Tauranga City

LIM

Land Information Memorandum

Land Information Memorandum

This Land Information Memorandum has been prepared for:

Applicant	**Arizto Limited**
Client	**Sharon Blaike**
Business	**Arizto Limited**
Property Address	**72C The Boulevard** **Papamoa**
Legal Description	**Lot 2224 DP 503458,** **1/6 Share Lot 2227 DP 503458**
Application Date	**13 March 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.

Contents

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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	**To Connection**
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 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 2025.

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	**06622 069 85**
Capital Value	**$1,500,000**
Land Value	**$550,000**
Improvement Value	**$950,000**

Rating Details

Current Annual Rates	**$5,424.46**
Balance Owing	**$Nil**

Water Meter Details

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

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	**$136.64**
Balance Owing	**$Nil**

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. 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: For Building Permits issued prior to 1993 a copy of the inspection records, if these are held by Council, are available in the property file.

Building Consents: For Building Consents issued after 1 January 1993 a Code Compliance Certificate (CCC) will be issued where the building work for which the building consent relates has been completed in accordance with the NZ Building Code.

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
19/07/21	Construct 3 Bedroom Domestic Dwelling, Double Attached Garage	311506	Yes

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	**None Known**
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	27/01/17

Resource Consents *(Resource Management Act 1991)*

Description	**Date Granted**	**RC Number**
Resource Consent	04/05/16	24916
Land Use Consent	07/03/16	24897
Change Conditions of RC24897	28/05/21	24897-01

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 27 January 2017 together with Geotechnical Completion Report Including Recommendations for Building by S&L Consultants Ltd, reference 20464-12, dated 2 November 2016.

Documentation Relevant to the Subject Property

Refer the following documentation:

1. Ground Inspection Report by Kirk Roberts Consulting reference 2120626, dated 16 August 2021.

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.

To view further information including Frequently Asked Questions, go to the Tsunami page on Tauranga City Council's website. Please see attached tsunami evacuation zone map.

Tsunami evacuation maps will be updated in early 2026.

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: 31 March 2026

Tauranga City

Services Plan

Tauranga City

Produced by - Tauranga City Council

Printed 31/03/2026

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

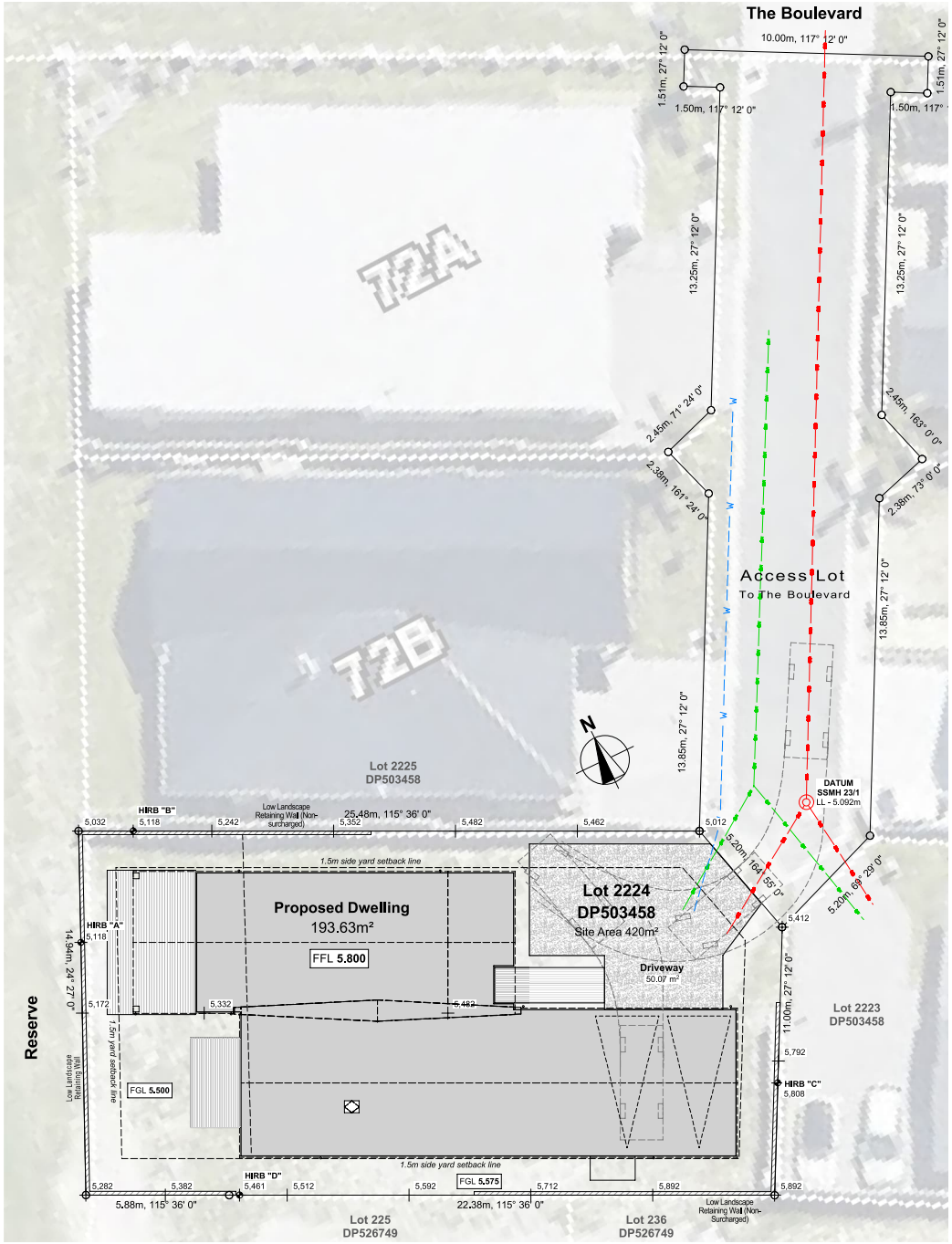
- Abandoned assets and lines
- Private assets and lines
- Geotech Utility Buffer

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

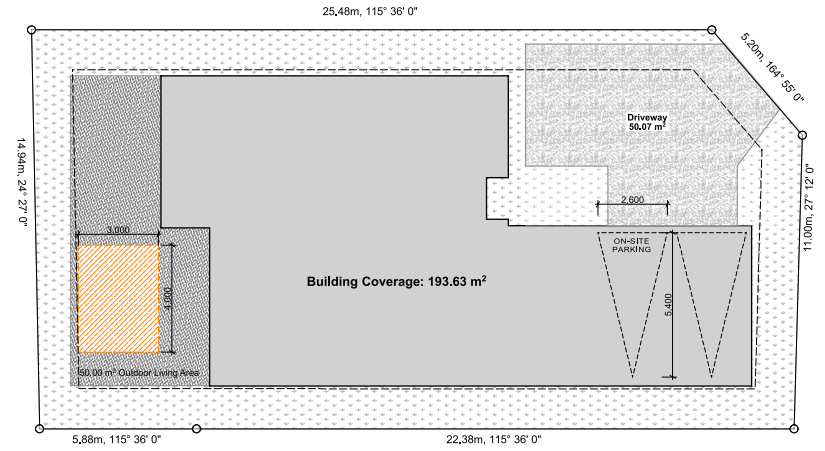
Tauranga City

Building Information

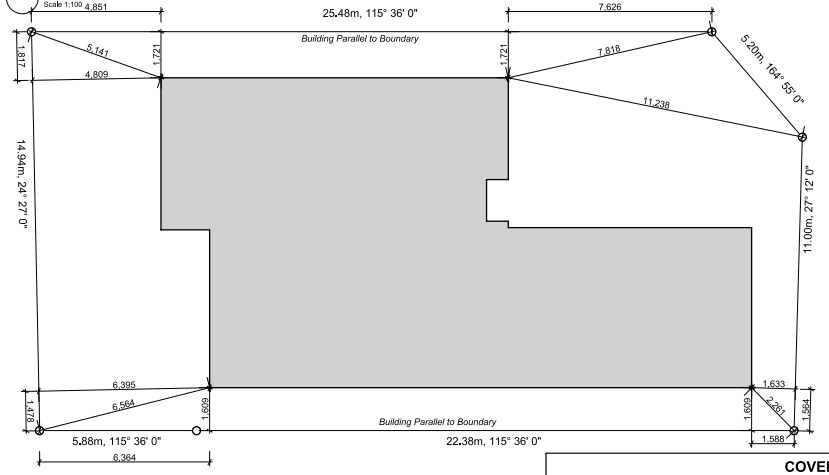
Tauranga City



Site Plan
Scale 1:100



Site Bulk & Location
Scale 1:100



Site Setout
Scale 1:100

ALL LEVELS IN RELATION TO NZVD 2016 TO BE CONFIRMED BY REGISTERED SURVEYOR PRIOR TO CONSTRUCTION

PLANNING (TCC)

Zone: Wairakei	Control:	Result
Site Coverage	Max. 55% of Nett Site Area	Complies
Building Height	Maximum 9.5m height restriction	Complies
Building Platform	Minimum RL 5.10m for habitable buildings	Complies
Yard Setbacks (to wall cladding)	Side Yard: 1.5m Rear Yard: 1.5m Front Yard: 1.5m	Complies Complies Complies
Overshadowing	North: 2.7m @ 55 Degrees	Complies
Overshadowing	South, East, West: 2.7m @ 45 Degrees	Complies
Car Parking/Turning	2 on-site with site turning	Complies

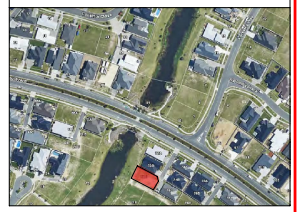
SITE COVERAGE

Area Described	Value
Nett Site Area	420m²
Building Coverage Area	193.63m²
Site Coverage Percent	46.1%
Driveway/Hardstand Area	50.07m²
Total Impervious Coverage Area	239.01m²
Impervious Coverage Percent	55.6%

PLANNING KEY

- Area of Building Coverage
- Area of Concrete Driveway
- Area of 50m² outdoor area
- Area of 4m x 3m outdoor living
- Area of Permable Ground

SITE LOCALITY



COVENANTS

Minimum Building Platform Levels

- All buildings located on land within stage 13 shall have the following minimum building platform levels (all referenced to Moturiki Datum) RL 4.8 m for non-habitable residential buildings; and
- RL 5.1m for habitable buildings (including attached garages);

Building Height

d) All buildings shall have a maximum building height of 9.5 m above approved subdivision ground level.

Site Coverage

e) The maximum site coverage for allotments within stage 13 shall be as follows:

i. 55% for allotments with a nett site area less than 500 m²;

ii. 40% for allotments with a nett site area of 500 m² or greater.

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;

Outdoor Living Areas

f) Every independent dwelling unit shall be provided with an outdoor living area that complies with one of the following minimum requirements (being i. or ii.);

i. A minimum continuous area of 20 m² that is capable of accommodating minimum dimensions of 4.0 m by 2.0 m and located on the northern, north-eastern or north-western aspect of any allotment; or

ii. A minimum continuous area of 50 m² that is capable of accommodating minimum dimensions of 4.0 m by 3.0 m provided either at ground floor level or as a balcony with a minimum area of 12 m² with the balance provided at ground level.

g) The outdoor living area provided in accordance with condition 4 f) shall be free of driveways, manoeuvring and parking areas, and be unenclosed except for cover by a roof, shade sail or other cover to provide sun protection and/or views (including guttering);

Setbacks

h) All buildings and on-site car parking to be setback at least 3.0 m from the legal road boundary.

i) All buildings must be setback a minimum of 1.5 m from side or rear boundaries, except as provided for in the following situations:

- building eves and gutters can intrude up to 0.6 m into these setbacks;
- For nominated Builder Blocks and Sub dividable lots, any other part of a building can be positioned closer to internal any side or rear boundary, only where the written approval of the property owners and occupiers whose properties adjoin the proposed setback encroachment has been obtained and that approval is shown on all relevant building plans that show the encroachment. Written approval must be obtained prior to the building works occurring;

Fencing

j) Fencing on the boundaries of any allotment adjoining a Local Purpose Reserve (access ways), Recreation Reserve or any land vested in Tauranga City Council for stormwater purposes shall be no greater than 1.2 m in height, or no greater than 1.8 m in height provided the part of the fence between 1.2 m and 1.8 m is a minimum of 75% visually permeable;

Transportation

k) Every independent dwelling unit shall be provided with a minimum of two on-site car parking spaces that meet the minimum dimensions of 2.5m x 5.4m (w x l).

l) All garages or carports designed with direct vehicle access onto a road shall be setback at least 4.5m from the road boundary. Garages and car ports can be located no less than 3.0m from the road boundary, provided they do not have direct access on to the road.

For the avoidance of doubt 'direct access' shall have the same meaning as set out in Chapter 3 (Definitions) of the Tauranga City Plan;

m) For lots with frontage to the boulevard, on site manoeuvring shall be provided in accordance with Rule 4B.2.5 of the City Plan.

Overshadowing

n) All buildings shall be located within a building envelope calculated in accordance with Table 1 set out within this condition except as provided for otherwise and in accordance with i of this condition (below).

i. For Subdividable Lots and Builders Blocks Buildings can extend outside of the building envelope prescribed by this condition along internal boundaries, provided the written approval of the property owners and occupiers whose properties adjoin the encroachment, including those properties separated from the encroachment by vehicle or pedestrian access ways, private ways, access legs, rights of way or access lots where the encroachment occurs if the envelope is applied at the boundary of that property, has been obtained and is shown on all relevant building plans that show the encroachment. Written approval must be obtained prior to the building works occurring;

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Site Information:	
Lot No: 2224	DPS:503458
Wind Zone:	HIGH
Earthquake Zone:	Zone 1
Exposure Zone:	Zone C
Climate Zone:	Zone 2

Boathouse

72C The Boulevard, Palm Springs, Papamoa, Tauranga

Issue ID	Change Name	Date
00	Building Consent	11/06/2021

SHEET TITLE: **Site Plan**

PROJECT # **21010**

PROJECT STATUS: **Building Consent**

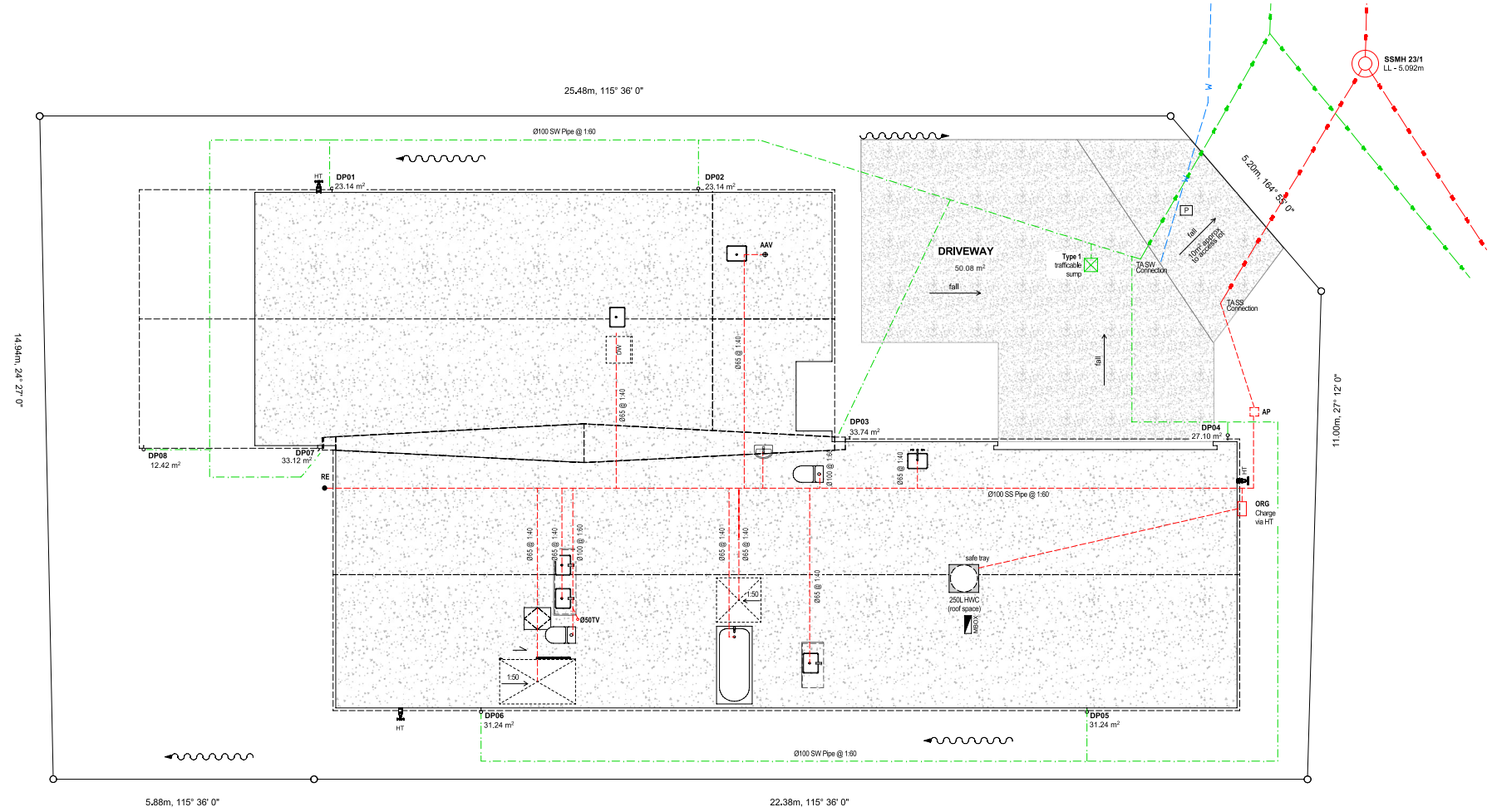
DRAWN BY: **SAW**

CHECKED BY: **JMAC**

SCALES: **1:100 @ A1**
1:### @ A3

SHEET # **100**

REVISION # **00**



Site Services
Scale 1:50

VENTILATION CALCS

Mechanical Ventilation WC
WC = 10 litres/sec = 36m³/hr
ACH (Air changes per hour)
WC = 10

Room size
1.3 x 2.4 x 2.6 = 8.1m³
10ACH = 8.1 x 10 = 81m³/hr
= 22.5l/s required min flow rate

Mechanical Vent
Manrose FAN0101 or equivalent

Mechanical Ventilation Bathroom
Bathrooms = 25 litres/sec = 90m³/hr
ACH (Air changes per hour)
Bathrooms / Toilets = 11-15

Room size
3.4 x 2.4 x 2.6 = 21.2m³
15ACH = 21.2 x 15 = 318m³/hr
= 88.3l/s required min flow rate

Mechanical Vent
Manrose FAN0101 or equivalent

Mechanical Ventilation Ensuite
Bathrooms = 25 litres/sec = 90m³/hr
ACH (Air changes per hour)
Bathrooms / Toilets = 11-15

Room size
4 x 1.7 x 2.6 = 17.7m³
15ACH = 17.7 x 15 = 265.5m³/hr
= 74l/s required min flow rate

Mechanical Vent
Manrose FAN0101 or equivalent

Mechanical Ventilation Laundry
Laundries = 20 litres/sec = 72m³/hr
ACH (Air changes per hour)
Laundries (domestic) = 20

Room size
1.7 x 1.9 x 2.6 = 8.4m³
20ACH = 8.4 x 20 = 168m³/hr
= 436.7l/s required min flow rate

Mechanical Vent
Manrose FAN0101 or equivalent

Mechanical Ventilation Kitchen
Kitchens = 50 litres/sec = 180m³/hr
ACH (Air changes per hour)
Kitchens = 20

Room size
3.4 x 2.8 x 3.0 = 28.6m³
20ACH = 28.6 x 20 = 571m³/hr
= 159l/s required min flow rate

Mechanical Vent
Selected Fisher & Paykel Powerpack Rangehood or similar (780m³/hr)

INVERT CALCS

SS Connection
Longest SS run: 26m @ 1.60 = 433mm
Slab Depth: 305mm FFL: 5.800m
Minimum Cover to Pipe: 375mm
Total Depth Required: 1,113mm
Minimum IL required for connection: **4,687m**
Note: IL level given as minimum requirement - confirm level on site

SW Connection
Longest SW run: 34m @ 1.60 = 566mm
FGL Depth: 5.675m FFL: 5.800m
Minimum Cover to Pipe: 375mm
Total Depth Required: 941mm
Minimum IL required for connection: **4,734**
Note: IL level given as minimum requirement - confirm level on site

Note: Contractor/Plumber to investigate existing site connections to ensure minimum invert levels required are achievable before commencment of construction. Report any site discrepancies to Architectural designer.

SERVICES KEY

	Council Sanitary Sewer Line	DP	Ø80 downpipe
	Council Stormwater Pipe	RE	Rodding Eye
	Water Pipe		Type 1 Sump
	Sanitary Sewer Pipe	HT	Hose Tap
	Stormwater Pipe	AP	Access Point

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Lot No: 2224	**DPS:**503458
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Exposure Zone:	Zone C
Climate Zone:	Zone 2

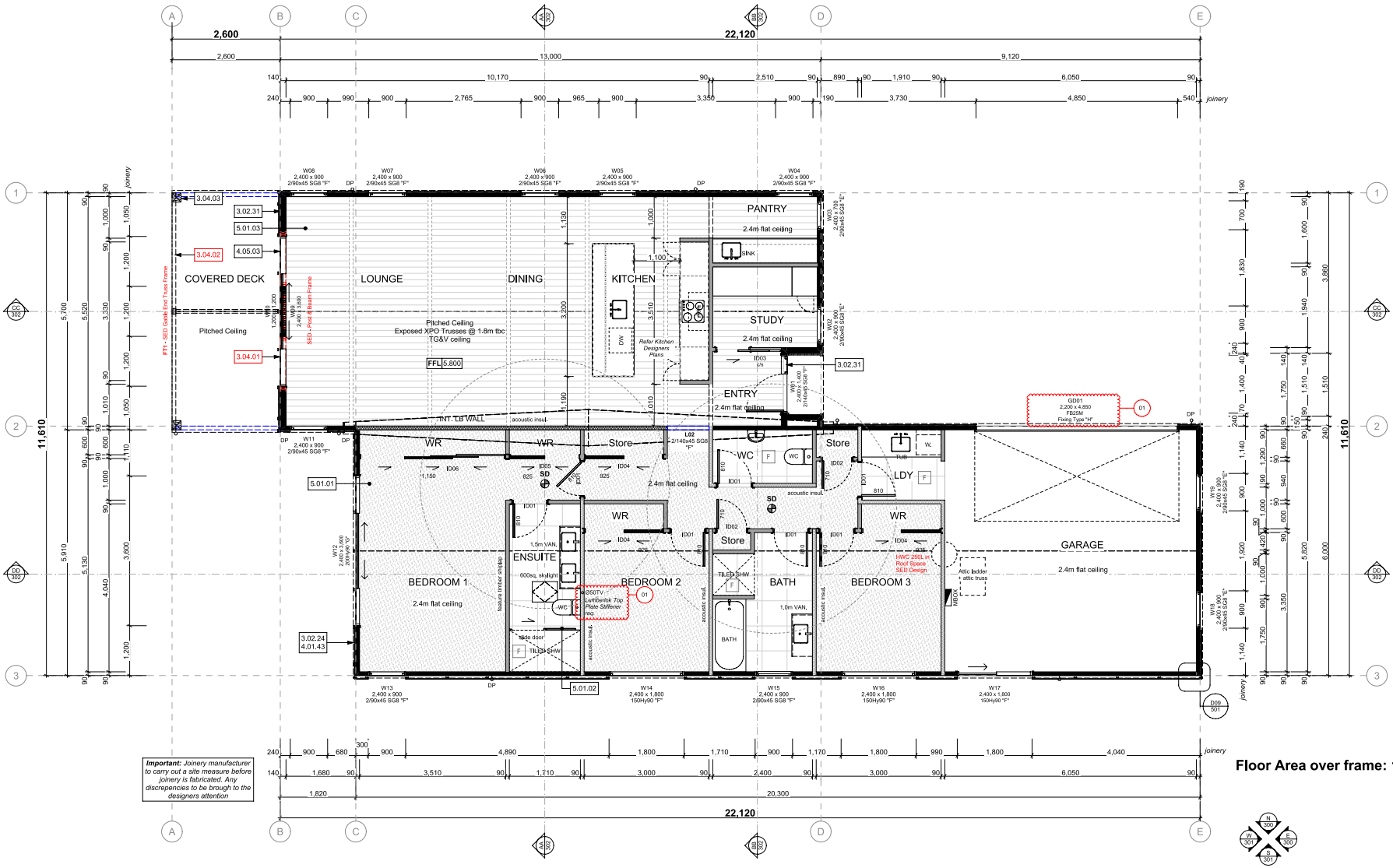
Boathouse

72C The Boulevard, Palm Springs, Papamoa, Tauranga

Issue ID	Change Name	Date
00	Building Consent	11/06/2021

SHEET TITLE: **Site Services Plan**
PROJECT #: **21010**
PROJECT STATUS: **Building Consent**
DRAWN BY: **SAW**
CHECKED BY: **JMAC**
SCALES: **1:50 @ A1 1:### @ A3**
SHEET #: **101**
REVISION #: **00**

TCC - Approved Building Consent Document - BC 311506 - Pg 6 of 30 - 12/07/2021 - Andrew Thomas - STL



Notes

1.01.05 SITE MEASURE
Site measure all openings. Preliminary dimensions only. Joinery supplier to confirm all sizes and joinery types with client before construction.

3.02.24 90x45 WALL FRAMING @600CRS (2.4M STUDS)
SG8 90x45 H1.2 framing. Studs @600crs. Nogs as per NZS:3604. Up to HIGH wind zone with a max loaded dimension of 6.0M.

3.02.31 140x45 WALL FRAMING @300CRS (4.2M STUDS)
SG8 140x45 H1.2 framing. Studs @300crs. Nogs as per NZS:3604. Up to HIGH wind zone with a max loaded dimension of 6.0M.

3.04.01 SED TIMBER POST & BEAM FRAME
SED Timber Post & Beam Frame.
LB1 - 3/140x45 SG8
WB1 - 240x135 PL12
P1 - 2/140x45 SG8 Studs
P2 - 2/140x45 OEL G12 Studs + 140x45 SG8 trimmer
Refer Engineers details and documentation.

3.04.02 SED GABLE END TRUSS
SED timber gable frame truss. 2/240x45mm H3.2 SG8 top and bottom chords, 2/140x45mm H3.2 SG8 centre post.
Refer Engineers fixing details.

3.04.03 220X220 PL12 H5 POST
220x220mm PL12 H5 post. Refer to Engineers details and documents.

4.01.43 SELECTED TIMBER WEATHERBOARDS
H3.1 timber pre-primed weatherboards over 20mm cavity. 65x18mm timber battens @ 900mm crs approx. Installed & finished as per manufacturers specifications & NZBC E2/AS1. Nogs & battens as per manufacturers requirements. Cavity construction as per manufacturer's requirements.

4.05.03 APL RESIDENTIAL SERIES ALUMINIUM DOORS & WINDOWS
APL Residential series powdercoated aluminium joinery installed to comply with NZBC: E2/AS1. Client to confirm colour.

5.01.01 FINISH - CARPET
Selected stretch-in carpet with underlay

5.01.02 FINISH - TILES
Selected ceramic floor tiles. Allow for 6mm JH tile underlay installed as per manufactureres requirements.

5.01.03 FINISH - TIMBER PLANKING
Timber planking floor system. Client to confirm colour & Style.

7.02.13 RECESSED DOWN LIGHT
Residential recessed down light luminaries shall be on the following types, as specified in AS/NZS 60598.2.2:
a) IC-F, or
b) IC, or
c) CA-80 or
d) CA-135.
To ensure full compliance is achieved, the installation of the luminaire must be in accrodance with AS/NZS 60598.2.2.

TCC - Approved Building Consent Document - BC 311506 - Pg 8 of 30 - 12/07/2021 - Andrew Thomas - STL

Floor Plan DIMS
Scale 1:50

FLOOR PLAN KEY

	SG8 H1.2 Load Bearing wall/External Wall
	SG8 H1.2 timber interior wall
	SG8 H1.2 timber interior wall with insulation (R2.2 to int. walls facing garage)
DS	Double stud
	SED Beam

VENTILATION REQUIREMENTS
All extractor fans shown on plans to be vented through roof

ACCESS ROUTES
ALL access routes to comply with D1/AS1. A maximum rise of 190mm is permitted from FFL to FGL at common and main private access ways. Where this is exceeded, timber or concrete steps and/or landings with a slip resistance in accordance with NZBC D1/AS1 Access will be necessary

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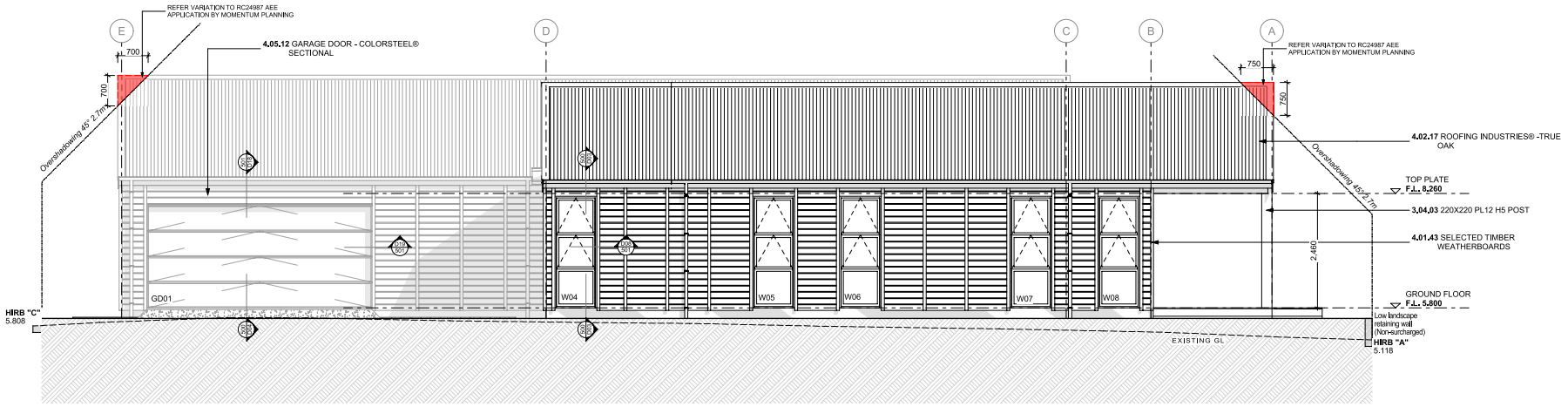
Site Information:	
Lot No: 2224	DPS:503458
Wind Zone:	HIGH
Earthquake Zone:	Zone 1
Exposure Zone:	Zone C
Climate Zone:	Zone 2

Boathouse

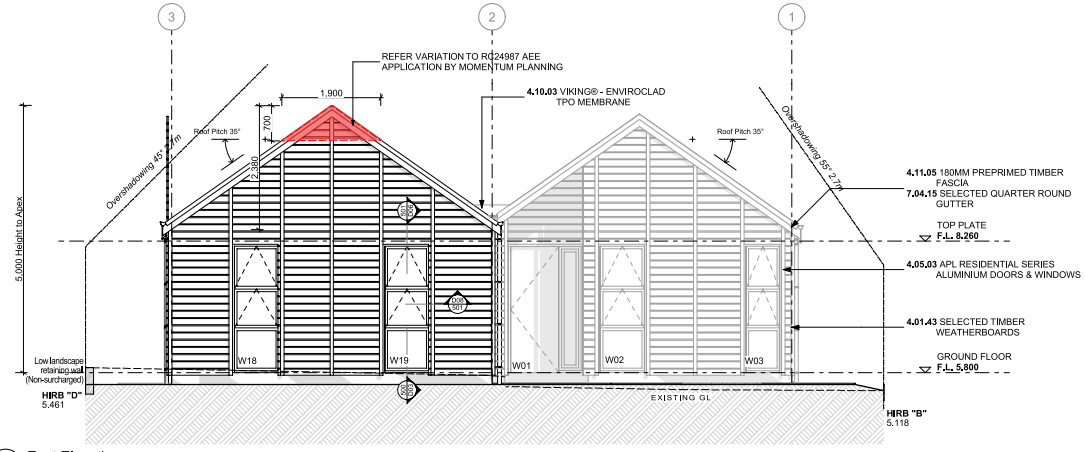
72C The Boulevard, Palm Springs, Papamoa, Tauranga

Issue ID	Change Name	Date
00	Building Consent	11/06/2021
01	RFI	7/07/2021

SHEET TITLE: **Ground Floor Plan**
PROJECT #: **21010**
PROJECT STATUS: **Building Consent**
DRAWN BY: **SAW**
CHECKED BY: **JMAC**
SCALES: **1:50 @ A1** **1:### @ A3**
SHEET #: **201**
REVISION #: **01**



North Elevation
Scale 1:50



East Elevation
Scale 1:50

BUILDING ENVELOPE RISK MATRIX		
North Elevation		
Risk Factor	**Risk Severity**	**Risk Score**
Wind zone (per NZS 3604)	High risk	1
Number of storeys	Low risk	0
Roof/wall intersection design	Medium risk	1
Eaves width	Very high risk	5
Envelope complexity	Low risk	0
Deck design	Low risk	0
Total Risk Score:		**7**

BUILDING ENVELOPE RISK MATRIX		
East Elevation		
Risk Factor	**Risk Severity**	**Risk Score**
Wind zone (per NZS 3604)	High risk	1
Number of storeys	Low risk	0
Roof/wall intersection design	Very high risk	5
Eaves width	Very high risk	5
Envelope complexity	Low risk	0
Deck design	Low risk	0
Total Risk Score:		**11**

Notes

3.04.03 220X220 PL12 H5 POST
220x220mm PL12 H5 post. Refer to Engineers details and documents.

4.01.43 SELECTED TIMBER WEATHERBOARDS
H3.1 timber pre-primed weatherboards over 20mm cavity. 65x18mm timber battens @ 900mm crs approx. Installed & finished as per manufacturers specifications & NZBC E2/AS1. Nogs & battens as per manufacturers requirements. Cavity construction as per manufacturer's requirements.

4.02.17 ROOFING INDUSTRIES® -TRUE OAK
Roofing Industries True Oak corrugate Colorsteel roofing. Installed, flashed & finished as per the manufacturers specifications & NZBC E2/AS1. Minimum pitch 4°. Material options to include; Colorsteel 'Endura.' Refer to Colorsteels website for more information.

4.05.03 APL RESIDENTIAL SERIES ALUMINIUM DOORS & WINDOWS
APL Residential series powdercoated aluminium joinery installed to comply with NZBC: E2/AS1. Client to confirm colour.

4.05.12 GARAGE DOOR - COLORSTEEL® SECTIONAL
Colorsteel® powdercoated aluminium sectional automatic garage door with 2 remote openers. Provide rigid EPS insulation boards with core flute to door panels. NOTE: Garage door insulation is NOT part of H1 Calculations. It is provided as an aesthetic& noise inhibitor only.

4.10.03 VIKING® - ENVIROCLAD TPO MEMBRANE
Viking Roofspec® TPO synthetic 1.5mm waterproofing membrane on 19mm H3.2 structural plywood. All roof claddings and associated flashings including all barge and apron flashings are to be undertaken by a licenced applicator in strict accordance with NZBC E2/AS1 and manufacturers specifications. Provide producer statements to cover the whole design and application of the cladding system including all flashings & penetration flashing kits. BRANZ Appraisal No. 656.

4.11.05 180MM PREPRIMED TIMBER FASCIA
Selected preprimed timber fascia. Fixed as per manufacturer's specifications and in compliance with NZS3604:2011 B1, B2 and E2

7.04.15 SELECTED QUARTER ROUND GUTTER
Colorsteel® 'Endura' Quarter Round Gutter fixed with proprietry brackets. 6100m2 cross-sectional area used for catchment calculations.

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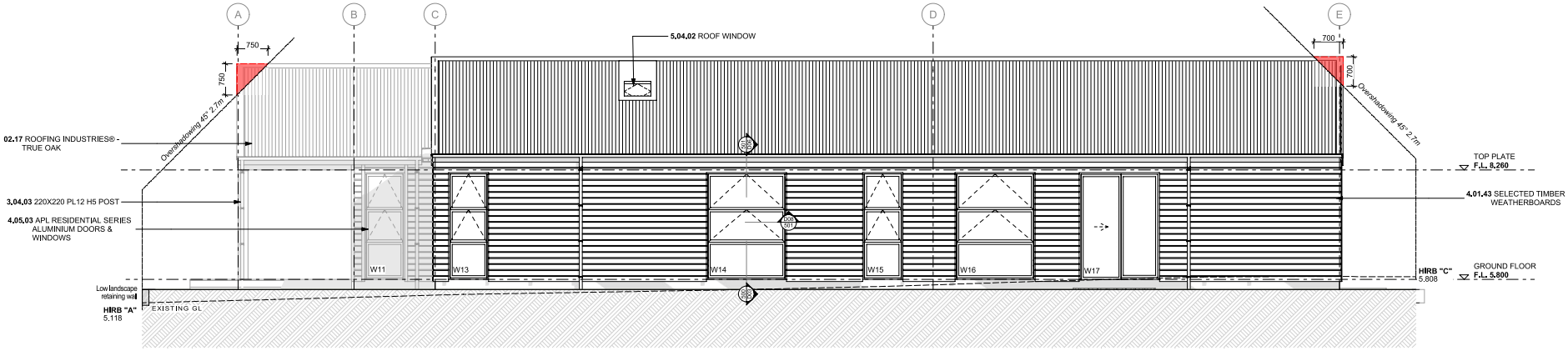
Site Information:	
Lot No: 2224	**DPS:**503458
Wind Zone:	HIGH
Earthquake Zone:	Zone 1
Exposure Zone:	Zone C
Climate Zone:	Zone 2

Boathouse

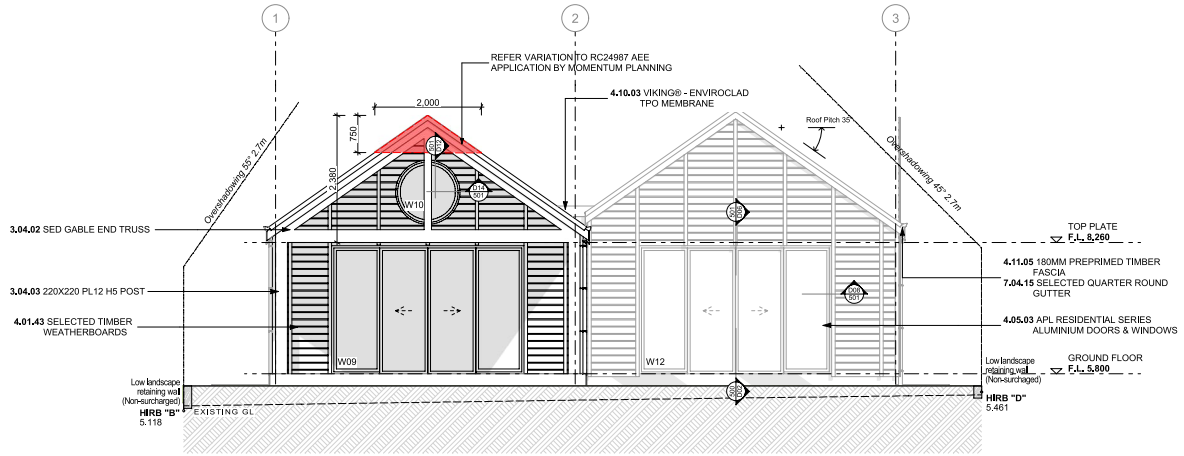
72C The Boulevard, Palm Springs, Papamoa, Tauranga

Issue ID	Change Name	Date
00	Building Consent	11/06/2021

SHEET TITLE: **Elevations Sheet 01**
PROJECT #: **21010**
PROJECT STATUS: **Building Consent**
DRAWN BY: **SAW**
CHECKED BY: **JMAC**
SCALES: **1:50 @ A1** **1:### @ A3**
SHEET #: **300**
REVISION #: **00**



South Elevation
Scale 1:50



West Elevation
Scale 1:50

BUILDING ENVELOPE RISK MATRIX		
South Elevation		
Risk Factor	**Risk Severity**	**Risk Score**
Wind zone (per NZS 3604)	High risk	1
Number of storeys	Low risk	0
Roof/wall intersection design	Medium risk	1
Eaves width	Very high risk	5
Envelope complexity	Low risk	0
Deck design	Low risk	0
Total Risk Score:		**7**

BUILDING ENVELOPE RISK MATRIX		
West Elevation		
Risk Factor	**Risk Severity**	**Risk Score**
Wind zone (per NZS 3604)	High risk	1
Number of storeys	Low risk	0
Roof/wall intersection design	Very high risk	5
Eaves width	Very high risk	5
Envelope complexity	Low risk	0
Deck design	Low risk	0
Total Risk Score:		**11**

Notes

3.04.02 SED GABLE END TRUSS
SED timber gable frame truss. 2/240x45mm H3.2 SG8 top and bottom chords, 2/140x45mm H3.2 SG8 centre post. Refer Engineers fixing details.

3.04.03 220X220 PL12 H5 POST
220x220mm PL12 H5 post. Refer to Engineers details and documents.

4.01.43 SELECTED TIMBER WEATHERBOARDS
H3.1 timber pre-primed weatherboards over 20mm cavity. 65x18mm timber battens @ 900mm crs approx. Installed & finished as per manufacturers specifications & NZBC E2/AS1. Nogs & battens as per manufacturers requirements. Cavity construction as per manufacturer's requirements.

4.02.17 ROOFING INDUSTRIES® -TRUE OAK
Roofing Industries True Oak corrugate Colorsteel roofing. Installed, flashed & finished as per the manufacturers specifications & NZBC E2/AS1. Minimum pitch 4°. Material options to include; Colorsteel 'Endura.' Refer to Colorsteels website for more information.

4.05.03 APL RESIDENTIAL SERIES ALUMINIUM DOORS & WINDOWS
APL Residential series powdercoated aluminium joinery installed to comply with NZBC: E2/AS1. Client to confirm colour.

4.10.03 VIKING® - ENVIROCLAD TPO MEMBRANE
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4.11.05 180MM PREPRIMED TIMBER FASCIA
Selected preprimed timber fascia. Fixed as per manufacturer's specifications and in compliance with NZS3604:2011 B1, B2 and E2

5.04.02 ROOF WINDOW
Selected roof window 600x600mm installed to manufacturers specifications.

7.04.15 SELECTED QUARTER ROUND GUTTER
Colorsteel® 'Endura' Quarter Round Gutter fixed with proprietry brackets. 6100m2 cross-sectional area used for catchment calculations.

