Tauranga City

LIM

Land Information Memorandum

Land Information Memorandum

This Land Information Memorandum has been prepared for:

Applicant	**Arizto Limited**
Client	**Rachel Griffiths**
Business	**Arizto Limited**
Property Address	**130 Union Drive** **Papamoa**
Legal Description	**Lot 1463 DP 540448**
Application Date	**11 August 2026**

This Land Information Memorandum has been prepared for the purposes of Part 6 of the Local Government Official Information and Meetings Act 1987. It is based on a search of Council records only. Additional information relevant to the property may be held on Council's property file or within other Council systems; however, is not included in this Land Information Memorandum. There may be other information relating to the land which is unknown to Council. The Council has not undertaken any inspection of the land or any building on it for the purpose of preparing this Land Information Memorandum. The applicant is solely responsible for ensuring that the land is suitable for a particular purpose. This Land Information Memorandum has been prepared for the applicant only. The Council accepts no responsibility or liability for any use of this report by third parties or for any reliance placed on its contents by persons other than the applicant. This Land Information Memorandum is valid only if reproduced in full and applies only as at the date of issue.

It is recommended that the Certificate/Record of Title, which is not held by Council, be searched by the purchaser.

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Services Information

Land information which is likely to be relevant includes information on private and public stormwater, water and sewer details. Please refer to the appropriate authorities for further information about network utility services.

Service Record

Service Print Attached	**Yes**
Method of Sewer Disposal	**To Public Sewer**
Existing Method of Stormwater Disposal	**Soakholes**
Drinking Water Supplied to the Land	**Yes**
Drinking Water Supplier Is:	
(I) Owner of the Land; or	**No Information Available**
(ii) Tauranga City Council [Water Supply Authority Unit (WSA)]; or	**Yes**
(iii) Another Networked Supplier	**No Information Available**
Any Information Notified under Section 206(1) Water Services Act 2021	**No Information Available**

Note:

1. Please note that the existence of a watermain along a property frontage does not necessarily mean that a connection is available. This may need to be provided at the applicant's expense.
2. If the land is supplied with drinking water by Tauranga City Council as a Water Supply Authority, any conditions (generally set out in Tauranga City Council's Supply of Water Bylaw 2019 applicable to that supply are included in this Land Information Memorandum.
3. If the land is supplied with drinking water by a networked supplier other than the WSA, any conditions that are applicable to that supply are included in this Land Information Memorandum.
4. If the land is supplied with drinking water by the owner of the land, any information Council has about the supply is included in this Land Information Memorandum.
5. Any information notified to the territorial authority by a drinking-water supplier under Section 206(1) Water Services Act 2021 is included in this Land Information Memorandum.
6. Water services legislation is transitioning from the Water Services Act 2021 to the local Government (Water Services) Act 2025 and associated amendments. Some information in this Land Information Memorandum may reflect the previous legislative framework and may be subject to change or reinterpretation under the new Act.

Rating and Valuation Details

Tauranga City Council rates are billed twice a year and are due on the last business day of August and February. Unpaid rates for each instalment will incur a 10% penalty.

The valuation details below are based on a revision date of 1 May 2023. This has been used to assess the rates for Council's financial year beginning 1 July 2026.

Further information on property valuations can be found on Council's website at the following link: Property valuations - Tauranga City Council.

Valuation Details

Valuation Reference	**06943 212 32**
Capital Value	**$685,000**
Land Value	**$365,000**
Improvement Value	**$320,000**

Rating Details

Current Annual Rates	**$3,492.28**
Balance Owing	**$80.95**

Water Meter Details

Water Meter On Property	**Yes**
Meter Type	**Individual Meter**
Water Rates Owing	**$124.87**

A separate account is issued for water metered properties. Residential meters are read every three months. Commercial/Industrial meters vary depending on use.

Note:

Council's Water Supply Bylaw requires a final water meter reading to be undertaken when a property is sold.

Infrastructure Funding and Financing (IFF) Levy Details

The IFF levy (under the Infrastructure Funding and Financing (Western Bay of Plenty Transport System Plan Levy) Order 2022) is payable for a period of 30 years from 1 July 2024 to 30 June 2054. The method for assessing the liability for an IFF levy on the property is set out in the 2022 Order. The annual levy (as calculated under the 2022 Order) is allocated across the levy area with 50% of the overall levy coming from commercial and industrial properties and 50% coming from residential properties and with the IFF levy on the property being based on the capital value of the property. Further information on the levy is available at the following link: Infrastructure Levy - Tauranga City Council.

IFF Levy Details

Current Annual IFF Levy	**$63.26**
Balance Owing	**$31.63**

Building Information

This information is sourced from Council records and may not reflect the situation on site if work has been undertaken without consent or has been undertaken and was exempt from consent.

This Land Information Memorandum provides a summary of key building-related information and does not include all documents held by Council. It is recommended that the property file is viewed together with this Land Information Memorandum to satisfy any due diligence requirements. The property file may be ordered at the following link: Order a LIM or Property File.

Building Permits and Consents: Information related to Permits (issued prior to 1993) and Consents (issued after 1 January 1993) is listed below. Where the permit issue date is unknown, the application or payment date is recorded instead. Plans and other associated documents, where held by Council, are available on the property file.

Solid Fuel Heaters: It is important that any solid fuel heater has been legally installed, either as part of the original dwelling or by way of a separate permit/consent.

Granny Flats: From 15 January 2026, a small standalone dwelling may be constructed without a building consent, if all exemption conditions are met under Schedule 1A of the Building Act 2004. Further information is available at the following link: Guidelines on Building a Granny Flat.

Permits and Consents

Building Consents

Date Issued	Description of Work	BC Number	CCC Issued
24/09/20	Erect Single Level, 3 Bedroom Dwelling with Attached Single Garage Amendment1: Change to Cladding System in Entry Space from Cavity to Direct Fixed	301678	Yes

Additional Comments:

An exemption to the requirement to obtain Building Consent for “Paling Fence 2.5m High” EX182105 was granted under Schedule 1 of the Building Act 2004 on 13 November 2018.

Compliance Schedule	**N/A**
Requisitions	**None**

City Planning

The Operative Tauranga City Plan

The Tauranga City Plan provides the rules for how people can build or develop the land they own in our city. This can be land that is residential, commercial, industrial etc. The City Plan covers all subdivision, land use and development, how and where the city grows, how infrastructure is located and how natural and physical resources are managed. It is the blueprint by which any development in Tauranga is managed. It also includes rules on other things that are covered by the Resource Management Act - including hazards, signage, reserves, noise, heritage, etc.

There are specific rules within the City Plan that cover, amongst other matters, building height, earthworks, tree protection, bulk and scale of buildings, setbacks from coastal and harbour margins, and specific residential, commercial and industrial uses depending on location within the City.

Specific rules for each suburb and property can vary depending on the underlying zone of the area and the location of a specific property within that zone.

The majority of the City Plan became 'operative in part' on 9 August 2013. The remaining parts of the City Plan subsequently became operative on 5 July 2014.

A table showing a complete list of variations and plan changes to the operative City Plan can be found in the Table of Plan Change Dates.

It is advised that prospective purchasers of property review and consider all relevant planning rules for the specific property this Land Information Memorandum applies to prior to purchase.

To view the Operative Tauranga City Plan please click here.

If you have any specific queries on any rules or any existing or proposed use of a property, please contact the Tauranga City Council's Duty Planner (07 577 7000) for further information.

Development Contributions

Council operates a development contributions policy under the Local Government Act 2002, and also has financial contributions provisions in its City Plan. The broad purpose of these policies is to fund infrastructure costs that relate to the city's growth from those parties that undertake subdivision, building or development. These contributions are required on building consents, resource consents, service connection authorisations, certificates of acceptance and PIMs for small standalone dwellings. Contributions may remain payable on any property in circumstances where subdivision, building and development projects have not been completed, and in rare occasions where the Council has agreed to defer payment. In addition, further subdivision, building or development of a property may trigger the requirement to pay further development and/or financial contributions.

Council's development contributions team can advise further on these matters in relation to the application of development and financial contributions to the property in question.

Transportation Strategy & Planning and Reserve Management Plans

As part of Tauranga City Council's Transport strategy and planning activities and Reserves Management Plans, properties neighbouring Council-owned or administered land may be subject to transport network development such as walkways and cycleways or other development, activities or use of the land. The Tauranga Reserves Management Plan is available online at the following link: Reserve Management Plans.

Relevant Planning Information

All Planning information for this property is available online through the **City ePlan.**

Zone: Operative Tauranga City Plan	**Medium Density Residential**
Identified Plan Areas	**NZTA Reverse Sensitivity Plan Area – Refer City Plan Chapter 4, Section 4E.2.5** **Adjacent to NZTA16 – Road Widening – Refer City Plan Chapter 10 Appendix 10C**
Utilities/Designations	**None**
Protected Heritage/Notable or Groups of Trees, or Protected Buildings	**None Known**
Archaeological or Heritage Sites	**None Known**

Certificates, Notices, or Orders Affecting the Land

Description	Date Issued
Consent Notice	16/03/20*

Resource Consents *(Resource Management Act 1991)*

Description	Date Granted	RC Number
Subdivision Consent	24/01/19	26512
Lan Use Consent	24/01/19	26513

Comments:

*Attached for information, Construction of Acoustic Fence by S&L Consultants Ltd, reference 20076-S50, dated 24 May 2019.

Land Development

The following information relates to land development and landform characteristics. It is based on information held by council and may include reports, assessments, and other documentation relevant to site development. This information may not reflect the current on-site conditions, or any work undertaken that is not known to council.

The Tauranga City Council does not act as agent for network utility operators.

The landform and geology within Tauranga City have some features which demand particular attention. These features, which may or may not be relevant to the property in question, are outlined in "General Description of Landform within Tauranga District" as attached.

Comments:

Consent Notice

Refer Consent Notice dated 16 March 2020 together with Geotechnical Completion Report Including Recommendations for Building by S&L Consultants, reference 20076-s56, dated 19 November 2019.

Documentation Relevant to the Subject Property

Refer the following documentation:

1. Site Observation Form by Geoconsult, reference TM357, dated 7 October 2020.
2. Geotechnical Inspection of Subgrade by Geoconsult, reference TM357, dated 12 October 2020.
3. Building Location Certificate Details by Aldersley Surveys Ltd, dated 13 October 2020.

HAIL Sites

This site is included in the Bay of Plenty Regional Council's Selected Land Use Register which records sites that have had past or present hazardous activities located on them. This site is categorised in that register as "At or Below Background - Persistent pesticide use – Persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds." For further information please contact the Bay of Plenty Regional Council quoting site reference TGA_886 HAIL code A10.

Please contact Tauranga City Council for a copy of the following documentation if required:

1. Investigation of Soil Quality, Golden Sands – Papamoa South by GES Gwilym Environmental Services Ltd dated 22 August 2016 (Document ID A17287475).

Natural Hazards

This information relates to nation-wide, city-wide, or region-wide studies and may not reflect the on-site situation or natural hazard investigations and mitigation done on a site-specific property level. It is recommended that hazards identified in this section of the Land Information Memorandum be considered both individually and in combination, as their cumulative effects may influence the overall level of risk.

Flooding

Flood hazard information referenced here includes modelling produced at a nation-wide scale by Earth Sciences New Zealand (ESNZ). The national tool provides consistent flood hazard data across New Zealand and is zoomable to street level, but not to individual properties. For property-specific flood hazard information that may affect this property please refer to the following section of this Land Information Memorandum titled, “Natural Hazards Relevant to the Subject Property”. The modelling produced by ESNZ is available to view at the following link: Flood Hazard Modelling.

Microzoning for Earthquake Hazards

The Council has received reports and results that assessed Tauranga City's liquefaction vulnerability during earthquakes.

Different properties face varying probability levels of liquefaction damage. The maps assess natural ground conditions only and don't consider recent human activities like earthworks, ground improvements, or foundation design that may reduce liquefaction risk. Detailed, site-specific studies by qualified practitioners may take precedence over these city-wide assessments.

Liquefaction information may affect property use and development, including building consent requirements (Building Act 2004, NZ Standard AS/NZ 1170, TCC Infrastructure Development Code Chapter 10.10.6), subdivision consents (Resource Management Act), and infrastructure design.

Further information and reports are available at: Earthquakes and Liquefaction.

Landslide Susceptibility

Council has received an assessment of Tauranga City’s susceptibility to landslides. Two maps have been prepared, one showing areas susceptible to land sliding triggered by rainfall, and the other by earthquakes. A report detailing the assessment and maps are available by accessing the following link: Landslide Susceptibility.

Shallow Groundwater

Council has received an assessment of shallow groundwater conditions in Tauranga City. The assessment analysed groundwater monitoring data from 2015-2021 across 97 monitoring sites and developed predictive models for future conditions under sea level rise.

Shallow groundwater occurs close to the surface throughout Tauranga's low-lying areas. Groundwater levels fluctuate with tides, rainfall, and seasonal variations. In some areas, groundwater sits less than 1 meter below ground surface. The assessment forecasts that rising groundwater levels will occur as sea levels rise.

Development Implications: This information may affect property use and development, including building consent requirements (Building Act 2004), subdivision consents (Resource Management Act), and infrastructure design. Site-specific geotechnical investigations may be required to assess local groundwater conditions and mitigation measures.

The full technical report and spatial datasets are available at: Groundwater.

Bay of Plenty Regional Council

Further information regarding natural hazards held by the Bay of Plenty Regional Council that may be relevant to this property can be found at the below links. Further enquiries may also be made by contacting the Bay of Plenty Regional Council on 0800 884 880.

Bay of Plenty Regional Council – Natural Hazards
Bay Hazards
Bay Explorer

Natural Hazards Relevant to the Subject Property

The following information relates to natural hazards identified at a site-specific scale. It is based on information held by Council and may not reflect the current on-site conditions or any hazard investigations or mitigation measures that have occurred since, or that are not known to Council.

Further information about natural hazards held by Tauranga City Council can be found at the following link: Tauranga City Council – Natural Hazards and may also be identified on Council's mapping website, Mapi.

Tsunami

Tsunami

Council holds information that shows this property is located in a possible tsunami inundation zone.

GNS Science (now known as Earth Science New Zealand) have prepared a report titled Comprehensive Tsunami Inundation Modelling and Evacuation Zone Mapping: Final Report (March 2025). The report was commissioned by the Bay of Plenty Regional Council.

The purpose of the report is to document the methodology, results and limitations of the modelling undertaken by GNS Science to produce comprehensive tsunami inundation mapping for the Bay of Plenty region. The scope of the report is the Bay of Plenty coastline and offshore islands.

The tsunami inundation maps show:

- The area of land that could potentially be flooded by a tsunami caused by a rare offshore earthquake that has a wave height ranging between 8m and 15m along the Bay of Plenty coast.

  The likelihood of a tsunami like this occurring in any year is calculated as 0.04% (which is a 1 in 2,500 chance).

The technical report can be accessed from the Bay of Plenty Regional Council website: Natural hazards.

Further information is available on the Tsunami pages of Tauranga City Council's website and Bay of Plenty Regional Council's website. Information explaining the difference between evacuation zones and inundation zones is also available in the Frequently Asked Questions.

Please see attached tsunami evacuation zone map.

Additional Information

Licences Affecting the Land or Buildings

None

Signed for and on behalf of the Council:

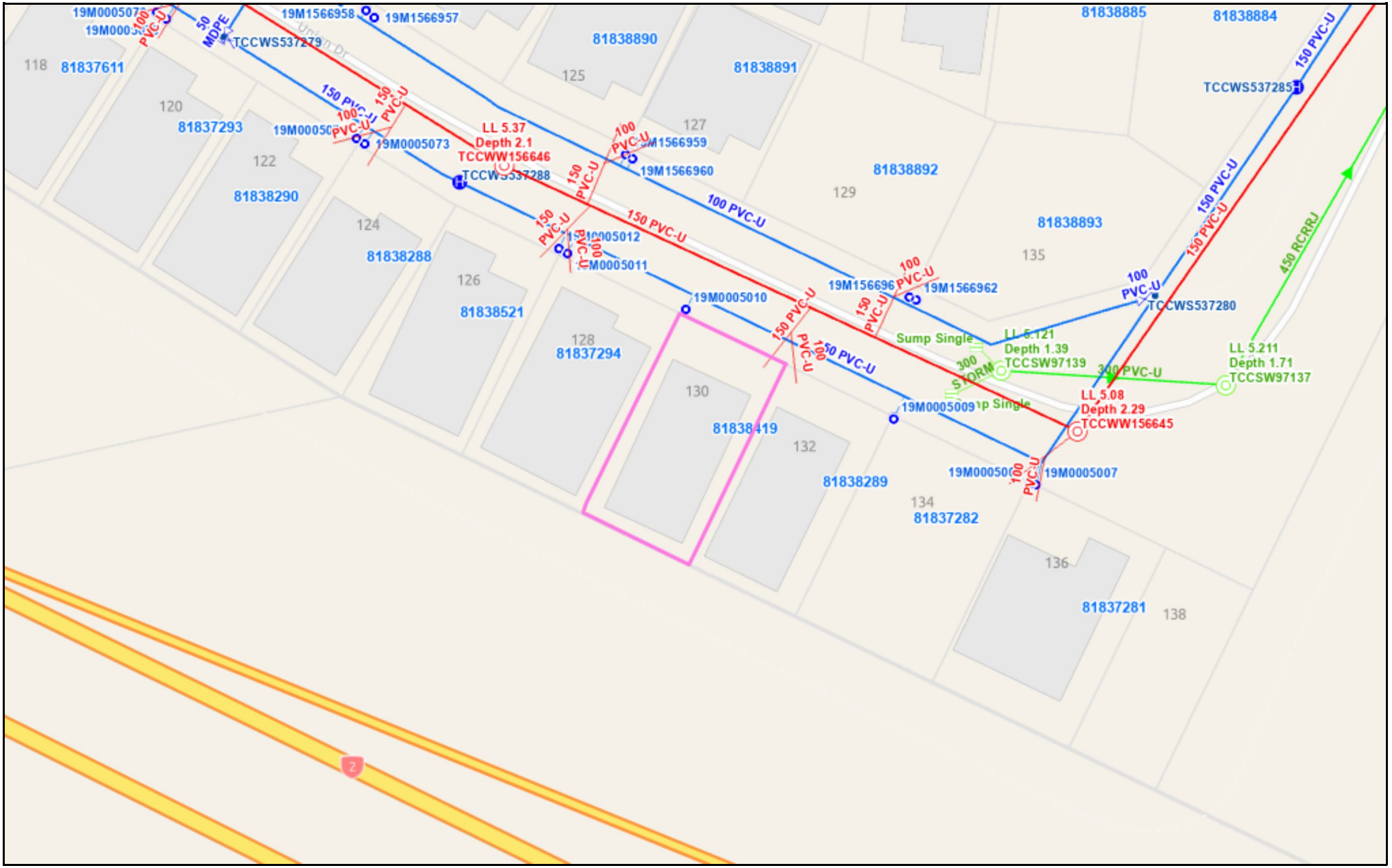
Position held: LIM and Property Files Officer

Date: 24 August 2026

Tauranga City

Services Plan

Tauranga City



Produced by - Tauranga City Council

Printed 24/08/2026

Cadastral Information sourced from LINZ. Crown Copyright Reserved

Services Plan

0 5 10 m

Meters

Scale 1: 500 **@A4**

N

Information shown on this plan is indicative only. The Council accepts no liability for its accuracy and it is your responsibility to ensure that the data contained herein is appropriate and applicable to the end use intended.

Services Key

Water

- Water Service Line
- Water Meter
- Rider Main
- Reticulation Main
- Trunk Water Main
- Asbestos Pipe (Abandoned)
- Asbestos Pipe (Operational)
- Hydrant
- Valve
- Water Reservoir
- Backflow - Double Check
- RPZ
- Valve
- Private Water Bore

Stormwater

- Service Line
- Rising Main
- Gravity Main
- Stormwater Drain
- Subsoil Drain
- Stormwater Overland Flow Path
- Culvert
- Inlet
- Outlet
- Stormwater Manhole
- Stormwater Sump
- Stormwater Rodding Eye
- Large Sump
- Storage Pond

Wastewater

- Service Line
- Rising Main
- Gravity Main
- Asbestos Pipe (Abandoned)
- Asbestos Pipe (Operational)
- Node
- Rodding Eye (Inspection Point)
- Manhole
- Valve
- Chamber
- Pump Station

Other

- Abandoned assets and lines
- Private assets and lines
- Geotech Utility Buffer

More symbols may appear on the Services Plan than are shown here. For a full key please contact the Tauranga City Council LIM Office.

Tauranga City

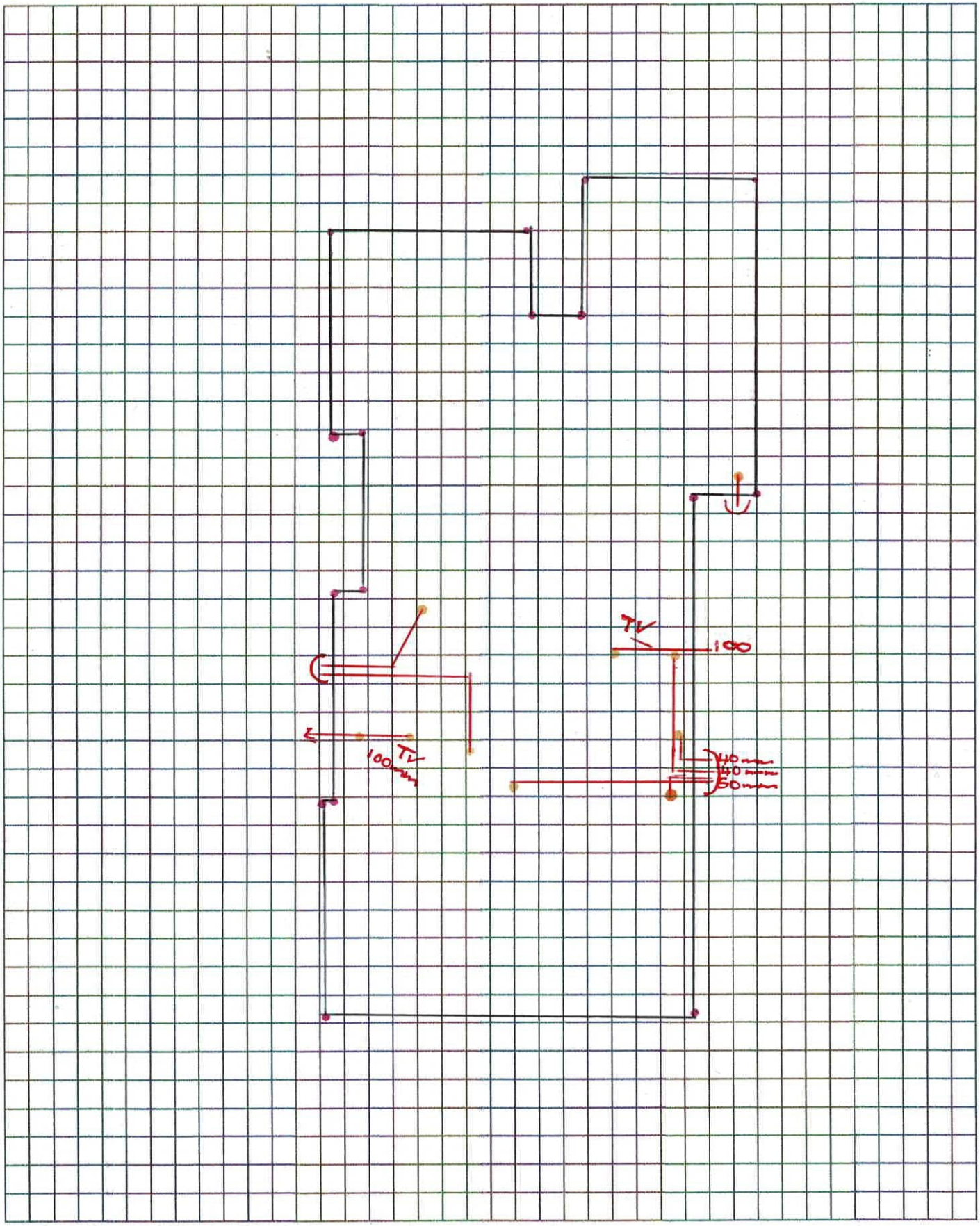
Building Information

Tauranga City

As Built

Underfloor Asbuilt

Street Number: 160	**Street Name:** Union Drive
Lot: 1463	**DP:**
Suburb: Golden Sands, Papamoa	
Owner: ZB Homes	
Plumbing Company: Master Plumb & Gas	
Certifying Plumber: Wade Horton	**Registration Number:** 17440
Type of Building: Residential	
Building Consent number: BC301678	
Date of Inspection: 13/10/2020	**Inspector:**



Address Lot 1463, 130 Union Drive, Golden Sands, Papamoa.

Building Consent number: BC 301678.

As Built
Drainage Plan

Tauranga City

Drainage Plan for: 30178

Street Number 130 Street Name Union Drive

Lot ..... DP .....

Suburb Papamoa

Owner Roll + White

Type of Building New Dwelling

Drainlayer Superior Drainage Ltd, Andrew Dambaski 24935

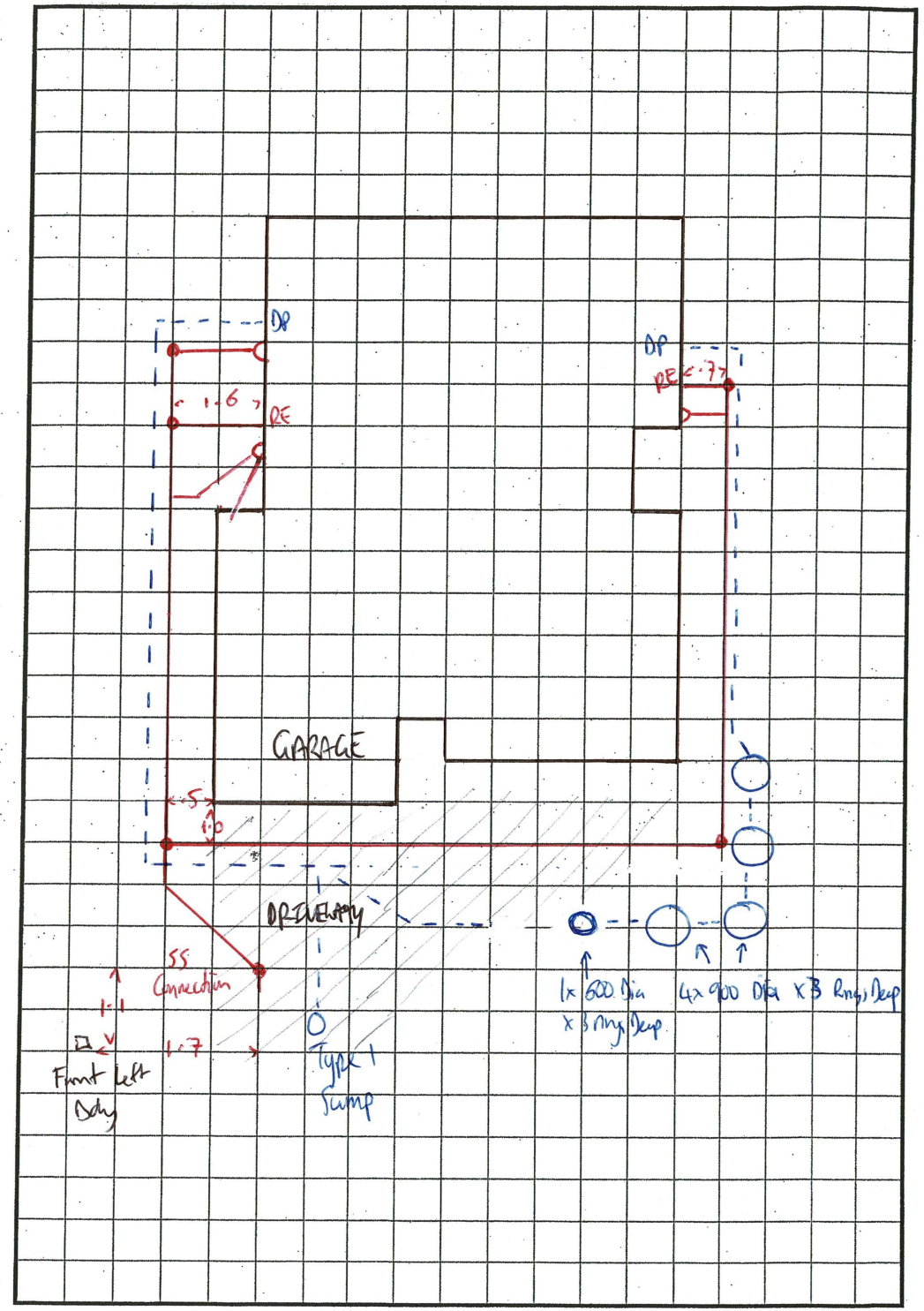
Date of Inspection ..... Inspector .....

Drainage Permit No .....

Note : Plan to be drawn in black ballpoint on graph opposite

Plan to include:

1. The correct position of the drains in relation to the building and boundaries.
2. The position of the street frontage.
3. Depth of drains at connection point.
4. Both foulwater and stormwater drains to be drawn.
5. Clearly define all inspection openings, with accurate measurements from two points.
6. Clearly define all buildings and boundaries.
7. Refer to example drain plan back page.



Planning Information

Tauranga City

TAURANGA CITY COUNCIL

CONSENT NOTICE PURSUANT TO SECTION 221 RESOURCE MANAGEMENT ACT 1991

TCC Reference: RC26512
(Stage 56)

IN THE MATTER OF DP 540448

AND

IN THE MATTER OF Subdivision Consent pursuant to Sections 104, 108AA, 220 & 221 of the Resource Management Act 1991

Pursuant to Section 221 of the Resource Management Act 1991, the Tauranga City Council hereby certifies that by way of resolutions passed under delegated authority on 24 January 2019, the following conditions were imposed on the subdivision consent for Lot 602 DP 520791, Section 24 SO 481628, and Section 27 SO 427562 (Future Lot 100):

A consent notice shall be registered on the Record of Titles for Lots as set out below advising the owners and subsequent owners of the following requirement to be complied with on a continuing basis:

For Lots 1460 - 1525:

a) *The design and construction of any building or structures requiring a Building Consent in accordance with the Building Act 2004 shall comply with the recommendations contained in the Geotechnical Completion Report prepared by S&L Consultants Ltd entitled "Golden Sands Residential Subdivision Stage 56, Union Drive, Anchor Crescent, Papamoa, Geotechnical Completion Report including Recommendations for Building" referenced 20076 S56, dated 19 November 2019 [Council Reference: TL11147].*

For Lots 1460, and 1486 – 1488):

b) *The owners of these lots are required to meet the full cost of any fencing along the common boundary between the lot and adjoining land that is intended to be vested in Tauranga City Council as local purpose and/or recreation reserve.*

For Lots 1460 – 1485):

c) *An Acoustic barrier comprising a close boarded timber fence shall be maintained on the boundary of this lot.*

d) *The acoustic integrity of the acoustic barrier shall be maintained at all times through the following:*

   i. *The barrier shall be a minimum of 2.5 metres height above finished ground level;*

ii. There shall be no gaps between the wall and the finished ground level;

iii. There shall be no gaps between any components of the acoustic barrier, with overlapping details provided at all junctions of individual components; and

iv. The components of the wall shall have a minimum surface mass of 10kg/m^2.

DATED at Tauranga this 16th day of March 2020

……

Authorised Officer
Tauranga City Council

DECISION IN RESPECT OF
SECTION 88 SUBDIVISION RESOURCE CONSENT APPLICATION RC26512
UNDER THE RESOURCE MANAGEMENT ACT 1991

Tauranga City Council resolves:

That pursuant to Sections 104 and 104B of the Resource Management Act 1991, to grant the the application made by Bluehaven Holdings Limited for resource consent to undertake the subdivision of land located within the Wairakei Residential Zone comprising the creation of freehold allotments and associated supporting infrastructure and service connections, on land located at number 6 Stevenson Drive, Papamoa and legally described as Lot 602 DP 520791 (Record of Title 843144), Section 24 SO 481628 and Section 27 SO 427562 (Future Lot 100 DP 527814 and Record of Title 860944).

Reasons for Decisions:

The proposal includes the subdivision of greenfield land together with the provision of associated infrastructure and services within the Wairakei Residential Zones under the Tauranga City Plan. The purpose of this subdivision is to facilitate urban residential land use of the Site as anticipated and provided for by the Tauranga City Plan in a continuation of the Golden Sands subdivision. The future residential land use is subject to a number of specific site development controls that are prescribed within land use resource consent RC26513.

Pursuant to section 104(7) of the RMA it has been determined that the information provided with the application and through further information provided after initial lodgement is sufficiently comprehensive and reliable for the purpose of making a determination on an informed basis.

In accordance with section 104B(a) of the RMA, having considered those relevant matters within the Tauranga City Plan, it has been determined appropriate to grant consent on the basis that the activity's adverse environmental effects are acceptable.

This determination has been made on the basis that the adverse effects of the proposed activity will be appropriately mitigated through compliance with consent conditions to an extent that they are considered to be acceptable.

Furthermore, it has been determined that granting consent is consistent with the relevant provisions of the Tauranga City Plan, the Bay of Plenty Regional Policy Statement and Part 2 of the RMA.

The granting of this resource consent is subject to the following conditions pursuant to Sections 104B(b), 108 and 220 of the RMA 1991:

1. *Subject to changes required in order to satisfy the requirements of conditions of this resource consent, the proposal shall proceed in accordance with the plans and all information submitted with the application prepared by S & L Consultants Limited, referenced 20076 – S56-RCA and dated June 2018 and as set out in Table 1:*

Table 1: Application Documentation and Plans

Reference No.	***Title***	***Author***	***Date***
20076 – S56	*Application for Subdivision & Land Use Resource Consent – Resource Consent - Section 24 SO 481628 & Section 27 SO 427562 and Lots 2 & 3 DP 517522 - Stages 56 - Golden Sands – Bluehaven Holdings Limited*	*S & L Consultants Ltd*	*06/2018*
20076 – RC56, Rev 1	*Scheme Plan – Proposed Subdivision of Section 24 SO 481628, Section 27 SO 427562, Lots 2 & 3 DP 517522 (Stage 56)*		*10/2018*
20076 – 56 – 12m, Rev 3	*Street Layout Plan –Stage 56 – Street Layout 12.4 metre Corridor*		*11/2018*
20076 – AW4, Revision 2	*Acoustic Wall Design – Papamoa South Block – Cross Sections 1 – 5*		*04/2018*
20076-AW29a, Revision 2	*Acoustic Wall Design Papamoa South Block – Cross Sections 9a & 10*		*41/2018*
20076 – 56DE, Revision 0	*Stage 56 Draft Lot Levels*		*06/2018*
20076 – S56	*Golden Sands - Residential Subdivision – Stage 56 - Wairakei Urban Growth Area – Geotechnical Assessment Report*		*01/06/2018*
Gwilym Environmental Services Ltd - 438.16	*Investigation of Soil Quality, Golden Sands – Papamoa South*	*Gwilym Environmental Services Ltd*	*22/08/2016*
-	*Bluehaven Holdings Ltd, Subdivision Development, Papamoa – Noise Control Treatment to Two-Storey Dwellings*	*Design Acoustics Ltd*	*31/05/2018*
17208	*Bluehaven Holdings Limited, Papamoa – Assessment of Noise Effects*	*Hegley Acoustic Consultants*	*20/03/2018*

2. *All costs associated with the complying with conditions of this consent, including those under the Tauranga City Council Infrastructure Development Code ('the **IDC**') and associated legal expenses, shall be met by the Consent Holder.*

3. *Any survey plans submitted to Council for approval pursuant to section 223 of the Resource Management Act 1991 must conform with the conditions of this consent including the subdivision scheme plan (reference 20076 – RC56, Rev 1) set out in Table 1 of Condition 1 and attached to this consent. Any survey plan submitted in accordance with this condition must be done so within 5 years of the commencement of this consent.*

4. *The Consent Holder may, for the purpose of giving effect to this consent in stages, submit separate survey plans to Council for approval pursuant to section 223 of the RMA. Prior to the deposit of any separate survey plan submitted in accordance with this condition the Consent Holder must demonstrate compliance with the conditions of this consent that are applicable to the allotments shown on that particular survey plan and to the satisfaction of Council.*

Development Plan/ Works Approval (DWA):

5. *Prior to the commencement of any construction/ earthworks activities, the Consent Holder shall submit full and complete engineering plans to Tauranga City Council's Team Leader:*

Land Development Engineering (or their delegate) for approval. The plans shall include the following:

(a) The information and plans required by the IDC[1];

(b) Identification of all flood risk areas;

(c) Details of the design and construction of Roads to be vested in Council that demonstrate compliance with the Street Layout Plan (reference 20076 – 56 – 12m, Rev 3) (see Condition 1) including vehicle tracking curves, proposed traffic management measures, details of on-street car parking, sub soil drains, street lighting and any transformers within the road reserve;

(d) Details of the design and construction of Private Vehicle Access Lots / Right of Ways (Lots 500, 501, 502 and 503) to remain in private ownership that demonstrates compliance with the plans referenced under Condition 1 of this consent;

(e) A landscape planting plan that:

(i) Shows the location of street trees, shrubs and other plants within the road zone;

(ii) Identifies species and grade of trees/plants at the time of planting; and

(iii) Includes any replacement planting required as a result of proposed construction works;

(iv) Street trees may be provided at a rate lower than one tree per lot with road frontage prescribed by DS-2.8 of the Tauranga City Council Infrastructure Development Code.

(f) Details of the erosion and sediment control measures to be implemented during earthworks;

(g) Details of the firefighting system and the location of new fire hydrants to confirm compliance with the IDC;

(h) Details of the location, layout and design of proposed sewer, stormwater (to comply with Rule 12B.3.1.13 of the Tauranga City Plan) and water main reticulation and allotment connections, and the location of any easements in gross required for vested infrastructure within private property (including proposed access lots/ shared access ways);

(i) In relation to the proposed water supply, all water supply infrastructure within private property shall not be vested in Council. Those assets shall remain in private ownership, with this clearly identified on the DWA plans.

(ii) In relation to the proposed water supply within private access lots, the design of these shall include ducted risers for each allotment. This detail shall be clearly identified on the DWA plans.

(i) Details of the overland flow path and areas of ponding in extreme rainfall events;

(j) Details of the construction of proposed Local Purpose (Stormwater) Reserve (Lot 504);

(k) Details of the work to be undertaken to establish a building platform on each proposed allotment that provides a platform level that is a minimum of 500 millimetres above the flood level for a 1 in 100 year (1% AEP) 48 hour rainfall event[2]. The details provided shall include any retaining structures to be constructed within those allotments. There are to be no retaining structures located within land to vest in Council or the existing Te Okuroa Drive Road Zone;

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[1] Refer to section QA-3 Development Works Approval of the Tauranga City Infrastructure Development Code.

[2] The building platform level confirmed under this condition shall be no less than RL5.1 metres (relative to Moturiki Datum) in accordance with Rule 12B.3.12(g) of the Tauranga City Plan.

(l) *Confirm the minimum volume of stormwater mitigation required to satisfy the Papamoa Comprehensive Stormwater Consent (reference 63636) issued by the Bay of Plenty Regional Council and any approved change to the conditions of that consent;*

(m) *Any infrastructure constructed to vest in Council, **and** located within a Council reserve (existing or proposed) shall not be located within an easement facility proposed to convey electricity[3];*

(n) *Acoustic Wall mitigation in general accordance with the Acoustic Wall Design plans and Acoustic Assessments referenced in condition 1, including:*

(i) *Along the full length of the common boundary with State Highway 2 (Tauranga Eastern Link Toll Road, Section 1 SO 427562) and ;*

(ii) *Perpendicular to State Highway 2 at the eastern end of the subdivision on the eastern boundary of Lot 504;*

(iii) *With the sole exception of the 500 millimetre gap at the Local Purpose Stormwater Reserve (Lot 504), there shall be no gaps between the acoustic barrier and the finished ground level;*

(iv) *The barrier shall be a minimum of 2.5 metres height above finished ground level;*

(v) *There shall be no gaps between any components of the acoustic barrier, with overlapping details provided at all junctions of individual components; and*

(vi) *The components of the wall shall have a minimum surface mass of 10kg/m2.*

6. *The Consent Holder shall complete all Development Works in accordance with the details and plans approved under Condition 5 of this Consent.*

***Servicing/ Engineering Certifications**:*

7. *All works relating to the servicing and accessing of the subdivision and the creation of building platforms, including but not limited to, the construction of Roads to vest, Stormwater Reserves and all shared access ways, shall be undertaken in accordance with the plans referenced under Condition 1 of this consent, or as otherwise approved under Condition 5 of this consent, so as to comply with conditions of this consent.*

8. *The Consent Holder shall provide certification from a Suitably Qualified and Experienced Professional[4] that infrastructure to be vested in Council have been constructed in accordance with the plans approved under Condition 5 of this consent.*

9. *Prior to the lodgement of an application for certification under section 224(c) of the RMA, unless otherwise agreed to by way of completed and signed bond documentation, all Development Works approved under Condition 5 shall be completed and certified by Tauranga City Council's Team Leader: Land Development Engineering (or their delegate) in accordance with the IDC[5].*

10. *Copies of the certification(s) and/or bond documentation under Condition 9 shall be provided with any application for certification under section 224(c) of the RMA.*

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[3] The purpose of this condition is to prevent the co-location of TCC and Powerco assets within the same easement area due to the conflicting operational requirements this creates.

[4] For the purpose of this condition, 'Suitable Qualified and Experienced Professional' shall have the same definition as 'SQE Professional' contained within section GEN-4.1 – *General* of the Tauranga City Infrastructure Development Code.

[5] Refer to section QA-5 Final Sign Off (s224c) Application Requirements of the Tauranga City Infrastructure Development Code

11. *All residential lots shall be provided with a separate underground connections to the sanitary sewer, water and electricity reticulation systems. These systems are to be operational. Stormwater can be disposed of by ground soakage where this complies with the design criteria specified in the Geotechnical Completion Report ('GCR') submitted in accordance with Condition 16 of this consent.*

12. *The Consent Holder shall provide certification from a Suitably Qualified and Experienced Professional[6] that any stormwater mitigation volume works required to satisfy the requirements of Condition 5(l) of this consent have been fully completed.*

13. *The Consent Holder shall supply to the Council a set of 'as built' plans of all engineering and landscaping works in accordance with QA-6 'As-Built Information' of the Tauranga City Council Infrastructure Development Code.*

14. *All earthworks design, testing and construction, including erosion and sediment control measures, shall be undertaken in accordance with the Geotechnical Assessment Report (20076 – S56, dated 1 June 2018) referenced under Condition 1 of this consent, the Tauranga City Council Infrastructure Development Code, the details as approved under Condition 5 of this consent and the requirements of the Consent Holder's appointed Geo-Professional[7].*

15. *A Licensed Cadastral Surveyor shall certify, in writing, that all finished building platforms are constructed to the required minimum level as approved under Condition 5(k) of this consent and that all retaining structures constructed in accordance with Condition 5 of this consent are contained within the legal boundaries of these allotments.*

    This certification shall be appended to the Geotechnical Completion Report required by Condition 16 of this consent.

16. *The Consent Holder shall provide to the Council a 'Geotechnical Completion Report' compiled by a Category 1 Geotechnical Professional. The report shall:*

    (a) Comply with requirements of the Tauranga City Council IDC[8];

    (b) Display the position of all designated building platforms and building restriction lines where applicable;

    (c) Provide recommendations for the on-site disposal of stormwater including minimum separation distances from boundaries and structures;

    (d) Provide recommendations for the ongoing development of the lots including those lots located near engineered fill along the site's western boundary;

    (e) Confirm earthworks and/or building platforms, including all retaining structures and engineered fill have been constructed to comply with the New Zealand Building Code requirements and the requirements of Condition 5 of this consent;

    (f) Provide an analysis of the liquefaction risk and any specific foundation requirements that may be required; and

    (g) Comment on removal or amendment of existing land feature/s displayed on Council's GIS.

---

[6] For the purpose of this condition, 'Suitable Qualified and Experienced Professional' shall have the same definition as 'SQE Professional' contained within section GEN-4.1 – *General* of the Tauranga City Infrastructure Development Code.

[7] For the avoidance of doubt 'Geo-Professional' shall have the same meaning as set out in Council's Infrastructure Development Code.

[8] For the purpose of this condition, to comply with the IDC shall mean to include the information set out in QA-5.4.2 - *Geotechnical Completion Report* of the Tauranga City Infrastructure Development Code.

17. *Certification pursuant to section 224(c) of the RMA shall not be sought or issued until such time as connections to the transportation, sanitary sewer, water and electricity reticulation systems are made via completed and vested section(s) of Te Okuroa Drive.*

Amalgamations:

18. *The following amalgamation conditions shall be recorded on the survey plan submitted in accordance with Conditions 3 and 4 of this consent (see LINZ Request 1530050):*

    (a) That Lot 500 hereon (Legal access) be held as to five undivided one fifth shares by the owners of Lots 28, 29, 30, 31 and 32 hereon and individual certificates of title be issued in accordance therewith.

    (b) That Lot 501 hereon (Legal access) be held as to three undivided one third shares by the owners of Lots 34, 35 & 36 hereon and individual certificates of title be issued in accordance therewith.

    (c) That Lot 502 hereon (Legal access) be held as to two undivided one half shares by the owners of Lots 45 & 46 hereon and individual certificates of title be issued in accordance therewith.

    (d) That Lot 503 hereon (Legal access) be held as to fourteen undivided one fourteenth shares by the owners of Lots 49 to 62 (inclusive) hereon and individual certificates of title be issued in accordance therewith.

Easements, Vesting and Notations on Survey Plan(s):

19. *All easements required for underground services and rights of way serving lots within the subdivision shall be duly granted or reserved.*

20. *The Consent Holder shall register an easement in gross in favour of Tauranga City Council over any stormwater overland flow path located on private property, including those resulting from overload of the roading primary stormwater system under extreme rainfall conditions.*

    Any overland flow path easement shall be shown on the survey plan submitted in accordance with Conditions 3 & 4 of this consent and shall be recorded as the "Right to Drain Water" and be registered on the survey plan under a "Memorandum of Easements in Gross".

21. *The Consent Holder shall register an easement in gross in favour of Tauranga City Council over any infrastructure (water, sewer, stormwater) to be vested in Council and located on any land (other than 'road to vest' in Council).*

    All easements required under this condition shall be shown on a memorandum for their intended purpose (right to convey water, right to drain sewage, right to drain water) and attached to the survey plan submitted in accordance with Conditions 3 & 4 of this consent and section 223 of the RMA.

22. *The Consent Holder shall show on the applicable survey plan submitted in accordance with Conditions 3 and 4 of this consent and section 223 of the RMA:*

    (a) Lot 505 as 'Road to vest in Tauranga City Council';

    (b) Lot 504 as 'Local Purpose (Stormwater) Reserve to vest in Tauranga City Council'.

23. *All building restriction lines shall be clearly identified and dimensioned on the survey plan submitted in accordance with Conditions 3 and 4 of this consent and section 223 of the RMA.*

24. *The Consent Holder shall, prior to any application submitted under section 223 of the RMA for the subdivision or any stage of the subdivision, submit to Council (Attention: Team Leader – Revenue three (3) alternative street names for Roads to be vested in Council* ***and*** *any private accessway that serves six or more allotments.*

    Street names must be provided in accordance with Tauranga City Council's 'Naming of Streets, Reserves and Community Facilities Policy' and include all information required under this policy including evidence of the significance of the proposed names [see Advice Note 5].

Consent Notices:

25. *Upon receipt of the surveyor certification required by Condition 15 and the Geotechnical Completion Report required by Condition 16 of this consent, the Council will review the information provided and ensure that any requirements relating to the design and construction of any future building or structure, or future works on and/or development of any allotment within the subdivision, including prescribing minimum finished floor levels, to be complied with on a continuing basis is set out within a Consent Notice issued pursuant to section 221 of the RMA.*

26. *Pursuant to section 221 of the RMA, a Consent Notice shall be imposed on those allotments that share a boundary with any local purpose reserve advising the owners and subsequent owners thereof, of the following condition to be complied with on a continuing basis:*

    (a) The owners are required to meet the full cost of any fencing along the common boundary between the lot and adjoining land that is intended to be vested in Tauranga City Council as local purpose and/or recreation reserve.

27. *Pursuant to section 221 of the RMA, a Consent Notice shall be registered on the Certificate of Title of any residential allotment that shares a common boundary with State Highway 2 (Tauranga Eastern Link Toll Road, Section 1 SO 427562). The consent notice shall advise the owners and subsequent owners of the following requirements on an ongoing basis:*

    (a) An acoustic barrier comprising a close boarded timber fence shall be maintained on the boundary of this lot.

    (b) The acoustic integrity of the acoustic barrier shall be maintained at all times through the following:

        (i) The barrier shall be a minimum of 2.5 metres height above finished ground level;

        (ii) There shall be no gaps between the wall and the finished ground level;

        (iii) There shall be no gaps between any components of the acoustic barrier, with overlapping details provided at all junctions of individual components; and

        (iv) The components of the wall shall have a minimum surface mass of 10kg/m^2.

Landscape Maintenance Agreement:

28. *The Consent Holder shall enter into a 12-month landscaping maintenance agreement with Council in respect of all planting carried out in accordance with this consent and within land to vest in Tauranga City Council, unless otherwise agreed in writing by the Chief Executive Officer (or their delegate).*

NZTA Reverse Sensitivity Acoustic Barrier:

29. *Prior to certification pursuant to section 224(c) of the RMA, the Consent Holder shall construct an acoustic barrier for the entire stage(s) as detailed within the plans approved under Condition 5 of this Consent.*

30. *Upon application for certification pursuant to Section 223 of the RMA, the Consent Holder shall confirm in writing to Council which property boundaries require an acoustic wall consent notice to be registered on its title.*

Earthworks

31. *Any earthworks carried out on an allotment where those earthworks will expose more than 100m² of area shall use a combination of erosion and sediment control measures that are consistent with* ***Appendix 4N: Erosion and Sediment Control Measures*** *of the Tauranga City Plan.*

Delegated Authorisation by:

Shanan Miles
Manager: Environmental Planning

Date: 24 January 2019

Advice Notes:

1. *Under section 357 of the Resource Management Act 1991you have a right of objection to the authorised agency in respect of any additional fees and charges required in respect of this decision. In accordance with section 357C of the RMA, notice of any such objection must be in writing to the Council within 15 working days of receiving this decision and/or the date on which the invoice is received. Any notice given under section 357 should describe the reasons for the objection.*

2. *Should the actual processing cost exceed the deposit fee paid at lodgement, if not already accompanying this decision, an invoice may be sent at a later date.*

3. *All archaeological sites whether recorded or unrecorded under Subpart 2 of the Heritage New Zealand Pouhere Taonga Act 2014 cannot be destroyed, damaged or modified without the consent of Heritage New Zealand. In the event that an archaeological site(s) and/or koiwi are unearthed, the Consent Holder is advised to immediately stop work on the part of the site that the archaeological site(s) is located, and contact Heritage New Zealand for advice. Contact Details: email - infolowernorthern@heritage.org.nz; phone - 07 577 4530*

4. *The Consent Holder shall obtain all other necessary consents and permits, including those under the Building Act 2004, and the Heritage New Zealand Pouhere Taonga Act 2014. This consent does not remove the need to comply with all other applicable Acts (including the Property Law Act 2007), regulations, relevant Bylaws, and rules of law. This consent does not constitute building consent approval. Please check whether a building consent is required under the Building Act 2004.*

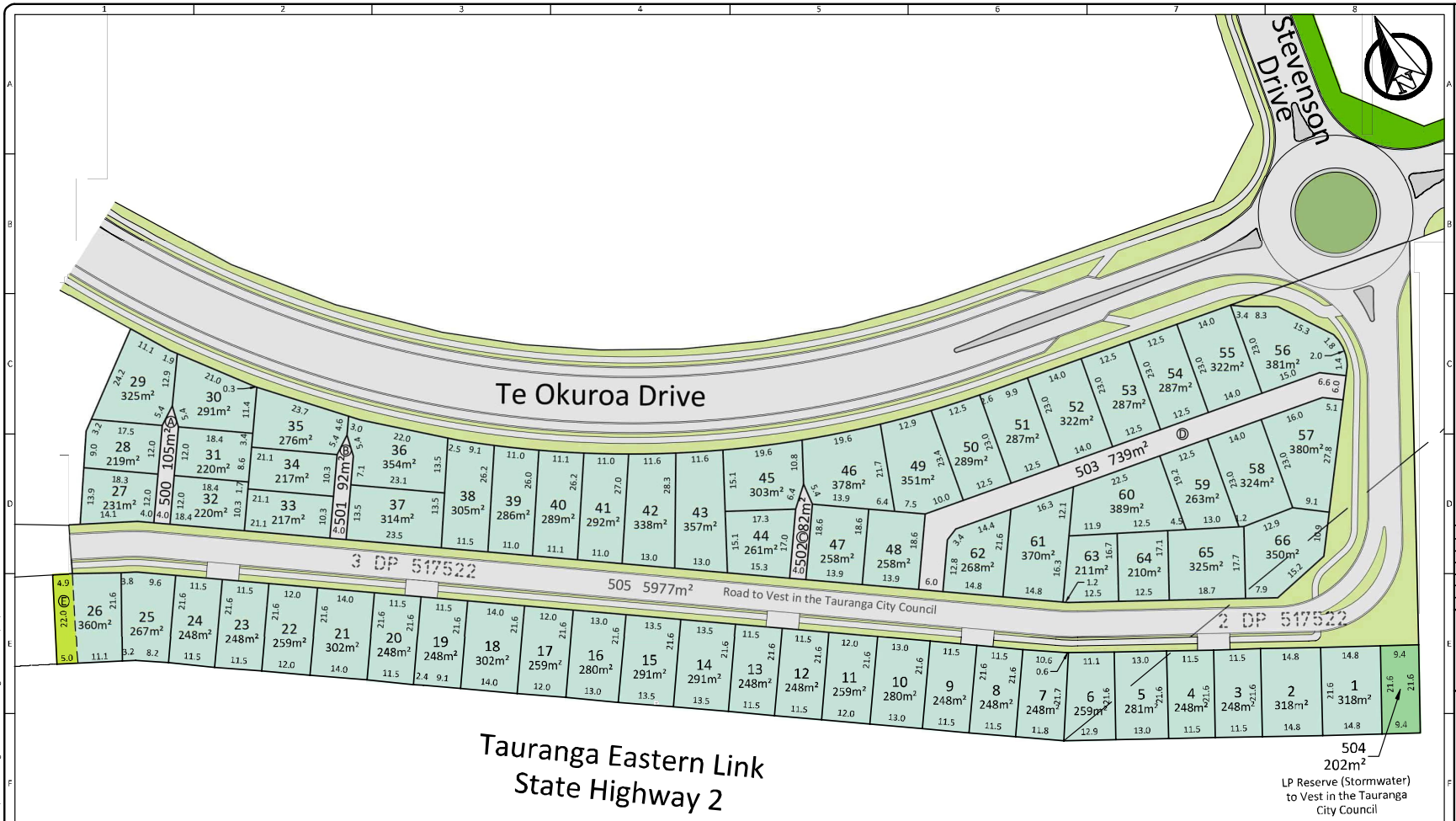
5. *The Consent Holder is advised of the requirements in relation to the naming of access ways where six (6) or more allotments will be served by the accessway in accordance with Council's Policy and NZS4819:11. For more information regarding this please refer to http://www.linz.govt.nz/kb/704 and Council's website www.tauranga.govt.nz*

7. *For all new connections to council's infrastructure, a services connection approval is required. Applications can be found via Council's website and be can be submitted to sca@tauranga.govt.nz*

8. *The applicant has indicated through this application that they intend to operate their own 'approval' process in respect to activities and building carried out on allotments within this development (Stages 49 to 56). Further information on this 'approval' process can be obtained by contacting the Consent Holder (Bluehaven Holdings Limited) directly.*

9. *Development contributions under LGA 2002 –*

   Requirement for development contribution: Pursuant to section 198(1)(a) of the Local Government Act 2002, Council requires that a development contribution provided for and in accordance with Council's Development Contributions Policy (which is subject to change), be made (paid) by the Consent Holder to Council.



