

WDC LIM REPORT



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LAND INFORMATION MEMORANDUM NO: LM2501254**Received: 06 Aug 2025****Issued: 12 Aug 2025****Section 44A, Local Government Official Information
And Meetings Act 1987****APPLICANT**

S Maich
75 Forest View Road
RD 1
Te Kamo 0185

SITE INFORMATION

Property ID: 172239
Street Address: 98 Kaurinui Crescent, One Tree Point 0118
Legal Description: LOT 270 DP 564989

This is a Land Information Memorandum only.

Full payment has been made for this Land Information Memorandum.

1: PROPERTY DETAILS.

- Property Map
- Aerial Photo
- Record of Title: 1009387
- Deposited Plan: DP 564989

This property is subject to a Consent Notice, information attached.

- Interest Number 12201143.6 Dated – 03/11/2021

2: INFORMATION IDENTIFYING EACH (IF ANY) SPECIAL FEATURE OR CHARACTERISTIC OF THE LAND CONCERNED, INCLUDING BUT NOT LIMITED TO POTENTIAL EROSION, AVULSION, FALLING DEBRIS, SUBSIDENCE, SLIPPAGE, ALLUVION, OR INUNDATION, OR LIKELY PRESENCE OF HAZARDOUS CONTAMINANTS, BEING A FEATURE OR CHARACTERISTIC THAT IS KNOWN TO THE WHANGAREI DISTRICT COUNCIL.

Whangarei District Council holds indicative information on land stability hazard for Whangārei. Information on land stability, including an interactive web tool, can be found on the Council's website.

The Whangarei District Council may require site-specific investigations before granting future subdivision or building consent for the property, the level of investigation or assessment would depend on the level of stability risk of the area the property is in.

See map attached indicating this property is located within low zone and refer:

<https://www.wdc.govt.nz/Services/My-property-and-rates/Natural-hazards>

This property may be identified in a Northland Regional Council River Flood Hazard Zone.

For information refer:

<https://www.nrc.govt.nz/environment/natural-hazards-portal/river-flooding/>

Whangarei District Council notified Plan Change 1 - Natural Hazards (PC1) on the 31st of May 2023. The Plan Change introduces new provisions relating to natural hazards to the District Plan, including new hazard maps and rules for land use, development, and subdivision in hazard susceptible areas. As of 4 December 2024 the Decision Version PC1 rules have legal effect.

Refer to map attached and for more information on the proposed plan change please visit: <https://www.wdc.govt.nz/Services/Planning/District-Plan-changes/Current-plan-changes>

This property has been identified as having information available under Stormwater Catchment and Flood Management.

Any overland flow path shown provides an indicative understanding of routes where surface stormwater may flow during rainfall events.

Any depression storage area/surface depression ponding area shown provides an indicative extent of ponding that may form occur if the outlet to the ponding area is blocked or where the outlet capacity is exceeded eg a pipe is either blocked or the design capacity of the pipe is exceeded during a rainfall event.

Refer Water, Wastewater and Stormwater map attached and for further information please contact the Waste and Drainage Department on 09 430 4200.

This property is in an area that has been identified to contain:

Acid Sulphate Soil Risk

A copy of the Opus Acid Sulphate Soil guidance document dated August 2015 can be found on the Whangarei District Council website.

For information refer:

<https://www.wdc.govt.nz/Council/Council-documents/Policies/Acid-Sulphate-Soil-Planning-Policy>

Whangarei District Council holds information on the liquefaction vulnerability of the district.

The site is located within an area classified as Liquefaction vulnerability category:

- possible.

The report was prepared by Tonkin & Taylor Ltd to provide WDC with a district wide liquefaction vulnerability assessment to help inform spatial planning and assessment of landuse, subdivision and building consents.

To view the report and access maps please use the following link:

<https://www.wdc.govt.nz/Services/My-property-and-rates/Natural-hazards>

Please note: To view the liquefaction layer your map scale must be greater than 1:5000.

3: INFORMATION ON COUNCIL AND PRIVATE UTILITY (SEWERAGE, WATER & STORMWATER) SERVICES.

Information relating to Council Utility Services for this property is attached.

- Water, Wastewater and Stormwater Map

As-Built Plan for this property from the building file is attached.

- As Built Services Plan from BC2200646

For further information regarding Council Water Supply please refer:

<https://www.wdc.govt.nz/Services/Water-services/Water-Supply>

This property is within the area of benefit of a pressure sewer system.

See map attached and for the Homeowners guide and key requirements for maintaining the system please refer:

<https://www.wdc.govt.nz/Services/Water-services/Wastewater/Pressure-Sewer-Systems>

**4: INFORMATION RELATING TO VALUATION, LAND, AND WATER RATES.
INFORMATION FROM WHANGAREI DISTRICT COUNCIL RECORDS.**

Information on Valuation, Rates and Water Meter location (if applicable) for the current financial year, is attached.

Outstanding water balance as at today's date is \$0.00.
A final reading of the water meter will be required.

5: INFORMATION CONCERNING ANY PERMIT, CONSENT, CERTIFICATE, NOTICE ORDER, OR REQUISITION AFFECTING THE LAND OR ANY BUILDING ON THE LAND PREVIOUSLY ISSUED BY THE WHANGAREI DISTRICT COUNCIL OR BUILDING CERTIFIER (WHETHER UNDER THE BUILDING ACT 1991 AND/OR 2004 OR ANY OTHER ACT).

Copy of Building Consent and Code Compliance Certificate issued for this property is attached as listed below:

- BC2200646 – New Dwelling
Building Consent Issued – 21/04/2022
Code Compliance Certificate Issued – 12/05/2023

Copy of Applications (e.g. Vehicle Crossing Permit and/or Public Utility Service) for this property are attached as listed below:

- PU221210 – Pressure Sewer Connection
Approved – 31/05/2022
- PU221265 – Water Meter Only
Approved – 17/06/2022
- VC220117 – Vehicle Crossing
Issued – 30/06/2022

6: INFORMATION RELATING TO THE USE TO WHICH THE LAND MAY BE PUT AND ANY CONDITIONS ATTACHED TO THAT USE.

This property is located in a General Residential Zone.
See map attached and for more information search the property address on Councils ePlan here <https://eplan.wdc.govt.nz/plan/>

7: INFORMATION WHICH IN TERMS OF ANY OTHER ACT HAS BEEN NOTIFIED TO THE WHANGAREI DISTRICT COUNCIL BY ANY STATUTORY ORGANISATION HAVING THE POWER TO CLASSIFY LAND OR BUILDINGS FOR ANY PURPOSE.

Whangarei District Council is not aware of any classification attached to the land or building/s.

8: OTHER INFORMATION CONCERNING THE LAND AS WHANGAREI DISTRICT COUNCIL CONSIDERS, AT COUNCILS DISCRETION, TO BE RELEVANT.

Whangarei District Council recommends that all Whangarei District residents visit the Northland Regional Council website, <https://www.nrc.govt.nz/> for information on Civil Defence hazard response. This information includes Tsunami evacuation zones, maps and community response plans for flooding and extreme weather events etc.

Copies of site plan, floor plan and elevations are attached for your information.

- A copy of a Suitability Report by RS Eng Ltd dated 28/04/2022 from BC2200646 is attached for your information.

9: INFORMATION RELATING TO ANY UTILITY SERVICE OTHER THAN COUNCILS SUCH AS TELEPHONE, ELECTRICITY, GAS AND REGIONAL COUNCIL WILL NEED TO BE OBTAINED FROM THE RELEVANT UTILITY OPERATOR.

Further information may be available from other authorities; Northpower; Spark; Vector Limited; etc.

DISCLAIMER

Land Information Memoranda (LIM) are prepared under the provisions of Section 44A of the Local Government Official Information and Meetings Act 1987. An inspection of the land or building(s) has not been completed for the purposes of preparing the LIM. It has been compiled from the records held by Whangarei District Council. The information contained in the LIM is correct at the date of issue.

A LIM is prepared for the use of the applicant and may not be able to be relied on by other parties.

Advice from an independent professional such as a lawyer or property advisor should be sought regarding the contents of this LIM.

Additional information regarding the land or buildings (such as resource consents and other permissions and restrictions) not contained in this LIM may be held by Northland Regional Council. For further information contact Northland Regional Council on (09) 470 1200, 0800 002 004 or www.nrc.govt.nz.