TCC - Approved Building Consent Document - BC 311506 - Pg 13 of 30 - 12/07/2021 - Andrew Thomas - STL

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Site Information:	
Lot No: 2224	**DPS:**503458
Wind Zone:	HIGH
Earthquake Zone:	Zone 1
Exposure Zone:	Zone C
Climate Zone:	Zone 2

Boathouse

72C The Boulevard, Palm Springs, Papamoa, Tauranga

Issue ID	Change Name	Date
00	Building Consent	11/06/2021

SHEET TITLE: **Elevations Sheet 02**
PROJECT #: **21010**
PROJECT STATUS: **Building Consent**
DRAWN BY: **SAW**
CHECKED BY: **JMAC**
SCALES: **1:50 @ A1 1:### @ A3**
SHEET #: **301**
REVISION #: **00**

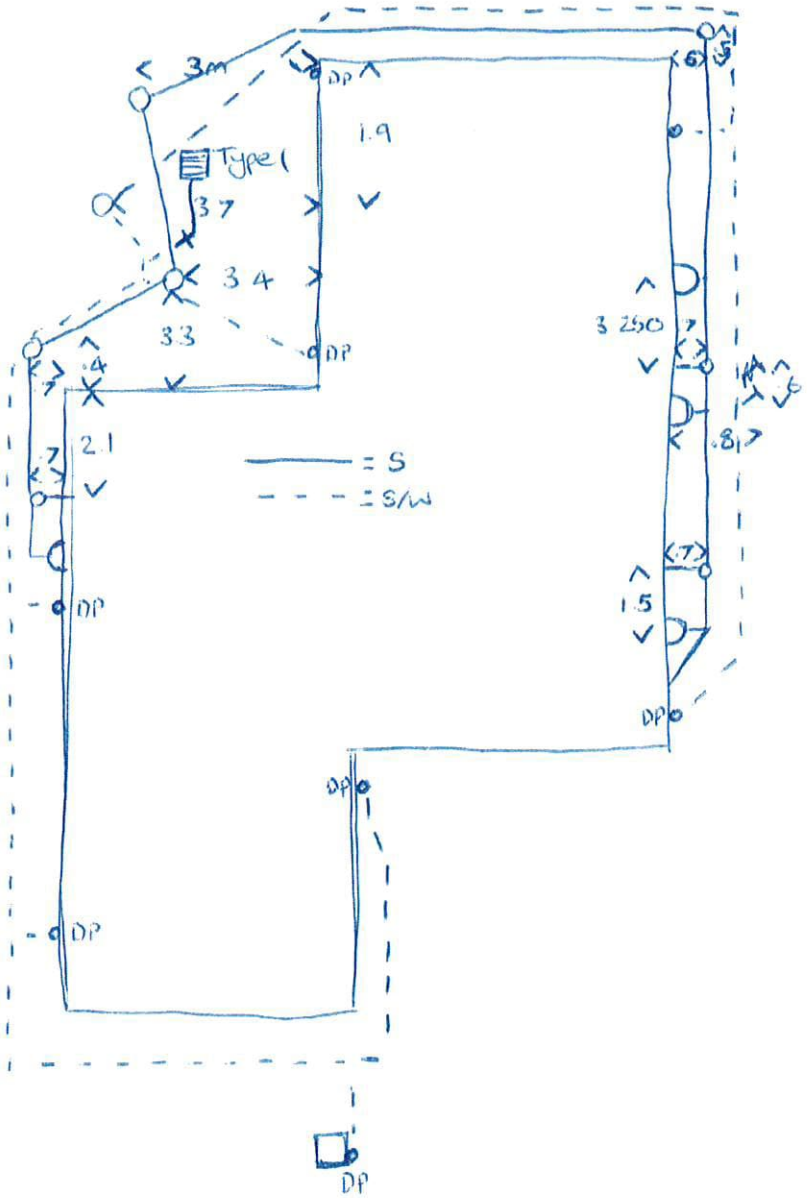
Bell Plumbing
PLUMBERS & DRAINLAYERS
A/Hrs: 0274 975 591
office@bellplumbing.co.nz
Phone 07 575 3049

BUILDING UNIT
AS BUILT DRAINAGE PLAN

Street: The boulevard No: 72c	Lot: 2224 DPS: 503458
Owner:	Drainlayer: Peter Bell
Inspector:	Reg No: 02974
Date of Inspection:	Consent No: 311506

DRAINLAYER PLEASE FILL IN ALL DETAILS

The building consent must be onsite for all inspections.



S/W STUB
ABOVE GROUND
Middle of driveway

Inspector's Signature: _____ Date: _____

Drainlayer's Signature: P Bell Date: 9.5.2022.

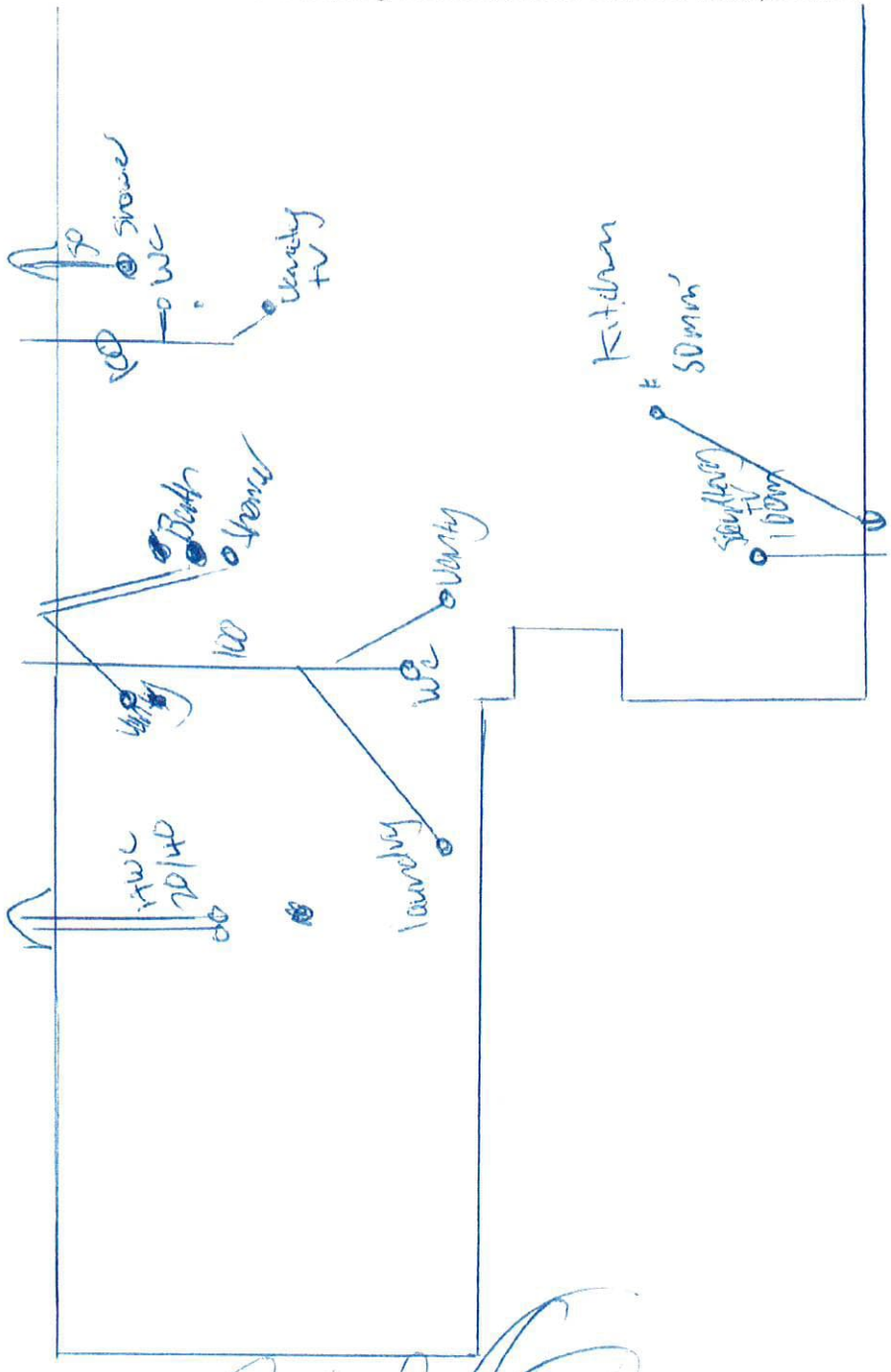
Bell Plumbing
PLUMBERS & DRAINLAYERS
A/H Hrs: 0274 975 591
office@bellplumbing.co.nz
Phone 07 575 3049

BUILDING UNIT
AS BUILT DRAINAGE PLAN

Street: The Boulevard No: 72c	Lot: 2224 DPS: 503458
Owner: Harwoods	Drainlayer: Peter Bell
Inspector:	Reg No: 02774
Date of Inspection:	Consent No: 311506

DRAINLAYER PLEASE FILL IN ALL DETAILS

The building consent must be onsite for all inspections.



Inspector's Signature: Carl Wall Date: 9.5.22

Drainlayer's Signature: Date:

Form 7
Code compliance certificate

Section 95, Building Act 2004

The building

Street address of building:	72C THE BOULEVARD, PAPAMOA BEACH, TAURANGA
Legal description of land where building is located:	LOT 2224 DP 503458
Building name:	N/A
Location of building within site/block number:	72C The Boulevard Bay of Plenty 3118
Level/unit number:	0
Current, lawfully established, use:	2.0 Housing: 2.0.2 Detached Dwelling
Year first constructed:	2022

The owner

Name of owner:	Harwood Homes Nz Limited
Customer number:	154187
Contact person:	Dave Harwood
Mailing address:	Po Box 11272, Papamoa , Tauranga
Street address/registered office:	N/A
Phone number:	Landline: 075724936 Mobile: N/A
Daytime:	Landline: 075724936 Mobile: N/A
After hours:	Landline: 075724936 Mobile: N/A
Facsimile number:	No information provided
Email address:	N/A
Website:	No information provided

First point of contact for communications with the council/building consent authority:
Jason Macdonald (JMAC Architecture Ltd); Mailing Address: 81 Maunganui Road
Mount Maunganui
Bay Of Plenty
Tauranga 3116; Phone: 021721796; Email: jason@jmacdesign.co.nz

Building work

Building consent number:	BC311506
Description:	Construct 3 Bedroom domestic dwelling, double attached garage
Issued by:	Tauranga City Council

Code compliance

The building consent authority named below is satisfied, on reasonable grounds, that -
the building work complies with the building consent.

No Compliance Schedule

Signature: Steve Pearce
Position: Manager: Building Services
On behalf of: Tauranga City Council
Date: 04 July 2022

Planning Information

Tauranga City

TAURANGA CITY COUNCIL

CONSENT NOTICE PURSUANT TO SECTION 221 RESOURCE MANAGEMENT ACT 1991

TCC Ref. RC24767/RC24916/RC24897

IN THE MATTER OF DP 503458

AND

IN THE MATTER OF Subdivision Consent Pursuant to Sections 104, 108, 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 21 October 2015, 04 May 2016, 26 September 2016 and 07 March 2016 the following conditions were imposed on the subdivision consent for Lot 6 DP501179, Lot 10 DP 501179, Lots 221 and 222 DP 501179 and Lots 12, 13, 219 and 220 DP 496563:

That a consent notice be registered on the Certificates of Title for all lots advising owners and subsequent owners of the following requirements to be complied with on a continuing basis:

For all lots (excluding Lots 920, 921, 924, and 928):

The design and construction of any building requiring a Building Consent in accordance with the Building Act 2004 shall comply with the recommendations contained within the geotechnical completion report prepared by S&L Consultants Ltd, dated 2 November 2016, reference 20464-12.

For Lots 920, 921, 924, 2224, 2225, 2226:

The owners are required to meet the full cost of any fencing along the common boundary between this lot and any adjoining reserve to be vested in Tauranga City Council as Local Purpose Reserve upon future stages.

DATED at Tauranga this 27th day of January 2017.

……..
Authorised Officer

NOTIFICATION DECISION IN RESPECT OF RESOURCE CONSENT APPLICATION – RC24916
Under the Housing Accords and Special Housing Areas Act 2013

Tauranga City Council, an authorised agency as set out under section 23 of the Housing Accords and Special Housing Areas Act 2013, resolves:

That pursuant to Section 29 of the Housing Accords and Special Housing Areas Act 2013, the application by Palm Springs Limited to undertake a qualifying development comprising the establishment of independent residential dwellings and freehold allotments, roads, accessways and associated development works within 'Area 1' of the Palm Springs special housing area at 61 Palm Springs Boulevard, Papamoa East legally described as Lot 501 DP 484164 (CFR 685/457) and thereon Lots be processed without notification.

Reasons for Decision:

In relation to section 29 it has been determined that notification of the application to any of the persons identified under section 29 (3) is not necessary. The application proposes the delivery of residential development in an Urban Growth Area which is of a density and form that is considered to achieve the purpose of the Act, and will satisfy the criteria prescribed within the Order in Council in respect to this Special Housing Area and be consistent with the purpose of the Wairakei Residential Zone. The proposed development will be supported by sufficient and appropriate infrastructure, including road and infrastructure and is considered to be consistent with the purpose and principles in Part 2 of the Resource Management Act 1991.

Assessed and Recommended by:

Stacey Hikairo
Team Leader (Technical): Environmental Planning

Delegated Authorisation by:

Lee Dove
Team Leader (People Management): Environmental Planning

Date: 04 May 2016

Tauranga City Council
91 Willow Street, Private Bag 12022, Tauranga 3143, New Zealand
Phone 07 577 7000 **Fax** 07 577 7193 **Email** info@tauranga.govt.nz **www.tauranga.govt.nz**

Palm Springs Limited
C/- S & L Consultants Ltd
P O Box 231
Tauranga 3140

DECISION ON RESOURCE CONSENT APPLICATION – RC24916
Under the Housing Accords and Special Housing Areas Act 2013

Tauranga City Council, an authorised agency as set out under section 23 of the Housing Accords and Special Housing Areas Act 2013, resolves:

That pursuant to Sections 34 to 38 of the Housing Accords and Special Housing Areas Act 2013, resource consent is granted to the application by Palm Springs Limited to undertake a qualifying development comprising the establishment of independent residential dwellings and freehold allotments, roads, accessways and associated development works within 'Area 1' of the Palm Springs special housing area at 61 Palm Springs Boulevard, Papamoa East legally described as Lot 501 DP 484164 (CFR 685/457).

Reasons for Decision:

1. The proposal, being to develop land for the purpose of establishing allotments and associated infrastructure to accommodate residential dwellings, is consistent with the purpose of HASHAA and the sustainable management purpose of Part 2 of the RMA;

2. The application is generally consistent with the Plan and will deliver development within the Wairakei Residential Zone that complements the existing developed landscape character of this urban growth area and is supported by the necessary level of infrastructure capacity.

3. Adequate infrastructure can be provided to support the Qualifying Development.

That pursuant to sections 37 and 38 of the Housing Accords and Special Housing Areas Act 2013 and sections 108 and 220 of the Resource Management Act 1991 the granting of this resource consent is subject to the following conditions:

General:

1. The qualifying development, comprising the establishment of independent dwelling units including the creation of freehold allotments and other associated works, shall proceed in accordance with the plans and all information submitted with the application prepared by S & L Consultants Limited, referenced 20464 – S13 dated December 2015.

Tauranga City Council
91 Willow Street, Private Bag 12022, Tauranga 3143, New Zealand
Phone 07 577 7000 **Fax** 07 577 7193 **Email** info@tauranga.govt.nz **www.tauranga.govt.nz**

Reference No.	Title	Author	Date
20464 –RC13B	*Proposed Subdivision of Lot 502 RC24897*	*S & L Consultants Ltd*	*February 2016*
20464	*Geotechnical Assessment Report*	*S & L Consultants Ltd*	*10 September 2015*
20464 – RC13D Rev 1	*Stormwater Mitigation Storage*	*S & L Consultants Ltd*	*December 2015*

Compliance with this condition is subject to changes required in order to satisfy the requirements of conditions of this resource consent.

2. *All costs associated with the conditions of this consent shall be met by the consent holder.*

3. *Prior to any application pursuant to section 45 of the HASHAA or section 224 RMA for Stage 13B, the applicant shall confirm that title has issued for the preceding stage (Stage 12B) and Lots 11, 12, 13, 14, 182, 219 and 220.*

4. *Pursuant to sections 51 of the HASHAA, this consent lapses two years after the date of commencement of the consent unless:*
   - *The consent is given effect to; or*
   - *The Council extends the period after which the consent lapses.*

Land Use Specific Conditions:

5. *All buildings shall be designed and constructed to satisfy the following minimum requirements ('site development controls'):*

   <u>Development Density</u>

   a) *For nominated "Regular Lots" within Stage 13B, no further subdivision shall be undertaken and shall contain an independent dwelling unit only.*

   b) *For nominated "Sub-dividable Lots", within Stage 13B the minimum lot size shall be no less than 325m2 nett site area and final lots shall contain no more than one independent dwelling unit.*

   c) *For nominated "Larger Builder's Block's" shall achieve the following minimum yields:*

Stage 13B:	*Lot No. 182*	*4 Dwelling Unit Equivalents (DUE's)*
	Lot No. 201	*12 DUE's*
	Lot No. 218	*5 DUE's*

   Lot 2191 – 2196 and Lots 2201 – 2206 are classified as Builder Blocks for the purposes of performance standards set out in this consent.

   For the avoidance of doubt 'nett site area' shall have the same meaning as set out in Chapter 3 (Definitions) of the Tauranga City Plan;

Minimum Building Platform Levels

- *All buildings located on land within stage 13 shall have the following minimum building platform levels (all referenced to Moturiki Datum) RL 4.8 m for non-habitable residential buildings; and*
- *RL 5.1m for habitable buildings (including attached garages);*

Building Height

d) All buildings shall have a maximum building height of 9.5 m above approved subdivision ground level;

Site Coverage

e) The maximum site coverage for allotments within stage 13 shall be as follows:

i. 55% for allotments with a nett site area less than 500 m²;

ii. 45% for allotments with a nett site area of 500 m² or greater.

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;

Outdoor Living Areas

f) Every independent dwelling unit shall be provided with an outdoor living area that complies with one of the following minimum requirements (being i. or ii.):

i. A minimum continuous area of 20 m² that is capable of accommodating minimum dimensions of 4.0 m by 3.0 m and located on the northern, north-eastern or north-western aspect of any allotment; or

ii. A minimum continuous area of 50 m² that is capable of accommodating minimum dimensions of 4.0 m by 3.0 m provided either at ground floor level or as a balcony with a minimum area of 12 m² with the balance provided at ground level.

g) The outdoor living area provided in accordance with condition 4 f) shall be free of driveways, manoeuvring and parking areas, and be unenclosed except for cover by a roof, shade sail or other cover to provide sun protection and/or eaves (including guttering);

Setbacks

h) All buildings and on-site car parking to be setback at least 3.0 m from the legal road boundary.

i) All buildings must be setback a minimum of 1.5 m from side or rear boundaries, except as provided for in the following situations:

- *building eves and gutters can intrude up to 0.6 m into these setbacks;*
- *For nominated Builder Blocks and Sub dividable lots, any other part of a building can be positioned closer to internal any side or rear boundary, only where the written approval of the property owners and occupiers whose properties adjoin the proposed setback encroachment has been*

obtained and that approval is shown on all relevant building plans that show the encroachment. Written approval must be obtained prior to the building works occurring;

Fencing

j) Fencing on the boundaries of any allotment adjoining a Local Purpose Reserve (accessways), Recreation Reserve or any land vested in Tauranga City Council for stormwater purposes shall be no greater than 1.2 m in height, or no greater than 1.8 m in height provided the part of the fence between 1.2 m and 1.8 m is a minimum of 75% visually permeable;

Transportation

k) Every independent dwelling unit shall be provided with a minimum of two on-site car parking spaces that meet the minimum dimensions of 2.5m x 5.4m (w x l).

l) All garages or carports designed with direct vehicle access onto a road shall be setback at least 4.5m from the road boundary Garages and car ports can be located no less than 3.0m from the road boundary, provided they do not have direct access on to the road.

For the avoidance of doubt 'direct access' shall have the same meaning as set out in Chapter 3 (Definitions) of the Tauranga City Plan;

m) For lots with frontage to the boulevard, on site manoeuvring shall be provided in accordance with Rule 4B.2.5 of the City Plan.

Overshadowing

n) All buildings shall be located within a building envelope calculated in accordance with Table 1 set out within this condition except as provided for otherwise and in accordance with i of this condition (below).

i. For Subdividable Lots and Builders Blocks Buildings can extend outside of the building envelope prescribed by this condition along internal boundaries, provided the written approval of the property owners and occupiers whose properties adjoin the encroachment, including those properties separated from the encroachment by vehicle or pedestrian access ways, private ways, access legs, rights of way or access lots where the encroachment occurs if the envelope is applied at the boundary of that property, has been obtained and is shown on all relevant building plans that show the encroachment. Written approval must be obtained prior to the building works occurring;

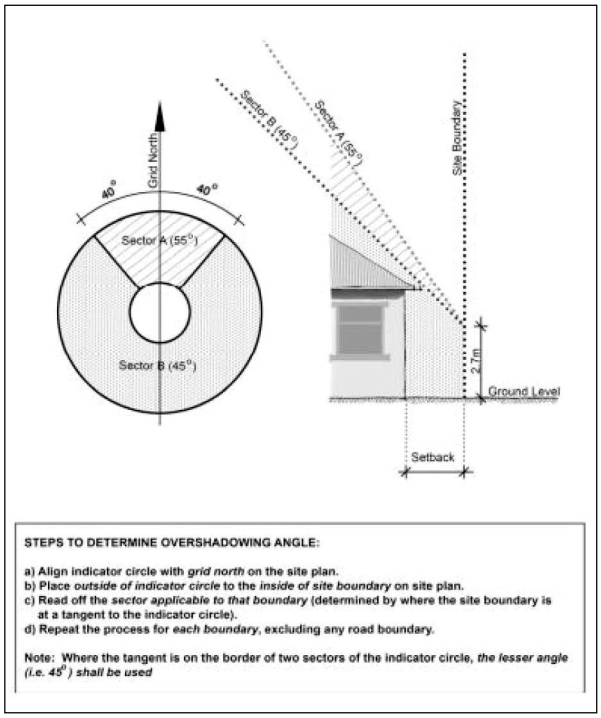
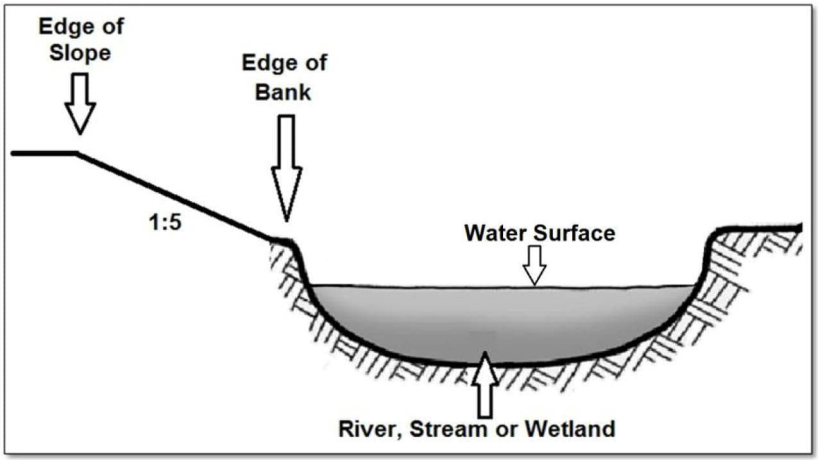


Table 1: Building Envelope (condition 5n)

6. *All buildings, excluding minor structures and activities, shall be setback a minimum of 10.0m from the edge of a bank of a permanently flowing river or stream, or wetland;*



7. *Construction noise as a result of giving effect to this consent shall not exceed the limits recommended in, and shall be measured and assessed in accordance with, NZS 6803:1999 Acoustics Construction Noise;*

8. *All earthworks carried out on allotments within Stages 13B 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 where earthworks will expose more than 100 m² of area;*

9. *After a dwelling is constructed, within 12 months of the Code of Compliance Certificate (CCC) being issued, the following is to be completed:*

- *Disturbed ground on the property shall be reinstated with either grass; paving or decking;*
- *10m^2 of Landscaping and at least 1 tree greater than 2.0m in height shall be planted.*

10. *The minimum gross floor area for a dwelling comprising two or more bedrooms shall be 90.0m^2.*

11. *All activities, except as referenced specifically above, shall be in accordance with the relevant provisions of the Tauranga City Plan.*

Subdivision Specific Conditions:

12. *The consent holder shall submit to Council a survey plan for approval under section 45 of the HASHAA and section 223 of the RMA that conforms with the proposed subdivision plan referenced 20464 – RC13B Rev 2, dated 12/15 and attached to this consent;*

13. *Any separate survey plans submitted to Council for approval in accordance with condition 3 of this consent for the purpose of giving effect to this consent in stages is appropriate subject to all conditions of this consent applicable to allotments shown on that scheme plan being complied with to the satisfaction of Council.*

14. *All matters and works relating to the servicing and accessing of the subdivision, shall be designed, supervised, constructed and certified in accordance with requirements of the Council's' Infrastructure Development Code except where those requirements are amended by way of engineering plans submitted and approved in accordance with the requirements of condition 15 of this consent.*

15. *Prior to the commencement of any construction/ earthworks or prior to the lodgement of the survey plan pursuant to section 45 of the HASHAA and section 223 of the RMA, whichever is the earlier, the consent holder shall submit complete engineering plans to the Team Leader: Development Engineering for approval. The plans shall include the following:*

    - *The information and plans required by the Infrastructure Development Code;*
    - *Details of the construction of all roads to vest (Lots 931 in accordance with IDC Drawing T108) including vehicle tracking curves, proposed traffic management measures and street planting;*
    - *Details of the construction of access lots 2197 and 2207;*
    - *Details of the proposed sewer, stormwater and water main reticulation layout and allotment connections;*
    - *Details of the overland flowpath and areas of ponding in extreme rainfall events;*
    - *Details of the works to establish a suitable building platform on each proposed lot and any retaining structures to be constructed for that purpose;*
    - *Confirm the minimum volume of stormwater mitigation required to satisfy the Papamoa Comprehensive Stormwater Consent (ref 63636) and any approved change to the conditions of that consent.*

16. *All residential lots shall be provided with a separate underground connection to the sanitary sewer, water and electricity reticulation system in accordance with the Council's Infrastructure Development Code. Stormwater can be disposed of by*

ground soakage with the design criteria specified in the Geotechnical Completion Report ('GCR') submitted in accordance with condition 21 of this consent.

17. *The consent holder shall supply to the Council a set of 'as built' plans of all engineering and landscaping works in accordance with the Council's Infrastructure Development Code.*

18. *All earthworks design, testing and construction shall be undertaken in accordance with Council's Infrastructure Development Code, the requirements of condition 15 of this consent and the requirements of the consent holders appointed Geo-Professional.*

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

19. *All earthworks carried out within Stage 13B 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 where earthworks will expose more than 100 m² of area;*

20. *The Consent Holder shall undertake works to establish a minimum building platform level of RL 5.10m Moturiki Datum on each proposed allotment to avoid the effects of inundation.*

    A Licensed Cadastral Surveyor shall certify, in writing, that all finished building platforms are constructed to the required minimum level.

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

    - *Comply with the Council's Infrastructure Development Code;*
    - *Provide recommendations for the on-site disposal of stormwater including minimum separation distances from boundaries and structures;*
    - *Provide recommendations for the ongoing development of the lots;*
    - *Confirm earthworks and/or building platforms have been constructed to comply with the New Zealand Building Code requirements;*
    - *Provide an analysis of the liquefaction risk and any specific foundation requirements that may be required;*
    - *Comment on removal or amendment of existing land feature/s displayed on Council's GIS.*

    Upon receipt of the above, all matters set out within the Geotechnical Completion Report will be reviewed and if necessary a consent notice, pursuant to section 44 of the HASHAA and section 221 of the RMA, may be registered on each of the Certificates of Title advising the owners and subsequent owners thereof, of requirements to be complied with on a continuing basis.

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

23. *The consent holder shall register an easement in gross in favour of Tauranga City Council over any stormwater overland flowpath located on private property, including those resulting from overload of the roading primary stormwater system in an extreme rainfall event.*

Any overland flowpath easement shall be shown on the survey plan submitted in accordance with condition 24 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".

24. *The following amalgamation conditions shall be recorded on the survey plan prior to certification pursuant to section 45 of the HASHAA and section 223 of the RMA (LINZ Request 1355222):*

    - *"That Lot 2197 hereon (Legal access) be held as to six undivided one sixth shares by the owners of Lots 2191, 2912, 2193, 2194, 2195 and 2196 hereon and one certificate of title be issued in accordance therewith";*
    - *"That Lot 2207 hereon (Legal access) be held as to six undivided one sixth shares by the owners of Lots 2201, 2202, 2203, 2204, 2205,and 2206 hereon and one certificate of title be issued in accordance therewith".*

25. *Prior to, or in conjunction with an application for certification pursuant to section 46 of the HASHAA and section 224(c) of the RMA the consent holder shall confirm that the roads to vest in Council, shown as lots 929, 930 and 9131 have been constructed in accordance with plans approved under condition 15 of the consent. Lots 929, 930 and 931 shall be shown on the survey plan to vest in Council as road prior to certification pursuant to section 45 of the HASHAA and section 223 of the RMA.*

26. *Prior to, or in conjunction with an application for certification pursuant to section 46 of the HASHAA and section 224(c) of the RMA the consent holder shall confirm that the accessways to vest in Council, shown as lots 4, 5, 6 and 8 and the Recreation Reserve to vest in Council, shown as Lot 10 have been constructed in accordance with plans approved under condition 7 of this consent. Lots 4, 5, 6 and 8 shall be shown on the survey plan to vest in Council as Local Purpose Reserve: Accessway and Lot 10 shall be shown on the survey plan to vest in Council as Recreation Reserve prior to certification pursuant to section 45 of the HASHAA and section 223 of the RMA.*

27. *Prior to, or in conjunction with an application for certification pursuant to section 46 of the HASHAA and section 224(c) of the RMA the consent holder shall confirm that any required stormwater mitigation volume works required have been fully completed.*

Assessed and Recommended by:

Stacey Hikairo
Team Leader (technical): Environmental Planning

Delegated Authorisation by:

Lee Dove
Team Leader (People Management): Environmental Planning

Date: 04 May 2016

Advice Notes:

1. *Under section 81 of the HASHAA you 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 82 of the HASHAA (see s357C 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 82 should describe the reasons for the objection.

2. *Where any building or drainage works are required to satisfy conditions of this consent, all consents required under the Building Act 2004 must be obtained prior to the works being carried out.*

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 and all relevant iwi/hapu for advice. Contact Details: email - infolowernorthern@heritage.org.nz; phone - 07 577 4530. Tauranga City Council is able to advise of the contact details for the relevant iwi/ hapu in this area.*

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. *This resource consent and associated conditions provides for the subdivision and subsequent residential and associated development of the land described and shown in the approved scheme plan. This resource consent, issued pursuant to the provisions of the Housing Accords and Special Housing Areas Act 2013 is in place of the requirement to obtain a comprehensive development consent in accordance with the requirements of the Tauranga City Plan.*

Palm Springs Limited
C/- S & L Consultants Ltd
P O Box 231
Tauranga 3140

DECISION ON RESOURCE CONSENT APPLICATION – RC24897 (LAND USE)
Under the Resource Management Act 1991

Tauranga City Council resolves:

That pursuant to Section 104 and 104B of the Resource Management Act 1991, the application for resource consent by Palm Springs Limited to use land for the creation of Independent Dwelling Units within the Wairakei Residential Zone at Palm Springs Boulevard, Papamoa legally described as Lot 501 DP 484164 (CFR 685457), Lot 6 DP 484164, Lot 923 (under RC24767) and thereon Lot 8 (under RC24897 - Phase 1) and Lots 2211 – 2216 & 2221 – 2226, 175 & 176, 193 - 195 and 207 – 210 (under RC24897 - Phase 3) is granted.

Reasons for Decision:

The land use component of this application proposes further residential development of the land following the creation of allotment proposed under Phase 3. The application site is part of the Palm Springs residential development and is located within the Wairakei Urban Growth Area. It has been determined that this application is for a non-complying activity on the basis that this development will surpass the controls put in place in respect of anticipated dwelling units within the UGA. It has been recognised however that the application is a by-product of a boundary issues between existing development and that enabled through the Housing Accord legislation. The development proposed is also in line with existing approved development and will be delivered at a rate that will coincide with the delivery of other critical infrastructure – namely Te Okuroa Drive.

Given the above this application has been considered against all relevant matters set out under the Tauranga City Plan as these relate to the delivery of comprehensive development within this UGA. It has been concluded that for the purposes of section 104D of the RMA, that the activities adverse effects will be no more than minor. This conclusion is considered appropriate in respect of conditions that are attached to this consent. These conditions will ensure the delivery of an urban development form that is compatible and complementary to that which exists in the UGA. For this reason the application is also considered not to be contrary to the objectives and policies for this UGA.

Conditions have been imposed which are considered to address matters relevant to the proposal and will enable the purpose and principles of the RMA to be achieved as set out under Part 2.

Tauranga City Council
91 Willow Street, Private Bag 12022, Tauranga 3143, New Zealand
Phone 07 577 7000 **Fax** 07 577 7193 **Email** info@tauranga.govt.nz **www.tauranga.govt.nz**

That pursuant to sections 108 of the RMA, the granting of this consent is subject to the following conditions:

1. *The proposed activity shall proceed in accordance with the following plans and information submitted as part of the application, including:*

   - *Assessment of Environmental Effects prepared by S & L Consultants Ltd referenced 20464- Stage 12B – RCA dated November 2015;*
   - *Scheme plan entitled 'Subdivision Plan' referenced 20464- RC12C Revision 1 dated December 2015;*

   Subject to any changes required through compliance with the following conditions.

Site Development Controls (SDC)

2. *All residential development of the application on the land comprising Stages 12B must be in accordance with the following SDCs;*

   I. ***Development Density*** *–*

   *For nominated "**Regular Lots**" within Stage 12C, no further subdivision shall be undertaken and shall contain a single Independent Dwelling Unit only.*

   *For nominated "**Sub-dividable Lots**", within Stage 12C the minimum lot size shall be no less than 325m^2 nett site area and final lots shall contain no more than one independent dwelling unit.*

   *For nominated "**Larger Builder's Block's"** shall achieve the following minimum yields:*

   – Stage 12C: Lot No. 193 - 13 Dwelling Unit Equivalents (DUE's);

   II. ***Frontage –*** *to provide physical and legal access to a public road, lots for residential use shall have a minimum road frontage of 3.0m.*

   III. ***Maximum Building Height*** *– 9.5m above approved subdivision ground level;*

   IV. *All new buildings on lots to have **minimum building platform level** of RL 4.8m for non-habitable residential buildings and RL 5.1m for habitable buildings (including attached garages);*

   V. ***Streetscape*** *– all buildings to be setback at least 3.0m from legal road boundaries; (except for the buildings eaves that can intrude no more than 0.6m into this streetscape setback);*

   VI. ***Other setbacks*** *– all buildings and structures to be a minimum of 1.5m from side or rear boundaries (except for building eaves that can intrude no more than 0.6m into this 1.5m setback).*

   Note: *For "Sub-dividable Lots" and "Larger Builder's Block's", this setback requirement can be reduced to less than 1.5m along the internal boundaries of the nominated lot, provided the written consent of the property owner/s where this setback reduction will occur is obtained and endorsed on the relevant building plans or other plans that show the encroachment;*

   VII. *Fencing on the boundaries of any allotment adjoining a Local Purpose Reserve (access way) Recreation Reserve or any land vested in Tauranga City Council for Stormwater purposes shall be no greater than*

1.2m in height, or no greater than 1.8m in height provided the part of the fence between 1.2m and 1.8m is a minimum of 75% visually permeable.

VIII. *All **garages or carports** designed with direct vehicle access onto a road shall be setback at least 4.5m from the road boundary. Garages and carports can be located no less than 3.0m from the road boundary, provided they do not have direct entry access onto the road.*

IX. ***Outdoor Living Area** – 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 that will include a minimum dimension of 3m x 4m is located on the northern or north-eastern or north-western; or*

b. *A minimum continuous area of at least 50m^2 that will include a minimum dimension of 3m x 4m provided either at ground level or as a balcony with a minimum area of 12m^2 with the balance provided at ground level.*

X. *The outdoor living area to be provided in accordance with IX above shall be free of buildings, driveways vehicle access, manoeuvring and parking areas, and be unenclosed except for cover by a roof , shade sail or other cover to provide sun protection and or eaves (including guttering)*

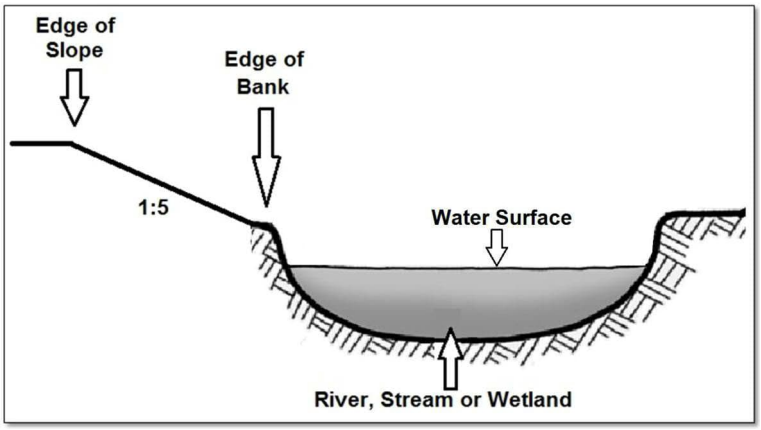
XI. ***Site coverage** - The maximum site coverage of nett site area by buildings shall be:*

- *55% for lots that have a nett site area less than 500m2; and*
- *45% for lots that have 500m^2 or greater.*

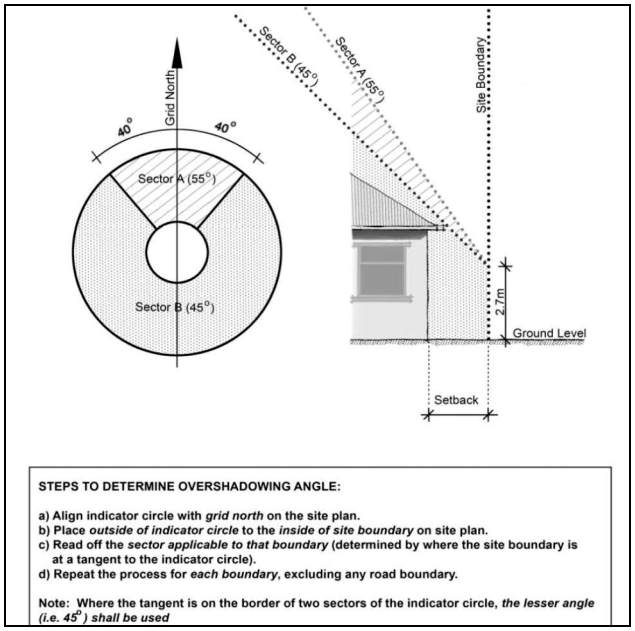
***Note:** The definition of "**nett site area"** is the area of a lot less any area of that lot that is solely for the purpose of providing access to the site and for clarity also excludes:*

a. *An entrance strip owned in common with the owners of other lots;*
b. *Any area in a cross-lease, company lease or unit title subdivision that is not covered by an independent dwelling unit, the accessory buildings of that independent dwelling unit, or other area set aside for the exclusive use of the occupants of that independent dwelling unit.*

XII. *All buildings, excluding minor structures and activities, shall be setback a minimum of 10.0m from the edge of a bank of a permanently flowing river or stream, or wetland;*



XIII. *All buildings shall be within an envelope calculated in accordance with the diagram below. For "Sub-dividable Lots" and "Larger Builder's Block's", this envelope can be penetrated by building/s along the internal boundaries of the nominated lot upon further subdivision, provided the written consent of the property owner/s where the penetration occurs is obtained and endorsed on the relevant building plans;*



XIV. *Every independent dwelling unit shall be provided with a minimum of two on site car parking spaces that meet the minimum dimensions of 2.5m wide x 5.4m in length.*

XV. *For lots with frontage to the Boulevard, on site manoeuvring shall be provided in accordance with Rule 4B.2.5 – On Site Manoeuvring.*

XVI. *After a dwelling is constructed, within 12 months of the Code Compliance Certificate (CCC) being issued, the following to be completed: disturbed ground on the property shall be reinstated with either grass, paving or decking, 10m^2 of landscaping and at least 1 tree greater than 2m in height shall be planted.*

XVII. *Minimum gross floor area for dwelling comprising two or more bedrooms to be 90.0m^2;*

XVIII. *All activities, except as specifically referenced above, shall be in accordance with the relevant provisions of the City Plan.*

Recommended and Assessed by:

Stacey Hikairo
Senior Environmental Planner

Delegated Authorisation by:

Bradley Bellamy
Team Leader: Environmental Planning

Date: 7 March 2016

Advice Notes:

1. *Under section 357 of the RMA, you can object to this consent by serving written notice on the Council within 15 working days of receiving this decision, detailing the reasons for and what would satisfy 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. *This resource consent does not constitute any form of approval in terms of the Building Act 2004 or the New Zealand Building Code. Where any building or drainage works are required to satisfy conditions of this consent, all consents required under the Building Act 2004 must be obtained prior to the works being carried out.*

Tauranga City	**RESOURCE MANAGEMENT ACT 1991** **SECTION 88 RESOURCE CONSENT APPLICATION**
	DECISION ON RESOURCE CONSENT APPLICATION NUMBER RC24897 01

Pursuant to sections 127 and 104B of the Resource Management Act 1991, Tauranga City Council determines:

To grant the application made pursuant to section 127 of the Resource Management Act 1991, made by Harwood Homes as holder of land use resource consent RC24897 (for the creation of Independent Dwelling Units within the Wairakei Residential Zone at Palm Springs Boulevard, Papamoa) on land described as 72C The Boulevard (Lot 2224 DP 503458), to change the conditions of that consent in accordance with Appendix A of this decision.

Description of the Activity

The proposal is described in detail within the Assessment of Environmental Effects Report prepared by Momentum Planning and Design titled "Application for Variation to Resource Consent RC24897' and dated 27 April 2021 ("Applications AEE"). In summary, the Applicant seeks a variation to consent condition 2(XIII) to allow for gable end roofs to intrude through the overshadowing envelope by no more than one third perpendicular height of the gable end.

Resource Consent(s)

Resource consent is granted for the purposes of section 127(3) of the Resource Management Act 1991 ("RMA") to authorise a discretionary activity, for a change to Condition 2(XIII) of RC24897 to enable gable end roofs to protrude through the overshadowing envelope by no more than one third perpendicular height of the gable end.

Notification

A determination to process the application on a non-notified basis was made under delegated authority on 27 May 2021, as recorded within the report titled "Council Officers Report on Resource Consent [RC24897 01], dated 27 May 2021 ("Council Planners Report").

Reasons for Decision

The documents submitted as part of the application, including the Applicant's AEE; the Council Planner's Report; and supporting documents and reports, have been received and taken into account in making this decision.

There is sufficient information to consider the matters required by the Resource Management Act 1991 in making this decision.

The reasons for this decision are adopted from, and fully set out in, the Council Planner's Report. The key conclusions include (but are not limited to) the following matters.

- In accordance with section 104(1)(a) it has been concluded that the change sought will not result in unacceptable effects on the environment;

- Having considered the relevant provisions within the Relevant Provisions of the Tauranga City Plan and Relevant Provisions of the Regional Policy Statement as directed by section 104(1)(b), it has been determined that granting of the resource consent sought is consistent with the direction provided by those provisions;

- The proposal does not create any adverse effects on the surrounding environment or adjoining properties and remains consistent with the underlying provisions of the comprehensively designed development land use consent (RC24897).

- It has been concluded that the City Plan has been completely prepared and addressed Part 2 Matters of the RMA, as they are relevant to the application. On the basis that it has been concluded that granting the variation to RC24897 is consistent with those provisions, so too is consistent with Part 2.

This determination is made under delegated authority by:

Recommended and Assessed by:	Delegated Authorisation by:
Holly Norton **Graduate Environmental Planner**	Amy Spurdle **Principal Planner** Date: 28 May 2021

Tauranga City	**RESOURCE CONSENT NUMBER RC24897 01**
	APPENDIX A – CONDITIONS OF RESOURCE CONSENT

Pursuant to section 127 of the Resource Management Act 1991 the conditions of resource consent RC24897 now read as follows:

1. *The proposed activity shall proceed in accordance with the following plans and information submitted as part of the application, including:*

   - *Assessment of Environmental Effects prepared by S & L Consultants Ltd referenced 20464- Stage 12B – RCA dated November 2015;*
   - *Scheme plan entitled 'Subdivision Plan' referenced 20464- RC12C Revision 1 dated December 2015;*

Subject to any changes required through compliance with the following conditions.

