Rely on Coffey for additional assistance

Coffey is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to a project, from design to construction. It is common that not all approaches will be necessarily dealt with in your site assessment report due to concepts proposed at that time. As the project progresses through design towards construction, speak with Coffey to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

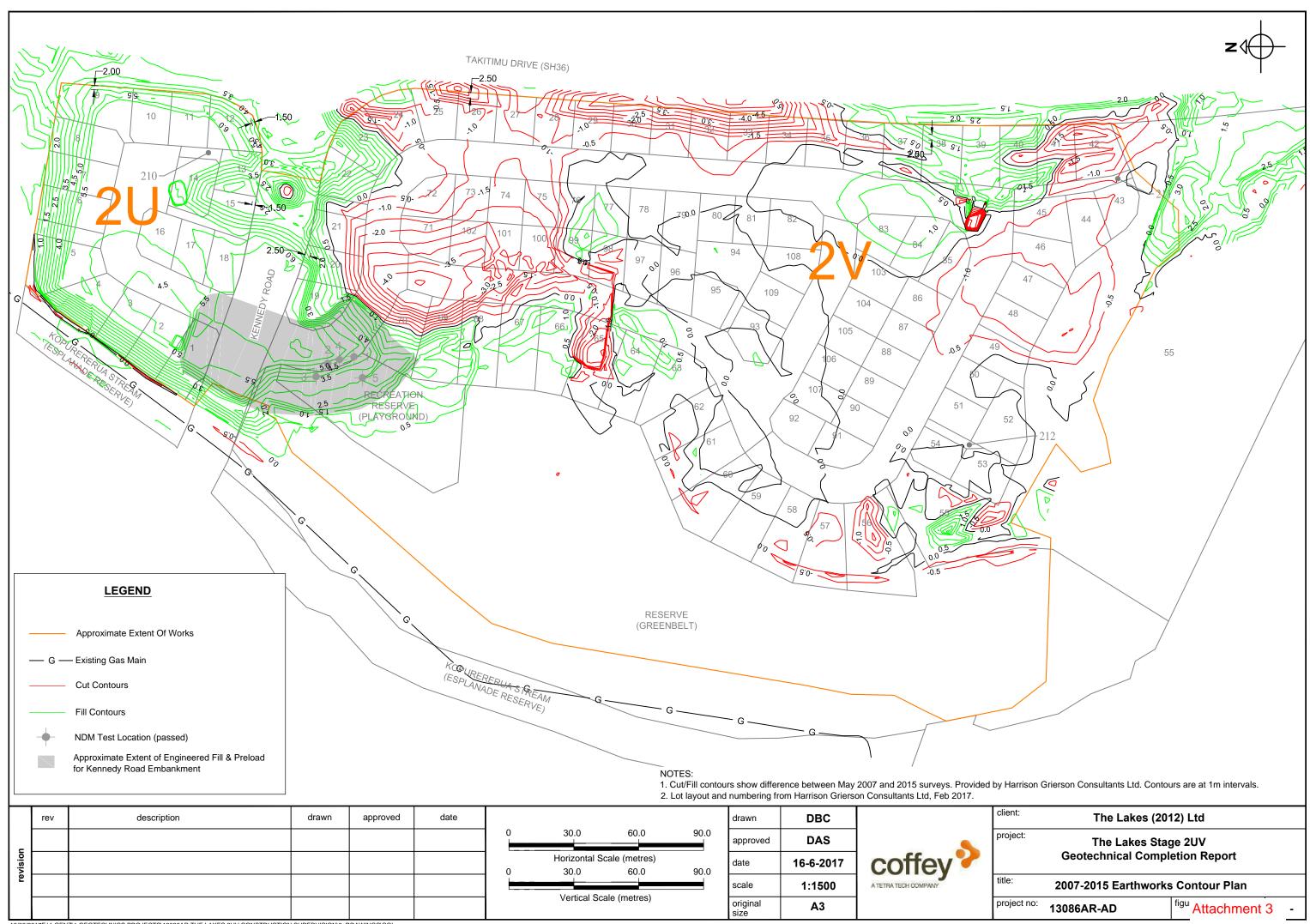
Responsibility

Reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than the design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in and other contracts. reports documents. Responsibility clauses do not transfer appropriate liabilities from Coffey to other parties but are included to identify where Coffey's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Coffey closely and do not hesitate to ask any questions you may have.