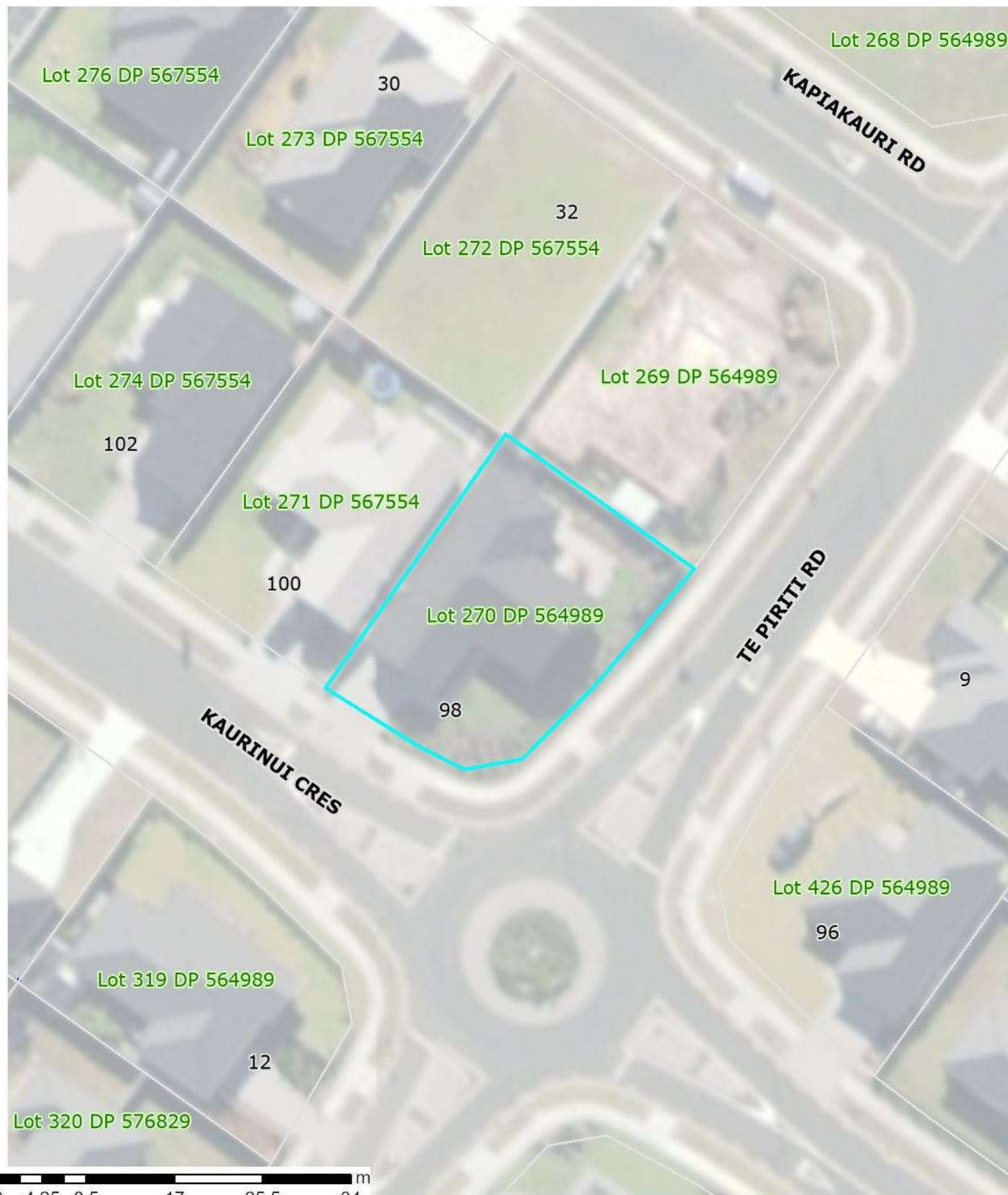
A LIM is not a suitable search of Council's records for the purposes of the National Environmental Standards (NES) for soil contamination of a potentially contaminated site.

Signed for and on behalf of Council:



P Luwes
Property Information Officer

Property Map



0 4.25 8.5 17 25.5 34 m

New Subdivisions

- Proposed Pre-223
- 223 Certificate

New subdivisions: Proposed as accepted, pre-223 and 223 Certificate with set Conditions.

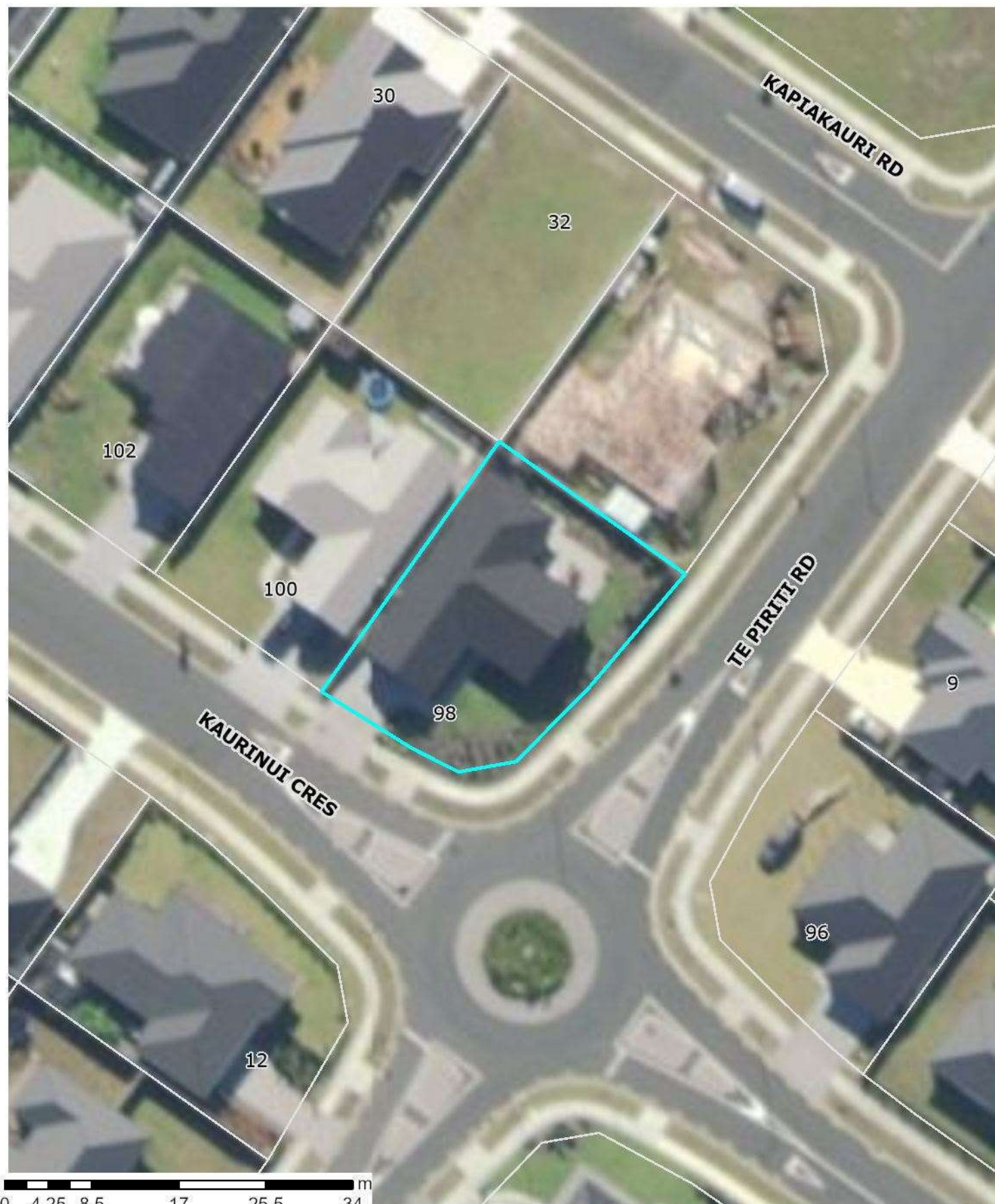
12 August 2025

Scale 1:500

Land Parcel boundaries are indicative only and are not survey accurate. Area measurement is derived from the displayed geometry and is approximate. True accurate boundary dimensions can be obtained from LINZ survey and title plans



Aerial Photography



This map includes New Zealand's most current publicly owned aerial imagery and is sourced from the LINZ Data Service.

12 August 2025

Scale 1:500



The information displayed is schematic only and serves as a guide. It has been compiled from Whangarei District Council records and is made available in good faith but its accuracy or completeness is not guaranteed. Parcel Information is sourced from the Land Information New Zealand (LINZ) Data Service. CROWN COPYRIGHT RESERVED. © Copyright Whangarei District Council.



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD**

**Guaranteed Search Copy issued under Section 60 of the Land
Transfer Act 2017**




R.W. Muir
Registrar-General
of Land

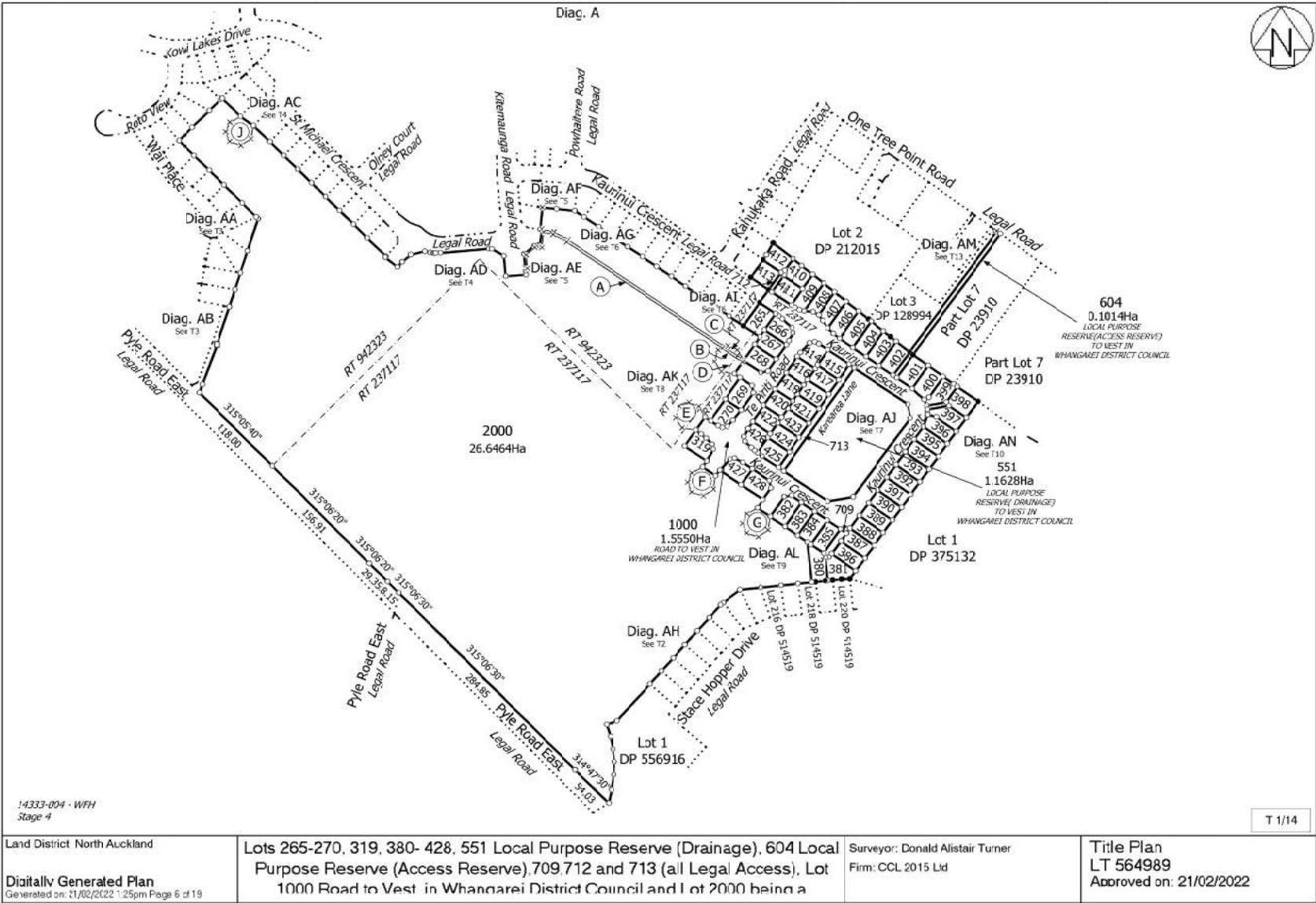
Identifier **1009387**
Land Registration District **North Auckland**
Date Issued 21 February 2022