Site Development Controls (SDC)

2. *All residential development of the application on the land comprising Stages 12B must be in accordance with the following SDCs;*

   I. ***Development Density –***

   *For nominated "**Regular Lots**" within Stage 12C, no further subdivision shall be undertaken and shall contain a single Independent Dwelling Unit only.*

   *For nominated "**Sub-dividable Lots**", within Stage 12C the minimum lot size shall be no less than 325m^2 nett site area and final lots shall contain no more than one independent dwelling unit.*

   *For nominated "**Larger Builder's Block's"** shall achieve the following minimum yields:*

   - *Stage 12C: Lot No. 193 - 13 Dwelling Unit Equivalents (DUE's);*

   II. ***Frontage –** to provide physical and legal access to a public road, lots for residential use shall have a minimum road frontage of 3.0m.*

   III. ***Maximum Building Height –** 9.5m above approved subdivision ground level;*

   IV. *All new buildings on lots to have **minimum building platform level** of RL 4.8m for non-habitable residential buildings and RL 5.1m for habitable buildings (including attached garages);*

   V. ***Streetscape –** all buildings to be setback at least 3.0m from legal road boundaries; (except for the buildings eaves that can intrude no more than 0.6m into this streetscape setback);*

VI. ***Other setbacks –*** *all buildings and structures to be a minimum of 1.5m from side or rear boundaries (except for building eaves that can intrude no more than 0.6m into this 1.5m setback).*

Note: *For "Sub-dividable Lots" and "Larger Builder's Block's", this setback requirement can be reduced to less than 1.5m along the internal boundaries of the nominated lot, provided the written consent of the property owner/s where this setback reduction will occur is obtained and endorsed on the relevant building plans or other plans that show the encroachment;*

VII. *Fencing on the boundaries of any allotment adjoining a Local Purpose Reserve (access way) Recreation Reserve or any land vested in Tauranga City Council for Stormwater purposes shall be no greater than 1.2m in height, or no greater than 1.8m in height provided the part of the fence between 1.2m and 1.8m is a minimum of 75% visually permeable.*

VIII. *All* ***garages or carports*** *designed with direct vehicle access onto a road shall be setback at least 4.5m from the road boundary. Garages and carports can be located no less than 3.0m from the road boundary, provided they do not have direct entry access onto the road.*

IX. ***Outdoor Living Area –*** *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 that will include a minimum dimension of 3m x 4m is located on the northern or north-eastern or north-western; or*

b. *A minimum continuous area of at least 50m^2 that will include a minimum dimension of 3m x 4m provided either at ground level or as a balcony with a minimum area of 12m^2 with the balance provided at ground level.*

X. *The outdoor living area to be provided in accordance with IX above shall be free of buildings, driveways vehicle access, manoeuvring and parking areas, and be unenclosed except for cover by a roof , shade sail or other cover to provide sun protection and or eaves (including guttering)*

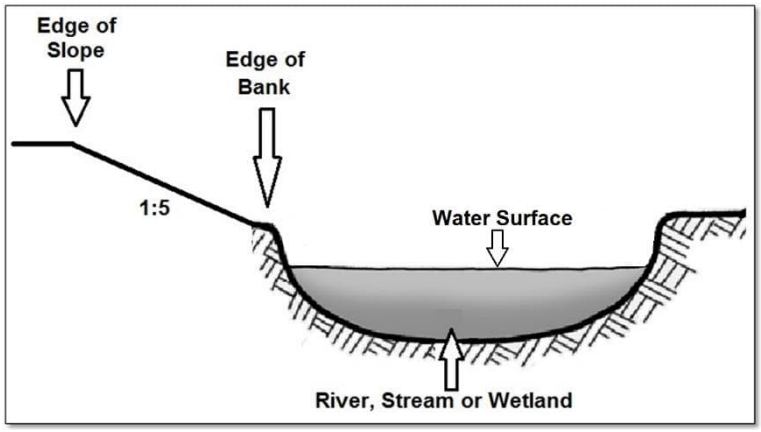
XI. ***Site coverage*** *- The maximum site coverage of nett site area by buildings shall be:*

- *55% for lots that have a nett site area less than 500m2; and*
- *45% for lots that have 500m^2 or greater.*

Note: *The definition of "**nett site area"** is the area of a lot less any area of that lot that is solely for the purpose of providing access to the site and for clarity also excludes:*

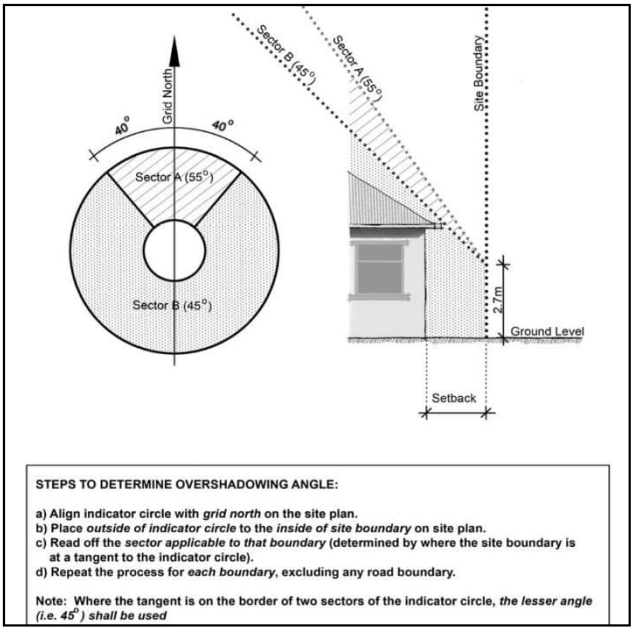
a. *An entrance strip owned in common with the owners of other lots;*
b. *Any area in a cross-lease, company lease or unit title subdivision that is not covered by an independent dwelling unit, the accessory buildings of that independent dwelling unit, or other area set aside for the exclusive use of the occupants of that independent dwelling unit.*

XII. *All buildings, excluding minor structures and activities, shall be setback a minimum of 10.0m from the edge of a bank of a permanently flowing river or stream, or wetland;*



XIII. *All buildings shall be within an envelope calculated in accordance with the diagram below. For "Sub-dividable Lots" and "Larger Builder's Block's", this envelope can be penetrated by building/s along the internal boundaries of the nominated lot upon further subdivision, provided the written consent of the property owner/s where the penetration occurs is obtained and endorsed on the relevant building plans;*

For Lot 2224 DP 503458, gable end roofs may intrude through the overshadowing envelope by no more than one third of the perpendicular height of the gable end



XIV. *Every independent dwelling unit shall be provided with a minimum of two on site car parking spaces that meet the minimum dimensions of 2.5m wide x 5.4m in length.*

XV. *For lots with frontage to the Boulevard, on site manoeuvring shall be provided in accordance with Rule 4B.2.5 – On Site Manoeuvring.*

XVI. *After a dwelling is constructed, within 12 months of the Code Compliance Certificate (CCC) being issued, the following to be completed: disturbed ground on the property shall be reinstated with either grass, paving or*

decking, 10m^2 of landscaping and at least 1 tree greater than 2m in height shall be planted.

XVII. *Minimum gross floor area for dwelling comprising two or more bedrooms to be 90.0m^2;*

XVIII. *All activities, except as specifically referenced above, shall be in accordance with the relevant provisions of the City Plan.*

Advice Notes:

1. *Under section 357A and 327B of the Resource Management Act 1991, you have the right of objection to the consent authority in respect of the above decision of any additional fees and charges required of this section. In accordance with section 357C notice of any such objection must be in writing to the Council within 15 working days of receiving this decision and/or the date of which the invoice is received. Any notice given under section 357C 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.*

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.

PALM SPRINGS
RESIDENTIAL SUBDIVISION

STAGE 12

The Boulevard (part), Forstera Way (part), Sarcodia Place, Papamoa

GEOTECHNICAL COMPLETION REPORT INCLUDING

RECOMMENDATIONS FOR BUILDING

Our Ref: 20464-12

2 November 2016

Prepared for Palm Springs Ltd

S&L CONSULTANTS LTD - SURVEYORS - ENGINEERS - PLANNERS
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1.0 *Subdivision Development Earthworks*

1.1 Introduction

Stage 12 comprises forty two residential lots numbered 155 to 174, 195 to 200, and 207 to 217, 24 comprehensive development lots numbered 2191 to 2196, 2201 to 2206, 2211 to 2214 and 2221 to 2226 as shown on DP 503458 and two large subdivisible lots 201 and 218 as shown on DP 496563.

These lots have been formed following bulk earthworks which have levelled and re-contoured the relic sand dune formations present within the Palm Springs Wairakei Development by Palm Springs Ltd.

The construction of an extension of The Boulevard, the first section of Forstera Way and the local road of Sarcodia Place were included in the development of this stage.

This report summarises the observations and testing undertaken during the development of Stage 12, discusses the suitability of the ground for the support of buildings that may be constructed and contains recommendations for the disposal of stormwater runoff generated on individual sites. Stormwater disposal will be mostly undertaken on the individual lots by ground soakage. The smaller comprehensive development lots are provided with stormwater reticulation.

Included in Appendix I of this report are

- parts of deposited plans DP 496563 and DP 503458 which show the relevant lot sizes and locations in Stage 12
- reference plan 20464-AB48 which shows the extent of the earthworks undertaken, depths of cut and filling, test positions in the areas of cut and filling and road and lot locations.

1.2 Earthworks in the Subdivision

The earthworks for this stage of the subdivision were undertaken from February to May 2016.

These earthworks comprised

- the removal to a stockpile of surface topsoil from areas of cut and fill
- the lowering of ground levels in cut along the lines of The Boulevard and parts of Fostera Way and Sarcodia Place. Depths of cut were up to 2.0 m but mostly in the range of 0 to 1.0m
- the lowering of original ground levels within lots 155 to 160, 164 to 167, 174 to 176, 208 to 217, part of large lot 201, and comprehensive development lots 2195, 2196, 2201, 2204 to 2206, 2211 to 2214 and 2221 to 2226. Depths of cut were generally up to 1.5 m but deeper cuts up to 3.0 m took place on lots 166, 167, 175 and 176.
- the placement of the sands taken from areas of cut as filling over the remainder of the Stage 12 area to depths of up to 2.0 m

- the formation of an extension of the stormwater mitigation reserves in cut that will be vested in the Council at a later time. These reserve areas were formed as an extension of the reserve in stage 8, in a southerly direction towards The Boulevard and an extension of the reserve formed for Stage 11, in a northerly direction, also towards the Boulevard. A four cell precast concrete culvert was constructed under The Boulevard to connect the two reserves to allow any flows to take place towards the Wairakei Stream to the north. The earthworks have created decorative ponds within these reserves with mowable slopes.
- The replacement of topsoil to surfaces within the lots and on the road berms and the grassing of these surfaces. Topsoil depths on the lots and the berms were generally re-established to be around 200 mm. No guarantee is implied or given that the topsoil on any part of any lot is actually 200 mm deep or less and it is recommended that future owners or builders check topsoil depths when preparing site development plans and cost schedules or planning site redevelopment earthworks.

Most of the lots in stage 12 have been constructed to ensure that overland flow paths for surface water runoff are towards the road boundaries and pavements. For the lots along the western and northern sides of Forstera Way, the ground on these lots has been shaped so that slopes fall to the adjacent reserve.

The depths of cut and filling placed are shown on 20464-AB48. With the removal of topsoil and any disturbed soils that may have been encountered, the actual depths of cut or filling on some lots may vary slightly from those shown on this drawing.

The soils encountered during the formation of the lots and road subgrades were a mixture of uniform and graded beach sands, typical of soils in the Papamoa coastal strip.

Testing was undertaken in both the areas of filling and in the areas of cut with a Scala penetrometer for Fulton Hogan Ltd, by representatives of their Tauranga based soils laboratory.

Testing was also undertaken by S & L Consultants for the suitability of the sand based soils for the on site disposal of stormwater by ground soakage to service future houses

All of the building platforms in the Stage 12 area are above RL 5.1 m in terms of Moturiki datum to meet the requirement of Condition 11 of Subdivision Resource Consent RC 24767-0123979 issued by the Tauranga City Council and dated July 2016. The actual levels of the building platforms are described in Section 1.6 of this report.

1.3 Earthworks Standards

The earthworks in filling were undertaken using insitu sands gained from areas of cut. 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." With such compliance NZS 3604 may therefore be adopted for the detailing of residential buildings within the subdivision, not withstanding foundation requirements in 1.6.3 below.

For testing of the filling, the Scala penetrometer had been calibrated from trial compaction tests undertaken prior to the earthworks commencing. 4 blows per 100 mm of penetration were determined as the monitoring standard to achieve the minimum compaction standard of 95% of maximum dry density as specified in the Infrastructure Development Code (IDC).

At all test sites, the test results in the upper 200 mm were discounted as the required compaction could not generally be achieved because of the sands drying and moving under the compaction equipment. Any looser surface sands will be recompacted as part of the site preparation for building foundations which are likely to comprise surface raft type structures (refer to section 1.6.3 on page 8 of this report). A compacted levelling screed is required for the construction of this foundation type.

Testing was also undertaken in the areas of cut with a Scala penetrometer after the earthworks had been completed.

1.4 Filled Ground

During the placement of the filling that took place on the lots, the subcontractor, McPherson Earthmovers Ltd, was observed by S & L Consultants Ltd to strip and remove all topsoil to stockpiles for reuse. Filling was then observed to be placed in discrete layers with the compactive effort mostly applied through systematic movements with the loaded motorscraper earthmoving equipment over the filled areas, along with a large vibrating drum roller.

Fulton Hogan Ltd, on behalf of the head contractor, HEB Construction Ltd, undertook Scala penetrometer testing throughout the contract works to verify that the filling had been placed with adequate compaction to the contract specifications. Fulton Hogan undertook tests on each lot that was filled. The test positions were determined by S & L Consultants.

These tests results are attached and were reviewed by S & L Consultants for compliance at project site meetings.

Thee test positions are shown on drawing 20464-AB48. The test results provided by the contractor's appointed soils laboratory confirmed that the construction filling standards had been achieved. These test results are in Appendix III. Each test is noted by the lot number on which the test was undertaken.

For the specific design of foundations, an ultimate bearing capacity in the limit state of 300 kPa may be taken by the designer for all lots formed by filling.

1.5 Areas of Cut

Areas developed on lots or parts of lots in cut are shown on 20464-AB48. In all areas of cut, the ground at formation levels was observed to comprise the same sands that had been used for filling elsewhere and as identified by pre subdivision tests. Before the placement of the surface topsoil, the sand surfaces in the cut areas were rolled with at least four passes of the compaction equipment used to densify the surface sands in the filling elsewhere.

Fulton Hogan Ltd, on behalf of the head contractor, HEB Construction Ltd, also undertook Scala penetrometer testing to verify that the areas of cut. The test positions were also

determined by S & L Consultants and the test results are contained in Appendix III. Each test is noted by the lot number on which the test was undertaken.

Based on the test results in the cut areas, good ground, in terms of NZS 3604, was also confirmed as being present and would be expected on building sites. For the specific design of foundations, an ultimate bearing capacity in the limit state of 300 kPa may be taken by the designer.

1.6 Land Hazards

1.6.1 Land Stability

There are no **land form stability** issues within Stage 12 of the Palm Springs Subdivision

The exception is within large lot 201. Along the eastern boundary of lot 201 the finished ground levels in fill are above the ground levels in the properties to the east that front Hebe Close and Kokihi Crescent by up to 1.0 m in height. The finished filled batters have been formed at 40 degrees and the batter surfaces have been covered with reinforced coconut fibre matting and grass for the prevention of erosion. Surfaces above these batters have been shaped so that no surface water runoff can flow over the batter faces. For the future development of lot 201 it is recommended that buildings are not located closer than 2.0 m from the crests of these batters. Any encroachment over this set back distance may require piled foundations to be set below the lower property levels or the erection of a retaining wall to stabilise the batter faces. Maintenance of the batter surfaces will require the grass cover to be cut regularly and for the grass density to be maintained. In the design of the development of lot 201, surface water should be prevented from shedding over the batter faces.

Above the water surface in the reserve to the west of stage, 12 slopes have been formed at 1 in 5 (11 degrees). Buildings on lots 155 to 166 will be set back from the western boundaries of these lots by yard clearances. The stability of these slopes is such that buildings located adjacent to them are unlikely to be subject to the future natural hazard of slippage as described in the latest edition of The Building Act 2004.

1.6.2 Flooding

For the **prevention of a flooding hazard,** lot levels have been constructed to be above potential flooding levels which may occur in the lower sections of the roads. In the resource consent, one of the requirements for this geotechnical completion report is that "the minimum finished floor level required for each lot is to be advised to avoid the effects of inundation and/or local flooding."

In terms of section DS-5.4.5 of the IDC, building floor levels are to be determined by clearances above ponding levels in roads during storm events in excess of 10% AEP with the "top water level" being defined as the level of ponding on the road.

On Stage 12, the runoff not captured by the reticulation in Forstera Way and Sarcodia Place will flow down the roads and ponding may occur to minor depths around the catchpits in Forstera Way adjacent to lots 160 and 161. If top water levels at these catchpits rise to RL 4.68 m at the kerbline, overland flow will take place down the concrete walkway between

lots 160 and 161 and into the stormwater reserve to the west of stage 12. Finished ground levels have been confirmed by survey to be RL 5.20 m on lot 160 and RL 5.2 m on lot 161. The finished ground levels on lots 170 and 171 on the eastern side of the road opposite the overland flow path are RL 5.5 m. The IDC requires a freeboard of at least 500 mm above the top water level to the underside of a floor slab (minimum RL 5.18 m). There is therefore no flooding hazard on these lots provided that existing ground levels are not reduced below RL 5.18 m.

Additional runoff on the Boulevard will pond within the central swale on the road. The top water level that may develop before overland flows take place into the drainage reserves at the culverts on The Boulevard is RL 4.5 m. The ground levels on adjacent lots 155, 174, 2216, 2221, and 2226 are above RL 5.1 m and therefore will be above the 500 mm of freeboard required by the IDC.

Acceptable solution E1/AS1 of Compliance Document for New Zealand Building Code, E1 "Surface Water," is also relevant. This publication recommends that "for sites level with or above the road crown, suspended floors or slabs on the ground shall be no less than 150 mm above the road crown." On the frontages to the lots in Stage 12, the water levels on the roads are not expected to be above kerb levels. Building floor levels in terms of E1/AS1 are to be at least 150 mm above the kerb levels and this clearance has been established on all lots.

1.6.3 Liquefaction Potential

The **hazard of liquefaction potential** for Stage 12 has been assessed. Data from CPT tests were used in the analyses. The CPTs in close proximity or within Stage 12 are 27 to 29 inclusive which were undertaken in September 2014 and 30 to 32 which were undertaken in March 2016. These test positions are shown on 20076-AB48.

These assessments were based on

(a) The publication "Earthquake Geotechnical Engineering Practice"– Module 1, "Overview of the Guidelines" dated March 2016 and Module 3 "Identification, Assessment and Mitigation of Liquefaction Hazards" dated May 2016, both by the New Zealand Geotechnical Society and the Ministry of Business, Innovation and Employment.
(b) The soils present being considered as subsoil class D in terms of NZS 1170.5.2004. "Structural Design Actions Part 5."
(c) Seismic events for the ultimate limit state (ULS) (1 in 500 year event) and the serviceability limit state (SLS) (1 in 25 year event) being considered in accordance with NZS 1170.5:2004 Peak ground accelerations were derived for both seismic events to be 0.27g in the ULS and 0.06g in the SLS based on buildings having an importance category of 2.
(c) A seismic magnitude of 6.0 to the Richter Scale as shown in Figure A.5 of Module 1.
(d) Analyses undertaken by software CLiq by Geologismiki

Liquefaction may occur below groundwater levels. The groundwater levels in the boreholes adjacent to the CPT test positions have been modified to suit the depths below finished ground levels in some instances.

The results of the analyses are contained in Appendix V and are summarised on the table below

CPT Position	Date Tested	Depth Analysed To Refusal (m)	Potential Liquefaction Level (m)	Vertical Settlement ULS (mm)	Vertical Settlement SLS (mm)	Lateral Spread ULS (mm)
27	4.9.14	16.9	3(gwl)- 4.5, below 15.5	50	Less than 1	200
28	4.9.14	7.3	6.0 – 7.2	80	Not determined	120
29	4.9.14	13.5	35(gwl)- 4.0, 5.5-6.5	92	Not determined	500
30	23.3.16	7.0	3.8 – 5.4	25	Not determined	0
31	22.3.16	7.0	None	6	None	45
32	22.3.16	13.1	2(gwl)- 3.0, 7.5, 8.7, 10.7	50	Not determined	0

In the SLS, the only data analysed was for test positions 27 being the deepest CPT and where the maximum vertical settlements was derived. At this position, no significant liquefaction is likely to occur and no discernible ground settlements are considered likely.

These results show that

(i) CPT cone resistances varied at each test position. At all test positions the tests were terminated before the target depth of 20 m when the soil densities resisted the penetration of the probe.

(ii) The subsoils comprise mostly sands or silty sands.

(iii) The computed liquefaction potential index (LPI) indicates that the risk of liquefaction is low at all test positions. At test position 31 no liquefaction is considered likely even in the ultimate limit state

(iv) The effects of cyclic seismic loadings are that cohesionless (sand based) soils can be re sorted as groundwater is released and drainage and consolidation of the soils take place. The software has estimated cumulative vertical settlements based on the liquefaction effects at each level.

The effects of liquefaction immediately below the groundwater levels and in the lower strata in the ULS would be suppressed due to the presence of the surface raft of sands which will be present naturally or as placed as part of the subdivision earthworks. Ishihara (1985) indicated that in layered deposits, a liquefied layer below a non-liquefied layer is unlikely to contribute to settlements at the ground surface provided that that the liquefiable layer is less thick than the upper non liquefied layer, such as would be present at the ground surfaces within Stage 12.

In the SLS, no subsurface liquefaction is likely to occur and no discernible vertical ground settlements are considered likely.

CPT 27, 28 and 29 were located close to the stormwater swale to the west and the Wairakei Stream to the north of Stage 12. The presence of the 1 in 5 batters into the reserve and stream were input into the liquefaction assessment software from which lateral spread

distances of up to 500 mm in the ULS were derived at CPT 29. Such a displacement will be resisted by the construction of a stiffened raft foundation for buildings as described below.

In the absence of any local or other adopted guidelines for assessing the effects of liquefaction in the Papamoa area, the likely building sites on Stage 12 can be categorized as TC2 in terms of the definitions in the publication "Repairing and Rebuilding Houses Affected by the Canterbury Earthquakes" dated December 2012, current at the time of this report, by the Ministry of Business, Innovation & Employment.

In using the Ministry guidelines for Christchurch in assessing any mitigation measures for liquefaction risk at Papamoa, it is recommended that the guidelines for a TC2 designation be adopted whereby slab on the ground construction can be undertaken in the manner described for **enhanced foundation slabs.** On all sites in Stage 12, the ultimate bearing capacity is in excess of 200 kPa (the minimum value specified in Christchurch) and therefore MBIE guidelines, 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 need for the flooring system to span specified distances. The use of such a tied slab system will be more resistant to any effects of seismically induced differential settlements or lateral movements.

Alternatively, the use of a **timber framed subfloor on shallow piles,** in accordance with NZS 3910:2011 can be adopted as described for Types A and B for TC2 applications in the MBIE guidelines

1.7 Building Foundations

The observations undertaken during the subdivision earthworks and the results of subsequent testing have determined that the ground on Stage 12 is suitable for the support of low rise buildings on good ground as defined in NZS 3604:2011 (an ultimate bearing capacity in the limit state of 300 kPa), notwithstanding that foundations would be detailed in accordance with 1.6.3 above. As such, this same bearing capacity may be used for any specific design of building foundations by chartered professional engineers. Loads would be factored in accordance with NZS 1170.0:2002 and the ultimate bearing capacity would be modified by a capacity reduction factor of 0.5 for gravity loads and 0.8 for seismic loads.

In the development of building sites the surface sands may be found to be loose immediately below the topsoil layer. Ground preparation for buildings with raft foundations should include the recompaction of any loose surficial sands.

2.0 Disposal of Stormwater

2.1 Introduction

For the residential lots in Stage 12 the soils present on the subdivision are generally considered suitable for the disposal of stormwater generated on the lots by ground soakage as is generally adopted in the Papamoa area.

A reticulation system has been installed to capture and remove surface water runoff from the roads through Stage 12, and the runoff from larger lots 201 and 218 as these lots will be further subdivided into smaller lots where housing densities would preclude the installation

of soakpits, and the smaller lots of the comprehensive development blocks, 2191 to 2196, 2201 to 2206, 2211 to 2216, and 2221 to 2226 inclusive.

2.2 Design of the Stormwater Reticulation System

The piped reticulation system, as installed, has been designed for the road reserve catchments and also an allowance for runoff from a 3 m wide strip along the road frontage of each lot from which runoff could discharge to the road berms, as well as discharges from the lots listed in 2.1 above.

Overland flow design for routes shown on the submitted as built drawings is based on a 1% 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. Individual lot owners should ensure that any overland flow from their properties, when the site soakage system is overloaded, should be directed to the roadways and not on to adjacent properties.

2.3 Soakage Testing and Design

Testing of ground soakage rates for the detailing of on site soakage systems on the lots within Stage 12 was undertaken to determine catchment areas that can be serviced by soakpits constructed of perforated concrete cylinders as is standard practice in the Mount Maunganui and Papamoa areas.

For Stage 12, soakage tests were undertaken on the boundaries of lots 167/175 (test 1), 158/159 (test 2), 1198/199 (test 3), 205/206 (test 4), and 214/215 (test 5). The locations of these tests are shown on drawing 20076-AB48. Only test location 3 was located on an area of fill while the remainder were in areas of cut.

The trial soakpits were constructed of two 450 mm deep x 500 mm ID standard soak rings (nom. 600mm diameter) set at a depth of 0.7 m below the finished ground level. Each test soakpit was filled and allowed to empty, then refilled three more times. The soakage rate to empty was remeasured over these periods. Plots of the falling head water level – time relationships are contained in Appendix IV.

The determined soakage rates to be subject to further analysis are

Test Position	Soakage Rate	Subsoils
1	6900 mm/hr	In cut area, cut 2 m deep
2	3800 mm/hr	In cut area, cut 1 m deept
3	1500 mm/h	In filled area 1 m deep
4	3225 mm/h	In cut area, cut 1 m deep
5	3540 mm/h	In cut area 0.5m deep

2.4 Soakage Calculations

The analysis for soakage suitability and the number or size of soakpits required for housing development was based on the requirements of Section 9.0 of Verification Method E1/VM1 of Compliance Document for the New Zealand Building Code Clause E1 of the Ministry of Business, Innovation & Employment.

The calculations in Appendix IV show the method of analysis for a soakage rate of **1500 mm/h.** Contributing catchments for the capacities of soakpits constructed of three vertically stacked perforated concrete soakrings of 500 mm and 800 mm internal diameters were derived, based on:

- A runoff factor of 1.0 applicable to roofs or hardstand areas.
- A storm return period of 10 years (10% AEP).
- Drainage out of the soakrings through the floor and the side wall areas.
- A 60 minute duration storm and a rainfall intensity of 65 mm/h
  A soakage rate of 750 mm/h being the minimum derived test rate of 1500 mm/h reduced by 50% as required in the IDC.

The analysis of the soakage test results in Appendix 3 showed that the runoff from roofs or hardstand areas for a 10% AEP 60 minute duration storm can be disposed of by soakage with

A contributing catchment area of 30 m^2 for 500mm internal diameter soakrings, 3 deep, or
A contributing catchment area of 55 m^2 for 800mm internal diameter soakrings, 3 deep

2.5 Recommendations for Stormwater Disposal On Individual Sites

Two means of the disposal of stormwater runoff on the individual lots within Stage 12 may be undertaken using ground soakage in the sand based soils that are present, namely,

(A) By the use of **soakpits** as has generally been undertaken in the Papamoa area and described in 2.4 above, whereby

(i) The soakpits would be constructed of three vertically stacked perforated rings, unless ground water conditions dictate otherwise. The maximum contributing catchment areas, as listed in 2.4 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 0.4 m from any boundary and the soakpits are not to be spaced closer than 1.5 m centres.

(ii) 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. The drainlayer is to take notice of the actual ground conditions in which the soakpits are to be installed. If hardpans are encountered they are to be broken up or the pit sites are to be subexcavated to the sands below the hardpan.

If ground conditions vary across a property the drainlayer may also connect the pits with a high level pipe so that pits with a slower loss rate may be helped by others that are more efficient.

(iii) Where considered necessary because of identified soakage limitations, the drainlayer may install larger diameter or more frequent or deeper pits as appropriate.

(iv) If the drainlayer installs a system as in (1) above, they 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.

(v) 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.

(vi) 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.

(vii) 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.

(viii) Sumps are to be installed in rear yards where required to prevent surface runoff from flowing into adjacent properties. If these sumps are required they should be installed at the time of the construction of houses and associated soakpits to service those houses.

(B) By the use of **other soakage systems** such as Atlantis or similar 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 may be more significant.

A soakage loss rate of 750 mm per hour, as derived above, would be the basis of the specific design of a suitable alternative system by a professional civil engineer.

3.0 Professional Opinion

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 summaries the information and recommendations in this report.

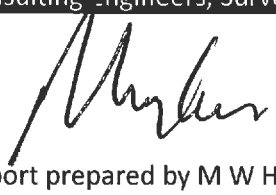
4.0 Applicability

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 12 as shown on DP 496563 and DP 503458 within the Palm Springs 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 Consultants Ltd
Consulting Engineers, Surveyors, Planners



Report prepared by M W Hughes CPEng MIPENZ
Geotechnical Engineer 11 November 2016

APPENDIX I

Reference Drawings: 20464-AB48

DP 496563 (part)

DP 503458 (part)

Key

- Cut - Fill Contours - 1.0m Contour Interval
- CPT and Borehole Test Locations (09/14 - 03/16)
- Scala Penetrometer Tests. (Fulton Hogan) (03/16-09/16)
- Nuclear Densometer Test
- Geotech Soakage Test (S&L) (10/16)

CAD BY	REV No.	DESCRIPTION	DATE
	1	Issued for 224 Cert.	11/16

	NAME	DATE	SIGNED
Surveyed	ACH	06/16	
Designed			
Drawn	NP	10/16	
Checked	DH	11/16	
Approved			

References

Coordinates are in terms with Geodetic BOP 2000.

Heights are in terms with Moturiki Datum. Origin: TCC BM830 RL 4.37 IP 24767

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

Title

Palm Springs

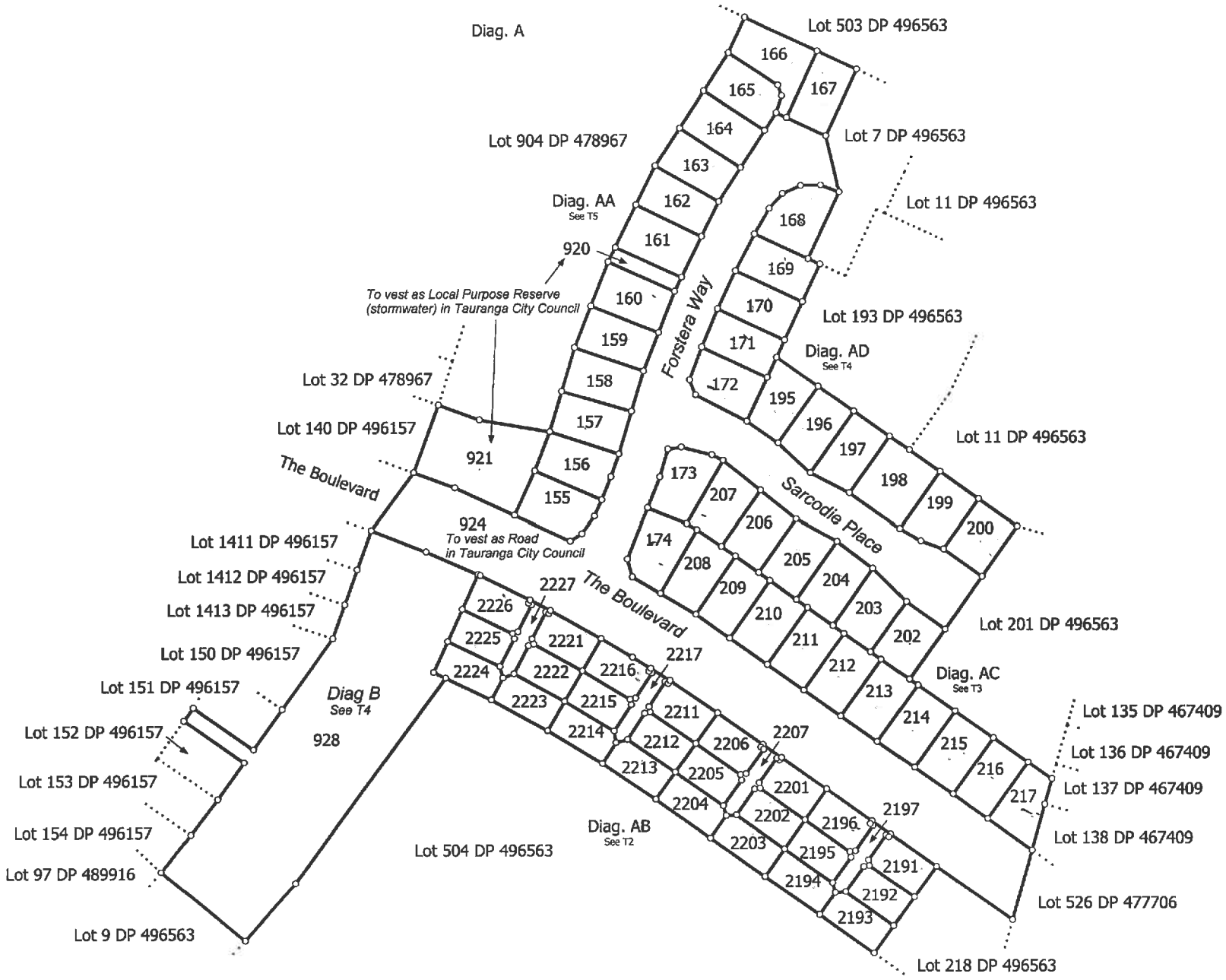
Stage 12

Geotechnical Reference Plan

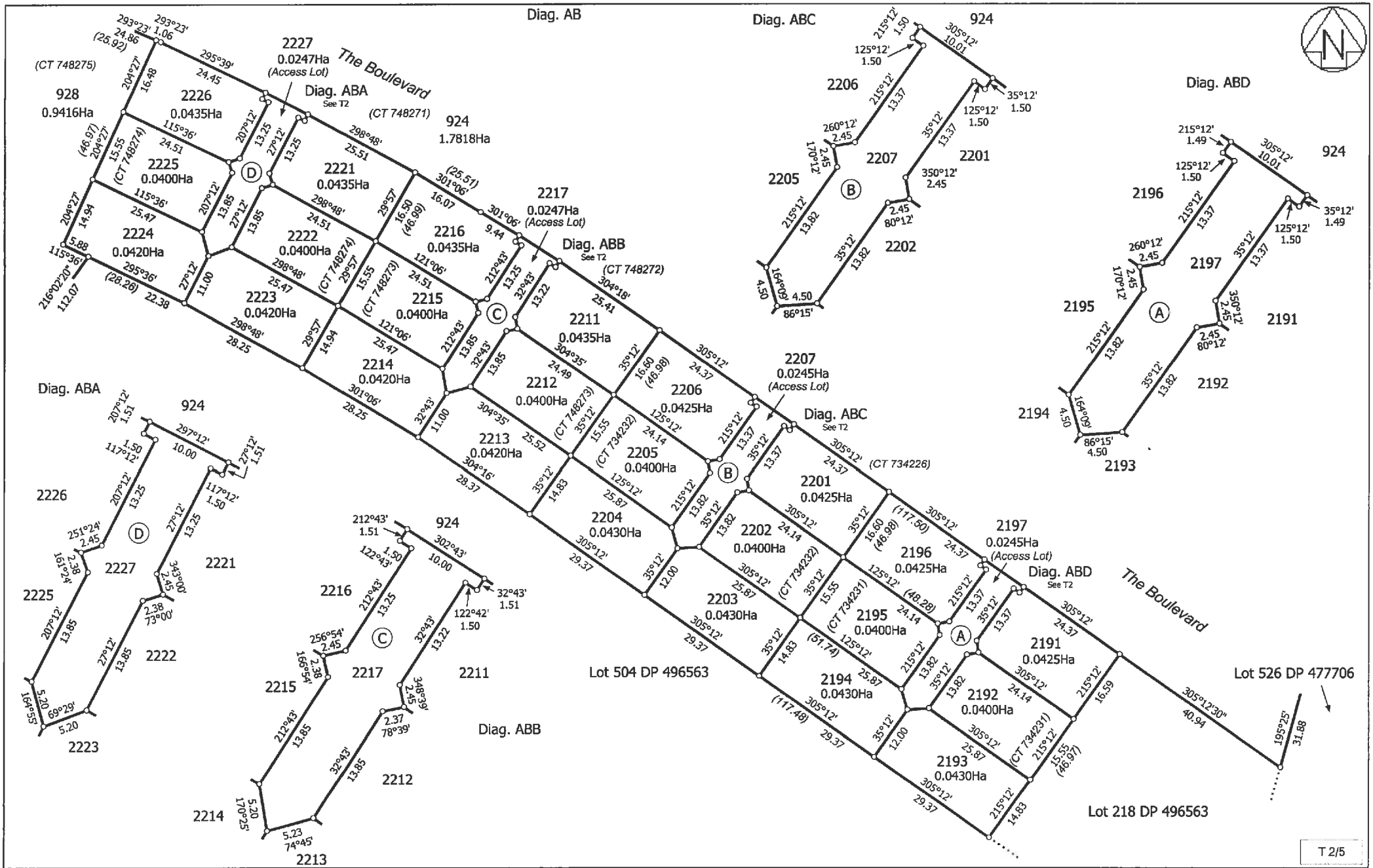
Copyright on this drawing is reserved

Original Scales @ A3	Date
1:1250	11/16
Do Not Scale Dimensions	
Drawing No	Revision
20464 - AB48	1

H:\20000 - 20599\20400 - 20499\20464 - Hawridge Developments - Papamoa\Drawings\Asbuilts\20464 - AB48 - Stage 12-13 - Geotechnical Reference Plan - Rev 1.dwg - Plotted: 17/11/2016



Land District: South Auckland Digitally Generated Plan Generated on: 27/10/2016 4:21 pm Page 6 of 10	Lots 155-174, 195-200, 202-217, 920, 921, 924, 928, 2191-2197, 2201-2207, 2211-2217, 2221-2227 being subdivision of Lots 12, 13, 219 and 220 DP 496563 and Lots 6, 10, 221, 222 and 928 DP 501179	Surveyor: Denis John McDonald Firm: S & L Consultants Ltd	Title Plan LT 503458 DRAFT



Land District: South Auckland Digitally Generated Plan Generated on: 27/10/2016 4:21pm Page 7 of 10	Lots 155-174, 195-200, 202-217, 920, 921, 924, 928, 2191-2197, 2201-2207, 2211-2217, 2221-2227 being subdivision of Lots 12, 13, 219 and 220 DP 496563 and Lots 6, 10, 221, 222 and 928 DP 501179	Surveyor: Denis John McDonald Firm: S & L Consultants Ltd	Title Plan LT 503458 DRAFT

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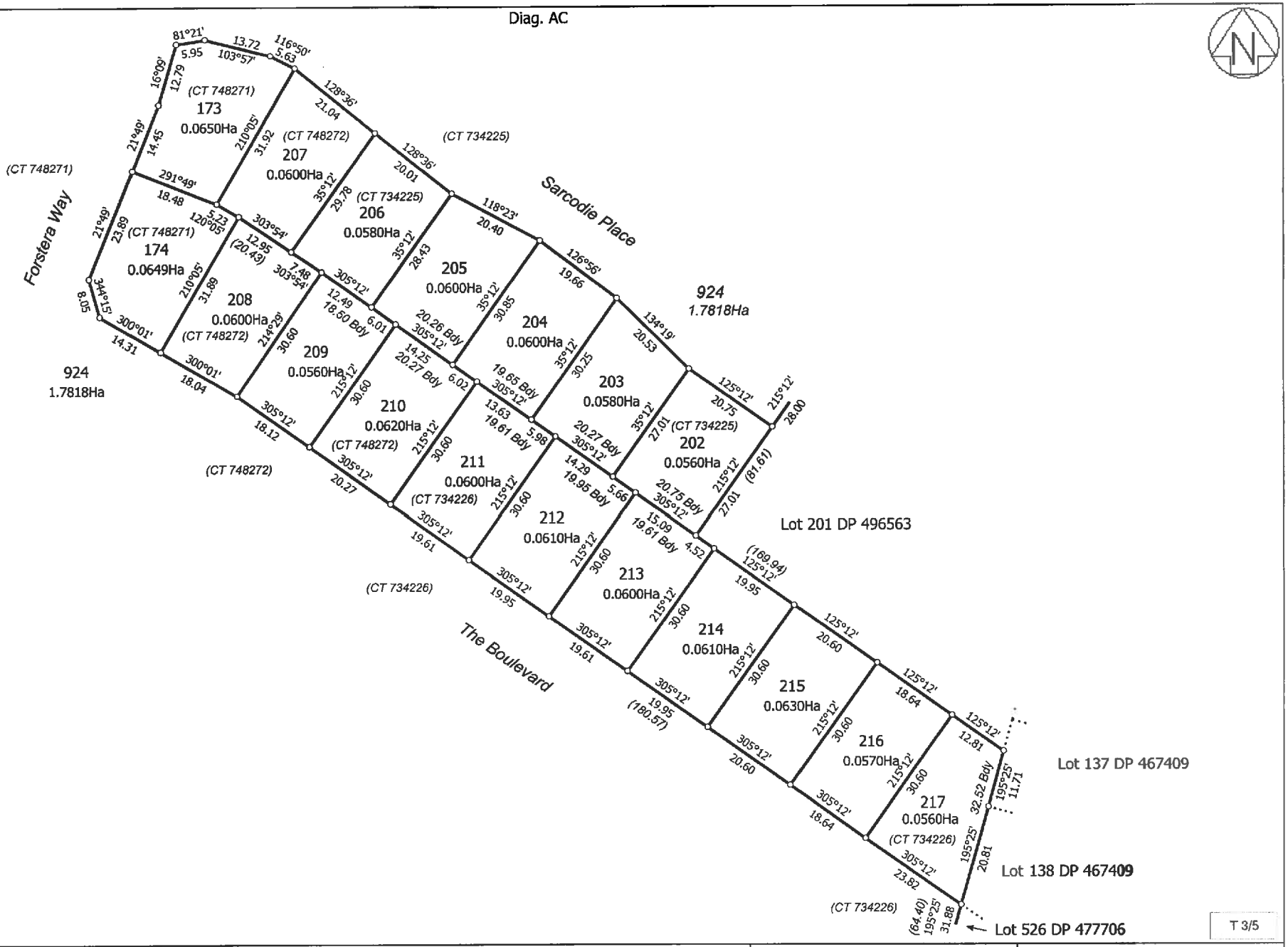
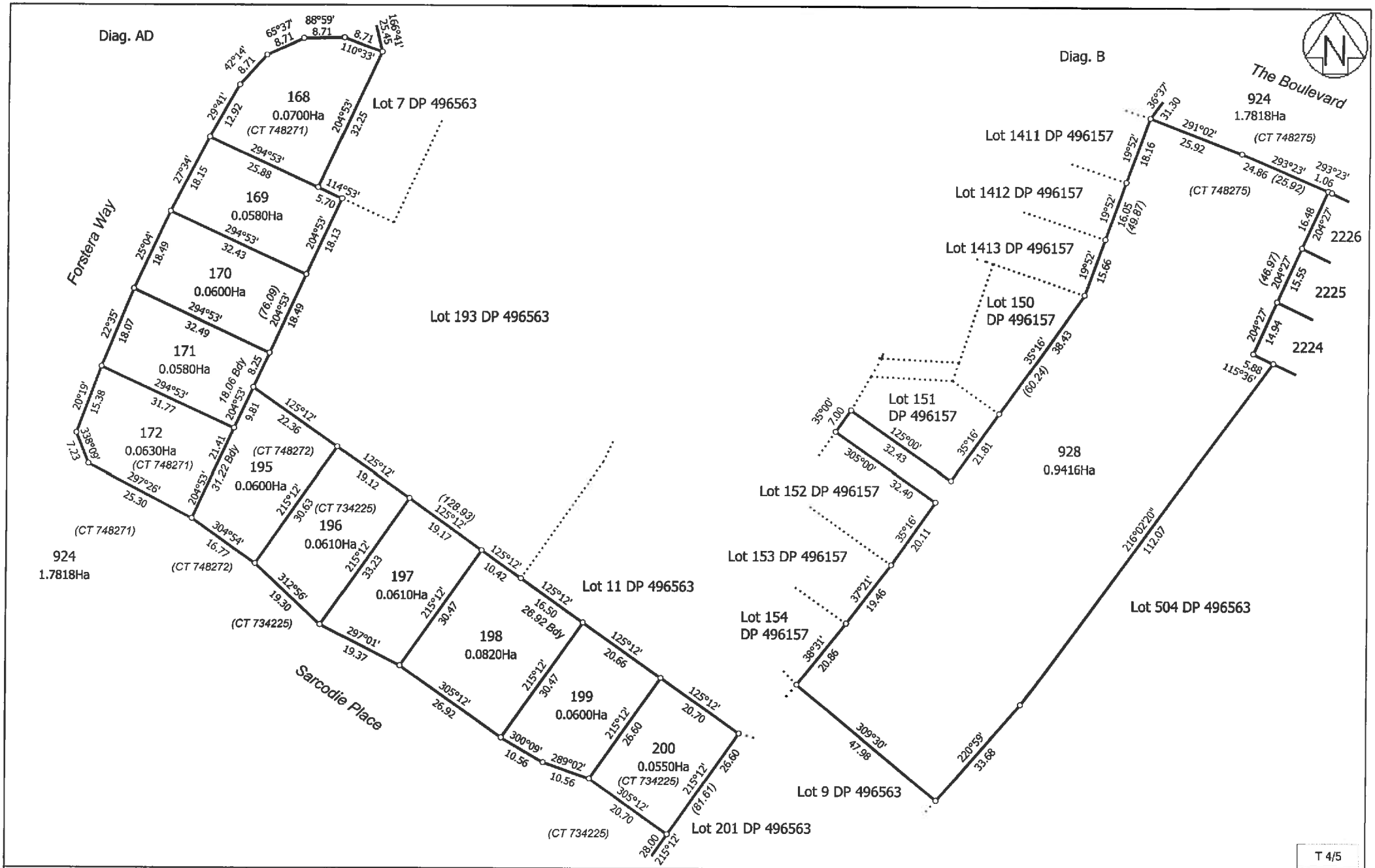