Amalgamation Conditions

That Lot 500 hereon (Legal access) be held as to five undivided one fifth shares by the owners of Lots 28, 29, 30, 31 and 32 hereon and individual certificates of title be issued in accordance therewith.

That Lot 501 hereon (Legal access) be held as to three undivided one third shares by the owners of Lots 34, 35 & 36 hereon and individual certificates of title be issued in accordance therewith.

That Lot 502 hereon (Legal access) be held as to two undivided one half shares by the owners of Lots 45 & 46 hereon and individual certificates of title be issued in accordance therewith.

That Lot 503 hereon (Legal access) be held as to fourteen undivided one fourteenth shares by the owners of Lots 49 - 62 hereon and individual certificates of title be issued in accordance therewith.

Proposed Easements

Purpose	Shown	Serv. Ten.	Dom. Ten.
Right to Convey Water, Electricity, Gas, Telecommunications and Computer Media	A	Lot 500 hereon	Lots 28 - 32 hereon
	B	Lot 501 hereon	Lots 34, 35 & 36 hereon
	C	Lot 502 hereon	Lots 45 & 46 hereon
	D	Lot 503 hereon	Lots 49 - 62 hereon

Proposed Easements in Gross

Purpose	Shown	Serv. Ten.	Grantee
Right to Convey Electricity	E	Lot 26 hereon	PowerCo

Tauranga City Council
RC26512
APPROVED
Resource Consent
PLAN
24 January 2019

Areas and dimensions are approximate only and subject to survey.

This plan has been prepared for the purposes of Section 88 of the Resource Management Act 1991 and should not be relied on for any other purpose.

CAD BY	REV No.	DESCRIPTION	DATE
	1	RC Application	10/18

	NAME	DATE	SIGNED
Surveyed			
Designed			
Drawn	NP	10/18	
Checked	GC	10/18	
Approved	GC	10/18	

References

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

Title
Proposed Subdivision of Section 24 SO 481628, Section 27 SO 427562, Lots 2 & 3 DP 517522 (Stage 56)

Comprised in
CT 730806 & 808690
Total Area: 4.9471ha

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Original Scales @ A3	Date
1:1000	10/18
Do Not Scale Dimensions	
Drawing No	Revision
20076 - RC56	1

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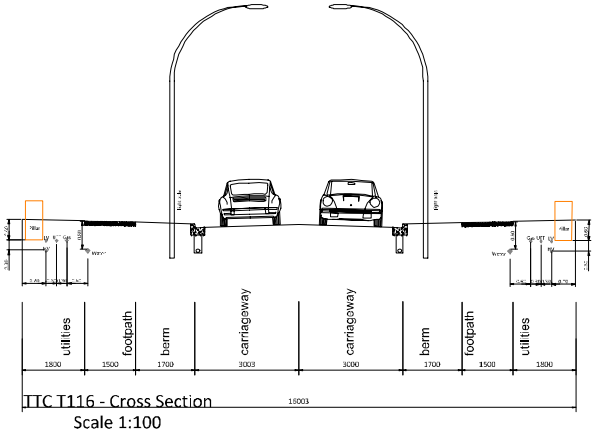
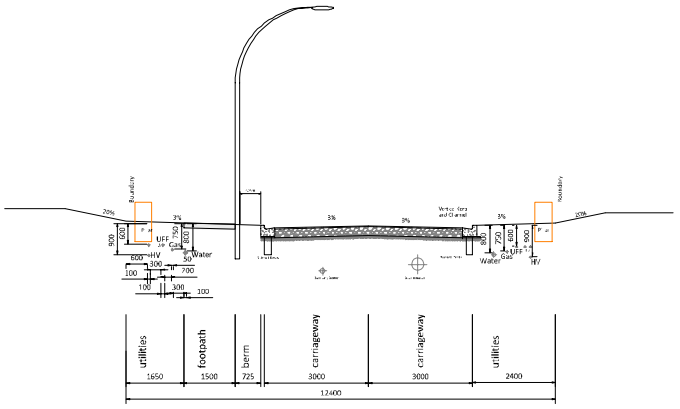


TTC T116 - Cross Section
Scale 1:100



Typical Cross Section

Tauranga City Council
RC26512
APPROVED
Resource Consent
PLAN
24 January 2019

Rev. No.	Description	DATE
DCE 3	Road width increased	11/18
DCE 2	Road width increased	11/18

checked. by.

	NAME	DATE	SIGNED
Surveyed			
Designed	DE	08/18	
Drawn	NW	08/18	
Checked			
Approved			

REFERENCES

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

Title

Stage 56 - Street Layout 12.4m Corridor

Golden Sands

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Original Scales @ A2: 1:1500
Date: 08/18
Do Not Scale Dimensions
Drawing No: 20076 - 56 - 12m
Revision: 3

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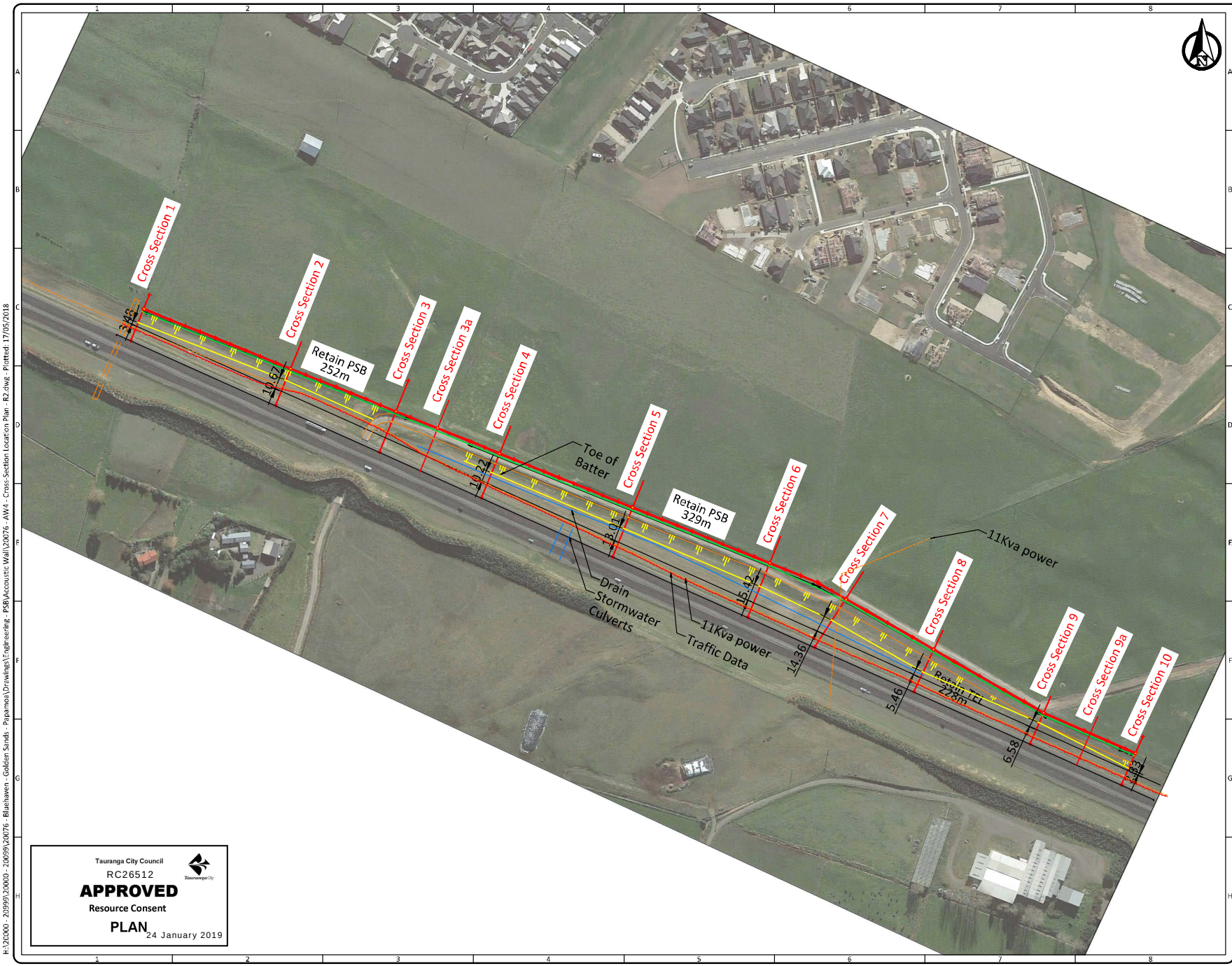

Note:
Read in conjunction with "Assessment of Noise Effects" report no 17208 by Nevil Hegley.

See 20076 - AW2 & AW3 for Longsections

CKD BY	REV. No.	DESCRIPTION	DATE
	2	Section 9a add	4/18
	1	Cattle track	2/18

	NAME	DATE	SIGNED
Surveyed			
Designed			
Drawn			
Checked			
Approved			

References

S & L CONSULTANTS LTD
SURVEYORS - ENGINEERS - PLANNERS
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P.O. Box 231 Ph.(07)577-6069
Fax(07)577-6065
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Web Site: www.sltga.co.nz

Title

Acoustic Wall Design
Papamoa South Block
Cross Sections 1-5

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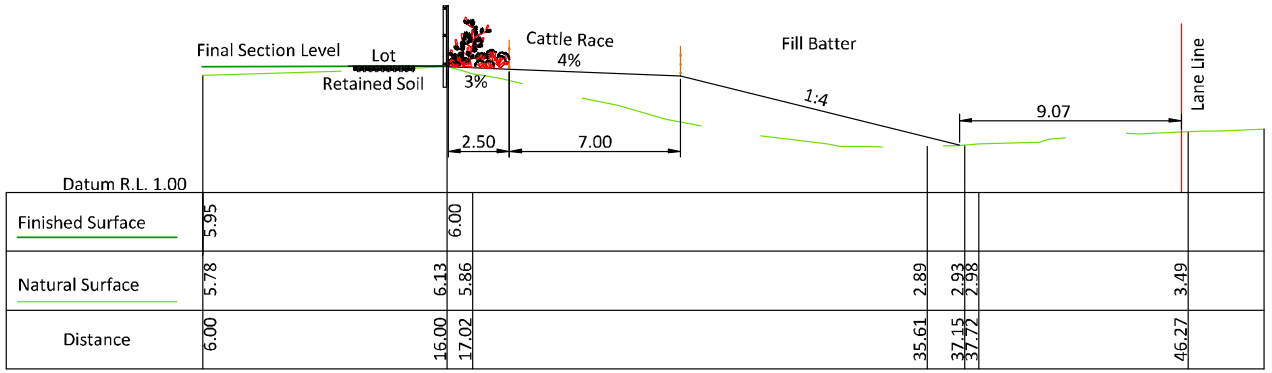
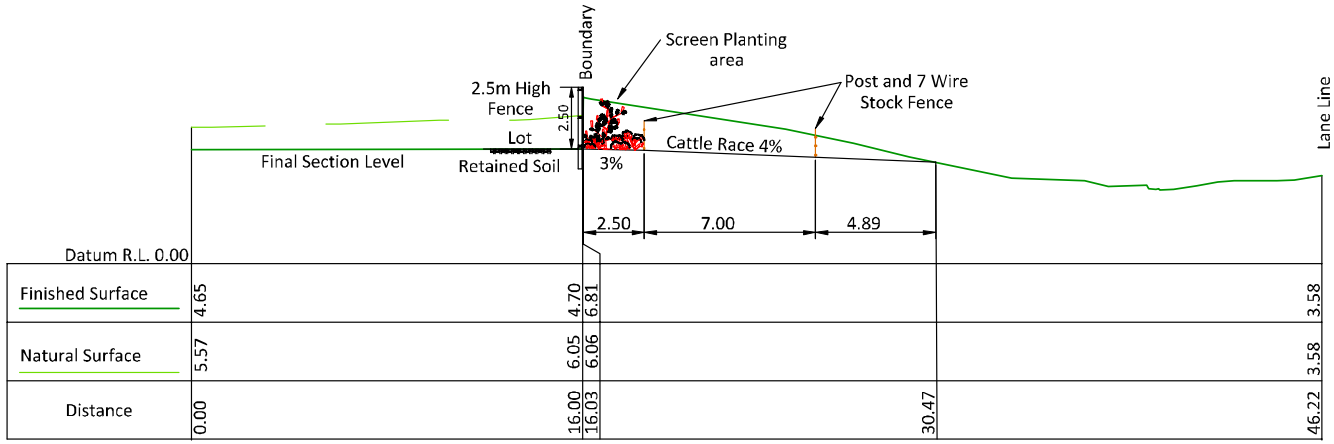
Original Scales @ A3	Date
1:3000	11/17
Do Not Scale Dimensions	
Drawing No	Revision
20076 - AW4	2

Tauranga City Council
RC26512
APPROVED
Resource Consent
PLAN
24 January 2019

H:\20000 - 20999\20000 - 20099\20076 - Bluehaven - Golden Sands - Papamoa\Drawings\Engineering - PSB\Accoustic Wall\20076 - AW4 - Cross-Section Location Plan - R2.dwg - Plotted: 17/05/2018



Cross Section 9a



Cross Section 10

Tauranga City Council
RC26512
APPROVED
Resource Consent
PLAN
24 January 2019

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GOLDEN SANDS
PAPAMOA BEACH

Acoustic Wall Design Papamoa South Block
Cross Sections 9a & 10

Note:
Read in conjunction with "Assessment of Noise Effects" report no 17208 by Nevil Hegley.

CKD BY	REV No.	DESCRIPTION	DATE

	NAME	DATE	SIGNED
Surveyed	BTW	09/17	
Designed	DE	04/18	
Drawn	DE	01/18	
Checked			
Approved			

References

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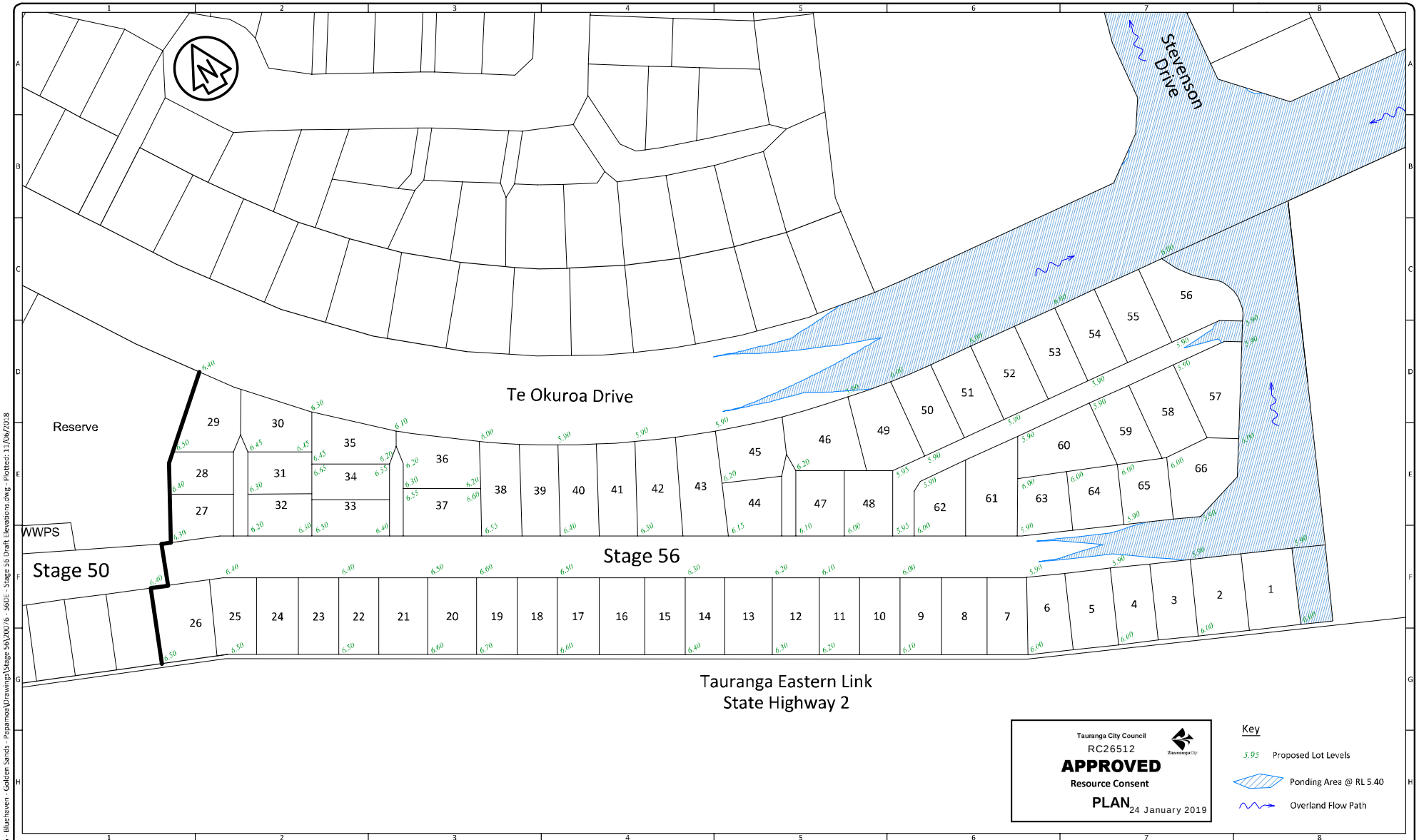
Original Scales @ A3: 1:200 H&V
Do Not Scale Dimensions
Date: 04/18
Drawing No: 20076-AW29a
Revision: 2

H:\20000 - 20999\20000 - 20099\20076 - Bluehaven - Golden Sands - Papamoa\Drawings\Engineering - PSB\Acoustic Wall\20076 - AW2 - AW3 - 2017-05-12 - Retaining Wall Design - Cross Sections 9a - R2.dwg - Plotted: 22/05/2018



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Web Site: www.sltga.co.nz

GOLDEN SANDS
PAPAMOA BEACH

Stage 56 Draft Lot Levels

REV No.	DESCRIPTION	DATE
1	First Issue	06/18

CKD BY	NAME	DATE	SIGNED
Surveyed			
Designed			
Drawn	TM	06/18	
Checked			
Approved			

References

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Original Scales @ A3: 1:1000
Do Not Scale Dimensions
Date: 06/18
Drawing No: 20076 - 56DE
Revision: 0

DECISION IN RESPECT OF
SECTION 88 LAND USE RESOURCE CONSENT APPLICATION RC26513
UNDER THE RESOURCE MANAGEMENT ACT 1991

Tauranga City Council resolves:

That pursuant to Sections 104 and 104B of the Resource Management Act 1991, to grant the the application made by Bluehaven Holdings Limited for resource consent to establish independent residential dwelling units on land located within the Wairakei Residential Zone associated with subdivision resource consent RC25312, on land located at number 6 Stevenson Drive, Papamoa and legally described as Lot 602 DP 520791 (Record of Title 843144), Section 24 SO 481628 and Section 27 SO 427562 (Future Lot 100 DP 527814 and Record of Title 860944).

Reasons for Decisions:

The proposal includes the establishment of residential land use activities in the form of independent dwelling units on residential allotments created under subdivision consent number RC25312. The consent includes a set of specific site development controls for Stage 56 of the Golden Sands Subdivision.

Pursuant to section 104(7) of the RMA it has been determined that the information provided with the application and through further information provided after initial lodgement is sufficiently comprehensive and reliable for the purpose of making a determination on an informed basis.

In accordance with section 104B(a) of the RMA, having considered those relevant matters within the Tauranga City Plan, it has been determined appropriate to grant consent on the basis that the activity's adverse environmental effects are acceptable.

This determination has been made on the basis that the adverse effects of the proposed activity will be appropriately mitigated through compliance with consent conditions to an extent that they are considered to be acceptable.

Furthermore, it has been determined that granting consent is consistent with the relevant provisions of the Tauranga City Plan, the Bay of Plenty Regional Policy Statement and Part 2 of the RMA.

The granting of this resource consent is subject to the following conditions pursuant to Sections 104B(b) and 108 of the RMA 1991:

1. *Subject to changes required in order to satisfy the requirements of conditions of this resource consent, the proposal shall proceed in accordance with the plans and all information submitted with the application prepared by S & L Consultants Limited, referenced 20076 – S56-RCA and dated June 2018 and as set out in Table 1:*

Table 1: Application Documentation and Plans

Reference No.	***Title***	***Author***	***Date***
20076 – S56	*Application for Subdivision & Land Use Resource Consent – Resource Consent - Section 24 SO 481628 & Section 27 SO 427562 and Lots 2 & 3 DP 517522 - Stages 56 - Golden Sands – Bluehaven Holdings Limited*	*S & L Consultants Ltd*	*06/2018*
20076 – RC56, Rev 1	*Scheme Plan – Proposed Subdivision of Section 24 SO 481628, Section 27 SO 427562, Lots 2 & 3 DP 517522 (Stage 56)*		*10/2018*
Gwilym Environmental Services Ltd - 438.16	*Investigation of Soil Quality, Golden Sands – Papamoa South*	*Gwilym Environmental Services Ltd*	*22/08/2016*

2. *All costs associated with the complying with conditions of this consent, including those under the Tauranga City Council Infrastructure Development Code ('the **IDC**') and associated legal expenses, shall be met by the Consent Holder.*

Building Height

3. *All buildings shall have a maximum building height of 9.5 metres above approved subdivision ground level.*

Site Coverage

4. *The maximum site coverage for Lots within Stage 56 (Scheme Plan reference 20076 – S56, Revision 1) shall be:*

   (a) 55 percent of the nett site area of the allotment where it is equal to or greater than 325m^2;

   (b) 65 percent of the nett site area of the allotment where it is less than 325m^2.

   [For the avoidance of doubt, 'site coverage' and 'nett site area' shall have the same meaning as set out in Chapter 3 (Definitions) of the Tauranga City Plan as at the date of approval of this Consent]

Streetscape

5. *Subject to the specific exemptions provided in Conditions 5(a) and 5(b), all buildings on a site with a frontage/s to a legal road shall be setback 3.0 metres from the road boundary/s of the site:*

   (a) Eaves and gutters of any building may intrude into this setback by up to 0.6 metres; and

   (b) For Lots 57 and 66 the setback shall be 1.5 metres from the legal boundary, except for eaves and gutters that may be 0.9 metres from the legal boundary.

Side and Rear Yard Setbacks

6. *Subject to the specific exemptions and requirements provided in Conditions 6(a) to 6(d) (inclusive), all buildings and structures shall be setback a minimum of 1.0 metre from side or rear boundaries:*

(a) *Building eaves and gutters can intrude up to 0.5 metres into the 1.0 metre side and rear yard setbacks;*

(b) *The 1.0 metre setback rule shall not apply where there is an existing common wall on the boundary between two independent dwelling units on adjoining sites or where a common wall on the boundary is proposed; (Zero Lot Boundary);*

(c) *Where a Zero Lot Boundary applies and is utilised, the side yard setback on the opposite side boundary shall be a minimum of 1.5 metres, except that eaves and gutters may be located up to 0.9 metres from the legal boundary.*

[Note: For clarity this clause shall not apply to Rear Yards]

(d) *Notwithstanding clauses '(b)' and '(c)' above any part of a building or structure can be positioned closer to any side or rear boundary (but not more than two boundaries in total) only where the written approval of the property owners and occupiers whose properties adjoin the proposed setback encroachment has been obtained and is shown on all relevant building plans that show the encroachment prior to the building works occurring.*

[For clarity, and in respect to this condition any setback between a building and allotment boundary does not remove any obligations under the Building Code. Certification from a licenced cadastral surveyor may be requested as part of construction works to confirm setbacks.]

Setbacks (Traffic Management)

7. *For those allotments with frontage to a public road, all garages or carports designed with direct vehicle access onto a public road shall be setback at least 4.5 metres from the road boundary.*

Outdoor Living Areas

8. *Every independent dwelling unit shall be provided with an outdoor living area that complies with either **one** of the following requirements:*

   (a) *A minimum continuous area of at least 20m^2 and has a 3.0 metre diameter circle as a minimum shape factor and is located on the northern, north-eastern or north-western aspect of any allotment; or*

   (b) *A minimum continuous area of at least 50m^2 that has a minimum dimension of 3.0 metres x 4.0 metres; or*

   (c) *If located above ground level be a balcony of at least 6.0m^2 having a minimum dimension of 1.5 metres.*

9. *Any nominated outdoor living area shall be unobstructed by buildings, parking spaces or vehicle access and manoeuvring areas and future boundary lines.*

10. *Be unenclosed except for cover by a roof, shade sail or other cover to provide sun protection and/or eaves (including guttering).*

Open Space Setbacks and Boundary Treatment

11. *Where the site adjoins an Open Space Area all buildings shall be setback at least 1.0 metre from the legal boundary.*

12. *With the exception of Local Purpose (Stormwater) Reserve Lot 504, fencing along boundaries adjoining Local Purpose Reserves to Vest (or Vested) in Tauranga City Council shall be either:*

    (a) No greater than 1.2 metres in height: or

    (b) No greater than 1.8 metres in height provided the part of the fence between 1.2 metres and 1.8 metres in height is a minimum of 75 per cent visually permeable.

Vehicle Access

13. *Where vehicle access is provided in the form of an easement and/or ownership over a privately owned vehicle access lot, vehicle access to the road network shall only be from the privately owned vehicle access lot adjoining the allotment. For all other allotments, access shall be directly to the road network.*

14. *There shall be no vehicle access and/or egress between a residential allotment and Te Okuroa Drive.*

Overshadowing

15. *For all allotments, no Overshadowing Envelope shall apply.*

Fencing

16. *Fencing on any allotment and located within 3.0 metres of any road boundary or boundary adjoining a private access lot shall not exceed a maximum height of 1.2 metres.*

17. *Notwithstanding Condition 16, fencing adjoining a private access lot shall not obstruct vehicle access and manoeuvring to/from/within residential allotments.*

18. *Fencing on all other boundaries not covered by Conditions 16 and 17 shall be a maximum height of 1.8 metres.*

19. *Conditions 16 to 18 (inclusive) do not apply to any acoustic fencing required under subdivision resource consent RC25312.*

Transportation

20. *Every independent dwelling unit shall be provided with a minimum of two (2) on-site car parking spaces that meet the following requirements prior to occupation:*

    (a) Each space shall have minimum dimensions of 2.5 metres wide by 5.4 metres long;

    (b) No parking spaces shall be located within the setback required by Condition 5; except as provided for under Condition 20(c) below;

    (c) For Lots with a net site area of 400m^2 or less, with the exception of the Streetscape Setback as it relates to Te Okuroa Drive, a single on-site car parking space required under this condition may be located either wholly or partially within the setback under Condition 5.

    [For the purpose of clarity, there shall be no car parking spaces provided within the 3.0 metre Streetscape Setback from Te Okuroa Drive]

Building Platforms

21. *All buildings shall have the following minimum building platform level:*

    (a) RL 4.8 metres Moturiki Datum for non-habitable residential buildings; and

    (b) RL 5.1 metres Moturiki Datum for habitable residential buildings including attached garages.

Earthworks

22. *Any earthworks carried out on an allotment where those earthworks will expose more than 100m² of area shall use a combination of erosion and sediment control measures that are consistent with* ***Appendix 4N: Erosion and Sediment Control Measures*** *of the Tauranga City Plan and attached to this consent.*

NZTA Reverse Sensitivity Provisions

23. *For residential allotments located within the NZTA Reverse Sensitivity Plan Area as shown on the Tauranga City Plan Maps, any new dwelling or alteration to an existing dwelling that exceeds 25 per cent of the existing gross floor area shall be constructed to comply with the requirements of Rule 4E.2.5 of the Tauranga City Plan.*

Delegated Authorisation by:

Shanan Miles
Manager: Environmental Planning

Date: 24 January 2019

Advice Notes:

1. *Under section 357 of the Resource Management Act 1991you have a right of objection to the authorised agency in respect of any additional fees and charges required in respect of this decision. In accordance with section 357C of the RMA, notice of any such objection must be in writing to the Council within 15 working days of receiving this decision and/or the date on which the invoice is received. Any notice given under section 357 should describe the reasons for the objection.*

2. *Should the actual processing cost exceed the deposit fee paid at lodgement, if not already accompanying this decision, an invoice may be sent at a later date.*

3. *All archaeological sites whether recorded or unrecorded under Subpart 2 of the Heritage New Zealand Pouhere Taonga Act 2014 cannot be destroyed, damaged or modified without the consent of Heritage New Zealand. In the event that an archaeological site(s) and/or koiwi are unearthed, the Consent Holder is advised to immediately stop work on the part of the site that the archaeological site(s) is located, and contact Heritage New Zealand for advice. Contact Details: email - infolowernorthern@heritage.org.nz; phone - 07 577 4530*

4. *The Consent Holder shall obtain all other necessary consents and permits, including those under the Building Act 2004, and the Heritage New Zealand Pouhere Taonga Act 2014. This consent does not remove the need to comply with all other applicable Acts (including the Property Law Act 2007), regulations, relevant Bylaws, and rules of law. This consent does not constitute building consent approval. Please check whether a building consent is required under the Building Act 2004.*

5. *The Consent Holder is advised of the requirements in relation to the naming of access ways where six (6) or more allotments will be served by the accessway in accordance with Council's Policy and NZS4819:11. For more information regarding this please refer to http://www.linz.govt.nz/kb/704 and Council's website www.tauranga.govt.nz*

7. *For all new connections to council's infrastructure, a services connection approval is required. Applications can be found via Council's website and be can be submitted to sca@tauranga.govt.nz*

8. *The applicant has indicated through this application that they intend to operate their own 'approval' process in respect to activities and building carried out on allotments within this development (Stages 49 to 56). Further information on this 'approval' process can be obtained by contacting the Consent Holder (Bluehaven Holdings Limited) directly.*

9. *Development contributions under LGA 2002 –*

   Requirement for development contribution: Pursuant to section 198(1)(a) of the Local Government Act 2002, Council requires that a development contribution provided for and in accordance with Council's Development Contributions Policy (which is subject to change), be made (paid) by the Consent Holder to Council.

Tauranga City Council

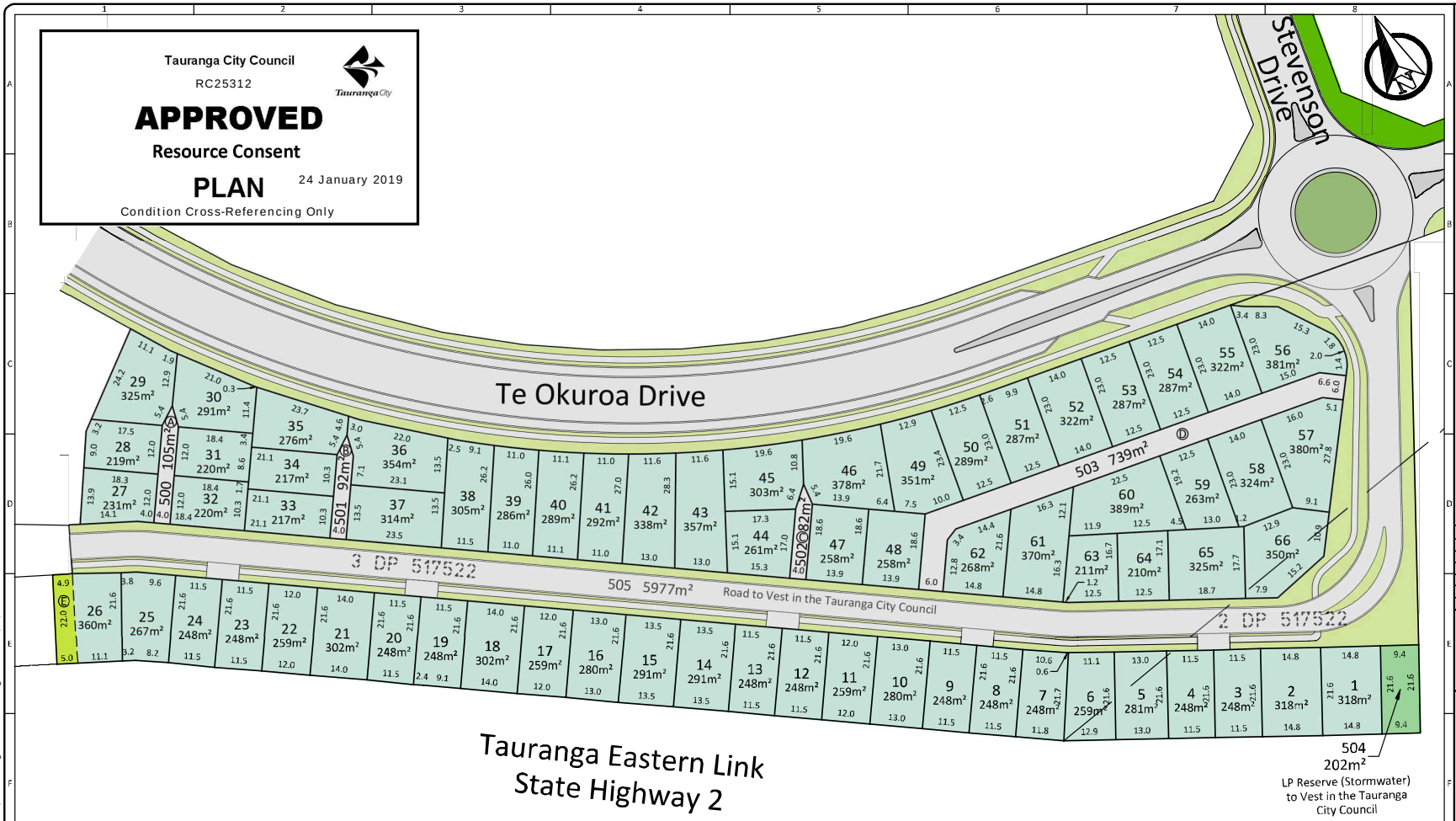
RC25312

APPROVED

Resource Consent

PLAN 24 January 2019

Condition Cross-Referencing Only



Amalgamation Conditions

That Lot 500 hereon (Legal access) be held as to five undivided one fifth shares by the owners of Lots 28, 29, 30, 31 and 32 hereon and individual certificates of title be issued in accordance therewith.

That Lot 501 hereon (Legal access) be held as to three undivided one third shares by the owners of Lots 34, 35 & 36 hereon and individual certificates of title be issued in accordance therewith.

That Lot 502 hereon (Legal access) be held as to two undivided one half shares by the owners of Lots 45 & 46 hereon and individual certificates of title be issued in accordance therewith.

That Lot 503 hereon (Legal access) be held as to fourteen undivided one fourteenth shares by the owners of Lots 49 - 62 hereon and individual certificates of title be issued in accordance therewith.

Proposed Easements

Purpose	Shown	Serv. Ten.	Dom. Ten.
Right to Convey Water, Electricity, Gas, Telecommunications and Computer Media	A	Lot 500 hereon	Lots 28 - 32 hereon
	B	Lot 501 hereon	Lots 34, 35 & 36 hereon
	C	Lot 502 hereon	Lots 45 & 46 hereon
	D	Lot 503 hereon	Lots 49 - 62 hereon

Proposed Easements in Gross

Purpose	Shown	Serv. Ten.	Grantee
Right to Convey Electricity	E	Lot 26 hereon	PowerCo

Areas and dimensions are approximate only and subject to survey.

This plan has been prepared for the purposes of Section 88 of the Resource Management Act 1991 and should not be relied on for any other purpose.

CAD BY	REV No.	DESCRIPTION	DATE
	1	RC Application	10/18

	NAME	DATE	SIGNED
Surveyed			
Designed			
Drawn	NP	10/18	
Checked	GC	10/18	
Approved	GC	10/18	

References

S&L
Land Development and Design Specialists

Ph. 07 577 6069
Email: info@sltga.co.nz
36 Koroiti Street, Mt Maunganui, Tauranga 3116
P.O. Box 231, Tauranga 3140
www.sltga.co.nz

Title

Proposed Subdivision of Section 24 SO 481628, Section 27 SO 427562, Lots 2 & 3 DP 517522 (Stage 56)

Comprised in

CT 730806 & 808690

Total Area: 4.9471ha

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Original Scales @ A3	Date
1:1000 Do Not Scale Dimensions	10/18
Drawing No	Revision
20076 - RC56	1

H:\0000 - H Drive\npatkinson\Autocad\2007612\0076 - Stage 56 - Scheme - Autocad\20076 - Stage 56 - Scheme.dwg - Plotted: 27/11/2018

S&L
Land Development
and Design Specialists

STAGES 50, 52, 53 AND 56
GOLDEN SANDS SUBDIVISION
PAPAMOA

CONSTRUCTION OF ACOUSTIC FENCE
BUILDING CONSENT EXEMPTION EX182105

Our reference: 20076-S50

Prepared for Bluehaven Developments Ltd

07 577 6069
info@sltga.co.nz
www.sltga.co.nz

36 Kereiti St
Mount Maunganui
Tauranga 3115

PO Box 231
Tauranga 3140

S&L
Land Development
and Design Specialists

Contents

1.0 Introduction 1

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3.0 Fence Construction 2

4.0 Construction Certification 3

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Drawings 20076-AW4, 20076-AW2e, 20076-AF

PS1 Design Producer Statement

Fence Design Calculations

Fence Construction Specification

Construction Inspection Notes

PS4 Construction Review Producer Statement

Building Location Certificate

Building Consent Exemption EX182105

SHRIMPTON & LIPINSKI EST. S&L 1963 LAND DEVELOPMENT & DESIGN SPECIALISTS

1.0 Introduction

Resource consent RC 26171 was issued by the Tauranga City Council (TCC) on 11 April 2018. This consent took in Stages 50, 52, 53 and 56 of the Golden Sands Subdivision.

Condition 32 of this consent dealt with NZTA Reverse Sensitivity Provisions which required that

Prior to certification pursuant to section 46 of the HASHAA (section 224(c) of the RMA), the Consent Holder shall construct an acoustic barrier for the entire stage(s) as detailed within the recommendations of the Assessment of Noise Effects prepared by Hegley Acoustic Ltd, referenced as 17208 and dated 20 March 2018 (TCC Objective reference A8641133), the cross-sections prepared by Hegley Acoustic Consultants, dated 14 February 2018 (TCC Objective reference A8648617) and the following specific requirements:

(a) The acoustic barrier shall be a minimum of 2.5 metres in height above the finished ground level of the allotment in which it is located;

(b) There shall be no gaps between any components of the acoustic barrier, with overlapping details to be provided at all junctions of individual components ;

(c) The components of the acoustic barrier shall have a minimum surface mass of 10kg/m^2;

(d) The acoustic barrier shall be located entirely within the subject sites;

(e) Where 'Option One' is selected by the Consent Holder, the acoustic barrier is to be constructed

i. along the full length of the common boundary with State Highway 2 (Tauranga Eastern Link Toll Road, Section 1 SO 427562);

ii. Perpendicular to State Highway 2 at the western and eastern ends of the subdivision;

iii. With the sole exception of the 500 millimetre gap at the Local Purpose Stormwater Reserve (Lot 702), there shall be no gaps between the acoustic barrier and the finished ground level;

iv. Where the acoustic barrier is located on Lot 702, its acoustic integrity shall be maintained at all times. Specifically:

- *The barrier shall be a minimum of 2.5 metres height above finished ground level;*
- *There shall be no gaps between the wall and the finished ground level, except for as provided for in (iii) above;*
- *There shall be no gaps between any components of the acoustic barrier, with overlapping details provided at* all *junctions of individual components; and*

- *The components of the wall shall have a minimum surface mass of 10kg/m2*

Such an acoustic barrier (fence) has been designed by S&L and constructed under the observation of S&L engineering staff. Pre-construction discussions were held with TCC inspectors regarding seeking approval for the fence by way of a building consent. RC 26171 requires the fence to be at least 2.5m high while Schedule 1 of the Building Act 2004 states that a fence is exempt from requiring a building consent if the fence does not exceed 2.5m. TCC advice given to S&L was that approval for the fence, as subsequently installed, would be given by TCC by their issue of a Certificate of Acceptance (COA).

This document provides the relevant information for TCC to consider and issue a COA.

2.0 Fence Design

The fence has been designed by M.W.Hughes CPEng 13410 in accordance with Clause B1: Structure of Building Code and Compliance Document B1/VM4 issued by The Ministry of Business, Innovation and Employment. Copies of Mr Hughes' PSI Design Producer Statement, calculations and specification are attached. Plans and details of the fence are shown on attached copies of S&L drawings 20076-AW4 and 20076-AF.

The fence has been designed to resist face wind loads determined from NZS 1170.2:2011 "Structural Design Actions – Part 2: Wind Actions" and deals with exposures to wind pressures from open farmland on the TEL side of the fence.

In keeping with the requirements of RC 26171, condition32,

- The fence is at least 2.5m high
- There are no gaps detailed between any components of the fence
- The components have a surface mass of 10kg/m² met by the timber components as detailed
- There are no gaps between the fence and the finished ground level except where the fence passes over the Stormwater Management Swale between Stages 50 and 52. The gap under the fence at that location is to permit overland flows from the swale to enter the TEL in extreme rainfall events.

3.0 Fence Construction

The fence was constructed in the period October 2018 to February 2019 by Davies Fencing, subcontracting to Bay Civil Ltd. Eighteen formal inspections were undertaken by S Phillips, Civil Engineer of S&L. Copies of the Phillips' Site Records are attached.

During the course of construction some modifications were made to the original design regarding the embedments of the vertical posts. The ground was not flat over the 940m length of the fence. These modifications included the deepening of some drilled holes to achieve minimum embedment depths and installing dowel rods when the posts did not reach the bases of the drilled holes. These modifications are described in more detail in the attached inspection notes.

4.0 Construction Certification

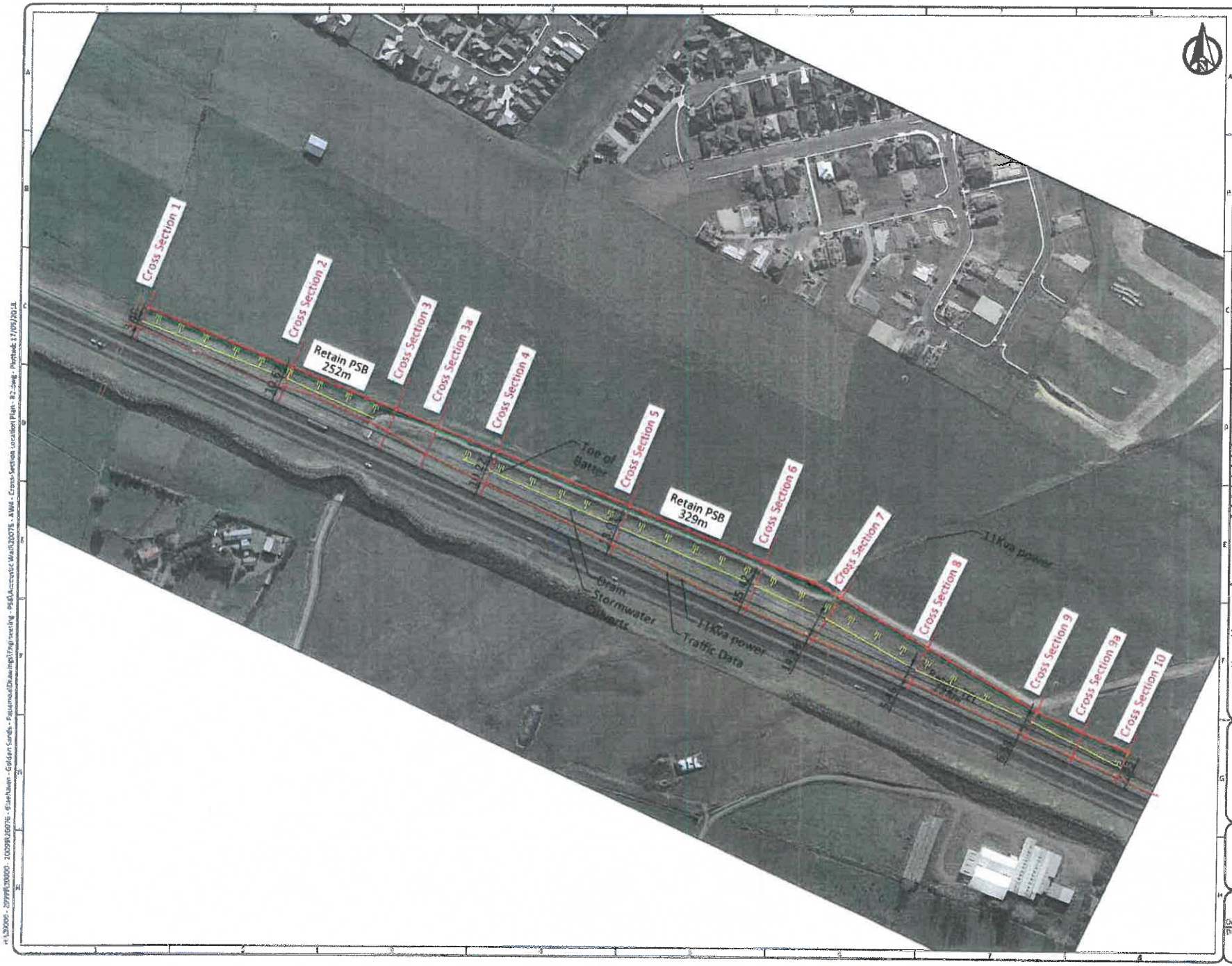
TCC COA notes from their website request a PS4 "Construction Revue Producer Statement" from the Supervising Engineer. Such a PS4 is usually referred to the building consent (number) but no such consent was applied for or issued. A modified PS4 is attached and signed by M.W. Hughes, CPEng 13410.

A Statement is attached from G.D. Cowles, Licensed Cadastral Surveyor, to advise that the fence has been constructed to comply with RC 26171 condition 32(a) that the "components of the acoustic barrier shall be located entirely within the Subject Sites" being Stages 50, 52, 53 and 56 of the Golden Sands Subdivision, with no encroachment within Stage Highway 2 (TEL)

S & L
Consulting Engineers, Surveyors, Planners

M W Hughes, CPEng CMEngNZ
Senior Geotechnical Engineer

24 May 2019



Note:
Read in conjunction with "Assessment of Noise Effects" report no 17208 by Nevil Hegley.

See 20076 - AW2 & AW3 for Longsections

REV No.	DESCRIPTION	DATE
2	Section 9a add	4/18
1	Cattle track	2/18

	NAME	DATE	SIGNED
Designed			
Designed			
Drawn			
Checked			
Approved			

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

Title
Acoustic Wall Design
Papamoa South Block
Cross Sections 1-5

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Original Scales @ A3	Date
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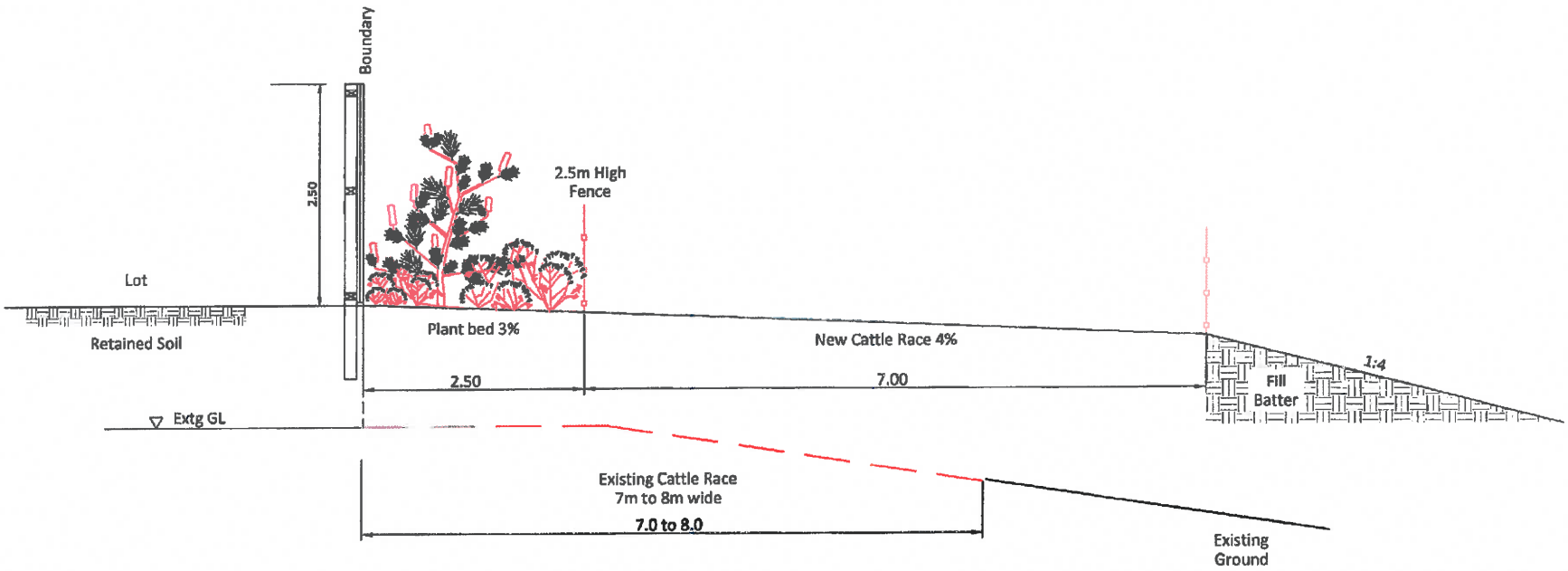
Do Not Scale Dimensions	
Drawing No	Revision
20076 - AW4	2



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Web Site: www.slnga.co.nz

GOLDEN SANDS
PAPAMOA BEACH

Acoustic Wall Design Papamoa South Block
OPTION "A" - Cross-Sections 1 - 3, 7 - 9

Note:
Read in conjunction with "Assessment of Noise Effects" report no 17208 by Nevil Hegley.