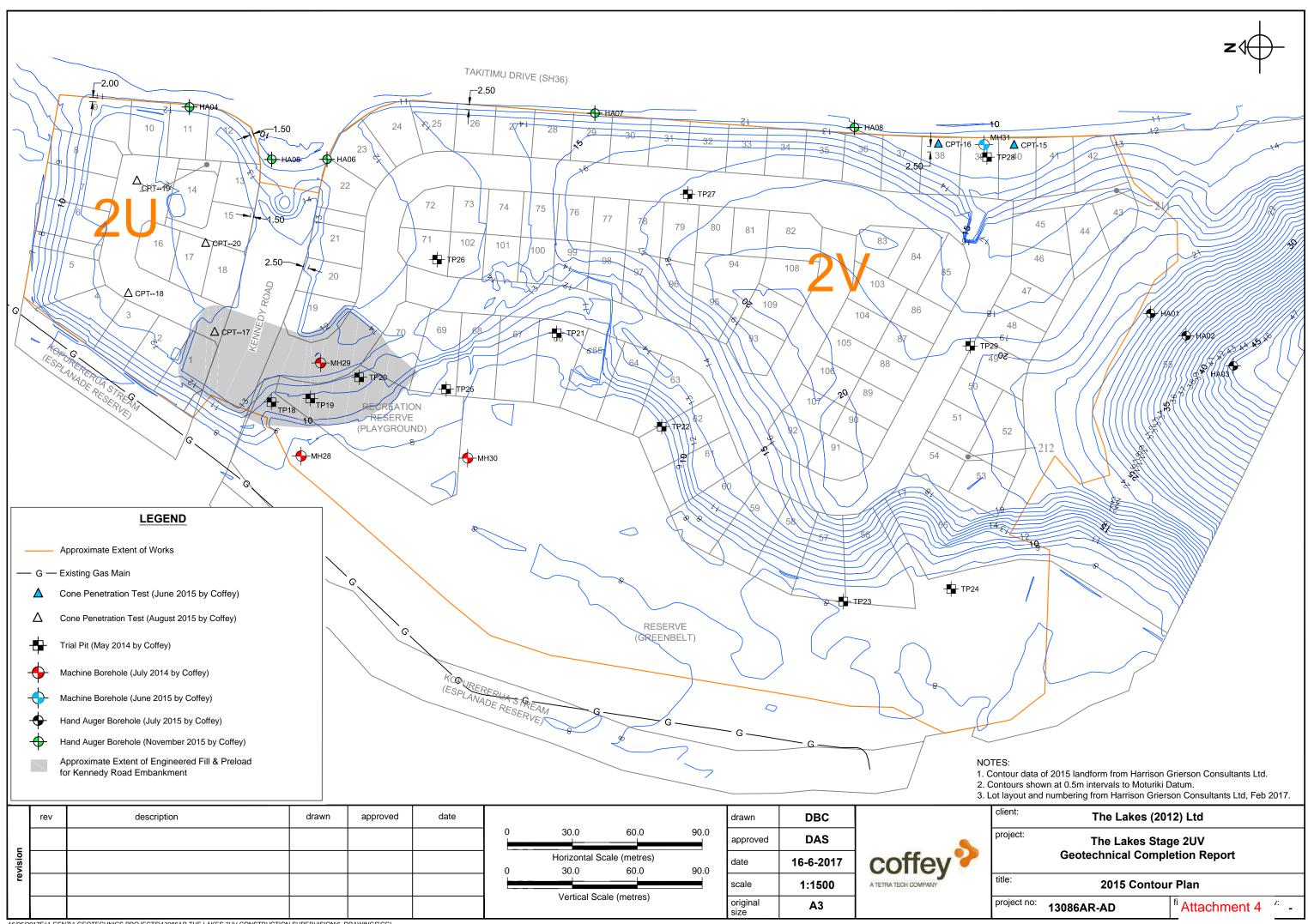