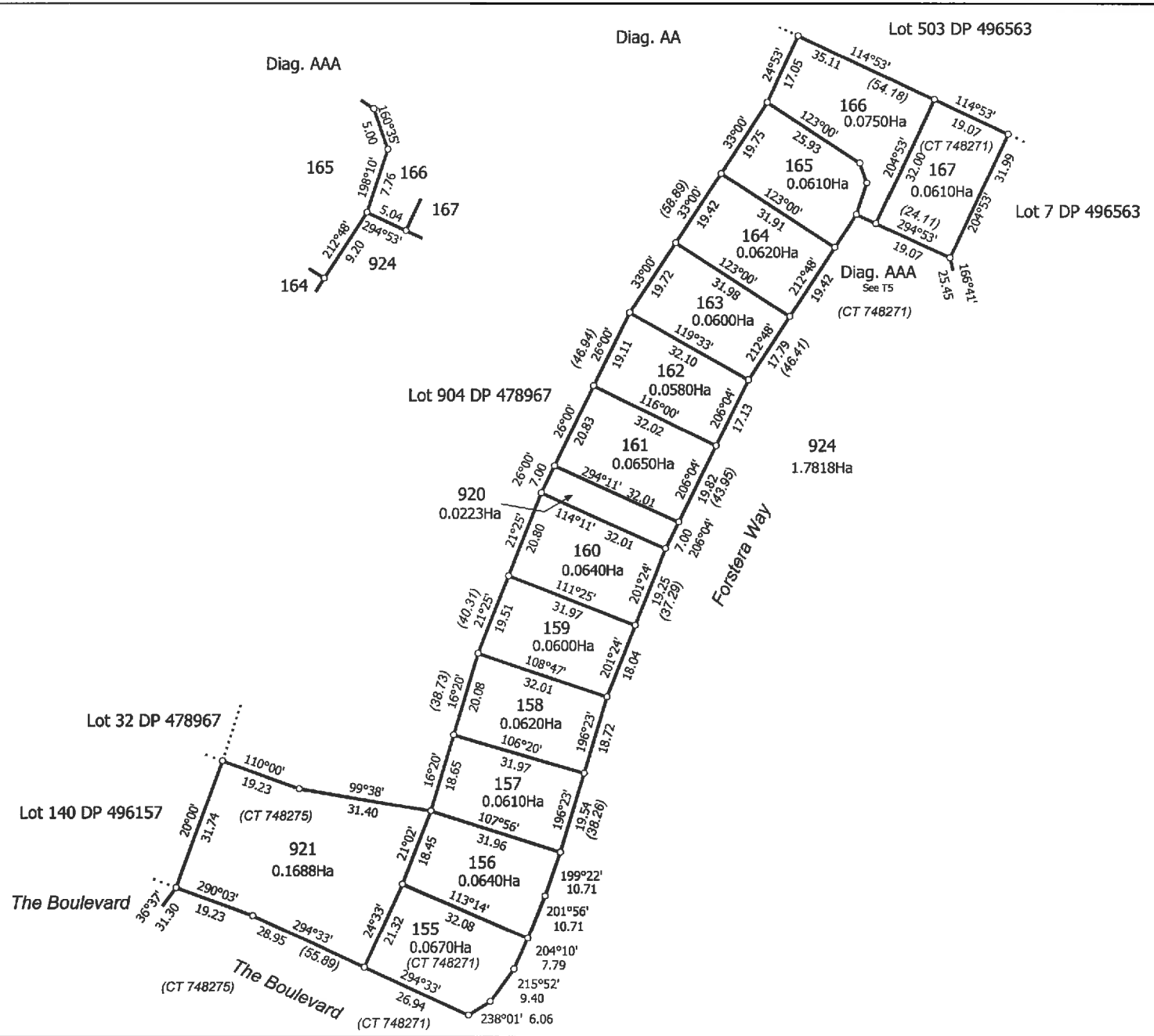
T 3/5

Land District: South Auckland Digitally Generated Plan Generated on: 27/10/2016 4:21 pm Page 8 of 10	Lots 155-174, 195-200, 202-217, 920, 921, 924, 928, 2191-2197, 2201-2207, 2211-2217, 2221-2227 being subdivision of Lots 12, 13, 219 and 220 DP 496563 and Lots 6, 10, 221, 222 and 928 DP 501179	Surveyor: Denis John McDonald Firm: S & L Consultants Ltd	Title Plan LT 503458 DRAFT



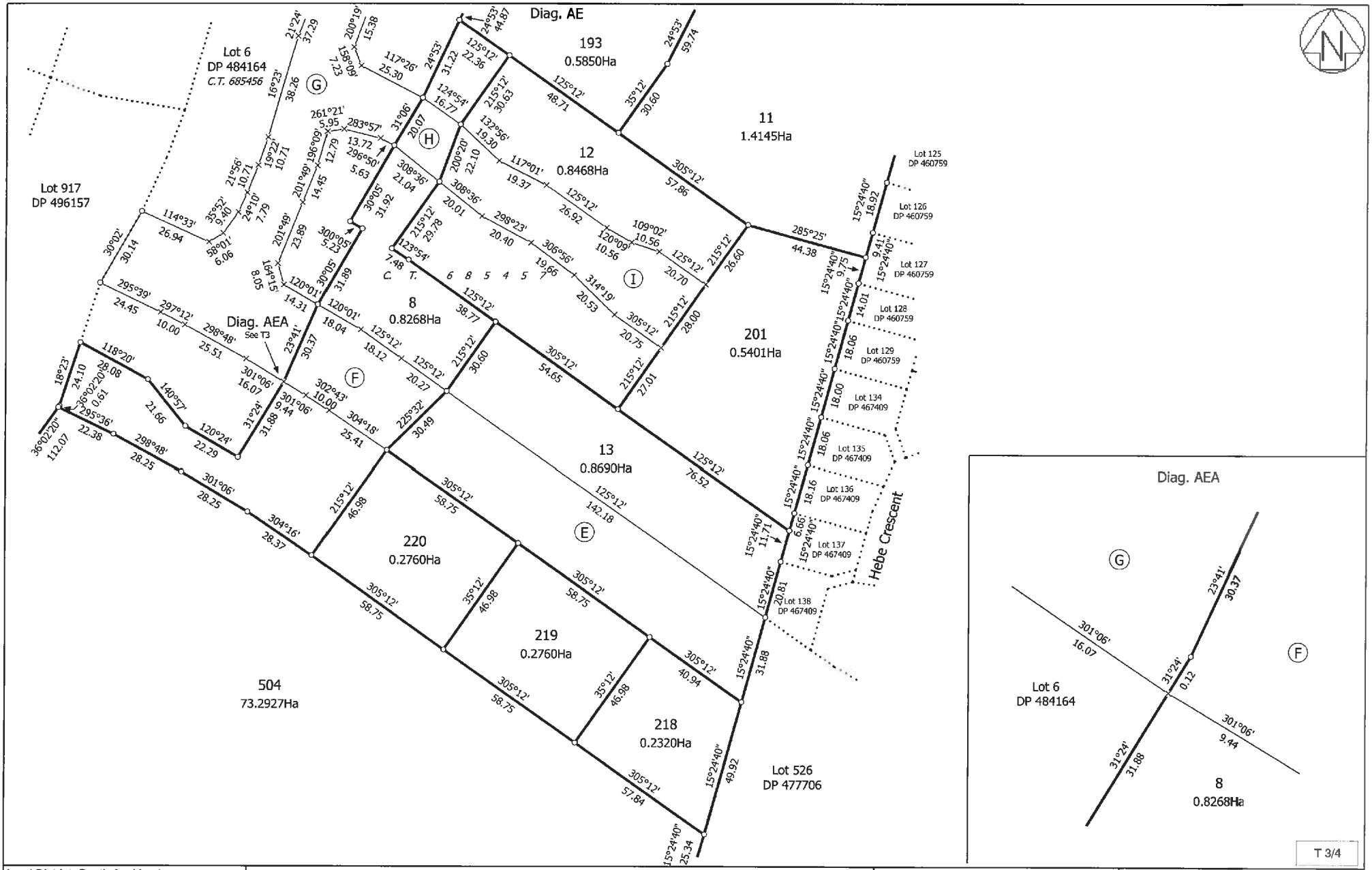
Land District: South Auckland Digitally Generated Plan Generated on: 27/10/2016 4:21pm Page 9 of 10	Lots 155-174, 195-200, 202-217, 920, 921, 924, 928, 2191-2197, 2201-2207, 2211-2217, 2221-2227 being subdivision of Lots 12, 13, 219 and 220 DP 496563 and Lots 6, 10, 221, 222 and 928 DP 501179	Surveyor: Denis John McDonald Firm: S & L Consultants Ltd	Title Plan LT 503458 DRAFT

T 4/5



T 5/5

Land District: South Auckland Digitally Generated Plan Generated on: 27/10/2016 4:21pm Page 10 of 10	Lots 155-174, 195-200, 202-217, 920, 921, 924, 928, 2191-2197, 2201-2207, 2211-2217, 2221-2227 being subdivision of Lots 12, 13, 219 and 220 DP 496563 and Lots 6, 10, 221, 222 and 928 DP 501179	Surveyor: Denis John McDonald Firm: S & L Consultants Ltd	Title Plan LT 503458 DRAFT



Land District: South Auckland Digitally Generated Plan Generated on: 27/08/2016 08:21 am Page 6 of 7	Lots 7-9, 11-13, 182, 193, 201, 218-220 & 503-504 Being a Subdivision of Lot 501 DP 484164 and Easement over Lot 6 DP 484164	Surveyor: Christopher John Roper Firm: S & L Consultants Ltd	Title Plan DP 496563 Deposited on: 17/08/2016

APPENDIX II

Statement of Professional Opinion

Lot Summary Report

To: The Manager: City Development

STATEMENT OF PROFESSIONAL OPINION AS TO THE GEOTECHNICAL SUITABILITY OF LAND FOR BUILDING

DEVELOPMENT: **Palm Springs Sub-division Stage 12**

OWNER: **Palm Springs Ltd**

LOCATION: **The Boulevard, Forstera Way, Sarcodia Place, Papamoa**

I, **Michael William Hughes** of **S & L Consultants Ltd, PO Box 231, Tauranga**

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 my development evaluation dated 11 November 2016

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. 20464-AB48 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 ground is suitable for the erection thereon of residential buildings supported on enhanced foundation slabs as described in Section 1.6.3 of my report or on shallow piles as detailed in NZS 3604:2011.

(d) The original ground in cut that is not affected by filling is suitable for the erection thereon of residential buildings on enhanced foundation slabs as described in the report, or on shallow piles as detailed in NZS 3604:2011.

(e) The ultimate ground bearing capacity for foundation design on all lots is 300 kPa.

4) 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 11 November 2016

SUMMARY OF GEOTECHNICAL DATA/RECOMMENDATIONS FOR INDIVIDUAL LOTS
FROM IDC _ G3 Page 1

Subdivision: Palm Springs Stage 12 TCC Ref: RC 24767, RC 24897, RC 24916

Location: The Boulevard, Forstera Way, Sarcodia Place, Papamoa S&L Ref: 20464-St12

The comments and notations included on this summary sheet are outlined in the support documents
These shall be read in conjunction with this summary.

		Subsurface Data				Cut		Foundations		Building Restriction Line	S/W Specific Design	S/W Soakage	S/W Reticulate	Designated Building Platform	Minimum Building Platform **	Compressible Soils	on-site effluent disposal	consent notice	Recommendations /Restrictions
		Shear Strength *	Subdivision Filling		Natural Topography Unworked	Natural Topography earthworked		Conventional shallow	Specific Design										
Lot No.	Area (m2)	(kPa)	Y/N	Depth (m)	Y/N	Y/N	Depth (m)	Y/N/NA	*** Y/N										
155	670		N		N	Y	0.5 - 2.0	Y	Y	N	N	Y	N	N	Y	N	N	Y	See
156	640		N		N	Y	0.0 - 0.5	Y	Y	N	N	Y	N	N	Y	N	N	Y	Below
157	610		N		N	Y	0.0 - 0.5	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
158	620		N		N	Y	0.0 - 0.5	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
159	600		N		N	Y	0.0 - 0.5	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
160	640		Y	0.0 - 1.0	N	Y	0.0 - 0.5	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
161	650		Y	0.0 - 0.5	Y	Y		Y	Y	N	N	Y	N	N	Y	N	N	Y	"
162	580		Y	0.5 - 1.0	Y	Y		Y	Y	N	N	Y	N	N	Y	N	N	Y	"
163	600		Y	0.0 - 1.0	Y	Y		Y	Y	N	N	Y	N	N	Y	N	N	Y	"
164	620		N		N	Y	0.0 - 0.5	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
165	610		N		N	Y	0.5 - 3.0	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
166	750		N		N	Y	0.5 - 3.5	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
167	610		N		N	Y	0.5 - 4.0	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
168	700		Y	0.0 - 1.0	Y	Y		Y	Y	N	N	Y	N	N	Y	N	N	Y	"
169	580		Y	0.0 - 1.0	Y	Y		Y	Y	N	N	Y	N	N	Y	N	N	Y	"
170	600		Y	0.0 - 1.5	Y	Y		Y	Y	N	N	Y	N	N	Y	N	N	Y	"
171	580		Y	0.5 - 1.5	Y	Y		Y	Y	N	N	Y	N	N	Y	N	N	Y	"
172	630		Y	0.0 - 0.5	N	Y	0.0 - 0.5	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
173	650		Y	0.0 - 0.5	N	Y	0.0 - 0.5	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
174	650		Y	0.0 - 0.5	N	Y	0.0 - 1.0	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
195	600		Y	0.0 - 1.5	N	Y	0.0 - 0.5	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
196	610		Y	0.0 - 1.5	N	Y	0.0 - 0.5	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
197	610		Y	0.0 - 1.5	Y	Y		Y	Y	N	N	Y	N	N	Y	N	N	Y	"
198	820		Y	0.0 - 1.0	Y	Y		Y	Y	N	N	Y	N	N	Y	N	N	Y	"
199	600		Y	0.0 - 1.0	Y	Y		Y	Y	N	N	Y	N	N	Y	N	N	Y	"
200	550		Y	0.0 - 1.0	Y	Y		Y	Y	N	N	Y	N	N	Y	N	N	Y	"
202	560		Y	0.0 - 0.5	N	Y	0.0 - 0.5	Y	Y	N	N	Y	N	N	Y	N	N	Y	"

Tauranga City

SUMMARY OF GEOTECHNICAL DATA FOR INDIVIDUAL LOTS

INFRASTRUCTURE DEVELOPMENT CODE

G3
VERSION

*** not applicable in Palm Springs** **** Refer to Section 1.6.2 in report** ***** Enhanced foundation slabs. Refer to section 1.6.3 in report**

SUMMARY OF GEOTECHNICAL DATA/RECOMMENDATIONS FOR INDIVIDUAL LOTS
FROM IDC _ G3 Page 2
Subdivision: Palm Springs Stage 12 TCC Ref: RC 24767, RC 24897, RC 24916
Location: The Boulevard, Forstera Way, Sarcodia Place, Papamoa S&L Ref: 20464-st12

The comments and notations included on this summary sheet are outlined in the support documents
These shall be read in conjunction with this summary.

		Subsurface Data				Cut		Foundations											
		Shear Strength *	Subdivision Filling		Natural Topography Unworked	Natural Topography earthworked		Conventional shallow	Specific Design	Building Restriction Line	S/W Specific Design	S/W Soakage	S/W Reticulate	Designated Building Platform	Minimum Building Platform **	Compressible Soils	on-site effluent disposal	consent notice	Recommendations /Restrictions
Lot No.	Area (m2)	(kPa)	Y/N	Depth (m)	Y/N	Y/N	Depth (m)	Y/N/NA	*** Y/N										
203	580		Y	0.0 - 1.0	N	Y	0.0- -1.0	Y	Y	N	N	Y	N	N	Y	N	N	Y	See
204	600		Y	0.0 - 0.5	N	Y	0.0 - 1.0	Y	Y	N	N	Y	N	N	Y	N	N	Y	Below
205	600		Y	0.0 - 1.0	N	Y	0.0 - 1.0	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
206	580		Y	0.0 - 1.0	N	Y	0.0 - 1.0	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
207	600		Y	0.0 - 0.5	N	Y	0.0 - 0.5	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
208	600		N		N	Y	0.0 - 1.0	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
209	560		N		N	Y	0.5 - 1.0	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
210	620		N		N	Y	0.0 - 1.0	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
211	600		N		N	Y	0.0 - 1.0	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
212	610		Y	0.0 - 0.5	N	Y	0.0 - 1.0	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
213	600		Y	0.0 - 0.5	N	Y	0.0 - 1.0	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
214	610		Y	0.0 - 0.5	N	Y	0.0 - 1.0	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
215	630		Y	0.0 - 0.5	N	Y	0.0 - 1.0	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
216	570		Y	0.0 - 0.5	N	Y	0.0 - 0.5	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
217	560		N		N	Y	0.0 - 1.5	Y	Y	N	N	Y	N	N	Y	N	N	Y	"
201	5401		Y	0.0 - 1.0	N	Y	0.0 - 0.5	Y	Y	N	N	N	Y	N	Y	N	N	Y	"
218	2320		Y	0.0 - 2.5	Y	N		Y	Y	N	N	N	Y	N	Y	N	N	Y	"

Tauranga City

SUMMARY OF GEOTECHNICAL DATA FOR INDIVIDUAL LOTS

INFRASTRUCTURE DEVELOPMENT CODE

G3
VERSION

*** not applicabl ble in Palm Springs** **** Refer to Section 1.6.2 in report** ***** Enhanced foundation slabs. Refer to section 1.6.3 in report**

SUMMARY OF GEOTECHNICAL DATA/RECOMMENDATIONS FOR INDIVIDUAL LOTS
FROM IDC _ G3 Page 3
Subdivision: Palm Springs Stage 12 TCC Ref: RC 24767, RC 24897, RC 24916
Location: The Boulevard, Forstera Way, Sarcodia Place, Papamoa S&L Ref: 20464-st12

The comments and notations included on this summary sheet are outlined in the support documents
These shall be read in conjunction with this summary.

		Subsurface Data				Cut		Foundations												
		Shear Strength *	Subdivision Filling		Natural Topography Unworked	Natural Topography earthworked		Conventional shallow	Specific Design	Building Restriction Line	S/W Specific Design	S/W Soakage	S/W Reticulate	Designated Building Platform	Minimum Building Platform **	Compressible Soils	on-site effluent disposal	consent notice	Recommendations /Restrictions
Lot No.	Area (m2)	(kPa)	Y/N	Depth (m)	Y/N	Y/N	Depth (m)	Y/N/NA	*** Y/N										
2191	425		Y	0.0 - 0.5	N	Y	0.0 - 0.5	Y	Y	N	N	N	Y	N	Y	N	N	Y	**See**
2192	400		Y	0.0 - 1.0	Y	N		Y	Y	N	N	N	Y	N	Y	N	N	Y	**Below**
2193	430		Y	0.5 - 2.0	Y	N		Y	Y	N	N	N	Y	N	Y	N	N	Y	"
2194	430		Y	0.5 - 2.0	Y	N		Y	Y	N	N	N	Y	N	Y	N	N	Y	"
2195	425		Y	0.0 - 0.5	N	Y	0.0 - 0.5	Y	Y	N	N	N	Y	N	Y	N	N	Y	"
2196	425		N		N	Y	0.0 - 0.5	Y	Y	N	N	N	Y	N	Y	N	N	Y	"
2201	425		N		N	Y	0.0 - 2.0	Y	Y	N	N	N	Y	N	Y	N	N	Y	"
2202	400		Y	0.0 - 0.5	N	Y	0.0 - 0.5	Y	Y	N	N	N	Y	N	Y	N	N	Y	"
2203	430		Y	0.5 - 2.0	Y	N		Y	Y	N	N	N	Y	N	Y	N	N	Y	"
2204	430		Y	0.0 - 0.5	N	Y	0.0 - 0.5	Y	Y	N	N	N	Y	N	Y	N	N	Y	"
2205	400		N		N	Y	0.0 - 1.0	Y	Y	N	N	N	Y	N	Y	N	N	Y	"
2206	425		N		N	Y	1.0 - 2.0	Y	Y	N	N	N	Y	N	Y	N	N	Y	"
2211	435		Y	0.0 - 1.5	N	Y	0.0 - 1.0	Y	Y	N	N	N	Y	N	Y	N	N	Y	"
2212	400		Y	0.0 - 1.0	N	Y	0.0 - 1.0	Y	Y	N	N	N	Y	N	Y	N	N	Y	"
2213	420		N		N	Y	0.0 - 0.5	Y	Y	N	N	N	Y	N	Y	N	N	Y	"
2214	420		N		N	Y	0.5 - 1.5	Y	Y	N	N	N	Y	N	Y	N	N	Y	"
2215	400		N		N	Y	0.5 - 1.5	Y	Y	N	N	N	Y	N	Y	N	N	Y	"
2216	435		Y	0.0 - 1.0	N	Y	0.0 - 0.5	Y	Y	N	N	N	Y	N	Y	N	N	Y	"
2221	435		Y	0.0 - 1.0	N	Y	0.0 - 1.5	Y	Y	N	N	N	Y	N	Y	N	N	Y	"
2222	400		N		N	Y	0.5 - 2.0	Y	Y	N	N	N	Y	N	Y	N	N	Y	"
2223	420		N		N	Y	0.5 - 2.0	Y	Y	N	N	N	Y	N	Y	N	N	Y	"
2224	420		N		N	Y	1.0 - 2.0	Y	Y	N	N	N	Y	N	Y	N	N	Y	"
2225	400		N		N	Y	2.0 - 2.5	Y	Y	N	N	N	Y	N	Y	N	N	Y	"
2226	435		N		N	Y	0.5 - 2.5	Y	Y	N	N	N	Y	N	Y	N	N	Y	"

Tauranga City

SUMMARY OF GEOTECHNICAL DATA FOR INDIVIDUAL LOTS

INFRASTRUCTURE DEVELOPMENT CODE

G3
VERSION

*** not applicable in Palm Springs** **** Refer to Section 1.6.2 in report** ***** Enhanced foundation slabs. Refer to section 1.6.3 in report**

APPENDIX III

Trial compaction test results (Fulton Hogan) 30 March 2016

Scala penetrometer test results in cut and filling (Fulton Hogan)

Bay of Plenty Laboratory

Poplar Lane, Te Puke
Private Bag 12016, Tauranga 3143
Telephone: +64 7 542 9672
Facsimile: +64 7 542 2245
www.fultonhogan.com
0800 LABORATORY

Nuclear Density Report

Report No: ND:BOP16W0206
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The test results reported herein are not accredited. Contact the laboratory for further information. Samples are tested as received unless stated otherwise. This report may only be reproduced in full.

Approved Signatory: Rob Ermens
(Lab Manager)

Date of Issue: 11/03/2016

Testing Details

Site Tested: Stage 12 - Fill Area, NDM-Scala Correlation
Tested By: Barrack Carle
Date Tested: 3/03/2016
Time Tested: 13:00
Material: Insitu Fill Sand
Specification: Contract Specification
Field Methods: NZS 4407:2015 Test 4.3

Compaction Target Details

Material Sample ID: BOP15S-01053
MDD Method:
Max. Dry Density: 1.62 t/m³ @ 22 %
Min. Dry Density (t/m³):
Solid Density Type: Measured

Test Results

Passes	Roller	Moisture (%)	Wet Density (t/m³)	Dry Density (t/m³)	Relative Compaction (%)
0	Low Vibe	7.0	1.53	1.44	88.9
2	Low Vibe	7.0	1.70	1.59	98.1
2	Low Vibe	7.5	1.71	1.59	98.1
4	Static	7.5	1.67	1.56	96.3
4	Static	7.0	1.66	1.55	95.7

Comments

Report not IANZ endorsed due to density measurements being outside of NDM range of calibration.
No moisture contents taken.

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Bay of Plenty Laboratory

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Telephone: +64 7 542 9672
Facsimile: +64 7 542 2245
www.fultonhogan.com
0800 LABORATORY

Report No: PR:BOP16S-00491
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 14/03/2016

Test Details

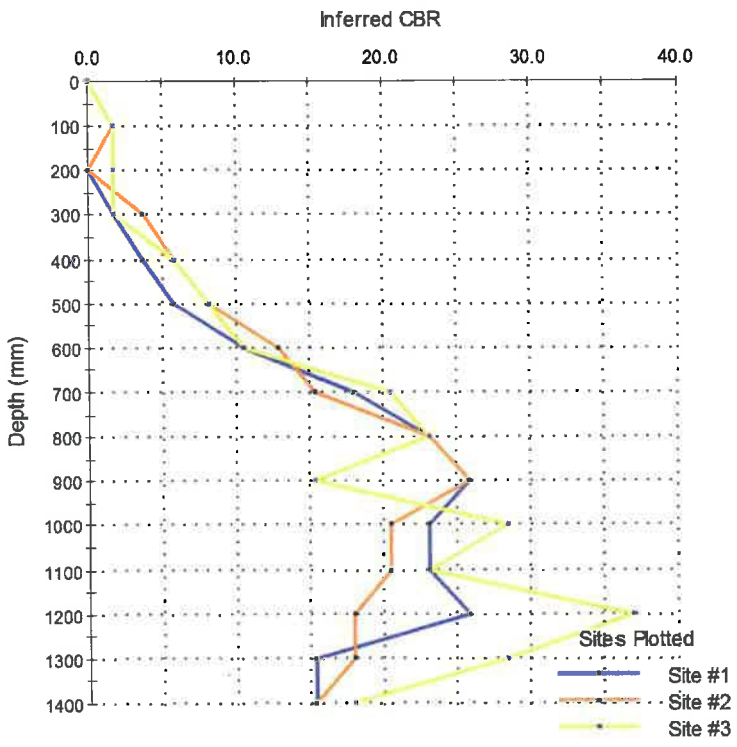
Sample ID: BOP16S-00491
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Stage 12 - Fill Area, NDM-Scala Correlation
Date Tested: 3/03/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-00491
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 14/03/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
1	1	100	1.7
1	0	200	0.0
1	1	300	1.7
1	2	400	3.7
1	3	500	5.8
1	5	600	10.5
1	8	700	18.0
1	10	800	23.2
1	11	900	25.9
1	10	1000	23.2
1	10	1100	23.2
1	11	1200	25.9
1	7	1300	15.4
1	7	1400	15.4
2	1	100	1.7
2	0	200	0.0
2	2	300	3.7
2	3	400	5.8
2	4	500	8.1
2	6	600	12.9
2	7	700	15.4
2	10	800	23.2
2	11	900	25.9
2	9	1000	20.6
2	9	1100	20.6
2	8	1200	18.0
2	8	1300	18.0
2	7	1400	15.4
3	1	100	1.7
3	1	200	1.7
3	1	300	1.7
3	3	400	5.8
3	4	500	8.1
3	5	600	10.5
3	9	700	20.6
3	10	800	23.2
3	7	900	15.4
3	12	1000	28.6
3	10	1100	23.2
3	15	1200	36.9
3	12	1300	28.6

Site	Blows	Depth (mm)	Inferred CBR
3	8	1400	18.0

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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SCALA PENETROMETER TEST RESULTS

(No. of Blows / Sucessive 0.1m Penetration)

Job Number: 20464 S12
Client: Palm Springs Ltd
Location: Palm springs Subdivision Stage 12, lots 155, 156
Tested by: MH
Date: 17 .11.16

_____ indicates base of fill

R = Refusal (>15 blows per 100 mm)

Test Position		lot 155		lot 156										
Depth (m)		**Number Of Blows**												
0.0 - 0.1		1		1										
0.1 - 0.2		2		1										
0.2 - 0.3		4		4										
0.3 - 0.4		5		6										
0.4 - 0.5		8		6										
0.5 - 0.6		7		7										
0.6 - 0.7		6		4										
0.7 - 0.8		7		7										
0.8 - 0.9		8		6										
0.9 - 1.0		7		9										
1.0 - 1.1		4		10										
1.1 - 1.2		4		8										
1.2 - 1.3		4		8										
1.3 - 1.4		5		10										
1.4 - 1.5		7		10										
1.5 - 1.6														

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Penetration Resistance

Report No: PR:BOP16S-01820
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

Approved Signatory: Barrack Carle

IANZ Accreditation No:749
Date of Issue: 22/07/2016

Test Details

Sample ID:	BOP16S-01820	**Location:**	Stage 12
Tested By:	Barrack Carle	**Date Tested:**	20/06/2016
Material:	Insitu Sand Fill	**Specification:**	Contract Specification

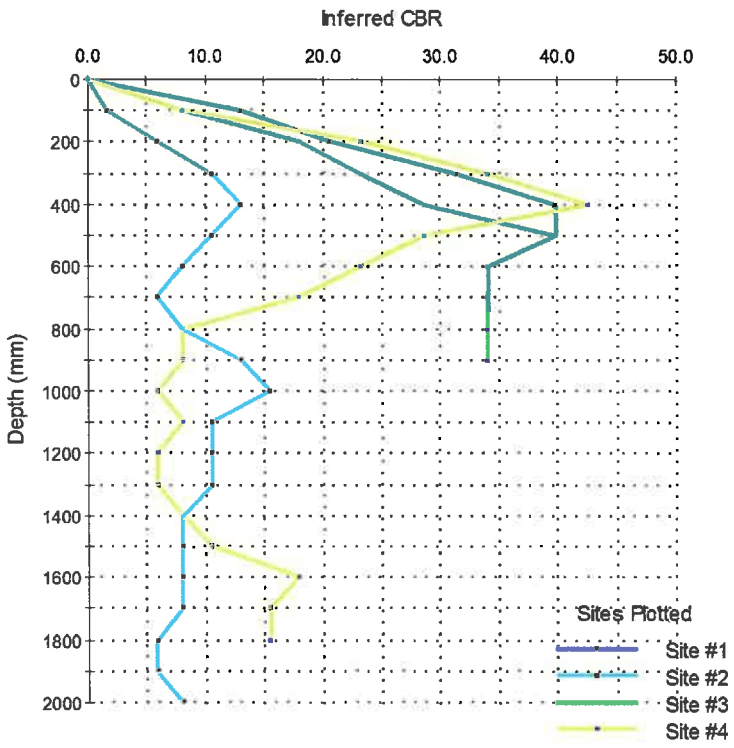
Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm):

Depth at the Commencement (mm):

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

Site 1 = Lot 158, Site 2 = Lot 159, Site 3 = Lot 160, Site 4 = Lot 164.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Results for depths beyond 1.5 metres are not accredited, and are excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-01820
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

Approved Signatory: Barrack Carle

IANZ Accreditation No:749
Date of Issue: 22/07/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
1	6	100	12.9
1	9	200	20.6
1	13	300	31.3
1	16	400	39.8
1	16	500	39.8
2	1	100	1.7
2	3	200	5.8
2	5	300	10.5
2	6	400	12.9
2	5	500	10.5
2	4	600	8.1
2	3	700	5.8
2	4	800	8.1
2	6	900	12.9
2	7	1000	15.4
2	5	1100	10.5
2	5	1200	10.5
2	5	1300	10.5
2	4	1400	8.1
2	4	1500	8.1
2	4	1600	8.1
2	4	1700	8.1
2	3	1800	5.8
2	3	1900	5.8
2	4	2000	8.1
3	4	100	8.1
3	8	200	18.0
3	10	300	23.2
3	12	400	28.6
3	16	500	39.8
3	14	600	34.1
3	14	700	34.1
3	14	800	34.1
3	14	900	34.1
4	4	100	8.1
4	10	200	23.2
4	14	300	34.1
4	17	400	42.6
4	12	500	28.6
4	10	600	23.2
4	8	700	18.0
4	4	800	8.1
4	4	900	8.1
4	3	1000	5.8
4	4	1100	8.1
4	3	1200	5.8
4	3	1300	5.8
4	4	1400	8.1
4	5	1500	10.5
4	8	1600	18.0
4	7	1700	15.4
4	7	1800	15.4

Comments

Site 1 = Lot 158, Site 2 = Lot 159, Site 3 = Lot 160, Site 4 = Lot 164.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Results for depths beyond 1.5 metres are not accredited, and are excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-00744
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 18/04/2016

Test Details

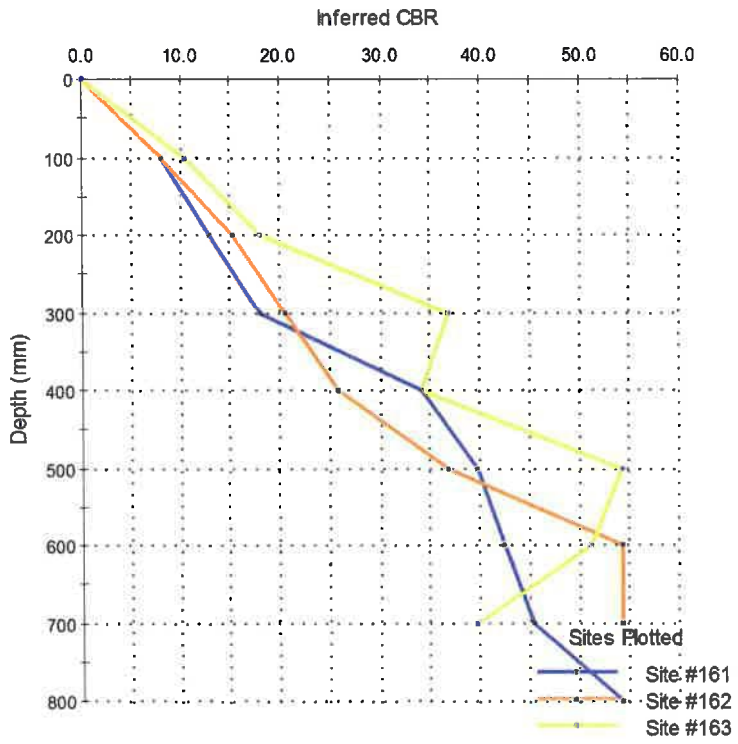
Sample ID:	BOP16S-00744	**Location:**	Stage 12 - Lots 161-163
Tested By:	Barrack Carle	**Date Tested:**	30/03/2016
Material:	Insitu Sand Fill	**Specification:**	Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0 **Depth at the Commencement (mm):** 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-00744
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 18/04/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
161	4	100	8.1
161	6	200	12.9
161	8	300	18.0
161	14	400	34.1
161	16	500	39.8
161	17	600	42.6
161	18	700	45.5
161	21	800	54.3
162	4	100	8.1
162	7	200	15.4
162	9	300	20.6
162	11	400	25.9
162	15	500	36.9
162	21	600	54.3
162	21	700	54.3
163	5	100	10.5
163	8	200	18.0
163	15	300	36.9
163	14	400	34.1
163	21	500	54.3
163	20	600	51.3
163	16	700	39.8

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-01821
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Barrack Carle

IANZ Accreditation No:749
Date of Issue: 22/07/2016

Test Details

Sample ID:	BOP16S-01821	**Location:**	Stage 12
Tested By:	Barrack Carle	**Date Tested:**	20/06/2016
Material:	Insitu Sand Fill	**Specification:**	Contract Specification

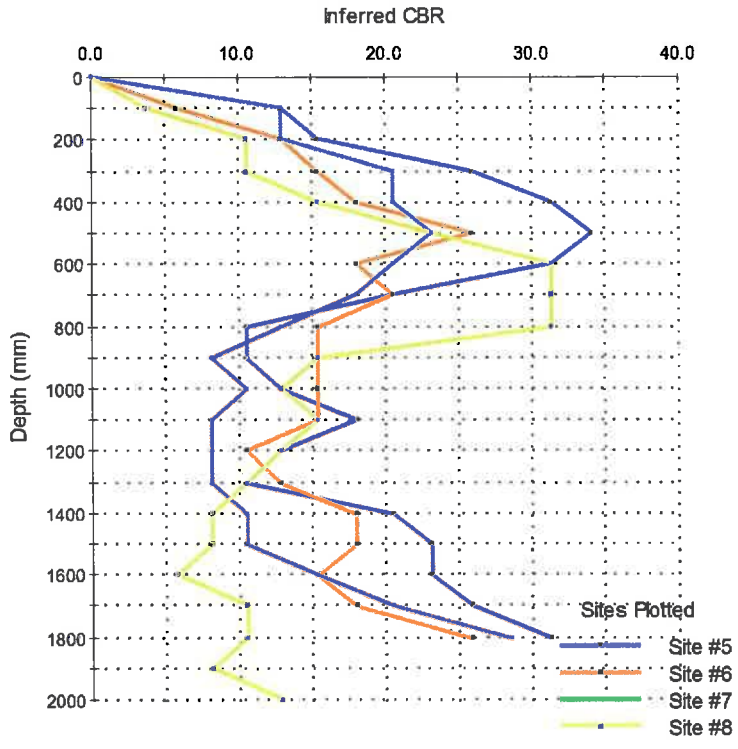
Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm):

Depth at the Commencement (mm):

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

Site 5 = Lot 165, Site 6 = Lot 166, Site 7 = Lot 167, Site 8 = Lot 172.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Results for depths beyond 1.5 metres are not accredited, and are excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-01821
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Barrack Carle

IANZ Accreditation No:749
Date of Issue: 22/07/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
5	6	100	12.9
5	7	200	15.4
5	11	300	25.9
5	13	400	31.3
5	14	500	34.1
5	13	600	31.3
5	9	700	20.6
5	5	800	10.5
5	5	900	10.5
5	6	1000	12.9
5	8	1100	18.0
5	6	1200	12.9
5	5	1300	10.5
5	9	1400	20.6
5	10	1500	23.2
5	10	1600	23.2
5	11	1700	25.9
5	13	1800	31.3
6	3	100	5.8
6	6	200	12.9
6	7	300	15.4
6	8	400	18.0
6	11	500	25.9
6	8	600	18.0
6	9	700	20.6
6	7	800	15.4
6	7	900	15.4
6	7	1000	15.4
6	7	1100	15.4
6	5	1200	10.5
6	6	1300	12.9
6	8	1400	18.0
6	8	1500	18.0
6	7	1600	15.4
6	8	1700	18.0
6	11	1800	25.9
7	6	100	12.9
7	6	200	12.9
7	9	300	20.6
7	9	400	20.6
7	10	500	23.2
7	9	600	20.6
7	8	700	18.0
7	6	800	12.9
7	4	900	8.1
7	5	1000	10.5
7	4	1100	8.1
7	4	1200	8.1
7	4	1300	8.1
7	5	1400	10.5
7	5	1500	10.5
7	7	1600	15.4
7	9	1700	20.6
7	12	1800	28.6
8	2	100	3.7
8	5	200	10.5
8	5	300	10.5
8	7	400	15.4
8	10	500	23.2
8	13	600	31.3
8	13	700	31.3
8	13	800	31.3
8	7	900	15.4
8	6	1000	12.9
8	7	1100	15.4
8	6	1200	12.9
8	5	1300	10.5
8	4	1400	8.1
8	4	1500	8.1
8	3	1600	5.8
8	5	1700	10.5
8	5	1800	10.5
8	4	1900	8.1
8	6	2000	12.9

Comments

Site 5 = Lot 165, Site 6 = Lot 166, Site 7 = Lot 167, Site 8 = Lot 172.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Results for depths beyond 1.5 metres are not accredited, and are excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-01239
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 7/06/2016

Test Details

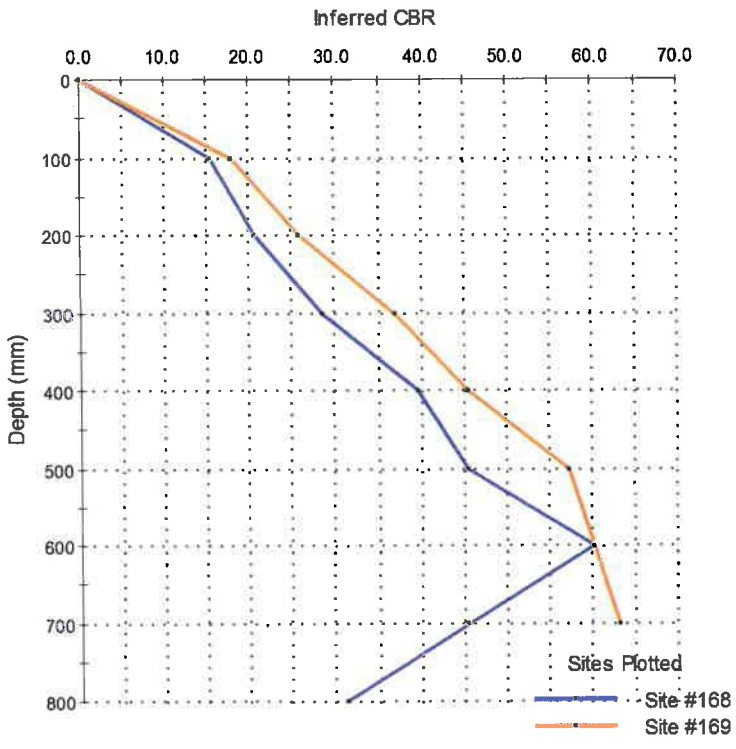
Sample ID: BOP16S-01239
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Stage 12 - Lots 168-169
Date Tested: 13/05/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-01239
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 7/06/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
168	7	100	15.4
168	9	200	20.6
168	12	300	28.6
168	16	400	39.8
168	18	500	45.5
168	23	600	60.3
168	18	700	45.5
168	13	800	31.3
169	8	100	18.0
169	11	200	25.9
169	15	300	36.9
169	18	400	45.5
169	22	500	57.3
169	23	600	60.3
169	24	700	63.3

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-01240
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 7/06/2016

Test Details

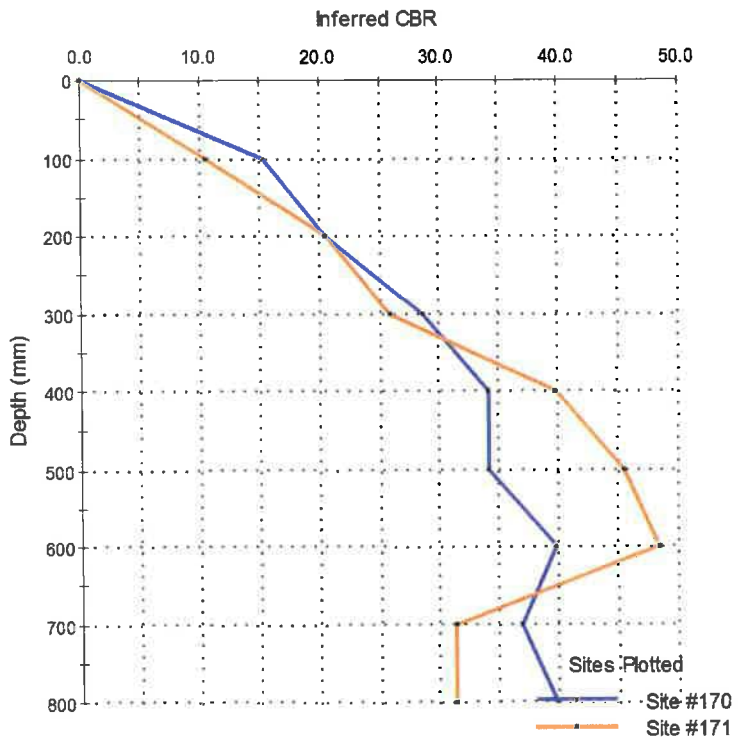
Sample ID: BOP16S-01240
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Stage 12 - Lots 170-171
Date Tested: 13/05/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-01240
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 7/06/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
170	7	100	15.4
170	9	200	20.6
170	12	300	28.6
170	14	400	34.1
170	14	500	34.1
170	16	600	39.8
170	15	700	36.9
170	16	800	39.8
171	5	100	10.5
171	9	200	20.6
171	11	300	25.9
171	16	400	39.8
171	18	500	45.5
171	19	600	48.4
171	13	700	31.3
171	13	800	31.3

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-01822
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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Approved Signatory: Barrack Carle

IANZ Accreditation No:749
Date of Issue: 22/07/2016

Test Details

Sample ID:	BOP16S-01822	**Location:**	Stage 12
Tested By:	Barrack Carle	**Date Tested:**	20/06/2016
Material:	Insitu Sand Fill	**Specification:**	Contract Specification

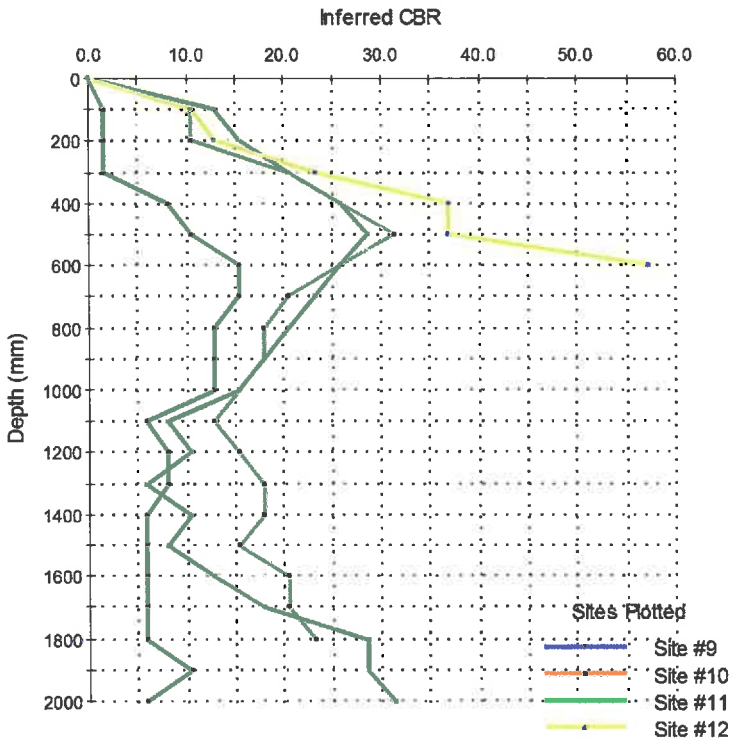
Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm):

Depth at the Commencement (mm):

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

Site 9 = Lot 174, Site 10 = Lot 175, Site 11 = Lot 176, Site 12 = Lot 177/178.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Results for depths beyond 1.5 metres are not accredited, and are excluded from the endorsement of this test report.