Prior References
237117

Estate Fee Simple
Area 602 square metres more or less
Legal Description Lot 270 Deposited Plan 564989
Registered Owners
Laurence White and Jill Yvonne White

Interests

12201143.6 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 21.2.2022 at 4:16 pm
Land Covenant in Covenant Instrument 12201143.7 - 21.2.2022 at 4:16 pm
Land Covenant (in gross) in favour of WFH Properties Limited created by Covenant Instrument 12201143.7 - 21.2.2022 at 4:16 pm
Land Covenant in Covenant Instrument 12201143.8 - 21.2.2022 at 4:16 pm



IN THE MATTER of the Resource Management Act
1991 ("the Act")

A N D

IN THE MATTER of a subdivision consent as evidenced
by Land Transfer Plan No. 564989

A N D

IN THE MATTER of a Consent Notice issued pursuant to
Section 221 of the Act by
WHANGAREI DISTRICT COUNCIL
("the Council")

IT IS HEREBY CERTIFIED that the following conditions to be complied with on a continuing basis by the subdividing owner and subsequent owners was imposed by the Council as a condition of approval for the subdivision as effected by Land Transfer Plan No. 564989 ("the plan")

In relation to lots 265-270, 319 and 380-428.

1. At the time of building consent provide suitable evidence/design to illustrate that stormwater attenuation will be provided for all impervious surfaces exceeding 45% of the lot size area, to ensure compliance with Council's Environmental Engineering Standards 2010 and to the satisfaction of the Whangarei District Council. The design shall be undertaken by a suitably qualified engineer or Council IQP.
2. Any development shall comply with the restrictions and recommendations identified in the Earthworks Completion Report by Cook Costello – The Landing Stages 4 and 5 – Project Number 14333-004 dated 21 October 2021, available from Council under file reference SD1800110, unless an alternative engineering report prepared by a Geotechnical or Chartered Professional Engineer is approved in writing by Council.
3. At the time of building consent, the property owner shall arrange to supply and install (at its own cost) a pressure sewer system of an approved make, brand or type (including all its constituent components) to the satisfaction of Council. After approval by WDC Waste and Drainage Manager, and connection of the pressure sewer system to the Council's reticulated system, WDC shall own and maintain the pressure sewer system in accordance with the WDC Pressure Sewer Policy. The Owner shall continue to own and maintain the property's gravity drain to the pump chamber. The Owner shall be responsible for paying for the power consumption of the pumping unit in accordance with Council Pressure Sewer Policy.
4. At the time of building consent, the owner shall construct the vehicle entrance crossing in accordance with Sheet 18 Residential Single Width Crossing also in



accordance with Sheets 22 & 23 of Council's Environmental Engineering Standards 2010 Edition unless an existing approved vehicle crossing to the site exist. Entrance crossings are to be designed and constructed in such a manner that will control stormwater run-off entering a property from the road, and that likewise prevent stormwater and detritus, including gravel, dirt and other materials, migrating onto the road reserve from a property.

DATED at Whangarei this 3rd day of November 2021.

SIGNED for **WHANGAREI DISTRICT COUNCIL**
pursuant to the authority of the Council given
pursuant to the Local Government Act 2002 and the
Resource Management Act 1991



Authorised Signatory
Karen Toni Satherley
Post Approval RMA Officer



cook | costello

**The Landing Stage 4 & Stage 5
Earthworks Completion Report**

WFH PROPERTIES LIMITED

One Tree Point
The Landing
Stage 4 & Stage 5



Project Number: 14333-004
Date: 21/10/2021



COOK COSTELLO

DOCUMENT CONTROL RECORD

Client: WFH PROPERTIES LIMITED

Project description: The Landing Stage 4 & 5 - Earthworks Completion Report

Document name: 14333 - Stage 4 & Stage 5 - Earthworks Completion report_saved.docx

Address: One Tree Point, Stage 4 & 5

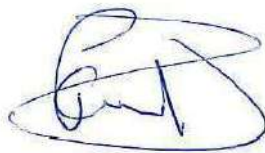
Date of issue: Thursday, 21 October 2021

Status: For Issue



Originator: **Stefano Rotatori – Chartered Professional Engineer (Geotechnical)**

ME, IntPE (NZ), CMEngNZ, CPEng



Approved for issue: **Philip Cook – Chartered Professional Engineer**
BE(hons), Dip Ag, CPEng, CMEngNZ, IntPE(NZ),
MACENZ, MInstD



Office of origin: Whangarei

Version	Date	Comment	By
1.0	14 September 2021	Review	P. Cook
2.0	17 September 2021	Issue	S. Rotatori
3.0	21 October 2021	Issue	S. Rotatori

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1. Limitations

This report, and the stated or inferred professional opinions found within, relating to the suitability of the areas being ready for building development, shall not be construed as a guarantee.

This report, and the inferred professional opinions found within does not remove the necessity for site-specific geotechnical investigation, normal inspection and design of foundations for each lot, as would be made in natural ground and NZS3604 for standard residential building foundations.

2. Executive Summary

Cook Costello was engaged by WFH Properties Ltd, to provide technical advice for earthworks and be the geo-professional for the Landing Stage 4 & 5 subdivision at One Tree Point, Northland. Cook Costello designed earthwork cuts and placement of controlled sand engineered fill, in order to enable construction of the building platforms within the proposed development.

A requirement of the consenting authority WDC (Whangarei District Council) is that a “Statement of Professional Opinion on Suitability of Land for Building Construction” (Statement of Suitability) is made by the geo-professional at the end of construction (prior to building developments). This process requires “WDC form EES-PO1” to be completed, and requires a geotechnical completion report. The completion report summarises the situation and is used to describe any departure from the standard foundation conditions expected by the building industry and outline any restrictions or recommendations if required. The purpose of this report is to provide the supporting details required for the Statement of Suitability.

The Statement of Professional Opinion on Suitability of Land for Building Construction - Form EES-PO1 has been attached to Appendix 6.

3. Introduction

Cook Costello was engaged by WFH Properties Ltd, to provide technical advice for earthworks and be the geo-professional for the Landing Stage 4 & 5 subdivision at One Tree Point, Northland. Cook Costello designed earthwork cuts and placement of controlled sand engineered fill, in order to enable construction of the building platforms within the proposed development.

Previous reports and geotechnical information at the site comprise of:

- Ormiston Associates Ltd. Geotechnical Report (dated September 2005).
- Cook Costello Earthworks Specification (dated October 2018).

This report is for completion of the subdivision works in relation to the developed sections and covers the information required by the Whangarei District Council for preparing consent notices for the future property titles and provides geotechnical information to the future lot owners. It covers the requirements of the Whangarei District Council Engineering Standards (Issue 1, operative from 1 July 2010) for subdivision completion and is an addendum to the Form EES-PO1 certificate.

On completion of the works, the developer shall provide the following:

- Geotechnical reports and plans,
- All limitations on the development of the properties, including hazards, easement requirements etc.

This report relates to the lots in Stages 4 & 5 of the subdivision. The lot numbers for Stage 4 & 5 (as shown on the Scheme Plan appended to Appendix 1) covered by this report are:

Stage 4:

- 56 Residential Lots (lots 265 – 270; 319; – 452; 380 - 428).
- Roads 4, 5, and 8.

Stage 5:

- 45 Residential Lots (lots 250 – 264; 447 – 452; 271 – 291; 316-318).
- Roads 6, 7, 10 and 19.

The subdivision has been designed and constructed to satisfy Whangarei District Council Environmental and Engineering Standards 2010.

4. Site Description

The Landing subdivision is situated at One Tree Point, approximately 17 km southeast of Whangarei Central Business District. The subdivision consists of 9 stages, with Stage 1, Stage 2, Stage 3, Stage 4 and Stage 5 completed and Stage 6 and Stage 7 currently under construction. The scheme plan for Stages 4 & 5 can be seen in Appendix 1.

5. Geology

The property is regionally placed as part of the Marsden Point Barrier Spit, a broad peninsula, comprised of coastal SAND dunes, estuarine and alluvial sediments, that partly encloses Whangarei Harbour. These are considered young soils.