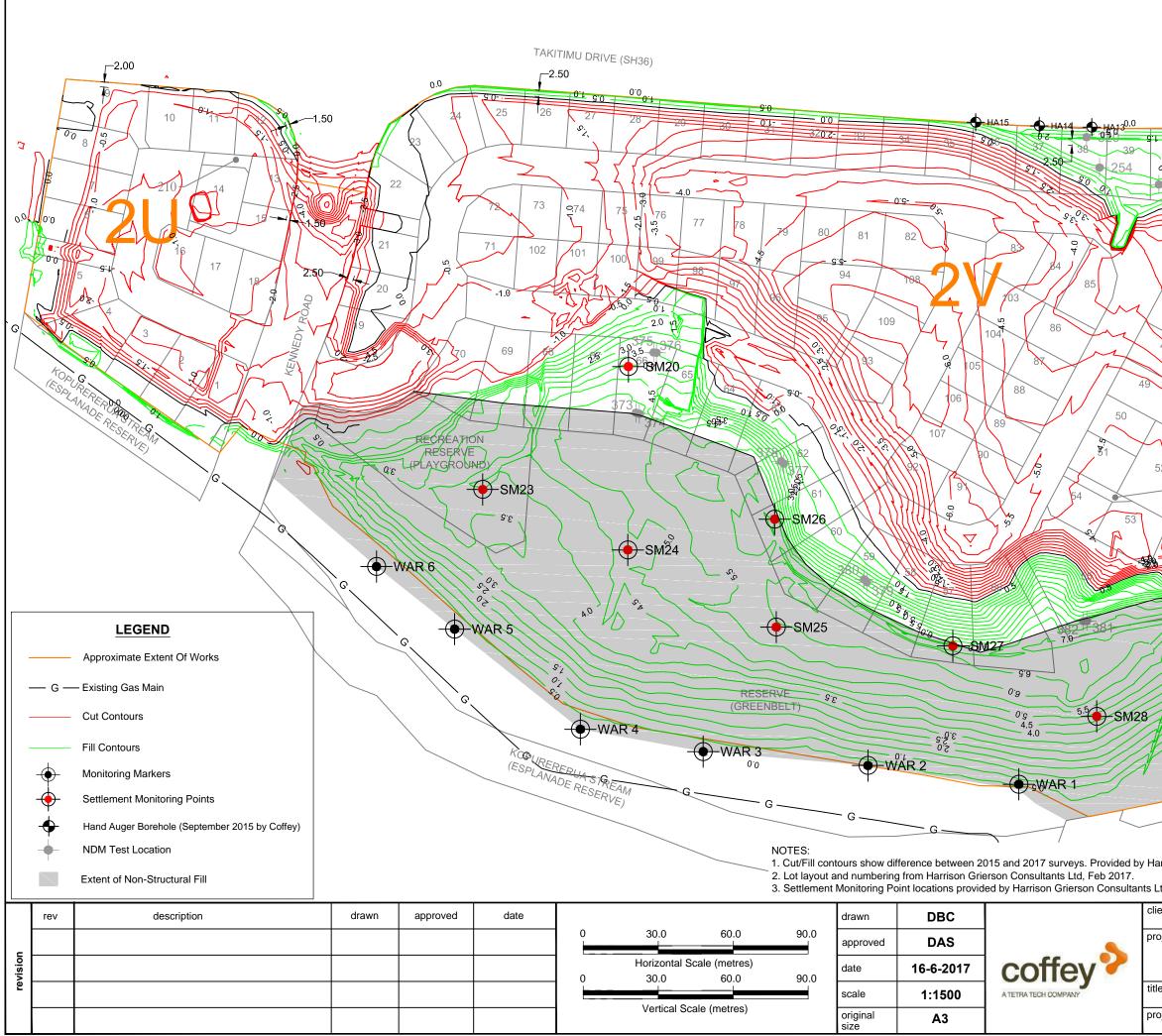
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