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0800 LABORATORY

Penetration Resistance

Report No: PR:BOP16S-01822
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

Approved Signatory: Barrack Carle

IANZ Accreditation No:749
Date of Issue: 22/07/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
9	1	100	1.7
9	1	200	1.7
9	1	300	1.7
9	4	400	8.1
9	5	500	10.5
9	7	600	15.4
9	7	700	15.4
9	6	800	12.9
9	6	900	12.9
9	6	1000	12.9
9	3	1100	5.8
9	4	1200	8.1
9	4	1300	8.1
9	3	1400	5.8
9	3	1500	5.8
9	3	1600	5.8
9	3	1700	5.8
9	3	1800	5.8
9	5	1900	10.5
9	3	2000	5.8
10	5	100	10.5
10	5	200	10.5
10	9	300	20.6
10	11	400	25.9
10	13	500	31.3
10	11	600	25.9
10	9	700	20.6
10	8	800	18.0
10	8	900	18.0
10	7	1000	15.4
10	6	1100	12.9
10	7	1200	15.4
10	8	1300	18.0
10	8	1400	18.0
10	7	1500	15.4
10	9	1600	20.6
10	9	1700	20.6
10	10	1800	23.2
11	6	100	12.9
11	7	200	15.4
11	9	300	20.6
11	11	400	25.9
11	12	500	28.6
11	11	600	25.9
11	10	700	23.2
11	9	800	20.6
11	8	900	18.0
11	7	1000	15.4
11	4	1100	8.1
11	5	1200	10.5
11	3	1300	5.8
11	5	1400	10.5
11	4	1500	8.1
11	6	1600	12.9
11	8	1700	18.0
11	12	1800	28.6
11	12	1900	28.6
11	13	2000	31.3
12	5	100	10.5
12	6	200	12.9
12	10	300	23.2
12	15	400	36.9
12	15	500	36.9
12	22	600	57.3

Comments

Site 9 = Lot 174, Site 10 = Lot 175, Site 11 = Lot 176, Site 12 = Lot 177/178.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Results for depths beyond 1.5 metres are not accredited, and are excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-01242
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 7/06/2016

Test Details

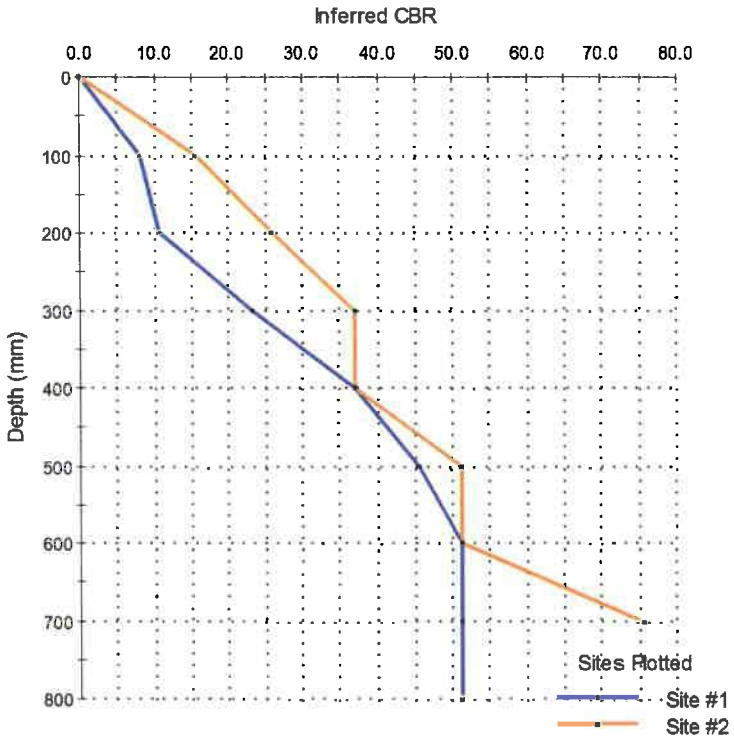
Sample ID: BOP16S-01242
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Stage 12 - Lot 193
Date Tested: 13/05/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Site 1 = 193A; Site 2 = 193B

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Penetration Resistance

Report No: PR:BOP16S-01242
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 7/06/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
1	4	100	8.1
1	5	200	10.5
1	10	300	23.2
1	15	400	36.9
1	18	500	45.5
1	20	600	51.3
1	20	700	51.3
1	20	800	51.3
2	7	100	15.4
2	11	200	25.9
2	15	300	36.9
2	15	400	36.9
2	20	500	51.3
2	20	600	51.3
2	28	700	75.5

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Site 1 = 193A; Site 2 = 193B

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Penetration Resistance

Report No: PR:BOP16S-01245
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 8/06/2016

Test Details

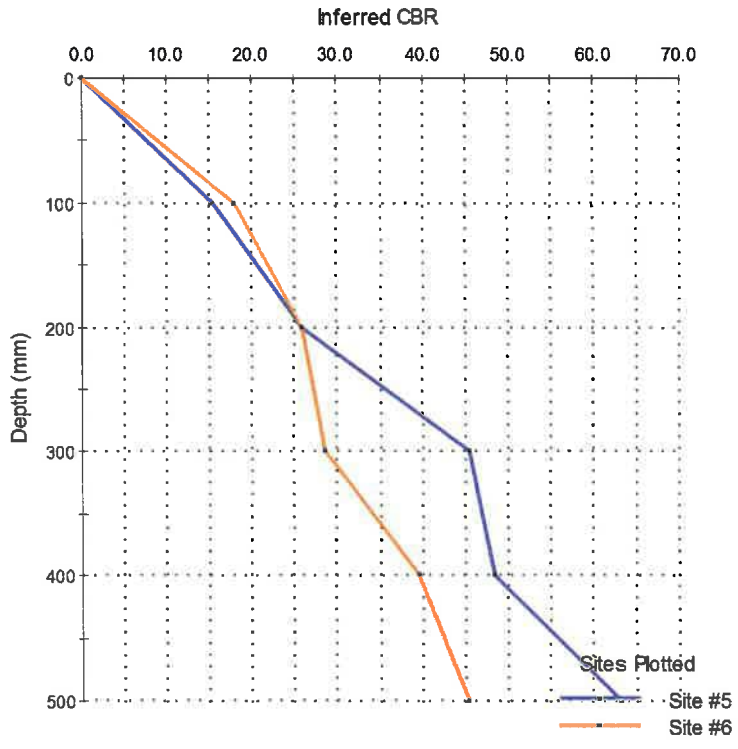
Sample ID:	BOP16S-01245	**Location:**	Stage 12 - Lot 193
Tested By:	Barrack Carle	**Date Tested:**	16/05/2016
Material:	Insitu Fill Sand	**Specification:**	Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0 **Depth at the Commencement (mm):** 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Site 5 = 193E, Site 6 = 193F

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Penetration Resistance

Report No: PR:BOP16S-01245
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 8/06/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
5	7	100	15.4
5	11	200	25.9
5	18	300	45.5
5	19	400	48.4
5	24	500	63.3
6	8	100	18.0
6	11	200	25.9
6	12	300	28.6
6	16	400	39.8
6	18	500	45.5

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Site 5 = 193E, Site 6 = 193F

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Penetration Resistance

Report No: PR:BOP16S-01246
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 8/06/2016

Test Details

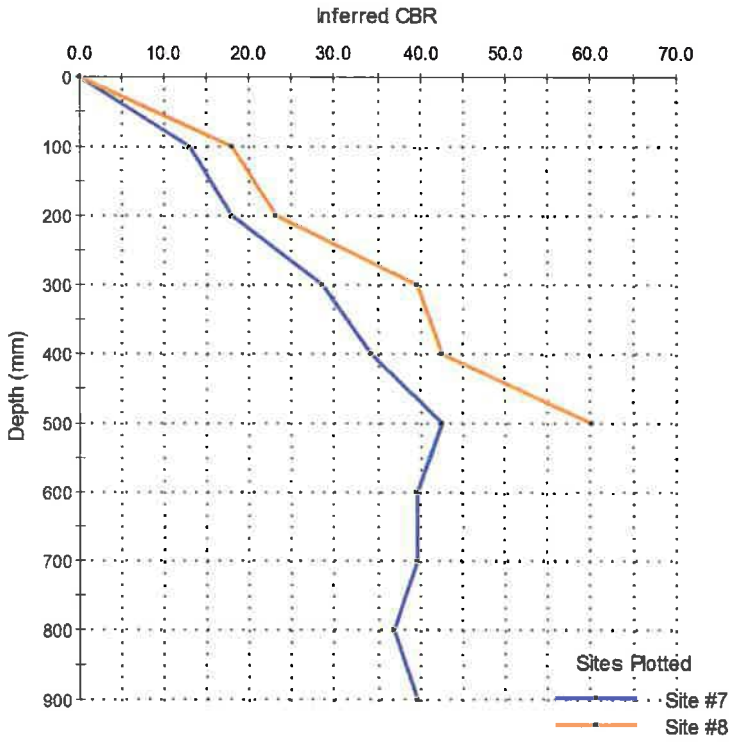
Sample ID: BOP16S-01246
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Stage 12 - Lot 193
Date Tested: 16/05/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Site 7 = 193G, Site 8 = 193H

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Penetration Resistance

Report No: PR:BOP16S-01246
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 8/06/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
7	6	100	12.9
7	8	200	18.0
7	12	300	28.6
7	14	400	34.1
7	17	500	42.6
7	16	600	39.8
7	16	700	39.8
7	15	800	36.9
7	16	900	39.8
8	8	100	18.0
8	10	200	23.2
8	16	300	39.8
8	17	400	42.6
8	23	500	60.3

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Site 7 = 193G, Site 8 = 193H

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Penetration Resistance

Report No: PR:BOP16S-01243
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 7/06/2016

Test Details

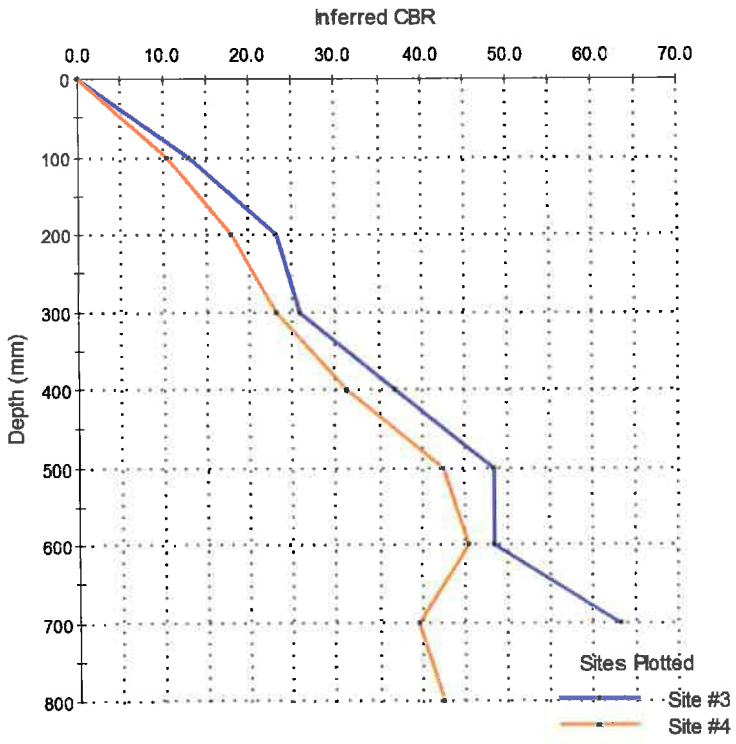
Sample ID: BOP16S-01243
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Stage 12 - Lot 193
Date Tested: 13/05/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Site 3 = 193C; Site 4 = 193D.

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Penetration Resistance

Report No: PR:BOP16S-01243
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 7/06/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
3	6	100	12.9
3	10	200	23.2
3	11	300	25.9
3	15	400	36.9
3	19	500	48.4
3	19	600	48.4
3	24	700	63.3
4	5	100	10.5
4	8	200	18.0
4	10	300	23.2
4	13	400	31.3
4	17	500	42.6
4	18	600	45.5
4	16	700	39.8
4	17	800	42.6

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Site 3 = 193C; Site 4 = 193D.

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Penetration Resistance

Report No: PR:BOP16S-01241
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 7/06/2016

Test Details

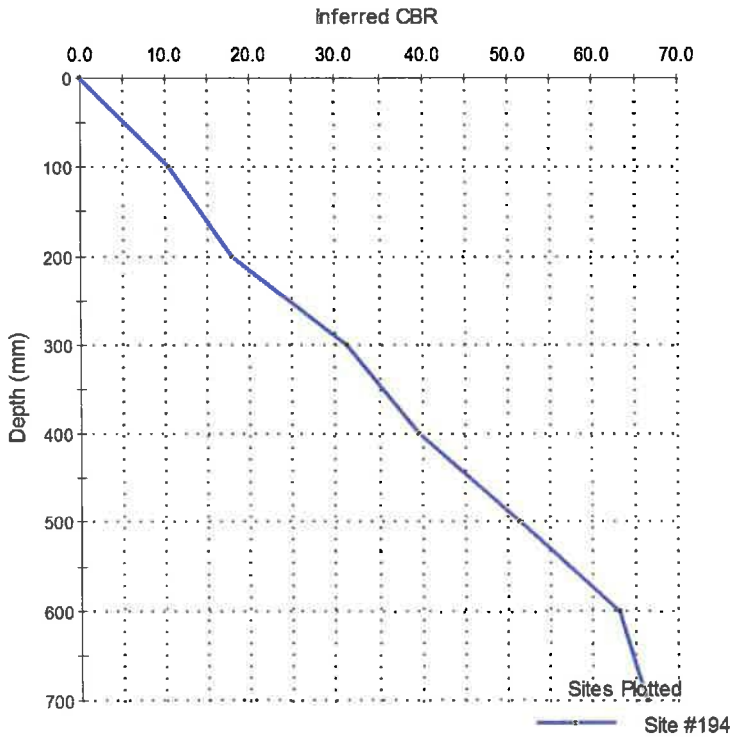
Sample ID: BOP16S-01241
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Stage 12 - Lot 194
Date Tested: 13/05/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-01241
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 7/06/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
194	5	100	10.5
194	8	200	18.0
194	13	300	31.3
194	16	400	39.8
194	20	500	51.3
194	24	600	63.3
194	25	700	66.3

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-01826
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

Approved Signatory: Barrack Carle

IANZ Accreditation No:749
Date of Issue: 22/07/2016

Test Details

Sample ID:	BOP16S-01826	**Location:**	Stage 12
Tested By:	Barrack Carle	**Date Tested:**	20/06/2016
Material:	Insitu Sand Fill	**Specification:**	Contract Specification

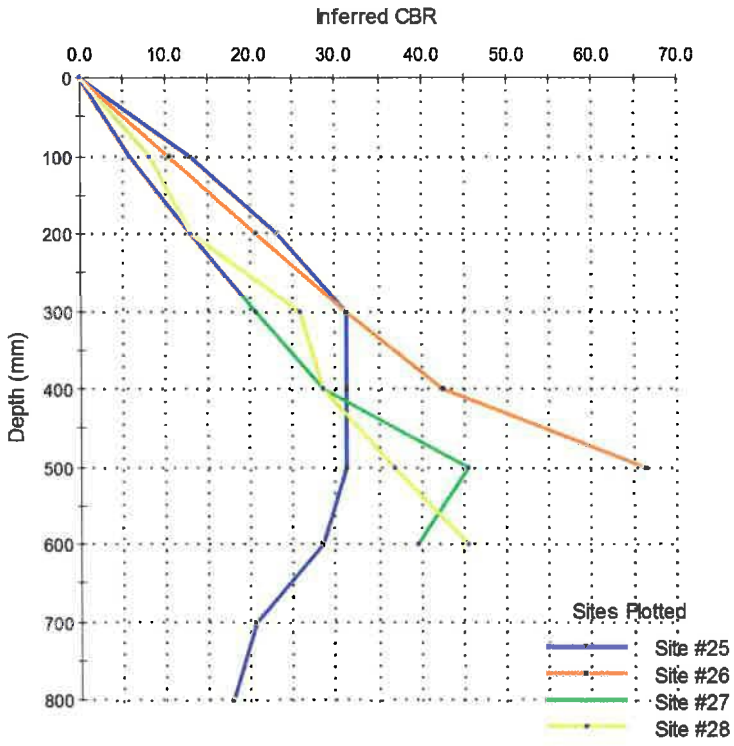
Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm):

Depth at the Commencement (mm):

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

Site 25 = Lot 196, Site 26 = Lot 198, Site 27 = Lot 200, Site 28 = Lot 201A.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Results for depths beyond 1.5 metres are not accredited, and are excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-01826
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Barrack Carle

IANZ Accreditation No:749
Date of Issue: 22/07/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
25	6	100	12.9
25	10	200	23.2
25	13	300	31.3
25	13	400	31.3
25	13	500	31.3
25	12	600	28.6
25	9	700	20.6
25	8	800	18.0
26	5	100	10.5
26	9	200	20.6
26	13	300	31.3
26	17	400	42.6
26	25	500	66.3
27	3	100	5.8
27	6	200	12.9
27	9	300	20.6
27	12	400	28.6
27	18	500	45.5
27	16	600	39.8
28	4	100	8.1
28	6	200	12.9
28	11	300	25.9
28	12	400	28.6
28	15	500	36.9
28	18	600	45.5

Comments

Site 25 = Lot 196, Site 26 = Lot 198, Site 27 = Lot 200, Site 28 = Lot 201A.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Results for depths beyond 1.5 metres are not accredited, and are excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-01827
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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Approved Signatory: Barrack Carle

IANZ Accreditation No:749
Date of Issue: 22/07/2016

Test Details

Sample ID:	BOP16S-01827	**Location:**	Stage 12
Tested By:	Barrack Carle	**Date Tested:**	20/06/2016
Material:	Insitu Sand Fill	**Specification:**	Contract Specification

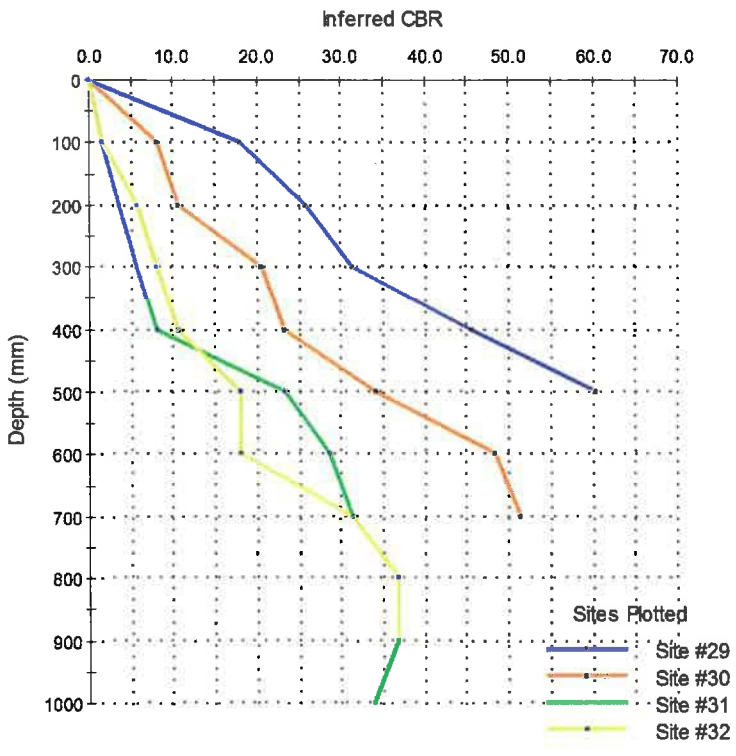
Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm):

Depth at the Commencement (mm):

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

Site 29 = Lot 201B, Site 30 = Lot 201C, Site 31 = Lot 201D, Site 32 = Lot 201E
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Results for depths beyond 1.5 metres are not accredited, and are excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-01827
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

Approved Signatory: Barrack Carle

IANZ Accreditation No:749
Date of Issue: 22/07/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
29	8	100	18.0
29	11	200	25.9
29	13	300	31.3
29	18	400	45.5
29	23	500	60.3
30	4	100	8.1
30	5	200	10.5
30	9	300	20.6
30	10	400	23.2
30	14	500	34.1
30	19	600	48.4
30	20	700	51.3
31	1	100	1.7
31	2	200	3.7
31	3	300	5.8
31	4	400	8.1
31	10	500	23.2
31	12	600	28.6
31	13	700	31.3
31	15	800	36.9
31	15	900	36.9
31	14	1000	34.1
32	1	100	1.7
32	3	200	5.8
32	4	300	8.1
32	5	400	10.5
32	8	500	18.0
32	8	600	18.0
32	13	700	31.3
32	15	800	36.9
32	15	900	36.9

Comments

Site 29 = Lot 201B, Site 30 = Lot 201C, Site 31 = Lot 201D, Site 32 = Lot 201E
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Results for depths beyond 1.5 metres are not accredited, and are excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-01828
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

IANZ ACCREDITED LABORATORY

Approved Signatory: Barrack Carle

IANZ Accreditation No:749
Date of Issue: 22/07/2016

Test Details

Sample ID:	BOP16S-01828	**Location:**	Stage 12
Tested By:	Barrack Carle	**Date Tested:**	20/06/2016
Material:	Insitu Sand Fill	**Specification:**	Contract Specification

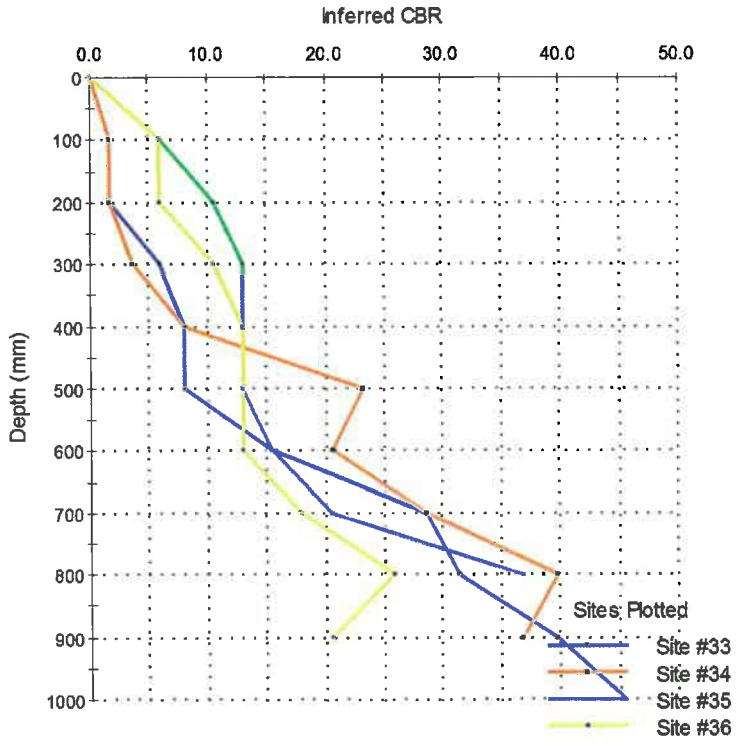
Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm):

Depth at the Commencement (mm):

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

Site 33 = Lot 202/213, Site 34 = Lot 203/212, Site 35 = Lot 204, Site 36 = Lot 206/207.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Results for depths beyond 1.5 metres are not accredited, and are excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-01828
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Barrack Carle

IANZ Accreditation No:749
Date of Issue: 22/07/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
33	1	100	1.7
33	1	200	1.7
33	3	300	5.8
33	4	400	8.1
33	4	500	8.1
33	7	600	15.4
33	12	700	28.6
33	13	800	31.3
33	16	900	39.8
33	18	1000	45.5
34	1	100	1.7
34	1	200	1.7
34	2	300	3.7
34	4	400	8.1
34	10	500	23.2
34	9	600	20.6
34	12	700	28.6
34	16	800	39.8
34	15	900	36.9
35	3	100	5.8
35	5	200	10.5
35	6	300	12.9
35	6	400	12.9
35	6	500	12.9
35	7	600	15.4
35	9	700	20.6
35	15	800	36.9
36	3	100	5.8
36	3	200	5.8
36	5	300	10.5
36	6	400	12.9
36	6	500	12.9
36	6	600	12.9
36	8	700	18.0
36	11	800	25.9
36	9	900	20.6

Comments

Site 33 = Lot 202/213, Site 34 = Lot 203/212, Site 35 = Lot 204, Site 36 = Lot 206/207.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Results for depths beyond 1.5 metres are not accredited, and are excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-01829
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

Approved Signatory: Barrack Carle

IANZ Accreditation No:749
Date of Issue: 22/07/2016

Test Details

Sample ID:	BOP16S-01829	**Location:**	Stage 12
Tested By:	Barrack Carle	**Date Tested:**	20/06/2016
Material:	Insitu Sand Fill	**Specification:**	Contract Specification

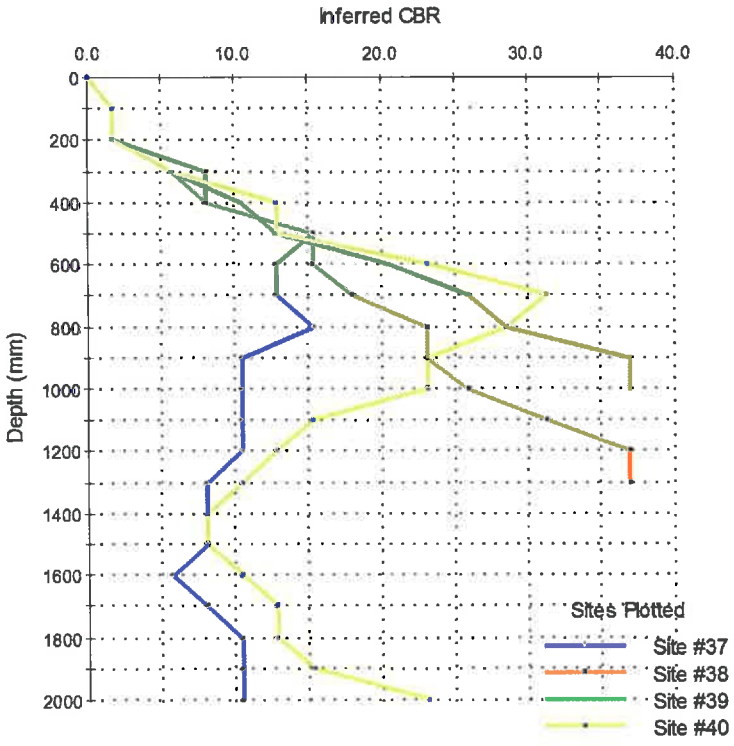
Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm):

Depth at the Commencement (mm):

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

Site 37 = Lot 208, Site 38 = Lot 209, Site 39 = Lot 210, Site 40 = Lot 211.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Results for depths beyond 1.5 metres are not accredited, and are excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-01829
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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Approved Signatory: Barrack Carle

IANZ Accreditation No:749
Date of Issue: 22/07/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
37	1	100	1.7
37	1	200	1.7
37	4	300	8.1
37	4	400	8.1
37	7	500	15.4
37	6	600	12.9
37	6	700	12.9
37	7	800	15.4
37	5	900	10.5
37	5	1000	10.5
37	5	1100	10.5
37	5	1200	10.5
37	4	1300	8.1
37	4	1400	8.1
37	4	1500	8.1
37	3	1600	5.8
37	4	1700	8.1
37	5	1800	10.5
37	5	1900	10.5
37	5	2000	10.5
38	1	100	1.7
38	1	200	1.7
38	3	300	5.8
38	4	400	8.1
38	7	500	15.4
38	7	600	15.4
38	8	700	18.0
38	10	800	23.2
38	10	900	23.2
38	11	1000	25.9
38	13	1100	31.3
38	15	1200	36.9
38	15	1300	36.9
39	1	100	1.7
39	1	200	1.7
39	3	300	5.8
39	5	400	10.5
39	6	500	12.9
39	9	600	20.6
39	11	700	25.9
39	12	800	28.6
39	15	900	36.9
39	15	1000	36.9
40	1	100	1.7
40	1	200	1.7
40	3	300	5.8
40	6	400	12.9
40	6	500	12.9
40	10	600	23.2
40	13	700	31.3
40	12	800	28.6
40	10	900	23.2
40	10	1000	23.2
40	7	1100	15.4
40	6	1200	12.9
40	5	1300	10.5
40	4	1400	8.1
40	4	1500	8.1
40	5	1600	10.5
40	6	1700	12.9
40	6	1800	12.9
40	7	1900	15.4
40	10	2000	23.2

Comments

Site 37 = Lot 208, Site 38 = Lot 209, Site 39 = Lot 210, Site 40 = Lot 211.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Results for depths beyond 1.5 metres are not accredited, and are excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-01830
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

IANZ ACCREDITED LABORATORY

Approved Signatory: Barrack Carle

IANZ Accreditation No:749
Date of Issue: 22/07/2016

Test Details

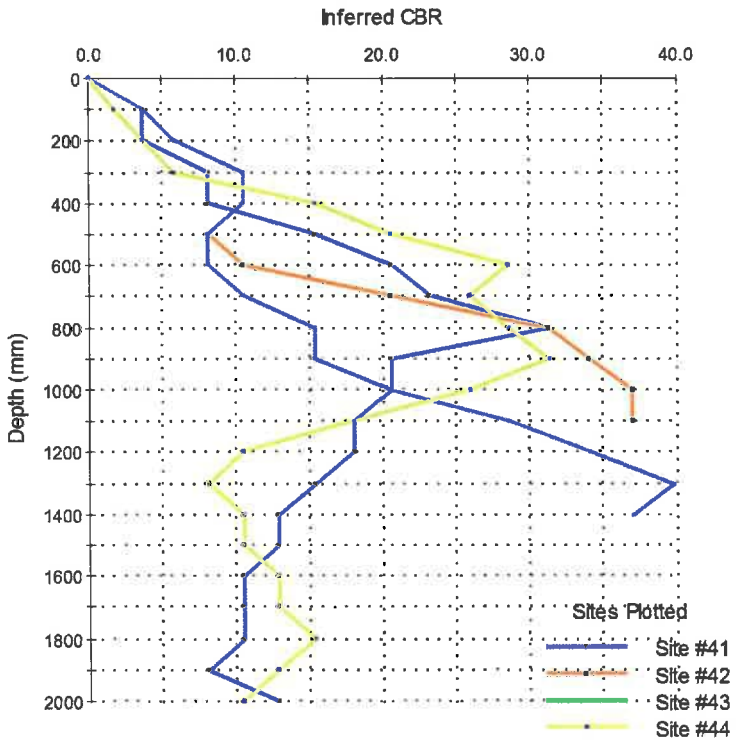
Sample ID: BOP16S-01830
Tested By: Barrack Carle
Material: Insitu Sand Fill
Location: Stage 12
Date Tested: 20/06/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm):
Depth at the Commencement (mm):

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

Site 41 = Lot 214, Site 42 = Lot 215, Site 43 = Lot 216, Site 44 = Lot 217.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Results for depths beyond 1.5 metres are not accredited, and are excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-01830
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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Approved Signatory: Barrack Carle

IANZ Accreditation No:749
Date of Issue: 22/07/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
41	2	100	3.7
41	2	200	3.7
41	4	300	8.1
41	4	400	8.1
41	7	500	15.4
41	9	600	20.6
41	10	700	23.2
41	13	800	31.3
41	9	900	20.6
41	9	1000	20.6
41	8	1100	18.0
41	8	1200	18.0
41	7	1300	15.4
41	6	1400	12.9
41	6	1500	12.9
41	5	1600	10.5
41	5	1700	10.5
41	5	1800	10.5
41	4	1900	8.1
41	6	2000	12.9
42	2	100	3.7
42	3	200	5.8
42	5	300	10.5
42	5	400	10.5
42	4	500	8.1
42	5	600	10.5
42	9	700	20.6
42	13	800	31.3
42	14	900	34.1
42	15	1000	36.9
42	15	1100	36.9
43	2	100	3.7
43	3	200	5.8
43	5	300	10.5
43	5	400	10.5
43	4	500	8.1
43	4	600	8.1
43	5	700	10.5
43	7	800	15.4
43	7	900	15.4
43	9	1000	20.6
43	12	1100	28.6
43	14	1200	34.1
43	16	1300	39.8
43	15	1400	36.9
44	1	100	1.7
44	2	200	3.7
44	3	300	5.8
44	7	400	15.4
44	9	500	20.6
44	12	600	28.6
44	11	700	25.9
44	12	800	28.6
44	13	900	31.3
44	11	1000	25.9
44	8	1100	18.0
44	5	1200	10.5
44	4	1300	8.1
44	5	1400	10.5
44	5	1500	10.5
44	6	1600	12.9
44	6	1700	12.9
44	7	1800	15.4
44	6	1900	12.9
44	5	2000	10.5

Comments

Site 41 = Lot 214, Site 42 = Lot 215, Site 43 = Lot 216, Site 44 = Lot 217.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Results for depths beyond 1.5 metres are not accredited, and are excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-02701
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The tests reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. Samples are tested as received, in natural condition, unless stated otherwise in the comments. This report may only be reproduced in full.

IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 31/10/2016

Test Details

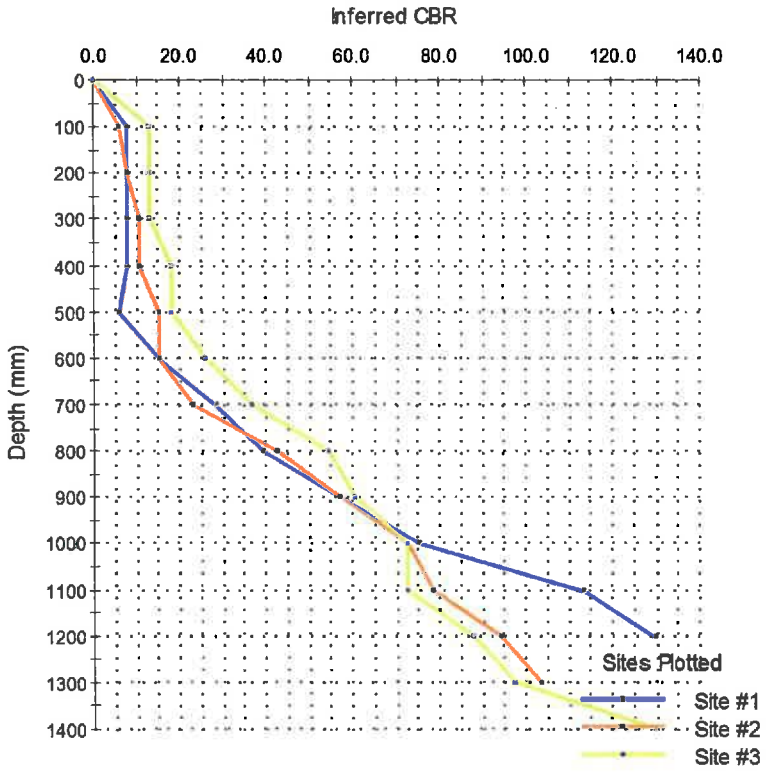
Sample ID: BOP16S-02701
Location: ~~Lot X (adjacent to Lot 218)~~ LOT 217
Tested By: Barrack Carle
Date Tested: 18/10/2016
Material: Insitu Fill Sand
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

Results for depths beyond 1 metre are not accredited, and are excluded from the endorsement of this test report.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Site 1 = Peg A; Site 2 = Peg B; Site 3 = E176.33344, S37.721995.

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Penetration Resistance

Report No: PR:BOP16S-02701
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 31/10/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
1	4	100	8.1
1	4	200	8.1
1	4	300	8.1
1	4	400	8.1
1	3	500	5.8
1	7	600	15.4
1	12	700	28.6
1	16	800	39.8
1	22	900	57.3
1	28	1000	75.5
1	40	1100	113.6
1	45	1200	130.0
2	3	100	5.8
2	4	200	8.1
2	5	300	10.5
2	5	400	10.5
2	7	500	15.4
2	7	600	15.4
2	10	700	23.2
2	17	800	42.6
2	22	900	57.3
2	27	1000	72.4
2	29	1100	78.6
2	34	1200	94.3
2	37	1300	103.9
3	6	100	12.9
3	6	200	12.9
3	6	300	12.9
3	8	400	18.0
3	8	500	18.0
3	11	600	25.9
3	15	700	36.9
3	21	800	54.3
3	23	900	60.3
3	27	1000	72.4
3	27	1100	72.4
3	32	1200	88.0
3	35	1300	97.5
3	45	1400	130.0

Comments

Results for depths beyond 1 metre are not accredited, and are excluded from the endorsement of this test report.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Site 1 = Peg A; Site 2 = Peg B; Site 3 = E176.33344, S37.721995.

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Penetration Resistance

Report No: PR:BOP16S-01238
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 7/06/2016

Test Details

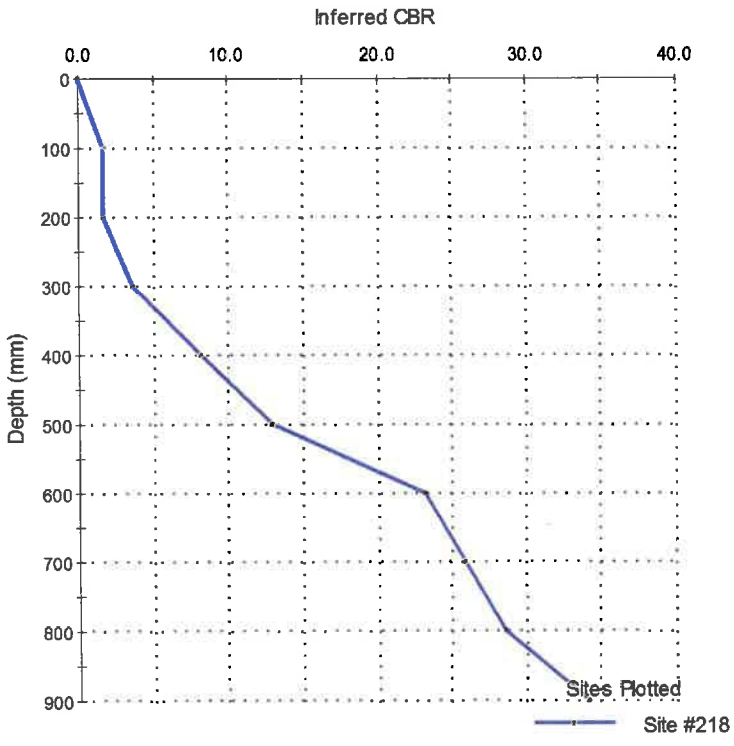
Sample ID: BOP16S-01238
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Stage 12 - Lot 218, Lift 1
Date Tested: 13/05/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-01238
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 7/06/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
218	1	100	1.7
218	1	200	1.7
218	2	300	3.7
218	4	400	8.1
218	6	500	12.9
218	10	600	23.2
218	11	700	25.9
218	12	800	28.6
218	14	900	34.1

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Report No: PR:BOP16S-01244
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 8/06/2016

Test Details

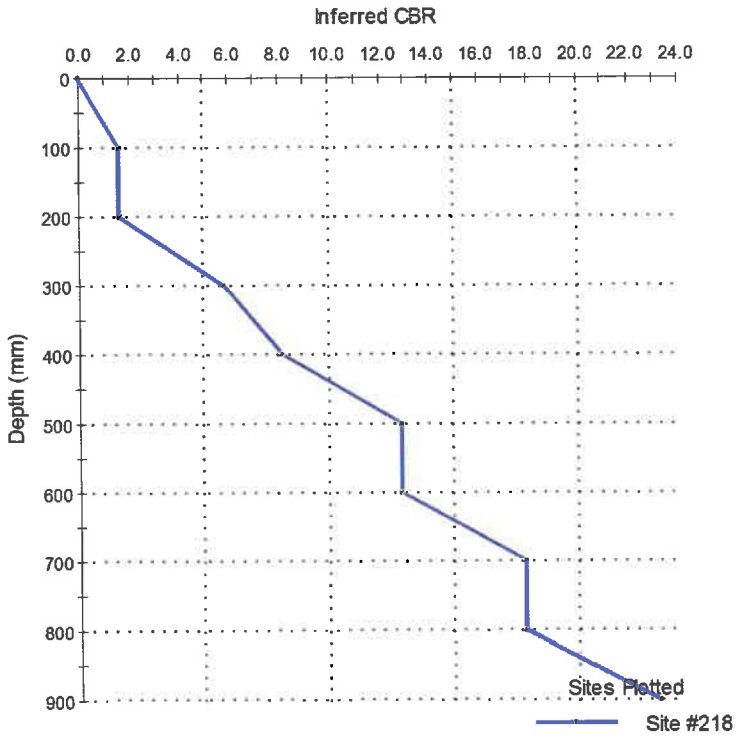
Sample ID: BOP16S-01244
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Stage 12 - Lot 218, Lift 2
Date Tested: 16/05/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-01244
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The test (s) reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. This report may only be reproduced in full.

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 8/06/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
218	1	100	1.7
218	1	200	1.7
218	3	300	5.8
218	4	400	8.1
218	6	500	12.9
218	6	600	12.9
218	8	700	18.0
218	8	800	18.0
218	10	900	23.2

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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0800 LABORATORY

Report No: PR:BOP16S-02054
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The tests reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. Samples are tested as received, in natural condition, unless stated otherwise in the comments. This report may only be reproduced in full.

IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 25/08/2016

Test Details

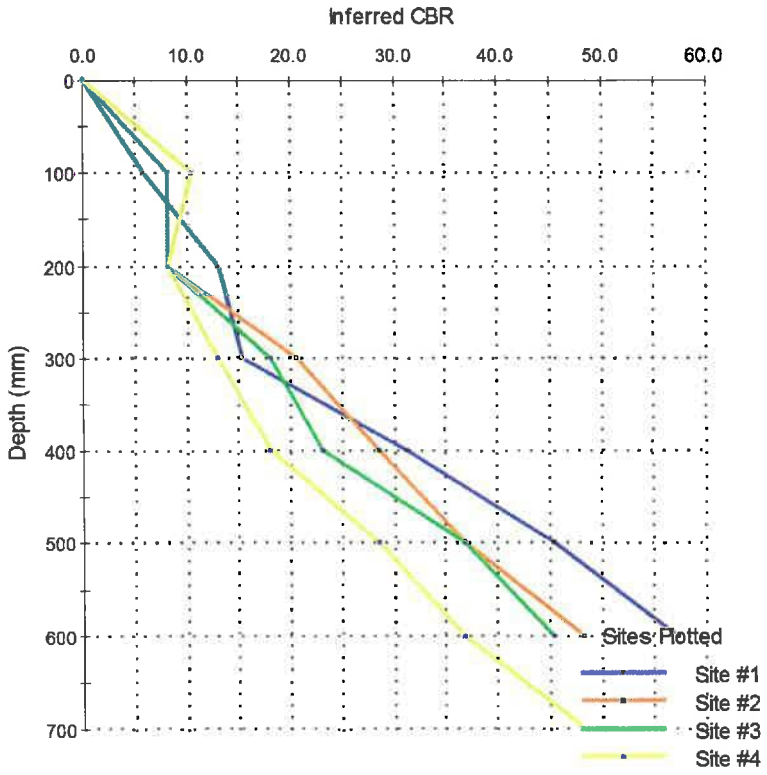
Sample ID:	BOP16S-02054	**Location:**	Lot 218
Tested By:	Barrack Carle	**Date Tested:**	25/07/2016
Material:	Insitu Fill Sand	**Specification:**	Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0 **Depth at the Commencement (mm):** 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Site 1 = A; Site 2 = B; Site 3 = C; Site 4 = D.