Rev No.	Description	Date	Signed
3	XS - Updated	01/18	
2	XS - Updated	01/18	

	Name	Date
Surveyed	BTW	09/17
Designed	DE	01/18
Drawn	NP	01/18
Checked		
Approved		

References

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Do Not Scale Dimensions
Date: 09/17
Drawing No: 20076 - AW2e
Revision: 3

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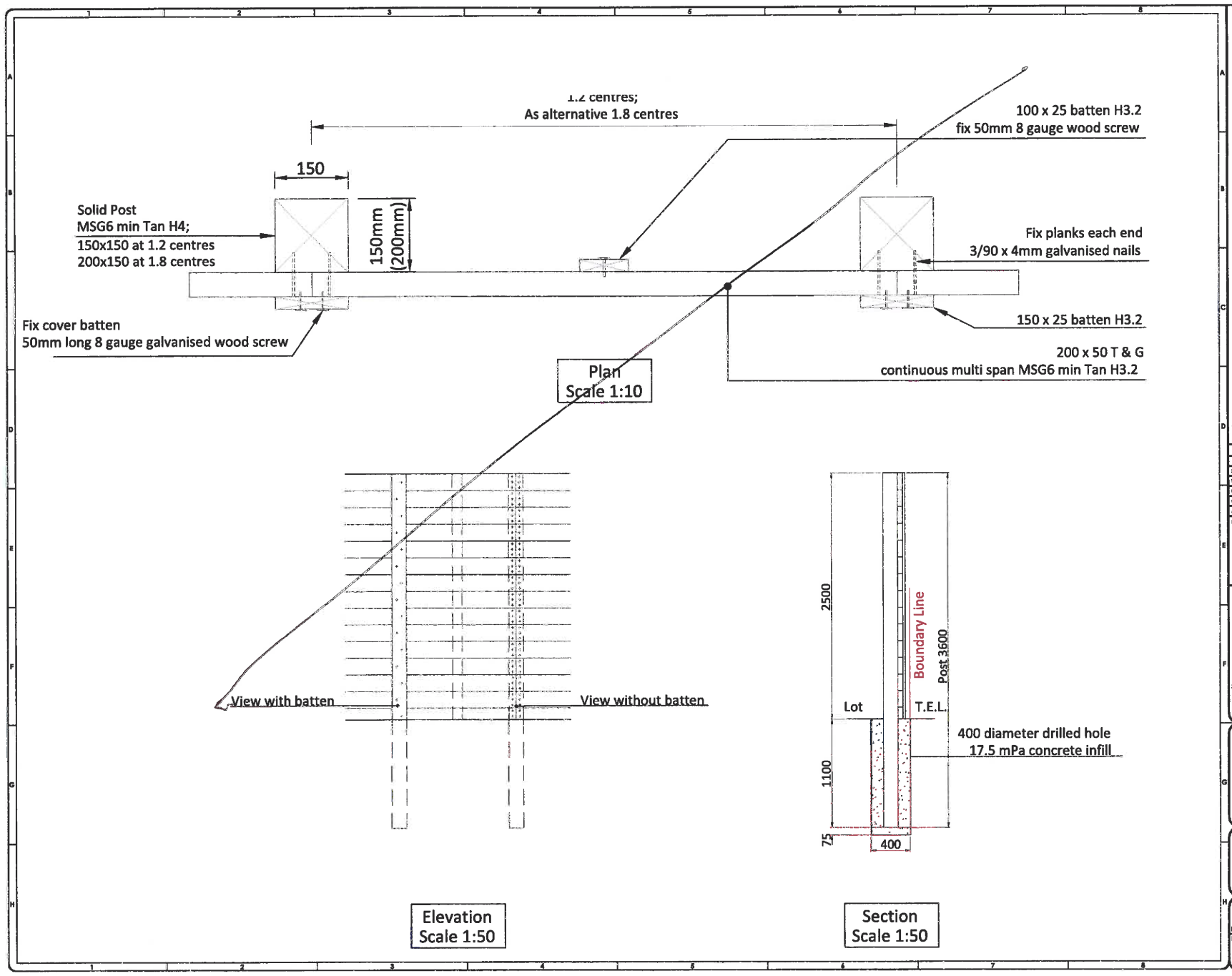

Notes:

Details shown for fence 2.5m high. For 3.0m high, post size is 200 x 150 and the embedment depth is 1.5m.

CAD BY	REV No.	DESCRIPTION	DATE
DCE	1	Timber treatment	10/18
	0	Building Consent	09/18

	NAME	DATE	SIGNED
Surveyed			
Designed	MH	08/18	
Drawn	NW	08/18	
Checked	GDC	08/18	
Approved	GDC	08/18	

References

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

Title

Acoustic Fence Detail

Golden Sands

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Original Scales @ A4	Date
As Shown	09/18
Do Not Scale Dimensions	
Drawing No	Revision
20076 - AF	1

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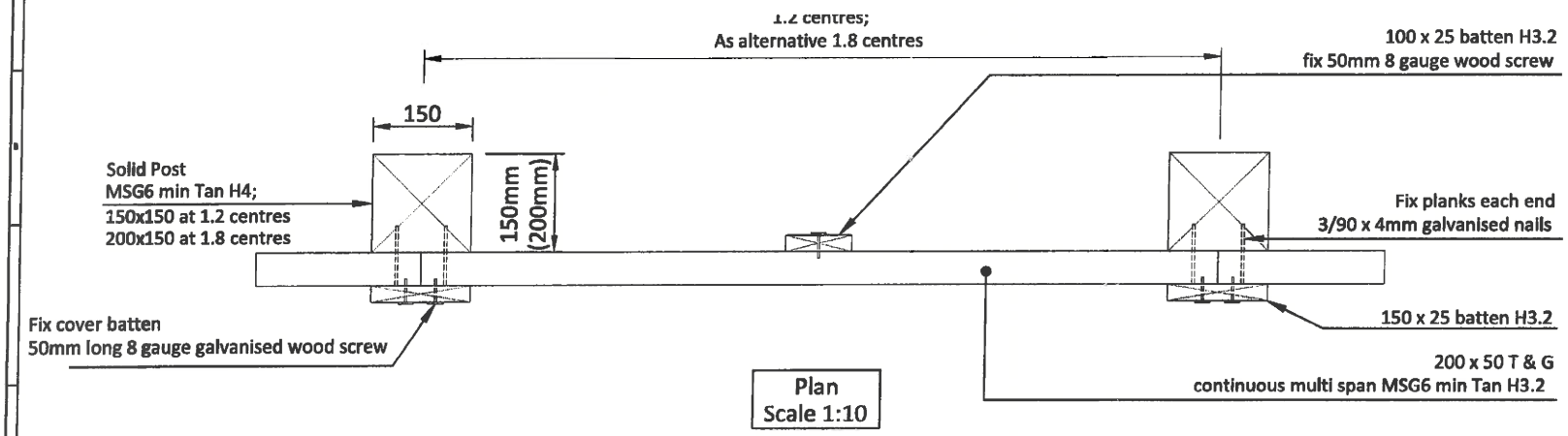

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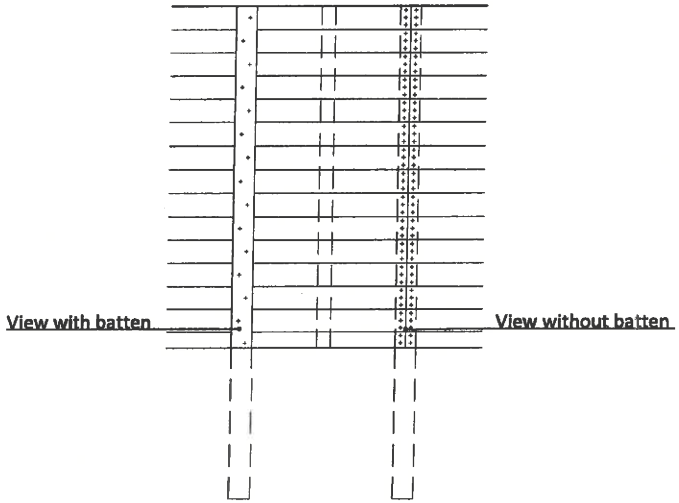

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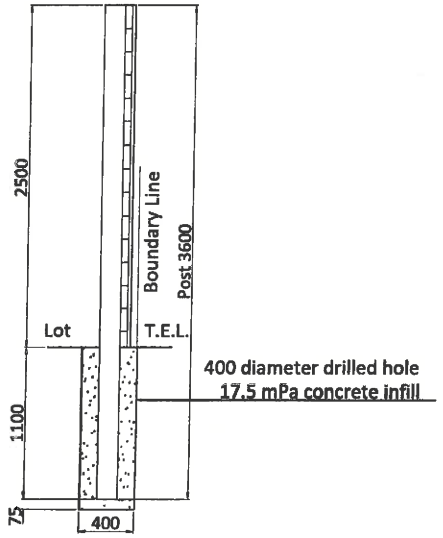

Section
Scale 1:50

Notes:

Details shown for fence 2.5m high. For 3.0m high, post size is 200 x 150 and the embedment depth is 1.5m.

DCE	1	Timber treatment		10/18
	0	Building Consent		09/18
CAD ET	REV No.	DESCRIPTION		DATE

	NAME	DATE	SIGNED
Surveyed			
Designed	MH	08/18	
Drawn	NW	08/18	
Checked	GDC	08/18	
Approved	GDC	08/18	

References

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P.O. Box 231, Tauranga 3140
www.sltga.co.nz

Title

Acoustic Fence Detail

Golden Sands

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Original Scales @ A4	Date
As Shown	09/18
Do Not Scale Dimensions	
Drawing No	Revision
20076 - AF	1

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S&L
Land Development
and Design Specialists

Our ref: 20076

Bluehaven Holdings Ltd
Golden Sands Subdivision
Acoustic Fence along Subdivision Boundary with Tauranga Eastern link Road
Specification for Construction

1.0 Reference Drawings

By S & L

Site Plans	20076- AW4
Fence Cross Section	20076– AW2e
Fence Details and Elevations	20076– AF

2.0 Scope of Work

The scope of the work is to construct a timber framed fence along the boundary between the Golden Sands subdivision and the Tauranga Eastern Link roadway to provide an acoustic barrier to the houses within the subdivision. The fence is to be constructed of cantilevered vertical timber posts embedded to the depths shown on the details. Horizontal timber planks are to be installed behind the posts.

3.0 Timber Components

- The fence posts are to be tanalised H4 and be graded MSG6. The posts are to be cut to cross section sizes of 150 x 150 when the posts are at 1.2 m centres or 200 x 150 if spaced at 1.8 m centres. The posts are to be erected vertically.

- The 200 x 50 tanalised H3.2 tongue and groove timber planks are to be graded MSG6 and fixed over 2 or more spans with staggered joints. Any cut faces are to be treated with ensele or similar.

- The vertical cover battens to the faces of the horizontal planks are to be 150 x 25. The vertical battens behind the fence at the midspan of the horizontal planks are to be 100 x 25. Both lengths of the battens are to be tantalised H3.2 and are to be in continuous lengths for the full height of the fence.

07 577 6069
info@sltga.co.nz
www.sltga.co.nz
36 Kereiti St
Mount Maunganui
Tauranga 3116
PO Box 231
Tauranga 3140

4.0 Fixings

The planks are to be fixed to the faces of the posts with 3/ 90 x 4 mm galvanised nails. The cover battens are to be fixed to the planks with galvanised 8 gauge, wood screws 50 mm long..

5.0 Embedment of Posts

- The holes for the posts are to be machine drilled vertically. The holes are to be 400 mm diameter and a minimum depth of 1.1 m.
- The depths and embedment diameters of the holes for the posts are to be checked by S & L or their approved representative or the local authority building inspector.
- The poles are to be encased in concrete with a minimum characteristic compressive strength of 17.5 MPa at 28 days.

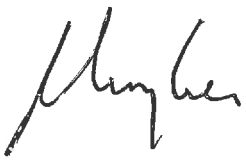
6.0 Earthworks

The alignment of the fence is to be formed by earthworks to provide a level surface along the line of the wall. Any grass cover and buried topsoil is to be removed and replaced if necessary with compacted local sand. After the levelled surface has been formed the surface is to be rolled with at least 4 passes of a steel drum self propelled roller to densify the ground surface.

After the fence is complete backfilling is to take place to ensure that there are no gaps below the bottom planks of the fence.

7.0 Finishes

Bluehaven Holdings will advise the surface finishes to be applied to the wall components after construction.



M W Hughes CPEng
Design Engineer
S & L

14 August 2018

Building Code Clause(s) B1: Structure

PRODUCER STATEMENT – PS1 – DESIGN

(Guidance on use of Producer Statements (formerly page 2) is available at www.ipenz.nz)

ISSUED BY: S & L
(Design Firm)

TO: Bluehaven Holdings Ltd
(Owner/Developer)

TO BE SUPPLIED TO: Tauranga City Council
(Building Consent Authority)

IN RESPECT OF: Acoustic Fence Along Subdivision Boundary With Tauranga Eastern Link Road
(Description of Building Work)

AT: Papamoa
(Address)

Town/City: Tauranga **LOT** ..... **DP** ..... **SO** .....
(Address)

We have been engaged by the owner/developer referred to above to provide:

Civil and Structural Engineering Services for Both Design and Construction Observation of the Acoustic Fence

(Extent of Engagement)

services in respect of the requirements of Clause(s) B1: Structure of the Building Code for:

☑ All or ☐ Part only (as specified in the attachment to this statement), of the proposed building work.

The design carried out by us has been prepared in accordance with:

☑ Compliance Documents issued by the Ministry of Business, Innovation & Employment B1/VM4 or
(verification method/acceptable solution)

☐ Alternative solution as per the attached schedule.....

The proposed building work covered by this producer statement is described on the drawings titled:

Golden Sands Acoustic Fence Plan and Detail and numbered 20076-AW4 and 20076-AF;
together with the specification, and other documents set out in the schedule attached to this statement.

On behalf of the Design Firm, and subject to:
(i) Site verification of the following design assumptions Embedment holes inspected by fence designer
(ii) All proprietary products meeting their performance specification requirements;

I believe on reasonable grounds that a) the building, if constructed in accordance with the drawings, specifications, and other documents provided or listed in the attached schedule, will comply with the relevant provisions of the Building Code and that b), the persons who have undertaken the design have the necessary competency to do so. I also recommend the following level of construction monitoring/observation:

☐ CM1 ☑ CM2 ☐ CM3 ☐ CM4 ☐ CM5 (Engineering Categories) or ☐ as per agreement with owner/developer (Architectural)

I, Michael William Hughes am: ☑ CPEng 13410 # ☐ Reg Arch ..... #
(Name of Design Professional)

I am a Member of: ☑ IPENZ ☐ NZIA and hold the following qualifications: BE (civil)
The Design Firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than $200,000*.
The Design Firm is a member of ACENZ: ☐

SIGNED BY Michael William Hughes (Signature)
(Name of Design Professional)

ON BEHALF OF S & L Date 14/8/18
(Design Firm)

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

This form is to accompany **Form 2 of the Building (Forms) Regulations 2004** for the application of a Building Consent.

THIS FORM AND ITS CONDITIONS ARE COPYRIGHT TO ACENZ, IPENZ AND NZIA

GUIDANCE ON USE OF PRODUCER STATEMENTS

Producer statements were first introduced with the Building Act 1992. The producer statements were developed by a combined task committee consisting of members of the New Zealand Institute of Architects, Institution of Professional Engineers New Zealand, Association of Consulting Engineers New Zealand in consultation with the Building Officials Institute of New Zealand. The original suite of producer statements has been revised at the date of this form as a result of enactment of the Building Act (2004) by these organisations to ensure standard use within the industry.

The producer statement system is intended to provide Building Consent Authorities (BCAs) with reasonable grounds for the issue of a Building Consent or a Code Compliance Certificate, without having to duplicate design or construction checking undertaken by others.

PS1 Design	Intended for use by a suitably qualified independent design professional in circumstances where the BCA accepts a producer statement for establishing reasonable grounds to issue a Building Consent;
PS2 Design Review	Intended for use by a suitably qualified independent design professional where the BCA accepts an independent design professional's review as the basis for establishing reasonable grounds to issue a Building Consent;
PS3 Construction	Forms commonly used as a certificate of completion of building work are Schedule 6 of NZS 3910:2003 [1] or Schedules E1/E2 of NZIA's SCC 2007 [2]
PS4 Construction Review	Intended for use by a suitably qualified independent design professional who undertakes construction monitoring of the building works where the BCA requests a producer statement prior to issuing a Code Compliance Certificate. This must be accompanied by a statement of completion of building work (Schedule 6).

The following guidelines are provided by ACENZ, IPENZ and NZIA to interpret the Producer Statement.

Competence of Design Professional

This statement is made by a Design Firm that has undertaken a contract of services for the services named, and is signed by a person authorised by that firm to verify the processes within the firm and competence of its designers.

A competent design professional will have a professional qualification and proven current competence through registration on a national competence-based register, either as a Chartered Professional Engineer (CPEng) or a Registered Architect.

Membership of a professional body, such as the Institution of Professional Engineers New Zealand (IPENZ)or the New Zealand Institute of Architects (NZIA), provides additional assurance of the designer's standing within the profession. If the design firm is a member of the Association of Consulting Engineers New Zealand (ACENZ), this provides additional assurance about the standing of the firm.

Persons or firms meeting these criteria satisfy the term "suitably qualified independent design professional".

*** Professional Indemnity Insurance**

As part of membership requirements, ACENZ requires all member firms to hold Professional Indemnity Insurance to a minimum level.

The PI insurance minimum stated on the front of this form reflects standard, small projects. If the parties deem this inappropriate for large projects the minimum may be up to $500,000.

Professional Services during Construction Phase

There are several levels of service which a Design Firm may provide during the construction phase of a project (CM1-CM5)[3] (OL1-OL4) [2]. The Building Consent Authority is encouraged to require that the service to be provided by the Design Firm is appropriate for the project concerned.

Requirement to provide Producer Statement PS4

Building Consent Authorities should ensure that the applicant is aware of any requirement for producer statements for the construction phase of building work at the time the building consent is issued as no design professional should be expected to provide a producer statement unless such a requirement forms part of the Design Firm's engagement.

Attached Particulars

Attached particulars referred to in this producer statement refer to supplementary information appended to the producer statement.

Refer Also:

1 *Conditions of Contract for Building & Civil Engineering Construction NZS 3910: 2003*

2 *NZIA Standard Conditions of Contract SCC 2007 (1st edition)*

3 *Guideline on the Briefing & Engagement for Consulting Engineering Services (ACENZ/IPENZ 2004)*

www.acenz.org.nz
www.ipenz.org.nz
www.nzia.co.nz

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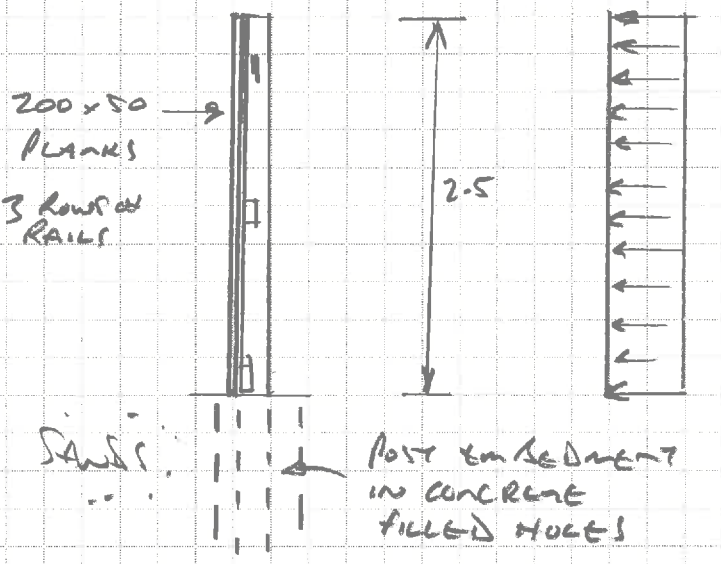
S&L CONSULTANTS LTD
ENGINEERS - SURVEYORS - PLANNERS
102 Hamilton Street PO Box 231 Tauranga 3140 New Zealand
Phone 07 577 6069 Fax 07 577 6065 Web www.sltga.co.nz

Title GOLDEN SANDS
STAGES ADJACENT TO TEL
Description
ACOUSTIC fence components

Job No. 20076
Page No. 1 of
Date 6/10/16
Designed By MWH
Checked

ENGINEERING CALCULATIONS

1.0 Proposed Fence Dimensions



Install design for POSTS at 1.8m c/c

2.0 Design Wind Pressure

From NZS 1170.2

Fence is in open farmland from the TEL side

$V_{site} = V_R M_d (M_{zcat} M_s M_t)$

The site is in Region A7 (Fig 3.1)

No Lee Multipliers

Regional wind speed = 39 m/s. Table 3.1 — $V_{50} = 39$ m/s

Take $M_d = 0.90$ for N, NE, SE, S, SW. — $M_d = 0.9$

Importance level = 1

25 year design life

AEP = 1/50

Take terrain category 2

From table 4.1(a) $M_{zcat} = 0.91$ — $M_{zcat} = 0.91$

Take $M_s = 1.0$ $M_{t1} = 1.0$

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Title GOLDEN SANDS
STAGE 1 ADJACENT TO TEL
Description Acoustic Fence Components

Job No. 20076
Page No. 2
Date 6/6/16
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Checked

ENGINEERING CALCULATIONS

then $V_{s,\alpha} = 39 (0.9)(0.91)(1.0)(1.0)$

$= 31.9$ m/s

for a fence (Loading)

$C_{fig} = C_{pn} \cdot K_a \cdot K_e \cdot K_p$ (aerodynamic shape factor)

$K_a = 1.0$ $K_p = 1.0$

$K_e = 1.0$ $C_{pn} = 0.8$ (Table 5.2(a))

$C_{fig} = 0.8 \cdot 1.0 \cdot 1.0 \cdot 1.0 = 0.8$

$C_{dyn} = 1.0$

Then ULS wind pressure

$P_w = 0.5 \rho_{air} (V_{des.\theta})^2 C_{fig} C_{dyn}$

$= 0.5 \times 1.2 \frac{kg}{m^3} \cdot (31.9)^2 (0.8)(1.0) / 1000$

$= 0.49$ kPa.

design wind pressure = 0.49 kPa

3.0 Fence Components

3.1 Fence Posts

fence posts are spaced at 1.2 m centres

Load factor for strength of structure = 1.0

Flexure

$M^* = 1.0 \times 0.49 \times 2.5 \times 1.2 \times 1.25$ (m = 1)

$= 1.84$ kN-m

for 150 x 150 Post $Z = 562 \times 10^3$ mm^3

$\phi M_n = \phi K_1 f_b Z$ where $\phi = 0.8$, $K_1 = 1.0$, $f_b = 10$ mPa (SG6)

$= 4.50$ kN-m $> M^*$

150 x 150 Posts (SG6)

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Title Golden Sands
STAGE 1 ADJACENT TO TEL
Description
Acoustic fence Components

Job No. 20076
Page No. 3
Date 12/8/18
Designed By
Checked

ENGINEERING CALCULATIONS

3.2 Horizontal Planks

to span 1.2m but continuous over 2 or more spans

Load on plank (wind) = 1.0 x 0.49 x 0.2
= 0.098 kN/m

$M^* = 0.098 \times 1.2^2/8 = 0.0176$ kN/m

For 200 x 50 plank $Z = 195 \times 45^2/6$
$= 65.6 \times 10^3$ mm³

$\phi M_{uw} = 0.8 \times 1.0 \times 10 \times 65.6 \times 10^{-3}$
$= 0.53$ kN-m $> M^*$

200 x 50 planks

Use 200 x 50 planks → ✓

4.0 Embedment

Install in 300 dia bored holes in Sand

Take $K_p = \frac{1+\sin\phi}{1-\sin\phi} = 3.0$ where $\phi = 30°$

$D_s = 0.3$

$\gamma = 16$ kN/m³

L = embedment

f = 1.25m (location of point load)

From B1/VM4 $\phi H_u = \frac{K_p D_s L^3 \gamma}{2(f+L)}$ $\phi = 0.5$

Take L = 1.2m

$\phi H_u = \frac{3.0 \times 0.3 \times 1.2^3 \times 16 \times 0.5}{2(1.25+1.2)}$

$= 2.54$ kN

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Title Golden Sands
Stages adjacent to TEL
Description
Acoustic fence Component

Job No. 20076
Page No. 4
Date 12/8/18
Designed By
Checked

ENGINEERING CALCULATIONS

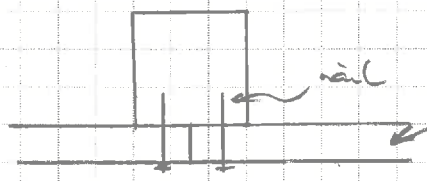
$H^* = 1.0 \times 0.49 \times 1.2 \times 2.5$

$= 1.47$ kN $\rightarrow \phi H_n = 2.54$ kN

∴ Embed 150x150 post in 300 diameter holes 1.2m deep - Encase with 17.5 MPa concrete

5.0 Fixing – Planks to Posts

Use 3 nails per end fixing per plank



Wind load on nails $= 1.0 \times 0.2 \times 0.49 \times 1.2/2$

$= 0.059$ kN (59 N)

Use maximum reduction factor of 0.6 (conservative)

minimum penetration into post = 10 nail diameters

Specify 90 x 4.0 mm nails

W.P. withdrawal strength per mm of penetration

$= 8.3$ N/mm (SG Timber)

penetration = 90 – 45 = 45 mm

For 3 nails withdrawal resistance

$= 8.3 \times 45 \times 3 = 1120$ N

Strength reduction factor = 0.85 x 0.7 = 0.60

resistance becomes $0.6 \times 1120 = 666$ N

> 59 N

Fix each plank to post with 3/90 x 4 nails

Job Location:	Golden Sands	**Inspection #**	1
Job Description:	Acoustic Fence Inspection		
Date:	18/10/2018		
Inspected by:	Scott Phillips		
Items Inspected:	Posts (distances, depth and height : GL, orientation) Materials		
Other Parties Present:	Shaun		
Weather/Conditions:	Sunny, warm, no breeze		

Inspection Criteria

- Posts set 1.5m apart on centres	YES	- Post tops on same plane	YES
- 150 face towards boundary	YES	- Posts inside boundary	YES
- 400mm Ø drilled holes	YES		

Inspection Methods:

A stingline is strung to represent the boudary line. It is based off our survey boundary pegs
A second stringline is inside the boundary and represents the outer face of the POSTS

- Ensure the inside stringline is a MINIMUM of 100 mm from the Boundary stringline (likely 150mm)
- Ensure that the concrete fill in the holes will not extend past the boundary.
- Ensure that the inside stringline is level (or at correct grade) and at the correct elevation (based off survey pegs). Shaun will help set up the laser and we will check every 10 metres or so.
- Ensure the Posts are set with the 150mm face towards the TEL.
- Measure from the inside stingline to the top of the post (MUST be a MINIMUM of 2.5m)
    - if we know this height, we don't need to measure depth
- Measure (with a tape) that the posts are on centre at 1.5m.
    - Shaun said he set them to be at 1.48m on centre (my measurements averaged 1.462m. The T & G planks average about 6.035m in length, and so a span over 5 posts must not excede this.
    - The average length over a 5 post span needs to be less than 1.509m.

Other Notes:

- This is the first inspection of the fence posts, materials, holes, boundaries, levels, etc.
- First concrete pour around posts is going in after inspection.
- 40 posts inspected and ready for concrete.
- Material lengths have a large variance. Measuring 10 posts showed lengths of 3605 to 3645mm.
- Plates at bottom of holes are not concrete, instead, they are fastening 75 x 190 x 100 (slight variability) treated wood to the bottoms of the posts prior to setting them in the holes. Thickness is steady at 75mm.
- Plate material is GV130 NZS 3622 SG8.
- Posts are H5 instead of H4
- Auger is 420mm Ø and so the holes are roughly 440mm-450mm.

Component	Posts	Timber Planks	Battens	Concrete	Fastening	Base Plates
Material	MSG6 min Tan H4	MSG6 min Tan H3.2	H3.2	17.5 mPa		17.5 mPa Conc.
Dimension Spec	200 x 150 x 3.6m	200 x 50 T&G	150 x 25, 100 x 25			
Dimension Meas.	205 x 155	180 x 42	-	-	-	75 x 190 x 100 GV130 NZS 3622 SG8
Notes						

Job Location:	Golden Sands	**Inspection #**	**2**
Job Description:	Acoustic Fence Inspection		
Date:	24/10/2018		
Time:	10:00 a.m.		
Inspected by:	Scott Phillips		
Items Inspected:	Posts (distances, depth and height : GL, orientation) Materials		
Other Parties Present:			
Weather/Conditions:			

Inspection Criteria

- Review previous inspection comments	YES
- Posts and holes are within boundary	YES
- String Line is at correct grade (check with lazer level)	YES
- 150 face towards boundary	YES
- Posts are 2.5m MINIMUM above G.L. stringline	YES
- Posts set 1450 apart on centres (+/- 100mm)	YES
- minimum 400mm Ø drilled holes	YES
- Step downs of fence occur at post closest to lot boundaries	YES

Inspection Methods:

Checked the string ending data point with the laser level. Set this as zero level for datum. Checked string roughly every 10 metres and sting was within +/- 7mm of datum at 5 locations. String was originally based off of endpoints shot by Chris K. At each step, a drop of 180mm is included. This will need to be checked next visit.

Other Notes:

- There was some confusion on gradient that was sorted out by Mike S.
    - Gradient (not angle) is set to .3 which allows for loss of 3 planks (3 step downs) over a 180 metre length. The actual stepdown will be less because the planks are about 173mm.
- Post 0, which was not installed last visit has been installed and is 1010 metres off centre from Post 1. It is slightly higher than Post 1 (roughly 30mm or so)
- Post holes 30-71 were filled with concrete today.
- Daryl and Grant went over some details with Shuan and we are working on coming up with a better plan moving forward.
- For now, we will carry on as we have been.

Component	Posts	Timber Planks	Battens	Concrete	Fastening	Base Plate
Material	MSG6 min Tan H4	MSG6 min Tan H3.2	H3.2	17.5 mPa		
Dimension Spec	200 x 150 x 3.6m	200 x 50 T&G	150 x 25, 100 x 25			
Dimension Meas.	205 x 155	180 x 42		17.5 mPa (receipt)		75 x 190 x 100 GV130 NZS 3622 SG8
Notes						

Job Location:	Golden Sands	**Inspection #**	**3**
Job Description:	Acoustic Fence Inspection		
Date:	26/10/2018		
Time:	9:30 a.m.		
Inspected by:	Scott Phillips & Lance Hope		
Items Inspected:	Post heights, distances, location in hole, boundary distance, lot location		
	plank layout,		
Other Parties Present:	Sean, Chris (at beginning)		
Weather/Conditions:	Sunny, Wind from NW		

Inspection Criteria	Yes/No
- Review previous inspection comments	Y
- Posts and holes are within boundary	N
- String Line is at correct grade (check with lazer level)	Y
- 150 face towards boundary	Y
- Posts are 2.5m MINIMUM above G.L. stringline	Y
- Posts set 1450 apart on centres (+/- 100mm)	Y
- minimum 400mm Ø drilled holes	Y
- Step downs of fence occur at post closest to lot boundaries	Y

Inspection Methods:

Same as previous methods, except there were two inspectors. This made it easier to get more accurate readings for post height. Accuracy was probably increased because it was easier to focus on one task such while one person measured, and one wrote the results.

Other Notes:

- **Conversation with Chris about non-retaining wall near cattle race**. Concerns include batters, wall height, quality of fill/soil, possibility of longer posts
- **Chris wants to control the design levels** and does not want to do any earthworks (cut/fill) in future sections.
- Shaun said that Chris had started his original string line 50mm higher than originally stated. The means the posts should all be higher due to finished level. However, we have no information on finished level. It will be up to Chris to grade the ground level to achieve a true 2.5m high fence.
- **Many posts were off centre** and this needs to be corrected moving forward.
- Holes need to be back of boundary
- **Request for Battens to be 2.4m** because this length is readily available which will reduce cutt-off waste, builder costs, and time (no cutting). Also, because the design is a lesser grade of timber, these must not be buried do to rotting concerns.
- **Layout for planks is below 2.5m.** We talked of a few different options (cuts at top or bottom, adding a row, putting in a cap). A cap is only to be used if we can't achieve our design height any other way. Due to the height of the planks, we need a 15th row of plank to achieve a 2.5m high (minimum) fence height. Shaun said he put up a few boards and is averaging 176mm per plank when all is installed. The bare minimum to achieve the fence height is 178.6mm, but that still leaves 0.0mm of fill up against the bottom plank. This is unreasonable and so we must average 180 if we want 20mm of cover at bottom. This needs to be decided with Chris, Daryl, and Grant. Chris will likely be the deciding voice moving forward and we will base our inspections on his recommendations and levels.
- **The nails are the wrong size**. They should be 4mm by 90mm and they are 3.15mm by 90mm (actually a bit closer to 3.5mm x 85mm). It was advised to use 4 nails and alternate the pattern. After consulting with Grant and Daryl, we looked at the calculations for nails and saw that they were designed with nearly a 200% safety factor. Daryl decided that the nails were fine, and **we will continue with the drawings and using the new nails in the original nailing pattern**.
- **27th Post is the lowest post** found in the first section where Shaun is beginning to nail in the planking. These posts were installed at the first inspection. First inspection also noted low posts at **#16, 17, & 19**.
- All Posts heights measured at Inspection 1 & 2 will be approximately 20 mm lower due to viewing angle from below. With two people inspecting (Lance and Scott) One could stand back farther away and get a better reading.
- **Post holes 72-153 should have been poured at 1:30 today, after our inspection was completed.**

Inspection Method Details

A stingline is strung to represent the boundary line. It is based off our survey boundary pegs
A second stringline is inside the boundary and represents the outer face of the POSTS

- Ensure the inside stringline is a MINIMUM of 100 mm from the Boundary stringline (likely 150mm)
- Ensure that the concrete fill in the holes will not extend past the boundary.
- Ensure that the inside stringline is level (or at correct grade) and at the correct elevation (based off survey pegs). Shaun will help set up the laser and we will check every 10 metres or so.
- Ensure the Posts are set with the 150mm face towards the TEL.
- Measure from the inside stingline to the top of the post (MUST be a MINIMUM of 2.5m)
    - if we know this height, we don't need to measure depth
- Measure (with a tape) that the posts are on centre at 1.5m.
    - Shaun said he set them to be at 1.48m on centre (my measurements averaged 1.462m. The T & G planks average about 6.035m in length, and so a span over 5 posts must not excede this.
    - The average length over a 5 post span needs to be less than 1.509m.
- Ensure that when the fence "steps" down, This occurs at the post nearest to a lot corner

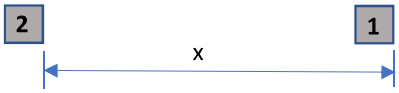
Inspection Fields Explained

Post # is measured from the origin at the first corner. The numbers may get off because it is easy to miscount after looking at so many posts. This can be replaced by lot and post number i.e. Lot 1254 Post 2.

Lot # is just the lot closest to the post. This may end up being ROW, Reserve, or Swale instead of a number

Datum is just where the distance on centre was measured from.

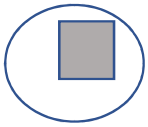
Dist on Centre is the measurement from the outside of one post to the inside of the next (shown below). This is easier than measuring on centre and will be more accurate.



G.L. to Base is calculated after data is entered into the spreadsheet.

G.L to Base = (average post length) - (G.L. to Top)

Post is off-centre is just to mark the when posts are pushed right up to the side of the hole (shown below). Only mark these for the worst ones. It shouldn't be expected that all posts will be centred perfectly.



Post from Bdry is just a measure of the boundary string line to the inside string line.

Notes is just a place to enter any additional info such as where a step down occurs.

Job Location:	Golden Sands	**Inspection #**	**4**
Job Description:	Acoustic Fence Inspection		
Date:	31/10/2018		
Time:	9:30		
Inspected by:	Scott Phillips		
Items Inspected:	Height of Planks at Lifestyle Block, Stage 50 Layout		
Other Parties Present:	Shaun Davies, Shaun (Bay Civil), Joel (Bay Civil operator)		
Weather/Conditions:	Hot, no wind, very nice		

Inspection Criteria	Yes/No
- Review previous inspection comments	Yes/No
- Posts and holes are within boundary	-
- String Line is at correct grade (check with lazer level)	-
- 150 face towards boundary	-
- Posts are 2.5m MINIMUM above G.L. stringline	-
- Posts set 1450 apart on centres (+/- 100mm)	-
- minimum 400mm Ø drilled holes	-
- Step downs of fence occur at post closest to lot boundaries	-

Inspection Methods:

Inspected height of rail at 4 locations.
No other inspections went on today (oustide of layout planning)

Other Notes:

- **Joel has dug down** about 100-200mm where Mike S. and Shaun D. thought the steps would go. They had left out a few steps and will have to remove a bit more.
- In order to achieve the correct finish height, **David has been instructed to set out a peg at each step** (which are all located at a lot boundary) which shows the design level of the ground at that point. Shaun will start with the bottom-most board at western side and run this level until it passes under the design height.
- **Concrete has been changed to fibre re-inforced** concrete due to lower post depth at step-ups.
- At step-ups, Shaun was instructed to keep **Holes to a minimum depth of 1.1m** and my need to double up on base plates in order to ensure his posts aren't set too low (from the 2.5 min height).
- **Shaun said he will bring his holes inside the boundary by a slight amount** to ensure the concrete doesn't extend past the boundary. He said this will help him center the posts easier inside the holes.
- **Holes will be dug tomorrow (Thursday 1/11/18)** and will be inspected the following morning (Friday 2/11/18), prior to installation of the posts.
- **Concrete will be poured on Monday, 5/11/18**.

Component	**Posts**	**Timber Planks**	**Battens**	**Concrete**	**Fastening**	**Base Plate**
Material	MSG6 min Tan H4	MSG6 min Tan H3.2	H3.2	17.5 mPa		17.5 mPa Concrete
Dimension Spec	200 x 150 x 3.6m	200 x 50 T&G	150 x 25, 100 x 25			
Dimension Meas.	205 x 155	180 x 42				75 x 190 x 100 GV130 NZS 3622 SG8
Notes						

Inspection Method Details

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    - The average length over a 5 post span needs to be less than 1.509m.
- Ensure that when the fence "steps" down, This occurs at the post nearest to a lot corner

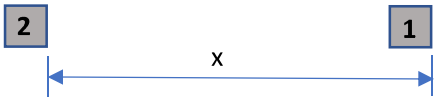
Inspection Fields Explained

Post # is measured from the origin at the first corner. The numbers may get off because it is easy to miscount after looking at so many posts. This can be replaced by lot and post number i.e. Lot 1254 Post 2.

Lot # is just the lot closest to the post. This may end up being ROW, Reserve, or Swale instead of a number

Datum is just where the distance on centre was measured from.

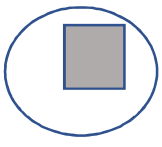
Dist on Centre is the measurement from the outside of one post to the inside of the next (shown below). This is easier than measuring on centre and will be more accurate.



G.L. to Base is calculated after data is entered into the spreadsheet.

G.L to Base = (average post length) - (G.L. to Top)

Post is off-centre is just to mark the when posts are pushed right up to the side of the hole (shown below). Only mark these for the worst ones. It shouldn't be expected that all posts will be centred perfectly.



Post from Bdry is just a measure of the boundary string line to the inside string line.

Notes is just a place to enter any additional info such as where a step down occurs.

Job Location:	Golden Sands	**Inspection #**	**5**
Job Description:	Acoustic Fence Inspection		
Date:	2/11/2018		
Time:	9:30		
Inspected by:	Scott Phillips		
Items Inspected:	Hole depth, fill material in hole, Progress on plank section, Layout		
Other Parties Present:	Shaun D, Joel (Bay C.), Cameron (Davies)		
Weather/Conditions:	Hot, Sunny, Windy from West		

Inspection Criteria	Yes/No
- Review previous inspection comments	Y
- Posts and holes are within boundary	Y
- String Line is at correct grade (check with lazer level)	-
- 150 face towards boundary	-
- Posts are 2.5m MINIMUM above G.L. stringline	-
- Posts set 1450 apart on centres (+/- 100mm)	-
- minimum 400mm Ø drilled holes	Y
- Step downs of fence occur at post closest to lot boundaries	-
- Holes are cleaned out.	Mostly

Inspection Methods:

- Used a staff to measure the hole depths
- Visually inspecected the amount of loose material (sand/soil) in the holes.
- Measured the height of the fence at the lifestyle block

Equipment/Gear

Boots Hat Vest
Tape Staff Sunnys
Hard Hat Clipboard
Pen

Other Notes:

- **Shaun had 102 holes dug** along stage 50, starting from lot 1224 and continuing until lot 1212/1211.
- All of the **holes are within the boundary** line but a few are set back about 100mm further.
- **All of the holes have loose sand up to 100mm deep** at the bottom of the hole. Only one was unacceptable (too shallow and too much loose sand/soil) and they have been instructed to fix this.
- **Cameron laid out the bottom board** stringlline to a level of finished ground based on the first dumpy peg at the southwestern corner of lot 1224. They are basing their design off this peg and leveling from there.
- **Joel came along and explained how they planned to make the steps**. They were given a basic drawing at the last inspection and it is their responsibility to ensure the minimum fence heights are met at the steps.
- **Joel had a good grasp on the project, and is going to assist Shaun periodically to set out the posts.**
- Shaun will install a few posts today and many more on 5/11 with **intent to pour concrete on 6/11.**
- **Many of the posts will not reach the design depth of 1.1m**. The holes will meet that requirement, but where the wall steps up, the post will be lifted out and aditional 175mm. These posts will most likely be fixed with two base plates instead of one. More to come on this in the future.
- **The fence is up to 10 planks along the lifestylfe block**. 3 heights as checks were: 1747, 1755, 1760 (in mm)

Component	**Posts**	**Timber Planks**	**Battens**	**Concrete**	**Fastening**	**Base Plate**
Material	MSG6 min Tan H4	MSG6 min Tan H3.2	H3.2	20 mPa Fibre Re.	Galvanized	17.5 mPa Concrete
Dimension Spec	200 x 150 x 3.6m	200 x 50 T&G	150 x 25, 100 x 25		3.15 x 90	
Dimension Meas.	205 x 155	180 x 42			3.5 x 85	75 x 190 x 100 GV130 NZS 3622 SG8
Notes	Length +/- 30mm	width +/- 5mm Length +/- 10mm			also has red glue on half	

Inspection Method Details

A stingline is strung to represent the boundary line. It is based off our survey boundary pegs
A second stringline is inside the boundary and represents the outer face of the POSTS

- Ensure the inside stringline is a MINIMUM of 100 mm from the Boundary stringline (likely 150mm)
- Ensure that the concrete fill in the holes will not extend past the boundary.
- Ensure that the inside stringline is level (or at correct grade) and at the correct elevation (based off survey pegs). Shaun will help set up the laser and we will check every 10 metres or so.
- Ensure the Posts are set with the 150mm face towards the TEL.
- ~~Measure from the inside stingline to the top of the post (MUST be a MINIMUM of 2.5m)~~
    - ~~if we know this height, we don't need to measure depth~~
- Measure (with a tape) that the posts are on centre at 1.5m.
    - Shaun said he set them to be at 1.48m on centre (my measurements averaged 1.462m. The T & G planks average about 6.035m in length, and so a span over 5 posts must not excede this.
    - The average length over a 5 post span needs to be less than 1.509m.
- Ensure that when the fence "steps" down, This occurs at the post nearest to a lot corner

Inspection Fields Explained

Post # is measured from the origin at the first corner. The numbers may get off because it is easy to miscount after looking at so many posts. This can be replaced by lot and post number i.e. Lot 1254 Post 2.

Lot # is just the lot closest to the post. This may end up being ROW, Reserve, or Swale instead of a number

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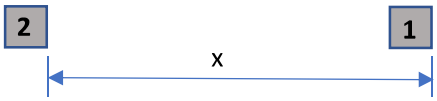

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G.L to Base = (average post length) - (G.L. to Top)

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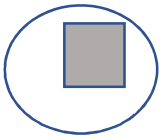


Post from Bdry is just a measure of the boundary string line to the inside string line.

Hole Depth is the depth of the of the hole before the post goes in. The top of the hole may be below the final ground level, so the G.L. to Base will be different than the hole depth. Although they are close.

Hole is Clean is a Yes/No question as to weather the hole is clean of loose dirt pior to post install. We just need to know this for when it comes time to sign off. It's one of our criteria we must check for regulations.

Notes is just a place to enter any additional info such as where a step down occurs.

Job Location:	Golden Sands	**Inspection #**	**6**
Job Description:	Acoustic Fence Inspection		
Date:	7/11/2018		
Time:	9:00 a.m.		
Inspected by:	Scott Phillips		
Items Inspected:	Posts: height/depth, centering, spacing. Holes: depth, clean		
Other Parties Present:	Cameron (Davies), Chris K. (B.C.), Daryl E. (S&L)		
Weather/Conditions:	Hot, Sunny, Windy from West		

Inspection Criteria	Yes/No
- Review previous inspection comments	Y
- Posts and holes are within boundary	Y
- String Line is at correct grade (check with lazer level)	Y
- 150 face towards boundary	Y
- Posts are 2.5m MINIMUM above G.L.	Y
- Posts set at least 1450 apart on centres (+/- 100mm)	Y
- minimum 400mm Ø drilled holes	Y
- Step downs of fence occur at post closest to lot boundaries	Y
- Posts are centered in holes +/- 30mm	N
- Holes a minimum of 1.1m deep and are cleaned out.	Mostly

Inspection Methods:

- Used a staff to measure the hole depths
- Used a tape to measure pole criteria.
- Visually inspecected the amount of loose material (sand/soil) in the holes.
- Measured the height of the fence at the lifestyle block

Equipment/Gear

Boots Hat Vest
Tape Staff Sunnys
Hard Hat Clipboard
Pen

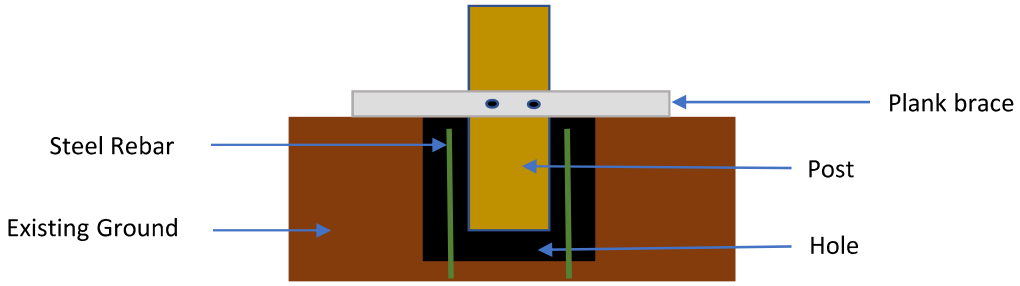
Other Notes:

Main issue of the day: Posts are not deep enough in the ground

- The concrete which was scheduled to come today, was called off so a plan could be developed to shore up shallow posts.
- Many of the posts were only into the hole by roughly 800mm which is only 22% of the post length
- The solution to handle the post depth was to put steel bar in the holes which would add strength to the concrete. This was originally only instructed for the first five posts of a new step up.
- By the end of the day, after much discussion, Mike Speed made the decision to install rebar in every hole. The only holes which will not have rebar, will be the original 153 posts that were set outside the lifestyle block. These posts were already installed at the required depth because the wall is lower and has a cap to bring it up to height.
- If the origianal design would have incorporated 4.2m posts instead of 3.6m posts. all of this would have been avoided. This was originally given as an option, but assumed cost savings resulted in choosing 3.6m posts. In the end, this may be a wash (or worse) due to added steel rebar, labour, higher concrete costs, time resulting from plan changes.

Other events of the day:

- **Shaun had 102 posts ready for concrete** along stage 50, from lot 1224 and continuing until lot 1212/1211.
- An additional 39 holes were also drilled.
- **Many of the newer holes have loose sand/soil up to 300mm deep** at the bottom of the hole. The most recent holes (40) seem to have slightly more than the last round (102). Cameron an Shaun were instructed to compact the soil with the post or by hand before concrete goes in.
- All of **the holes are within the boundary** line but a few are set back about 100mm further than Lifestyle block to help ensure this.
- **Many of the posts were off-centre** and Cameron was instructed to either open up the hole around the post to ensure a minimum of 60mm of concrete surrounds the post, or they can adjust the post left or right (parallel with the boundary offset). Their progress was observed and was deemed satisfactory.
- Cameron mentioned that **they had not used a spotter to help drill the holes** on this section. This is likely why they had so many off-centre posts.
- Shaun was told he could **use 2.4 m battens** in areas where it would allow him to be no more than 75mm above the ground level (measured from the top of the top plank. For longer spans, he must use longer battens.
- There are now **no baseplates attached to the posts**, because they are suspended in the hole by small planks at ground level. When the concrete is poured, it will fill the void in the hole. When the concrete sets up, the plank brace will be removed.



Component	Posts	Timber Planks	Battens	Concrete	Fastening	Base Plate
Material	MSG6 min Tan H4	MSG6 min Tan H3.2	H3.2	20 mPa Fibre Re.	Galvanized	17.5 mPa Concrete
Dimension Spec	200 x 150 x 3.6m	200 x 50 T&G	150 x 25, 100 x 25		3.15 x 90	
Dimension Meas.	205 x 155	180 x 42			3.5 x 85	75 x 190 x 100 GV130 NZS 3622 SG8
Notes	Length +/- 30mm	width +/- 5mm Length +/- 10mm			also has red glue on half	

Inspection Method Details

A stingline is strung to represent the boundary line. It is based off our survey boundary pegs
A second stringline is inside the boundary and represents the outer face of the POSTS

- Ensure the inside stringline is a MINIMUM of 100 mm from the Boundary stringline (likely 150mm)
- Ensure that the concrete fill in the holes will not extend past the boundary.
- Ensure that the inside stringline is level and at the correct elevation (based off survey pegs). Shaun will help set up the laser and we will check every 10 metres or so.
- This stringline represents the top of their bottom board. It must remain level until it steps up. At this point, the step up must not be between 175 and 180mm. A new string line will be strung at this height and must remain level until the next step up or down. This process continues until the end.
- The height measured above this string must be compared to the drawing in order to know the finished height. This height must be above 2467mm at all times.
- Ensure the Posts are set with the 150mm face towards the TEL.
- ~~Measure from the inside stingline to the top of the post (MUST be a MINIMUM of 2.5m)~~
    - ~~if we know this height, we don't need to measure dept~~
- Measure (with a tape) that the posts are on centre at 1.5m.
    - Shaun said he set them to be at 1.48m on centre (my measurements averaged 1.462m. The T & G planks average about 6.035m in length, and so a span over 5 posts must not excede this.
    - The average length over a 5 post span needs to be less than 1.509m.
- Ensure that when the fence "steps" down, This occurs at the post nearest to a lot corner

Inspection Fields Explained

Post # is measured from the origin at the first corner. The numbers may get off because it is easy to miscount after looking at so many posts. This can be replaced by lot and post number i.e. Lot 1254 Post 2.

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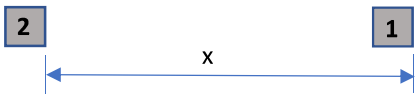

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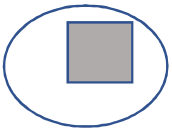


Post from Bdry is just a measure of the boundary string line to the inside string line.

Hole Depth is the depth of the of the hole before the post goes in. The top of the hole may be below the final ground level, so the G.L. to Base will be different than the hole depth. Although they are close.

Job Location:	Golden Sands	**Inspection #**	**7**
Job Description:	Acoustic Fence Inspection		
Date:	9/11/2018		
Time:	11:15		
Inspected by:	Scott Phillips		
Items Inspected:	Post heights and depths in hole		
Other Parties Present:	Shaun , Chris K., Joel (B.C.), Cameron		
Weather/Conditions:	Cloudy, Windy		

Inspection Criteria	Yes/No
- Review previous inspection comments	-
- Posts and holes are within boundary	-
- String Line is at correct grade (check with lazer level)	-
- 150 face towards boundary	-
- Posts are 2.5m MINIMUM above G.L.	-
- Posts set at least 1450 apart on centres (+/- 100mm)	-
- minimum 400mm Ø drilled holes	-
- Step downs of fence occur at post closest to lot boundaries	-
- Posts are centered in holes +/- 30mm	-
- Holes a minimum of 1.1m deep and are cleaned out.	-

Inspection Methods:

- Joel set laser to datum at very first dumpy peg level at lot 1224, then checked each step in relation to that one. We observed post height relative to the Design Surface, and the top of the hole relative to the Design Surface.