The spit has been built up by a prograding (seaward advancing) foreshore depositional process in the vicinity of the harbour entrance with sequences of aeolian influenced coastal SAND dunes and alluvial and estuarine sediments.

The GNS Science online geology map defines the underlying geology of the site as comprised of Late Pleistocene stable dune deposits. Weakly cemented sand in fixed transverse dune ridges.

The soil type in the area is defined on NZMS290 Sheet Q06/07 Hukerenui - Whangarei (SOILS) as a combination of Ruakaka Loamy Peat, One Tree Point Peaty Sand and Tangitiki Sandy Loam and Sand (imperfectly to poorly drained).

The rock type in the area is defined on NZMS290 Q06/07 Hukerenui - Whangarei (ROCK TYPES) as Sand: felspathic with some quartz, minor dark minerals and clay forming fixed dunes, minor swamp deposits; unconsolidated to very soft. Unweathered or weathered to brown-stained very soft clayey sand to depths of 5m.

6. Construction Methodology

The earthworks were carried out under Cook Costello as the supervising engineering consultants with Geocivil Ltd carrying out the physical testing. The general methodology consisted of a removal of organic material (peat and topsoil) stripped ground inspection, cut to fill, with fill being tested, and covering complete fill with organic topsoil peat.

A bulk earthworks plan showing the finished earthworks and contours is included in Appendix 2.

6.1. Earthworks

A bulk earthworks operation was carried out over the site to improve the drainage and contour of the Lots. Earthworks were also carried out to establish reasonable building platforms. Stage 4 & 5 of the Landing used the following methodology:

1. The topsoil and the peat were stripped off using motor scrapers and 50 ton Moxy dump trucks (Cat 725) with 20 – 30 ton excavators (Cat 320).
2. Cut to fill in the old sand dune complex using Sand fill was undertaken to bring the lots up to finished level.
3. Testing was undertaken to achieve a medium dense compacted sand with an allowable bearing capacity of greater than 100 kPa (Ultimate Bearing Capacity of 300kPa). This meets the requirements of the New Zealand Standard 4404 and the New Zealand Building Code.

4. Once the desired contours were achieved topsoil was spread from the temporary stockpile using Motor scrapers. This was track rolled with a D6 dozer and levelling bar.
5. Grassing of Stage 4 & 5 occurred very shortly after the top soiling process was completed.

6.2. Roding

A standard industrial/commercial roding operation was undertaken on Stage 4 & 5. The roding has been achieved using the following methodology:

1. Trim subgrade sand layer to level using Motor Scrapers and graders.
2. Check the subgrade CBR by Scala Penetrometer analysis.
3. Place lay and spread AP65 subbase layer using a Grader and 10 ton dynamic and static rollers to achieve optimum density.
4. Prepared Kerb lines using a grader and a 4 ton Dynapac roller.
5. Place, Laid, and formed slip form kerb and channels.
6. Backfilled kerb & channel using 12 Ton excavator.
7. Place lay and spread AP40 basecourse layer using a grader and 10 ton dynamic and static rollers to achieve optimum density, using a 9 ton PTR to tighten the top layer ready for sealing.
8. Check the compaction of the basecourse layer by Nuclear Densometer Readings and Benkelman Beam testing.
9. Sweep / clean the road of loose material and debris ready for seal.
10. Seal the street with waterproofing seal coat and single coat chip seal (grade 5) using automatic pressurised bitumen sprayer 6-wheel trucks with chip spreading boxes on to spread both the bitumen and chip over the surface evenly.
11. Apply asphaltic concrete over waterproofing layer using paving machine and rollers. Asphaltic concrete to be DG10 or AC10 (refer to paving plan) to comply with NZTA M/10 Specification.

7. Testing & Inspection Methodology

The relevant quality control testing for the bulk earthworks was undertaken by Cook Costello and Geocivil Ltd at the required intervals. Testing locations are appended in Appendix 3, results of the tests can be found in Appendix 4.

Supervision by the Engineers was required at key critical stages, and a series of hold points were identified and agreed with the Contractor.

7.1. Fill Testing

The Cook Costello Earthworks Specification (dated October 2018) initially suggested testing consisting of Light Weight Deflectometer (LWD), Scala Penetrometers (DCP) and Nuclear Densometers (NDM).

However, during compaction of the material, it was discovered that there was a delay of approximately 4 – 5 weeks between compaction and achieving the desired compaction results. This is due to pore-pressure build up in the compacted fill material caused by the compaction process. The delay between testing and receiving results was unacceptable in terms of constructability.

As a result, it was decided to test the fill material using Static Plate Load Tests (PLT) where fill to undercut levels was deeper than 1.5m. This allowed the testing to be conducted at the finished level, speeding up the construction process. DCPs, NDMs and LWDs were conducted at the finished level after the excess pore pressure was allowed to dissipate where fill depth to undercut was less than 1.5m depth.

Frequency of testing has been set up to be not less than:

- 1 test per layer or 200 mm thickness per material type per 2500 m²; or
- 1 test per 500 m³ distributed reasonably evenly throughout full depth and area; or
- 3 tests per visit; whichever requires the most tests.

As a result, the following testing has been carried out on the sand FILL areas:

- No. 103 Plate Load Tests
- No. 93 Scalas/NDMs/LWDs
- No. 5 CPTs

Locations of testing on the fill areas are shown on Drawing G01, appended to Appendix 3.

To be noted that the 300kPa ultimate bearing capacity has been calculated according to DIN 18134:2012-04 at 5mm vertical settlement (DIN 18134:2012-04: German Standard Soil Testing procedures and testing equipment – Plate load test, English translation of DIN 18134:2012-04).

7.2. Undercut Testing

The Cook Costello Earthworks Specification (dated October 2018) suggested testing consisting of Light Weight Deflectometer (LWD), Scala Penetrometers (DCP) and Nuclear Densometers (NDM). Prior to fill placement, the area was stripped of vegetation and topsoil and inspected by Cook Costello and Geocivil Ltd. Site testing with DCPs was conducted to identify areas and depths that required further undercutting. Undercutting terminates on the consolidated sand layers (i.e. hard pan) and/or at the bottom of the peat or sandy peat layer.

Enabling works, undercut and benching to competent material were inspected and approved by the supervising Engineer prior to filling.

Approximately 100 Scala penetrometer tests were carried out to assess the suitability of the undercut areas.

Locations of testing on the undercut areas are shown in Drawing G02, appended to Appendix 3.

7.3. Laboratory Testing

Laboratory testing was undertaken during construction to determine the following characteristics for the sand fill and for enabling site testing procedures. Laboratory testing is attached to Appendix 3. An Exhaustive list of laboratory testing is reported below:

- Determination of the Dry density/water content relationship – New Zealand Standard Compaction - NZS 4402: 1986 Test 4.1.1
- Determination of the particle size distribution-Dry sieving method - NZS 4407:2015 Test 3.8.2
- Determination of the Dry density/water content relationship – New Zealand Heavy Compaction - NZS 4402: 1986 Test 4.1.2
- Determination of Organic Content.
- Determination of PH(f) and PH(ox) in soil.

8. Foundation Design

8.1. Ultimate Bearing Capacity

Investigations have been carried out by or under the supervision of Geocivil Ltd or Cook Costello. The locations of tests are shown in Appendix 3. Test results are shown in Appendix 4.

In accordance with the Whangarei District Council Environmental Engineering Standards dated 2010 clause 2.7 The Councils Report on Completion of Construction undertook testing as the excavation or filling was carried out. The following testing was undertaken to support the statement of professional opinion as to the compliance of the filled/cut ground to the specification and the suitability of the land for Building Construction. (WDC Form EES-PO1). The testing undertaken in our view provides sufficient information to allow identification of any specific design requirements that necessitate the building foundation design to deviate from NZS 3604 and NZS 4229 and design parameters for detailed design of the foundations (such as bearing capacity, suitable founding depth etc).

The testing approach has been to test and demonstrate that the bearing capacity requirements of NZS3604 and NZS 4229 have been met or exceed the requirements of the definition of “Good Ground” where the tests were undertaken. It is assumed that the extent of testing represents that 300kPa ultimate bearing capacity is exceeded over the entire building platform even though not every piece of that ground/soil has been tested.

The existing depth of peat/peaty sand was determined by the Geotechnical Investigation Report carried out by Ormiston Associated Ltd for the residential subdivision (ref. # 1600/2114, dated September 2005). 51 CPTs, 25 Flight Augers, and 4 test pits were carried out on site. These tests showed a depth generally up to 5.5m of inferred organic peat, peaty sand and organic silts with good sand bearing below, over the majority of the site. Due to the ongoing long term settlement and shrinkage properties of the peat and organic soils, it was decided to remove this material as part of the bulk earthworks operations.

Scala Penetrometer and Plate Load testing were carried out to identify the compaction and ultimate bearing capacity of the sand fill layers. Scala Penetrometers were used to determine ultimate bearing capacity in cut areas. The bearing capacity results are summarised in Table 1. The provided ultimate bearing capacity of 300kPa is available below any topsoil that has been spread on site after the completion of the earthworks. To be noted that between 100 – 300 mm of topsoil has been spread throughout the site with an average of 200 mm.

Table 1: Bearing capacity summary for Stage 4 & Stage 5 of The Landing Subdivision.

Area	Depth (mbgl)	Ultimate Static Bearing Capacity (kPa)	Dependable Static Bearing Capacity (kPa)
Stage 4 & 5 (All Lots)	0.1 - 0.3	300	150

The Statement of Professional Opinion on Suitability of Land for Building Construction - Form EES-PO1 is included within Appendix 6.