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Report No: PR:BOP16S-02054
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The tests reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. Samples are tested as received, in natural condition, unless stated otherwise in the comments. This report may only be reproduced in full.

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 25/08/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
1	3	100	5.8
1	6	200	12.9
1	7	300	15.4
1	13	400	31.3
1	18	500	45.5
1	22	600	57.3
2	4	100	8.1
2	4	200	8.1
2	9	300	20.6
2	12	400	28.6
2	15	500	36.9
2	19	600	48.4
3	4	100	8.1
3	4	200	8.1
3	8	300	18.0
3	10	400	23.2
3	15	500	36.9
3	18	600	45.5
4	5	100	10.5
4	4	200	8.1
4	6	300	12.9
4	8	400	18.0
4	12	500	28.6
4	15	600	36.9
4	19	700	48.4

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Site 1 = A; Site 2 = B; Site 3 = C; Site 4 = D.

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Report No: PR:BOP16S-02700
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The tests reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. Samples are tested as received, in natural condition, unless stated otherwise in the comments. This report may only be reproduced in full.

IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 31/10/2016

Test Details

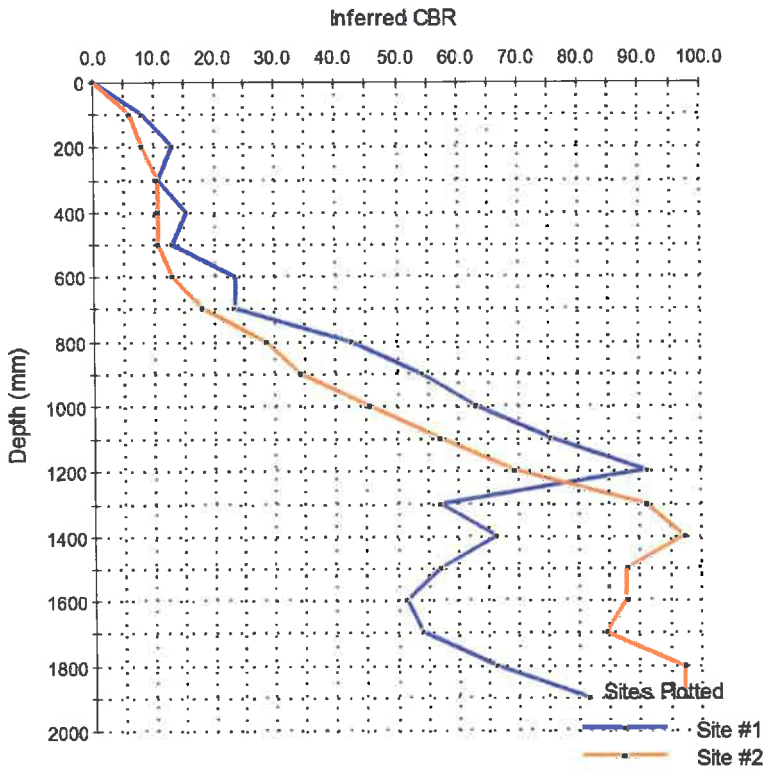
Sample ID: BOP16S-02700
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Lot 218
Date Tested: 18/10/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

Results for depths beyond 1 metre are not accredited, and are excluded from the endorsement of this test report.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Site 1 = 218E; Site 2 = 218F

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Report No: PR:BOP16S-02700
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The tests reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. Samples are tested as received, in natural condition, unless stated otherwise in the comments. This report may only be reproduced in full.

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 31/10/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
1	4	100	8.1
1	6	200	12.9
1	5	300	10.5
1	7	400	15.4
1	6	500	12.9
1	10	600	23.2
1	10	700	23.2
1	17	800	42.6
1	21	900	54.3
1	24	1000	63.3
1	28	1100	75.5
1	33	1200	91.1
1	22	1300	57.3
1	25	1400	66.3
1	22	1500	57.3
1	20	1600	51.3
1	21	1700	54.3
1	25	1800	66.3
1	30	1900	81.7
2	3	100	5.8
2	4	200	8.1
2	5	300	10.5
2	5	400	10.5
2	5	500	10.5
2	6	600	12.9
2	8	700	18.0
2	12	800	28.6
2	14	900	34.1
2	18	1000	45.5
2	22	1100	57.3
2	26	1200	69.3
2	33	1300	91.1
2	35	1400	97.5
2	32	1500	88.0
2	32	1600	88.0
2	31	1700	84.8
2	35	1800	97.5
2	35	1900	97.5

Comments

Results for depths beyond 1 metre are not accredited, and are excluded from the endorsement of this test report.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Site 1 = 218E; Site 2 = 218F

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Report No: PR:BOP16S-02549
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Test Details

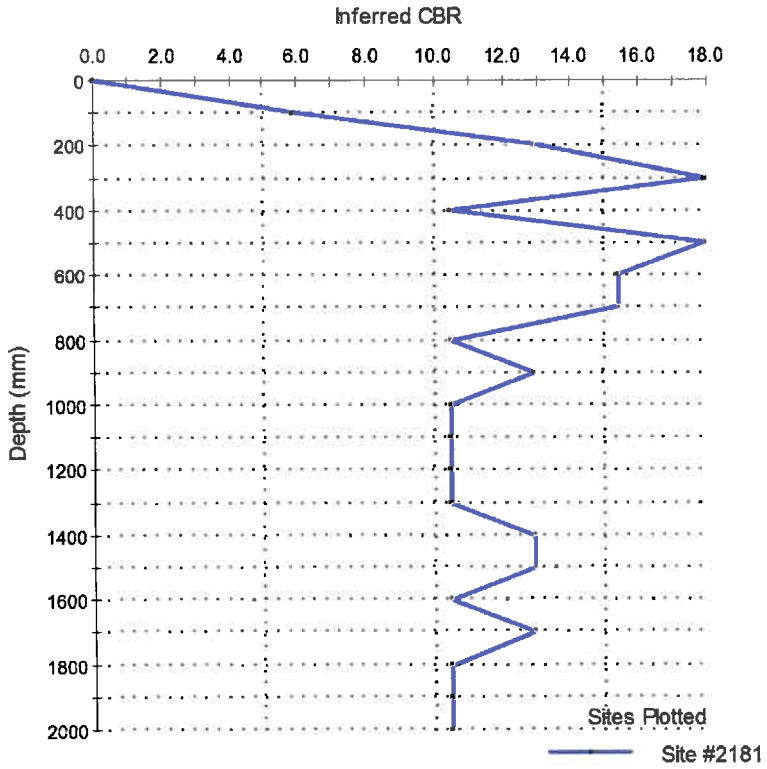
Sample ID: BOP16S-02549
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Lot# 2181
Date Tested: 5/09/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

Results for depths beyond 1 metre are not accredited, and are excluded from the endorsement of this test report.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-02549
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The tests reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. Samples are tested as received, in natural condition, unless stated otherwise in the comments. This report may only be reproduced in full.

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
2181	3	100	5.8
2181	6	200	12.9
2181	8	300	18.0
2181	5	400	10.5
2181	8	500	18.0
2181	7	600	15.4
2181	7	700	15.4
2181	5	800	10.5
2181	6	900	12.9
2181	5	1000	10.5
2181	5	1100	10.5
2181	5	1200	10.5
2181	5	1300	10.5
2181	6	1400	12.9
2181	6	1500	12.9
2181	5	1600	10.5
2181	6	1700	12.9
2181	5	1800	10.5
2181	5	1900	10.5
2181	5	2000	10.5

Comments

Results for depths beyond 1 metre are not accredited, and are excluded from the endorsement of this test report.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Report No: PR:BOP16S-02489
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The tests reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. Samples are tested as received, in natural condition, unless stated otherwise in the comments. This report may only be reproduced in full.

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Test Details

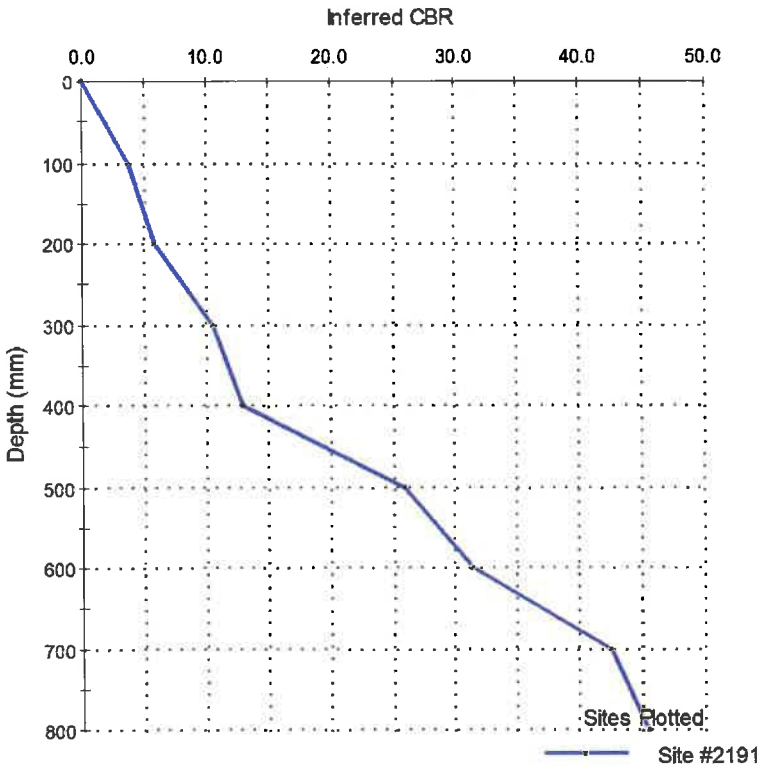
Sample ID: BOP16S-02489
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Stage 12 - Lot 2191
Date Tested: 24/08/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Report No: PR:BOP16S-02489
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The tests reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. Samples are tested as received, in natural condition, unless stated otherwise in the comments. This report may only be reproduced in full.

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
2191	2	100	3.7
2191	3	200	5.8
2191	5	300	10.5
2191	6	400	12.9
2191	11	500	25.9
2191	13	600	31.3
2191	17	700	42.6
2191	18	800	45.5

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Report No: PR:BOP16S-02055
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 25/08/2016

Test Details

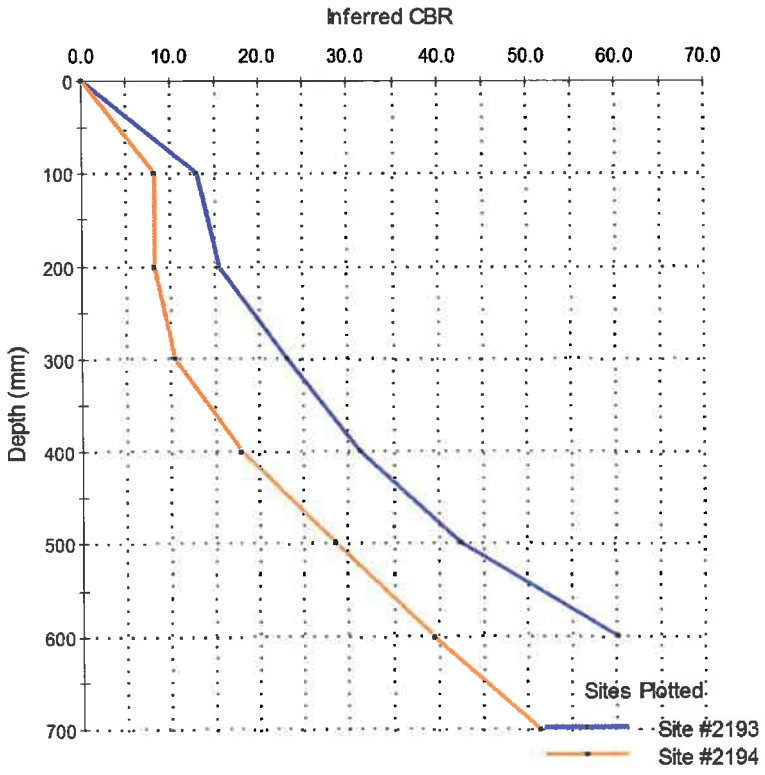
Sample ID: BOP16S-02055
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Lots 2193 & 2194
Date Tested: 25/07/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Report No: PR:BOP16S-02055
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The tests reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. Samples are tested as received, in natural condition, unless stated otherwise in the comments. This report may only be reproduced in full.

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 25/08/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
2193	6	100	12.9
2193	7	200	15.4
2193	10	300	23.2
2193	13	400	31.3
2193	17	500	42.6
2193	23	600	60.3
2194	4	100	8.1
2194	4	200	8.1
2194	5	300	10.5
2194	8	400	18.0
2194	12	500	28.6
2194	16	600	39.8
2194	20	700	51.3

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Report No: PR:BOP16S-02491
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The tests reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. Samples are tested as received, in natural condition, unless stated otherwise in the comments. This report may only be reproduced in full.

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Test Details

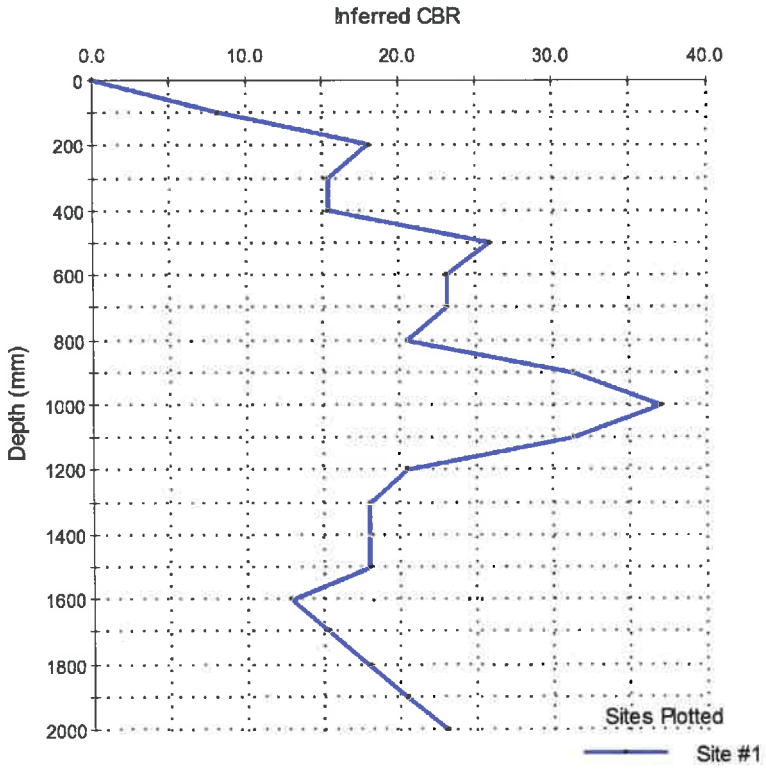
Sample ID:	BOP16S-02491	**Location:**	Stage 12 - Lot 2195/2202
Tested By:	Barrack Carle	**Date Tested:**	24/08/2016
Material:	Insitu Fill Sand	**Specification:**	Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0 **Depth at the Commencement (mm):** 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Results for depths beyond 1 metre are not accredited, and are excluded from the endorsement of this test report.

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Report No: PR:BOP16S-02491
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The tests reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. Samples are tested as received, in natural condition, unless stated otherwise in the comments. This report may only be reproduced in full.

IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
1	4	100	8.1
1	8	200	18.0
1	7	300	15.4
1	7	400	15.4
1	11	500	25.9
1	10	600	23.2
1	10	700	23.2
1	9	800	20.6
1	13	900	31.3
1	15	1000	36.9
1	13	1100	31.3
1	9	1200	20.6
1	8	1300	18.0
1	8	1400	18.0
1	8	1500	18.0
1	6	1600	12.9
1	7	1700	15.4
1	8	1800	18.0
1	9	1900	20.6
1	10	2000	23.2

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Results for depths beyond 1 metre are not accredited, and are excluded from the endorsement of this test report.

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Report No: PR:BOP16S-02490
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The tests reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. Samples are tested as received, in natural condition, unless stated otherwise in the comments. This report may only be reproduced in full.

IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Test Details

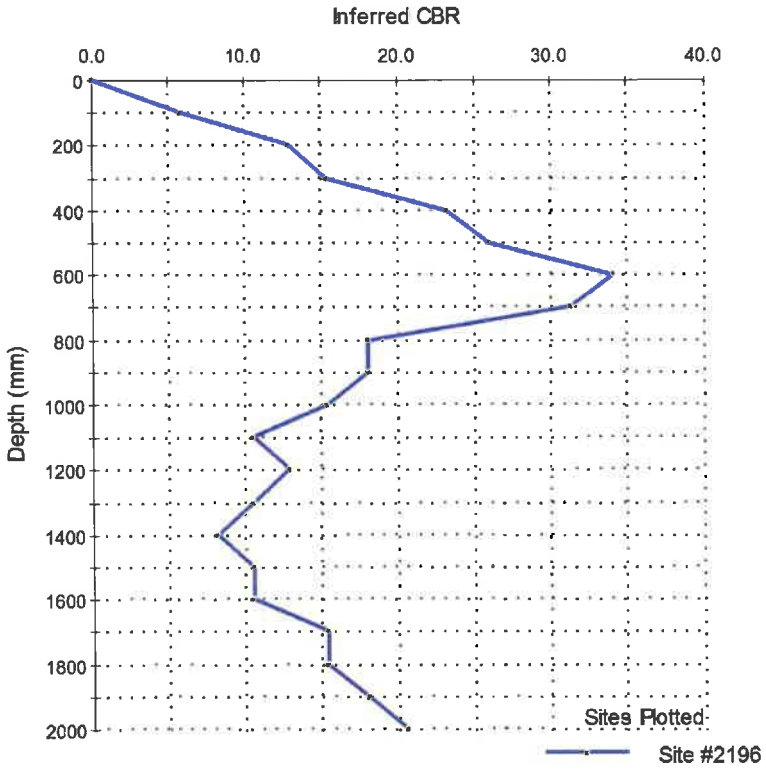
Sample ID: BOP16S-02490
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Stage 12 - Lot 2196
Date Tested: 24/08/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

Results for depths beyond 1 metre are not accredited, and are excluded from the endorsement of this test report.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Report No: PR:BOP16S-02490
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
2196	3	100	5.8
2196	6	200	12.9
2196	7	300	15.4
2196	10	400	23.2
2196	11	500	25.9
2196	14	600	34.1
2196	13	700	31.3
2196	8	800	18.0
2196	8	900	18.0
2196	7	1000	15.4
2196	5	1100	10.5
2196	6	1200	12.9
2196	5	1300	10.5
2196	4	1400	8.1
2196	5	1500	10.5
2196	5	1600	10.5
2196	7	1700	15.4
2196	7	1800	15.4
2196	8	1900	18.0
2196	9	2000	20.6

Comments

Results for depths beyond 1 metre are not accredited, and are excluded from the endorsement of this test report.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Bay of Plenty Laboratory

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Report No: PR:BOP16S-02056
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The tests reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. Samples are tested as received, in natural condition, unless stated otherwise in the comments. This report may only be reproduced in full.

IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 25/08/2016

Test Details

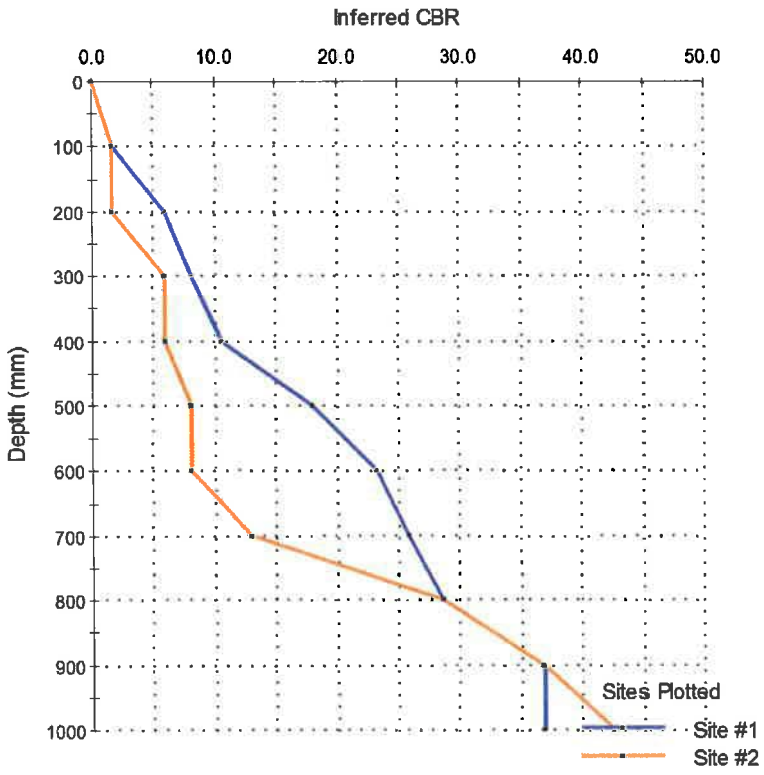
Sample ID:	BOP16S-02056	**Location:**	Lots 2203/2202 & 2211
Tested By:	Barrack Carle	**Date Tested:**	25/07/2016
Material:	Insitu Fill Sand	**Specification:**	Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0 **Depth at the Commencement (mm):** 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Site 1 = Lot 2203/2202; Site 2 = Lot 2211.

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Report No: PR:BOP16S-02056
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 25/08/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
1	1	100	1.7
1	3	200	5.8
1	4	300	8.1
1	5	400	10.5
1	8	500	18.0
1	10	600	23.2
1	11	700	25.9
1	12	800	28.6
1	15	900	36.9
1	15	1000	36.9
2	1	100	1.7
2	1	200	1.7
2	3	300	5.8
2	3	400	5.8
2	4	500	8.1
2	4	600	8.1
2	6	700	12.9
2	12	800	28.6
2	15	900	36.9
2	17	1000	42.6

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.
Site 1 = Lot 2203/2202; Site 2 = Lot 2211.

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Report No: PR:BOP16S-02492
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The tests reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. Samples are tested as received, in natural condition, unless stated otherwise in the comments. This report may only be reproduced in full.

IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Test Details

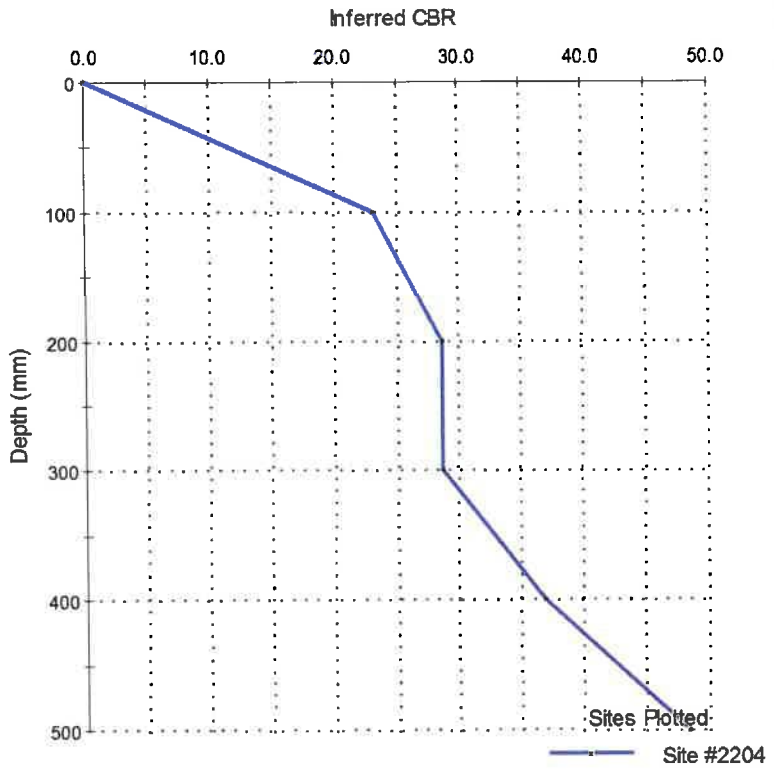
Sample ID: BOP16S-02492
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Stage 12 - Lot 2204
Date Tested: 24/08/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-02492
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
2204	10	100	23.2
2204	12	200	28.6
2204	12	300	28.6
2204	15	400	36.9
2204	19	500	48.4

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Report No: PR:BOP16S-02550
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Test Details

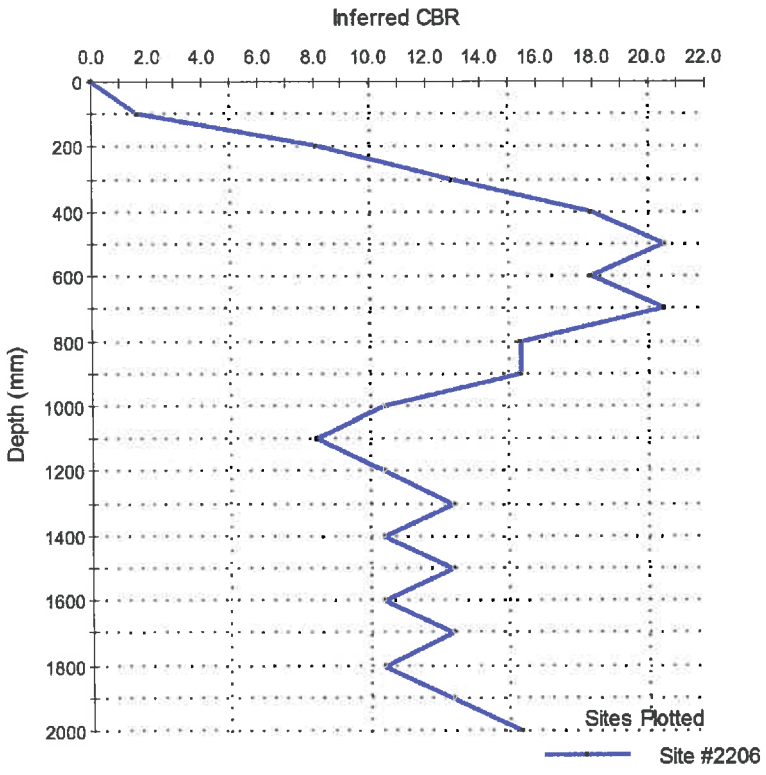
Sample ID: BOP16S-02550
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Lot #2206
Date Tested: 5/09/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

Results for depths beyond 1 metre are not accredited, and are excluded from the endorsement of this test report.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Report No: PR:BOP16S-02550
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
2206	1	100	1.7
2206	4	200	8.1
2206	6	300	12.9
2206	8	400	18.0
2206	9	500	20.6
2206	8	600	18.0
2206	9	700	20.6
2206	7	800	15.4
2206	7	900	15.4
2206	5	1000	10.5
2206	4	1100	8.1
2206	5	1200	10.5
2206	6	1300	12.9
2206	5	1400	10.5
2206	6	1500	12.9
2206	5	1600	10.5
2206	6	1700	12.9
2206	5	1800	10.5
2206	6	1900	12.9
2206	7	2000	15.4

Comments

Results for depths beyond 1 metre are not accredited, and are excluded from the endorsement of this test report.
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Report No: PR:BOP16S-02488
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Test Details

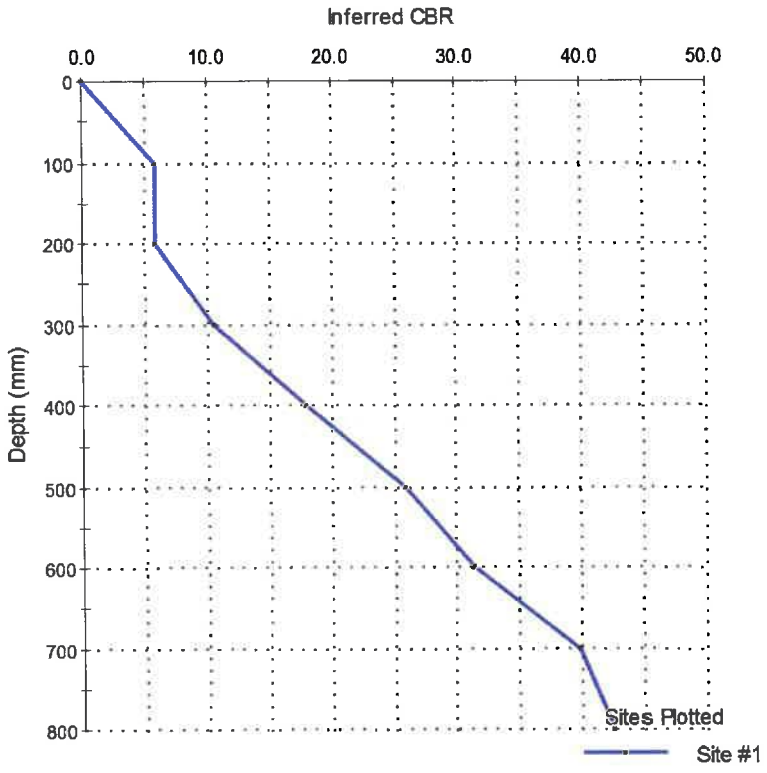
Sample ID: BOP16S-02488
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Stage 12 - Lot 2206/2211
Date Tested: 24/08/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-02488
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
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Project: Palm Springs Boulevard

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Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
1	3	100	5.8
1	3	200	5.8
1	5	300	10.5
1	8	400	18.0
1	11	500	25.9
1	13	600	31.3
1	16	700	39.8
1	17	800	42.6

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Report No: PR:BOP16S-02493
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Test Details

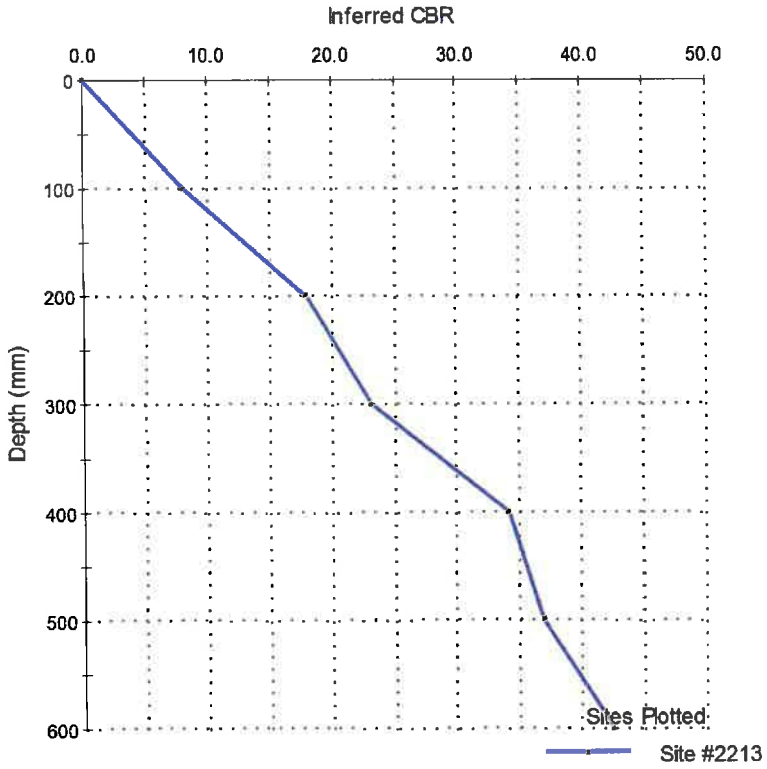
Sample ID: BOP16S-02493
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Stage 12 - Lot 2213
Date Tested: 24/08/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Report No: PR:BOP16S-02493
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
2213	4	100	8.1
2213	8	200	18.0
2213	10	300	23.2
2213	14	400	34.1
2213	15	500	36.9
2213	17	600	42.6

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Report No: PR:BOP16S-02494
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The tests reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. Samples are tested as received, in natural condition, unless stated otherwise in the comments. This report may only be reproduced in full.

IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Test Details

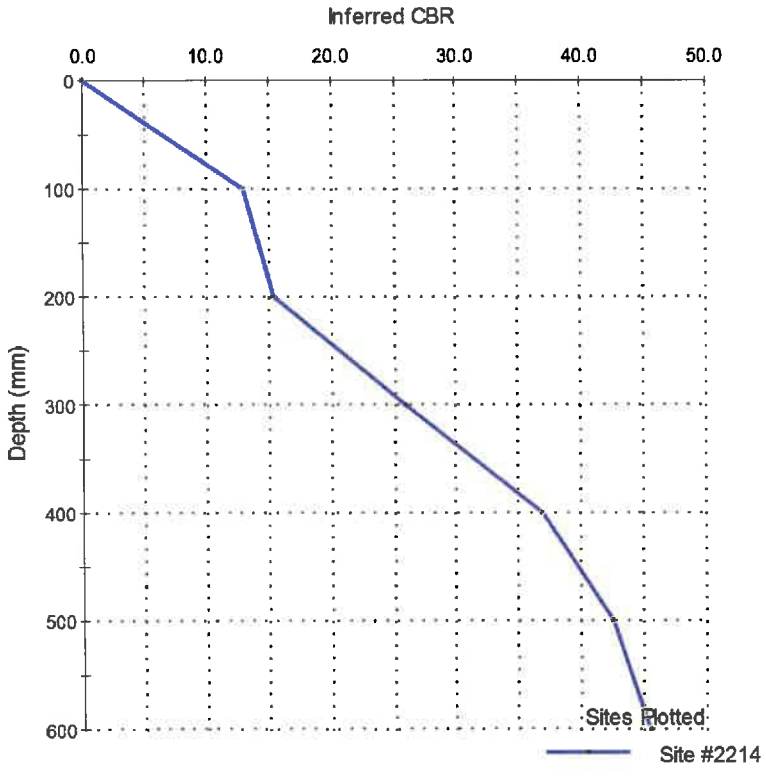
Sample ID: BOP16S-02494
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Stage 12 - Lot 2214
Date Tested: 24/08/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-02494
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
2214	6	100	12.9
2214	7	200	15.4
2214	11	300	25.9
2214	15	400	36.9
2214	17	500	42.6
2214	18	600	45.5

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Report No: PR:BOP16S-02551
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The tests reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. Samples are tested as received, in natural condition, unless stated otherwise in the comments. This report may only be reproduced in full.

IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Test Details

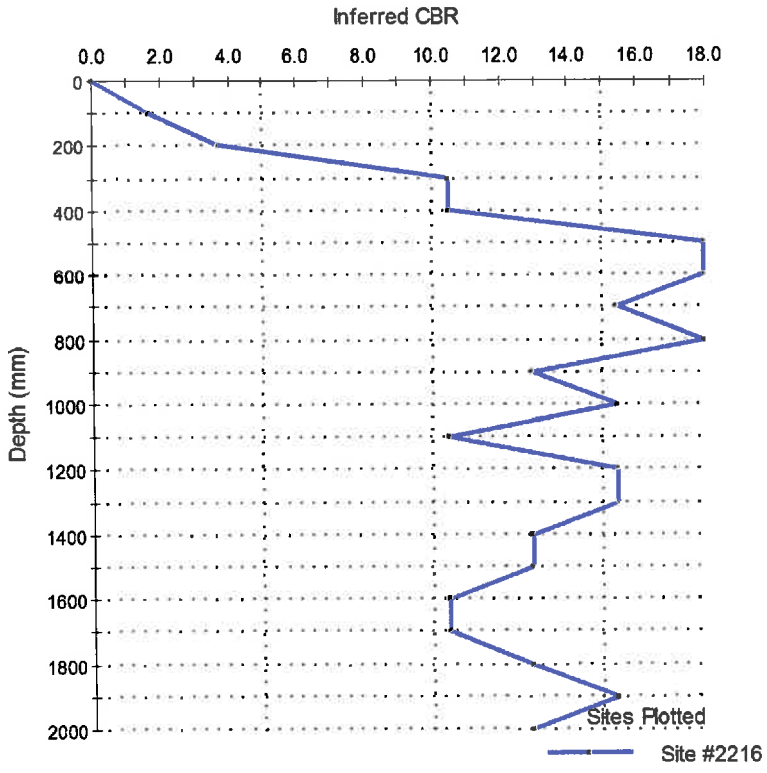
Sample ID: BOP16S-02551
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Lot# 2216
Date Tested: 5/09/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

Results for depths beyond 1 metre are not accredited, and are excluded from the endorsement of this test report.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Report No: PR:BOP16S-02551
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
2216	1	100	1.7
2216	2	200	3.7
2216	5	300	10.5
2216	5	400	10.5
2216	8	500	18.0
2216	8	600	18.0
2216	7	700	15.4
2216	8	800	18.0
2216	6	900	12.9
2216	7	1000	15.4
2216	5	1100	10.5
2216	7	1200	15.4
2216	7	1300	15.4
2216	6	1400	12.9
2216	6	1500	12.9
2216	5	1600	10.5
2216	5	1700	10.5
2216	6	1800	12.9
2216	7	1900	15.4
2216	6	2000	12.9

Comments

Results for depths beyond 1 metre are not accredited, and are excluded from the endorsement of this test report.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Report No: PR:BOP16S-02552
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

The tests reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. Samples are tested as received, in natural condition, unless stated otherwise in the comments. This report may only be reproduced in full.

IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Test Details

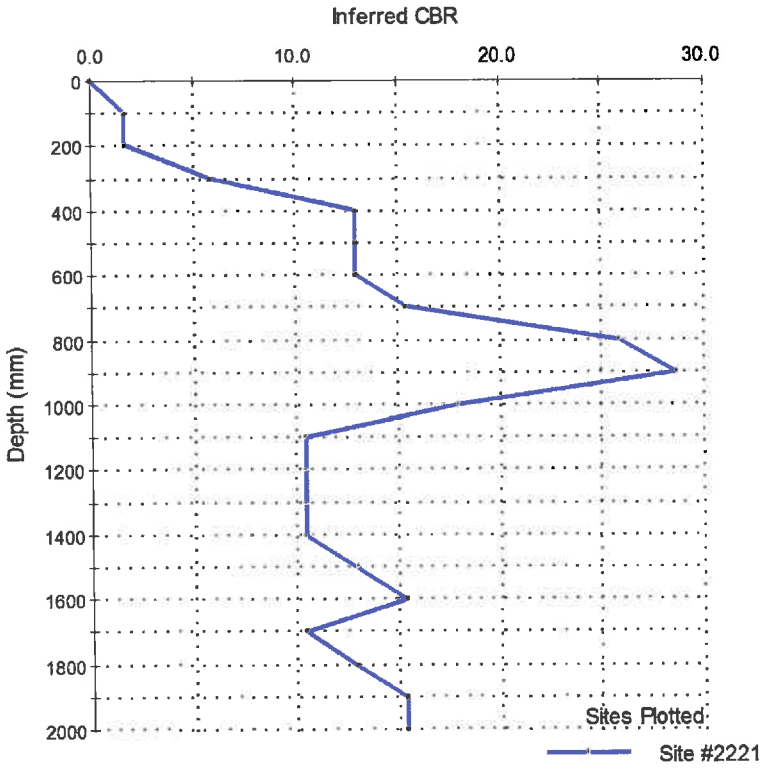
Sample ID: BOP16S-02552
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Lot# 2221
Date Tested: 5/09/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

Results for depths beyond 1 metre are not accredited, and are excluded from the endorsement of this test report.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Report No: PR:BOP16S-02552
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

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Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
2221	1	100	1.7
2221	1	200	1.7
2221	3	300	5.8
2221	6	400	12.9
2221	6	500	12.9
2221	6	600	12.9
2221	7	700	15.4
2221	11	800	25.9
2221	12	900	28.6
2221	8	1000	18.0
2221	5	1100	10.5
2221	5	1200	10.5
2221	5	1300	10.5
2221	5	1400	10.5
2221	6	1500	12.9
2221	7	1600	15.4
2221	5	1700	10.5
2221	6	1800	12.9
2221	7	1900	15.4
2221	7	2000	15.4

Comments

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0800 LABORATORY

Report No: PR:BOP16S-02495
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Test Details

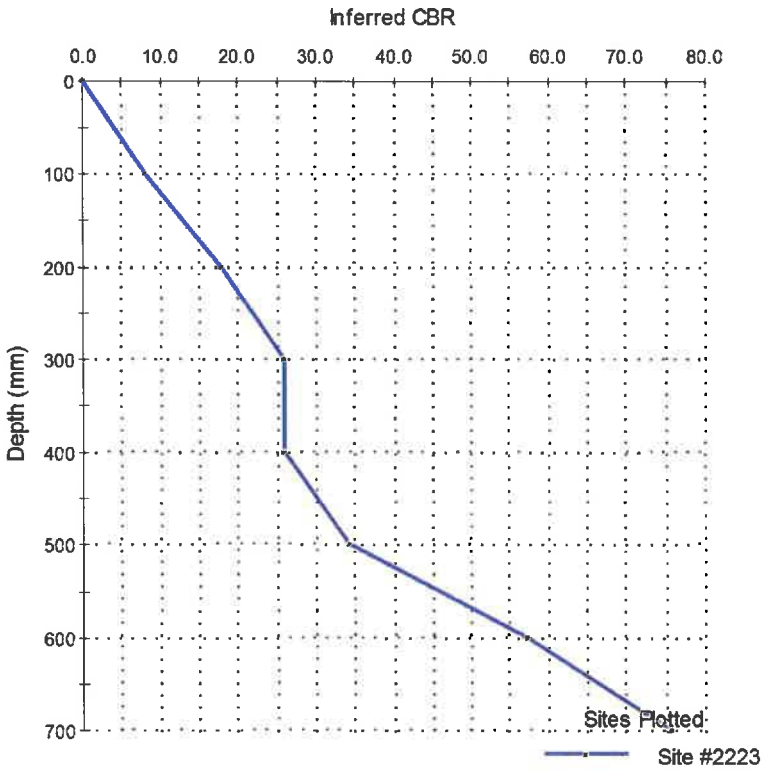
Sample ID: BOP16S-02495
Tested By: Rob Ermens
Material: Insitu Fill Sand
Location: Stage 12 - Lot 2223
Date Tested: 24/08/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

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Project: Palm Springs Boulevard

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Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
2223	4	100	8.1
2223	8	200	18.0
2223	11	300	25.9
2223	11	400	25.9
2223	14	500	34.1
2223	22	600	57.3
2223	28	700	75.5

Comments

The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Report No: PR:BOP16S-02496
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Test Details

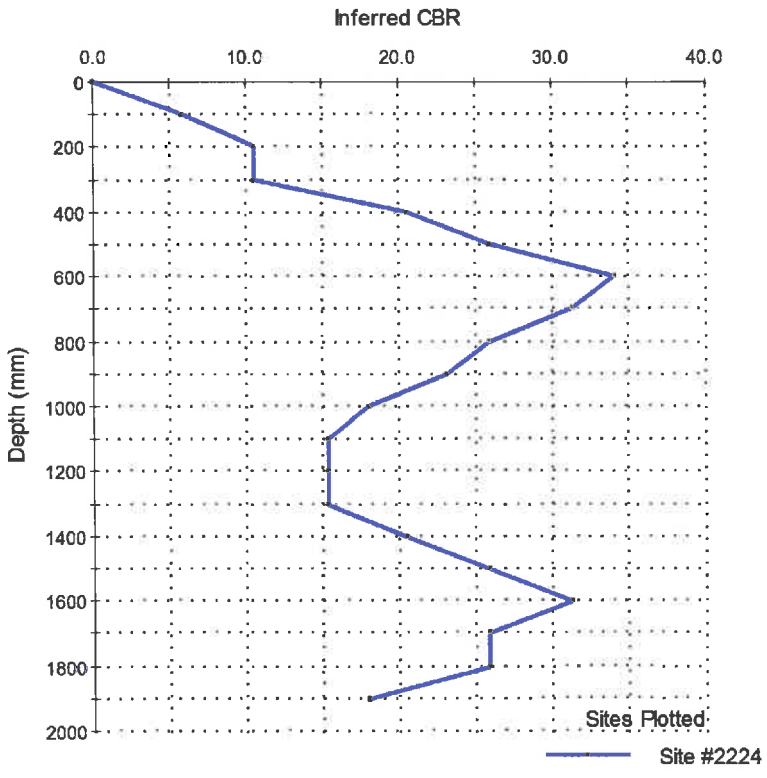
Sample ID: BOP16S-02496
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Stage 12 - Lot 2224
Date Tested: 24/08/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

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The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Penetration Resistance

Report No: PR:BOP16S-02496
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
2224	3	100	5.8
2224	5	200	10.5
2224	5	300	10.5
2224	9	400	20.6
2224	11	500	25.9
2224	14	600	34.1
2224	13	700	31.3
2224	11	800	25.9
2224	10	900	23.2
2224	8	1000	18.0
2224	7	1100	15.4
2224	7	1200	15.4
2224	7	1300	15.4
2224	9	1400	20.6
2224	11	1500	25.9
2224	13	1600	31.3
2224	11	1700	25.9
2224	11	1800	25.9
2224	8	1900	18.0

Comments

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Penetration Resistance

Report No: PR:BOP16S-02497
Issue No: 1

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Test Details

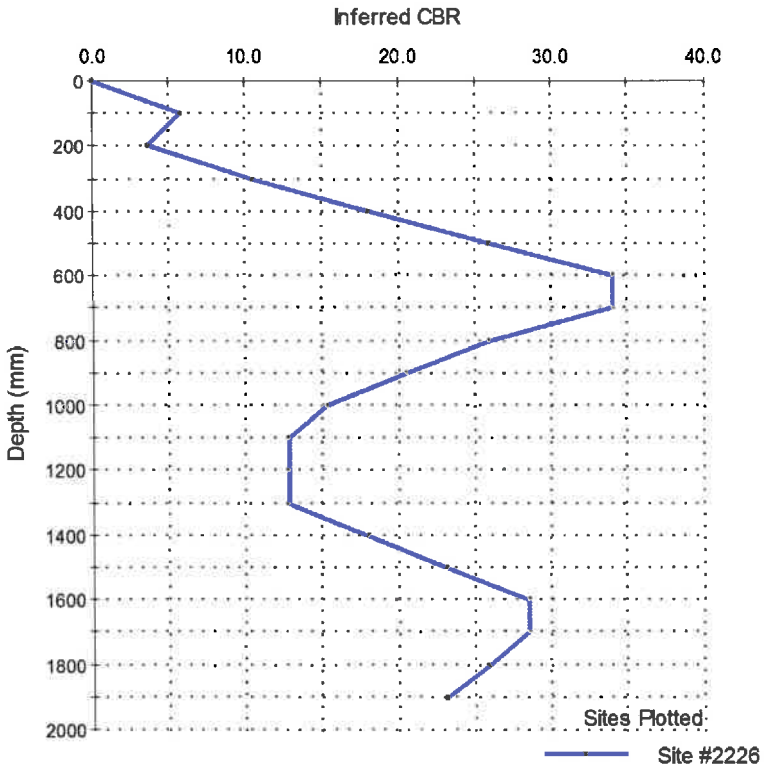
Sample ID: BOP16S-02497
Tested By: Barrack Carle
Material: Insitu Fill Sand
Location: Stage 12 - Lot 2226
Date Tested: 24/08/2016
Specification: Contract Specification

Test Results

NZS 4402:1988 Test 6.5.2

Depth of Excavation to surface (mm): 0
Depth at the Commencement (mm): 0

Penetration vs Inferred CBR



Inferred CBR values are based on Austroads Pavement Design:
Guide to the Structural Design of Road Pavements Section 5.5.2 & Fig 5.2

Comments

Results for depths beyond 1 metre are not accredited, and are excluded from the endorsement of this test report.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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Report No: PR:BOP16S-02497
Issue No: 1

Penetration Resistance

Client: Gareth Brown
HEB Construction Ltd
PO Box 226

Drury 2247
NZ

Project: Palm Springs Boulevard

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IANZ ACCREDITED LABORATORY

Approved Signatory: Rob Ermens
(Lab Manager)
IANZ Accreditation No:749
Date of Issue: 12/10/2016

Penetration Resistance Test Results

Site	Blows	Depth (mm)	Inferred CBR
2226	3	100	5.8
2226	2	200	3.7
2226	5	300	10.5
2226	8	400	18.0
2226	11	500	25.9
2226	14	600	34.1
2226	14	700	34.1
2226	11	800	25.9
2226	9	900	20.6
2226	7	1000	15.4
2226	6	1100	12.9
2226	6	1200	12.9
2226	6	1300	12.9
2226	8	1400	18.0
2226	10	1500	23.2
2226	12	1600	28.6
2226	12	1700	28.6
2226	11	1800	25.9
2226	10	1900	23.2

Comments

Results for depths beyond 1 metre are not accredited, and are excluded from the endorsement of this test report.
The inferred CBR calculation is not accredited, and is excluded from the endorsement of this test report.