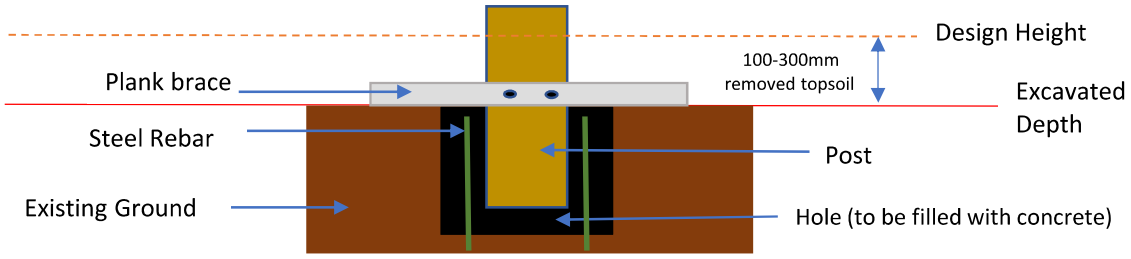
Equipment/Gear

Boots Hat Vest
Tape Staff Sunnys
Hard Hat Clipboard
Pen

Other Notes:

Main issue of the day: Posts are not deep enough in the ground

- This was not so much of an inspection as it was a call out to meet with Chris K. and Shaun. Shaun was very concerned that the posts were not deep enough in the hole and he did not want to install the posts at their current depth due to high risk of failure in the future.
- The posts started out (at lot 1224) with plenty of length recessed into the holes, but eventually, near Lot 1216 westward, they started to be recessed less. The initial check of the top-of-post heights seemed to be close (+/- 30mm) to the design ground levels (not existing ground levels).
- The problem was that the posts were only recessed into the holes by 600-800mm in some places. It has been agreed by Chris, Shaun, Joel and myself that this was due to the topsoil being stripped away by about 100-300mm (roughly) below the design levels before the holes were drilled. They had done this to keep from cutting the bottom board. They excavated (laterally) too far of a distance until the point where the bottom board was completely burried. Since a board is 176.25mm (on average) and they had actually excavated this to meet their goals, far too much topsoil had been removed. Now, even if the post was set to have 900mm of its length in the ground, only 600-800m of it would actually be encased in concrete. Also, becuase some areas already required fill (before topsoil was removed) to meet design height, the post length encased in the hole was even worse off.
- Shaun has ordered 30, 4m posts which will be here on Tuesday (13/11/18) and he ordered another 20 that may or may not show up by then. These will be placed in the areas that have the lowest recessed depth. It is up to him to choose the best placement in order to achieve the correct heights/depths.



Other events of the day:

- Concrete was scheduled for 1:00 and was called off.
- Shaun wants to move the step at Lot 1212/1211 over to 1211/1210, and possibly the step at Lot 1215/1214 over to 1214/1213. He was told that this was only acceptable if he would still be able to achieve the correct finished fence height minimum of 2.5m. That is his risk.
- Concrete was poured into holes up to Lot 1213 - Post 89. Some of these holes were not filled to the top. There was up to at least 100mm recession in the hole to top of concrete in many places.
- Vibration was used in this last pour for the first time on the job.

Component	Posts	Timber Planks	Battens	Concrete	Fastening	Base Plate
Material	MSG6 min Tan H4	MSG6 min Tan H3.2	H3.2	20 mPa Fibre Re.	Galvanized	17.5 mPa Concrete
Dimension Spec	200 x 150 x 3.6m	200 x 50 T&G	150 x 25, 100 x 25		3.15 x 90	
Dimension Meas.	205 x 155	180 x 42			3.5 x 85	75 x 190 x 100 GV130 NZS 3622 SG8
Notes	Length +/- 30mm	width +/- 5mm Length +/- 10mm			also has red glue on half	

Inspection Method Details

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A second stringline is inside the boundary and represents the outer face of the POSTS

- Ensure the inside stringline is a MINIMUM of 100 mm from the Boundary stringline (likely 150mm)
- Ensure that the concrete fill in the holes will not extend past the boundary.
- Ensure that the inside stringline is level and at the correct elevation (based off survey pegs). Shaun will help set up the laser and we will check every 10 metres or so.
- This stringline represents the top of their bottom board. It must remain level until it steps up. At this point, the step up must not be between 175 and 180mm. A new string line will be strung at this height and must remain level until the next step up or down. This process continues until the end.
- The height measured above this string must be compared to the drawing in order to know the finished height. This height must be above 2467mm at all times.
- Ensure the Posts are set with the 150mm face towards the TEL.
- ~~Measure from the inside stingline to the top of the post (MUST be a MINIMUM of 2.5m)~~
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- Measure (with a tape) that the posts are on centre at 1.5m.
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    - The average length over a 5 post span needs to be less than 1.509m.
- Ensure that when the fence "steps" down, This occurs at the post nearest to a lot corner

Inspection Fields Explained

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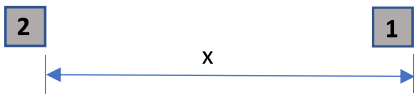

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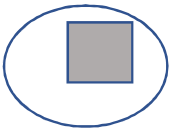

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Hole Depth is the depth of the of the hole before the post goes in. The top of the hole may be below the final ground level, so the G.L. to Base will be different than the hole depth. Although they are close.

Job Location:	Golden Sands	**Inspection #**	**8**
Job Description:	Acoustic Fence Inspection		
Date:	13/11/2018		
Time:	2:45		
Inspected by:	Scott Phillips		
Items Inspected:	Post Hole depths, new materials		
Other Parties Present:			
Weather/Conditions:	sunny, breezy, hot		

Inspection Criteria	Yes/No
- Review previous inspection comments	
- Posts and holes are within boundary	
- String Line is at correct grade (check with lazer level)	
- 150 face towards boundary	
- Posts are 2.5m MINIMUM above G.L.	
- Posts set at least 1450 apart on centres (+/- 100mm)	
- minimum 400mm Ø drilled holes	
- Step downs of fence occur at post closest to lot boundaries	
- Posts are centered in holes +/- 30mm	
- Holes a minimum of 1.1m deep and are cleaned out.	

Inspection Methods:

- Measured hole depths and pole heights with a survey staff.
- Measured loose fill in hole bottoms with staff

Equipment/Gear

Boots Hat Vest
Tape Staff Sunnys
Hard Hat Clipboard
Pen

Other Notes:

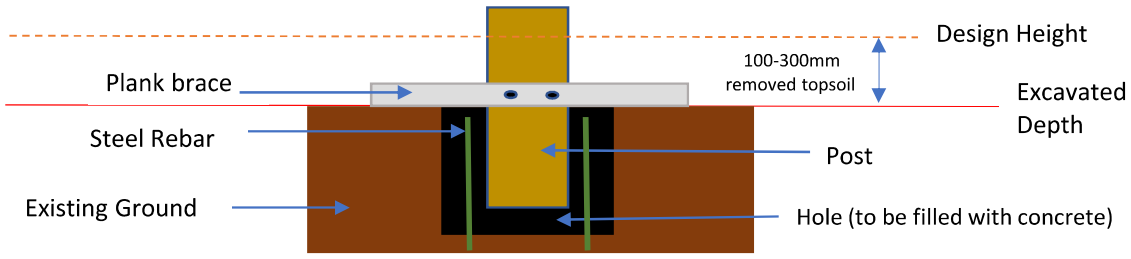
They have dug near where the buried power cable is, but Cameron said they had not been told by Shaun about the cable. I have told Shaun on at least three occaisions (over the phone) that he needs to have a stand over by a power authority before they reach the end of Stage 50. I have also told Chris K. that they need the stand over. They have both told me that they understood and knew where the power cable is. It appears this information was not relayed to the workers. However, Shaun may have instructed them to stop at a given point that was west of the cable. **This MUST be sorted tomorrow**. The lack of communication is unacceptable and represents an extreme safety hazard.

The longer posts were delivered today and there were two sizes as per the following

- **27 Posts at 4.5m**
- **24 Posts at 4.8m**

Last week, they poured about half of the posts that were deep enough. Rebar is continuly being installed in all holes (except for the 4.5/4.8m posts) as per earlier agreement.

Concrete is coming tomorrow (14/11/18) to pour all posts up to Post 172



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Dimension Meas.	205 x 155	180 x 42			3.5 x 85	75 x 190 x 100 GV130 NZS 3622 SG8
Notes	Length +/- 30mm	width +/- 5mm Length +/- 10mm			also has red glue on half	

Inspection Method Details

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- Ensure the inside stringline is a MINIMUM of 100 mm from the Boundary stringline (likely 150mm)
- Ensure that the concrete fill in the holes will not extend past the boundary.
- Ensure that the inside stringline is level and at the correct elevation (based off survey pegs). Shaun will help set up the laser and we will check every 10 metres or so.
- This stringline represents the top of their bottom board. It must remain level until it steps up. At this point, the step up must not be between 175 and 180mm. A new string line will be strung at this height and must remain level until the next step up or down. This process continues until the end.
- The height measured above this string must be compared to the drawing in order to know the finished height. This height must be above 2467mm at all times.
- Ensure the Posts are set with the 150mm face towards the TEL.
- ~~Measure from the inside stingline to the top of the post (MUST be a MINIMUM of 2.5m)~~
    - ~~if we know this height, we don't need to measure dept~~
- Measure (with a tape) that the posts are on centre at 1.5m.
    - Shaun said he set them to be at 1.48m on centre (my measurements averaged 1.462m. The T & G planks average about 6.035m in length, and so a span over 5 posts must not excede this.
    - The average length over a 5 post span needs to be less than 1.509m.
- Ensure that when the fence "steps" down, This occurs at the post nearest to a lot corner

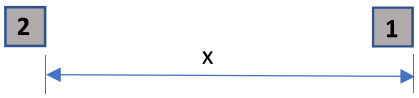
Inspection Fields Explained

Post # is measured from the origin at the first corner. The numbers may get off because it is easy to miscount after looking at so many posts. This can be replaced by lot and post number i.e. Lot 1254 Post 2.

Lot # is just the lot closest to the post. This may end up being ROW, Reserve, or Swale instead of a number

Datum is just where the distance on centre was measured from.

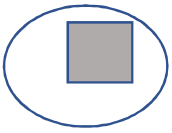
Dist on Centre is the measurement from the outside of one post to the inside of the next (shown below). This is easier than measuring on centre and will be more accurate.



G.L. to Base is calculated after data is entered into the spreadsheet.

G.L to Base = (average post length) - (G.L. to Top)

Post is off-centre is just to mark the when posts are pushed right up to the side of the hole (shown below). Only mark these for the worst ones. It shouldn't be expected that all posts will be centred perfectly.



Post from Bdry is just a measure of the boundary string line to the inside string line.

Hole Depth is the depth of the of the hole before the post goes in. The top of the hole may be below the final ground level, so the G.L. to Base will be different than the hole depth. Although they are close.

Job Location:	Golden Sands	**Inspection #**	**9**
Job Description:	Acoustic Fence Inspection		
Date:	14/11/2018		
Time:	9:00-12:30		
Inspected by:	Scott Phillips		
Items Inspected:	Post off-sets, Post heights: top to string, top to concrete, bottom to hole top		
Other Parties Present:	Shaun, Cameron		
Weather/Conditions:	Overcast and windy, Cool and wind from the South		

Inspection Criteria	Yes/No
- Review previous inspection comments	Y
- Posts and holes are within boundary	-
- String Line is at correct grade (check with lazer level)	Y
- 150 face towards boundary	Y
- Posts are 2.5m MINIMUM above G.L.	Y
- Posts set at least 1450 apart on centres (+/- 100mm)	Y
- minimum 400mm Ø drilled holes	Y
- Step downs of fence occur at post closest to lot boundaries	Y
- Posts are centered in holes +/- 30mm	Some are off
- Holes a minimum of 1.1m deep and are cleaned out.	Not Clean/Compacted

Inspection Methods:

- Tape to measure post tops to stringline, post bottom to hole top, post off-sets
- Staff to measure post top to concrete

Equipment/Gear

Boots Hat Vest
Tape Staff Sunnys
Hard Hat Clipboard

Other Notes:

- Shaun has talked with Chris K about the location of the buried power cable near lot 25. **Shaun said Chris told him that the power cable is about 20m east of where they stopped digging**. Shaun said they will have the cable located by a power authority before they begin digging any further. Shaun has been instructed to coordinate this with Chris K. and/or Mike Speed of Bay Civil.
- **Other safety issues were discussed in office with Daryl**. Topics centred around the buried **power cable** and cutting of the post tops. The cable issue will need sorting between Bay Civil (Chris or Mike or ?) Shaun, and a power authority. **Cut-offs of posts tops** may be over 1m in length and represent a hazard as they fall. Shaun may need to secure these longer sections to that they do not create a falling hazard. **Dust inhalation** may be avoided by dealing with wind direction. Shaun has mentioned that he will be putting up some **scaffolding** and Daryl said they he will not need special approval due to the short height.
- Where the concrete has previously been poured (posts 1-89) measurements from the top of the concrete to the top of the posts were taken. This measurement was used to figure how much post was actually surrounded by concrete. It was found that **many posts have less than 600mm imbedded in the concrete**, and in some cases, less than 500mm or 400mm. This is unacceptable. A fix will be need to be designed for these problem areas. This poor depth resulted from the following causes:
    - First, **over-excavation of topsoil caused the top of the hole to be reduced by roughly 150mm-300mm** from the designed surface levels. This reduces concrete surround by that same amount.
    - Second, **many of the holes have not been completely filled with concrete**. The depth from the top of the hole, down to the top of the concrete is over 200mm in many instances.

- **The original design for the posts did not allow for much wiggle room in post depths**. The design called for a bare minimum of a 2.5m finished height. At a step up, this must stretch to a minimum height of 2.68m (2.5m + 180mm). Since it is unreasonable to hit these marks exactly, the builder had to build up slightly higher than this in order to achieve the minimum height (at any point) of 2.5m. Another consideration is that the fence needs to sit slightly into the ground to avoid gaps. Even if the bare minimums were achieved to perfection, this would still only leave 920mm of the post in the ground. This would also not leave any topsoil available for grass which is needed to conceal the posts when finished.
    - The reality of this design should have expected, at best, to have 825-875mm of post encased in concrete. Where the ground was over-excavated (-200mm), and the holes not filled properly (-200mm), this leaves far too little of post encased in concrete. It is believed that the lack of wiggle room due to design problems was solved by adding rebar into the holes and upgrading the strength of the concrete from 17.5 mPA to 20 mPA fibre re-enforced. Longer posts were also added to the design where the "step-ups" occurred which helped with the heights at the worst spots.
    - The actual construction of the fence has rendered the fence unsatisfactory in many places. The contractor has added in an extra -400mm of error due to their construction methods.
- **Shaun's crew has not been compacting the loose soil** at the bottom of the hole as told. Cameron confirmed this. Last week, Chris (from Davies) said he was compacting some of the previously poured holes as he was going along opening up the holes (to ensure full encasement of the posts). Once again, the need for compaction was mentioned to Cameron and they need to make an effort to reduce the settling of the wall.
- **Shaun said he believes he can bend the boards when it comes to the slight change of direction at lot 25**. His has a few other options if this doesn't work.
- **The building exemption was approved today** and they can now build the fence up to the correct height. Scott P. has notified Shaun by phone conversation of this.

Component	Posts	Timber Planks	Battens	Concrete	Fastening	Base Plate
Material	MSG6 min Tan H4	MSG6 min Tan H3.2	H3.2	20 mPa Fibre Re.	Galvanized	20 mPa Fibre Re.
Dimension Spec	200 x 150 x 3.6, 4.5, 4.8	200 x 50 T&G	150 x 25, 100 x 25		3.15 x 90	
Dimension Meas.	205 x 155	180 x 42			3.5 x 85	
Notes	Length +/- 30mm	width +/- 5mm Length +/- 10mm			also has red glue on half	

Inspection Method Details

A stingline is strung to represent the boundary line. It is based off our survey boundary pegs
A second stringline is inside the boundary and represents the outer face of the POSTS

- Ensure the inside stringline is a MINIMUM of 100 mm from the Boundary stringline (likely 150mm)
- Ensure that the concrete fill in the holes will not extend past the boundary.
- Ensure that the inside stringline is level and at the correct elevation (based off survey pegs). Shaun will help set up the laser and we will check every 10 metres or so.
- This stringline represents the top of their bottom board. It must remain level until it steps up. At this point, the step up must not be between 175 and 180mm. A new string line will be strung at this height and must remain level until the next step up or down. This process continues until the end.
- The height measured above this string must be compared to the drawing in order to know the finished height. This height must be above 2467mm at all times.
- Ensure the Posts are set with the 150mm face towards the TEL.
- ~~Measure from the inside stingline to the top of the post (MUST be a MINIMUM of 2.5m)~~
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- Measure (with a tape) that the posts are on centre at 1.5m.
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    - The average length over a 5 post span needs to be less than 1.509m.
- Ensure that when the fence "steps" down, This occurs at the post nearest to a lot corner

Inspection Fields Explained

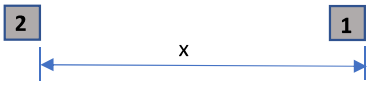
Post # is measured from the origin at the first corner. The numbers may get off because it is easy to miscount after looking at so many posts. This can be replaced by lot and post number i.e. Lot 1254 Post 2.

Lot # is just the lot closest to the post. This may end up being ROW, Reserve, or Swale instead of a number

Long Post identifies if the post used was one of the 4.5-4.8m posts that were delivered on (14/11/18)

Hole Not Filled refers to whether or not the concrete in the hole come up to the top of the hole, i.e. "is the hole completely filled with concrete? "

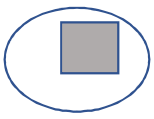
Dist on Centre is the measurement from the outside of one post to the inside of the next (shown below). This is easier than measuring on centre and will be more accurate.



Post Top to Concrete is the measure from the top of the post to the top of the concrete in the hole. This can be used to calculate how much of the post is actually encased in concrete.

S.L. to Top (stringline to top) is a measure taken before the concrete is poured. It is measured from the stringline (nearest the post) to the top of the post. This stringline varies as the contract has adjusted the bottom step. The stringline varies in reference to the top or bottom of the bottom board. This can be figured by observing the data and relating it to the plans. The jump should be about 180mm (the height of one board) excluding the tongue length.

Post is off-centre is just to mark the when posts are pushed right up to the side of the hole (shown below). Only mark these for the worst ones. It shouldn't be expected that all posts will be centred perfectly.



Post from Bdry is just a measure of the boundary string line to the inside string line.

Hole Depth is the depth of the of the hole before the post goes in. The top of the hole may be below the final ground level, so the G.L. to Base will be different than the hole depth. Although they are close.

Hole is Clean is a Yes/No question as to whether the hole is clean of loose dirt prior to post install. We just need to know this for when it comes time to sign off. It's one of our criteria we must check for regulations.

Job Location:	Golden Sands	**Inspection #**	**10**
Job Description:	Acoustic Fence Inspection		
Date:	19/11/2018		
Time:	2:30-4:30		
Inspected by:	Scott Phillips		
Items Inspected:	Post off-sets, Post heights: top to string, top to concrete, bottom to hole top Finished fence heights (and post "overhang"), cap options, power cable		
Other Parties Present:			
Weather/Conditions:			

Inspection Criteria	Yes/No
- Review previous inspection comments	Y
- Posts and holes are within boundary	-
- String Line is at correct grade (check with laser level)	-
- 150 face towards boundary	Y
- Posts are 2.5m MINIMUM above G.L.	Y
- Posts set at least 1450 apart on centres (+/- 100mm)	Y
- minimum 400mm Ø drilled holes	Y
- Step downs of fence occur at post closest to lot boundaries	Y
- Posts are centred in holes +/- 30mm	mostly
- Holes a minimum of 1.1m deep and are cleaned out.	y
- Power cable properly identified	wasn't found, not a problem now

Inspection Methods:

- Staff to measure hole depths and distance from top of concrete to top of post.
- Tape to measure distances between posts.
- Tape to measure board height at lifestyle block and to mesure post tops above 14th board.

Equipment/Gear

Boots Hat Vest
Tape Staff Sunnys
Hard Hat Clipboard

Stage 49/50/56

- They poured concrete up to post #218 last week. Posts are in holes up to hole#221. Holes were dug up to hole #249 by the time I left. They will dig more holes and install posts for the next two days (Tues, & Wed.) and will pour concrete on Thursday or Friday. Shaun will call me on Wednesday to keep me up to date.
- Concrete that was poured was poured flush with hole top. We are getting a bit more post imbedded in the concrete now that we were earlier on in Stage 50 (where Shaun had kept the concrete down a bit lower.
- Shaun mentioned that they might possibly pull every third post in the earlier parts of stage 50 (where only 400-600mm) of post was imbedded in concrete. They would replace these with longer posts. However, Shaun also said that there are no more available long of this type on the North Island. This would mean he wouldn't have enough longer posts on the future section. He knows this, but still is thinking of going ahead with this plan. He has already used 22 of his 51 longer posts, so he only has 29 left.

Lifestyle block with T&G planks/grooves going in

- The first 90m of this section has 14 boards installed to a rough height of 2450mm.
- First post of wall at corner only has 600mm imbedded in concrete, the rest are close to 1000mm imbedded in concrete (for the lifestyle block only.
- They have installed the boards up to 14 high for the first 90 metres along the lifestyle block. We need to make a decision on how to “cap” the fence. Shaun suggests 250mm x 45mm board.
- Some of the boards have gaps up to 10mm between them while other boards are butted tight. These gaps are not bigger than the tongue of the board but the tongue is pulled out about 10mm from the groove in spots. This may reduce the acoustic performance of the fence.
- Shaun said that he may try and put a 50-100mm rib below the bottom board in spots to help with the finish heights. His idea only works if the dirt is not filled in against the fence as much as was originally planned.
- He actually has just enough height left on his posts to be able to put a 50mm rip at the top if he wants. The posts are generally 100mm above the top of the 14th board. In a few spots it is 50mm.
- In a few places, the boards are not nailed flush to the posts. They need to be hammered flush
- More pictures were taken today. Pictures were also taken last visit.

Component	Posts	Timber Planks	Battens	Concrete	Fastening	Base Plate
Material	MSG6 min Tan H4	MSG6 min Tan H3.2	H3.2	20 mPa Fibre Re.	Galvanized	20 mPa Fibre Re.
Dimension Spec	200 x 150 x 3.6, 4.5, 4.8	200 x 50 T&G	150 x 25, 100 x 25		3.15 x 90	
Dimension Meas.	205 x 155	180 x 42			3.5 x 85	
Notes	Length +/- 30mm	width +/- 5mm Length +/- 10mm			also has red glue on half	

Inspection Method Details

A stingline is strung to represent the boundary line. It is based off our survey boundary pegs
A second stringline is inside the boundary and represents the outer face of the POSTS

- Ensure the inside stringline is a MINIMUM of 100 mm from the Boundary stringline (likely 150mm)
- Ensure that the concrete fill in the holes will not extend past the boundary.
- Ensure that the inside stringline is level and at the correct elevation (based off survey pegs). Shaun will help set up the laser and we will check every 10 metres or so.
- This stringline represents the top of their bottom board. It must remain level until it steps up. At this point, the step up must not be between 175 and 180mm. A new string line will be strung at this height and must remain level until the next step up or down. This process continues until the end.
- The height measured above this string must be compared to the drawing in order to know the finished height. This height must be above 2467mm at all times.
- Ensure the Posts are set with the 150mm face towards the TEL.
- Measure (with a tape) that the posts are on centre at 1.5m.
    - Shaun said he set them to be at 1.48m on centre (my measurements averaged 1.462m. The T & G planks average about 6.035m in length, and so a span over 5 posts must not exceed this.
    - The average length over a 5 post span needs to be less than 1.509m.
- Ensure that when the fence "steps" down, This occurs at the post nearest to a lot corner

Inspection Fields Explained

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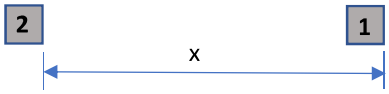
Lot # is just the lot closest to the post. This may end up being ROW, Reserve, or Swale instead of a number

Long Post identifies if the post used was one of the 4.5-4.8m posts that were delivered on (14/11/18)

Hole Not Filled refers to whether or not the concrete in the hole come up to the top of the hole, i.e. "is the hole completely filled with concrete? "

Dist on Centre is the measurement from the outside of one post to the inside of the next (shown below). This is easier than measuring on centre and will be more accurate.



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S.L. to Top (stringline to top) is a measure taken before the concrete is poured. It is measured from the stringline (nearest the post) to the top of the post. This stringline varies as the contract has adjusted the bottom step. The stringline varies in reference to the top or bottom of the bottom board. This can be figured by observing the data and relating it to the plans. The jump should be about 180mm (the height of one board) excluding the tongue length.

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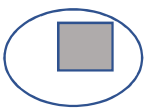

Post from Bdry is just a measure of the boundary string line to the inside string line.

Hole Depth is the depth of the of the hole before the post goes in. The top of the hole may be below the final ground level, so the G.L. to Base will be different than the hole depth. Although they are close.

Hole is Clean is a Yes/No question as to whether the hole is clean of loose dirt prior to post install. We just need to know this for when it comes time to sign off. It's one of our criteria we must check for regulations.

Notes is just a place to enter any additional info such as where a step down occurs.

Job Location:	Golden Sands	**Inspection #**	**11**
Job Description:	Acoustic Fence Inspection		
Date:	27/11/2018		
Time:	3:30-4:30		
Inspected by:	Scott Phillips		
Items Inspected:	General Progress, post offsets, concrete depth in hole.		
Other Parties Present:	Cameron		
Weather/Conditions:	Windy (from south), overcast, light sprinkle (rain)		

Inspection Criteria	Yes/No
- Review previous inspection comments	Y
- Posts and holes are within boundary	
- String Line is at correct grade (check with laser level)	
- 150 face towards boundary	Y
- Posts are 2.5m MINIMUM above G.L.	Y
- Posts set at least 1450 apart on centres (+/- 100mm)	N
- minimum 400mm Ø drilled holes	Y
- Step downs of fence occur at post closest to lot boundaries	Y
- Posts are centred in holes +/- 30mm	
- Holes a minimum of 1.1m deep and are cleaned out.	N

Inspection Methods:

- Tape to measure centers and a few post tops to concrete.
- Visual record of progress.

Equipment/Gear

Boots Hat Vest
Tape Staff Sunnys
Hard Hat Clipboard

Stage 49/50/56

- I only had an hour to look at the job and talk with Cameron today. I will do a more thorough inspection later in the week.
- Concrete has been poured up to post 284 (up to 218 at last inspection). Half of this new pour was done today, half was done last week.
- Posts are in the holes up to post 299 with braces and loosely place up to hole 320.
- Instant issues that I noticed were:
    - concrete not filled to top of holes in new pours (about 200mm below hole top)
        - Shaun has repeatedly been made aware that we need as much post imbedded in the concrete as possible. This means filling the holes better. He is cutting corners to avoid cutting any angles of the bottom board. This means he is sacrificing the amount of post embedded in the concrete.
        - Shaun said he would string a line to represent the bottom of the bottom board. He was going to use this to keep his concrete at (or 180mm below in spots) the line. In some places, I saw that it was up to 400mm below this line. I only was able to measure a few posts. Some of these posts only had 650mm of post in the concrete. This is avoidable in the areas where the topsoil wasn't stripped, but they have reverted back to the shallow embedment depths.
    - Spacing of posts varied quite a bit
    - Some posts were badly out of plumb
- I only talked to Shaun for a few seconds around noon when I went to catch up with him. I was on the site to perform pressure testing on stage 49/50. I haven't seen Shaun present as much over my last few visits when compared to my first visits.
- Some new, younger guys have been hired by Shaun throughout the job.
- Shaun has been giving direction to Cameron, and Cameron is pretty much in charge of the installation. I think he is doing his best with the information given, but due to the quick pace of the project, some communication seems to have gotten lost and some items may have been overlooked.
- The concrete that was poured today was held up to 200mm below the top of the hole. This makes no sense.

Lifestyle block

- I was told by Cameron that they have the entire section up to the 14 board height. Earlier in the day, I saw that they were close to being finished to this level
- We/Bay Civil/Bluehaven need to figure out what is acceptable regarding a cap for this situation before Shaun can finish the fence.

Component	Posts	Timber Planks	Battens	Concrete	Fastening	Base Plate
Material	MSG6 min Tan H4	MSG6 min Tan H3.2	H3.2	20 mPa Fibre Re.	Galvanized	20 mPa Fibre Re.
Dimension Spec	200 x 150 x 3.6, 4.5, 4.8	200 x 50 T&G	150 x 25, 100 x 25		3.15 x 90	
Dimension Meas.	205 x 155	180 x 42			3.5 x 85	
Notes	Length +/- 30mm	width +/- 5mm Length +/- 10mm			also has red glue on half	

Inspection Method Details

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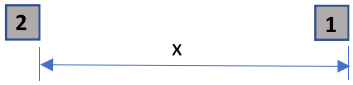

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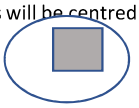


Post from Bdry is just a measure of the boundary string line to the inside string line.

Hole Depth is the depth of the of the hole before the post goes in. The top of the hole may be below the final ground level, so the G.L. to Base will be different than the hole depth. Although they are close.

Hole is Clean is a Yes/No question as to whether the hole is clean of loose dirt prior to post install. We just need to know this for when it comes time to sign off. It's one of our criteria we must check for regulations.

Notes is just a place to enter any additional info such as where a step down occurs.

Job Location:	Golden Sands	**Inspection #**	**12**
Job Description:	Acoustic Fence Inspection		
Date:	4/12/2018		
Time:	1:00-2:00		
Inspected by:	Scott Phillips		
Items Inspected:			
Other Parties Present:			
Weather/Conditions:			

Inspection Criteria	Yes/No
- Review previous inspection comments	N
- Posts and holes are within boundary	-
- String Line is at correct grade (check with laser level)	-
- 150 face towards boundary	-
- Posts are 2.5m MINIMUM above G.L.	-
- Posts set at least 1450 apart on centres (+/- 100mm)	-
- minimum 400mm Ø drilled holes	-
- Step downs of fence occur at post closest to lot boundaries	-
- Posts are centred in holes +/- 30mm	-
- Holes a minimum of 1.1m deep and are cleaned out.	-
	-

Inspection Methods:

- This was just a quick vist to observe progress and chat with the guys about progress.

Equipment/Gear

Boots Hat Vest
Tape Staff Sunnys
Hard Hat Clipboard

Stage 49/50/56

- The weather has slowed progress quite a bit.
- Shaun is not planning on installing many more posts for a while. He is focusing on building up the boards and finishing off the Lifestyle block. Therefore, with progress slowed down, the site visits are less frequent for a while.
- We still do not have any battens on site.
- They have poured about 40+ additional holes with concrete since last visit. At first glance, this all looks acceptable. The concrete is filling up the holes to the top. The problem section mentioned in the last report was only at the bend in the fence, which only incorporated about 15 posts. However, as I measured a couple of these spots, I saw that there are some posts that have only 450mm of post imbedded in concrete. Shaun acknowledged this. A few of these posts may need to be replaced.
- Shaun's crew has already replaced 8 posts in previous trouble areas (near the first step-ups oustide stage 50) where there was not enough post in concrete. I will verify which ones these were at the next visit. They now only have about 20 of the long posts left.
- Chris K. has advised Shaun on some new methods of finding correct heights. I've talked with both Shaun and Chris said that we need to maintain as much post in the concrete as possible, and if that means that we need to cut a few "bottom boards," then Shuan should do this.
- Things seem to be going smoother through this stage.
- Cameron has been putting step-ups in the locations as per the plans.

Lifestyle block

- We have instructed Shaun to put a 75mm rip along the top to reach the proper height. We have enough of the post above the 2500mm mark for this method to work.

Component	Posts	Timber Planks	Battens	Concrete	Fastening	Base Plate
Material	MSG6 min Tan H4	MSG6 min Tan H3.2	H3.2	20 mPa Fibre Re.	Galvanized	20 mPa Fibre Re.
Dimension Spec	200 x 150 x 3.6, 4.5, 4.8	200 x 50 T&G	150 x 25, 100 x 25		3.15 x 90	
Dimension Meas.	205 x 155	180 x 42			3.5 x 85	
Notes	Length +/- 30mm	width +/- 5mm Length +/- 10mm			also has red glue on half	

Inspection Method Details

A stingline is strung to represent the boundary line. It is based off our survey boundary pegs
A second stringline is inside the boundary and represents the outer face of the POSTS

- Ensure the inside stringline is a MINIMUM of 100 mm from the Boundary stringline (likely 150mm)
- Ensure that the concrete fill in the holes will not extend past the boundary.
- Ensure that the inside stringline is level and at the correct elevation (based off survey pegs). Shaun will help set up the laser and we will check every 10 metres or so.
- This stringline represents the top of their bottom board. It must remain level until it steps up. At this point, the step up must not be between 175 and 180mm. A new string line will be strung at this height and must remain level until the next step up or down. This process continues until the end.
- The height measured above this string must be compared to the drawing in order to know the finished height. This height must be above 2467mm at all times.
- Ensure the Posts are set with the 150mm face towards the TEL.
- Measure (with a tape) that the posts are on centre at 1.5m.
    - Shaun said he set them to be at 1.48m on centre (my measurements averaged 1.462m. The T & G planks average about 6.035m in length, and so a span over 5 posts must not exceed this.
    - The average length over a 5 post span needs to be less than 1.509m.
- Ensure that when the fence "steps" down, This occurs at the post nearest to a lot corner

Inspection Fields Explained

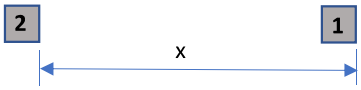
Post # is measured from the origin at the first corner. The numbers may get off because it is easy to miscount after looking at so many posts. This can be replaced by lot and post number i.e. Lot 1254 Post 2.

Lot # is just the lot closest to the post. This may end up being ROW, Reserve, or Swale instead of a number

Long Post identifies if the post used was one of the 4.5-4.8m posts that were delivered on (14/11/18)

Hole Not Filled refers to whether or not the concrete in the hole come up to the top of the hole, i.e. "is the hole completely filled with concrete? "

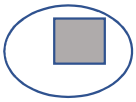
Dist on Centre is the measurement from the outside of one post to the inside of the next (shown below). This is easier than measuring on centre and will be more accurate.



Post Top to Concrete is the measure from the top of the post to the top of the concrete in the hole. This can be used to calculate how much of the post is actually encased in concrete.

S.L. to Top (stringline to top) is a measure taken before the concrete is poured. It is measured from the stringline (nearest the post) to the top of the post. This stringline varies as the contract has adjusted the bottom step. The stringline varies in reference to the top or bottom of the bottom board. This can be figured by observing the data and relating it to the plans. The jump should be about 180mm (the height of one board) excluding the tongue length.

Post is off-centre is just to mark the when posts are pushed right up to the side of the hole (shown below). Only mark these for the worst ones. It shouldn't be expected that all posts will be centred perfectly.



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Hole Depth is the depth of the of the hole before the post goes in. The top of the hole may be below the final ground level, so the G.L. to Base will be different than the hole depth. Although they are close.

Hole is Clean is a Yes/No question as to whether the hole is clean of loose dirt prior to post install. We just need to know this for when it comes time to sign off. It's one of our criteria we must check for regulations.

Notes is just a place to enter any additional info such as where a step down occurs.

Job Location:	Golden Sands	**Inspection #**	**13**
Job Description:	Acoustic Fence Inspection		
Date:	11/12/2018		
Time:	1:00-4:00		
Inspected by:	Scott Phillips		
Items Inspected:	All progress to date of entire job. Space under bottom board. Post heights and spacings. Board and nail patterns. Material storage		
Other Parties Present:			
Weather/Conditions:			

Inspection Criteria	Yes/No
- Review previous inspection comments	Y
- Posts and holes are within boundary	-
- String Line is at correct grade (check with laser level)	-
- 150 face towards boundary	Y
- Posts are 2.5m MINIMUM above G.L.	Y
- Posts set at least 1450 apart on centres (+/- 100mm)	lots of variation
- minimum 400mm Ø drilled holes	-
- Step downs of fence occur at post closest to lot boundaries	Y
- Posts are centred in holes +/- 30mm	-
- Holes a minimum of 1.1m deep and are cleaned out.	-
	-

Inspection Methods:

- LOTS of pictures were taken today.
- measured posts and generally all progress on site.

Equipment/Gear

Boots Hat Vest
Tape Staff Sunnys
Hard Hat Clipboard

Main issue of the day:

Shaun's crew has left a large amount of boards laying in the grass and mud, unsupported, un-covered, and mostly just piled up. They are warping and a substantial amount of material will likey be ruined because of this. If Shaun bills us for more boards, he might first need to pay for what was wasted if this was due to negligence.

Lifestyle Block:

- This entire section is complete except for the battens & trimming of post tops. Paint will be done by separate contractor.
- Board pattern is irregular. They are not staggered at even ratios. This shouldn't matter as the battens cover the joints. Otherwise the joints are very random for the boards.
- Bottom boards only have 2 nails instead of 3. Smallest windloads are at the bottom so is probably okay.
- Top 75mm has 2 nails to fasten.
- Ground is not level and earthworks will be needed around base.
- Shaun may need to put some rips in along the bottom where he is too far out of the ground.

Stages 49/50/56:

- Posts that were replaced by longer posts have been identified as 18, 20, 22, 49, 51, 53, 55 and possibly 16.
- There are long stretches where the embedment depth of the post in concrete is around 700mm (I only measured a total of 5 posts in this section but they were all near 700. By visually looking at the post heights, they are all very similar in height, therefore it is safe to say that nearly all of the posts are embedded by about 700-750mm in concrete
- A longer post was used at the bend near lot 25. All the boards start/stop again from this point. There is no offset. Shaun was told this was an acceptable option
- Boards are up to finished height for most of the length up to lot 25 (starting from the swale)
- Ground is very unlevel and some earthworks may be needed at the bottom of the fence. On the TEL side, the ground level is quite high in spots.

Component	Posts	Timber Planks	Battens	Concrete	Fastening	Base Plate
Material	MSG6 min Tan H4	MSG6 min Tan H3.2	H3.2	20 mPa Fibre Re.	Galvanized	20 mPa Fibre Re.
Dimension Spec	200 x 150 x 3.6, 4.5, 4.8	200 x 50 T&G	150 x 25, 100 x 25		3.15 x 90	
Dimension Meas.	205 x 155	180 x 42			3.5 x 85	
Notes	Length +/- 30mm	width +/- 5mm Length +/- 10mm			also has red glue on half	

Inspection Method Details

A stingline is strung to represent the boundary line. It is based off our survey boundary pegs
A second stringline is inside the boundary and represents the outer face of the POSTS

- Ensure the inside stringline is a MINIMUM of 100 mm from the Boundary stringline (likely 150mm)
- Ensure that the concrete fill in the holes will not extend past the boundary.
- Ensure that the inside stringline is level and at the correct elevation (based off survey pegs). Shaun will help set up the laser and we will check every 10 metres or so.
- This stringline represents the top of their bottom board. It must remain level until it steps up. At this point, the step up must not be between 175 and 180mm. A new string line will be strung at this height and must remain level until the next step up or down. This process continues until the end.
- The height measured above this string must be compared to the drawing in order to know the finished height. This height must be above 2467mm at all times.
- Ensure the Posts are set with the 150mm face towards the TEL.
- Measure (with a tape) that the posts are on centre at 1.5m.
    - Shaun said he set them to be at 1.48m on centre (my measurements averaged 1.462m. The T & G planks average about 6.035m in length, and so a span over 5 posts must not exceed this.
    - The average length over a 5 post span needs to be less than 1.509m.
- Ensure that when the fence "steps" down, This occurs at the post nearest to a lot corner

Inspection Fields Explained

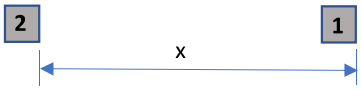
Post # is measured from the origin at the first corner. The numbers may get off because it is easy to miscount after looking at so many posts. This can be replaced by lot and post number i.e. Lot 1254 Post 2.

Lot # is just the lot closest to the post. This may end up being ROW, Reserve, or Swale instead of a number

Long Post identifies if the post used was one of the 4.5-4.8m posts that were delivered on (14/11/18)

Hole Not Filled refers to whether or not the concrete in the hole come up to the top of the hole, i.e. "is the hole completely filled with concrete? "

Dist on Centre is the measurement from the outside of one post to the inside of the next (shown below). This is easier than measuring on centre and will be more accurate.



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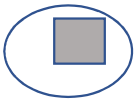
Post is off-centre is just to mark the when posts are pushed right up to the side of the hole (shown below). Only mark these for the worst ones. It shouldn't be expected that all posts will be centred perfectly.



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Hole Depth is the depth of the of the hole before the post goes in. The top of the hole may be below the final ground level, so the G.L. to Base will be different than the hole depth. Although they are close.

Hole is Clean is a Yes/No question as to whether the hole is clean of loose dirt prior to post install. We just need to know this for when it comes time to sign off. It's one of our criteria we must check for regulations.

Notes is just a place to enter any additional info such as where a step down occurs.

Job Location:	Golden Sands	**Inspection #**	**14**
Job Description:	Acoustic Fence Inspection		
Date:	17/12/2018		
Time:	11:00-11:30		
Inspected by:	Scott Phillips		
Items Inspected:	Post tops being cut off .		
Other Parties Present:			
Weather/Conditions:			

Inspection Criteria	Yes/No
- Review previous inspection comments	-
- Posts and holes are within boundary	-
- String Line is at correct grade (check with laser level)	-
- 150 face towards boundary	-
- Posts are 2.5m MINIMUM above G.L.	-
- Posts set at least 1450 apart on centres (+/- 100mm)	-
- minimum 400mm Ø drilled holes	-
- Step downs of fence occur at post closest to lot boundaries	-
- Posts are centred in holes +/- 30mm	-
- Holes a minimum of 1.1m deep and are cleaned out.	-
	-

Inspection Methods:

- Very brief 15 minute catchup and walkover with the guys on site.

Equipment/Gear

Boots Hat Vest
Tape Staff Sunnys
Hard Hat Clipboard

LifeStyle Block

- I was out for a rising main test for pump station 51 and noticed that the guys were cutting the tops of the posts off. Therefore, I went over to talk to them and see what the finished product looked like (minus battens and paint)
- Cameron said that they tried cutting the tops off with a circular saw and hand saws before grabbing the chainsaw. The chainsaw was making very quick work of things
- They were also using an electric planer to put a small 5-10mm bevel at the top of the post to clean up the cut a bit. I think that it looked fine.
- They will not be installing any more posts or digging any more holes until after the new year.
- This is the last inspection of 2018.

Component	Posts	Timber Planks	Battens	Concrete	Fastening	Base Plate
Material	MSG6 min Tan H4	MSG6 min Tan H3.2	H3.2	20 mPa Fibre Re.	Galvanized	20 mPa Fibre Re.
Dimension Spec	200 x 150 x 3.6, 4.5, 4.8	200 x 50 T&G	150 x 25, 100 x 25		3.15 x 90	
Dimension Meas.	205 x 155	180 x 42			3.5 x 85	
Notes	Length +/- 30mm	width +/- 5mm Length +/- 10mm			also has red glue on half	

Inspection Method Details

A stingline is strung to represent the boundary line. It is based off our survey boundary pegs
A second stringline is inside the boundary and represents the outer face of the POSTS

- Ensure the inside stringline is a MINIMUM of 100 mm from the Boundary stringline (likely 150mm)
- Ensure that the concrete fill in the holes will not extend past the boundary.
- Ensure that the inside stringline is level and at the correct elevation (based off survey pegs). Shaun will help set up the laser and we will check every 10 metres or so.
- This stringline represents the top of their bottom board. It must remain level until it steps up. At this point, the step up must not be between 175 and 180mm. A new string line will be strung at this height and must remain level until the next step up or down. This process continues until the end.
- The height measured above this string must be compared to the drawing in order to know the finished height. This height must be above 2467mm at all times.
- Ensure the Posts are set with the 150mm face towards the TEL.
- Measure (with a tape) that the posts are on centre at 1.5m.
    - Shaun said he set them to be at 1.48m on centre (my measurements averaged 1.462m. The T & G planks average about 6.035m in length, and so a span over 5 posts must not exceed this.
    - The average length over a 5 post span needs to be less than 1.509m.
- Ensure that when the fence "steps" down, This occurs at the post nearest to a lot corner

Inspection Fields Explained

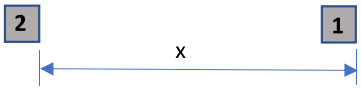
Post # is measured from the origin at the first corner. The numbers may get off because it is easy to miscount after looking at so many posts. This can be replaced by lot and post number i.e. Lot 1254 Post 2.

Lot # is just the lot closest to the post. This may end up being ROW, Reserve, or Swale instead of a number

Long Post identifies if the post used was one of the 4.5-4.8m posts that were delivered on (14/11/18)

Hole Not Filled refers to whether or not the concrete in the hole come up to the top of the hole, i.e. "is the hole completely filled with concrete? "

Dist on Centre is the measurement from the outside of one post to the inside of the next (shown below). This is easier than measuring on centre and will be more accurate.



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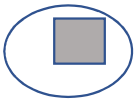

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Hole Depth is the depth of the of the hole before the post goes in. The top of the hole may be below the final ground level, so the G.L. to Base will be different than the hole depth. Although they are close.

Hole is Clean is a Yes/No question as to whether the hole is clean of loose dirt prior to post install. We just need to know this for when it comes time to sign off. It's one of our criteria we must check for regulations.

Notes is just a place to enter any additional info such as where a step down occurs.

Job Location:	Golden Sands	**Inspection #**	**15**
Job Description:	Acoustic Fence Inspection		
Date:	15/01/2019		
Time:	10:30 - 1:30		
Inspected by:	Scott Phillips		
Items Inspected:	Hole depths, post heights & offsets, batten lengths, progress, shrinkage		
Other Parties Present:	Cameron, Chris, a few other workers		
Weather/Conditions:	Hot, sunny, Thunder and lightning moving in as I left		

Inspection Criteria	Yes/No
- Review previous inspection comments	Y
- Posts and holes are within boundary	Too Far Inside
- String Line is at correct grade (check with laser level)	-
- 150 face towards boundary	Y
- Posts are 2.5m MINIMUM above G.L.	Y
- Posts set at least 1450 apart on centres (+/- 100mm)	Y
- minimum 400mm Ø drilled holes	Y
- Step downs of fence occur at post closest to lot boundaries	-
- Posts are centred in holes +/- 30mm	Mostly
- Holes a minimum of 1.1m deep and are cleaned out.	>1.1m but not clean

Inspection Methods:

- Measures hole depth and pole height with staff
- Other measurements taken with steel tape.

Equipment/Gear

Boots Hat Vest
Tape Staff Sunnys
Hard Hat Clipboard Pen

Main Issues:

Boards are drying out and shrinking. The earliest completed works show the highest level of shrinking. Chris (from Shaun's crew), said it was evident that there is a substantial amount of shrinkage occurring. Gaps are expanding between the boards. Gaps have expanded further than the tongue in only a few spots to allow visible light to shine through. Also, some of the boards have tongue and/or groove sections that have broken away (knotty sections) and there are visible gaps here as well.

Battens are going up and do not look to be long enough in some places. Shaun had previously been told on 7/11/2018 that he would be allowed a tolerance of 75 mm from the ground level to the bottom of the batten.

Stages 49/50/56:

- This is the first visit since returning from Christmas break. Shaun's crew returned to work last week. Posts are now in (w/o concrete) up to lot 10 and holes are dug to the end. However, the worker who dug the holes, dug them too far inside the boundary. When I visited the site today, the crew was shovels and the auger to open up the holes about 200-300mm closer to their boundary string line. --- This extra digging is adding a lot of loose soil to the bottom of the holes. Cameron and Chris have been told to remove as much as possible and compact the rest.

- Battens are being cut by hand to size and are being installed. They do not look to be long enough in spots. I was told they are being cut to either 2450 or 2650 lengths and installed from the top down. The measurements I took on site were at these sized. This will likely lead to the battens stopping well above the ground level when the fence is finished. --- On 7/11/2018, during the 6th inspection, Shaun was instructed that he could use shorter battens (2.4m) only where the distance from ground level to bottom of the batten was no greater than 75mm. He was told that he must use longer battens where necessary in order to keep this gap within the 75mm tolerance. Some battens may need to be replaced in order to fix this.

- One section at the bend at lot 25 was done as separate pieces and does not align with adjacent boards. This is easily visible from TEL side but less noticeable from the lot side

Lifestyle Block

- It looks like all battens are in and Davie's Fencing has completed their works. However, they may need to come back and add some boards to the bottom row if they have stopped too high. They also my need to fix the areas where the battens are not low enough to the ground.

Component	Posts	Timber Planks	Battens	Concrete	Fastening	Base Plate
Material	MSG6 min Tan H4	MSG6 min Tan H3.2	H3.2 (not verified)	20 mPa Fibre Re.	Galvanized	none
Dimension Spec	200 x 150 x 3.6, 4.5, 4.8	200 x 50 T&G	2500 x 150 x 25 2500 x 100 x 25		3.15 x 90	
Dimension Meas.	205 x 155	180 x 42	L = 2450, 2650 W = 100, 150 D = 25		3.5 x 85	
Notes	Length +/- 30mm	width +/- 5mm Length +/- 10mm	They are being hand cut to size		also has red glue on half	

Inspection Method Details

A stingline is strung to represent the boundary line. It is based off our survey boundary pegs
A second stringline is inside the boundary and represents the outer face of the POSTS

- Ensure the inside stringline is a MINIMUM of 100 mm from the Boundary stringline (likely 150mm)
- Ensure that the concrete fill in the holes will not extend past the boundary.
- Ensure that the inside stringline is level and at the correct elevation (based off survey pegs). Shaun will help set up the laser and we will check every 10 metres or so.
- This stringline represents the top of their bottom board. It must remain level until it steps up. At this point, the step up must not be between 175 and 180mm. A new string line will be strung at this height and must remain level until the next step up or down. This process continues until the end.
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- Ensure the Posts are set with the 150mm face towards the TEL.
- Measure (with a tape) that the posts are on centre at 1.5m.
    - Shaun said he set them to be at 1.48m on centre (my measurements averaged 1.462m. The T & G planks average about 6.035m in length, and so a span over 5 posts must not exceed this.
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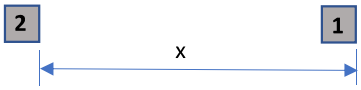

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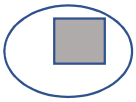

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Notes is just a place to enter any additional info such as where a step down occurs.

Job Location:	Golden Sands	**Inspection #**	**16**
Job Description:	Acoustic Fence Inspection		
Date:	17/01/2019		
Time:	1:30-4:30		
Inspected by:	Scott Phillips (Kurt Uttinger present)		
Items Inspected:	Hole depths, post heights & offsets, batten lengths, progress, shrinkage		
Other Parties Present:	Shaun, Cameron, Chris, a few other workers		
Weather/Conditions:			

Inspection Criteria	Yes/No
- Review previous inspection comments	Y
- Posts and holes are within boundary	Mostly
- String Line is at correct grade (check with laser level)	-
- 150 face towards boundary	Y
- Posts are 2.5m MINIMUM above G.L.	Y
- Posts set at least 1450 apart on centres (+/- 100mm)	Y
- minimum 400mm Ø drilled holes	Y
- Step downs of fence occur at post closest to lot boundaries	-
- Posts are centred in holes +/- 30mm	Mostly
- Holes a minimum of 1.1m deep and are cleaned out.	Y

Inspection Methods:

- Measures hole depth and pole height with staff
- Other measurements taken with steel tape.

Equipment/Gear

Boots	Hat	Vest
Tape	Staff	Sunnys
Hard Hat	Clipboard	Pen

Main Issues:

I talked with Shaun about Bluehaven's complaints regarding the gaps in the walls. There was some confusion surrounding mine and Daryl's conversation about what it is that Bluehaven is upset with. At first, I interpreted Daryl to say that Bluehaven did not like any of the gaps in the fence. I was understanding a gap to refer to any place where the boards were not flush with each other. It seems like the problem was just with the gaps that were big enough to let light through.

The boards have obviously shrunk after drying in the sun for as long as they have. The board edges have separated by up to 15 mm in some places. With the tongue only about 12mm tall, This is leaving gaps of light that are typically 3mm. Although the shrinkage is occuring, it is not shrinking as an entire mass. I measured the height of the fence at 3 locations where I had measured the height about 2 months ago. Two of the heights were the same, and one was 5mm smaller (this could just be how I read the tape). It therefore appears that the fence height is not affected by the shrinkage.