8.2. Static Settlements

Foundation design should limit the probable maximum differential settlement over a horizontal distance of 6 m to no more than 25 mm under serviceability limit state load combinations of AS/NZS 1170 Part 0, unless the structure is specifically designed to prevent damage under a greater settlement.

8.3. Subsoil Class

Generally, across the entire site, the soils are consistent with site subsoil classification Class C – Shallow Soil sites as per NZS1170.5, based on estimated shear velocity (V_s) values from the CPTs presented within Ormiston Associated Ltd (ref. # 1600/2114, dated September 2005) and the calculated natural period of the site was less than 0.6 seconds.

8.4. Liquefaction Potential

8.4.1. Previous Liquefaction Analysis

As stated in the Geotechnical Investigation Report carried out by Ormiston Associated Ltd (ref. # 1600/2114, dated September 2005). The site presents a low risk for the development of liquefaction during an earthquake. The investigations at the property presented in the Ormiston Geotechnical report, in particular the CPT tests, indicates that the site is underlain by upper dense sands (q_c varying from 8MPa to 20MPa) overlying a layer of loose to medium dense sands.

Groundwater is variable across the site, varying between 3.04m and 5.9m. Liquefaction does not occur above the groundwater table and this relatively deep groundwater decreases the potential of liquefaction within the shallow layers that have been cut up to the consolidated sands (hardpan) or filled using compacted sands.

In the sand-filled areas, where the unsuitable materials have been removed, sand fill has been compacted, increasing the relative density of the sands. Subsequently, further CPTs testing have been carried out to assess the liquefaction potential of the compacted sand fill. Liquefaction analysis is discussed in the next Section 1.1.1.

8.4.2. CPT Investigations

Geocivil Ltd conducted three CPTs to a 20 m target depth on 10 June 2020 where the sand fill depths were more significant within Stage 4 and Stage 5 subdivisions. To be noted that between 100 – 300 mm of topsoil has been spread throughout the site. In fact, the top 300 mm layer encountered within the CPTs records show a cone resistance between 2 and 6 MPa as recorded within the topsoil layer. However, all the test results show Dense / Very Dense Sand below the topsoil with a cone resistance q_c between 10 and 20 MPa.

CPT investigations carried out on site are summarised in Table 2. Detailed testing results are shown in Appendix 4, CPTs test locations are shown in Appendix 3.

Table 2: CPT Investigation results.

Test ID	Depth (m)	Groundwater Table (m)	Depth (m)	q_c (MPa) ¹	Interpreted Soil Description
CPTF	1.36	Not Encountered	0 – 0.25	3	Silty SAND and Sandy SILT
			0.25 – 1.36	18	SAND and Silty SAND
CPTG	0.86	Not Encountered	0 – 0.45	5	SAND and Silty SAND
			0.45 – 0.86	20	SAND
CPT I	3.46	Not Encountered	0.0 – 0.35	4.5	Silty SAND and Sandy SILT
			0.35 – 0.80	12	SAND and Silty SAND
			0.80 – 1.70	16	SAND
			1.70 – 3.20	13	SAND and Silty SAND
			3.18 – 3.46	20	SAND
CPTL	15.6	5.2	0.0 – 2.6	9.5 - 12	SAND and Silty SAND
			2.6 – 3.0	5	Silty SAND and Sandy SILT
			3.0 – 9.5	6 - 20	SAND and Silty SAND
			9.5 -	4 - 9	Silty SAND and Sandy SILT

1. Cone tip resistance

8.4.3. Peak Ground Acceleration

According to NZS 1170.5:2004, Importance Level 2 buildings are required to be designed to resist earthquake shaking with an annual probability of exceedance of 1/500 (i.e. a 500-year return period).

This is the ultimate limit state (ULS) design seismic loading. Structures are expected to retain their structural integrity during the ULS earthquake, and not collapse or endanger life.

Peak horizontal ground accelerations (PGA) have been calculated in accordance with MBIE/NZGS Module 1 (2016) using the following formula:

$$PGA = C_{0,1000} R f g / 1.3$$

$$C_{0,1000} = 0.13 \text{ for Whangarei (NZTA Bridge Manual Commentary (2018) Table C6)}$$

$$R = 1.0 \text{ for a 500-year return period event (NZS 1170.5)}$$

$$f = 1.33 \text{ for Class C}$$

Thus, the $PGA = 0.13 \times 1.0 \times 1.33 g / 1.3 = 0.13 g$ for ULS.

The seismic parameters are summarised in Table 3.

Table 3: Seismic parameters.

Importance Level	Limit State	Peak Ground Acceleration, PGA or C(T)	Effective Magnitude, M_w
2	ULS ¹	0.13	5.8
2	SLS ²	0.03	5.8

1. Ultimate Limit State

2. Serviceability Limit State

8.4.4. Method of Analysis

CPT results have been analysed using CLiq software to assess the potential soil liquefaction and settlement. Boulanger & Idriss (2014) was used to evaluate the liquefaction potential (triggering) of the soil strata at the site, the method proposed by Zhang et al. (2002) was used for settlement calculations.

Liquefaction analysis results are attached in Appendix 5.

The assessment of liquefaction has been undertaken under ultimate limit state design (ULS) criteria and serviceability limit state design (SLS) criteria. The serviceability limit state is the point where a structure can no longer be used for its intended purpose but would still be structurally sound. The tolerances for serviceability depend on the intended use of the structure and can vary significantly (Section 2 of NZS 1170.5:2004).

A groundwater level of 3.0 mbgl was conservatively considered during earthquake events for the liquefaction analysis which is the shallowest recorded value within the Geotechnical Investigation Report carried out by Ormiston Associated Ltd.

8.4.5. Liquefaction Severity Number (LSN)

The Liquefaction Severity Number (LSN) is a method developed by Van Ballegooy et al (2013) which provides an estimate of liquefaction damage manifesting at the ground surface. The LSN parameter

refines the calculated settlement by including a depth weighting function and can be used to differentiate the most severe damage land from the least affected land. Table 4 provides the LSN ranges and associated damage classifications.

Table 4: LSN Ranges and damage classifications

LSN Range	Damage Classification
0 – 10	Little to No expression of liquefaction
10 – 20	Minor expression of liquefaction
20 – 30	Moderate expression of liquefaction
30 – 40	Moderate to severe expression of liquefaction
40 – 50	Major expression of liquefaction
50+	Severe damage

8.4.6. Ultimate Limit State

A PGA value of 0.13 g and an earthquake magnitude (M_w) of 5.8 have been used for liquefaction analysis in accordance with NZGS Module 1 and the NZTA Bridge Manual guidelines.

8.4.6.1. Liquefaction Severity Number

The LSN for the ULS design case was 2.6 only for CPTL and nil for CPTF, G and I. This indicates *Little to no expression of liquefaction* according to Table 4. Refer to Figure 1 below.

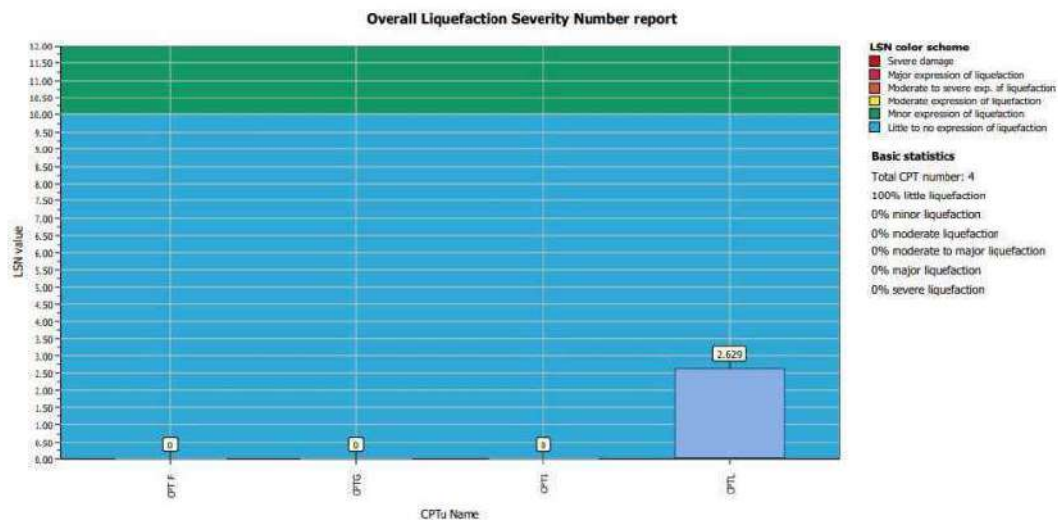


Figure 1: LSN results summary (ULS).

8.4.6.2. Liquefaction Induced Subsidence

up to 20 mm of settlement has been noted under the ULS design earthquake parameters for CPTL. Refer to the liquefaction results attached in Appendix 5.

8.4.6.3. Lateral Displacement

Lateral displacement is not considered to be an issue on site due to the presence of relatively flat ground.

8.4.7. Serviceability Limit State

A PGA value of 0.03 g and an earthquake magnitude (Mw) of 5.8 have been used for liquefaction analysis for the SLS case in accordance with NZGS Module 1 and the NZTA Bridge Manual guidelines.

8.4.7.1. Liquefaction Severity Number

The LSN for the SLS design case was nil. This indicates *Little to no expression of liquefaction* according to Table 4. Refer to Figure 2 below.