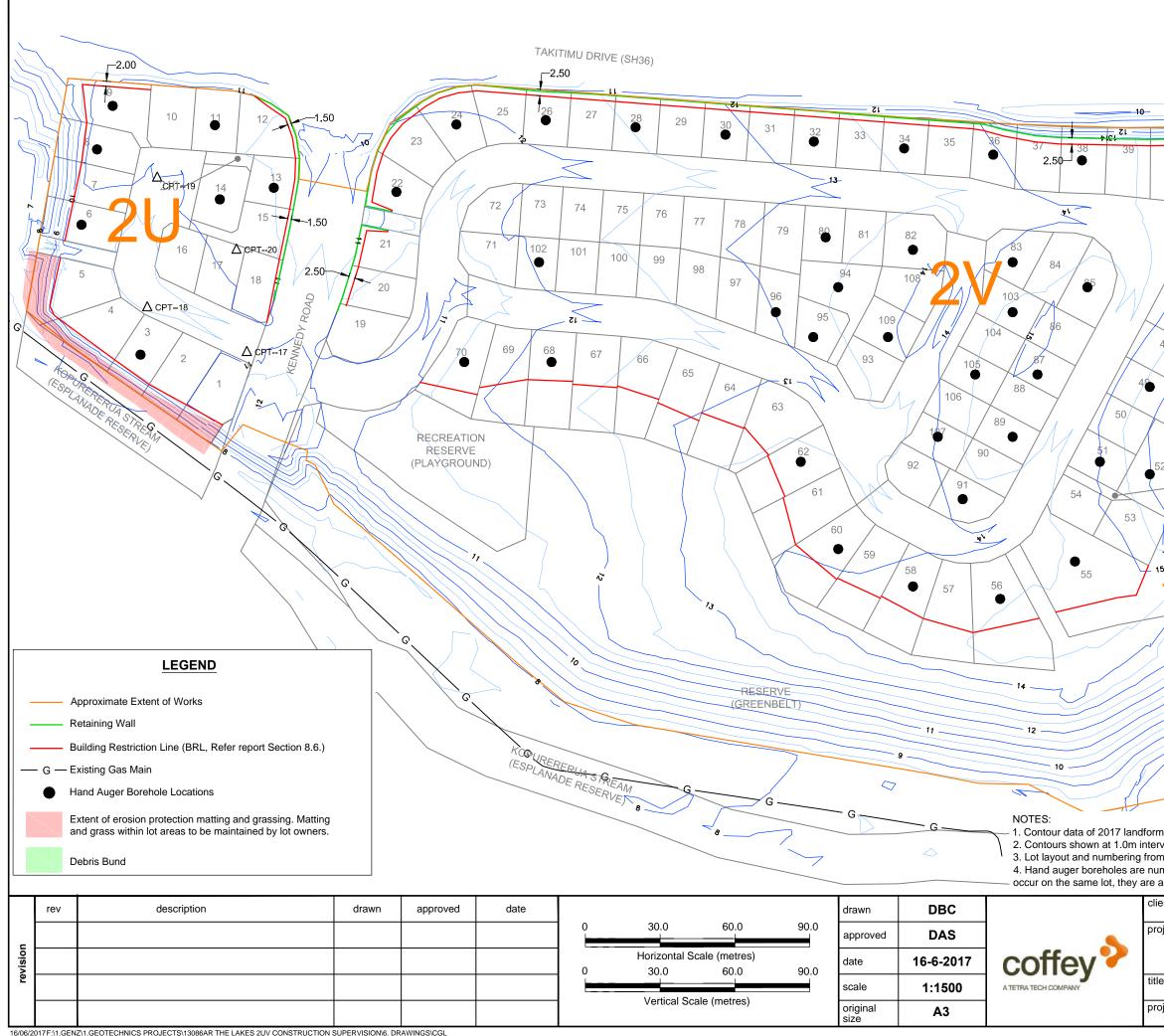