Shaun has talked to his board manufacturer, and they recommended a siliconized caulking to fill the gaps. Chris (one of Shaun's guys) was caulking on site when we were there. Once the fence is painted, this will probably look o.k., however, the caulk might prevent the boards from swelling back together in the humid winters. Also, there are concerns that if the wall is painted and it shrinks more, upainted parts of the tongue which were concealed during painting may become exposed as light brown streaks on a black wall.

The worst stretch of gaps was on the lifestyle block. This area has been up the longest (2.5-3 months) and has been able to dry the most. Shaun said that one day, after some rain had come, that the gaps had closed up quite a bit, but this has not been verified.

The caulking idea was something that was decided by Shaun in a conversation with Chris or Mike (not sure).

Everything else seems to be progressing as per usual.

There is still no decision on when to paint the fence.

Component	Posts	Timber Planks	Battens	Concrete	Fastening	Base Plate
Material	MSG6 min Tan H4	MSG6 min Tan H3.2	H3.2 (not verified)	20 mPa Fibre Re.	Galvanized	none
Dimension Spec	200 x 150 x 3.6, 4.5, 4.8	200 x 50 T&G	2500 x 150 x 25 2500 x 100 x 25		3.15 x 90	
Dimension Meas.	205 x 155	180 x 42	L = 2450, 2650 W = 100, 150 D = 25		3.5 x 85	
Notes	Length +/- 30mm	width +/- 5mm Length +/- 10mm	They are being hand cut to size		also has red glue on half	

Inspection Method Details

A stingline is strung to represent the boundary line. It is based off our survey boundary pegs
A second stringline is inside the boundary and represents the outer face of the POSTS

- Ensure the inside stringline is a MINIMUM of 100 mm from the Boundary stringline (likely 150mm)
- Ensure that the concrete fill in the holes will not extend past the boundary.
- Ensure that the inside stringline is level and at the correct elevation (based off survey pegs). Shaun will help set up the laser and we will check every 10 metres or so.
- This stringline represents the top of their bottom board. It must remain level until it steps up. At this point, the step up must not be between 175 and 180mm. A new string line will be strung at this height and must remain level until the next step up or down. This process continues until the end.
- The height measured above this string must be compared to the drawing in order to know the finished height. This height must be above 2467mm at all times.
- Ensure the Posts are set with the 150mm face towards the TEL.
- Measure (with a tape) that the posts are on centre at 1.5m.
    - Shaun said he set them to be at 1.48m on centre (my measurements averaged 1.462m. The T & G planks average about 6.035m in length, and so a span over 5 posts must not exceed this.
    - The average length over a 5 post span needs to be less than 1.509m.
- Ensure that when the fence "steps" down, This occurs at the post nearest to a lot corner

Inspection Fields Explained

Post # is measured from the origin at the first corner. The numbers may get off because it is easy to miscount after looking at so many posts. This can be replaced by lot and post number i.e. Lot 1254 Post 2.

Lot # is just the lot closest to the post. This may end up being ROW, Reserve, or Swale instead of a number

Long Post identifies if the post used was one of the 4.5-4.8m posts that were delivered on (14/11/18)

Hole Not Filled refers to whether or not the concrete in the hole come up to the top of the hole, i.e. "is the hole completely filled with concrete? "

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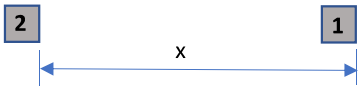

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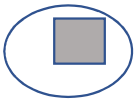

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Notes is just a place to enter any additional info such as where a step down occurs.

Job Location:	Golden Sands	**Inspection #**	**17**
Job Description:	Acoustic Fence Inspection		
Date:	22/01/2019		
Time:	9:30-12:30		
Inspected by:	Scott Phillips		
Items Inspected:	Hole depths, post heights & offsets, progress, shrinkage		
Other Parties Present:	Cameron, Chris, a few other workers		
Weather/Conditions:			

Inspection Criteria	Yes/No
- Review previous inspection comments	Y
- Posts and holes are within boundary	Mostly
- String Line is at correct grade (check with laser level)	-
- 150 face towards boundary	Y
- Posts are 2.5m MINIMUM above G.L.	Y
- Posts set at least 1450 apart on centres (+/- 100mm)	Y
- minimum 400mm Ø drilled holes	Y
- Step downs of fence occur at post closest to lot boundaries	-
- Posts are centred in holes +/- 30mm	Mostly
- Holes a minimum of 1.1m deep and are cleaned out.	Y

Inspection Methods:

- Measures hole depth and pole height with staff
- Other measurements taken with steel tape.

Equipment/Gear

Boots Hat Vest
Tape Staff Sunnys
Hard Hat Clipboard Pen

Main Issues:

THis is the last inspection of posts and holes

This was a fairly quick inspection. I measured the final holes and some concrete heights. All is pretty much as it has been for a while now. We are averageing about 800-900mm imbedment of post into concrete.

This distances on centre are ranging from 1285mm to 1580mm.

They have used up the remainder of their long posts (one left over) so that they could avoid a step down at lots 6 and 7. The longer posts are installed as evey other post.

all posts will be in concrete in the next couple day

Shaun has ran out of Battens and is awaiting more to be delivered.

Lifestyle block

The caulking that Chris did was very poor in some spots. Either it shrunk, or he just put in a really bad bead. some places where he caulked stll show plenty of light shining through. See the pictures for examples.

There is one stretch about 30m (acording to Shaun that still needs to be built to bring the wall to the swale. He can't do this until the retaining wall is in near the underpass.

Component	Posts	Timber Planks	Battens	Concrete	Fastening	Base Plate
Material	MSG6 min Tan H4	MSG6 min Tan H3.2	H3.2 (not verified)	20 mPa Fibre Re.	Galvanized	none
Dimension Spec	200 x 150 x 3.6, 4.5, 4.8	200 x 50 T&G	2500 x 150 x 25 2500 x 100 x 25		3.15 x 90	
Dimension Meas.	205 x 155	180 x 42	L = 2450, 2650 W = 100, 150 D = 25		3.5 x 85	
Notes	Length +/- 30mm	width +/- 5mm Length +/- 10mm	They are being hand cut to size		also has red glue on half	

Inspection Method Details

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- Ensure that the inside stringline is level and at the correct elevation (based off survey pegs). Shaun will help set up the laser and we will check every 10 metres or so.
- This stringline represents the top of their bottom board. It must remain level until it steps up. At this point, the step up must not be between 175 and 180mm. A new string line will be strung at this height and must remain level until the next step up or down. This process continues until the end.
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- Ensure that when the fence "steps" down, This occurs at the post nearest to a lot corner

Inspection Fields Explained

Post # is measured from the origin at the first corner. The numbers may get off because it is easy to miscount after looking at so many posts. This can be replaced by lot and post number i.e. Lot 1254 Post 2.

Lot # is just the lot closest to the post. This may end up being ROW, Reserve, or Swale instead of a number

Long Post identifies if the post used was one of the 4.5-4.8m posts that were delivered on (14/11/18)

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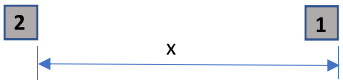

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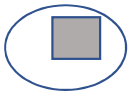

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Job Location:	Golden Sands	**Inspection #**	**18**
Job Description:	Acoustic Fence Inspection		
Date:	19/02/2019		
Time:	11:30-12:30		
Inspected by:	Scott Phillips		
Items Inspected:	Hole depths, post heights & offsets, progress, shrinkage		
Other Parties Present:	Cameron, Chris, a few other workers		
Weather/Conditions:			

Inspection Criteria	
- Look for Daylight Gaps in Fence	Very Minimal
- Inspect caulking	Good
- Inspect re-built section	Good
- Ensure ready for Painting	Yes

Inspection Methods:

• Visual Walkover with Chris of entire Lifestyle Block Section	**Equipment/Gear** Boots Hat Vest Tape Staff Sunnys Hard Hat Clipboard Pen

Main Issues:

- Gaps have been filled and fence is ready for paint
- They are drilling holes near the "retaining-ish" wall near the swale
    - Chris K. said they are getting the next size pole larger than 4.2 m for every post
    - The posts won't be in for a couple of weeks
    - There is no suitable platform for Shaun's crew to work off of when installing the boards to the posts.
- Battens will be installed soon on Eastern section
- Cameron was setting screws deeper into battens where they were sticking out. They were doing a good job ot tidying things up.

Gaps:

- There were only about 5 gaps that showed any light. They have done a very good job of putting in clean, smooth, caulk beads. They have covered up about 99% of the gaps. More may show once the fence is painted black, but Chris (Davies Fencing) said they would try and get the color of paint from the painters so that Davies could caulk and paint any future expansion where needed.
- The gaps have gotten a bit bigger than before. Now, it is easy to find a 15mm gap, as many gaps have expanded to this size. The tongue is completely pulled out in spots but you can only tell if you get right up to the wall. When painted, the fence should look ok. The TEL side looks much much better. The finished edge faces the TEL and this hides the expansion much better than on the lot side.
- The fence will be ready for pianting tomorrow.
- We will do a similar walkover when the next section is ready for paint

Component	Posts	Timber Planks	Battens	Concrete	Fastening	Base Plate
Material	MSG6 min Tan H4	MSG6 min Tan H3.2	H3.2 (not verified)	20 mPa Fibre Re.	Galvanized	none
Dimension Spec	200 x 150 x 3.6, 4.5, 4.8	200 x 50 T&G	2500 x 150 x 25 2500 x 100 x 25		3.15 x 90	
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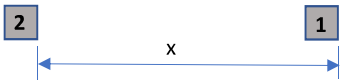

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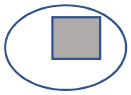

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Building Code Clause(s)

PRODUCER STATEMENT – PS4 CONSTRUCTION REVIEW

ISSUED BY:	S & L
TO:	Bluehaven Holdings Ltd
TO BE SUPPLIED TO	Tauranga City Council
IN RESPECT OF	Construction of Acoustic Barrier (fence)l
AT	Stages 50, 52, 53, 56 Golden Sands Subdivision, Papamoa

This producer statement refers to inspections made during the construction of the acoustic fence designed by S&L on the boundaries of Stages 50, 52, 53 and 56 of the Golden Sands subdivision with State Highway 2 (TEL), at Papamoa.

S&L have been engaged by Bluehaven Holdings Ltd

to provide **CM3** observation services in respect of clause(s) B1 of the Building Code to ensure that the acoustic fence has been built in accordance with their design. No Building Consent was issued for the fence as the Tauranga City Council advised that a Certificate of Acceptance be applied for instead. This PS4 is part of the documentation prepared for the application for that certificate. The results of 18 inspections by S&L during the construction of the fence are attached.

On the basis of our construction observations and tests, I **believe on reasonable grounds,** that the building works relating to the fence construction have been completed in accordance with the relevant requirements of the Building Code and to good engineering practice.

I, **Michael William Hughes** am: CPEng No. 13410

I am a Member of: **EngNZ** and hold the following qualifications: **BE (Civil)**

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

The Construction Review Firm is not a member of ACENZ

SIGNED BY **M W HUGHES** on behalf of S & L

Date: 24 May 2019. Signature

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

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

THIS FORM AND ITS CONDITIONS ARE COPYRIGHT TO ACENZ, IPENZ AND NZIA

GUIDANCE ON USE OF PRODUCER STATEMENTS

Producer statements were first introduced with the Building Act 1992. The producer statements were developed by a combined task committee consisting of members of the New Zealand Institute of Architects, Institution of Professional Engineers New Zealand, Association of Consulting Engineers New Zealand in consultation with the Building Officials Institute of New Zealand. The original suite of producer statements has been revised at the date of this form as a result of enactment of the Building Act (2004) by these organisations to ensure standard use within the industry.

The producer statement system is intended to provide Building Consent Authorities (BCAs) with reasonable grounds for the issue of a Building Consent or a Code Compliance Certificate, without having to duplicate design or construction checking undertaken by others.

PS1 Design	Intended for use by a suitably qualified independent design professional in circumstances where the BCA accepts a producer statement for establishing reasonable grounds to issue a Building Consent;
PS2 Design Review	Intended for use by a suitably qualified independent design professional where the BCA accepts an independent design professional's review as the basis for establishing reasonable grounds to issue a Building Consent;
PS3 Construction	Forms commonly used as a certificate of completion of building work are Schedule 6 of NZS 3910:2003 [1] or Schedules E1/E2 of NZIA's SCC 2007 [2]
PS4 Construction Review	Intended for use by a suitably qualified independent design professional who undertakes construction monitoring of the building works where the BCA requests a producer statement prior to issuing a Code Compliance Certificate. This must be accompanied by a statement of completion of building work (Schedule 6).

The following guidelines are provided by ACENZ, IPENZ and NZIA to interpret the Producer Statement.

Competence of Design Professional

This statement is made by a Design Firm that has undertaken a contract of services for the services named, and is signed by a person authorised by that firm to verify the processes within the firm and competence of its designers.

A competent design professional will have a professional qualification and proven current competence through registration on a national competence-based register, either as a Chartered Professional Engineer (CPEng) or a Registered Architect.

Membership of a professional body, such as the Institution of Professional Engineers New Zealand (IPENZ)or the New Zealand Institute of Architects (NZIA), provides additional assurance of the designer's standing within the profession. If the design firm is a member of the Association of Consulting Engineers New Zealand (ACENZ), this provides additional assurance about the standing of the firm.

Persons or firms meeting these criteria satisfy the term "suitably qualified independent design professional".

*** Professional Indemnity Insurance**

As part of membership requirements, ACENZ requires all member firms to hold Professional Indemnity Insurance to a minimum level.

The PI insurance minimum stated on the front of this form reflects standard, small projects. If the parties deem this inappropriate for large projects the minimum may be up to $500,000.

Professional Services during Construction Phase

There are several levels of service which a Design Firm may provide during the construction phase of a project (CM1-CM5)[3] (OL1-OL4) [2]. The Building Consent Authority is encouraged to require that the service to be provided by the Design Firm is appropriate for the project concerned.

Requirement to provide Producer Statement PS4

Building Consent Authorities should ensure that the applicant is aware of any requirement for producer statements for the construction phase of building work at the time the building consent is issued as no design professional should be expected to provide a producer statement unless such a requirement forms part of the Design Firm's engagement.

Attached Particulars

Attached particulars referred to in this producer statement refer to supplementary information appended to the producer statement.

Refer Also:

1 *Conditions of Contract for Building & Civil Engineering Construction NZS 3910: 2003*

2 *NZIA Standard Conditions of Contract SCC 2007 (1st edition)*

3 *Guideline on the Briefing & Engagement for Consulting Engineering Services (ACENZ/IPENZ 2004)*

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Building Location Certificate

TCC Reference: (BC / RC)	**RC 26171/ EX 182105**		
Applicant/Owner:	**BlueHaven**		
Property Address:	**Papamoa**		
Legal Description: (Lot / DP)	**Lot 100, 101, 1860, 1861, 1862, 1863, 1864, 1865, 1367 & 1866 DP 527814 & Lot 602 DP 520791**	**CT / CFR**	860944, 860945, 861033, 861034, 861035, 861036, 861037, 861038, 861014, 861039 & 843144.

A. Site Datum survey required by TCC? ☐ Yes ✔ No (go to Section B)

1. The following was surveyed: ☐ Completed Floor ☐ Other (specify)
2. Do the approved Building Consent plans have a specified minimum floor level? ☐ Yes ☐ No
   (If 'Yes' then complete Option A and Option B below)
3. Survey Date:

4. **Option A**	**Option B**
The Site Datum Level is ☐ Moturiki Datum ☐ Other (E.g. assumed Datum) Origin of Levels:	The surveyed floor level complies with: (E.g. consent notice requirement, approved BC plans, etc.)

5. Comments:

B. Building Location survey required by TCC? ✔ Yes ☐ No (go to Section C)

1. The following was surveyed: ☐ Completed Floor ✔ Other (please comment below)
2. Survey Date: **06/2019**
3. The surveyed building footprint is in accordance with the setbacks shown on the approved Building Consent Plans. ☐ Yes ✔ Other (comment below) ☐ See attached plan/photos (if required)
   NB: where necessary the 'footprint' will factor in the exterior cladding projecting past the foundation. Walls and eaves must comply with C/AS1/5.1.1(a), 5.2. & Fig. 5.1. Attach drawings or photos with comments if you think there is an issue.
4. Comments **The entirety of the wall has been built in accordance with S&L plan drawing number 20076 – AF Rev. 1 Dated: 09/18.**

C. Overshadowing survey required by TCC? ☐ Yes ✔ No (go to Section D)

1. The building was surveyed and complies with the City Plan rules for overshadowing or relevant Resource Consent. ☐ Yes ☐ Other (comment below) ☐ See attached plan/photos (as/if required)
   NB: Where overshadowing is allowed by permitted intrusions, written approval, or Resource Consent, illustrations are required.
2. Survey Date:
3. Comments (including boundaries specified):

D. Survey Firm Declaration

1. We have been engaged by the applicant stated above and have carried out the necessary field survey(s) to confirm the items detailed above and believe on reasonable grounds that the information provided is true and accurate within acceptable survey tolerances.

2.	**Survey Firm:**	**S & L**	
3.	**Survey Firm Contact Details:**	Postal Address: **P.O.Box 231, Tauranga 3140**	
		Email: info@sltga.co.nz Phone: **07 5776069**	
4.	**Licensed Cadastral Surveyor** (delete as appropriate) **Registered Professional Surveyor** (signed on behalf of Survey Firm)	Print Name: **Grant Cowles** Signature:	License No: **500643** Date: **13/08/2019**

Land Development

Tauranga City

General Description of Landform within Tauranga District

The landform and geology within Tauranga District have some features which demand particular attention.

(a) Minimum Building Platform Levels

Significant areas of Tauranga District are at risk of flooding through sea level rise, tidal surges within the harbour, storm-wave runup on the ocean coastline and the flooding of streams, sewer drains, ponding areas and overland flow paths in extreme climatic conditions. Council has some "broadbrush" information on many possibly flood prone areas. More detailed investigations by appropriately qualified people may be required to be submitted in support of Resource and Building consents. Building Platforms should be constructed with adequate freeboard above flood levels. Council has adopted a minimum floor level policy. This level is available from Council on request from Council's Development Engineer. However due to the dynamic nature of the environment and the ongoing investigative work these levels may be reviewed at any time. For the purposes of this clause, a "building platform" is defined as the area of ground within a line 1.0m outside the perimeter of the building proper.

(b) Low-lying Land

There are many areas of low-lying land (often adjacent to the harbour) which comprise soft or very soft foundation conditions. These conditions are characterised by normally consolidated fine grained alluvial sediments (silts and clays) which have been deposited in marine or estuarine environments. In many areas they have been subject to random and non-engineered fillings. The materials are prone to settlement caused by consolidation under even minor loadings. These areas require particular care and appropriate geotechnical investigation and advice prior to development concepts being prepared. Whilst most of the Mount Maunganui/Papamoa area has an underlying sand formation, pockets of peat and "black sand" occur which exhibit poor foundation support qualities. These should be removed from building platforms and roading subgrades.

(c) Sloping Ground

The foundation conditions of the low-lying areas in the District have been described in (b) above. The near surface geology of the higher ground within the District comprises a series of weathered fine grained rhyothic ashes known locally as the Older Ashes. The Older Ashes consist of the Pahoia Tuffs overlain by the Hamilton Ash (the top of which is known locally as the "chocolate" layer).

Overlying the Older Ashes is a series of coarse friable silts, sands and pumice lapilli which tends to mantle the topography formed within the Older Ashes and are known locally as the Younger Ashes.

On some sloping ground, particularly the present and relic slips adjacent to the harbour, the ashes often have marginal stability and there are numerous examples of past and recent instability. Deep seated failures are generally confined to the steep banks which are or have in their history been subjected to active toe erosion. Development must be set back from the top of such steep banks, with the setback distance being determined by appropriate geotechnical investigations carried out by a Person who has pre-qualified with Council as a Specialist Geotechnical Advisor.

The majority of other failures on modest to steeply sloping ground are shallow failures (involving the top 1m to 3m of soil), but are nonetheless of serious consequence to any building development. Such failures are usually initiated by extreme climatic conditions. Any sloping ground greater than 15-degree gradient should be subject to appropriate geotechnical investigations to determine whether the ground is adequately stable for development.

S&L
Land Development
and Design Specialists

GOLDEN SANDS

RESIDENTIAL SUBDIVISION

STAGE 56

UNION DRIVE, ANCHOR CRESCENT
PAPAMOA

GEOTECHNICAL COMPLETION REPORT INCLUDING

RECOMMENDATIONS FOR BUILDING

Our reference: 20076 S56

Prepared for Bluehaven Holdings

SHRIMPTON & LIPINSKI EST. 1963 LAND DEVELOPMENT & DESIGN SPECIALISTS

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Appendices

Appendix I *Reference Drawings*
20076-20076-S56-G1 rev AB Geotechnical Reference Plan
DP 540448
Aurecon Flood Level Plot v13 100y 48h Max Z

Appendix II *TCC Forms*
G2 - Statement of Professional Opinion
G3 – Summary of Geotechnical Data for Individual Lots
Confirmation of Building Platform Levels

Appendix III *Post Construction Testing*
Insitu density tests (Opus) – August 2016
Insitu density tests (Opus) – August 2018
Scala penetrometer tests (SL) – June – August 2019

Appendix IV *Soakage Analyses*

Appendix V *Liquefaction Analysis Plots*

1.0 Introduction

Stage 56 of the Golden Sands subdivision at Papamoa has been completed as an extension of Union Drive from stage 50 to the west to Te Okuroa Drive to the east and the private way of Anchor Crescent off Union Drive. This stage comprises 66 residential lots numbered 1460 to 1525. These lot positions are shown on DP 540448 in Appendix I of this report.

Included in Appendix I of this report is drawing 20076-S56-G1, rev AB, *Geotechnical Reference Plan*, which shows the extent of the earthworks undertaken, test positions, and road and lot locations.

Previous investigations had been undertaken in the stage 56 area by S & L Consultants Ltd (SL) and were reported in a geotechnical assessment report dated 1 June 2018 which was submitted with the application for subdivision approval for stage 56.

Bulk earthworks on this stage were undertaken in two periods. In 2016 the civil engineering contractor for the Bluehaven Development, Bay Civil Ltd, undercut to remove unsuitable filling and buried topsoil within lots 1516 to 1518, 1524 and 1525 that had been placed previously by contractors for the New Zealand Transport Agency (NZTA) in the taking of sands in cut for the construction of the Tauranga Eastern Link (TEL). The site was levelled to approximately RL 5.1 m Moturiki and then was returned to agricultural pasture land. Refilling was managed by SL and the filling compaction was tested for suitability by Opus International Consultants Ltd. The Opus test results are contained in Appendix III. The depths of filling placed were up to 3m.

Later earthworks by contractors for Bluehaven Holdings Ltd in 2018 and 2019 created the finished ground levels for road subgrades and lots with cut and fill depths in the range of 0 to 1m as shown on 20076-S56-G1. These latter earthworks have been completed in accordance with the requirements of Subdivision Resource Consent RC26171-01 issued by Tauranga City Council (TCC) on 25 January 2019.

This report has been prepared in accordance with Condition 16 of RC26512 which states that:

> *The Consent Holder shall provide to the Council a "Geotechnical Completion Report" compiled by a Category 1 Geotechnical Professional. The report shall:*
>
> *(a) Comply with the Tauranga City Council Infrastructure Development Code;*
> *(b) Display the position of all designated building platforms and building restriction lines where applicable:*
> *(c) Provide recommendations for the on-site disposal of stormwater including minimum separation distances from boundaries and structures;*
> *(d) Provide recommendations for the ongoing development of the lots including those lots located near engineered fill along the site's western boundary.*

(e) Confirm earthworks and/or building platforms including all retaining structures and engineered fill have been constructed to comply with the New Zealand Building Code requirements and the requirements of condition 5 of the consent;

(f) Provide an analysis of the liquefaction risk and any specific foundation requirements that may be required; and

(g) Comment on removal or amendment of existing land feature/s displayed on Council's GIS.

In accordance with the above requirements, this report summarises the observations and testing undertaken during the development of Stage 56, discusses the suitability of the ground for the support of the proposed residential buildings and contains recommendations for the disposal of stormwater runoff generated on individual sites, by on site soakage.

2.0 Subdivision Development Earthworks

2.1 Scope of Earthworks

The earthworks undertaken on stage 56 were part of more extensive earthworks that were being undertaken concurrently over several stages of the subdivision. These general works involved the following:

- The stripping and stockpiling of the surface topsoil to expose clean sands.
- The undertaking of standard laboratory compaction tests on typical sand samples from the site to determine filling compaction parameters. This work had been undertaken during the construction of previous stages. These tests established the required in situ densities to achieve 95% of standard compaction as specified in the Council Infrastructure Development Code (IDC) [1]. At these trial sites the relationship between 95% standard compaction and blow counts per 100mm of penetration with a Scala penetrometer was established.
- The undertaking of the earthworks by filling to achieve required finished grades with testing in the filling to verify compaction to acceptable standards.
- Reinstatement of the surface topsoil layer.
- Testing for the suitability of the sand based soils for the on-site disposal of stormwater by ground soakage to service future houses.

The earthworks generally comprised minor fill depths of up to 1.0m in the stage 56 on both sides of Union Drive with deeper filling placed in the lots in the area south of Anchor Crescent and north of Union Drive. The depths of filling placed during earthworks are shown on drawing 20076-S56-G1 rev AB. The natural soils encountered during the formation of the site and road subgrades were a mixture of uniform and graded beach sands, typical of soils in the Papamoa coastal strip.

Areas of cut were also established where the general natural ground levels were higher than final formation levels created to provide cross falls over some lots. Cut depths were generally less than 1m but were slightly deeper through lots 1463 to 1472 and within lot 1484.

Upon completion of the earthworks topsoil depths were generally re-established to be around 200mm.

The earthworks were undertaken in accordance with Bay of Plenty Regional Council consents 67841 and 66589-AP.

2.2 Quality Assurance

2.2.1 Earthworks Standards

The earthworks in filling were undertaken using insitu sands gained from areas of cut on adjacent stages of Golden Sands. The standards for the placement of filling, as stated in the earthworks contract documents, were to comply with NZS 4431:1989 "Code of Practice for Earthfill for Residential Development" and the IDC. Filling placed to these standards may be considered as "good ground" in terms of NZS 3604:2011 *Timber Framed Structures* and a maximum ultimate ground bearing capacity in the limit state of 300kPa may be taken for the specific design of foundations. NZS 3604 may therefore be adopted for the detailing of residential buildings within the subdivision where appropriate. For foundation design, refer to Section 5.3 of this report.

Adequate compaction of the filling placed was achieved when blow counts recorded with a Scala penetrometer were 4 or more per 100mm of penetration. Following the preliminary tests described in 2.1 above, it was shown that this standard correlates to the density of the sand fill material being at or above 95% of the maximum dry density.

2.2.2 Filled Ground

During the placement of filling on the road subgrades and on areas intended for residential development, the contractor, Bay Civil Ltd, was observed by SL to strip and remove all topsoil and other organics to stockpiles for reuse. Filling was observed to be placed in discrete layers with compaction effort applied through rubber tyre and steel drum vibrating rollers.

Upon completion of earthworks, both Opus on behalf of Bay Civil and SL undertook Scala penetrometer testing in the filled areas at positions shown on 20076-S56-G1 to confirm that the filling standards had been achieved. These test results are included in Appendix III.

2.2.3 Cut Ground

Areas of cut are shown on 20076-S56-G1. Scala penetrometer tests were also undertaken by SL to confirm that the natural sands that are present are of sufficient strength to be considered as good ground in terms of NZS3604. NZS 3604 may therefore be adopted for the detailing of residential buildings

on the areas of cut where appropriate. For foundation design, refer to Section 5.3 of this report.

3.0 Land Hazards

3.1 Land Stability

There are no land form stability issues within Stage 56 of the Golden Sands Subdivision. Minor batters are present from the southern boundaries of lots 1460 to 1485 inclusive and lead down to State Highway 2, the Tauranga Eastern Link (TEL). The areas within stage 56 are near flat.

3.2 Flooding

Flood hazards are governed by the following four criteria:

1) Lot Levels – Tauranga City Council in accordance with the Subdivision Resource Consent.
2) Localised Ponding – New Zealand Building Code (NZBC*),* Clause E1 (Stormwater) *and* TCC Infrastructure Development Code, Design Standard DS-5 (Stormwater).
3) Site Drainage - New Zealand Building Code (NZBC*),* Clause E1 (Stormwater)
4) Ground Clearance – New Zealand Standard NZS 3604 Section 7.5.2.1.

Criteria 1 and 2 are governed by flooding and ponding levels across the subdivision. Criteria 3 is based on site grades at the property boundary. Criteria 4 is based on site paving, slab construction and wall cladding details as determined by the building's design professional. Final grades on individual lots and finished floor levels of buildings must meet all of these requirements.

The following sections describe the flooding criteria in more detail. Table 2 in Section 5.2 provides finished floor levels to comply with the flooding criteria; however, **it is ultimately the responsibility of the building design professional to ensure that the requirements of all four of the flooding criteria are met by the design prior to submitting to Council for consent.**

3.2.1 Flooding Criteria 1 – Lot Levels

Condition 56(k) of Resource Consent RC26512 requires the establishment of the levels of the building platforms on individual lots to be "a minimum of 500mm above the flood level for a 1 in 100 year (1% AEP), 48 hour rainfall event."

TCC had commissioned Aurecon NZ Ltd to determine top water levels from the 1% AEP 48 hour duration flood event. Aurecon plot v13 Max Z shows that the top water levels on the eastern section of Union Drive that leads into the intersection with Te Okuroa Drive and the eastern intersection of Anchor Crescent and Union Drive within stage 56 are at RL 5.2m in terms of Moturiki datum

A copy of v13 100y 48H Max Z is in Appendix I.

Finished ground levels on lots adjacent to this top water level only need to observe a freeboard of 0.5m where the depths of ponded water exceed 0.1m. As built surveys by SL have determined that the finished ground levels on lots 1515 and 1516 adjacent to this top water level are at RL 5.90m and therefore the required freeboard of 0.5m would be present in the design storm event considered by Aurecon.

A minimum building floor level is listed in Table 2 in section 5.2 from as built surveys and is to be observed when designing buildings, and is set at 150mm above the finished ground level. The floor level however may have to be higher than 150mm to comply with criteria 3.2.3 and 3.2.4 below.

The achievement of the minimum floor level is to be confirmed by a licensed cadastral surveyor.

Site grading during house construction must not lower residential lot levels below the finished ground levels stated in Table 2 in section 5.2, and must also not direct stormwater runoff to adjacent properties and buildings, or create areas of localised ponding.

3.2.2 Flooding Criteria 2 – Localised Ponding

The stormwater runoff from individual lots in Stage 56 is towards the roadways of Union Drive and Anchor Crescent.

To satisfy the requirements of section DS-5.4.5 of the IDC and Clause E1, finished floor levels will all be in excess of freeboard clearances of 0.5m above road kerbs which have been identified by as built surveys. Criteria 3.2.3 and 3.2.4 are also to be satisfied.

3.2.3 Flooding Criteria 3 – Site Drainage

Acceptable Solution E1/AS1 of Compliance Document for New Zealand Building Code E1 "Surface Water" establishes the minimum acceptable floor level above any stormwater associated with site drainage.

During a storm event in excess of 10% AEP, flows will be down the roadways, eventually to the stormwater management area to the west within stage 50 or eastwards to the intersection of Union Drive and Te Okuroa Drive where Aurecon has identified that ponding may occur before being removed by the stormwater system installed to service the intersection and roundabout.. Paragraph 2.0.1 of E1/AS1 recommends that "suspended floors and slabs on ground shall be at least 150mm above the finished level of the surrounding ground immediately adjacent to the building, and for sites level with or above the road, no less than 150mm above the road crown on at least one cross-section through the building and roadway." As built details indicate that kerb levels along Union Drive and Anchor Crescent are more than 150mm below building platform levels.

3.2.4 Flooding Criteria 4 – Ground Clearance

Section 7.5.2.1 of NZS 3604 sets the minimum height of the top surface of the floor slab of the building above adjacent ground based on wall cladding and site paving. The minimum finished floor level listed in table 2 of section 5.2 is based on a height of 150mm above the finished ground level. **It is the building design professional's responsibility to set the minimum finished floor level in accordance with the ground clearance requirements of the building code.** Particular attention is to be paid to the maintenance of these clearances when replacing topsoil around houses.

3.3 Liquefaction

The hazard of liquefaction potential for Stage 56 of the Golden Sands Subdivision has been assessed. For the current assessment, the potential for liquefaction has been analysed based on the recommendations in the technical series *Earthquake Geotechnical Engineering Practice* by the Ministry of Business, Innovation and Employment (MBIE) and the seismic loading prescribed in *Bridge Manual SP/M/022* by New Zealand Transport Agency [3].

In this assessment, data from Cone Penetration Tests (CPT) tests were used in the analyses. CPT test positions immediately adjacent to Stage 56 are CPT 35 and CPT 40 and CPT 39 that was located on the position of Te Okuroa Drive before it was constructed. These test positions are shown on 20076-S56-G1.

3.3.1 Analysis

The current assessments have been based on:

- Analyses undertaken in accordance with the *Bridge Manual SP/M/022* [3] *and Module 1: General Overview* [4] and *Module 3: Identification, Assessment and Mitigation of Liquifaction Hazards* [5] of the MBIE technical series.
- Seismic events for the ultimate limit state (1 in 500 year event) and the serviceability limit state (1 in 25 year event) being considered in accordance with NZS 1170.5 [2].
- A seismic event with a Richter scale magnitude of 5.9 in accordance with the NZTA and MBIE guidelines.
- The subsoils classified as Class D and described as "deep or soft".
- Groundwater at depths of 2.0 to 3.0m
- Proposed houses deemed to have an importance level of 2 in accordance with NZS 1170.5 [2] and peak ground accelerations of 0.27g and 0.07g being derived for the ULS and SLS conditions, respectively.
- The use of reviewed software CLiq [6] whereby vertical settlement estimates were derived based on the work of Boulanger and Idriss [7] and lateral displacement estimates were derived based on work by Moss et al and Zhang [8].

3.3.2 Results

The results of the assessments were that:

- The CPT equipment was advanced to a depth of 20m at CPT positions 39 and 40 and 10.5m at CPT 35 where a tip resistance in excess of 40MPa was encountered, exceeding the capacity of the equipment..
- Vertical settlements in the ultimate limit state were estimated to be in the range of 48 to 105mm. Plots showing settlement estimates are included in Appendix V. No vertical settlements were identified in the serviceability limit state at each test position.
- As the location of stage 56 is on near flat ground and well clear of the stormwater management areas lateral spread is unlikely to occur.

Liquefaction assessment results are summarized in Table 1 below:

Table 1: Liquefaction Summary

CPT Position	Depth Analysed (m)	Potential Liquefaction Level (m)	Vertical Settlement (mm)
35 ULS	10.5	2.7-3.8 7.1-8.7	58
35 SLS	10.5	No liquefaction	zero
39 ULS	15	3.0-4.5 9.0-9.4	48
39 SLS	15	No liquefaction	zero
40 ULS	15	3.3-4.3 11.6-14.9	105
40 SLS	15	No liquefaction	0.8

3.3.1 Conclusions

In terms of the general performance levels for liquefiable deposits outlined in Table 5.1 of *Module 3* [5], the site can be classified as L1 (Mild) to L2 (Moderate).

To mitigate the effects of liquefaction induced settlement, buildings may be supported on an enhanced foundation slab as described below in Section 5.3. Based on the *Wairakei Liquefaction Hazard Desktop Assessment* prepared by Tonkin & Taylor for Tauranga City Council [9] and the Bay of Plenty Regional Council's (BOPRC) *Regional Policy Statement* [10], the anticipated consequence of liquefaction to buildings supported on this type of foundation would be insignificant to moderate.

With the ground improvement work undertaken during the subdivision earthworks subsequent to CPT testing and the presence of a non-liquefiable surficial layer with a thickness in excess of twice the width of a typical residential foundation, a seismically induced foundation bearing failure is not anticipated in the ultimate limit state. This is reflected in the determination of a factor of safety on the attached liquefaction analysis sheets. Furthermore, any differential settlements in the ultimate limit state are

anticipated to be within tolerable limits for standard house construction in accordance with MBIE Compliance Document B1,VM4 [7].

Appropriate building foundations for the lots within Stage 56 are discussed in section 5.3 below.

4.0 Disposal of Stormwater

4.1 Design of the Stormwater Reticulation System

The piped reticulation system, as installed, has been designed for the road reserve catchments only. In accordance with the Tauranga City Council IDC, each pipe has been designed to allow for a 10% increase in runoff into the road reserve as a result of soakage system "overflows" from within the lots.

Overland flow design for routes shown on the submitted as-built drawings is based on a 2% AEP event and allows for the total runoff in such an event from the residential lots as it is possible that some soakage systems may be overloaded at that time. Final site grades should ensure that any overland flow resulting from overloaded individual residential systems is directed to the roadways and not towards adjacent structures.

4.2 Design of Individual Ground Soakage Systems

4.2.1 Design Considerations

Stormwater generated by roof runoff from individual homes during a 60 minute storm event having a 10% annual exceedance probability (AEP) is to be disposed of by ground soakage. To estimate catchment areas that can be serviced by individual soakpits constructed of perforated concrete cylinders (3 deep), as is standard practice in the Mount Maunganui and Papamoa areas, testing of ground soakage rates was undertaken.

4.2.2 Ground Soakage Testing

Within stage 56, soakage testing was performed at the six locations indicated on drawing 20076-S56-G1 by installing three 600 mm diameter (500mm inside diameter) perforated concrete cylinders below a depth of 0.8m utilizing materials and methods of installation that are typical for soakpits constructed in the Mount Maunganui and Papamoa areas.

After the test pit had been filled and allowed to empty, a falling head test was performed by filling the soakpit to within 50mm of the top of the soak rings and the recording the water level reduction with time. The falling head test was undertaken during three fill to empty cycles.

Soakage rates derived were:

ST 1462/1463 in 0.5m fill	1950 mm/h
ST 1470/1471 in zero cut/fill	3000 mm/h
ST 1482/1483 in cut	3450 mm/h
ST 1491/1493 in 1m fill	1800 mm/h

ST 1501/1502 in 0.5m fill	1600 mm/h
ST 1518/1519 in 2m fill	2400 mm/h

The test results are presented in Appendix IV.

4.2.3 Soakage Calculations

The analysis for soakage suitability and the numbers or sizes of soakpits required for housing development was based on the results of in-situ testing of soakpits installed utilizing the typical means and methods for the Papamoa area. Based on the results of soakage testing, contributing catchments for soakpits constructed of three vertically stacked perforated concrete soakrings of 500mm and 800mm internal diameters were derived.

The calculations in Appendix IV show the method of analysis for soakage rates obtained from in-situ testing of a 500mm ID soakpit constructed as described above.

Calculations were based on:

- A runoff factor of 1.0 applicable to roofs or hardstanding areas.
- A storm return period of 10 years (10% AEP).
- A 60 minute duration storm and a rainfall intensity of 65 mm/h
- A soakage rates of 1600 l/h/m^2 was considered being the lowest of the rates derived from recorded and a rate of 1800 mm/h being the lowest of the six tests that were undertaken. This rate is reduced by 50% as required by Section DS-5.7.2 (f) of the IDC [11].

4.2.4 Conclusions

The soils present within the subdivision are considered suitable for the disposal of stormwater from individual lots by ground soakage as is generally adopted in the Papamoa area. No individual connections have been installed from the lots to the subdivision stormwater reticulation system. Recommendations for construction and maximum contributing catchment areas` of individual soakpits are presented below in Section 5.4.

5.0 Recommendations

5.1 Building Site Preparation

Topsoil depths have been observed to be less than 400mm in thickness across this stage. Disturbed sand based soils encountered beneath the surficial topsoil during post-construction observations by SL also indicate that the sands have been adequately compacted after disturbance. However, it is recommended that future owners or builders verify topsoil depths when preparing site development plans and cost schedules. Replacement filling upon the removal of the surface topsoil is to be compacted to the methods and standards listed in NZS 4431:1989.

5.2 Finished Levels

Table 2 below lists finished ground levels taken in the centre of the lots and the recommended minimum floor level based on a height of 150mm above the finished ground.

Prior to submission of design documents to Council, minimum floor levels should be shown **by the building design professional** based on the floor level listed below and building code requirements for the type of construction selected.

Table 2 : Minimum floor Levels

Lot Number	Finished Ground Level (m) See Note 1	Minimum Floor Level (m) See Note 2
1460	5.85	6.00
1461	5.90	6.05
1462	5.95	6.10
1463	6.00	6.15
1464	6.00	6.15
1465	6.00	6.15
1466	6.00	6.15
1467	6.00	6.15
1468	6.00	6.15
1469	6.00	6.15
1470	6.15	6.30
1471	6.20	6.35
1472	6.25	6.40
1473	6.30	6.45
1474	6.35	6.50
1475	6.35	6.50
1476	6.40	6.55
1477	6.50	6.65
1478	6.50	6.65
1479	6.50	6.65
1480	6.45	6.60
1481	6.45	6.60
1482	6.45	6.60
1483	6.45	6.60
1484	6.50	6.65
1485	6.50	6.65
1486	6.50	6.65
1487	6.55	6.70
1488	6.50	6.65
1489	6.50	6.65

1490	**6.55**	**6.70** 1)
1491	**6.50**	**6.65**
1492	**6.50**	**6.65**
1493	**6.50**	**6.65**
1494	**6.50**	**6.65**
1495	**6.48**	**6.63**
1496	**6.40**	**6.55**
1497	**6.35**	**6.50**
1498	**6.30**	**6.45**
1499	**6.25**	**6.40**
1500	**6.20**	**6.35**
1501	**6.15**	**6.30**
1502	**6.15**	**6.30**
1503	**6.15**	**6.30**
1504	**6.15**	**6.30**
1505	**6.15**	**6.30**
1506	**6.15**	**6.30**
1507	**5.90**	**6.05**
1508	**5.90**	**6.05**
1509	**5.90**	**6.05**
1510	**5.90**	**6.05**
1511	**5.90**	**6.05**
1512	**5.90**	**6.05**
1513	**5.90**	**6.05**
1514	**5.85**	**6.00**
1515	**5.90**	**6.05**
1516	**5.90**	**6.05**
1517	**5.95**	**6.10**
1518	**5.95**	**6.10**
1519	**6.00**	**6.15**
1520	**5.95**	**6.10**
1521	**5.95**	**6.10**
1522	**5.95**	**6.10**
1523	**6.00**	**6.15**
1524	**6.00**	**6.15**
1525	**6.00**	**6.15**

1) Levels shown to Moturiki datum.

2) Under all circumstances, building design professionals must ensure that ground clearance requirements of the building code are satisfied (NZS 3604, Section 7.5.2.1).

5.3 Foundations

To mitigate the effects of a seismic event in ULS conditions for buildings with concrete slabs, foundations are to be designed to resist the effects of the liquefaction induced settlement and lateral spread described in Section 3.3. *Module*

4: Earthquake Resistant Foundation Design [12] of the MBIE technical series provides guidance for the engineer.

Guidance for designing earthquake resistant foundations may also be found in *Repairing and Rebuilding Houses Affected by the Canterbury Earthquakes* by MBIE (The Guidelines). [13] Although a TC2 designation has not been established in Papamoa, the estimated ground accelerations, design earthquake magnitude, predicted liquefaction induced settlements and lateral spread are of the same magnitude as those in the designated TC2 areas of Christchurch. Therefore, it is recommended that the foundation solutions applicable for a TC2 designation be adopted whereby slab on the ground construction can be undertaken in the manner described for enhanced foundation slabs.

Testing indicates that the ultimate bearing capacity on lots within the current stages is in excess of 200kPa and therefore The Guidelines (MBIE), options 3 or 4, would be appropriate. Such a construction for Option 4 is available as a Firth RibRaftEQ detail or similar. This construction requires a specific design to take into account the number of storeys and the wall and roof cladding on the buildings as well as the ability of the raft system to span in the directions prescribed in the MBIE guidelines.

The use of such a tied slab system will be more resistant to any effects of seismically induced differential settlements or horizontal movements from any lateral spread.

Alternatively, the use of a timber framed subfloor on shallow piles, can be adopted as described for Type A and B dwellings and TC2 applications in the MBIE guidelines.

5.4 On-site Disposal of Stormwater

5.4.1 Soakpits

The analysis of the soakage test results in Appendix IV shows that runoff from roofs or hardstand areas during a 10% AEP 60 minute duration storm can be disposed of by the use of soakpits as has generally been undertaken in the Papamoa area. The maximum recommended contributing catchment areas presented below.

For all lots where soakage rates exceed 1600 mm/h

30 m² for **500mm** diameter soakrings, 3 deep

55 m² for **800mm** diameter soakrings, 3 deep

While the contributing areas derived in Appendix IV for some lots in stage 56 are in excess of these values it is recommended that the above listed contributing areas are adopted to be consistent with those derived for adjacent stages.

Soakpits are to be constructed as follows:

1) Soakpits are constructed of three vertically stacked perforated rings, unless ground water conditions dictate otherwise. The maximum

contributing catchment areas, as listed above, are not to be exceeded. Such soakage systems may be duplicated and interconnected in parallel if the catchment areas are exceeded. The soakpit locations are to observe a clear distance of 0.4m from any boundary and 1.5m from any building. Individual soakpits are not to be spaced closer than 1.5m centres.

2) The drainlayer shall examine the soils present and, after consideration of ground water levels and the soil compaction present, make a judgement on whether good soakage is present to proceed with construction as in (1) above. Care should be taken to penetrate restrictive layers where encountered.

3) Where considered necessary because of identified soakage limitations, the drainlayer may install larger diameter or more frequent or deeper pits as appropriate.

4) If the drainlayer installs a system as in (1) above, he shall advise the building inspector in writing of this decision and also provide dimensioned as-built details of the installation in the same format to that used for the sanitary sewer. Such documentation will be required before the issue of the Code Compliance Certificate.

5) The pits are specified for a 10% AEP storm event. For more intense storm events, any excess runoff should be directed to discharge to the street by pipework or overland flow paths. A direct pipeline from downpipes to the street will not be approved unless the drainlayer can demonstrate that on site soakage is not available. Where the soakage may be limited, an overflow pipe network may be installed to discharge at a convenient location on the property and not at the street kerb. The most appropriate construction would be a bubble up chamber in the driveway so that surface overflow can occur to the street via the kerb crossing.

6) Pits are to be located where lids can be removed for maintenance. The drainlayer is to discuss with the builder and owner where future hard-standing and landscaping developments will occur so that soakpits can be located away from these areas. Overland flow paths for any spillage at downpipe droppers should be determined in these discussions.

7) The runoff from driveways and paved vehicle parking areas can be significant. Sumps and soakpits are to be installed as part of the building work. The soakpits are not to be installed under permanent paved surfaces unless removable lids are installed to provide access for inspection, cleaning and maintenance..

8) Sumps shall be installed in rear yards where required to prevent surface runoff from flowing into adjacent properties or to cause flooding which may enter buildings.

5.4.2 Alternative Soakage Systems

As the lots in stage 56 are relatively small it may prove difficult to accommodate the number of soakpits based on roof and ground surface areas while still observing clearances to foundations, other pits and boundaries. Other systems using drainage cells in which both storage and soakage loss conditions can be determined, or by rock filled soakage trenches where storage would be minimal but soakage loss could be more significant, could be considered. These cells may be connected together thus reducing the distances required between individual pits. A soakage loss rate of 750 l/h/m^2 would be the basis of the specific design of a suitable system by a chartered professional civil engineer.

6.0 Amendments to GIS Records

TCC GIS records of 19 November 2019 show, in the natural hazard section, that Stage 56 is in a moderate "liquefaction hazard" area and that the land is likely to be inundated by a tsunami. Tsunami water depths are indicated. The construction of Stage 56 has not increased or reduced these hazards and no changes to the information in the GIS are required.

The "land features" section is to be updated to inform that

- Consent notices are present on each lot
- Minimum building platforms are applicable
- The means of stormwater disposal on the lots will be by ground soakage

7.0 Professional Opinion

In accordance with Condition 16 of RC26512 for Stage 56, it has been shown in this Geotechnical Completion Report that earthworks have been completed and building platforms have been constructed to comply with Council's Infrastructure Development Code and the New Zealand Building Code. No existing land features were shown on Council's GIS within Stage 56. Recommendations have been provided within for the on-site disposal of stormwater, for the ongoing development of the lots and for the mitigation of liquefaction risk where applicable.

A statement in the format of Council's Infrastructure Development Code (Form G2) that all lots are suitable for building is contained in Appendix II. This statement is accompanied by Form G3 which summarizes the information and recommendations in this report.

Appendix II also contains a statement from G D Cowles, Licensed Cadastral Surveyor that the finished building platform level of each lot within stage 56 is above RL 5.1 m Moturiki in accordance with Condition 15 of RC 26512.

8.0 Applicability

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

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

This report has been prepared specifically for Stage 56 as shown on DP 540448 within the Golden Sands Subdivision and no responsibility is accepted by S & L Consultants Ltd for the use of any part of this report for other development sites without their written approval.

S & L
Land Development and Design Specialists

Consulting Surveyors, Engineers & Planners

Report prepared by M W Hughes, CPEng CMEngNZ
Senior Geotechnical Engineer
Prequalified Geo-professional Category One with Tauranga City Council

19 November 2019

References

[1] "Construction Standards CS-6 Fill," in *Infrastructure Development Code*, Tauranga, Tauranga City Council, 2014.

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

[3] Bridge manual SP/M/022, Wellington, New Zealand: New Zealand Transport Agency, May 2016.

[4] "Module 1: Overview of the Guidelines, in *Earthquake Geotechnical Engineering Practice in New Zealand*, Wellington, New Zealand, Ministry of Business Innovation & Employment, March 2016.

[5] "Module 3: Identification, assessment and mitigation of liquefaction hazards," in *Earthquake Geotechnical Engineering Practice in New Zealand*, Wellington, New Zealand, Ministry of Business Innovation & Employment, March 2016.

[6] GeoLogismiki, "CLiq (Version 1.7.6.34) [Software]," Retrieved from http://www.geologismiki.gr, 2012.

[7] R. W. Boulanger and I. M. Idriss, "CPT and SPT Based Liquefaction Triggering Procedures," University of California Centre for Geotechnical Modeling, Davis, California, April 2014.

[8] G Zhang, P Robertson, R Brachman "Estimating Liquefaction Induced Lateral Displacements Using the SPT and CPT" ASCEJournal of Geotechnical and Geoenvironmental Engineering Vol 130, No 8, 861-871, 2004

[9] V. Lacrosse and D. Mllner, "Wairakei Liquefaction Hazard Desktop Assessment," Tonkin & Taylor Limited, Tauranga, New Zealand, 2016.

[10] "Bay of Plenty Regional Policy Statement," Bay of Plenty Regional Council, Whakatāne, New Zealand, 2014.

[11] "Design Standards DS-5 Stormwater," in *Infrastructure Development Code*, Tauranga City Council, 2014.

[12] "Module 4: Earthquake Resistant Foundation Design," in *Earthquake Geotechnical Engineering Practice in New Zealand*, Wellington, New Zealand, Ministry of Business Innovation & Employment, November 2016.