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APPENDIX IV

Falling Head Soakage Test Results

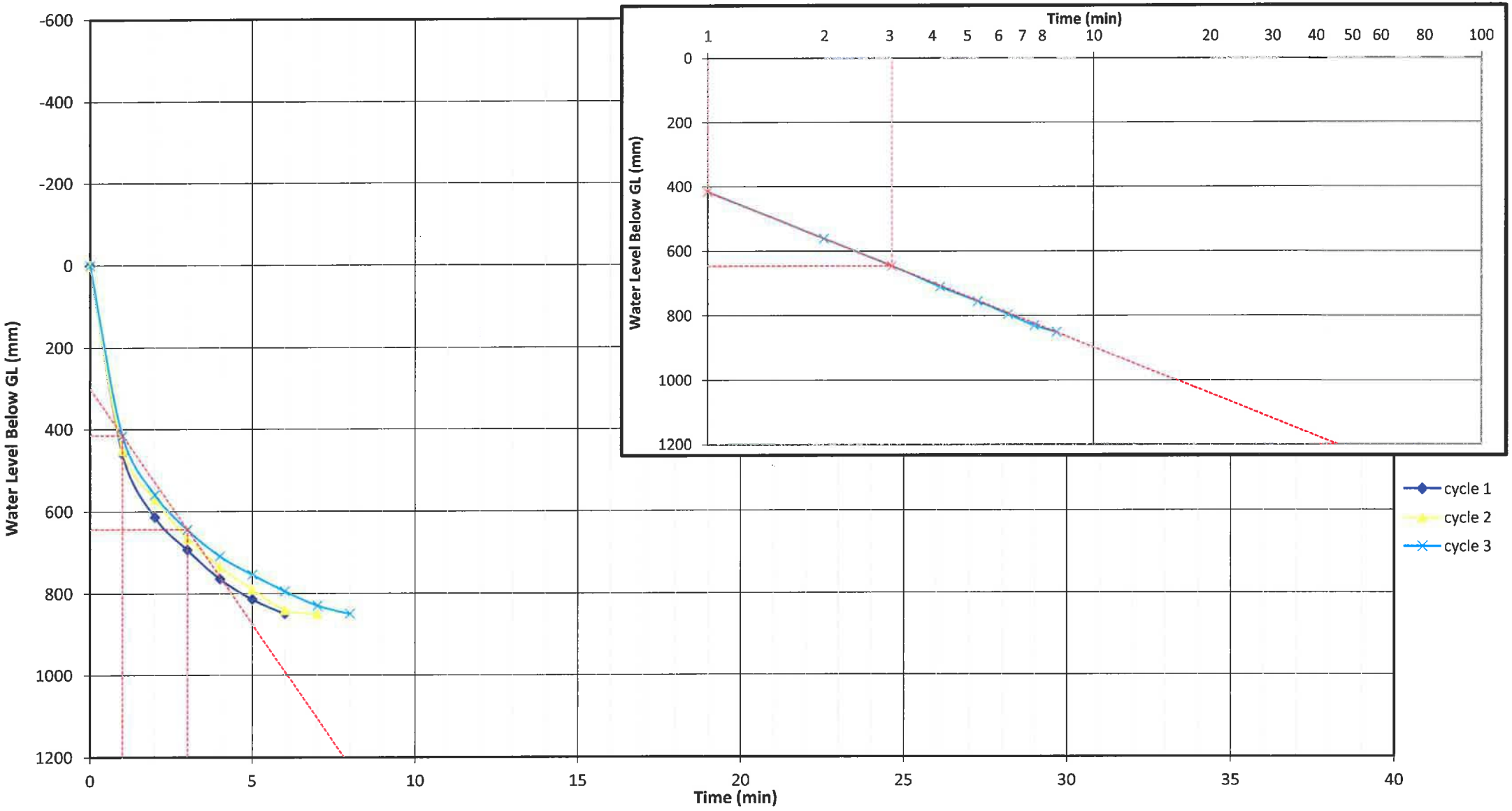
Soakage Analysis Calculations

Our Ref: 21078-S12
Date: 17/10/2016

Palm Springs Stage 12, Papamoa

Soakage Test Position # S1

S & L CONSULTANTS LTD
SURVEYORS - ENGINEERS - PLANNERS



	Time (min)	Water Level (mm)
Time 1	1	415
Time 2	3	645

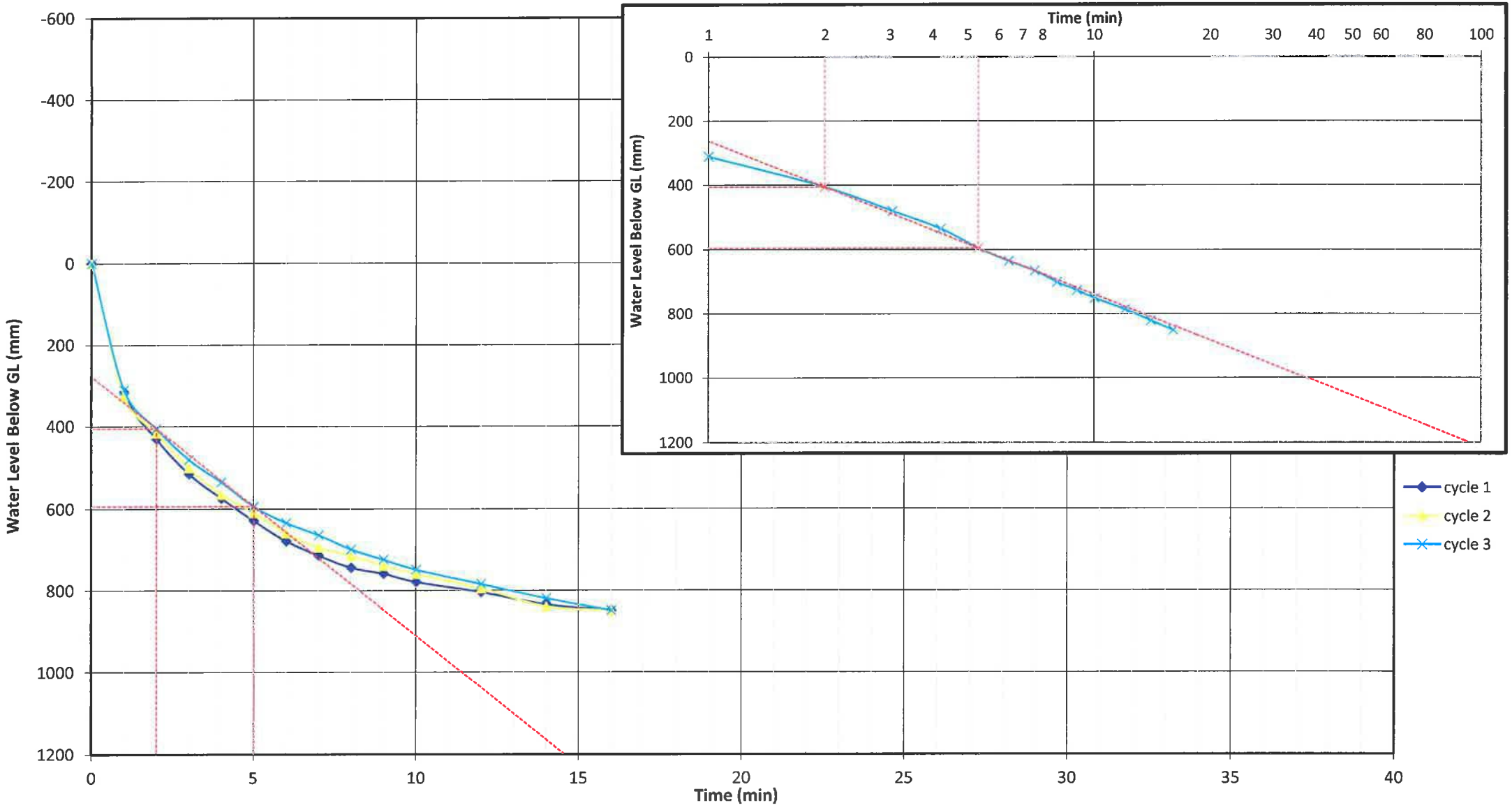
Soakage Rate = 6900 mm/hr

Our Ref: 21078-S12
Date: 17/10/2016

Palm Springs Stage 12, Papamoa

Soakage Test Position # S2

S & L CONSULTANTS LTD
SURVEYORS - ENGINEERS - PLANNERS



	Time (min)	Water Level (mm)
Time 1	2	405
Time 2	5	595

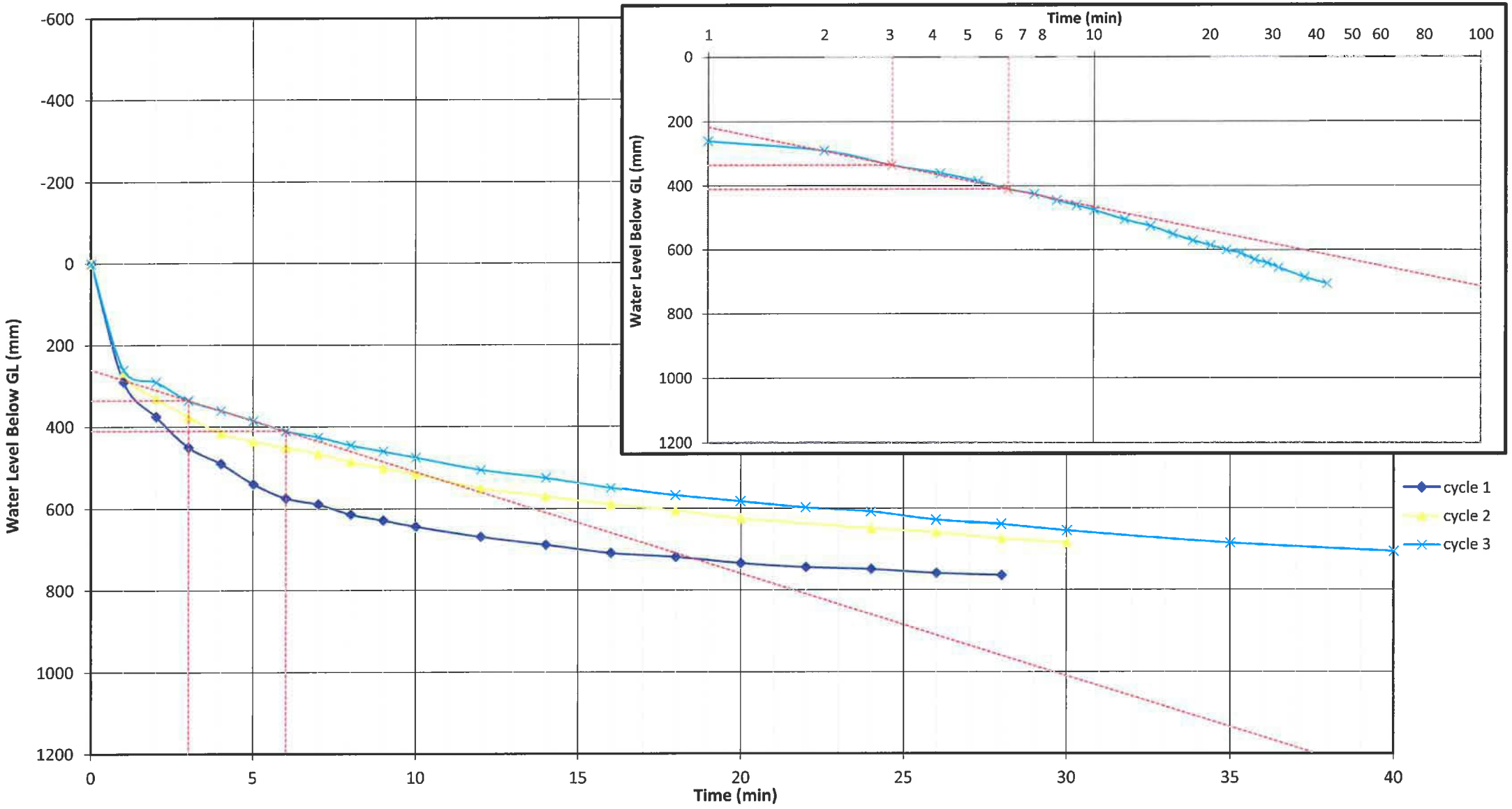
Soakage Rate = 3800 mm/hr

Our Ref: 21078-S12
Date: 14/10/2016

Palm Springs Stage 12, Papamoa

Soakage Test Position # S3

S & L CONSULTANTS LTD
SURVEYORS - ENGINEERS - PLANNERS



	Time (min)	Water Level (mm)
Time 1	3	335
Time 2	6	410

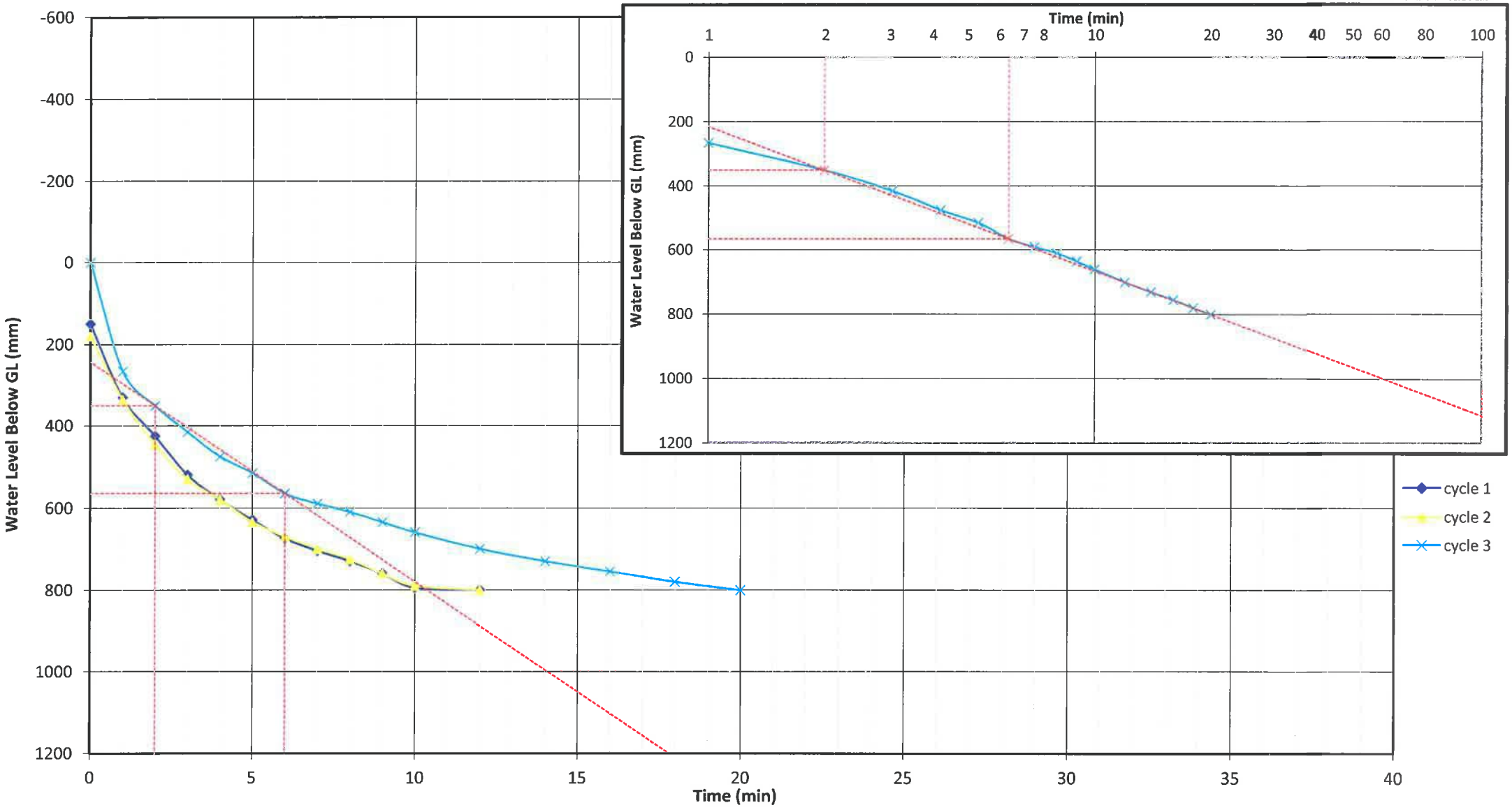
Soakage Rate = 1500 mm/hr

Our Ref: 21078-S12
Date: 14/10/2016

Palm Springs Stage 12, Papamoa

Soakage Test Position # S4

S & L CONSULTANTS LTD
SURVEYORS - ENGINEERS - PLANNERS



	Time (min)	Water Level (mm)
Time 1	2	350
Time 2	6	565

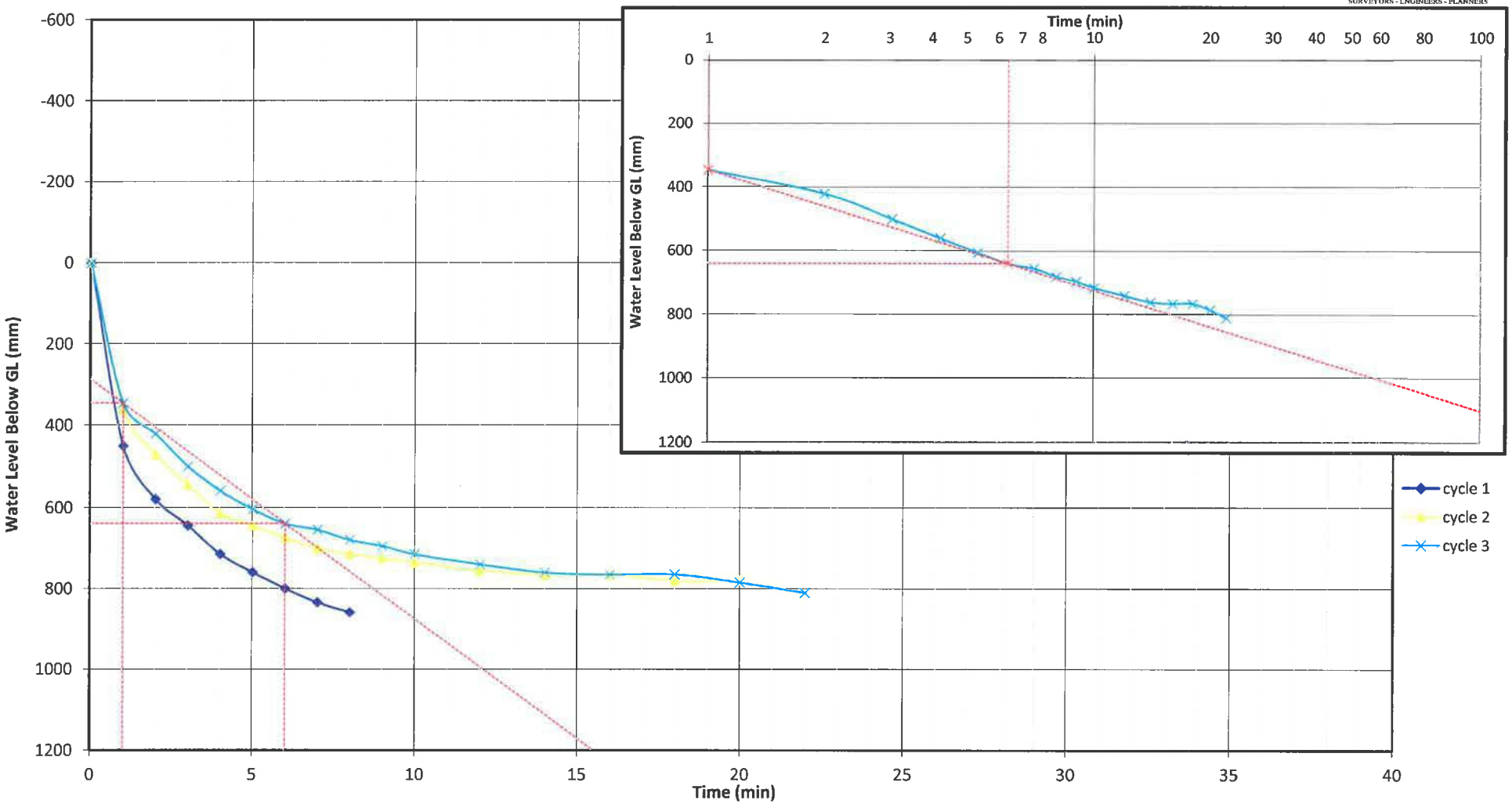
Soakage Rate = 3225 mm/hr

Our Ref: 21078-S12
Date: 14/10/2016

Palm Springs Stage 12, Papamoa

Soakage Test Position # S5

S & L CONSULTANTS LTD
SURVEYORS - ENGINEERS - PLANNERS



	Time (min)	Water Level (mm)
Time 1	1	345
Time 2	6	640

Soakage Rate = 3540 mm/hr

Our ref: 20464 Date: October 2015

S & L CONSULTANTS LTD
SURVEYORS - ENGINEERS - PLANNERS

Soakage Test Analyses
Location: Palm Springs Subdivision Stage 12

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 1500 mm/h, derived from site tests, 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 =1.0
i = 65 mm/h (taken from TCC IDC for a 1:10 year (10% AEP) rainfall, 1 hour event)
A = the catchment area in ha

Rc = 10 * 1.0 * 65 * A = 650*A m^3

Parameters for soak rings, 1.35m (3 rings) deep are

	500mm ID	800mm ID
V (storage) = $\frac{\pi d^2}{4}$ x 1.35m deep	0.265 m^3	0.677 m^3
A (soakage) = base area + wall area = $\pi d^2/4 + \pi d$ x 1.35	2.3 m^2	3.9 m^2
Soakage rate Sr from graph = 1500 mm/h x 0.5	750 mm/h	750 mm/h
V (soakage) = A (soakage) x Sr / 1000	1.725 m^3/h	2.925 m^3/h
Rc = V(storage + V(soakage) =	= 0.265 m^3 + 1.725 m^3 = 1.99 m^3	= 0.677 m^3 + 2.925 m^3 = 3.60m^3
Area of catchment served = Rc / 650	30.6 m^2	55 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 30 m^2.

800 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 55 m^2

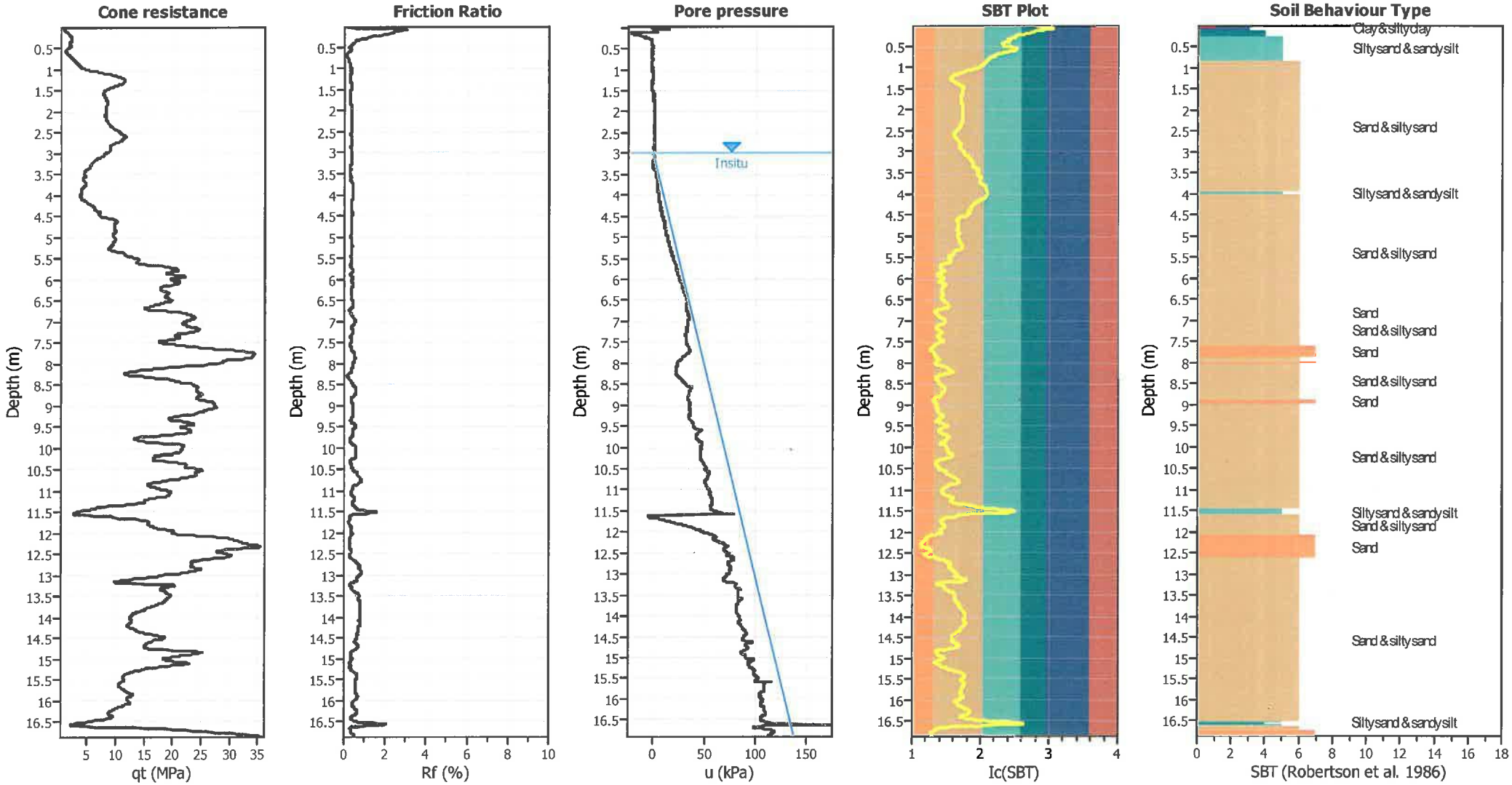
These results are consistent with the results of analyses for previous stages 8, 9, 10 and 11 within the Palm Springs subdivision.

APPENDIX V

CPT Basic Interpretation Plots
Liquefaction Analysis Plots

(test positions shown on 20464-AB48)

CPT basic interpretation plots



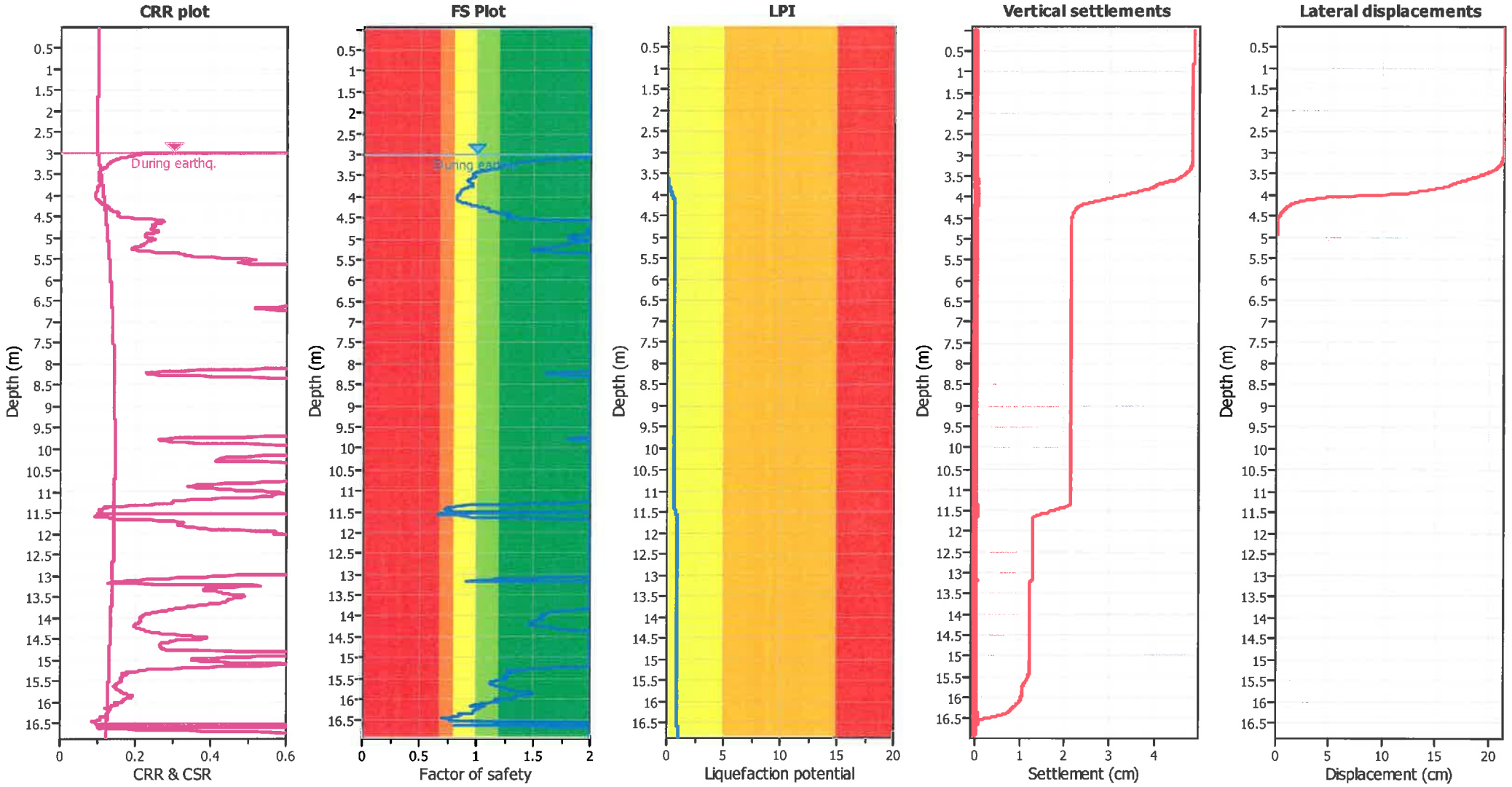
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	3.00 m	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	6.00	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):	3.00 m	Fill height:	N/A	Limit depth:	20.00 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

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	3.00 m	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	6.00	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):	3.00 m	Fill height:	N/A	Limit depth:	20.00 m

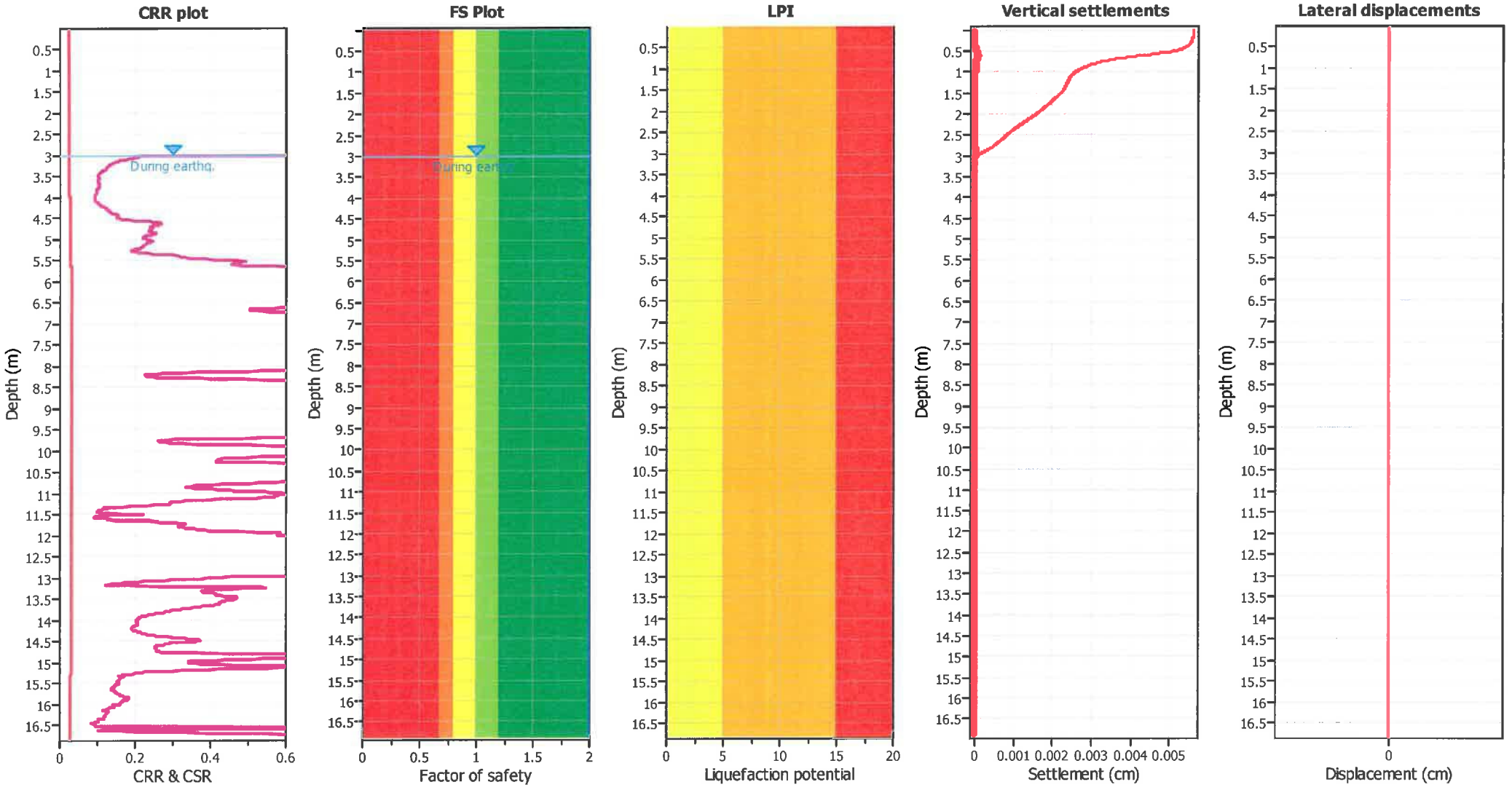
F.S. color scheme

- 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

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	3.00 m	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	6.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.06	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A	Limit depth:	N/A

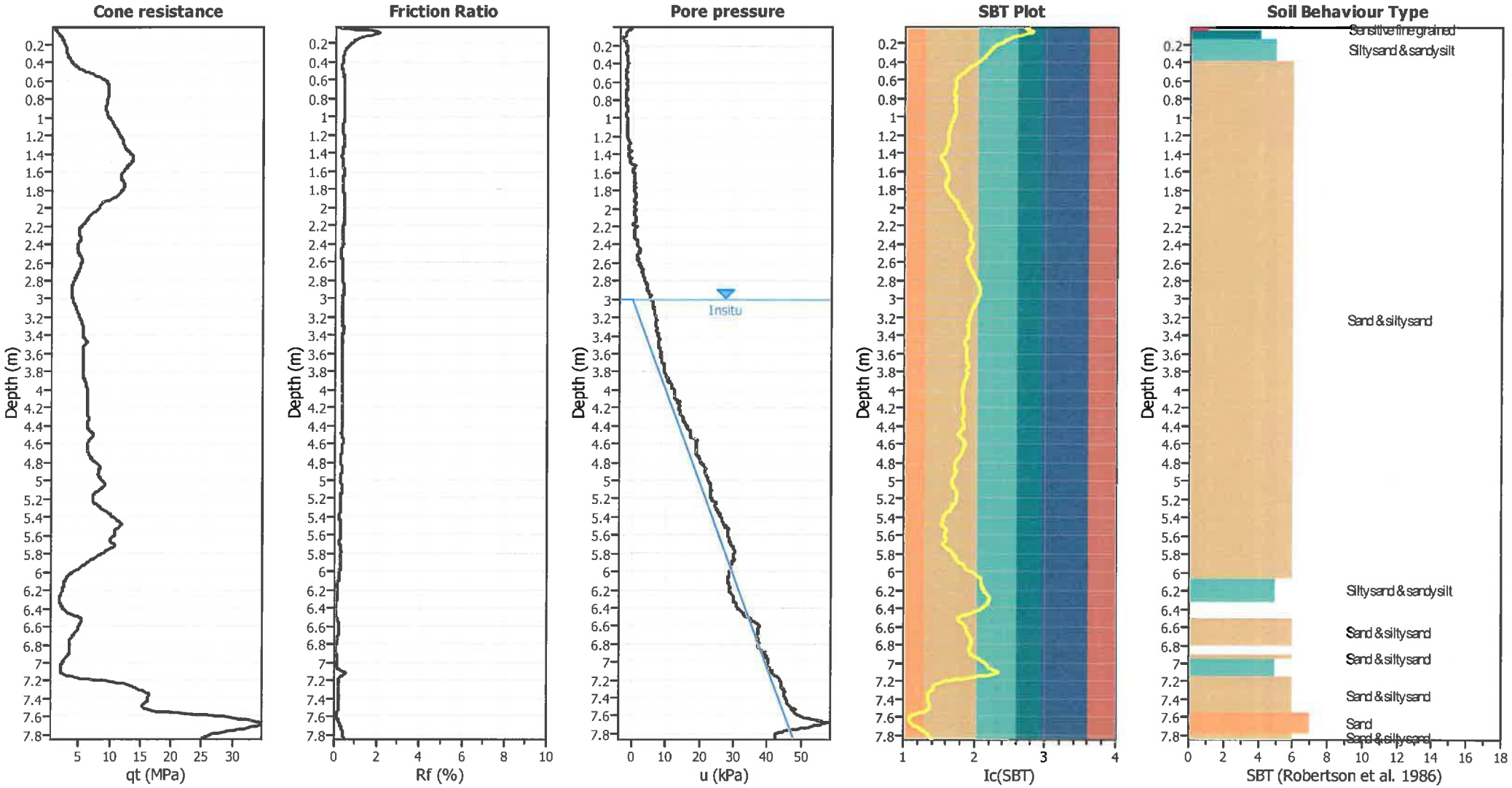
F.S. color scheme

- 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



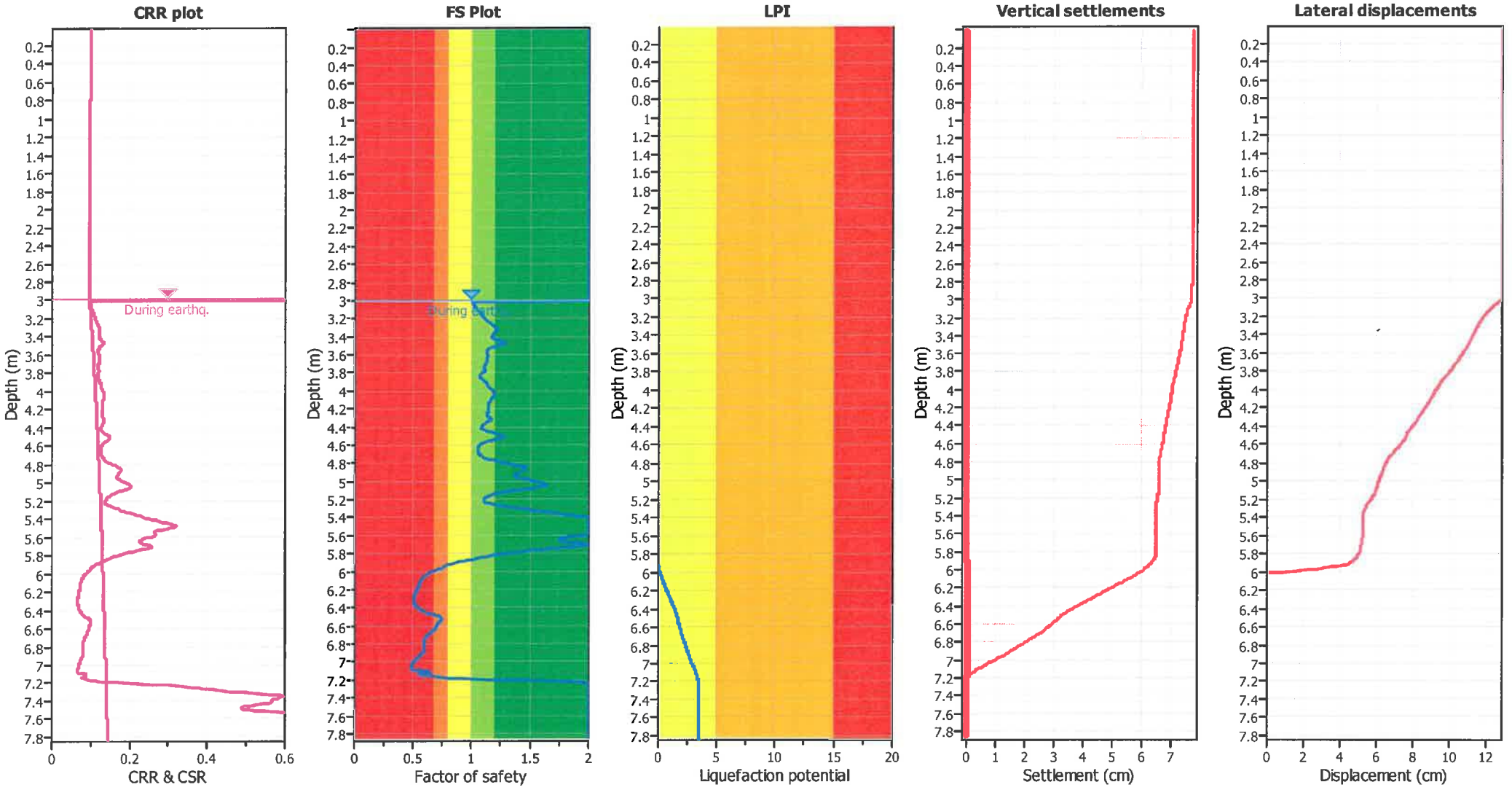
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	3.00 m	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	6.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.27	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A	Limit depth:	N/A