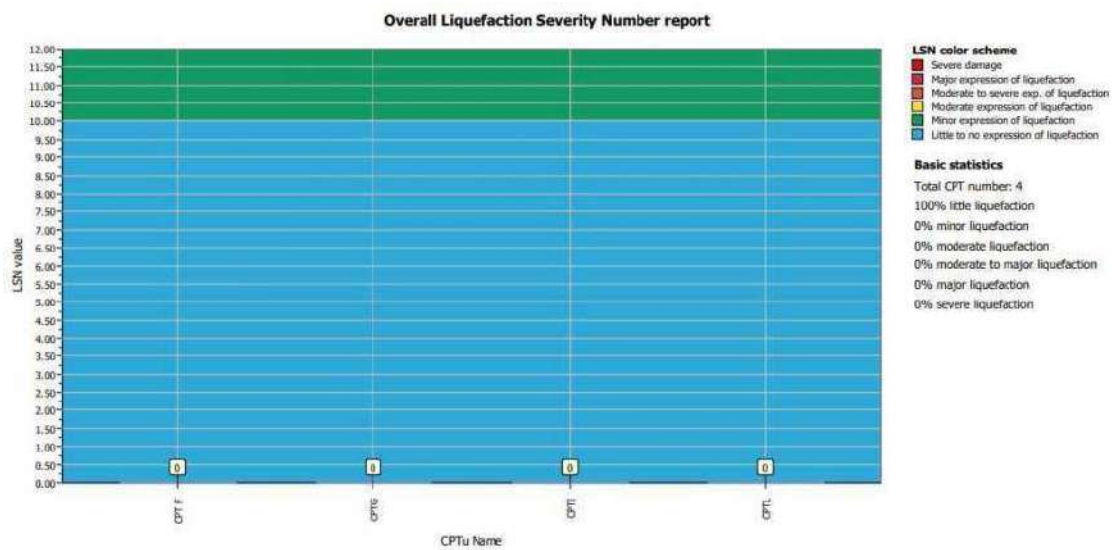


Figure 2: LSN results summary (SLS).

8.4.7.2. Liquefaction Induced Subsidence

No settlement has been noted under the SLS design earthquake parameter. Refer to the liquefaction results attached in Appendix 5.

8.4.8. Liquefaction Summary

Liquefaction potential is considered to be low. Little to no expression of liquefaction is expected within Stages 4 & 5 subdivision. Liquefaction analysis results are attached in Appendix 5. Up to 20 mm of settlements could be expected under the ULS earthquake case that are within the tolerance of the building code that is 25 mm over 6 m according to Clause B1/VM1 for static settlements.

8.5. Acid Sulphate Risk

8.5.1. Acid Sulphate Testing Discussion

The Landing Stage 4 & 5 subdivision is mapped on the Whangarei District Council Map to be in the Acid Sulphate Risk Area. Acid Sulphate Soil Field PH Tests have been conducted on site following the Acid

Sulfate Soils Laboratory Methods Guidelines, Version 2.1, Section H, published by Department of Natural Resources, Mines and Energy, Indooroopilly, Queensland, Australia, June 2004. This Australian guide applies to soils below an RL of 5.0m.

Given the vicinity with Stage 3, no further testing was carried out for Stages 4 & 5. Outcomes of further testing would not have changed the conservative approach the mitigation measures for foundation design recommended in Sections 8.5.2 and 8.5.3.

Field pH (pH_F) recording has been undertaken on site at the invert level (Test B) of proposed infrastructures (i.e. stormwater and sewer pipes) and 1 m above the invert level (Test A) in 10 different locations. Field testing is appended to Appendix 4.

For both Test A and Test B cases, field pH peroxide test (pH_{ox}) was performed on each of the 10 samples adding 30% of H₂O₂ (Hydrogen peroxide) to the 10 samples taken from the field in order to determine soil pH following complete oxidation.

After the reaction, the rate of the reaction indicates the level of sulfides present. The reaction is characterised by heat and gas evolution. A soil containing very little sulfides only rate an 'X' (Slight Reaction) however a soil containing high levels of sulfides is likely to rate an 'XXXX' (Very Vigorous Reaction). All the soil reaction of the pH_{ox} tests undertaken by Geocivil are characterised by an "X", therefore soils are likely to contain very little sulfides. Also, according to the ASS Sampling & Analysis Guidelines, 1998, a pH_{ox} value at least one unit below field pH_F indicates potential presence of acid sulphate soils. The greater the difference between the two measurements, the more indicative the value is of a PASS (Potential Acid Sulphate Soils). The lower the final pH_{ox} value is, the better the indication of a positive result. The lab testing generally shows a pH_{ox} value less than one unit below field pH, therefore the presence of acid sulphate soils could be little. Another qualitative indication of little sulphides is that If the measured pH_{ox} < 3. The more the pH_{ox} drops below 3, the more positive the presence of sulfides is. There is one pH_{ox} value recorded below 3.

These results are consistent with local observations of good quality concrete that had been in the ground for a long time and has been excavated and shows no sulphate acid damage.

However, the pH_F and pH_{ox} values are comprised between 2.92 and 5.22. According to NZS 3101:Part 1:2006 Section 3.4.3.2, an acidity represented by a PH of 5.0 to 5.5 may be considered as a practical limit of tolerance of high-quality concrete in contact with any acids. For pH lower than 5.0, the environment shall be assessed as exposure classification U. As per Section 3.8, NZS 3101, Exposure Classification U represents an exposure environment not specified in Table 3.1 of NZS 3101 for which the degree of severity should be assessed by the designer. Concrete in members subject to exposure classification U shall be specified to ensure durability under the particular exposure environment and for the chosen design life. Protective coatings may be taken into account in the assessment of concrete requirements.

Alternatively, as reported in the Acid Sulphate Soil Planning Policy Basic Guide prepared for WDC by Opus International Consultants, Australian Standard AS 2159 – 2009 Section 6 is relevant when

designing concrete and steel structures to withstand corrosive environments. This standard refers to piles, however the knowledge can be transferred to other structures.

8.5.2. Mitigation measure for Shallow Foundations

Given the acid sulphate soils risk and low pH values recorded on site, it is recommended installing a waterproof membrane underneath any shallow foundations, the membrane should be extended up to the edge of the foundations. If the above recommendations are followed, concrete exposure class can be A1 according to NZS3101. A typical detail is shown in Figure 3 showing the damp-proof membrane for a typical foundation detail.

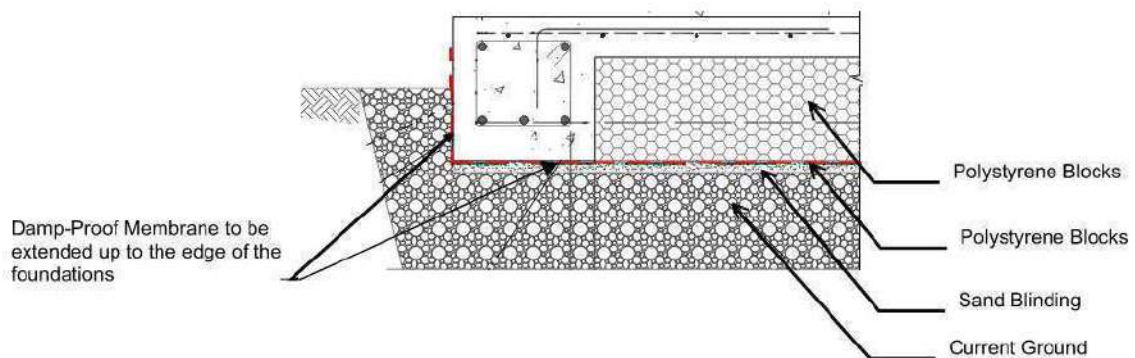


Figure 3: Damp-Proof Membrane Detail

8.5.3. Mitigation measure for Deep Foundations

8.5.3.1. Concrete

In case of deep concrete foundations were used on site, it is recommended referring to the Australian Standard AS 2159 – 2009 Section 6 when designing concrete and steel structures to withstand corrosive environments.

The exposure classification of concrete is *Very Severe* according to Table 6.4.2 (C) of AS 2159 – 2009, considering a pH less than 4 and soil Conditions A (high permeability soils). It is recommended to refer to Table 6.4.3 of AS 2159 – 2009 to select the minimum strength of concrete and concrete cover relevant for the *Very Severe* Exposure Classification and design life.

8.5.3.2. Steel

If steel elements are used in the ground (i.e. driven H-steel piles, etc.), it is recommended adopting the *Severe* Exposure Classification shown in Table 6.5.2 (C) of AS 2159 – 2009, considering a pH less than 3 and soil Conditions A (high permeability soils).

A uniform corrosion allowance of 0.04-0.1 mm/year should be adopted during the design of any underground steel structure.

8.5.3.3. Timber

No precautions are required to be taken for timber piles. Timber is not susceptible to corrosion by acid.

8.6. Proposed Building Foundations

The test results indicate that the sites (once the peat / topsoil layer is removed) are suitable for standard foundations for buildings.

If a shallow concrete strip footing or concrete slab on grade is to be used, any organic soil such as peat and topsoil in the building footprint is to be excavated and replaced with an engineered hard fill layer of compacted aggregate in accordance with NZS 4431 or AS 3798:2007.

The Sandy material for all lots in Stage 4 & 5 is consistent with a Class A site as defined by AS 2870:2011 indicating little to no ground movement from moisture changes is expected.

This means that the finished ground within the lots is suitable for the erection of buildings on “Good Ground” in terms of NZS 3604:2011 (Timber Framed Buildings) & NZS 4229:2013 (Concrete Masonry Buildings Not Requiring Specific Engineering Design) and related documents providing that:

- Standard check of excavated foundations is carried out at time of construction.
- Buildings subject to heavy loads or vibrations will require specific design.
- Buildings not meeting the criteria for NZS3604:2011 and NZS4229:2013 will require specific design.

This report and the inferred professional opinions found within does not remove the necessity for normal inspection and design of foundations, as would be made in natural ground.

For the additional investigation, test sites should be situated under the building areas for each site and should be selected to give adequate information about the soil over the entire plan area of the proposed building. There shall be a minimum of four test sites for a building up to 200 m², with at least one additional test site for each additional 100 m² plan area of building as recommended by NZS3604.