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

APPENDIX I

Reference Drawings

20076-S56-G1
rev AB

DP 540448

Aurecon Flood Level Plot v13 100y
48h Max Z

LEGEND:

- SCALA TEST LOCATION
- NUCLEAR / SCALA TEST LOCATION (23-08-17)
- NUCLEAR TEST LOCATION (15-08-16)
- SOAKAGE TEST LOCATION
- CUT AND FILL CONTOUR MAJOR (1m INTERVAL)
- FILL AREA
- CUT AREA
- LOT BOUNDARY
- ABBUTTALS

Rev	Description	Name	Date
AB	ISSUED FOR 224 CERT.	NW	11/19
1	LEVELS UPDATED 16/9/19	ER	09,19
0	INTERNAL ISSUE	NW	09/19

	Name	Date		Name	Date
Surveyed	DB	08/19	Designed		

Coordinate System: NZGD 2000 (BOP CIRCUIT)
Origin of Coordinates:
Height Datum: MOTURIKI DATUM
Origin of Height:

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

Title

GEOREFERENCE PLAN CUT AND FILL

Prepared For

GOLDEN SANDS STAGE 56

Original Scales @ A3: 1:1000 (Do Not Scale Dimensions)
Status: AS-BUILT
Drawing No: 20076-S56-G1
Revision: AB

Copyright on this drawing is reserved

\\slc-fp1\WorkingFiles\nwood\unionsquare.sltga.co.nz\20076-S56-G1 Final Surface - Cut Fill.dwg - Plotted: 18/11/2019

Title Plan - LT 540448

Survey Number	LT 540448
Surveyor Reference	20076 Stage 56
Surveyor	Grant David Cowles
Survey Firm	Shrimpton and Lipinski Limited Partnership
Surveyor Declaration	

Survey Details

Dataset Description	Lots 100, 500, 610-615 and 1460-1525 Being Subdivision of Lot 100 DP 536507 and Lot 602 DP 520791.		
Status	Initiated		
Land District	South Auckland	**Survey Class**	Class A
Submitted Date		**Survey Approval Date**	
		Deposit Date	

Territorial Authorities

Tauranga City

Comprised In

RT 843144

Created Parcels

Parcels	Parcel Intent	Area	RT Reference
Lot 100 Deposited Plan 540448	Fee Simple Title	2.2598 Ha	
Lot 500 Deposited Plan 540448	Fee Simple Title	0.3327 Ha	
Lot 610 Deposited Plan 540448	Fee Simple Title	0.0105 Ha	
Lot 611 Deposited Plan 540448	Fee Simple Title	0.0092 Ha	
Lot 612 Deposited Plan 540448	Fee Simple Title	0.0083 Ha	
Lot 613 Deposited Plan 540448	Fee Simple Title	0.0739 Ha	
Lot 614 Deposited Plan 540448	Fee Simple Title	0.0202 Ha	
Lot 615 Deposited Plan 540448	Fee Simple Title	0.5993 Ha	
Lot 1460 Deposited Plan 540448	Fee Simple Title	0.0318 Ha	
Lot 1461 Deposited Plan 540448	Fee Simple Title	0.0318 Ha	
Lot 1462 Deposited Plan 540448	Fee Simple Title	0.0248 Ha	
Lot 1463 Deposited Plan 540448	Fee Simple Title	0.0248 Ha	
Lot 1464 Deposited Plan 540448	Fee Simple Title	0.0280 Ha	
Lot 1465 Deposited Plan 540448	Fee Simple Title	0.0260 Ha	
Lot 1466 Deposited Plan 540448	Fee Simple Title	0.0248 Ha	
Lot 1467 Deposited Plan 540448	Fee Simple Title	0.0248 Ha	
Lot 1468 Deposited Plan 540448	Fee Simple Title	0.0248 Ha	
Lot 1469 Deposited Plan 540448	Fee Simple Title	0.0280 Ha	
Lot 1470 Deposited Plan 540448	Fee Simple Title	0.0260 Ha	
Lot 1471 Deposited Plan 540448	Fee Simple Title	0.0248 Ha	
Lot 1472 Deposited Plan 540448	Fee Simple Title	0.0248 Ha	
Lot 1473 Deposited Plan 540448	Fee Simple Title	0.0291 Ha	
Lot 1474 Deposited Plan 540448	Fee Simple Title	0.0291 Ha	

Title Plan - LT 540448

Created Parcels

Parcels	Parcel Intent	Area	RT Reference
Lot 1475 Deposited Plan 540448	Fee Simple Title	0.0281 Ha	
Lot 1476 Deposited Plan 540448	Fee Simple Title	0.0259 Ha	
Lot 1477 Deposited Plan 540448	Fee Simple Title	0.0302 Ha	
Lot 1478 Deposited Plan 540448	Fee Simple Title	0.0248 Ha	
Lot 1479 Deposited Plan 540448	Fee Simple Title	0.0248 Ha	
Lot 1480 Deposited Plan 540448	Fee Simple Title	0.0303 Ha	
Lot 1481 Deposited Plan 540448	Fee Simple Title	0.0258 Ha	
Lot 1482 Deposited Plan 540448	Fee Simple Title	0.0248 Ha	
Lot 1483 Deposited Plan 540448	Fee Simple Title	0.0248 Ha	
Lot 1484 Deposited Plan 540448	Fee Simple Title	0.0268 Ha	
Lot 1485 Deposited Plan 540448	Fee Simple Title	0.0360 Ha	
Lot 1486 Deposited Plan 540448	Fee Simple Title	0.0230 Ha	
Lot 1487 Deposited Plan 540448	Fee Simple Title	0.0220 Ha	
Lot 1488 Deposited Plan 540448	Fee Simple Title	0.0325 Ha	
Lot 1489 Deposited Plan 540448	Fee Simple Title	0.0291 Ha	
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Lot 1491 Deposited Plan 540448	Fee Simple Title	0.0220 Ha	
Lot 1492 Deposited Plan 540448	Fee Simple Title	0.0217 Ha	
Lot 1493 Deposited Plan 540448	Fee Simple Title	0.0217 Ha	
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Lot 1499 Deposited Plan 540448	Fee Simple Title	0.0290 Ha	
Lot 1500 Deposited Plan 540448	Fee Simple Title	0.0292 Ha	
Lot 1501 Deposited Plan 540448	Fee Simple Title	0.0339 Ha	
Lot 1502 Deposited Plan 540448	Fee Simple Title	0.0358 Ha	
Lot 1503 Deposited Plan 540448	Fee Simple Title	0.0262 Ha	
Lot 1504 Deposited Plan 540448	Fee Simple Title	0.0303 Ha	
Lot 1505 Deposited Plan 540448	Fee Simple Title	0.0378 Ha	
Lot 1506 Deposited Plan 540448	Fee Simple Title	0.0259 Ha	
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Lot 1517 Deposited Plan 540448	Fee Simple Title	0.0324 Ha	
Lot 1518 Deposited Plan 540448	Fee Simple Title	0.0263 Ha	

Title Plan - LT 540448

Created Parcels

Parcels	Parcel Intent	Area	RT Reference
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Lot 1520 Deposited Plan 540448	Fee Simple Title	0.0371 Ha	
Lot 1521 Deposited Plan 540448	Fee Simple Title	0.0269 Ha	
Lot 1522 Deposited Plan 540448	Fee Simple Title	0.0212 Ha	
Lot 1523 Deposited Plan 540448	Fee Simple Title	0.0211 Ha	
Lot 1524 Deposited Plan 540448	Fee Simple Title	0.0327 Ha	
Lot 1525 Deposited Plan 540448	Fee Simple Title	0.0350 Ha	
Area A Deposited Plan 540448	Easement		
Area B Deposited Plan 540448	Easement		
Area C Deposited Plan 540448	Easement		
Area D Deposited Plan 540448	Easement		
Area E Deposited Plan 540448	Easement		
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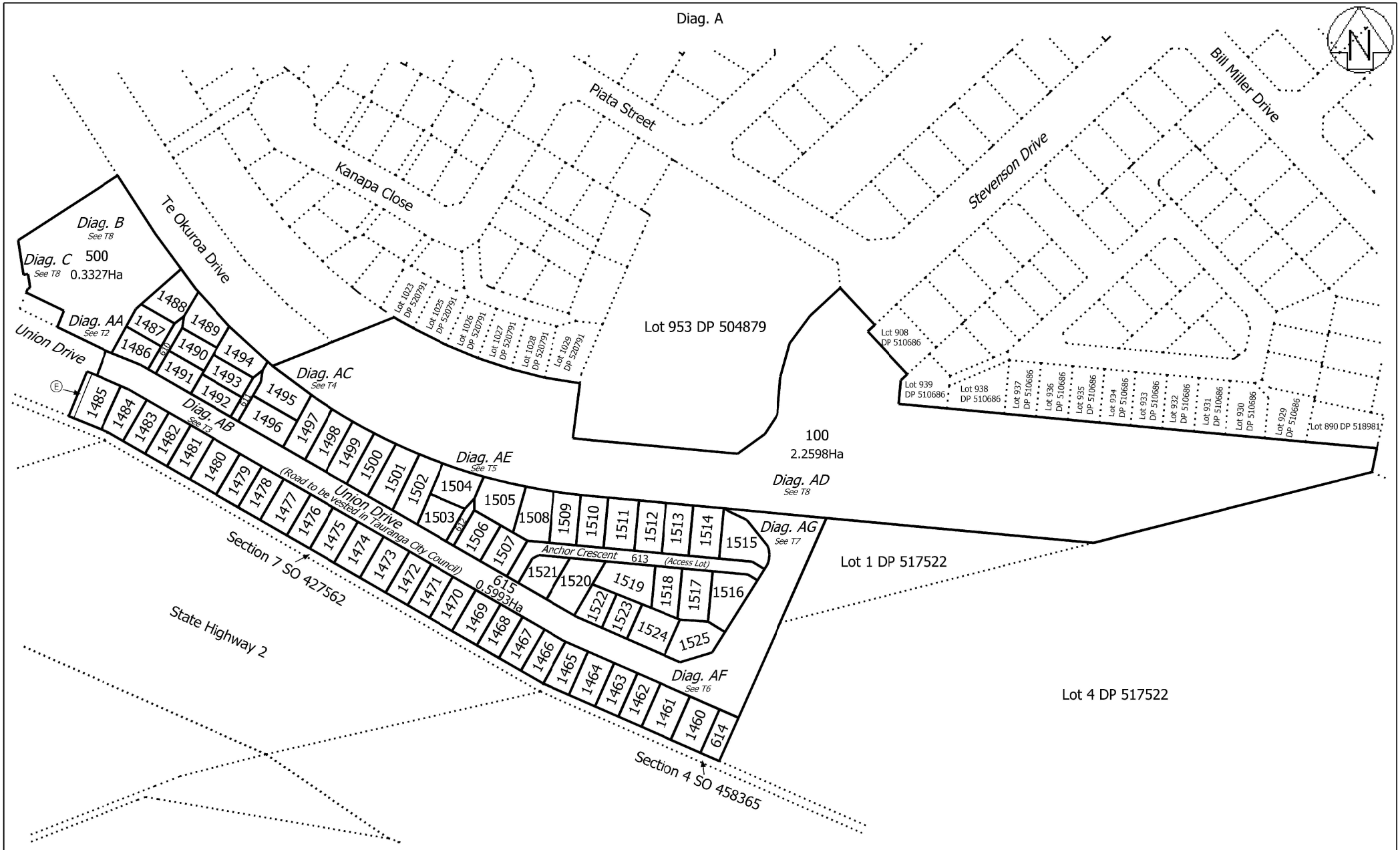

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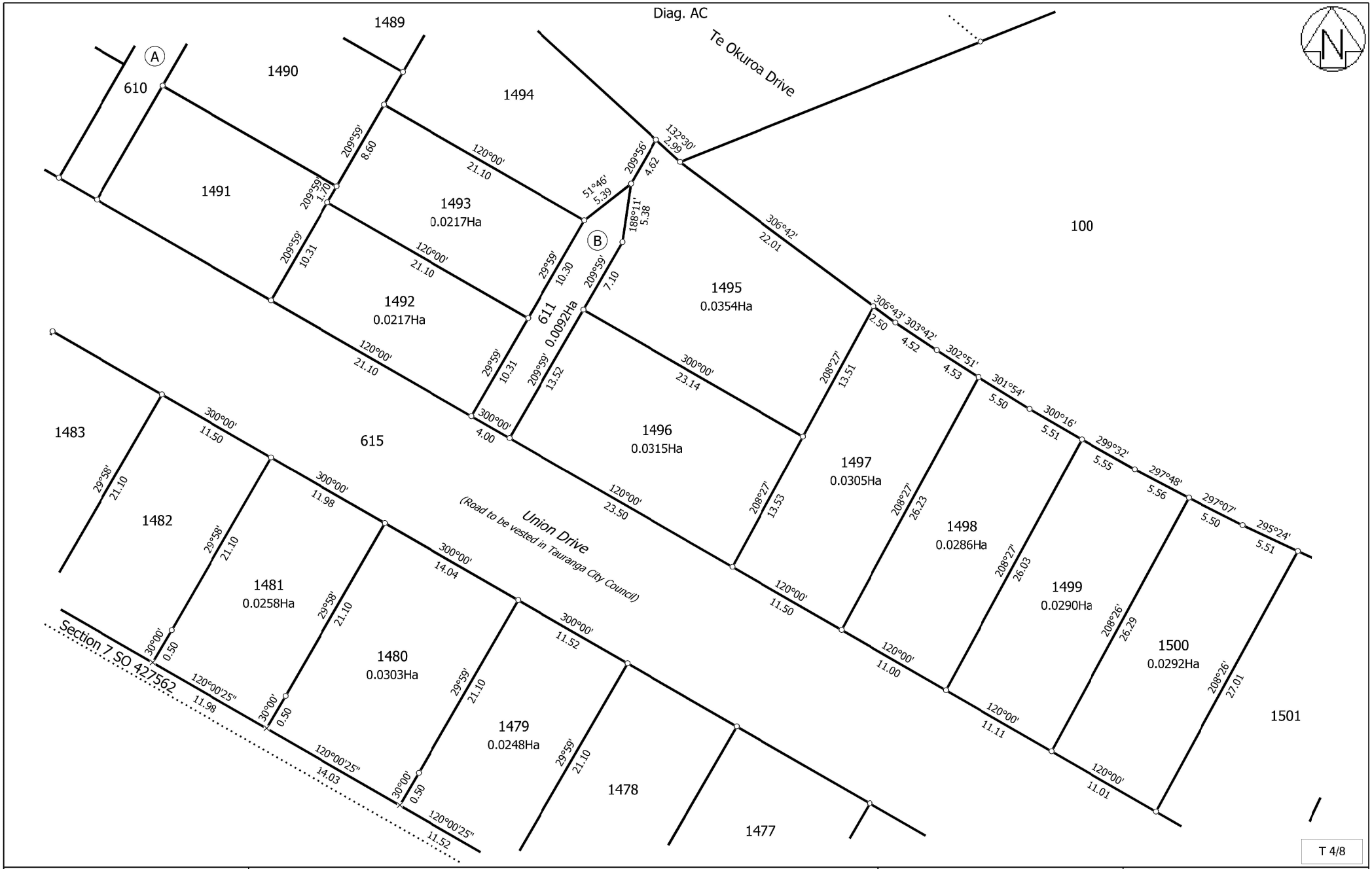
Land District: South Auckland Digitally Generated Plan Generated on: 22/08/2019 09:14am Page 5 of 11	Lots 100, 500, 610-615 and 1460-1525 Being Subdivision of Lot 100 DP 536507 and Lot 602 DP 520791.	Surveyor: Grant David Cowles Firm: Shrimpton and Lipinski Limited Partn	Title Plan LT 540448 DRAFT

Land District: South Auckland Digitally Generated Plan Generated on: 22/08/2019 09:14am Page 6 of 11	Lots 100, 500, 610-615 and 1460-1525 Being Subdivision of Lot 100 DP 536507 and Lot 602 DP 520791.	Surveyor: Grant David Cowles Firm: Shrimpton and Lipinski Limited Partn	Title Plan LT 540448 DRAFT



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Land District: South Auckland Digitally Generated Plan Generated on: 22/08/2019 09:14am Page 8 of 11	Lots 100, 500, 610-615 and 1460-1525 Being Subdivision of Lot 100 DP 536507 and Lot 602 DP 520791.	Surveyor: Grant David Cowles Firm: Shrimpton and Lipinski Limited Partn	Title Plan LT 540448 DRAFT

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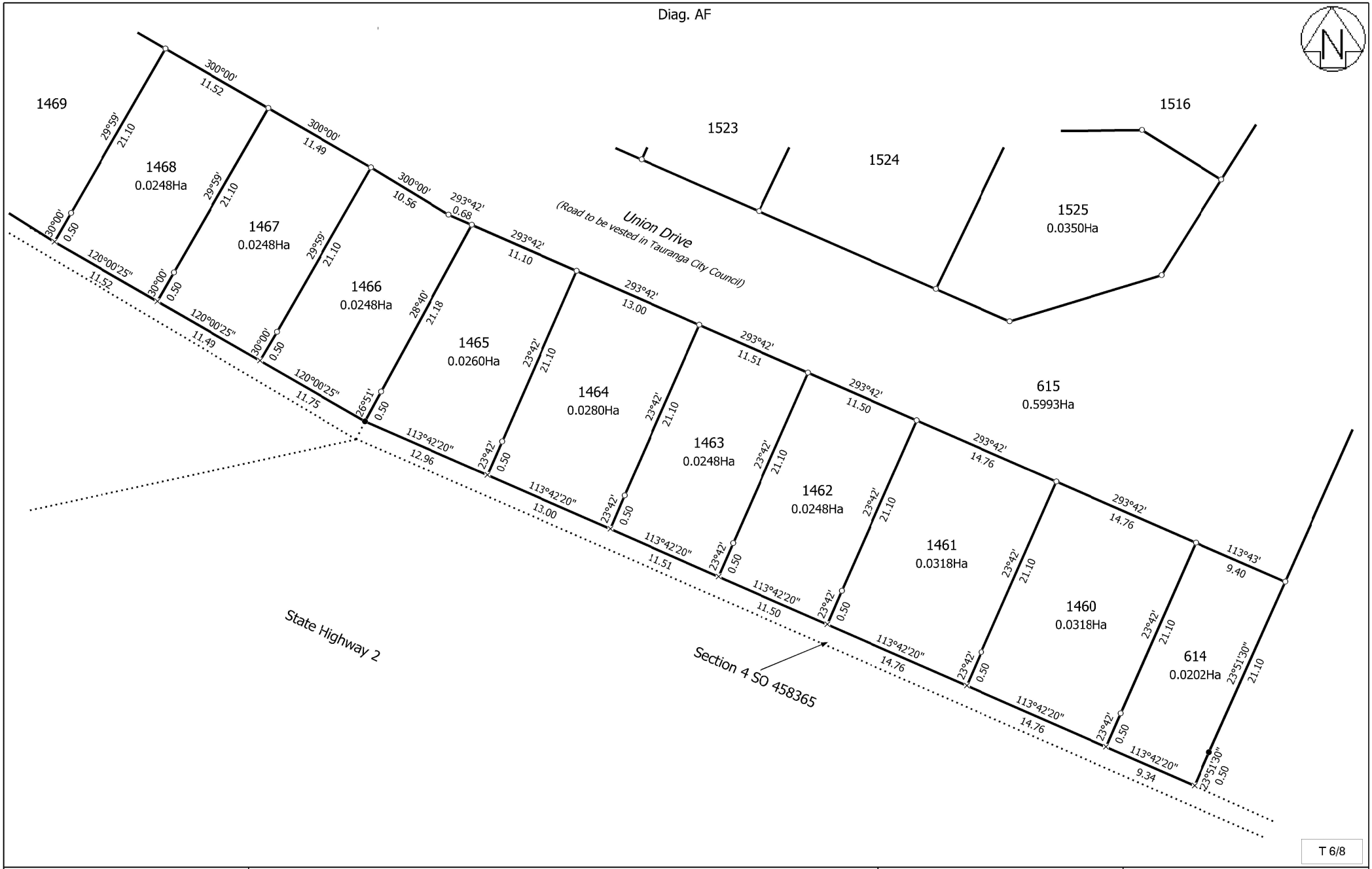

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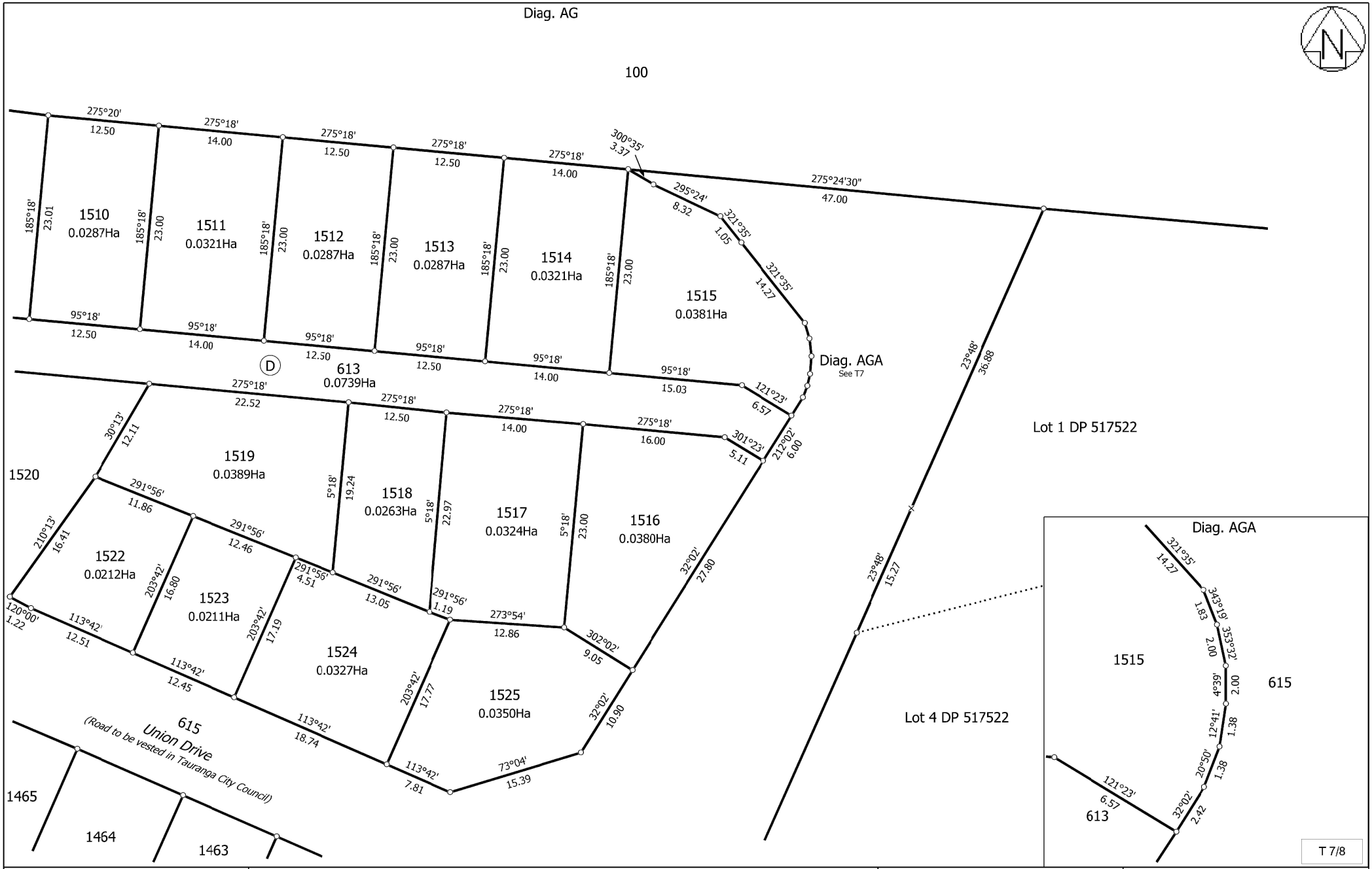
Land District: South Auckland Digitally Generated Plan Generated on: 22/08/2019 09:14am Page 9 of 11	Lots 100, 500, 610-615 and 1460-1525 Being Subdivision of Lot 100 DP 536507 and Lot 602 DP 520791.	Surveyor: Grant David Cowles Firm: Shrimpton and Lipinski Limited Partn	Title Plan LT 540448 DRAFT



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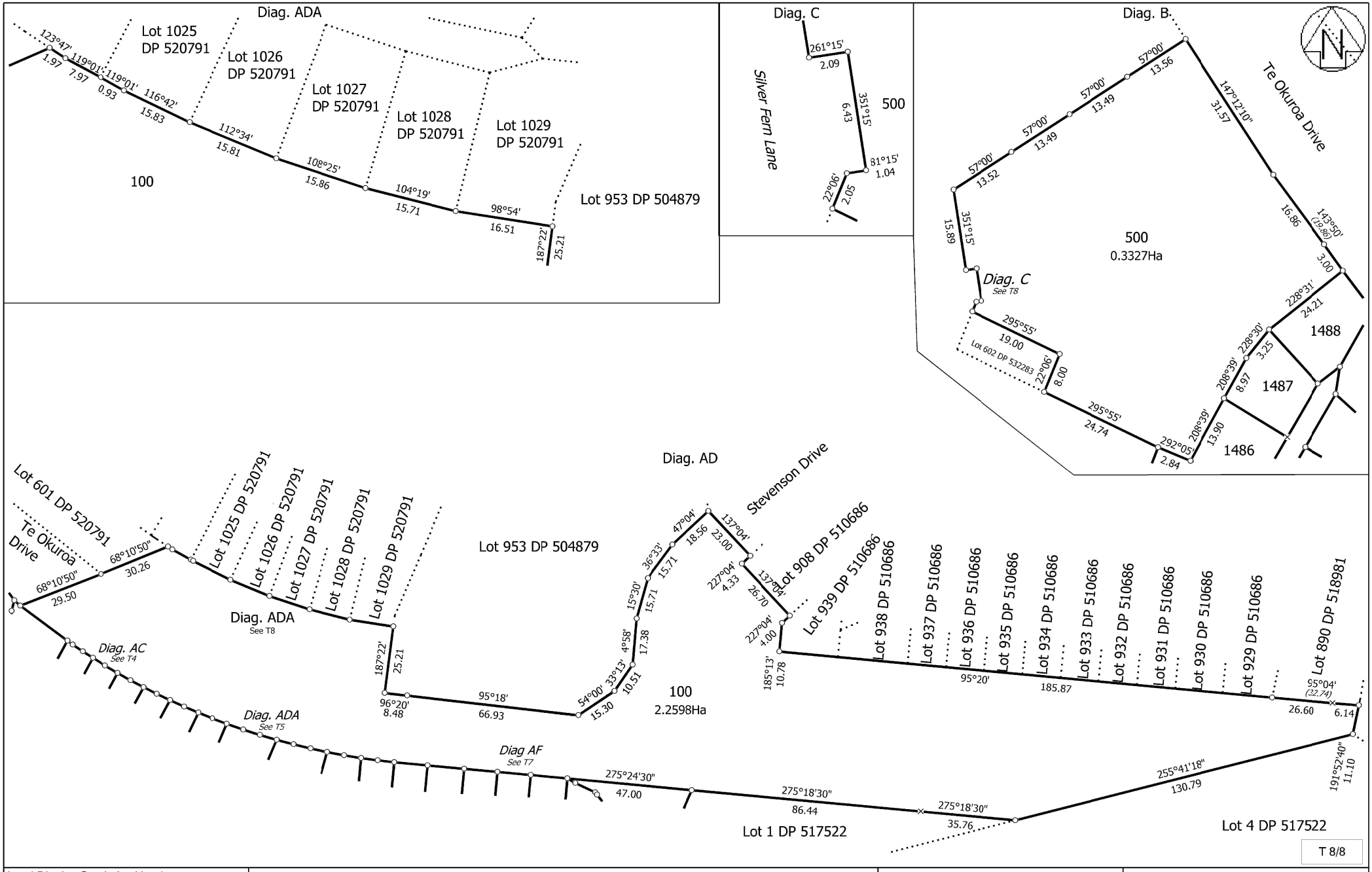
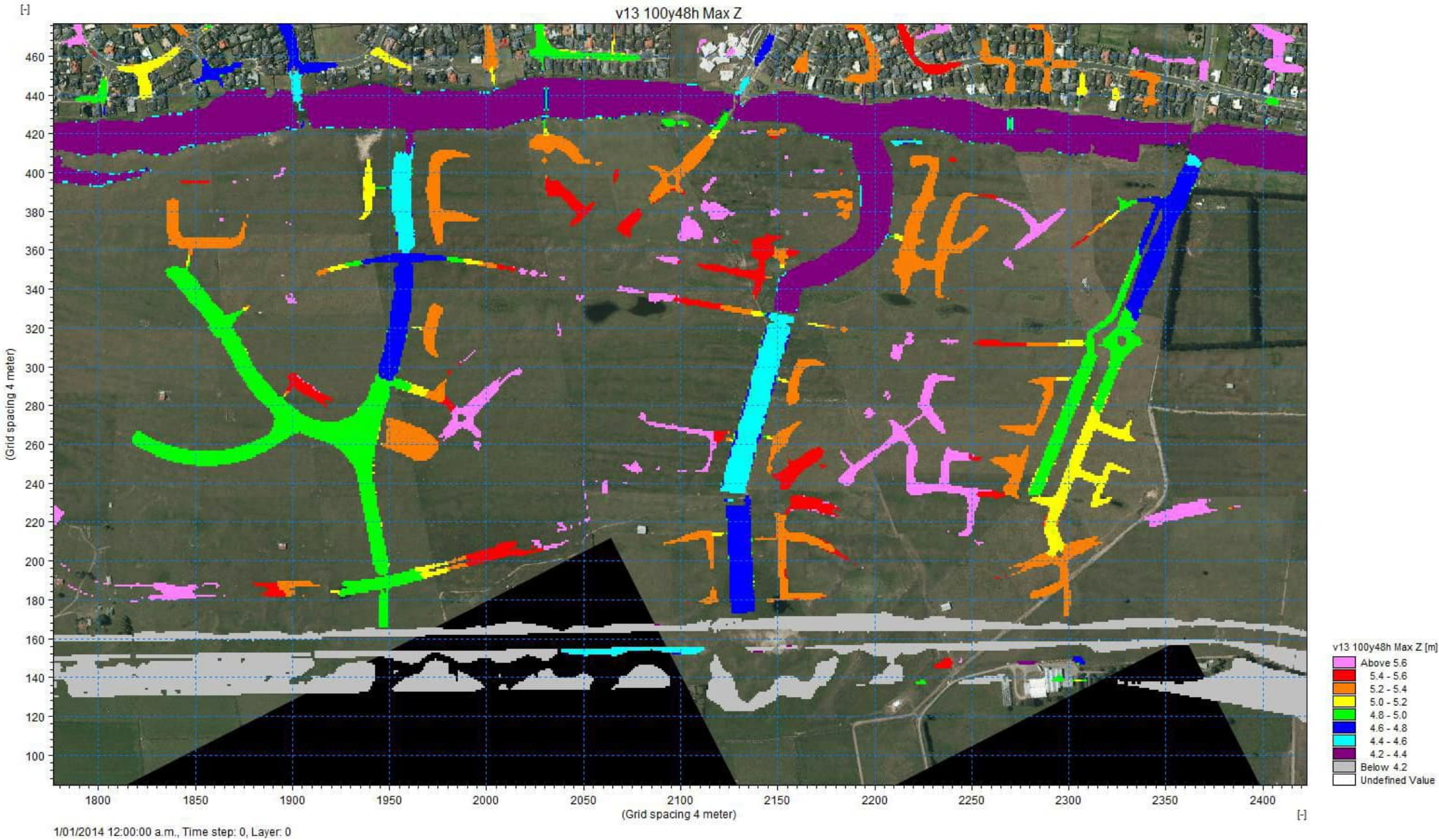


Land District: South Auckland Digitally Generated Plan Generated on: 22/08/2019 09:14am Page 11 of 11	Lots 100, 500, 610-615 and 1460-1525 Being Subdivision of Lot 100 DP 536507 and Lot 602 DP 520791.	Surveyor: Grant David Cowles Firm: Shrimpton and Lipinski Limited Partn	Title Plan LT 540448 DRAFT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2300
2350
2400
(Grid spacing 4 meter)
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5.4 - 5.6
5.2 - 5.4
5.0 - 5.2
4.8 - 5.0
4.6 - 4.8
4.4 - 4.6
4.2 - 4.4
Below 4.2
Undefined Value

APPENDIX II

TCC Infrastructure Development Code Forms

G2 - Statement of Professional Opinion

G3 – Summary of Geotechnical Data for Individual Lots

Licensed Cadastral Surveyor Confirmation of Building Platform Levels

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

NAME OF SUBDIVISION	Golden Sands Sub-division Stage 56
COUNCIL FILE NUMBER RC No:	RC 26512
ENGINEER RESPONSIBLE FOR DEVELOPMENT:	MW Hughes of S & L Consultants Ltd
QUALIFICATIONS:	BE CMEngNZ CPEng

I Michael William Hughes *(Full Name)* of SL, 36 Kereiti Street, Tauranga *(Name and Address of Firm)*

Hereby confirm that;

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

2) An appropriate level of site investigation and construction supervision has been carried out under my direction and is described in the development evaluation dated 19 November 2019 which I have reviewed.

3) In my professional opinion, not to be construed as a guarantee, I consider that;

(a) The earth fills shown on the attached Plan No. 20076-S56-G1 rev AB have been placed in accordance with the Infrastructure Development Code of the Tauranga City Council.

(b) The completed works give due regard to all land slope, flooding and foundation stability considerations provided that minimum building platform levels are observed as stated in my report.

(c) The filled areas are suitable for the erection thereon of residential buildings supported on enhanced foundation slabs as described in section 5.3 of the report or on shallow piles with a timber framed subfloor as detailed in NZS 3604:2011.

(d) The areas formed in cut are also suitable for the erection thereon of residential buildings supported on enhanced foundation slabs as described in section 5.3 of the report or on shallow piles with a timber framed subfloor as detailed in NZS 3604:2011.

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

Signed Date 19 November 2019

TaurangaCity

SUMMARY OF GEOTECHNICAL DATA FOR INDIVIDUAL LOTS

INFRASTRUCTURE DEVELOPMENT CODE

G3

VERSION July 2011

1

CERTIFICATION

DP No.:	540448	Property Address	Golden Sands, Stage 56, Union Drive, Anchor Crescent, Papamoa	RC No:	26512

Lot No.	Area (m^2)	Subsurface Data						Foundations		Building Restriction Line	S/W Specific Design	S/W Soakage	S/W Reticulate	Designated Building Platform	Minimum Building Floor Level	Compressible Soils	On-site Effluent Disposal	Consent Notice	Comment
		Shear Strength (kPa)	Subdivision Filling		Natural Topography Unworked	Natural Topography Earthworked		Conventional Shallow Foundation to NZS 3604:2011	Specific Design										
			Y/N	Depth (m)	Y/N	Y/N	Depth (m)	Y/N/NA	Y/N/NA										
1460	318	NA[1]	Y	0-1.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1461	318	NA[1]	Y	0-1.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1462	248	NA[1]	Y	0-1.0	Y	Y	0-1.0	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1463	248	NA[1]	Y	0-1.0	Y	Y	0-1.0	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1464	280	NA[1]	Y	0-1.0	Y	Y	0-1.0	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1465	260	NA[1]	Y	0-0.5	Y	Y	0-1.0	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1466	248	NA[1]	N		Y	Y	0-1.0	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1467	248	NA[1]	N		Y	Y	0-1.0	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1468	248	NA[1]	Y	0-0.5	Y	Y	0-1.0	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1469	280	NA[1]	Y	0-1.0	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1470	260	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1471	248	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1472	248	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1473	291	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1474	291	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1475	281	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1476	259	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1477	302	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1478	248	NA[1]	Y	0-0.5	Y	Y	0.0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1479	248	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1480	303	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	

Notes:
1) Testing undertaken with Scala Penetrometer
2) Minimum floor levels required (See Table 2: Minimum Floor Levels, Section 5.2 of *Geotechnical Completion Report* by S&L, dated 19 November 2019)
3) Timber framed subfloor may be constructed with shallow timber piles as detailed in NZS 3604:2011. (See Section 5.3 of *Geotechnical Completion Report*)
4) Enhanced design required for floor slabs-on-ground. (See Section 5.3 of *Geotechnical Completion Report*)

TaurangaCity

SUMMARY OF GEOTECHNICAL DATA FOR INDIVIDUAL LOTS

INFRASTRUCTURE DEVELOPMENT CODE

G3

VERSION July 2011

1

DP No.:	540448	Property Address	Golden Sands, Stage 56, Union Drive, Anchor Crescent, Papamoa	RC No:	26512

Lot No.	Area (m^2)	Subsurface Data						Foundations		Building Restriction Line	S/W Specific Design	S/W Soakage	S/W Reticulate	Designated Building Platform	Minimum Building Floor Level	Compressible Soils	On-site Effluent Disposal	Consent Notice	Comment
		Shear Strength (kPa)	Subdivision Filling		Natural Topography Unworked	Natural Topography Earthworked		Conventional Shallow Foundation to NZS 3604:2011	Specific Design										
			Y/N	Depth (m)	Y/N	Y/N	Depth (m)	Y/N/NA	Y/N/NA										
1481	258	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1482	248	NA[1]	Y	0-0.5	Y	y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1483	248	NA[1]	Y	0-0.5	Y	Y	0-1.0	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1484	268	NA[1]	Y	0-1.5	Y	Y	0-1.0	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1485	360	NA[1]	Y	0-1.0	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1486	230	NA[1]	Y	0-1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1487	220	NA[1]	Y	0.5-1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1488	325	NA[1]	Y	0.5-1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1489	291	NA[1]	Y	0.5-1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1490	220	NA[1]	Y	0.5-1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1491	220	NA[1]	Y	0-1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1492	217	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1493	217	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1494	276	NA[1]	Y	1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1495	354	NA[1]	Y	1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1496	315	NA[1]	Y	1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1497	305	NA[1]	Y	1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1498	286	NA[1]	Y	1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1499	290	NA[1]	Y	1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1500	292	NA[1]	Y	1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1501	339	NA[1]	Y	1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	

Notes:
1) Testing undertaken with Scala Penetrometer
2) Minimum floor levels required (See Table 2: Minimum Floor Levels, Section 5.2 of *Geotechnical Completion Report* by S&L, dated 19 November 2019)
3) Timber framed subfloor may be constructed with shallow timber piles as detailed in NZS 3604:2011. (See Section 5.3 of *Geotechnical Completion Report*)
4) Enhanced design required for floor slabs-on-ground. (See Section 5.3 of *Geotechnical Completion Report*)

CERTIFICATION

TaurangaCity

SUMMARY OF GEOTECHNICAL DATA FOR INDIVIDUAL LOTS

INFRASTRUCTURE DEVELOPMENT CODE

G3

VERSION July 2011

1

DP No.:	540448	Property Address	Golden Sands, Stage 56, Union Drive, Anchor Crescent, Papamoa	RC No:	26512

Lot No.	Area (m^2)	Subsurface Data						Foundations		Building Restriction Line	S/W Specific Design	S/W Soakage	S/W Reticulate	Designated Building Platform	Minimum Building Floor Level	Compressible Soils	On-site Effluent Disposal	Consent Notice	Comment
		Shear Strength (kPa)	Subdivision Filling		Natural Topography Unworked	Natural Topography Earthworked		Conventional Shallow Foundation to NZS 3604:2011	Specific Design										
			Y/N	Depth (m)	Y/N	Y/N	Depth (m)	Y/N/NA	Y/N/NA										
1502	358	NA[1]	Y	1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1503	262	NA[1]	Y	1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1504	303	NA[1]	Y	1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1505	378	NA[1]	Y	0-1.0	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1506	259	NA[1]	Y	0-1.0	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1507	259	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1508	351	NA[1]	Y	0-1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1509	289	NA[1]	Y	0-1.0	N	N	5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1510	287	NA[1]	Y	0-1.0	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1511	321	NA[1]	Y	0-1.0	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1512	287	NA[1]	Y	0-1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1513	287	NA[1]	Y	1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1514	287	NA[1]	Y	1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1515	381	NA[1]	Y	0-1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1516	380	NA[1]	Y	0-3.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1517	324	NA[1]	Y	2.0-4.0	N	N	0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1518	263	NA[1]	Y	1.0-4.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1519	389	NA[1]	Y	0-1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1520	371	NA[1]	N		Y	Y	0-1.0	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1521	269	NA[1]	N		Y	Y	0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1522	212	NA[1]	Y	0-1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	

Notes:
1) Testing undertaken with Scala Penetrometer
2) Minimum floor levels required (See Table 2: Minimum Floor Levels, Section 5.2 of *Geotechnical Completion Report* by S&L, dated 19 November 2019)
3) Timber framed subfloor may be constructed with shallow timber piles as detailed in NZS 3604:2011. (See Section 5.3 of *Geotechnical Completion Report*)
4) Enhanced design required for floor slabs-on-ground. (See Section 5.3 of *Geotechnical Completion Report*)

CERTIFICATION

TaurangaCity

SUMMARY OF GEOTECHNICAL DATA FOR INDIVIDUAL LOTS

INFRASTRUCTURE DEVELOPMENT CODE

G3

VERSION July 2011

1

CERTIFICATION

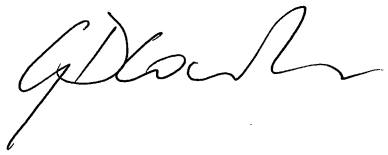
DP No.:	540448	Property Address	Golden Sands, Stage 56, Union Drive, Anchor Crescent, Papamoa	RC No:	26512

Lot No.	Area (m^2)	Subsurface Data						Foundations		Building Restriction Line	S/W Specific Design	S/W Soakage	S/W Reticulate	Designated Building Platform	Minimum Building Floor Level	Compressible Soils	On-site Effluent Disposal	Consent Notice	Comment
		Shear Strength (kPa)	Subdivision Filling		Natural Topography Unworked	Natural Topography Earthworked		Conventional Shallow Foundation to NZS 3604:2011	Specific Design										
			Y/N	Depth (m)	Y/N	Y/N	Depth (m)	Y/N/NA	Y/N/NA										
1523	211	NA[1]	Y	1.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1524	327	NA[1]	Y	1.0-4.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1525	350	NA[1]	Y	2.0-3.0	N	N		Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	

Notes:
1) Testing undertaken with Scala Penetrometer
2) Minimum floor levels required (See Table 2: Minimum Floor Levels, Section 5.2 of *Geotechnical Completion Report* by S&L, dated 19 November 2019)
3) Timber framed subfloor may be constructed with shallow timber piles as detailed in NZS 3604:2011. (See Section 5.3 of *Geotechnical Completion Report*)
4) Enhanced design required for floor slabs-on-ground. (See Section 5.3 of *Geotechnical Completion Report*)

Condition 15 of RC 26512

I, Grant Cowles, herby certify that the finished building platform level of each residential lot within Stage 56 shown on LT 540448 is above the minimum finished level requirement of RL 5.1 meters (relative to Moturiki Datum) in accordance with Rule 12B.3.12(g) of the Tauranga City Plan.



Grant D Cowles

Licenced Cadastral Surveyor - #500643

APPENDIX III

Test Results

In situ density tests (Opus) – August 2016

Insitu density tests (Opus) – August 2017

Scala penetrometer test results (SL) – June - August 2019

Opus International
Consultants Ltd
Tauranga Laboratory
278 Chadwick Road, Greerton
PO Box 9057, Tauranga 3142
New Zealand

t: +64 7 578 5425
f: +64 7 578 3382
w: www.opus.co.nz

2 July 2015

Mr C Kendrick
Bay Civil Ltd
PO Box 8244
Tauranga 3145

15/442

Dear Chris

Golden Sands Subdivision: Bulk Fill - Sand

Attached is the result of a dry density / optimum water content relationship test carried out on a sample of bulk fill sand obtained from Golden Sands subdivision, Papamoa Beach.

Sampling was carried out on 18 June 2015 and all remaining material will be disposed of unless a request to the contrary is received by 31 July 2015.

Regards

Bruce Hudson
Laboratory Manager

DRY DENSITY / WATER CONTENT RELATIONSHIP
STANDARD COMPACTION

OPUS

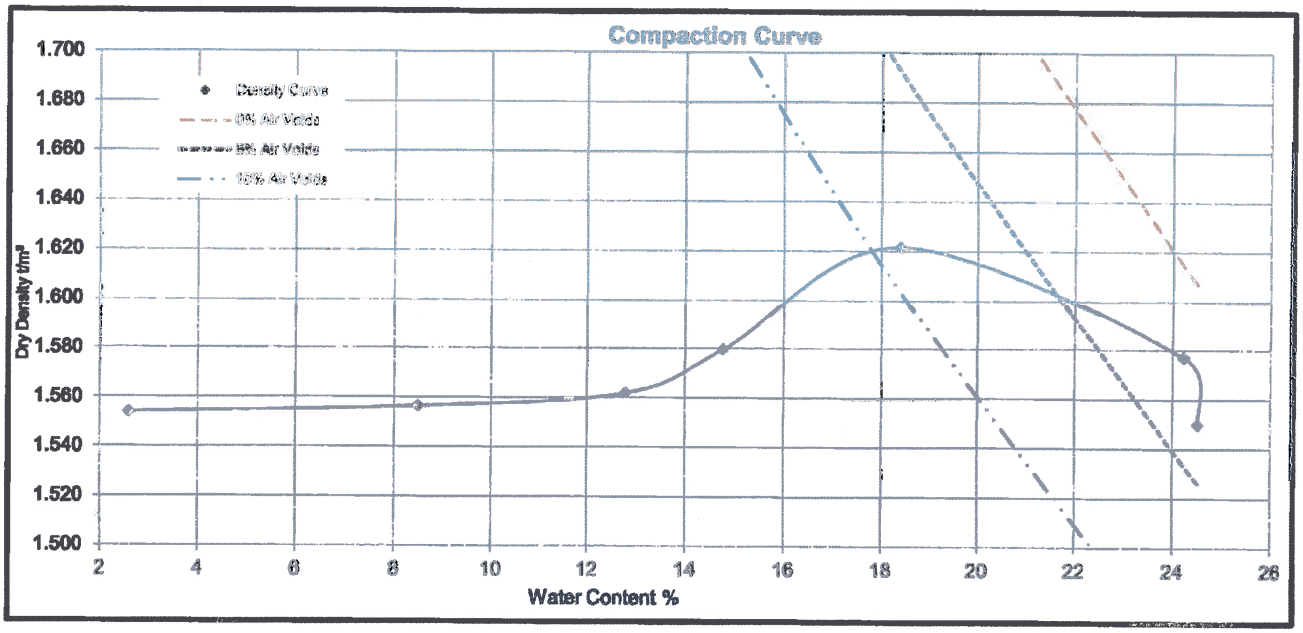
Project :	Golden Sands Subdivision
Location :	Papamoa Beach
Client :	Bay Civil Ltd
Contractor :	Bay Civil Ltd
Sampled by :	R McGee & L Tutty (Opus Laboratory)
Date sampled :	18 June 2015
Sampling method :	N/A
Sample description :	Bulk Fill (Sand)
Sample condition :	Natural State
Solid density :	2.65 t/m³ (Assumed)
Source :	On Site
GPS co ordinates :	N5819153 / E1894796

Project No :	255512.00/0TL
Lab Ref No :	15/442
Client Ref No :	–

Test Results

Maximum dry density	1.62	t/m³	Natural water content	2.6	%
Optimum water content	18	%	Fraction tested	Whole Soil	

Sample ID		1	3	4	5	6	8	7
Bulk density	t/m³	1.594	1.689	1.762	1.813	1.920	1.959	1.930
Water content	%	2.6	8.5	12.8	14.8	18.4	24.2	24.5
Dry density	t/m³	1.554	1.557	1.562	1.580	1.622	1.577	1.550
Sample condition		Med. Dense Moist	Med. Dense Very Moist	Med. Dense Very Moist	Dense Wet	Dense Very wet	Med. Dense Saturated	Med. Dense Saturated



Test Method		Notes
Compaction	NZS 4402 : 1986 Test 4.1.1 (Standard)	GPS co ordinates = NZ Transverse Mercator Projection This report may only be reproduced in full.

Date tested : 30 June 2015
Date reported : 30 June 2015

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

IANZ Approved Signatory

Designation : *Laboratory Manager*
Date : 30 June 2015

Opus International Consultants Ltd
Tauranga Laboratory
Quality Management Systems Certified to ISO 9001

278 Chadwick Road, Greerton
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22 October 2016

Mr M Speed
Bay Civil Ltd
PO Box 11496
Papamoa 3151

TG80

Dear Mike

Golden Sands Subdivision

Attached are the results of in-situ nuclear density, water content & scala penetrometer tests carried out on the compacted sand at Golden Sands subdivision, Papamoa Beach.

Site testing was carried out by Richard McGee of Opus Laboratory on 15 August 2016.

Regards

Bruce Hudson
Laboratory Manager

Copy to: Chris Kendrick
chris@baycivil.co.nz

EARTHWORKS COMPACTION CONTROL TEST RESULTS

OPUS

Project :	**Golden Sands Subdivision**
Location :	**Papamoa Beach**
Client :	**Bay Civil Ltd**
Contractor :	**Bay Civil Ltd**
Tested by :	**Richard McGee (Opus Laboratory)**
Date tested :	**15 August 2016**
Material description :	**Bulk Fill (sand)**
Material condition :	**Compacted**
Nuclear densometer no :	**3440-13867**
Solid density :	**-- t/m³**
Max dry density (tested) :	**1.62 t/m³**
Optimum water content (tested) :	**18 %**

Project No :	**255512.00/0TL**
Lab Ref No :	**TG80**
Client Ref No :	**--**

Nuclear Densometer Test Results

Test Number	1	2	3	4	5	6	7
GPS co ordinates (BOP Circuit 2000)	N803426.5 E389250.4	N803427.5 E389252.4	N803414.7 E389311.8	N803412.9 E389314.9	N803409.9 E389290.0	N803409.5 E389279.0	N803340.8 E389042.6
Depth	0.3m below finished level	1.2m below finished level	0.4m below finished level	1.3m below finished level	0.4m below finished level	1.3m below finished level	2.0m below finished level
Test Probe Depth (mm)	300	300	300	300	300	300	300
Wet Density (t/m³)	1.84	1.82	1.79	1.83	1.75	1.81	1.75
Dry Density (t/m³)	1.70	1.65	1.68	1.66	1.67	1.63	1.62
Water Content (%)	8.0	10.0	7.0	10.5	5.0	10.5	8.0
Air Voids (%)	--	--	--	--	--	--	--
% of MDD	105	102	103	102	103	101	100

Oven Corrected Test Results

Dry Density (t/m³)	1.67	1.65	1.69	1.60	1.64	1.66	1.60
Water Content (%)	9.9	10.3	6.4	14.0	7.2	8.5	9.4
Air Voids (%)	--	--	--	--	--	--	--
% of MDD	**103**	**102**	**104**	**99**	**101**	**103**	**99**

Test Methods	**Notes**
In-situ Density & Water Content : NZS 4407 : 1991, Test 4.2.1 Water Content : NZS:4402 : 1986, Test 2.1	The test positions were selected by Reid Candy of C & C Earthmovers and are approximate only.

The maximum dry density and optimum water content values were obtained from report 15/442, dated 30 June 2015.

This report may only be reproduced in full.

IANZ ACCREDITED LABORATORY

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

Date reported : 22 October 2016

IANZ Approved Signatory

Designation : *Laboratory Manager*
Date : 22 October 2016

Opus International Consultants Ltd
Tauranga Laboratory
Quality Management Systems Certified to ISO 9001

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PO Box 9057, Tauranga 3142, New Zealand

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Facsimile +64 7 578 3382
Website www.opus.co.nz

EARTHWORKS COMPACTION CONTROL TEST RESULTS

OPUS

Project :	**Golden Sands Subdivision**
Location :	**Papamoa Beach**
Client :	**Bay Civil Ltd**
Contractor :	**Bay Civil Ltd**
Tested by :	**Richard McGee (Opus Laboratory)**
Date tested :	**15 August 2016**
Material description :	**Bulk Fill (sand)**
Material condition :	**Compacted**
Nuclear densometer no :	**3440-13867**
Solid density :	**-- t/m³**
Max dry density (tested) :	**1.62 t/m³**
Optimum water content (tested) :	**18 %**

Project No :	**255512.00/0TL**
Lab Ref No :	**TG80**
Client Ref No :	**--**

Nuclear Densometer Test Results

Test Number	8	9	10				
GPS co ordinates (BOP Circuit 2000)	N803340.8 E389042.6	N803340.8 E389042.6	N803340.8 E389042.6				
Depth	1.2m below finished level	0.8m below finished level	1.0m below finished level				
Test Probe Depth (mm)	300	300	300				
Wet Density (t/m³)	1.80	1.81	1.76				
Dry Density (t/m³)	1.67	1.70	1.62				
Water Content (%)	8.0	6.5	8.5				
Air Voids (%)	--	--	--				
% of MDD	103	105	100				

Oven Corrected Test Results

Dry Density (t/m³)	1.64	1.69	1.62				
Water Content (%)	10.0	6.8	8.5				
Air Voids (%)	--	--	--				
% of MDD	**101**	**105**	**100**				

Test Methods	Notes
In-situ Density & Water Content : NZS 4407 : 1991, Test 4.2.1 Water Content : NZS:4402 : 1986, Test 2.1	The test positions were selected by Reid Candy of C & C Earthmovers and are approximate only.

The maximum dry density and optimum water content values were obtained from report 15/442, dated 30 June 2015.

This report may only be reproduced in full.