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DP512054 Pi

Property Address Foley Grove, Tauriko, Tauranga

RC No:

Lot No:	Area (m²)	Shear Strength (kPa)		Subsu division Iling	Conventional Shallow Foundation to	w Design		S/W Specific Design	S/W Soakage	S/W Reticulate	Designated Building Platform	Minimum Building Platform	Compressible Soils	On-Site Effluent Disposal	Consent Notice	For information purposes and to be read in conjunction with 'The Lakes Stages 2UV – Geotechnical Completion Report', ref: GENZTAUC13086AR-AD, dated 16			
		at 0.5m depth	Y/N	Depth (m)	Y/N	Y/N	Depth (m)	NZS 3604:2011 Y/N/NA	Y/N/NA					form	rm		-		June 2017. Comments
1	543	N/T	Y	4	Y	N		N	Y	Y	Ν	N	Y	Ν	Y	Ν	N	Y	
2	262	N/T	Y	4	Y	N		Ν	Y	Y	N	N	Y	N	Y	N	N	Y	
3	251	N/T	Y	4	Y	Ν		N	Y	Y	Ν	N	Y	Ν	Y	Ν	N	Y	
4	241	>215	Y	3.5	Y	Ν		N	Y	Y	Ν	N	Y	Ν	Y	Ν	N	Y	Lots subject to the following geotechnical conditions and limitations:
5	230	>215	Y	3.5	Y	Ν		Ν	Y	Y	Ν	N	Y	Ν	Y	Ν	N	Υ	 Specifically designed 'enhanced' waffle slab foundations.
6	328	N/T	Y	3.5	Y	Ν		Ν	Y	Y	Ν	N	Y	Ν	Y	Ν	N	Y	Building Restriction LineMinimum floor levels
7	343	N/T	Y	3.5	Y	Ν		Ν	Y	Y	Ν	N	Y	Ν	Y	Ν	N	Y	Consent notice to ensure lot owners maintain continuous grass cover and erosion protection on slope down to
8	293	N/T	Υ	3.5	Y	Ν		Ν	Y	Y	Ν	Ν	Y	Ν	Y	Ν	N	Y	Kopurererua Stream
9	426	N/T	Y	3.5	Y	N		Ν	Y	Y	N	N	Y	N	Y	N	N	Y	



INFRASTRUCTURE DEVELOPMENT CODE

SUMMARY OF GOTECHNICAL DATA FOR INDIVIDUAL LOTS

Attachment 7

G3

DP512054 P

Property Address Foley Grove, Tauriko, Tauranga

RC No:

Lot No:	Area (m²)	Shear Strength (kPa)		Subsu tivision Iling	Foundation Conventional Shallow Foundation to	ons Specific Design	Building Restriction Line	S/W Specific Design	S/W Soakage	S/W Reticulate	Designated Building Plat	Minimum Building Platform	Compressible Soils	On-Site Effluent Disposal	Consent Notice	For information purposes and to be read in conjunction with 'The Lakes Stages 2UV – Geotechnical Completion Report', ref: GENZTAUC13086AR-AD, dated 16			
		at 0.5m depth	Y/N	Depth (m)	Y/N	Y/N	Depth (m)	NZS 3604:2011 Y/N/NA	11			Platform	orm		-		June 2017. Comments		
10	254	UTP	Y	4	Y	Ν		N	Y	Y	N	N	Y	N	Y	N	N	Y	
11	257	UTP	Y	4	Y	Ν		N	Y	Y	N	N	Y	N	Y	N	N	Y	
12	260	N/T	Y	4.5	Y	Ν		N	Y	Y	Ν	Ν	Y	Ν	Y	Ν	Ν	Y	
13	263	N/T	Y	4.5	Y	Ν		N	Y	Y	Ν	Ν	Y	Ν	Y	N	N	Y	
14	266	UTP	Y	5	Y	Ν		N	Y	Y	Ν	Ν	Y	Ν	Y	Ν	N	Y	Lots subject to the following geotechnical conditions and limitations:
15	264	UTP	Y	5	Y	Ν		N	Y	Y	Ν	Ν	Y	Ν	Y	Ν	N	Y	 Specifically designed 'enhanced' waffle slab foundations.
16	252	UTP	Y	5	Y	Ν		N	Y	Y	N	N	Y	N	Y	N	N	Y	Building Restriction LineMinimum floor levels
17	345	UTP	Y	5	Y	N		Ν	Y	Y	N	N	Y	N	Y	N	N	Y	



INFRASTRUCTURE DEVELOPMENT CODE

SUMMARY OF GOTECHNICAL DATA FOR INDIVIDUAL LOTS

G3

Property Address Foley Grove, Tauriko, Tauranga RC No:

6	Are				rface data	Foundati	Building Restric	S/W Specific De	S/W Soakage	S/W Reticulate	Designated Bui	Minimum Build	Compressible S	On-Site Effluen	Consent Notice	For information purposes and to be read in conjunction with 'The Lakes Stages 2UV – Geotechnical				
Lot No:	Area (m²)	Shear Strength (kPa)		division Iling	Natural Topography Unworked	Natural Topography Earthworked		Conventional Specific Shallow Design Foundation to NZS		Restriction Line	Design			I Building Platform	Building Platform	Soils	Effluent Disposal		Completion Report', ref: GENZTAUC13086AR-AD, dated 16	
		at 0.5m depth	Y/N	Depth (m)	Y/N	Y/N	Depth (m)	3604:2011 Y/N/NA	2011	N/NA				orm	Ш				June 2017. Comments	
18	221	N/T	Y	4.5	Y	N		N	Y	N	N	N	Y	Ν	Y	Ν	Ν	Y	Lots subject to the following geotechnical conditions	
19	224	N/Y	Y	4.5	Y	N		N	Y	N	N	N	Y	N	Y	N	N	Y	and limitations:	
20	224	UTP	Y	4.5	Y	Ν		N	Y	Ν	N	N	Y	Ν	Y	Ν	Ν	Y	 Specifically designed 'enhanced' waffle slab foundations. Minimum floor levels 	
21	220	UTP	Υ	4.5	Y	Ν		N	Y	N	N	N	Υ	Ν	Υ	Ν	Ν	Υ		
22	236	N/T	Y	4.5	Y	Ν		N	Y	Y	N	N	Y	Ν	Y	Ν	Ν	Y		
23	226	N/T	Y	4.5	Y	Ν		N	Y	Y	Ν	Ν	Y	Ν	Y	Ν	Ν	Y		
24	225	UTP	Y	5	Y	Ν		N	Y	Y	Ν	Ν	Y	Ν	Y	Ν	Ν	Y	Lots subject to the following geotechnical conditions and limitations:	
25	245	UTP	Y	5	Y	Ν		N	Y	Y	Ν	Ν	Y	Ν	Y	Ν	Ν	Y	 Specifically designed 'enhanced' waffle slab foundations. 	
26	285	N/T	Y	3.5	Y	N		Ν	Y	Y	N	N	Y	N	Y	N	N	Y	 Building Restriction Line Minimum floor levels 	

Tauranga City	SUMMARY OF GOTECHNICAL DATA FOR INDIVIDUAL LOTS	G3
	INFRASTRUCTURE DEVELOPMENT CODE	Attachment 7

DP No: Lots 1 – 32, DP512054

Property Address Foley Grove, Tauriko, Tauranga RC No:

Area (m²) Lot No:		Subsurface dataShearSubdivisionNaturalNaturalStrengthFillingTopographyTopography(kPa)UnworkedEarthworked						Foundatio Conventional Shallow Foundation to	al Specific Ction Design			S/W Soakage	S/W Reticulate	Designated Building Plat	Minimum Building Platform	Compressible Soils	On-Site Effluent Disposal	Consent Notice	For information purposes and to be read in conjunction with 'The Lakes Stages 2UV – Geotechnical Completion Report', ref: GENZTAUC13086AR-AD, dated 16
		at 0.5m depth	Y/N	Depth (m)	Y/N	Y/N	Depth (m)	NZS 3604:2011 Y/N/NA	Y/N/NA				Platform	orm		_		June 2017. Comments	
07	000	VTD	V	0	X			N	Ň				X		V			V	
27	233	YTP	Y	3	Y	Ν		N	Y	Ν	Ν	Ν	Y	Ν	Y	Ν	Ν	Y	
28	252	UTP	Y	3	Y	Ν		N	Y	Ν	Ν	Ν	Y	Ν	Y	Ν	Ν	Y	Lots subject to the following geotechnical conditions and limitations:
29	286	N/T	Y	4	Y	Ν		Ν	Y	Ν	Ν	Ν	Y	Ν	Y	Ν	Ν	Y	 Specifically designed 'enhanced' waffle slab foundations.
30	244	N/T	Y	4	Y	Ν		N	Y	Ν	Ν	Ν	Y	Ν	Y	Ν	Ν	Y	Minimum floor levels
31	256	N/T	Y	4	Y	Ν		N	Y	N	Ν	Ν	Y	Ν	Y	Ν	Ν	Y	
32	340	N/T	Y	4	Y	N		Ν	Y	Y	N	N	Y	N	Y	Ν	N	Y	Lots subject to the following geotechnical conditions and limitations: • Specifically designed 'enhanced' waffle slab foundations. • Building Restriction Line Minimum floor levels
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Key:

DCP = Tested with Dynamic Cone Penetration (Scala); N/T = Not Tested; UTP = Unable To Penetrate