9. Conclusions

Cook Costello was engaged by WFH Properties Ltd, to provide technical advice for earthworks and be the geo-professional for the Landing Stage 4-5 subdivision at One Tree Point, Northland. Cook Costello designed earthwork cuts and placement of controlled sand engineered fill, in order to enable construction of the building platforms within the proposed development.

All lots have been subject to bulk earthworks to provide sites suitable for standard foundations for typical residential buildings. Any heavy structures or heavy industry users will require specific design and further investigations. A layer of topsoil was spread over the lots to ensure moisture is retained and grass will grow to prevent wind-blown erosion.

Based on our investigations we make the following conclusions and recommendations:

- The test results indicate that the sites (once the peat/topsoil layer is removed) are suitable for standard foundations for buildings.
- An ultimate bearing capacity of 300kPa is available below any peat / topsoil that has been spread on site after the completion of the earthworks. To be noted that between 100 – 300 mm of topsoil has been spread throughout the site with an average of 200 mm.
- The site is consistent with Subsoil Class C – Shallow Soil sites as per NZS1170.5.
- Liquefaction potential is low. Little to no expression of liquefaction is expected within Stage 4 and Stage 5 subdivisions.
- Up to 20 mm of settlements could be expected under the ULS earthquake case that are within the tolerancy of the building code that is 25 mm over 6 m according to Clause B1/VM4 for static settlements.
- Foundation design should limit the probable maximum differential settlement over a horizontal distance of 6 m to no more than 25 mm under serviceability limit state load combinations of AS/NZS 1170 Part 0, unless the structure is specifically designed to prevent damage under a greater settlement.
- The Landing Stages 4 & 5 subdivisions are mapped on the Whangarei District Council Map to be in the Acid Sulphate Risk Area that is a well-known hazard in the area and well addressed with standard construction measures (i.e. waterproof membrane for shallow foundations).

Acid Sulphate Soil Field PH Tests have been conducted. Results of lab testing suggest that soils are likely to contain very little sulfides.

- However, the PH_F and pH_{ox} values are comprised between 2.92 and 5.22. According to NZS 3101:Part 1:2006 Section 3.4.3.2, an acidity represented by a PH of 5.0 to 5.5 may be considered as a practical limit of tolerance of high-quality concrete in contact with any acids.

- For pH lower than 5.0, the environment shall be assessed as exposure classification U as per NZS 3101.
 - Alternatively, as reported in the Acid Sulphate Soil Planning Policy Basic Guide prepared for WDC by Opus International Consultants, Australian Standard AS 2159 – 2009 Section 6 is relevant when designing concrete and steel structures to withstand corrosive environments.
 - It is recommended installing a waterproof membrane underneath any shallow foundations, the membrane should be extended up to the edge of the foundations to mitigate the presence of corrosive environment. If the above recommendations are followed, concrete exposure class can be A1 according to NZS3101.
 - In case of deep concrete foundations were used on site, it is recommended referring to the Australian Standard AS 2159 – 2009 Section 6 when designing concrete and steel structures to withstand corrosive environments. The exposure classification of concrete is *Very Severe* according to Table 6.4.2 (C) of AS 2159 – 2009, considering a pH less than 4 and soil Conditions A (high permeability soils). It is recommended to refer to Table 6.4.3 of AS 2159 – 2009 to select the minimum strength of concrete and concrete cover relevant for the *Very Severe* Exposure Classification and design life.
 - If steel elements are used in the ground (i.e. driven H-steel piles, etc.), it is recommended adopting the Severe Exposure Classification shown in Table 6.5.2 (C) of AS 2159 – 2009, considering a pH less than 3 and soil Conditions A (high permeability soils). A uniform corrosion allowance of 0.04-0.1 mm/year should be adopted during the design of any underground steel structure.
 - No precautions are required to be taken for timber piles. Timber is not susceptible to corrosion by acid.
- If a shallow concrete strip footing or concrete slab on grade is to be used, any organic soil such as peat and topsoil in the building footprint is to be excavated and replaced with an engineered hard fill layer of compacted aggregate in accordance with NZS 4431 or AS 3798:2007.
 - The Sandy material for all lots in Stage 4-5 is consistent with a Class A site as defined by AS 2870:2011 indicating little to no ground movement from moisture changes is expected.
 - The finished ground within the lots is suitable for the erection of buildings on “Good Ground” in terms of NZS 3604:2011 (Timber Framed Buildings) & NZS 4229:2013 (Concrete Masonry Buildings Not Requiring Specific Engineering Design) and related documents providing that:
 - Standard check of excavated foundations is carried out at time of construction.
 - Buildings subject to heavy loads or vibrations will require specific design.
 - Buildings not meeting the criteria for NZS3604:2011 and NZS4229:2013 will require specific design.

- This report and the inferred professional opinions found within does not remove the necessity for site-specific geotechnical investigation, normal inspection and design of foundations, as would be made in natural ground.

10. Limitations

This report has been prepared for the benefit of WFH Properties Limited as our client & The Whangarei District Council with respect to a geotechnical completion report for Stage 4 & 5 of The Landing Subdivision, One Tree Point. It shall not be relied upon for any other purpose. The reliance by other parties on the information or opinions contained in this report shall, without our prior review and agreement in writing, be at such parties' sole risk.

Opinions and judgments expressed herein are based on our understanding and interpretation of current regulatory standards and should not be construed as legal opinions. Where opinions or judgments are to be relied on they should be independently verified with appropriate legal advice. Any recommendations, opinions, or guidance provided by Cook Costello in this report are limited to technical engineering requirements and are not made under the Financial Advisers Act 2008.

Recommendations and opinions in this report are based on data from testing undertaken on site. The nature and continuity of subsoil conditions away from the tests are inferred and it must be appreciated that actual conditions could vary considerably from the assumed model.

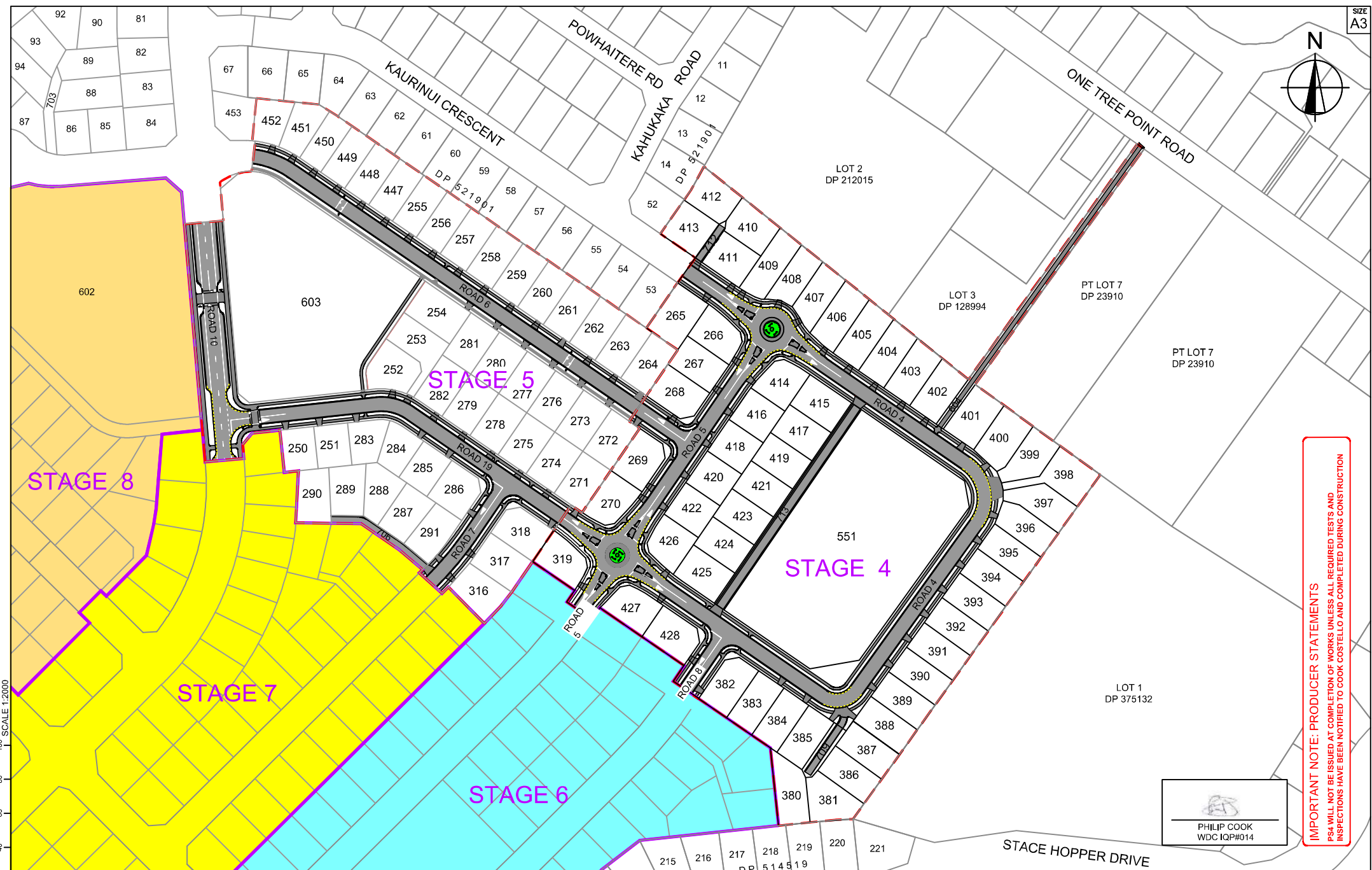
During excavation and construction the site should be examined by a Cook Costello Engineer or Engineering Geologist to judge whether the exposed subsoil's are compatible with the inferred conditions on which the report has been based. It is possible that the nature of the exposed subsoil's may require further investigation and the modification of the design based on this report. In any event it is essential that the firm is notified if there is any variation in subsoil conditions from those described in the report as it may affect the design parameters recommended in the report.