IANZ ACCREDITED LABORATORY

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

Date reported : 22 October 2016

IANZ Approved Signatory

Designation : *Laboratory Manager*
Date : 22 October 2016

Opus International Consultants Ltd
Tauranga Laboratory
Quality Management Systems Certified to ISO 9001

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PENETRATION RESISTANCE OF A SOIL TEST REPORT

OPUS

Project :	**Golden Sands Subdivision**
Location :	**Papamoa Beach**
Client :	**Bay Civil Ltd**
Contractor :	**Bay Civil Ltd**
Tested by :	**Richard McGee (Opus Laboratory)**
Date tested :	**15 August 2016**
Material description :	**Bulk Fill (sand)**
Material condition :	**Compacted**

Project No :	**255512.00/0TL**
Lab Ref No :	**TG80**
Client Ref No :	**--**

Test No. 1 — Adjacent to nuclear densometer test

Depth (m)	Blows No.	Inf'd CBR (%)
0.1	1	**2**
0.2	2	**4**
0.3	4	**8**
0.4	7	**16**
0.5	7	**16**
0.6	8	**18**
0.7	9	**20**
0.8	7	**16**
0.9	8	**18**
1.0	8	**18**

Test No. 2 — Adjacent to nuclear densometer test

Depth (m)	Blows No.	Inf'd CBR (%)
0.1	2	**4**
0.2	2	**4**
0.3	5	**10**
0.4	6	**13**
0.5	10	**23**
0.6	7	**16**
0.7	8	**18**
0.8	7	**16**
0.9	6	**13**
1.0	5	**10**

Test No. 3 — Adjacent to nuclear densometer test

Depth (m)	Blows No.	Inf'd CBR (%)
0.1	1	**2**
0.2	1	**2**
0.3	5	**10**
0.4	6	**13**
0.5	6	**13**
0.6	7	**16**
0.7	10	**23**
0.8	11	**26**
0.9	10	**23**
1.0	10	**23**

Test No. 4 — Adjacent to nuclear densometer test

Depth (m)	Blows No.	Inf'd CBR (%)
0.1	1	**2**
0.2	3	**6**
0.3	7	**16**
0.4	7	**16**
0.5	6	**13**
0.6	8	**18**
0.7	7	**16**
0.8	8	**18**
0.9	8	**18**
1.0	10	**23**

Test No. 5 — Adjacent to nuclear densometer test

Depth (m)	Blows No.	Inf'd CBR (%)
0.1	1	**2**
0.2	1	**2**
0.3	3	**6**
0.4	6	**13**
0.5	9	**20**
0.6	7	**16**
0.7	8	**18**
0.8	9	**20**
0.9	9	**20**
1.0	8	**18**

Test No. 6 — Adjacent to nuclear densometer test

Depth (m)	Blows No.	Inf'd CBR (%)
0.1	2	**4**
0.2	4	**8**
0.3	7	**16**
0.4	7	**16**
0.5	9	**20**
0.6	8	**18**
0.7	8	**18**
0.8	9	**20**
0.9	10	**23**
1.0	11	**26**

Test No. 7 — Adjacent to nuclear densometer test

Depth (m)	Blows No.	Inf'd CBR (%)
0.1	1	**2**
0.2	3	**6**
0.3	4	**8**
0.4	5	**10**
0.5	5	**10**
0.6	5	**10**
0.7	6	**13**
0.8	6	**13**
0.9	5	**10**
1.0	5	**10**

Test No. 8 — Adjacent to nuclear densometer test

Depth (m)	Blows No.	Inf'd CBR (%)
0.1	1	**2**
0.2	4	**8**
0.3	5	**10**
0.4	7	**16**
0.5	7	**16**
0.6	9	**20**
0.7	9	**20**
0.8	10	**23**
0.9	11	**26**
1.0	11	**26**

Test Method	**Notes**
Determination of the Penetration Resistance, NZS 4402 : 1988, Test 6.5.2	IANZ accreditation of this report excludes the
Inferred CBR values taken from Austroads Pavement Design Manual 2004	inferred CBR values.

The test positions were selected by Reid Candy of C & C Earthmovers and are approximate only.

This report may only be reproduced in full.

Date reported : 22 October 2016

IANZ Approved Signatory

Designation : *Laboratory Manager*

Date : 22 October 2016

IANZ ACCREDITED LABORATORY

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

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PENETRATION RESISTANCE OF A SOIL TEST REPORT

OPUS

Project :	**Golden Sands Subdivision**
Location :	**Papamoa Beach**
Client :	**Bay Civil Ltd**
Contractor :	**Bay Civil Ltd**
Tested by :	**Richard McGee (Opus Laboratory)**
Date tested :	**15 August 2016**
Material description :	**Bulk Fill (sand)**
Material condition :	**Compacted**

Project No :	**255512.00/0TL**
Lab Ref No :	**TG80**
Client Ref No :	**--**

Test No. **9** Adjacent to nuclear densometer test			Test No. **10** Adjacent to nuclear densometer test			Test No. Adjacent to nuclear densometer test			Test No. Adjacent to nuclear densometer test		
Depth (m)	Blows No.	Inf'd CBR (%)	Depth (m)	Blows No.	Inf'd CBR (%)	Depth (m)	Blows No.	Inf'd CBR (%)	Depth (m)	Blows No.	Inf'd CBR (%)
0.1	1	**2**	0.1	1	**2**	0.1			0.1		
0.2	2	**4**	0.2	4	**8**	0.2			0.2		
0.3	5	**10**	0.3	6	**13**	0.3			0.3		
0.4	6	**13**	0.4	7	**16**	0.4			0.4		
0.5	6	**13**	0.5	8	**18**	0.5			0.5		
0.6	7	**16**	0.6	6	**13**	0.6			0.6		
0.7	6	**13**	0.7	6	**13**	0.7			0.7		
0.8	6	**13**	0.8	6	**13**	0.8			0.8		
0.9	7	**16**	0.9	6	**13**	0.9			0.9		
1.0	7	**16**	1.0	5	**10**	1.0			1.0		
Test No. Adjacent to nuclear densometer test			Test No. Adjacent to nuclear densometer test			Test No. Adjacent to nuclear densometer test			Test No. Adjacent to nuclear densometer test		
Depth (m)	Blows No.	Inf'd CBR (%)	Depth (m)	Blows No.	Inf'd CBR (%)	Depth (m)	Blows No.	Inf'd CBR (%)	Depth (m)	Blows No.	Inf'd CBR (%)
0.1			0.1			0.1			0.1		
0.2			0.2			0.2			0.2		
0.3			0.3			0.3			0.3		
0.4			0.4			0.4			0.4		
0.5			0.5			0.5			0.5		
0.6			0.6			0.6			0.6		
0.7			0.7			0.7			0.7		
0.8			0.8			0.8			0.8		
0.9			0.9			0.9			0.9		
1.0			1.0			1.0			1.0		

Test Method	Notes
Determination of the Penetration Resistance, NZS 4402 : 1988, Test 6.5.2	IANZ accreditation of this report excludes the
Inferred CBR values taken from Austroads Pavement Design Manual 2004	inferred CBR values.

The test positions were selected by Reid Candy of C & C Earthmovers and are approximate only.

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Date reported : 22 October 2016

IANZ Approved Signatory

Designation : *Laboratory Manager*

Date : 22 October 2016

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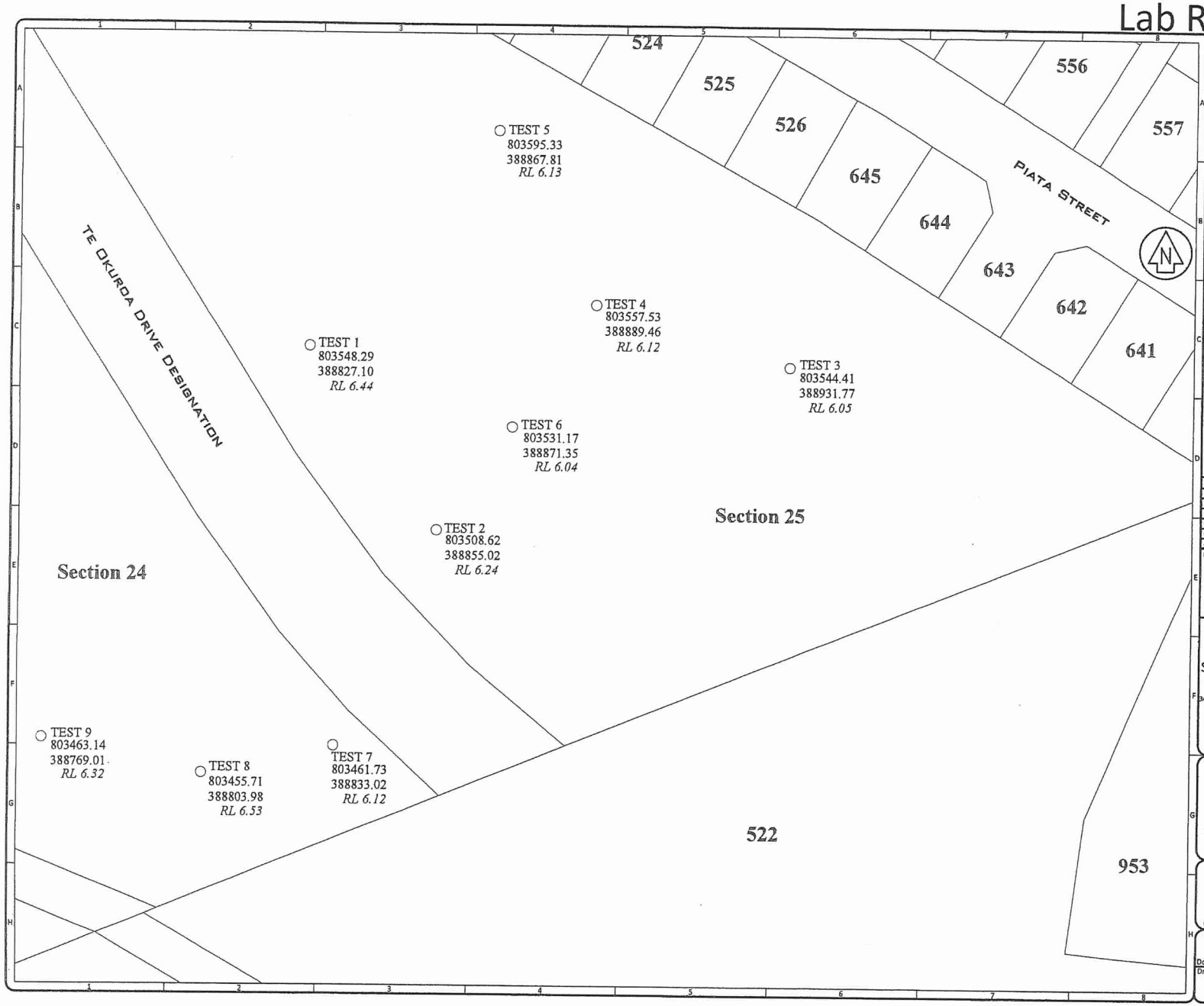

NOTE:
Coordinates & heights are in terms of BP 33 DP 486234 RL 5.918 Moturiki Datum.

Issued to Opus International 08/2017

CAD BY	REV No	DESCRIPTION	DATE

	NAME	DATE	SIGNED
Surveyed	AW	08/2017	
Designed			
Drawn	BTW	08/2017	
Checked			
Approved			

References

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SURVEYORS - ENGINEERS - PLANNERS
36 Kerelit Street, Mt Maunganui, New Zealand
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Web Site: www.sltga.co.nz

Title
Golden Sands
Papamoa
Earthworks Testing

Scala Penetrometer Tests
PSB West

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Original Scales @ A3	Date
1:750 Do Not Scale Dimensions	08/2017
Drawing No: 21137 - OPUS 2	Revision: 1

PENETRATION RESISTANCE OF A SOIL TEST REPORT

OPUS

Project :	**Golden Sands Earthworks Contract**
Location :	**PSB West**
Client :	**Bay Civil Ltd**
Contractor :	**Bay Civil Ltd**
Tested by :	**R McGee & B McDonald (Opus Laboratory)**
Date tested :	**23 August 2017**
Material description :	**Sand**
Material condition :	**Compacted**

Project No :	**255512.00/0TL**
Lab Ref No :	**TG1336**
Client Ref No :	**--**

Test : 7			Test : 8			Test : 9					
Depth (m)	Blows No.	Inf'd CBR	Depth (m)	Blows No.	Inf'd CBR	Depth (m)	Blows No.	Inf'd CBR	Depth (m)	Blows No.	Inf'd CBR
0.1	1	**2**	0.1	1	**2**	0.1	1	**2**			
0.2	2	**4**	0.2	2	**4**	0.2	1	**2**			
0.3	5	**10**	0.3	6	**13**	0.3	5	**10**			
0.4	5	**10**	0.4	6	**13**	0.4	5	**10**			
0.5	8	**18**	0.5	9	**20**	0.5	7	**16**			
0.6	10	**23**	0.6	8	**18**	0.6	12	**>36**			
0.7	12	**28**	0.7	8	**18**	0.7	11	**26**			
0.8	12	**28**	0.8	8	**18**	0.8	10	**23**			

Depth (m)	Blows No.	Inf'd CBR	Depth (m)	Blows No.	Inf'd CBR	Depth (m)	Blows No.	Inf'd CBR	Depth (m)	Blows No.	Inf'd CBR

Test Method	Notes
Determination of the Penetration Resistance, NZS 4402 : 1988, Test 6.5.2 Inferred CBR values taken from Austroads Pavement Design Manual 2004	IANZ accreditation of this report excludes the inferred CBR values.

The test positions were selected by Bay Civil staff and the GPS positions were recorded by S & L Consultants staff.

This report may only be reproduced in full.

Date reported : 31 October 2017

IANZ Approved Signatory

Designation : *Laboratory Manager*

Date : 31 October 2017

IANZ ACCREDITED LABORATORY

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

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SCALA PENETROMETER TEST RESULTS

(No. of Blows / Successive 0.1m Penetration)

Job Number: 20076 - S56
Client: Bluehaven Holdings Limited
Location: Golden Sands Stage 56
Tested by: Aidan Waterhouse/David By De Ley
Date: 28/06/2019

_____ indicates base of fill

R = Refusal (>15 blows per 100 mm)

Test Position (Lot No.)	614	1460	1461	1462	1463	1464	1465	1466	1467	1468	1469	1470	1471	1472
Depth (m)														
0.0 - 0.1	3	6	5	3	4	5	3	4	7	4	4	9	5	7
0.1 - 0.2	10	7	5	3	4	7	4	4	6	6	5	9	8	9
0.2 - 0.3	13	5	5	7	7	9	12	9	10	11	9	R	12	14
0.3 - 0.4	11	7	7	10	9	11	R	11	12	14	12		12	R
0.4 - 0.5	11	9	9	14	11	R		15	15	R	15		13	
0.5 - 0.6	10	11	11	15	14			R	R		R		13	
0.6 - 0.7	8	11	13	R	R								10	
0.7 - 0.8	6	13	15										10	
0.8 - 0.9														
0.9 - 1.0														
1.0 - 1.1														
1.1 - 1.2														
1.2 - 1.3														
1.3 - 1.4														
1.4 - 1.5														
1.5 - 1.6														

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SCALA PENETROMETER TEST RESULTS

(No. of Blows / Successive 0.1m Penetration)

Job Number: 20076 - S56
Client: Bluehaven Holdings Limited
Location: Golden Sands Stage 56
Tested by: Aidan Waterhouse/David By De Ley
Date: 28/06/2019

_____ indicates base of fill

R = Refusal (>15 blows per 100 mm)

Test Position (Lot No.)	1473	1474	1475	1476	1477	1478	1479	1480	1481	1482	1483	1484	1485	1486
Depth (m)														
0.0 - 0.1	6	3	3	3	4	3	3	4	3	3	5	5	5	2
0.1 - 0.2	10	4	3	4	4	4	4	4	4	4	3	7	9	2
0.2 - 0.3	9	5	4	5	5	4	4	8	9	4	4	6	10	4
0.3 - 0.4	14	R	10	11	8	12	6	13	13	5	4	9	15	6
0.4 - 0.5	R		R	R	10	R	15	15	14	5	3	12	R	11
0.5 - 0.6					R		R	R	R	4	1	12		15
0.6 - 0.7										4	2	13		R
0.7 - 0.8										5	1	15		
0.8 - 0.9														
0.9 - 1.0														
1.0 - 1.1														
1.1 - 1.2														
1.2 - 1.3														
1.3 - 1.4														
1.4 - 1.5														
1.5 - 1.6														

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SCALA PENETROMETER TEST RESULTS

(No. of Blows / Successive 0.1m Penetration)

Job Number: 20076 - S56
Client: Bluehaven Holdings Limited
Location: Golden Sands Stage 56
Tested by: Aidan Waterhouse/David By De Ley
Date: 28/06/2019

_____ indicates base of fill

R = Refusal (>15 blows per 100 mm)

Test Position (Lot No.)	1487	1488	1489	1490	1491	1492	1493	1494	1495	1496	1497	1498		
Depth (m)														
0.0 - 0.1	2	2	3	3	3	3	3	2	1	2	3	4		
0.1 - 0.2	1	2	3	3	3	3	2	2	2	4	3	4		
0.2 - 0.3	3	6	4	6	7	6	4	4	3	6	6	6		
0.3 - 0.4	6	15	6	8	9	6	5	5	5	10	9	9		
0.4 - 0.5	14	R	6	9	11	8	6	6	7	15	12	10		
0.5 - 0.6	R		12	11	14	9	10	7	12	R	14	15		
0.6 - 0.7			R	11	R	15	12	15	14		R	R		
0.7 - 0.8				13		R	13	R	R					
0.8 - 0.9														
0.9 - 1.0														
1.0 - 1.1														
1.1 - 1.2														
1.2 - 1.3														
1.3 - 1.4														
1.4 - 1.5														
1.5 - 1.6														

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SCALA PENETROMETER TEST RESULTS

(No. of Blows / Successive 0.1m Penetration)

Job Number: 20076 - S56
Client: Bluehaven Holdings Limited
Location: Golden Sands Stage 56
Tested by: Henry Conway/Lance Hope
Date: 28/08/2019

_____ indicates base of fill

R = Refusal (>15 blows per 100 mm)

Test Position (Lot No.)	1499	1500	1501	1502	1503	1504	1505	1506	1507	1508	1509	1510		
Depth (m)														
0.0 - 0.1	3	3	3	4	4	5	3	4	4	5	3	5		
0.1 - 0.2	5	4	3	4	4	7	4	6	5	4	4	4		
0.2 - 0.3	5	4	3	4	4	7	5	6	6	6	5	5		
0.3 - 0.4	7	8	6	8	6	8	7	11	11	7	7	8		
0.4 - 0.5	9	8	8	14	10	8	10	14	13	8	9	12		
0.5 - 0.6	10	9	10	R	13	8	9	R	R	13	12	14		
0.6 - 0.7	10	9	13		R	8	10			R	R	R		
0.7 - 0.8	13	11	R			9	10							
0.8 - 0.9														
0.9 - 1.0														
1.0 - 1.1														
1.1 - 1.2														
1.2 - 1.3														
1.3 - 1.4														
1.4 - 1.5														
1.5 - 1.6														

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SCALA PENETROMETER TEST RESULTS

(No. of Blows / Successive 0.1m Penetration)

Job Number: 20076 - S56
Client: Bluehaven Holdings Limited
Location: Golden Sands Stage 56
Tested by: Henry Conway/Lance Hope
Date: 28/08/2019

_____ indicates base of fill

R = Refusal (>15 blows per 100 mm)

Test Position (Lot No.)	1511	1512	1513	1514	1515	1516	1517	1518	1519	1520	1521	1522		
Depth (m)														
0.0 - 0.1	4	3	3	3	2	3	4	5	6	3	5	4		
0.1 - 0.2	4	5	6	3	4	6	4	9	9	7	6	6		
0.2 - 0.3	4	5	7	6	4	6	6	8	12	9	7	5		
0.3 - 0.4	7	7	10	9	6	10	15	13	14	11	11	6		
0.4 - 0.5	11	11	14	12	11	12	R	R	R	15	13	13		
0.5 - 0.6	14	15	R	14	13	14				R	R	R		
0.6 - 0.7	R	R		R	R	R								
0.7 - 0.8														
0.8 - 0.9														
0.9 - 1.0														
1.0 - 1.1														
1.1 - 1.2														
1.2 - 1.3														
1.3 - 1.4														
1.4 - 1.5														
1.5 - 1.6														

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SCALA PENETROMETER TEST RESULTS

(No. of Blows / Successive 0.1m Penetration)

Job Number: 20076 - S56
Client: Bluehaven Holdings Limited
Location: Golden Sands Stage 56
Tested by: Henry Conway/Lance Hope
Date: 28/08/2019

_____ indicates base of fill

R = Refusal (>15 blows per 100 mm)

Test Position (Lot No.)	1523	1524	1525											
Depth (m)														
0.0 - 0.1	4	2	4											
0.1 - 0.2	6	5	7											
0.2 - 0.3	9	3	8											
0.3 - 0.4	9	5	6											
0.4 - 0.5	9	8	6											
0.5 - 0.6	13	10	7											
0.6 - 0.7	R	13	8											
0.7 - 0.8		R	8											
0.8 - 0.9														
0.9 - 1.0														
1.0 - 1.1														
1.1 - 1.2														
1.2 - 1.3														
1.3 - 1.4														
1.4 - 1.5														
1.5 - 1.6														

APPENDIX IV

Soakage Tests and Analyses

S & L CONSULTANTS LTD
SURVEYORS - ENGINEERS - PLANNERS

Our ref: 20076-S56

Date: November 2019

Soakage Test Analyses

Location: Golden Sands, Stage 56

Objective: To determine the contributing catchment areas for soakpits constructed of nominally 600 mm or 900 mm diameter precast concrete perforated rings, 3 deep. These soakpits are required to effectively dispose of stormwater runoff in a 10% AEP: 60 minute storm event. A soakage rate of 1600mm/h, derived from site testing, has been used in the analysis, which is reduced by 50% as per the IDC of the Tauranga City Council.

Use is of the method outlined in 9.05 of Section E1/VM1 of New Zealand Building Code – as referred to in the Council IDC, where Rc = V (storage) + V (soakage)

= run-off from catchment
= 10CiA

Where C = 1
i = 65mm/h (taken from TCC IDC for a 1:10 year (10% AEP) rainfall, 1 hour event
A = the catchment area in ha
Rc = 10 * 1 * 65 * A = 650*A (m^3)
A = Rc / 650 (ha) = Rc / 0.065 (m^2)

Parameters for 3 soak rings, 1.35m deep are:	500 mm ID	800 mm ID
V (storage) = πd^2 x 1.35 m deep = ¼	0.27 m^3	0.68 m^3
A (soakage) = base area + wall area = $\pi d2/4 + \pi d$ x 1.35	2.3 m^2	3.9 m^2
Soakage rate (Sr) from graph = 1600 mm/h x 0.5 =	800 mm/hr	800 mm/hr
V (soakage) = A (soakage) x Sr / 1000	1.84 m^3/h	3.12 m^3/h
Rc = V(storage + V(soakage) =	= 0.27 m^3 + 1.84 m^3/h = 2.11 m^3	= 0.68 m^3 + 3.12 m^3/h = 3.80 m^3
Area of catchment served = Rc / 0.065 =	32 m^2	58 m^2

CONCLUSIONS

500 mm id perforated soakrings x 3 deep (depth 1.35 m) are suitable for the onsite disposal of stormwater runoff from a catchment area of 32m^2 – adopt 30m^2.

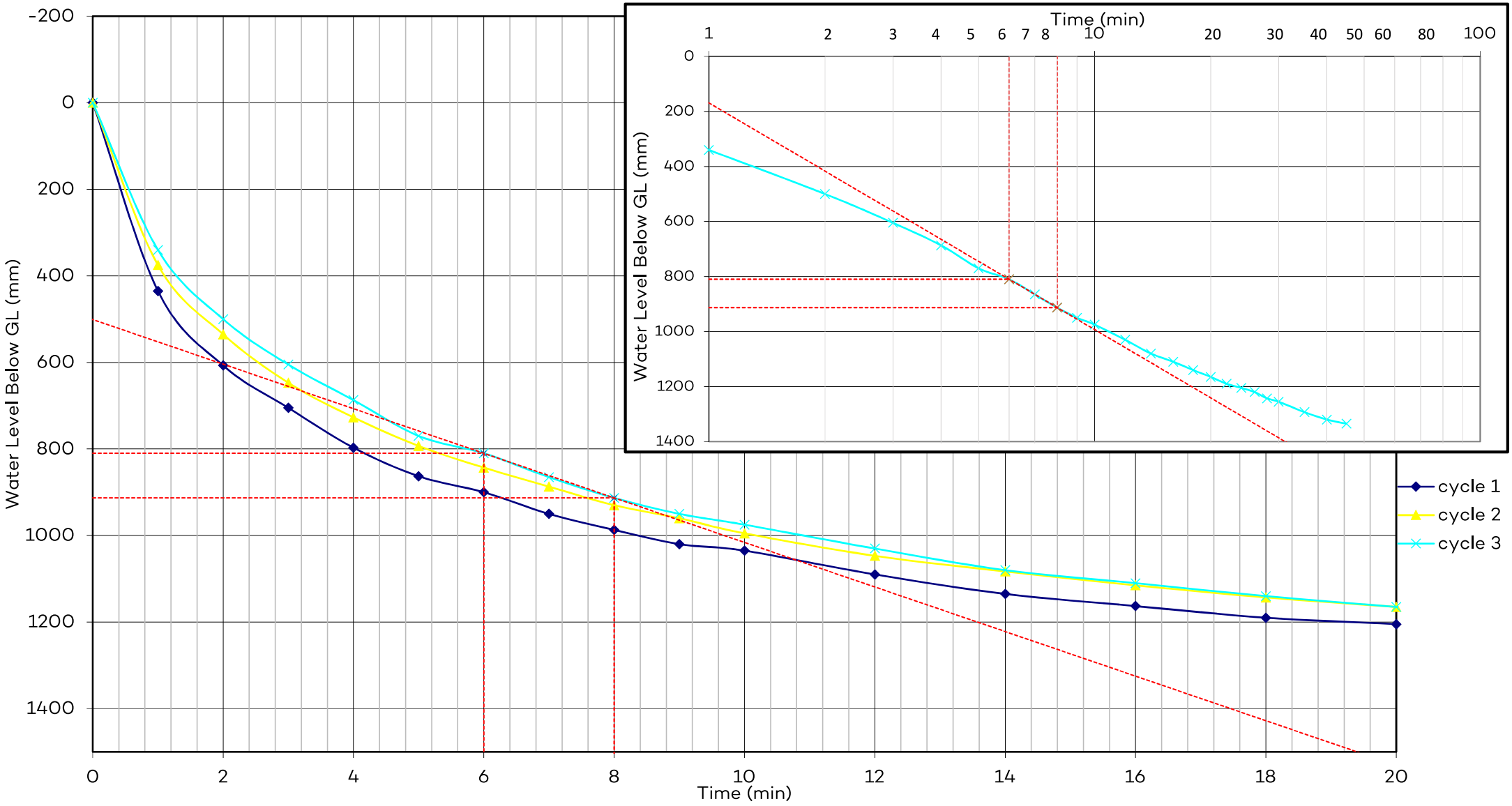
500 mm id perforated soakrings x 3 deep (depth 1.35 m) are suitable for the onsite disposal of stormwater runoff from a catchment area of 58m^2 – adopt 55m^2.

Our Ref: 20076 - S47, S48, S55
Date: 11/09/2019

Golden Sands Stage 47, 48, 55

Soakage Test Position # **Lot 1041/1042**

S&L Land Development and Design Specialists



	Time (min)	Water Level (mm)
Time 1	6	810
Time 2	8	913

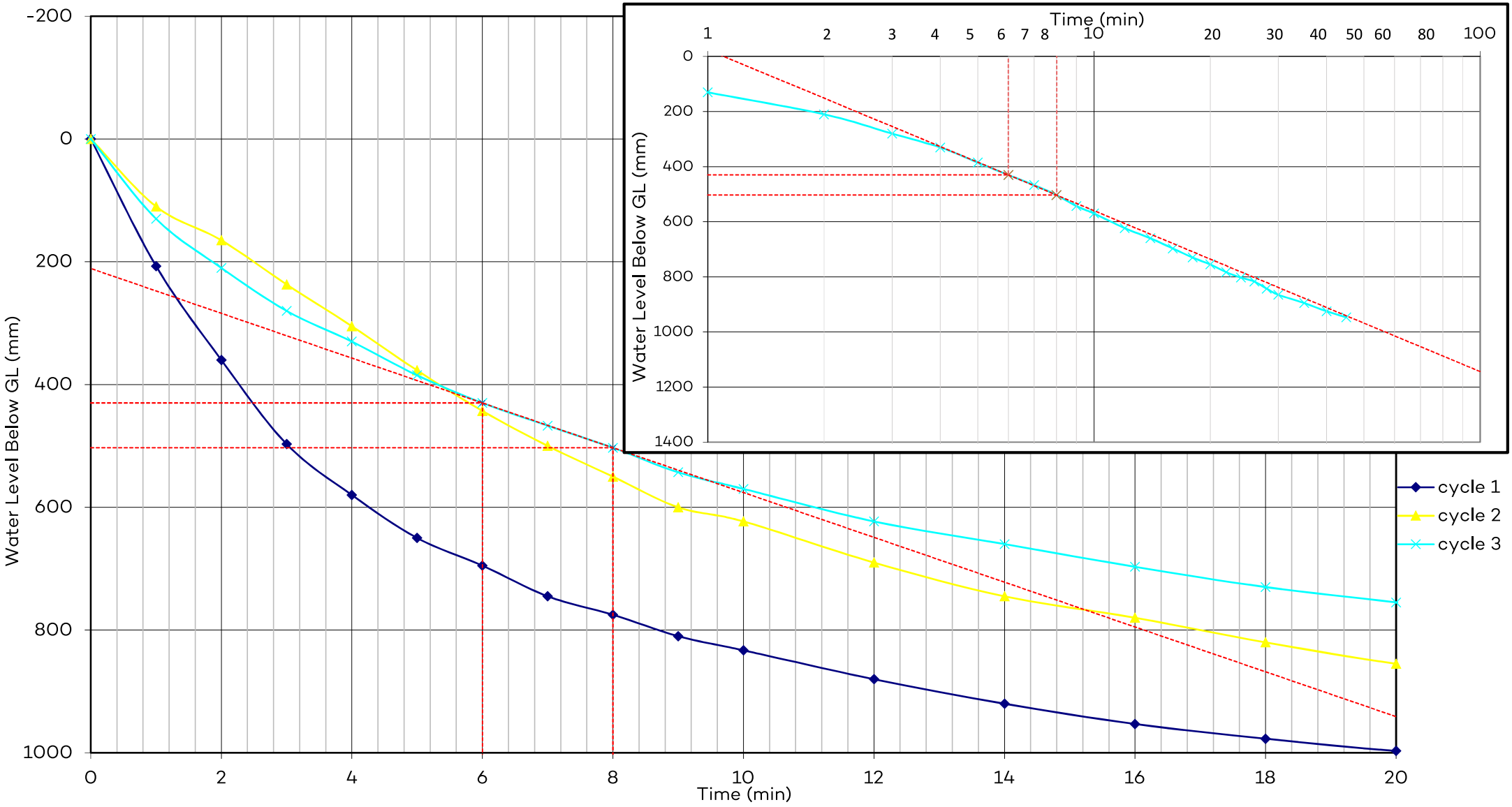
Soakage Rate = 3090 mm/hr

Our Ref: 20076 - S56
Date: 6/09/2019

Golden Sands Stage 56

Soakage Test Position # **Lot 1462/1463**

S&L Land Development and Design Specialists



	Time (min)	Water Level (mm)
Time 1	6	430
Time 2	8	503

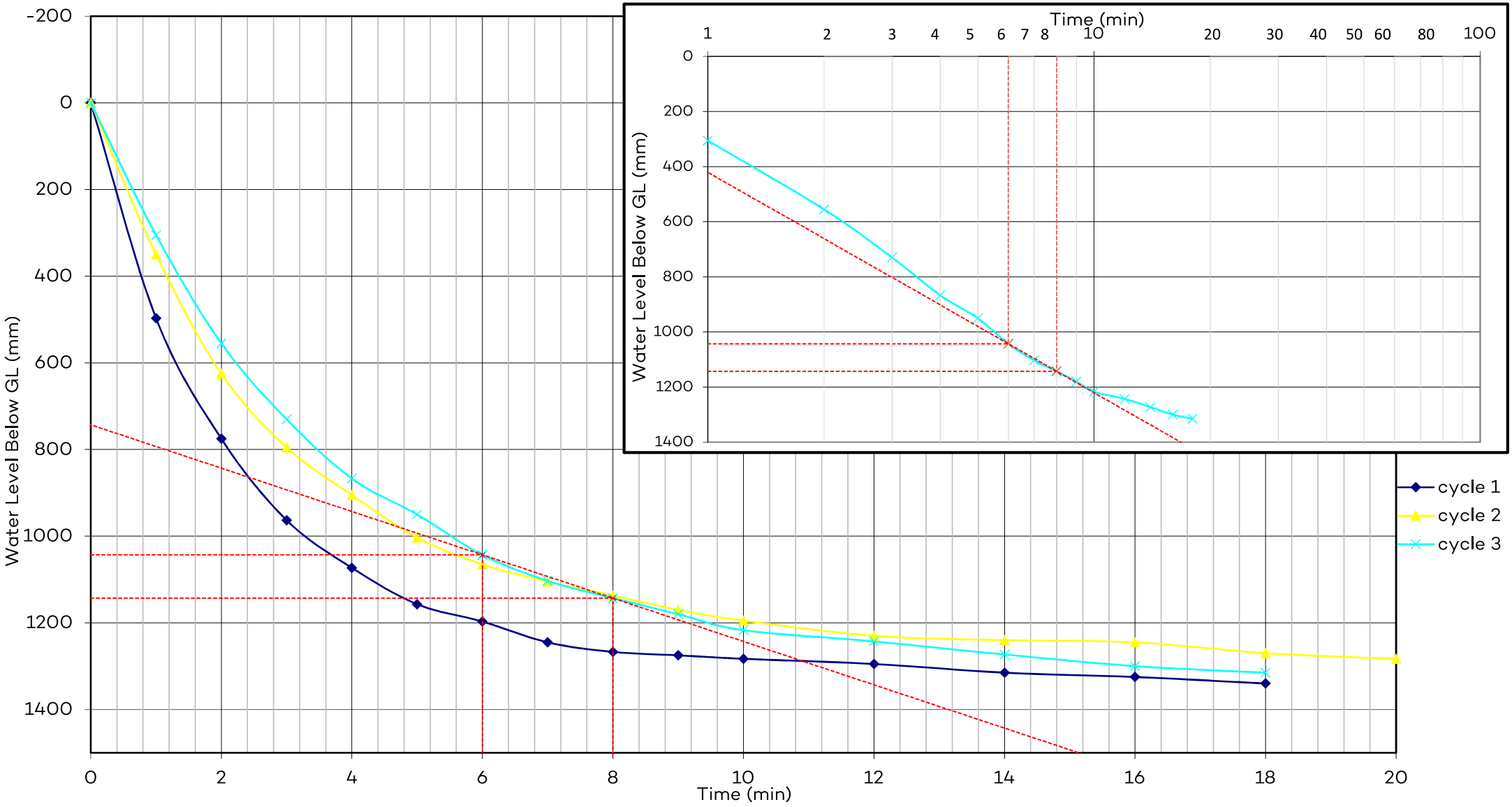
Soakage Rate = 2190 mm/hr

Our Ref: 20076 - S56
Date: 6/09/2019

Golden Sands Stage 56

Soakage Test Position # **Lot 1470/1471**

S&L Land Development and Design Specialists



	Time (min)	Water Level (mm)
Time 1	6	1043
Time 2	8	1143

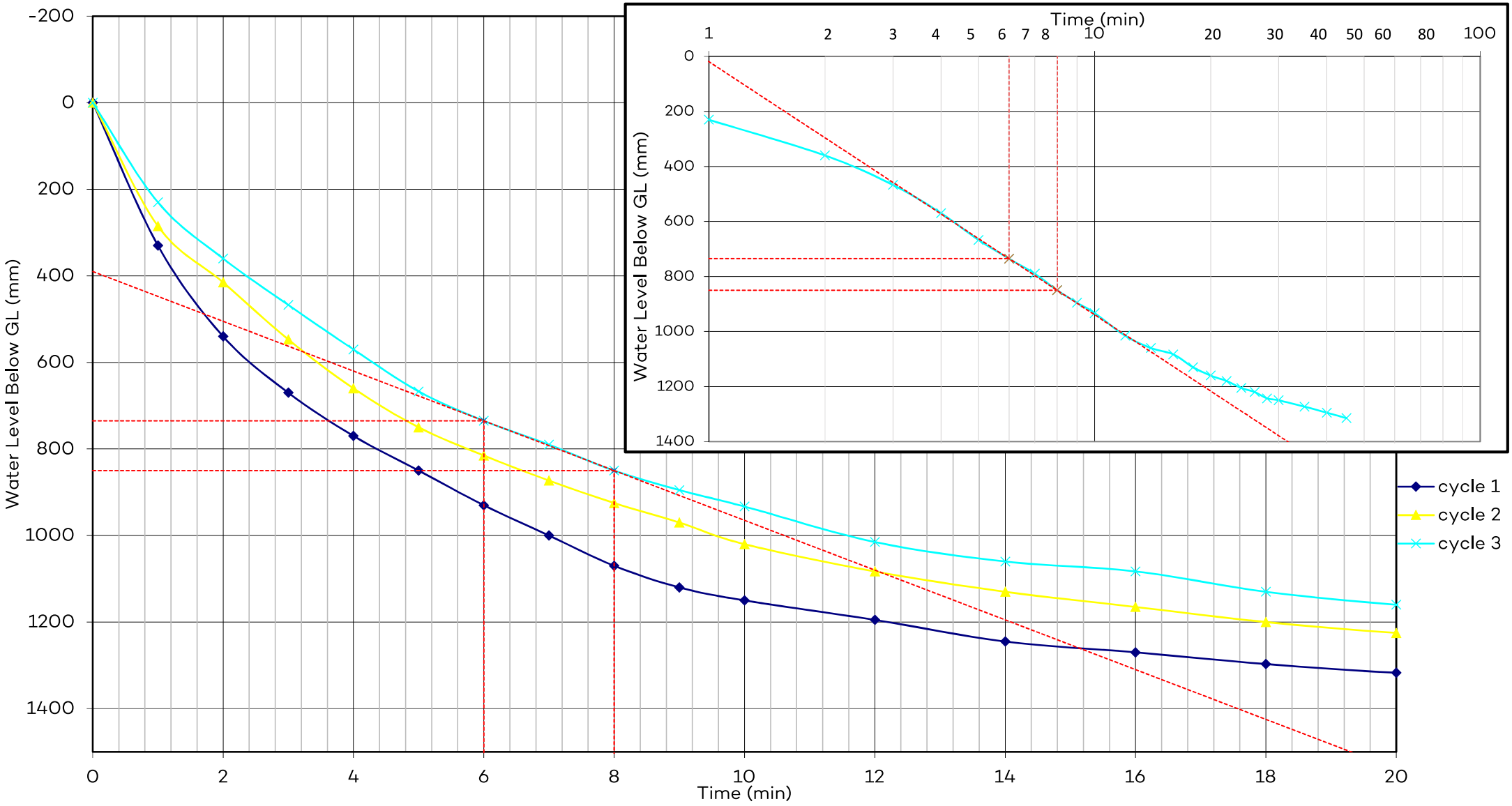
Soakage Rate = 3000 mm/hr

Our Ref: 20076 - S56
Date: 6/09/2019

Golden Sands Stage 56

Soakage Test Position # **Lot 1482/1483**

S&L Land Development and Design Specialists



	Time (min)	Water Level (mm)
Time 1	6	735
Time 2	8	850

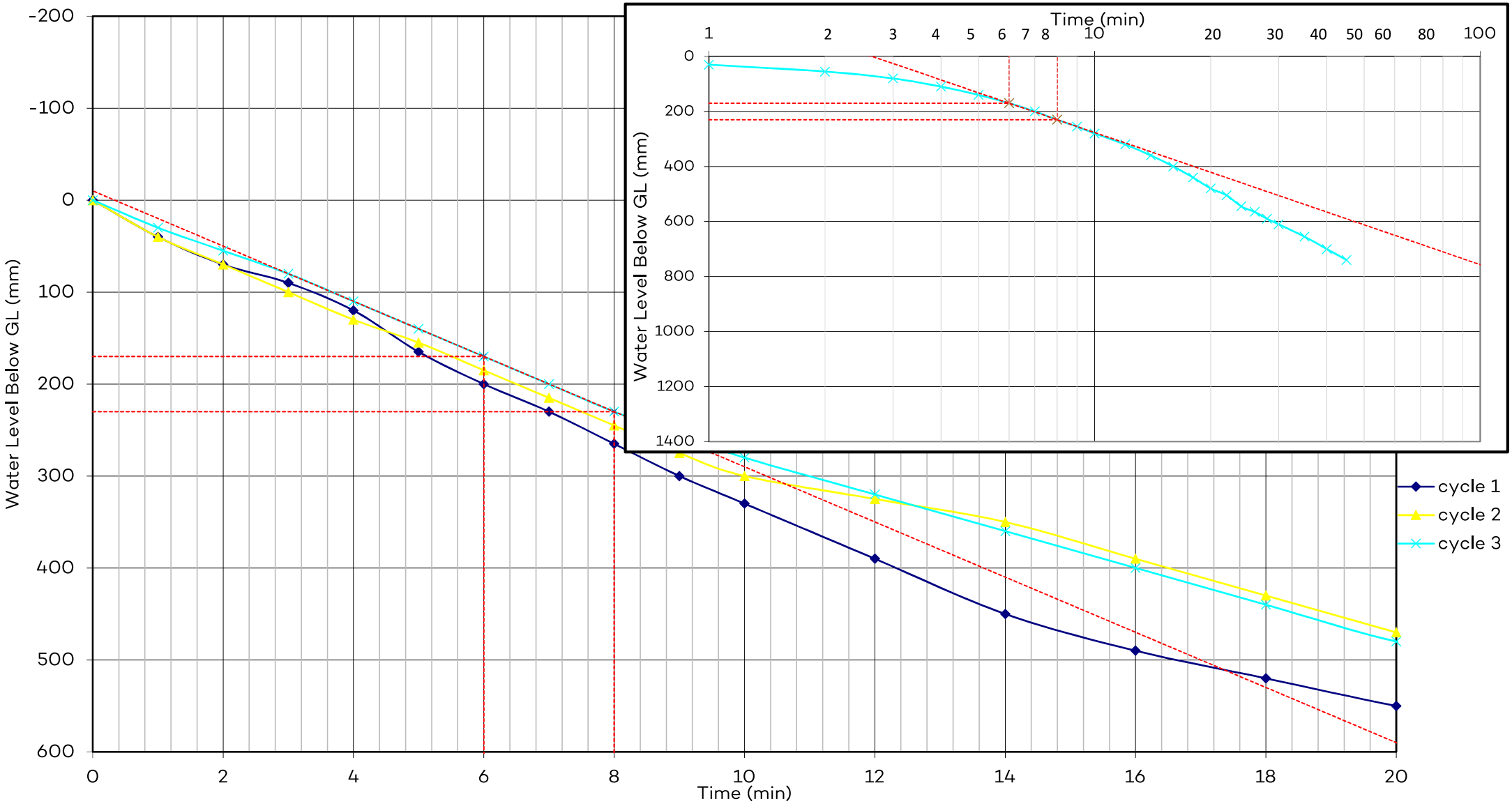
Soakage Rate = 3450 mm/hr

Our Ref: 20076 - S56
Date: 9/09/2019

Golden Sands Stage 56

Soakage Test Position # **Lot 1491/1493**

S&L Land Development and Design Specialists



	Time (min)	Water Level (mm)
Time 1	6	170
Time 2	8	230

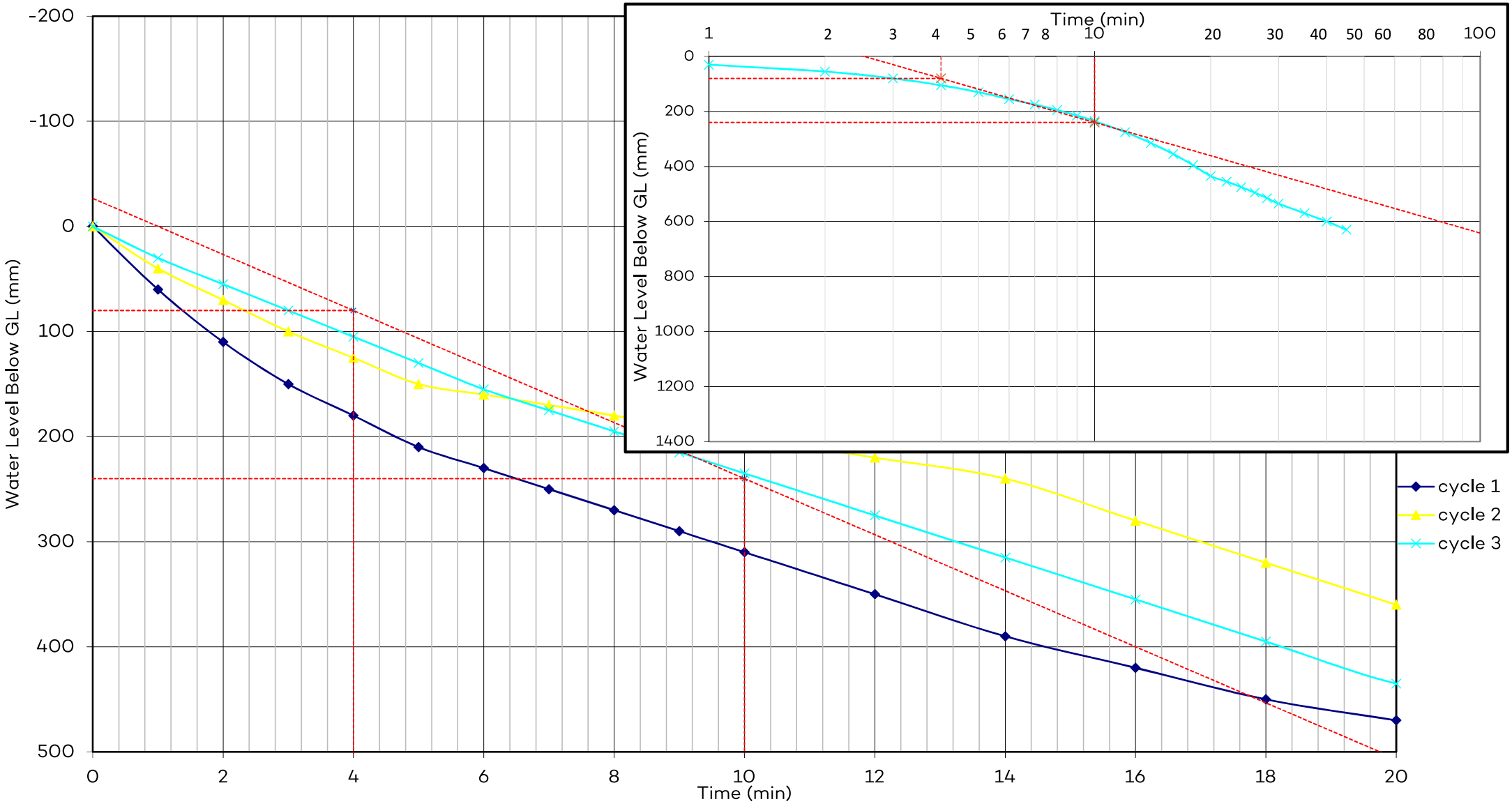
Soakage Rate = 1800 mm/hr

Our Ref: 20076 - S56
Date: 9/09/2019

Golden Sands Stage 56

Soakage Test Position # **Lot 1501/1502**

S&L Land Development and Design Specialists



	Time (min	Water Level (mm)
Time 1	4	80
Time 2	10	240

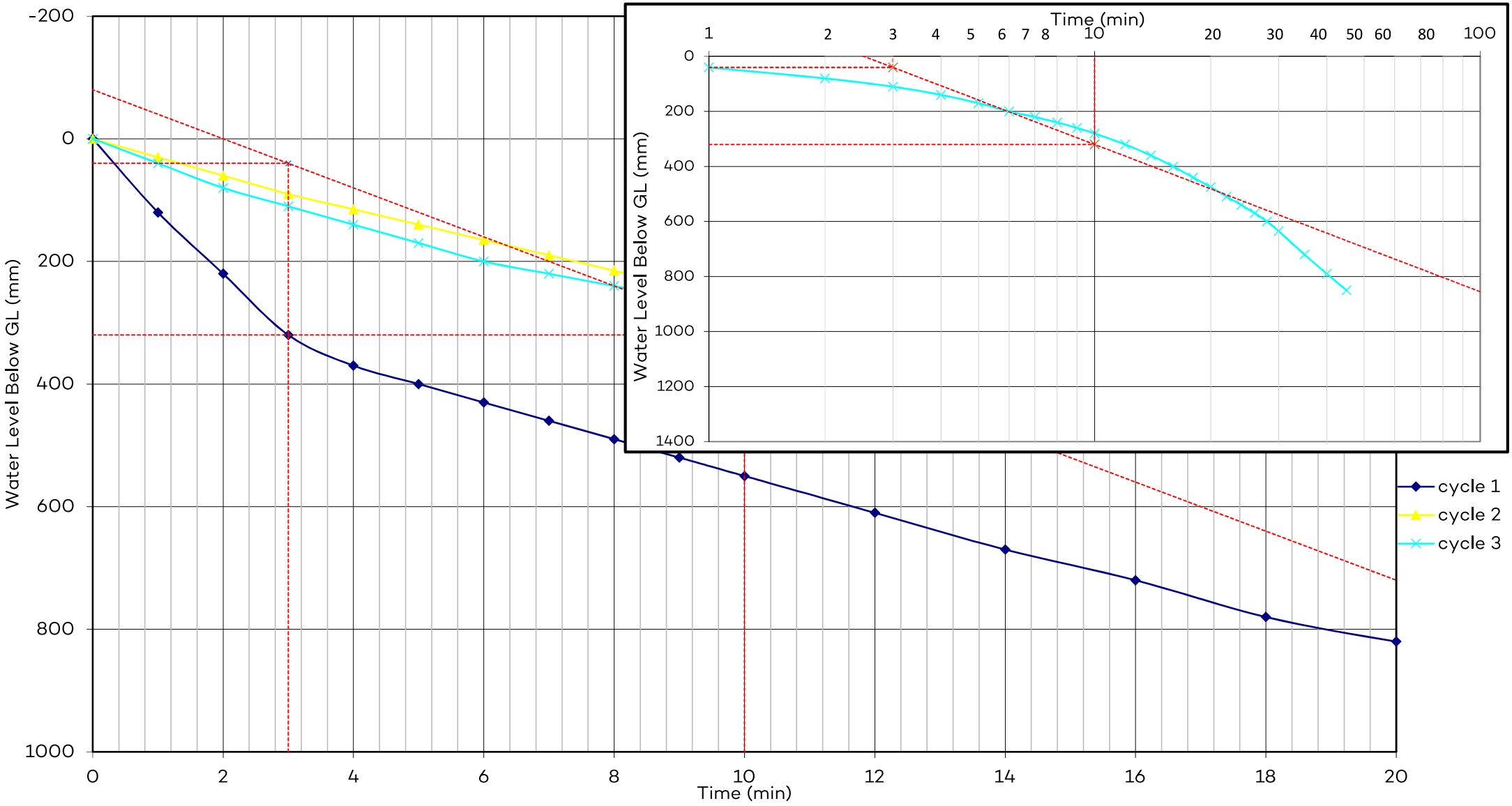
Soakage Rate = 1600 mm/hr

Our Ref: 20076 - S56
Date: 9/09/2019

Golden Sands Stage 56

Soakage Test Position # **Lot 1518/1519**

S&L Land Development and Design Specialists



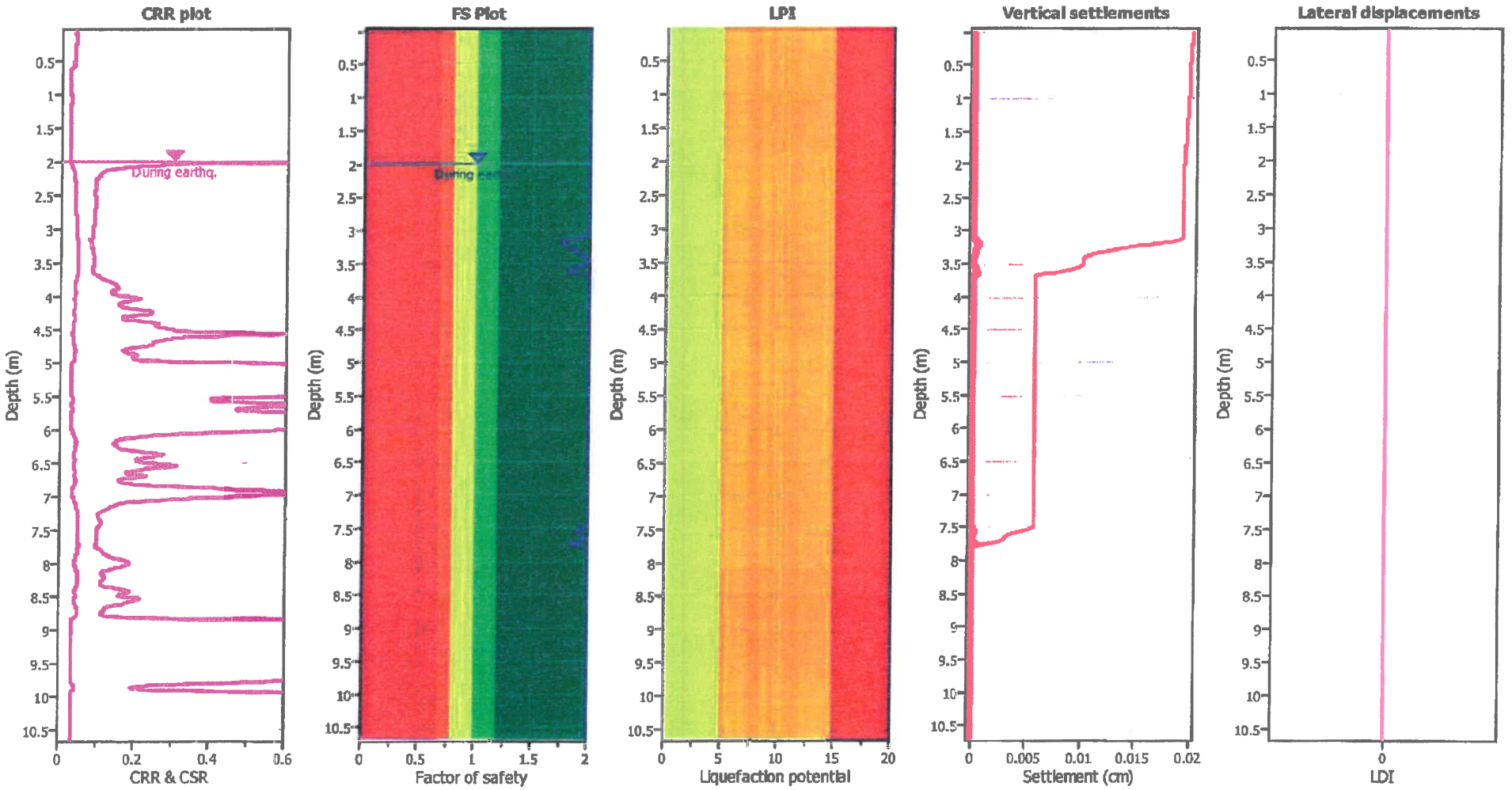
	Time (min)	Water Level (mm)
Time 1	3	40
Time 2	10	320