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

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	3.00 m	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	6.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.27	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A	Limit depth:	N/A

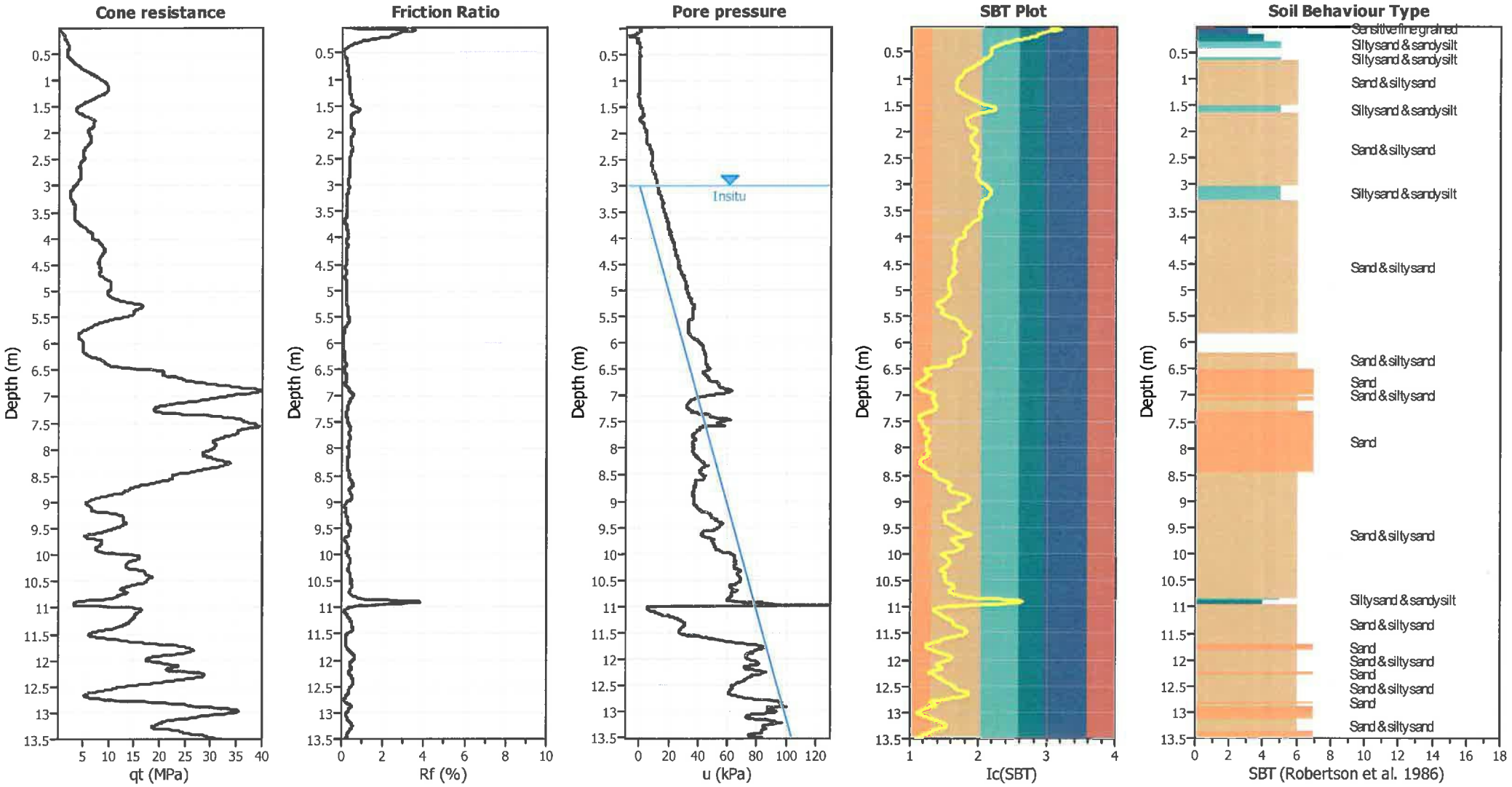
F.S. color scheme

- 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



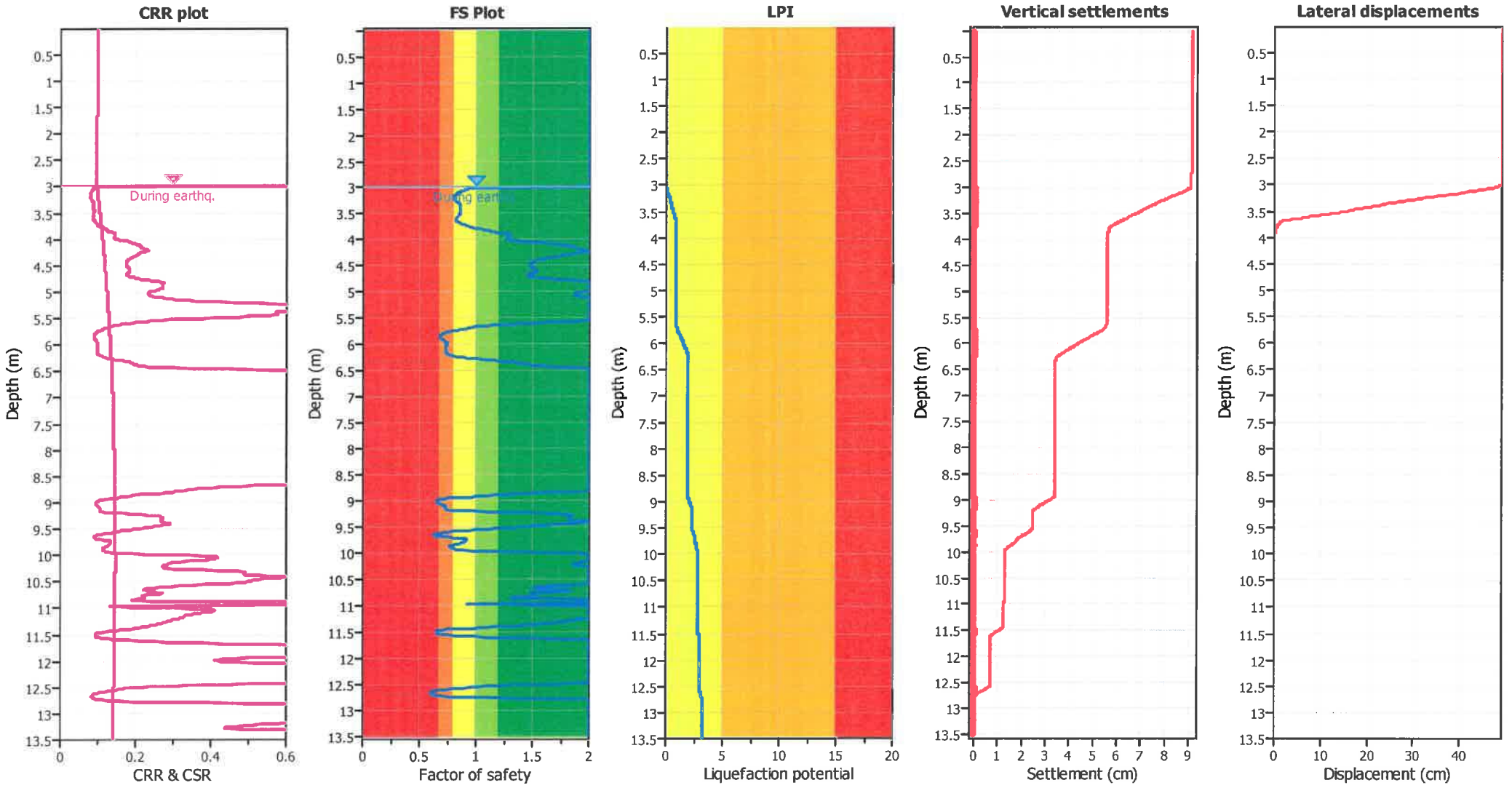
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	3.00 m	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	6.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.27	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A	Limit depth:	N/A

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

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	3.00 m	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	6.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.27	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	3.00 m	Fill height:	N/A	Limit depth:	N/A

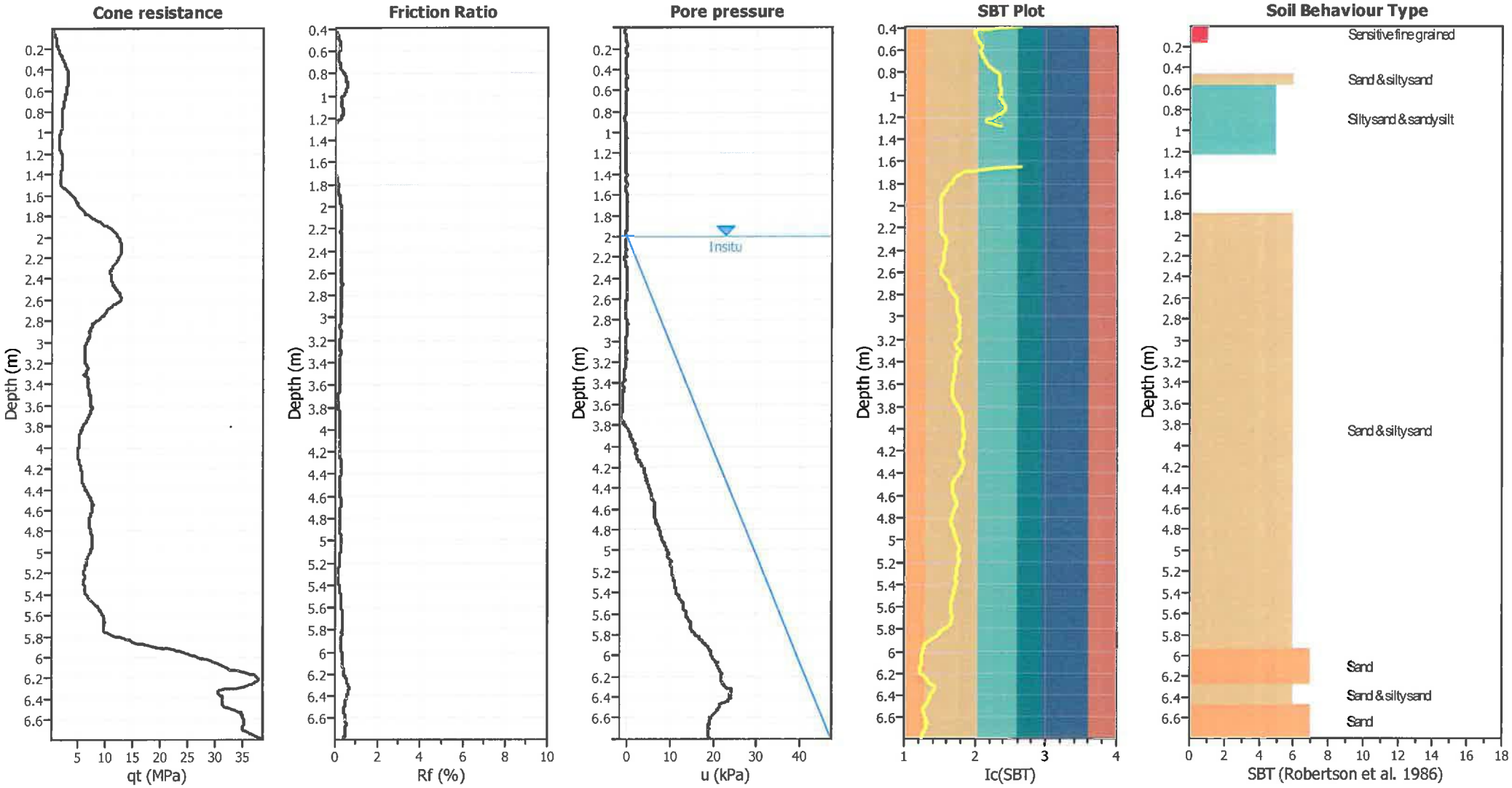
F.S. color scheme

- 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



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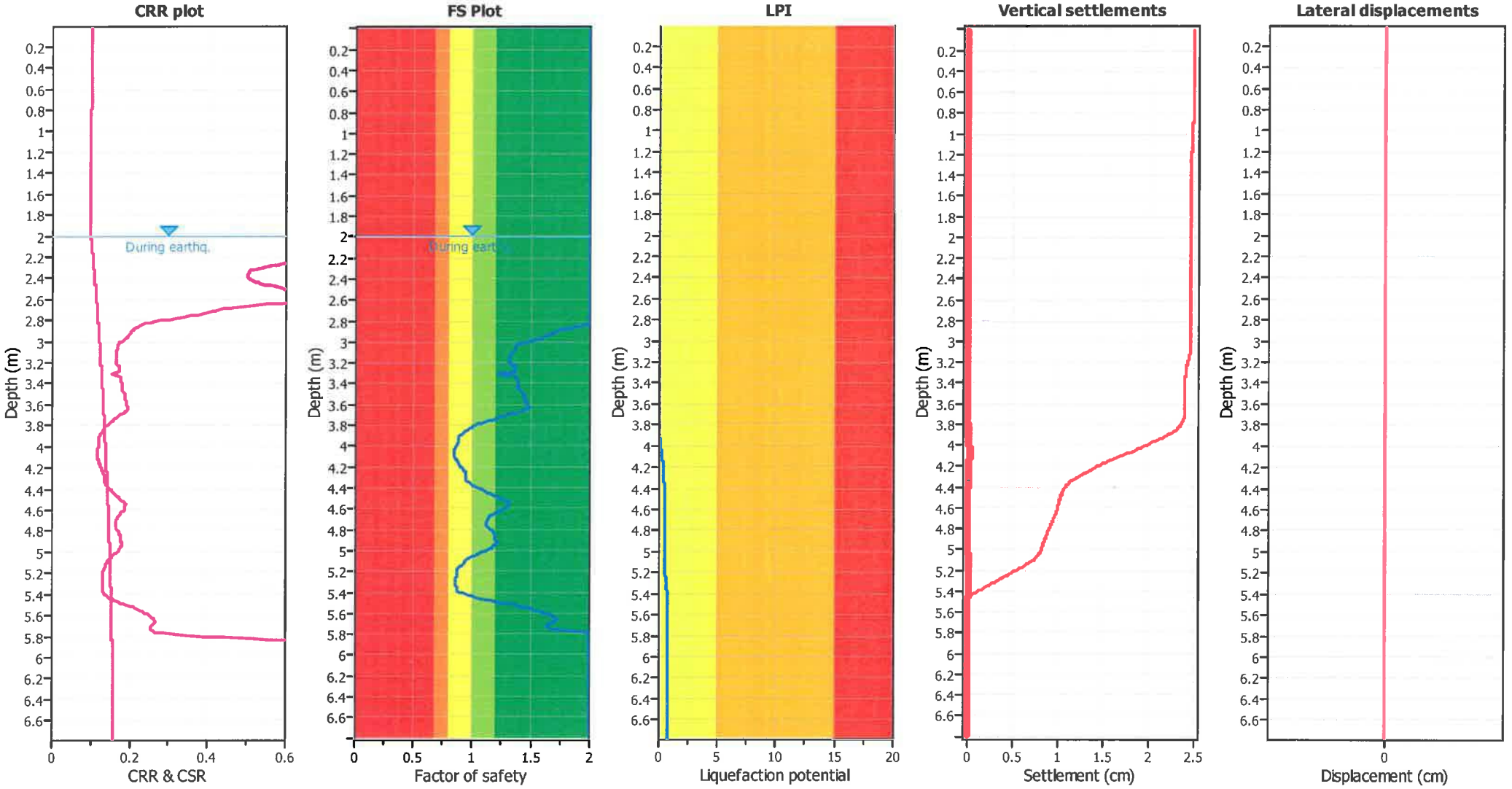
SBT legend

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



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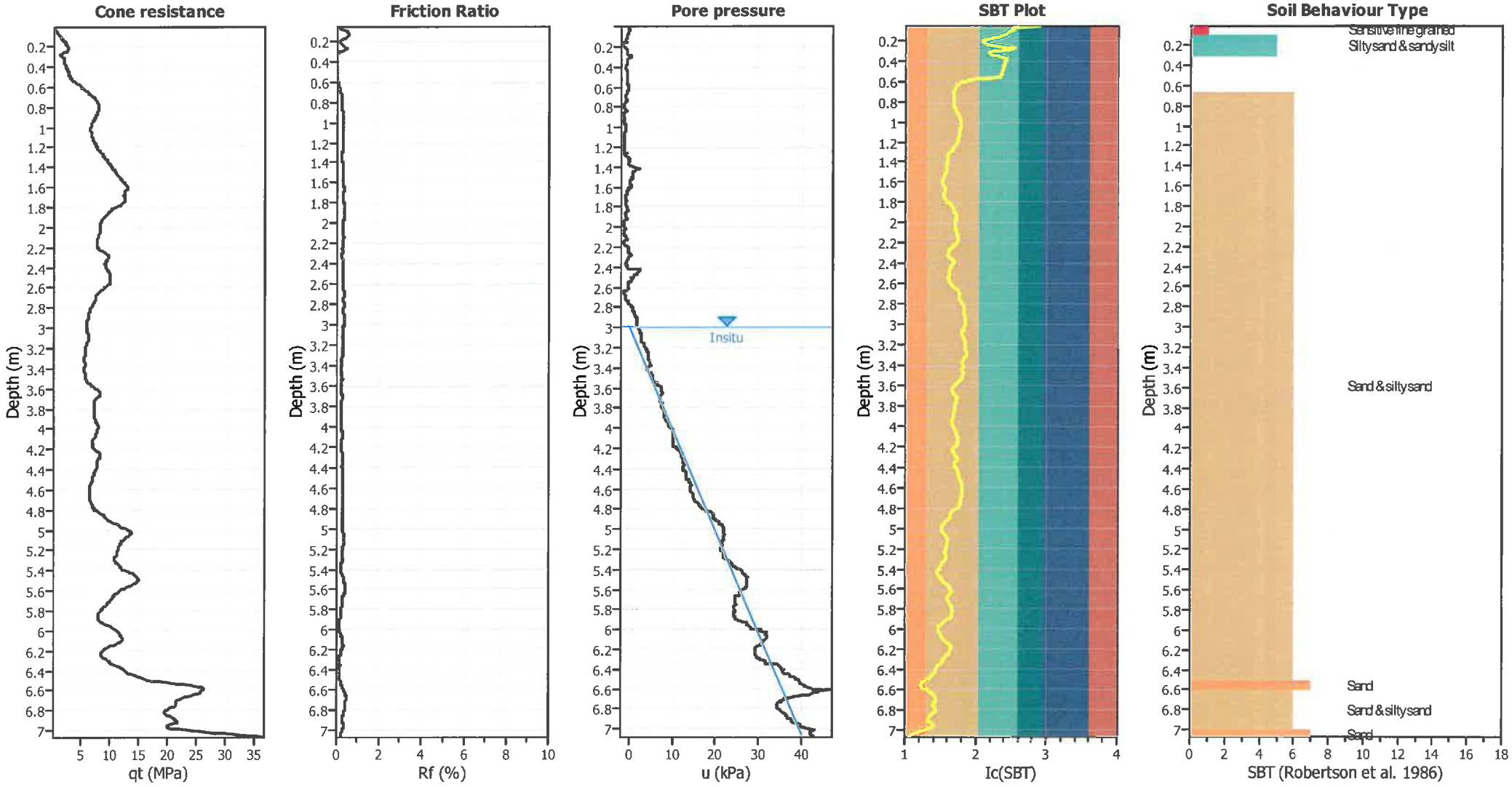

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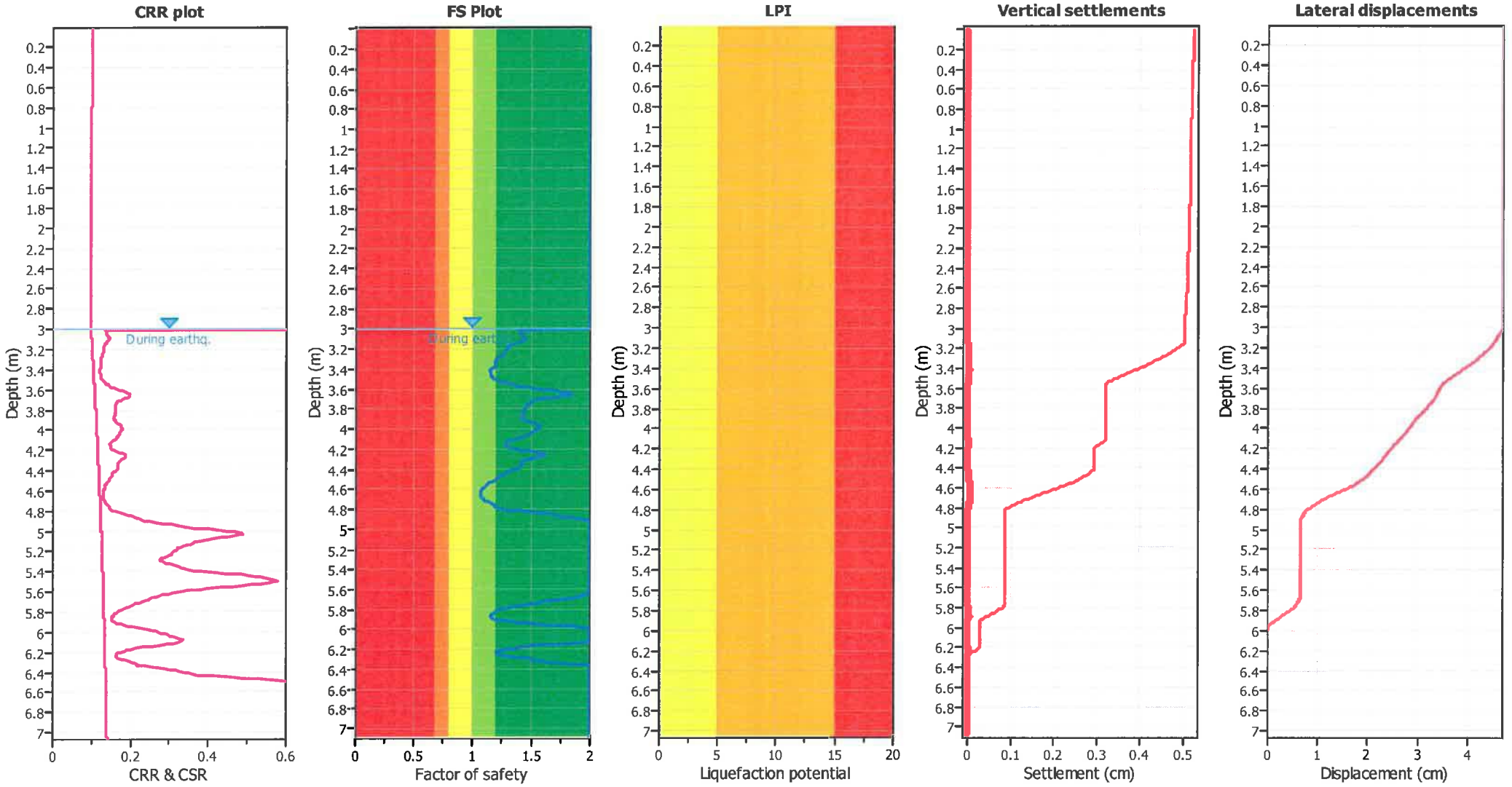
Liquefaction analysis overall plots



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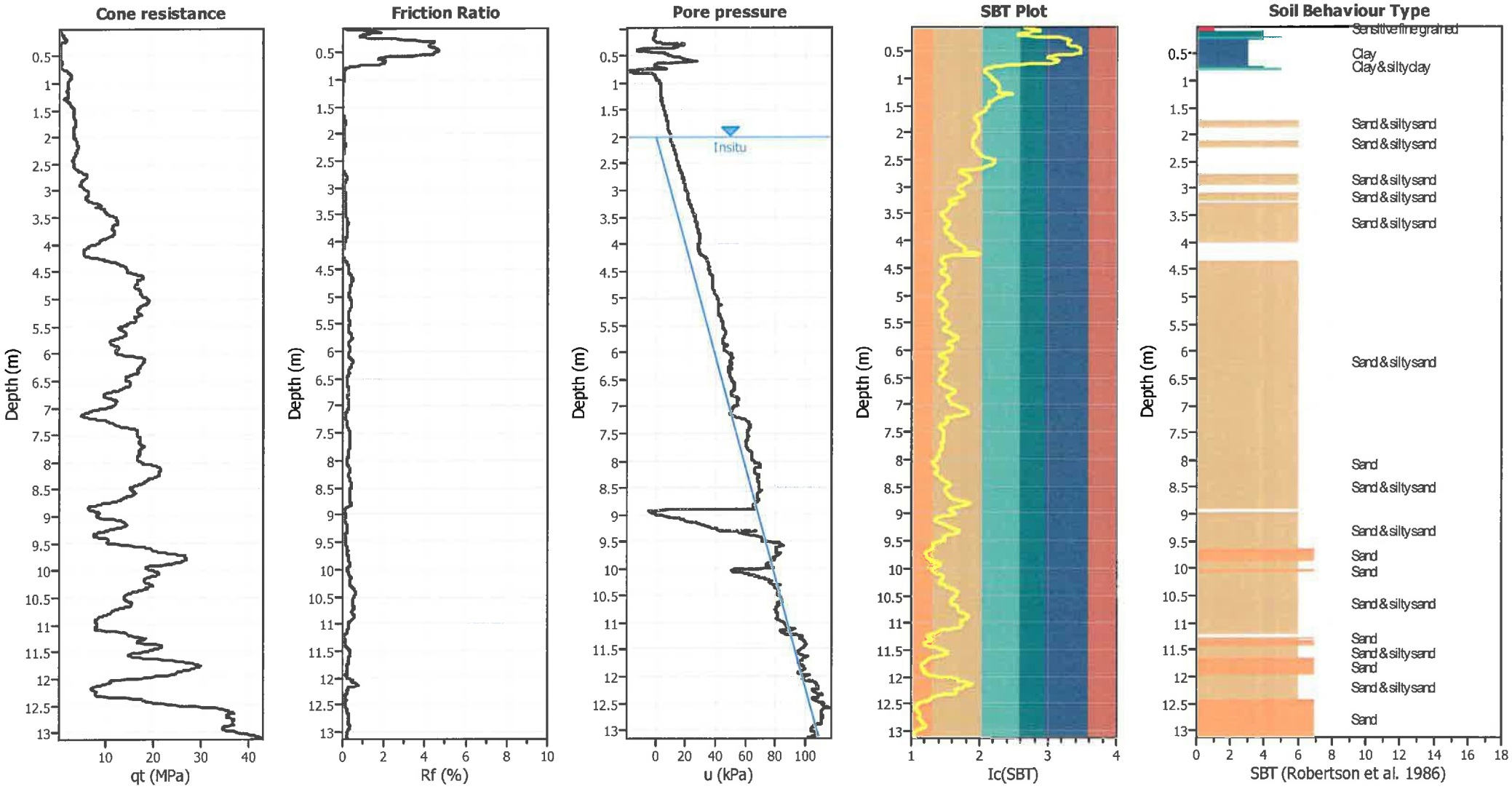

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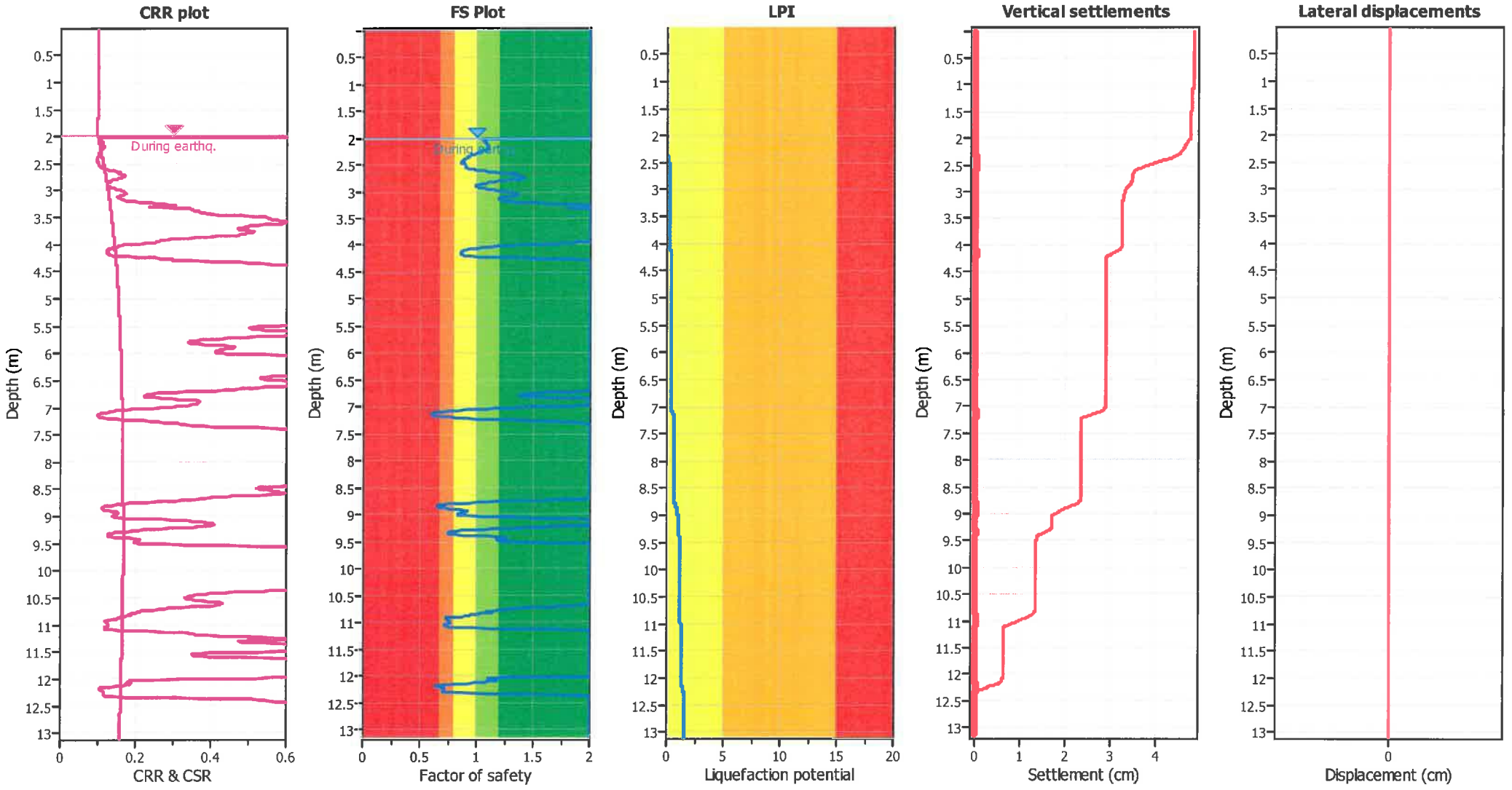
Liquefaction analysis overall plots



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KIRK ROBERTS CONSULTING

16 August 2021

Steve Page
Page Earthworks
Tauranga (by email)

JOB NO: 2120626

Dear Steve,

RE: Ground Inspection Report for the Proposed Dwelling at 72 C The Boulevard, Papamoa, Tauranga
Building Consent Number 311506

At the request of Page Earthworks, an inspection of the build site at 72 C The Boulevard, Papmoa, Tauranga (Lot 2224, DP 503458) was undertaken on 04 August 2021. The purpose of this inspection was to identify if ground conditions were consistent with those outlined in the S&L Consultants Geotechnical Completion Report[1], dated 2 November 2016. Prior to our inspection, Page Earthworks had stripped all topsoil from beneath the proposed building platform. Our testing consisted of the following:

- Visual Inspection revealed site preparations extended a suitable distance past the proposed building platform. Approximately 0.3 m of film material would be required to raise the ground height to the required level. Photographs have been kept on file.
- Four hand auger boreholes were undertaken to a depth of 1.5m below prepared ground level (HA-1 to HA-4, as shown on the attached site plan SK-1). Hand auger results indicated the site was underlain by sandy soils. No significant organic material was identified.
- Four Scala Penetrometer tests were conducted (SP-1 to SP-4, as shown on the attached site plan SK-1), to a maximum depth of 1.5 m below the ground level. The results indicate that the underlying soils generally achieve a geotechnical ultimate bearing capacity of 300 kPa.

In our professional opinion, not to be construed as a guarantee, we believe that the ground conditions encountered are suitable for foundations designed in accordance with the geotechnical report referenced above.

Report prepared by:	Reviewed by:	Approved by:
Lovepreet Singh	David Simpson	Craig Manssen
Graduate Geotechnical Engineer	Geotechnical technician	BE (Hons), CMEngNZ, CPEng (ID: 161576)

Disclaimer

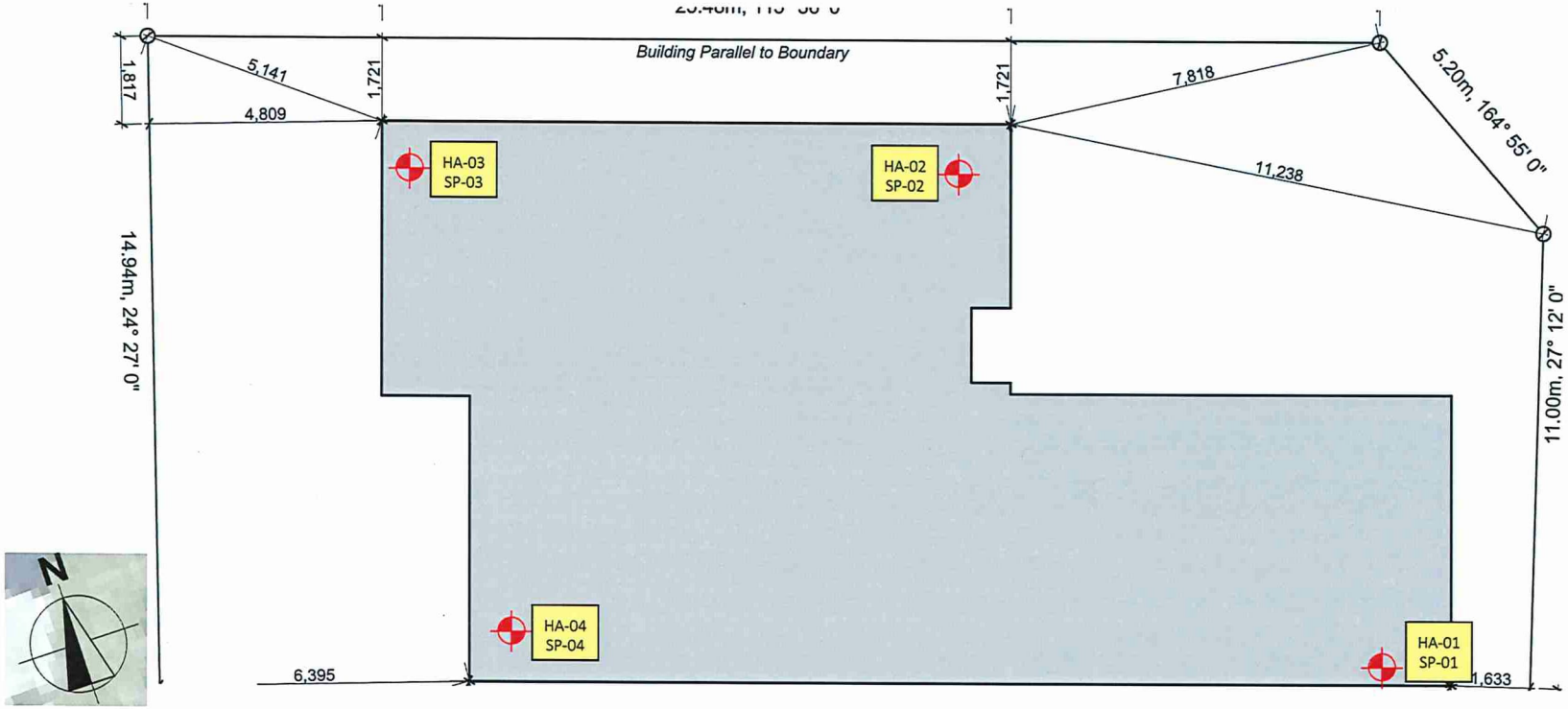
This report is based on information gained from limited subsurface test boring and sampling, supplemented by knowledge of local conditions from published sources. The report is therefore interpretative rather than factual and is limited to some extent by the scope of information on which it is based.

The advice tendered in this report is based on information obtained from the limited subsurface test boring and sample locations and is not warranted in respect to the conditions that may be encountered across the site at other than these locations. It must be appreciated that the actual characteristics of the subsurface materials may vary significantly between adjacent test locations and sample intervals other than where observations, explorations and investigations have been made.

It should be noted that because of the inherent uncertainties in subsurface evaluations, changed or unanticipated subsurface conditions may occur that could affect total project cost and/or execution. Kirk Roberts Ltd does not accept responsibility for the consequences of significant variances in the conditions and the requirements for execution of the works.

[1] Palm Springs Residential Subdivision – Stage 12, The Boulevard (part), Forstera Place (part), Sarcodia Place, Papamoa – Geotechnical completion report including recommendations for building reference: 20464-12, 2 November 2016.

KIRK ROBERTS CONSULTING



Note:
Test positions and boundaries are indicative only.

Legend:

= Test Locations
HA= Hand Auger Locations
SP= Scala Penetrometer Locations
SV= Shear Vane Locations
Bdy = Boundary Locations

Site Plan was replicated from JMAC Architecture Homes drawings dated 14/06/2021.

No.	Date	Revision	By

Project	72C The Boulevard, Papamoa
Client	PAGE EARTHWORKS LTD
Title	SITE PLAN
Designed by	LS
Drawn by	LS
Checked by	DS
Date	11/08/2021
Scale	Not to Scale
Job No.	2120626
Drawing No.	SK - 1
Rev.	A

SCALA PENETROMETER & HAND AUGER RESULTS

KIRK ROBERTS CONSULTING

Client:	Page Earthworks	**Scala Penetrometer:**	SP-4
Site Address:	72C The Boulevard, Papmoa	**Hand Auger No.**	HA-4
Town/City:	Tauranga	**Job No.:**	2120626
Logged By:	LS	**Checked By:**	DS
Logged Date:	11/08/21	**Checked Date:**	16/08/21
		Date:	04/08/21
		Weather:	Rainy
		Operator:	DS

Geological Formation	Depth (m)	Sample Description	Graphic	USCS	D_r	Water Table	Undrained Shear Strength Su (kPa)	Blows per 100 mm of Penetration
	0.0	SAND (S); greyish brown. Moist, sand, fine to medium.		S	VL	Groundwater Not Encountered		2
					MD			4, 7, 6, 7
	0.5				D			8, 8
					MD			6, 7, 4, 4
	1.0				L			3, 3, 2.5, 2.5
	1.5	EOH: 1.50m						

Remarks:

Scala Penetrometer and Test Bore log tests give an indication of the ground condition at the location of the tests only. While they are representative of typical conditions across the site, they do not identify variations in the ground away from the test locations.

Generated with CORE-GS

SCALA PENETROMETER & HAND AUGER RESULTS

KIRK ROBERTS CONSULTING

Client:	Page Earthworks	**Scala Penetrometer:**	SP-3
Site Address:	72C The Boulevard, Papmoa	**Hand Auger No.**	HA-3
Town/City:	Tauranga	**Job No.:**	2120626
Logged By:	LS	**Checked By:**	DS
Logged Date:	11/08/21	**Checked Date:**	16/08/21
		Date:	04/08/21
		Weather:	Rainy
		Operator:	DS

Geological Formation	Depth (m)	Sample Description	Graphic	USCS	D_r	Water Table	Undrained Shear Strength Su (kPa)	Blows per 100 mm of Penetration
	0.0	SAND (S); greyish brown. Moist, sand, fine to medium.		S	VL	Groundwater Not Encountered		2
					L			3
					MD			6
								7
					D			8
	0.5							7
					MD			7
								5
								4
	1.0							5
								5
								5
								4
					L			3
	1.5	EOH: 1.50m						3

Remarks:

Scala Penetrometer and Test Bore log tests give an indication of the ground condition at the location of the tests only. While they are representative of typical conditions across the site, they do not identify variations in the ground away from the test locations.

Generated with CORE-GS

SCALA PENETROMETER & HAND AUGER RESULTS

KIRK ROBERTS CONSULTING

Client:	Page Earthworks	**Scala Penetrometer:**	SP-2
Site Address:	72C The Boulevard, Papmoa	**Hand Auger No.**	HA-2
Town/City:	Tauranga	**Job No.:**	2120626
Logged By:	LS	**Checked By:**	DS
Logged Date:	11/08/21	**Checked Date:**	16/08/21
		Date:	04/08/21
		Weather:	Rainy
		Operator:	DS

Geological Formation	Depth (m)	Sample Description	Graphic	USCS	D_r	Water Table	Undrained Shear Strength Su (kPa)	Blows per 100 mm of Penetration
	0.0	SAND (S); greyish brown. Moist, sand, fine to medium.		S	VL	Groundwater Not Encountered		2
					L			3
								5
					MD			7
					D			8
	0.5							6
								7
					MD			6
								5
	1.0							4
								4
					L			3
								3
								3
								3
	1.5	EOH: 1.50m						

Remarks:

Scala Penetrometer and Test Bore log tests give an indication of the ground condition at the location of the tests only. While they are representative of typical conditions across the site, they do not identify variations in the ground away from the test locations.

Generated with CORE-GS

SCALA PENETROMETER & HAND AUGER RESULTS

KIRK ROBERTS CONSULTING

Client:	Page Earthworks	**Scala Penetrometer:**	SP-1
Site Address:	72C The Boulevard, Papmoa	**Hand Auger No.**	HA-1
Town/City:	Tauranga	**Job No.:**	2120626
Logged By:	LS	**Checked By:**	DS
Logged Date:	11/08/21	**Checked Date:**	16/08/21
		Date:	04/08/21
		Weather:	Rainy
		Operator:	DS

Geological Formation	Depth (m)	Sample Description	Graphic	USCS	D_r	Water Table	Undrained Shear Strength Su (kPa)	Blows per 100 mm of Penetration
	0.0	SAND (S); light brown. Moist, sand, fine to medium.		S	L	Groundwater Not Encountered		3
					MD			5
								8
					D			11
		0.4m: becomes greyish brown						11
	0.5							10
								9
								7
								6
	1.0				MD			5
								5
								5
								4
								5
	1.5	EOH: 1.50m						4

Remarks:

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Generated with CORE-GS

Natural Hazards

TSUNAMI EVACUATION ZONE: Pāpāmoa East *(Wairakei)*

Tsunami Evacuation Zone

Tsunami Safe Area is anywhere beyond the Tsunami Evacuation zone

Tsunami Safe Locations are possible evacuation points

Evacuation Route

Waterway

Scale: 1:20,000

BAY OF PLENTY CIVIL DEFENCE EMERGENCY MANAGEMENT GROUP

Tauranga City

IMPORTANT

Parts of this area are at risk of tsunami

A **LONG** or **STRONG** earthquake could be your only warning.

Long or Strong GET GONE

LONG or STRONG: GET GONE

DO NOT ignore these natural warning signs:

- Strong earthquake where it is hard to stand up.
- Weak, rolling earthquake shaking for longer than a minute.
- Unusual sea behaviour, like sudden sea level changes.
- The sea making loud and unusual sounds, especially roaring noises.

WHAT TO DO?

1. **Leave immediately, don't wait for an official warning.**
2. **Walk or bike quickly if possible. Only drive if you have to.**
3. **Move quickly to higher ground, or as far from the coastline as possible.**

STAY OUT OF THE TSUNAMI EVACUATION ZONE AND LOW-LYING AREAS UNTIL YOU GET THE ALL CLEAR FROM OFFICIAL CHANNELS

For more information visit:
www.bopcivildefence.govt.nz

Follow Bay of Plenty Civil Defence on social media for updates.

facebook.com/bopcivildefence
twitter.com/bopcivildefence
Listen to the radio

VIEW ONLINE MAP HERE