Soakage Rate = 2400 mm/hr

APPENDIX V

Liquefaction Analysis Plots

Liquefaction analysis overall plots



Input parameters and analysis data

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
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.07	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	2.70 m	Fill height:	N/A	Limit depth:	15.00 m

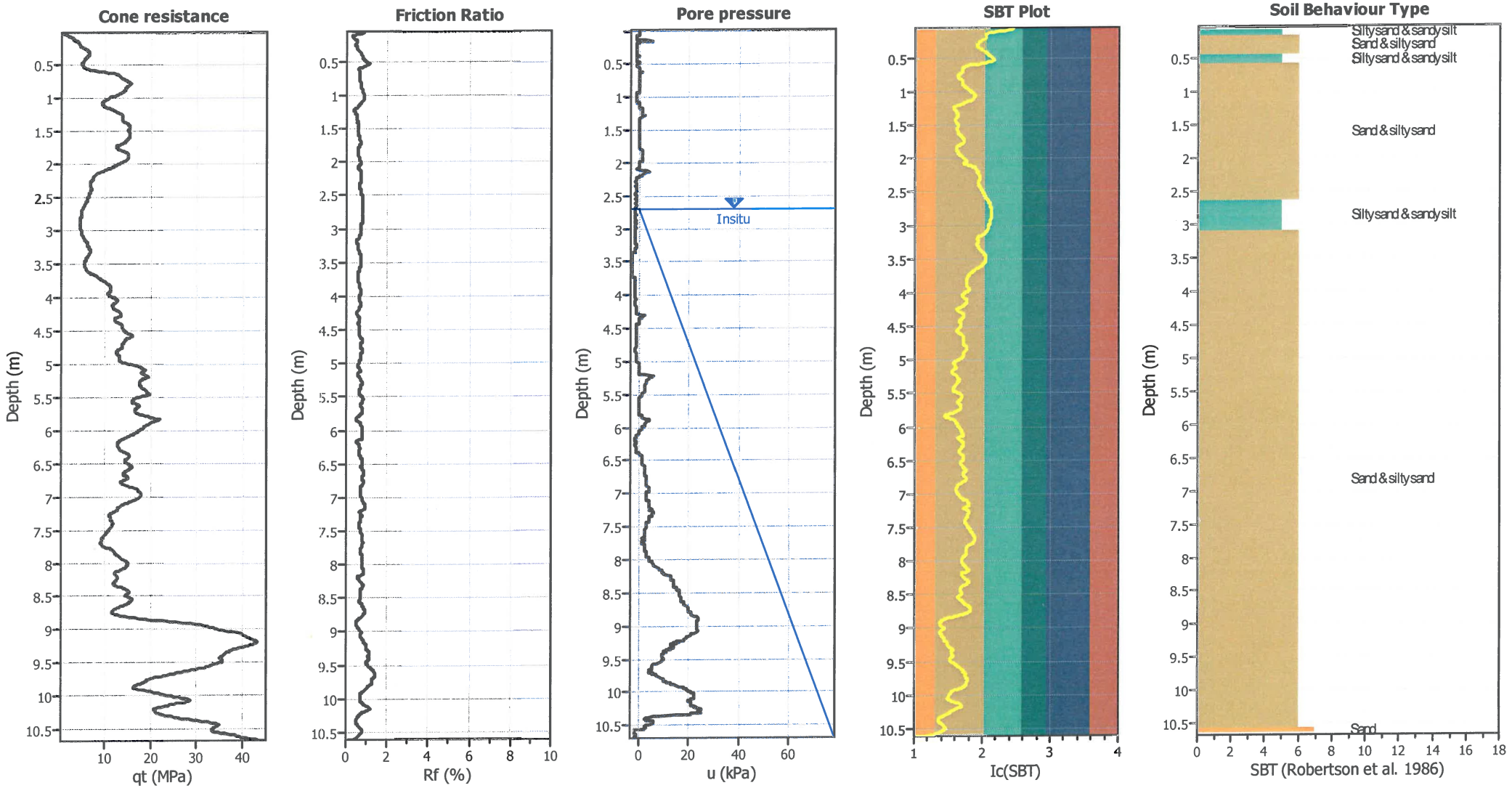
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

CPT basic interpretation plots



Input parameters and analysis data

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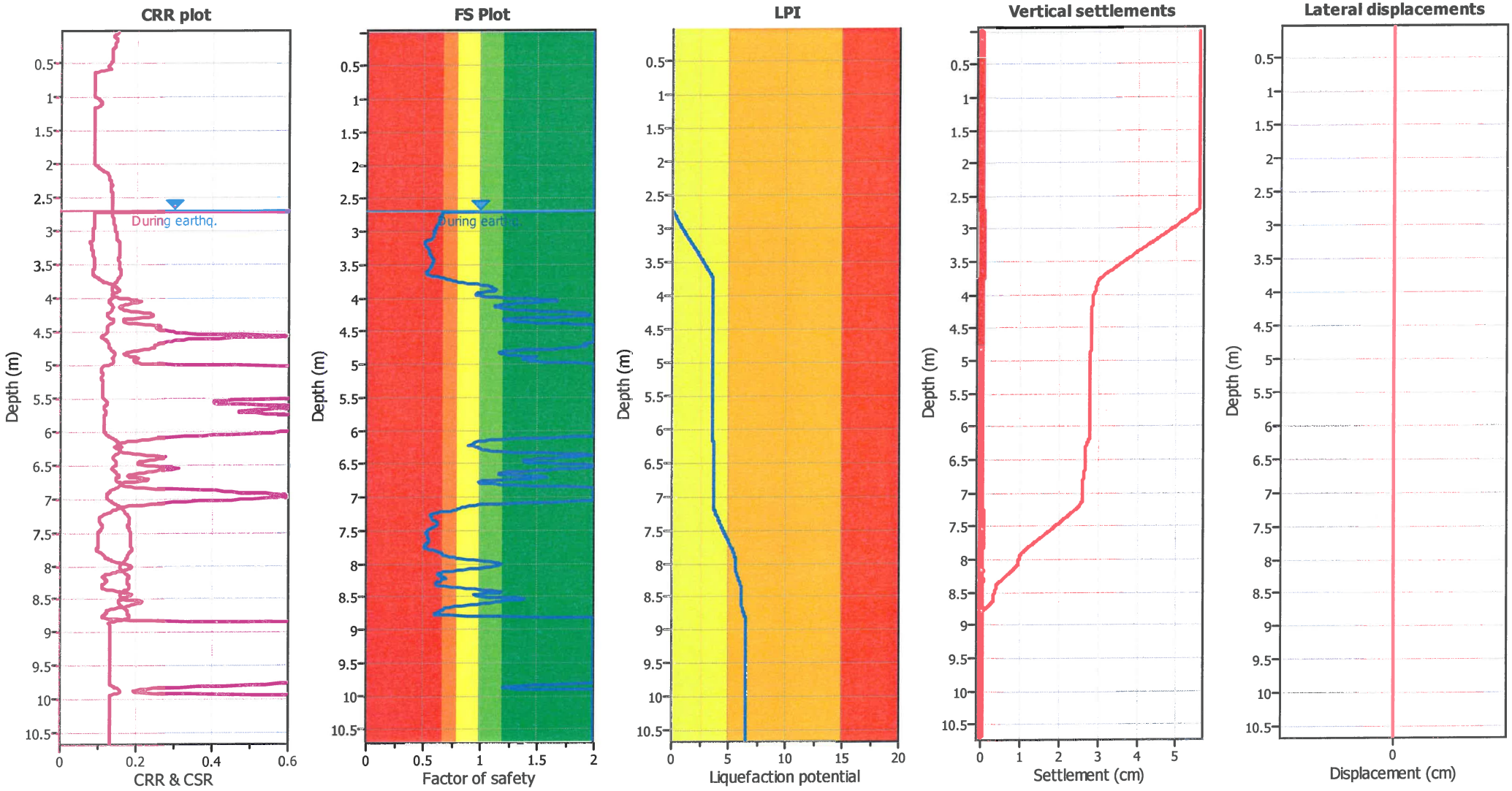
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sand & Clay
Peak ground acceleration:	0.27	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	2.70 m	Fill height:	N/A	Limit depth:	15.00 m

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

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Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
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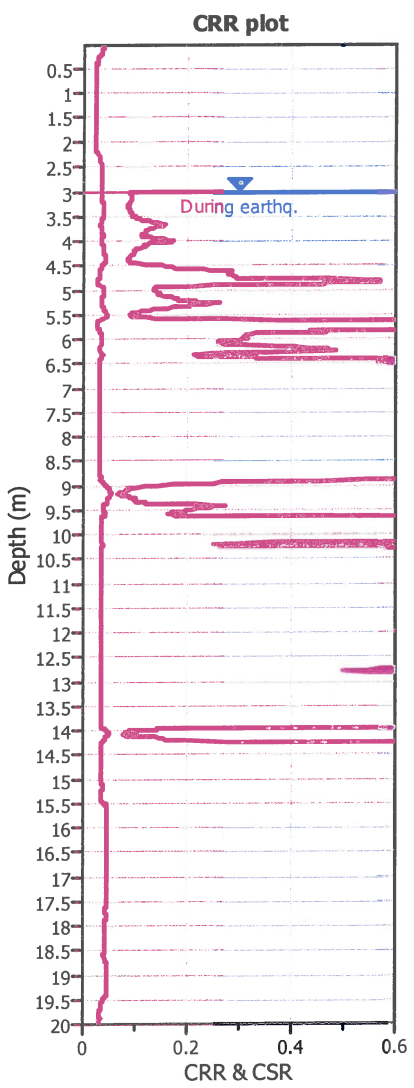
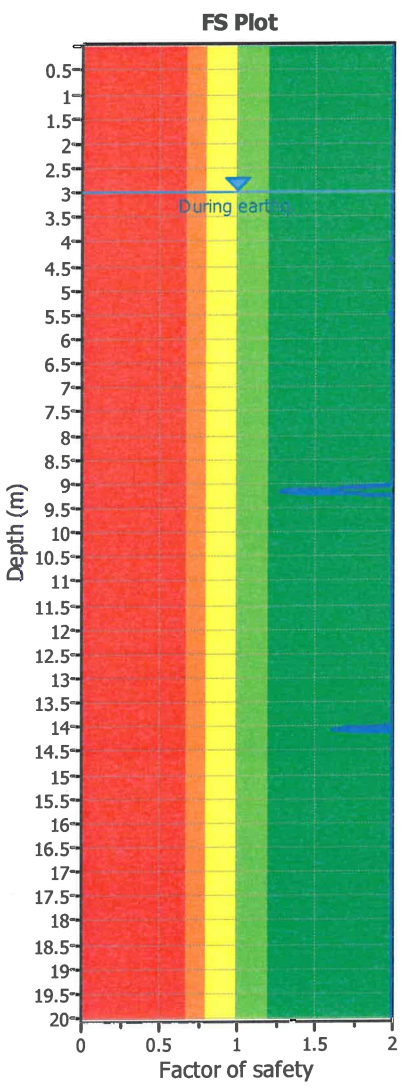
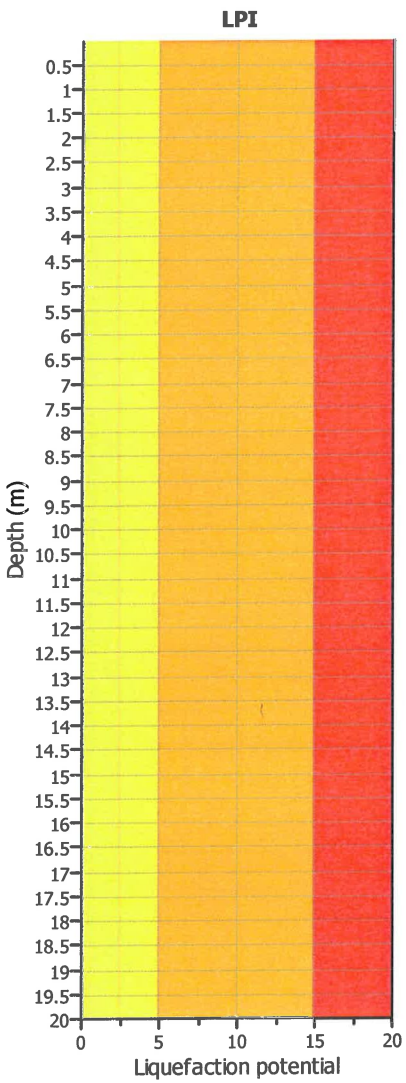
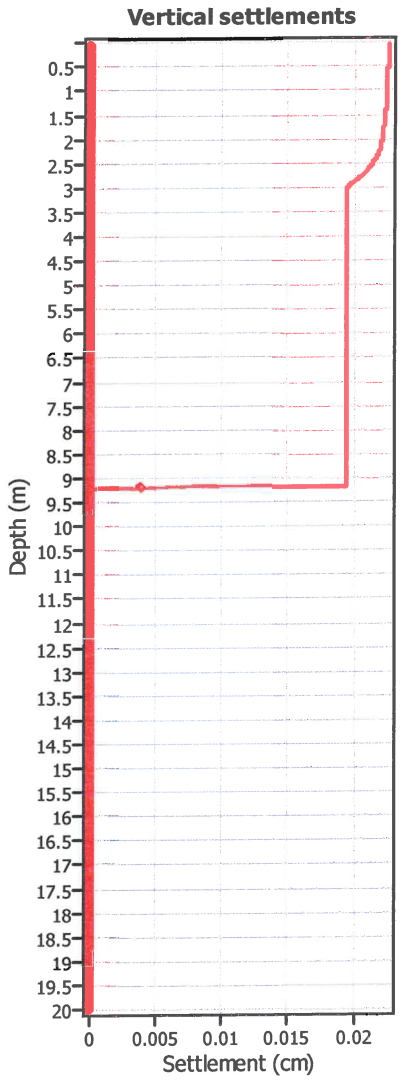
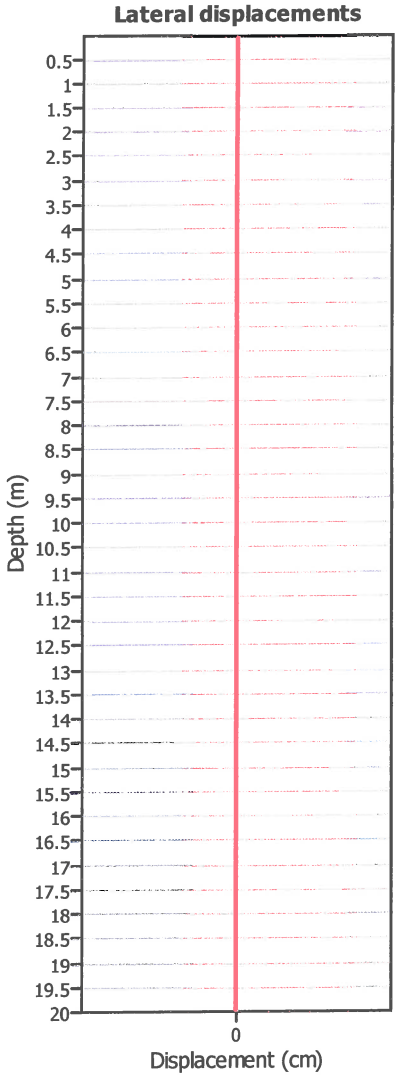
Liquefaction analysis overall plots











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Earthquake magnitude M_w:	5.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.07	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	3.00 m	Fill height:	N/A	Limit depth:	15.00 m

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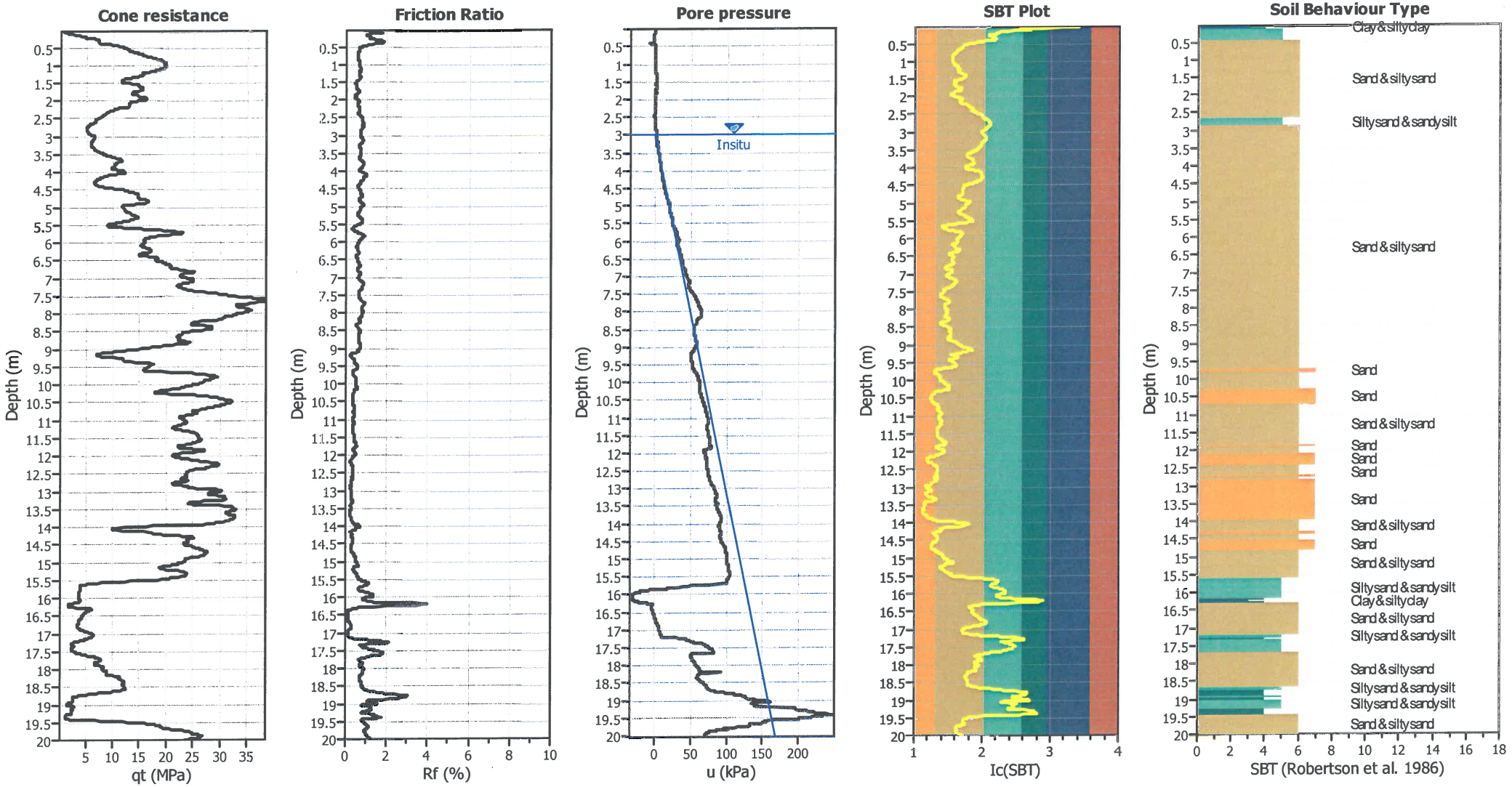
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

CPT basic interpretation plots



Input parameters and analysis data

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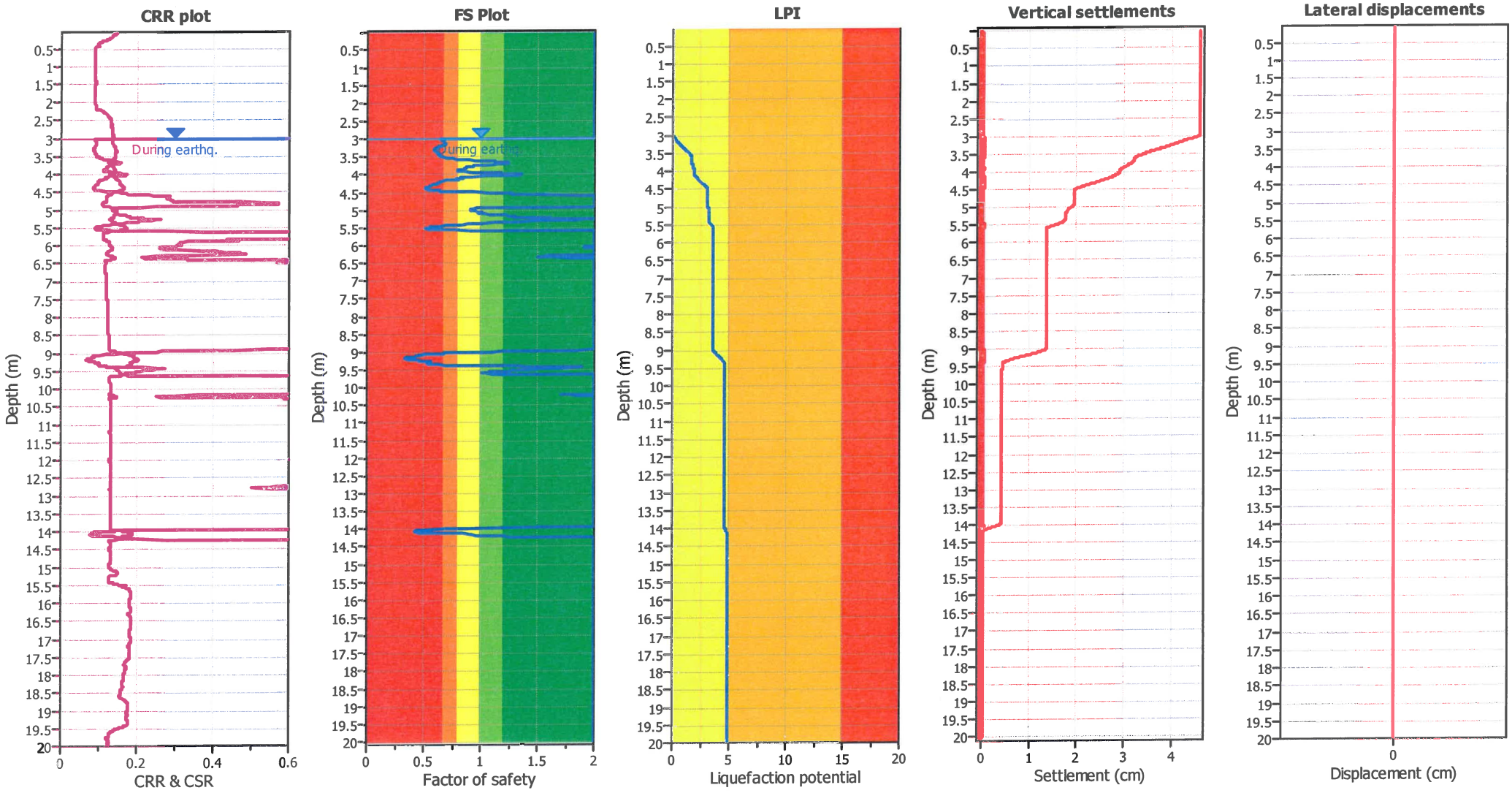
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Liquefaction analysis overall plots



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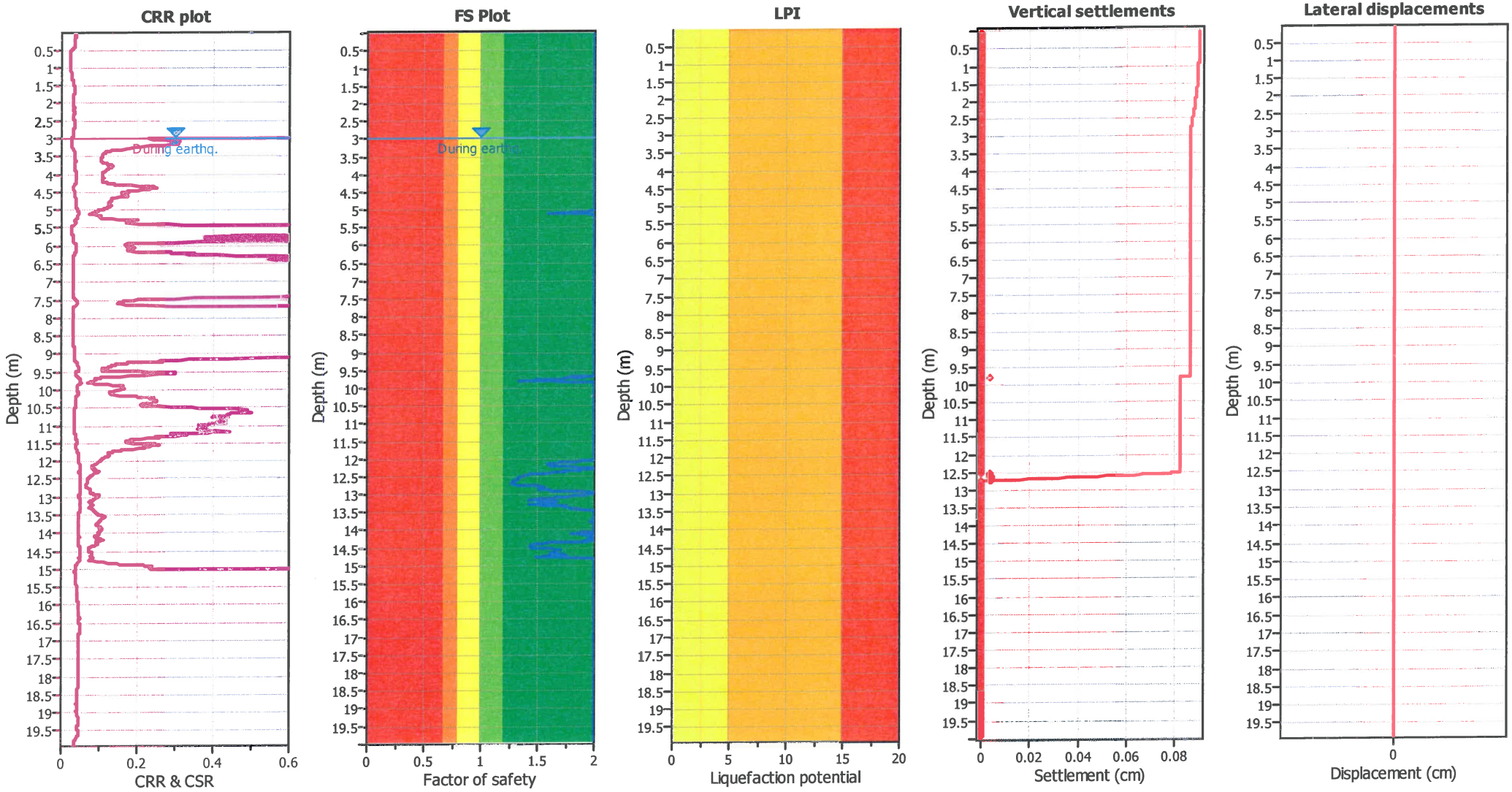

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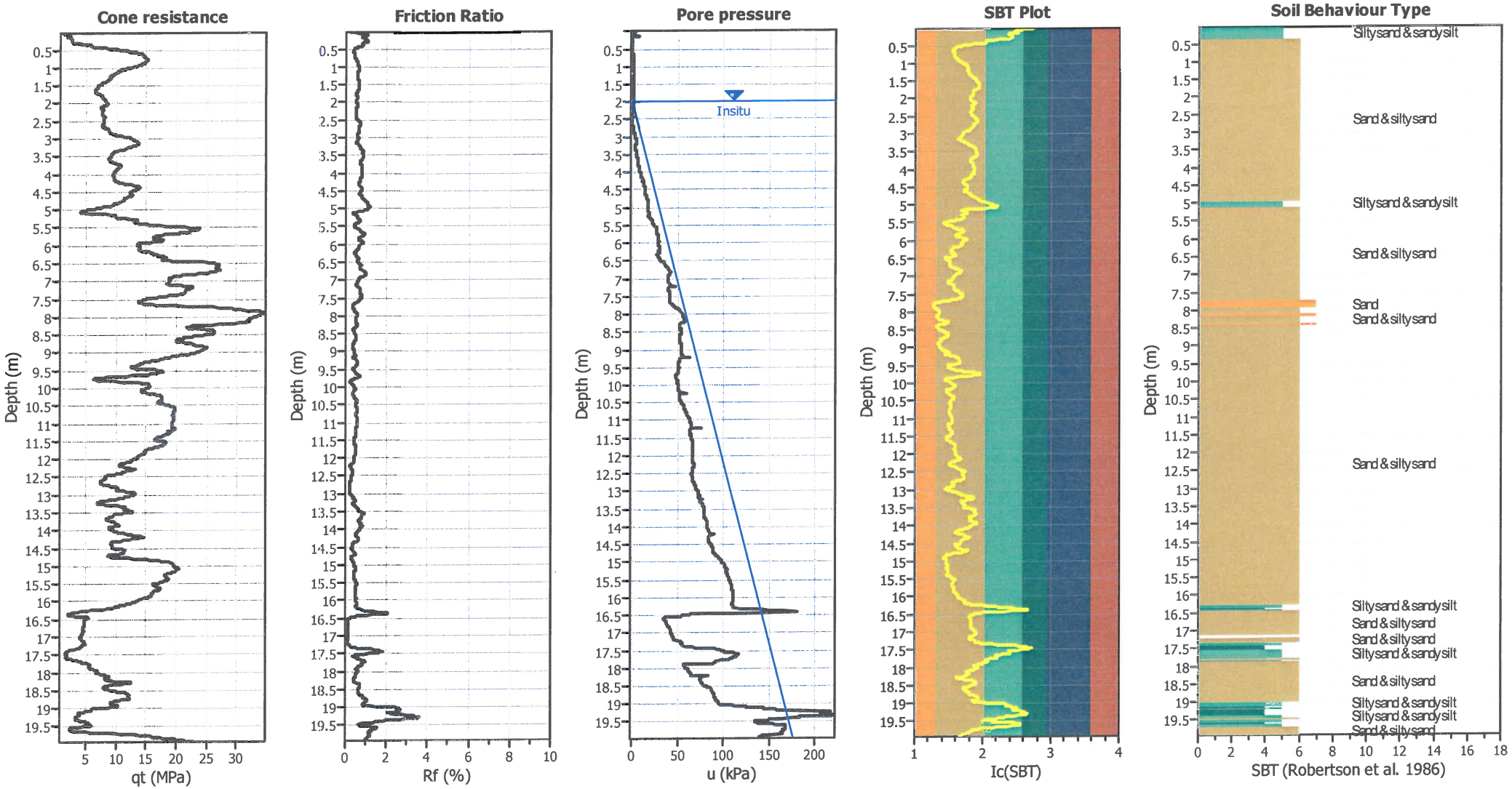

Input parameters and analysis data

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Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.90	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.27	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	2.00 m	Fill height:	N/A	Limit depth:	15.00 m

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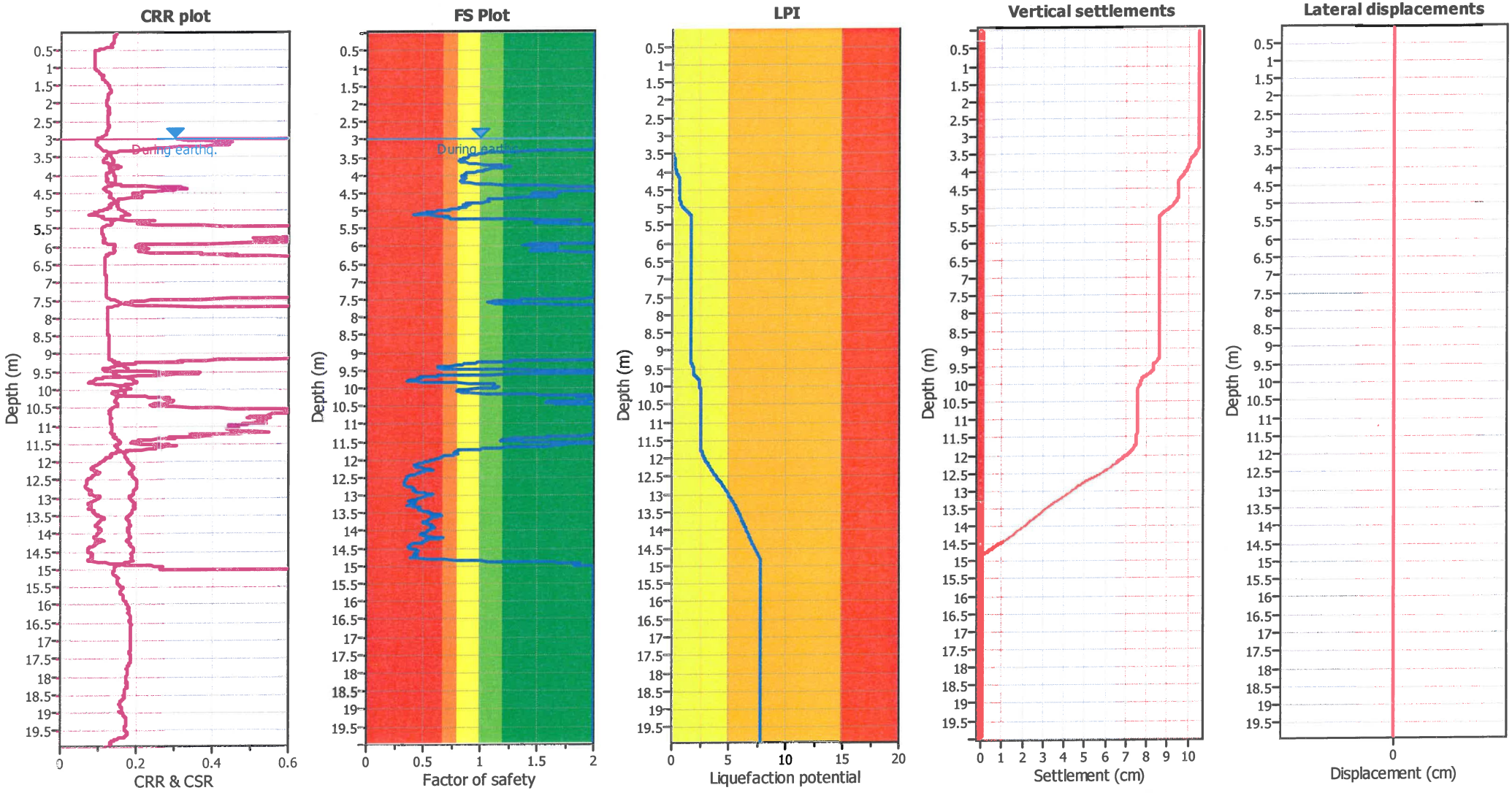

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Geoconsult

PO Box 104089, Lincoln North, Auckland 0654
P: 09 836 5311
E: info@geoconsult.co.nz
W: www.geoconsult.co.nz

SITE OBSERVATION FORM

PROJECT DETAILS					
SITE ADDRESS	Lot 1463 130 Union Drive Papamoa	OUR REF	TM357	ENGINEER	JTH
		BUILDING CONSENT NO.		BC301678	
		DATE	7-Oct-20	TIME	9.00am
CONTACT	Andrew - ZB Homes	EMAIL	andrew@zbhomes.co.nz		
		PHONE	-		

TYPE OF INSPECTION		
BUILDING PLATFORM	FOUNDATION EXCAVATIONS	RETAINING WALLS
☑ Subgrade	☐ Shallow foundations	☐ Pile holes
☐ Clay fill earthworks	☐ Pile foundations	☐ Foundation excavations
☐ Hardfill compaction	☑ Raft floor or ☐ Slab-on-grade	
OTHER:		

GEOTECHNICAL DESIGN ASSUMPTIONS		
Geotechnical design assumptions based on:	☑ Geotechnical report: GCR - S&L Stage 56 dated 19 Nov 2019.	☐ Not available
	☐ Other:	
Geotechnical design assumptions to be confirmed:	☐ NZ3604: Good Ground	☐ Unable to determine (Further information is required)
	☑ Other: 200kPa UBC	

OBSERVATION NOTES/SITE SKETCH

- Inspected building platform subgrade following the removal of all re-spread subdivision topsoil.
- Engineered fill exposed across the entire building platform area.
- Shallow hand auger boreholes were drilled in selected locations to ascertain fill depths. 300mm noted at the rear of the site and up to 1.0m across the front (northern).
- Scala blows through the fill achieved >5 blows per 100mm (5-15)
- Scala blows through underlying natural sands achieved >3 blows per 100mm.

Are the results of this inspection in accordance with the geotechnical assumptions, outlined above?	☑ **Yes** (Subject to recommendations)	☐ **No** (Re-inspection is required)

RECOMMENDATIONS/DISCUSSION

- Fill considered to have been placed and compacted in general accordance with NZS4431:1989.
- Site considered suitable for design UBC of 200kPa. No geotechnical issues.

Are further inspections required for the item above?	☐ **Yes**	☑ **No**	Discussed with: ZB Homes	
Is this likely to be the final inspection required for this site?	☑ **Yes**	☐ **No** :		☐ **Unknown**

ADVISORY NOTE

This form is a record of the site observation for the item identified above only. Further inspections may be required. This form is not a substitute for a PS4 producer statement and should not be relied upon as a certification of compliance. Additional information such as photographs or test results of the inspected item may be held with Geoconsult's file copy of this form.

14340

SITE COPY = WHITE • FILE COPY = PINK • OFFICE COPY = YELLOW

LEGEND:

- SCALA TEST LOCATION
- NUCLEAR / SCALA TEST LOCATION (23-08-17)
- NUCLEAR TEST LOCATION (15-08-16)
- SOAKAGE TEST LOCATION
- CUT AND FILL CONTOUR MAJOR (1m INTERVAL)
- FILL AREA
- CUT AREA
- LOT BOUNDARY
- ABBUTTALS

Rev	Description	Drn	Ckd	App	Date
AB	ISSUED FOR 224 CERT	NW	AJW	GDC	11/19
1	LEVELS UPDATED 16/9/19	ER	DB	GC	09/19
0	INTERNAL ISSUE	NW	DB	GC	09/19

	Name	Date		Name	Date
Surveyed	DB	08/19	Designed		

Coordinate System: NZGD 2000 (BOP CIRCUIT)
Origin of Coordinates:
Height Datum: MOTUPIKI DATUM
Origin of Height:

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

Title:
GEOREFERENCE PLAN
CUT AND FILL

Prepared For:
GOLDEN SANDS
STAGE 56

Original Scales @ A3: 1:1000
Do Not Scale Dimensions
Status: AS-BUILT
Drawing No: 20076-S56-G1
Revision: AB

Copyright on this drawing is reserved

Tauranga City

SUMMARY OF GEOTECHNICAL DATA FOR INDIVIDUAL LOTS

INFRASTRUCTURE DEVELOPMENT CODE

G3

VERSION July 2011 — 1

CERTIFICATION

DP No.:	540448	Property Address	Golden Sands, Stage 56, Union Drive, Anchor Crescent, Papamoa	RC No:	26512

Lot No.	Area (m^2)	Subsurface Data						Foundations		Building Restriction Line	S/W Specific Design	S/W Soakage	S/W Reticulate	Designated Building Platform	Minimum Building Floor Level	Compressible Soils	On-site Effluent Disposal	Consent Notice	Comment
		Shear Strength (kPa)	Subdivision Filling		Natural Topography Unworked	Natural Topography Earthworked		Conventional Shallow Foundation to NZS 3604:2011	Specific Design										
			Y/N	Depth (m)	Y/N	Y/N	Depth (m)	Y/N/NA	Y/N/NA										
1460	318	NA[1]	Y	0-1.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1461	318	NA[1]	Y	0-1.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1462	248	NA[1]	Y	0-1.0	Y	Y	0-1.0	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1463	248	NA[1]	Y	0-1.0	Y	Y	0-1.0	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1464	280	NA[1]	Y	0-1.0	Y	Y	0-1.0	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1465	260	NA[1]	Y	0-0.5	Y	Y	0-1.0	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1466	248	NA[1]	N		Y	Y	0-1.0	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1467	248	NA[1]	N		Y	Y	0-1.0	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1468	248	NA[1]	Y	0-0.5	Y	Y	0-1.0	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1469	280	NA[1]	Y	0-1.0	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1470	260	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1471	248	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1472	248	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1473	291	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1474	291	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1475	281	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1476	259	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1477	302	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1478	248	NA[1]	Y	0-0.5	Y	Y	0.0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1479	248	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	
1480	303	NA[1]	Y	0-0.5	Y	Y	0-0.5	Y[3]	Y[4]	N	N	Y	N	N	Y[2]	N	N	Y	

Notes:
1) Testing undertaken with Scala Penetrometer
2) Minimum floor levels required (See Table 2: Minimum Floor Levels, Section 5.2 of *Geotechnical Completion Report* by S&L, dated 19 November 2019)
3) Timber framed subfloor may be constructed with shallow timber piles as detailed in NZS 3604:2011. (See Section 5.3 of *Geotechnical Completion Report*)
4) Enhanced design required for floor slabs-on-ground. (See Section 5.3 of *Geotechnical Completion Report*)

Geoconsult
GEOTECHNICAL CONSULTANTS

12 October 2020

Ref. TM357

ZB Homes
Attn: Andrew Morris-Vette

BY EMAIL: andrew@zbhomes.co.nz

Dear Sir,

LOT 1463, 130 UNION DRIVE, GOLDEN SANDS, PAPAMOA
GEOTECHNICAL INSPECTION OF BUILDING SUBGRADE
BUILDING CONSENT NO. BC301678

This letter presents the results of a geotechnical inspection of the building subgrade for a dwelling at the above site. This letter has been prepared for ZB Homes and should be supplied to the Tauranga City Council building inspectors to verify the ground conditions are as per the consented documents.

The consented drawings (01-30 job no. 196 3466) prepared by Franklin Architectural Design indicates that a specifically designed pod-raft type foundation is proposed. The geotechnical completion report (ref. 20076-S56, dated 19 November 2019) prepared by S&L Consultants Limited states that a geotechnical ultimate bearing capacity of 200 kPa can be assumed as the site is underlain by a thin layer of engineered sand fill (<1.0 m thick) placed per NZS4431:1989 overlying loose to medium dense natural beach sands.

At the time of our inspection (7-10-20) the building subgrade had been stripped of all unsuitable material, exposing engineered sand fill. The density of the surface soils were tested using a Scala penetrometer to confirm the available bearing capacity. Blow counts between 5 and 15 per 100 mm penetration were typically achieved. The results were in excess of the required geotechnical ultimate bearing capacity of 200 kPa assumed for the underlying natural sands and greater than 300 kPa within the engineered fill as per NZS4431:1989.

Based on our observations and testing we are satisfied the ground conditions meet the specified design requirements as per the consented documents. We trust that this is satisfactory, please do not hesitate to contact the undersigned if you have any queries.

GEOCONSULT

Jordan Howie
Senior Engineering Geologist
BSc MEngSc MEngNZ

Phil Williams
Geotechnical Team Leader
BE ME CMEngNZ IntPE CPEng - 8670

Building Location Certificate Details

Please email this Certificate to: groundcheck@tauranga.govt.nz
Or attach it to the supporting information needed for a Code Compliance (Form 6) application.

TCC Reference: (BC / RC)	BC 301678		
Applicant/Owner:	ZB Homes		
Property Address:	130 Union Drive, Papamoa		
Legal Description: (Lot / DP)	Lot 1463 DP 540448	**CT / CFR**	

A. Floor Level survey required by TCC ☑ Yes ☐ No (go to Section B)

1. The following was surveyed: ☐ Completed Floor ☑ Other (specify)
2. Does the approved Building Consent have a specified minimum floor level? ☐ Yes ☐ No
   (Please refer to the approved building consent plans)
3. Survey Date: 12th October 2020

4. **Option A**	**Option B**
The Surveyed floor level is RL=6.30m ☑ Moturiki Datum ☐ Other (E.g. assumed Datum) Origin of Levels: TCC BM1156 (RL=4.35m)	The surveyed floor level complies with: Approved BC Site Plan RL=6.30m (Min FFL RL=6.15m) (E.g. consent notice requirement, approved BC plans,etc)

5. Comments: Surveyed FFL (boxing) is the same as the Approved BC Site Plan, therefore complies. Surveyed to boxing (pre-pour).

B. Building Location survey required by TCC ☑ Yes ☐ No (go to Section C)

1. The following was surveyed: ☐ Completed Floor ☑ Other (please comment below)
2. Survey Date: 12th October 2020
3. The surveyed building footprint is in accordance with the setbacks shown on the approved Building Consent Plans. ☑ Yes ☐ Other (comment below) ☑ See attached plan/photos (if required)
   NB: where necessary the 'footprint' will factor in the exterior cladding projecting past the foundation. Walls and eaves must comply with C/AS 5.1.1(a) fig. 5.1. Attach drawings or photos with comments if you think there is an issue.
4. Comments: Refer attached plan Ref. 3209 for surveyed offsets to boundary. Surveyed to boxing (pre-pour).

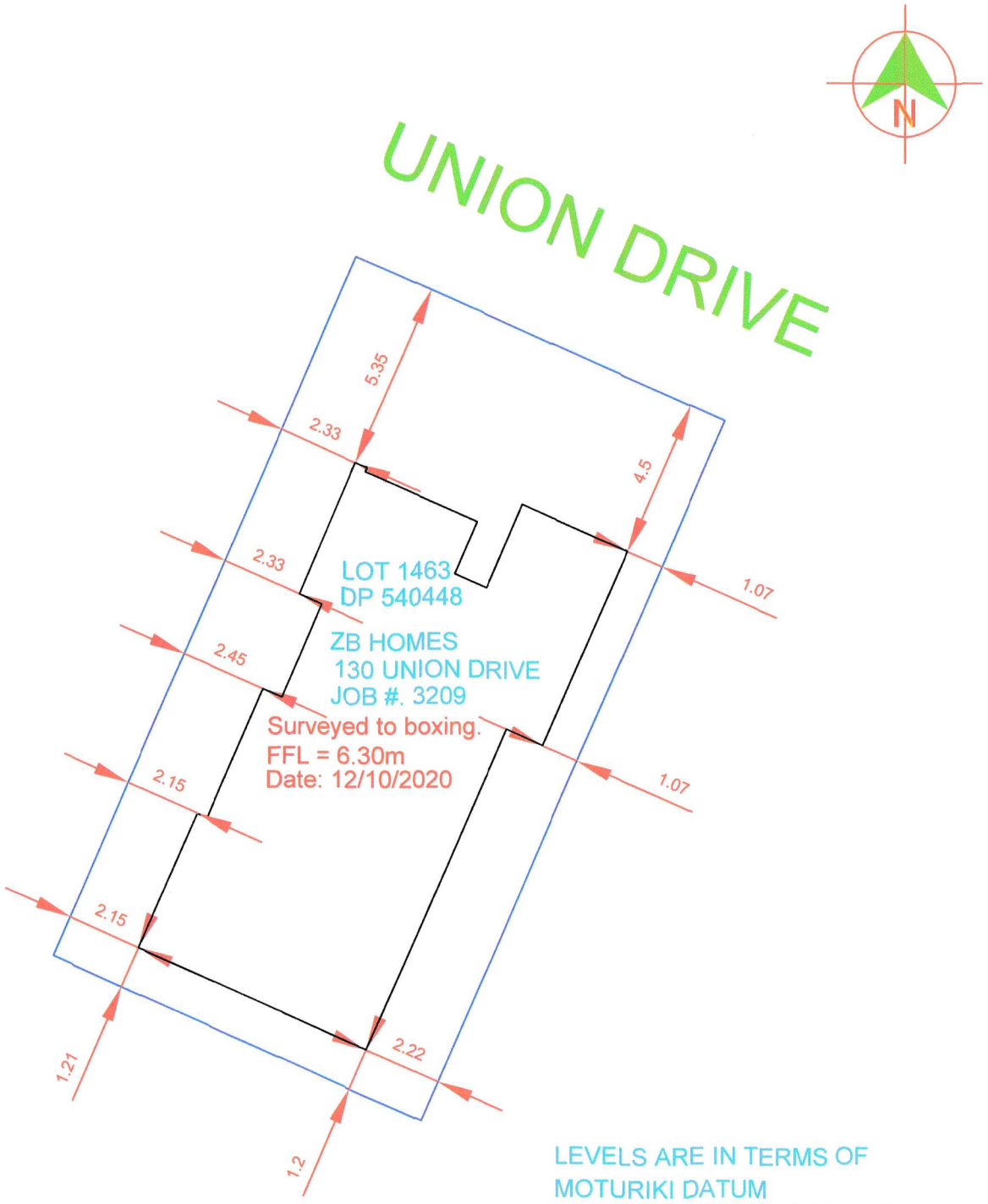
C. Overshadowing survey required by TCC ☐ Yes ☑ No (go to Section D)

1. The building was surveyed and complies with the City Plan rules for overshadowing or relevant Resource Consent. ☐ Yes ☐ Other (comment below) ☐ See attached plan/photos (as/if required)
   NB: Where overshadowing is allowed by permitted intrusions, written approval, or Resource Consent, illustrations are required.
2. Survey Date:
3. Comments (including boundaries specified):

D. Survey Firm Declaration

1. We have been engaged by the applicant stated above and have carried out the necessary field survey(s) to confirm the items detailed above and believe on reasonable grounds that the information provided is true and accurate within acceptable survey tolerances.
2. **Survey Firm:** Aldersley Surveys Ltd

3. **Survey Firm Contact Details:**	Postal Address: 21C Bradley Ave, Tauranga 3112	
	Email: tony@aldersleysurveys.co.nz Phone: 0212112429	
4. **Licensed Cadastral Surveyor** (delete as appropriate) **Registered Professional Surveyor** (signed on behalf of Survey Firm)	Print Name: Tony Aldersley Signature:	License No: 1000272 RPSurv No: Date: 13/10/20



LEVELS ARE IN TERMS OF
MOTURIKI DATUM
ORIGIN TCC BM 1156 RL= 4.35m

Natural Hazards

TSUNAMI EVACUATION ZONE: Pāpāmoa East *Wairakei*

WARNING

Tsunami is a safety risk here.

The evacuation zone is coloured **BLUE**. In a

LONG or STRONG earthquake

GET OUT OF THE BLUE

- Go inland or to higher ground.
- Walk or bike if you can.
- Stay out of the blue zone. Wait for official updates.

A tsunami might be coming if there...

- is a strong earthquake.
- is a long earthquake, even if it's weak.
- are unexpected sea level changes.
- are loud and unusual noises from the sea.

For more information and updates:

bopcivildefence.govt.nz
bopcivildefence
bopcivildefence
radio

LONG OR STRONG, GET GONE

Tsunami Evacuation Zone

Waterway

Scale: 1:20,000

Bay of Plenty Emergency Management Group
Tauranga City
Western Bay of Plenty District Council