Cook Costello have performed the services for this project in accordance with the standard agreement for consulting services and current professional standards for environmental site assessment. No guarantees are either expressed or implied.

There is no investigation which is thorough enough to preclude the presence of materials at the site which presently, or in the future, may be considered hazardous. Because regulatory evaluation criteria are constantly changing, concentrations of contaminants present and considered to be acceptable now may in the future become subject to different regulatory standards which cause them to become unacceptable and require further remediation for this site to be suitable for the existing or proposed land use activities.

This report is generally appropriate for engineering use for five years, however it should be considered that future seismic events may change soil parameters and as a result, a new assessment of the site may be necessitated. Local changes in groundwater tables may also necessitate a reassessment of the site. It is recommended that if an interpretive report is more than two years old, or the proposed building that the report originally applied to have changed significantly, (e.g., layout, height, weight of building materials, foundation loads etc.) and/or design loadings have changed (e.g., design PGA levels), then the report is reviewed by the geotechnical engineer for current applicability.

Appendix 1 – Scheme Plan



IMPORTANT NOTE: PRODUCER STATEMENTS
PS4 WILL NOT BE ISSUED AT COMPLETION OF WORKS UNLESS ALL REQUIRED TESTS AND INSPECTIONS HAVE BEEN NOTIFIED TO COOK COSTELLO AND COMPLETED DURING CONSTRUCTION


PHILIP COOK
WDC IQP#014



D	JOAL 713 MOVED & LOT BDYS CHANGED	11/01/21 KH PC
C	NEW IQP DETAILS	18/03/20 KH PC
B	JOAL 707 REMOVED & LOTS 252-254 CHANGED	28/02/20 AP GM
REV.	REVISION DETAILS	DRAWN APP.

PROJECT DETAILS
WFH PROPERTIES LIMITED
THE LANDING - STAGES 4 & 5
ONE TREE POINT
RUAKAKA

TITLE
PROPOSED LAYOUT
STAGES 4 & 5

DATE CREATED 29/11/2019	DRAWN K HANSARD	DESIGNED A PARKER	APPROVED G MCGREGOR
CCL REF NO 14333-004	SCALE 1:2000 @ A3	STATUS FOR APPROVAL	REVISION D
DWG NUMBER DD201			

Appendix 6 – Statement of Professional Opinion on Suitability of Land for Building Construction - Form EES-PO1



Statement of Professional Opinion on Suitability of Land for Building Construction Form EES-PO1

Development The Landing – Stage 4 and Stage 5, One Tree Point
Developer WFH POPERTIES LIMITED
Location One Tree Point
I (full name) Stefano Rotatori
of (Name and address of firm) Cook Costello Ltd, Norfolk House, 2 Norfolk Street, Whangarei, Northland

Hereby confirm that _____

- 1 I am a geo-professional as defined in **Section 1.2** of the WDC EES and was retained by the developer as the geo-professional on the above development
- 2 The extent of my preliminary investigations are described in my Report(s) number **14333-004** dated **21/10/2021** & the conclusions and recommendations of that/those document(s) have been re-evaluated in the preparation of this report. The extent of my inspections during construction, & the results of all tests and/or re-evaluations carried out are as described in my geotechnical completion report dated **21/10/2021**.
- 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 **AS EW 1D, AS EW 2D** appended within **Appendix 2 of the Completion Report dated 21/10/2021** have been placed in compliance with the requirements of Council & my specification
 - b The completed works take into account land slope & foundation stability considerations, subject to the appended foundation recommendations and earthworks restrictions, *(which should be read in conjunction with the appended final site contour plan AS EW 1D, AS EW 2D).*
 - c Subject to 3(a) and 3(b) above, the original ground not affected by filling satisfies the description of 'good ground' as described in NZS3604/NZS4229
 - d Subject to 3(a) & 3(b) above, the filled ground satisfies the description of 'good ground' as described in NZS3604/NZS4229
 - e The original ground not affected by filling & the filled ground are not subject to erosion, subsidence, or slippage in accordance with the provisions of section 106 of the Resource Management Act 1991 provided that:
 - (i) **Site-specific geotechnical investigation and design of foundations are to be carried out at the detailed design of buildings.**
 - (ii) **Standard inspection of excavated foundations is to be carried out at time of construction**
 - (iii) **Buildings subject to heavy loads or vibrations will require specific design.**
- 4 This professional opinion is furnished to the TA & the developer for their purposes alone on the express condition that it will not be relied upon by any other person and does not remove the necessity for the normal inspection of foundation conditions at the time of erection of any building.
- 5 This certificate shall be read in conjunction with my geotechnical report referred to in clause 2 above & shall not be copied or reproduced except in conjunction with the full geotechnical completion report.

Signature

Qualifications

Date

ME, IntPE (NZ), CMEngNZ, CPEng # 1027758

21/10/2021



Landslide Susceptibility
Zone

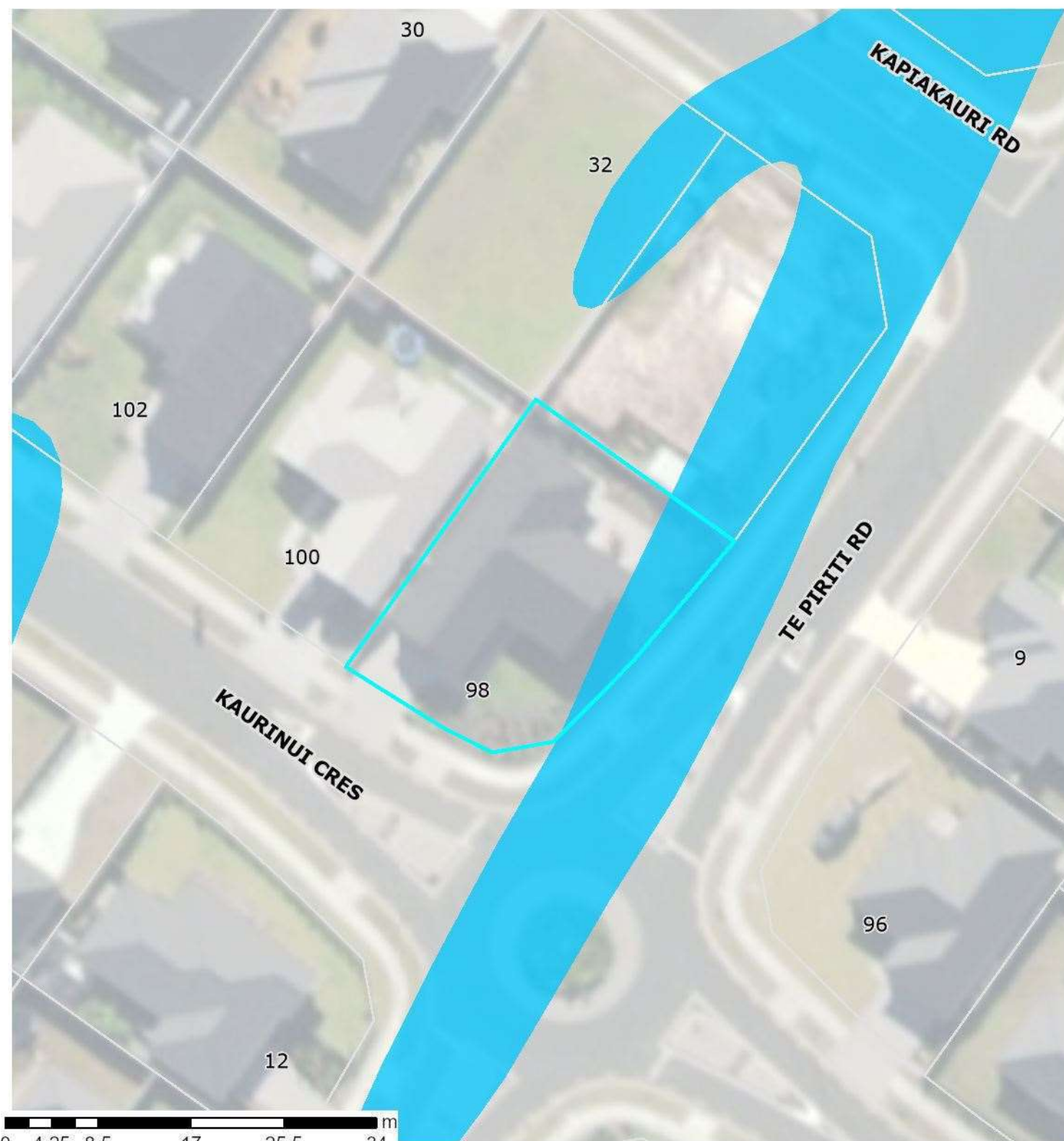
- High
- Moderate
- Low

Whangārei District Council holds indicative information on land stability hazard for Whangārei. The Whangārei District Council may require site-specific investigations before granting future subdivision or building consent for the property, depending on the level of stability risk of the area the property is in. Tonkin + Taylor Ltd Landslide Susceptibility assessment report: <https://www.wdc.govt.nz/files/assets/public/documents/council/reports/hazard-reports/land-stability/landslide-susceptibility-technical-report.pdf>

12 August 2025
Scale 1:500



District Plan Change 1 - Natural Hazards Flooding



PC1 - Natural Hazards

Flood Hazard Area

- 10 Year Flood Hazard Area
- 100 Year Flood Hazard Area

12 August 2025

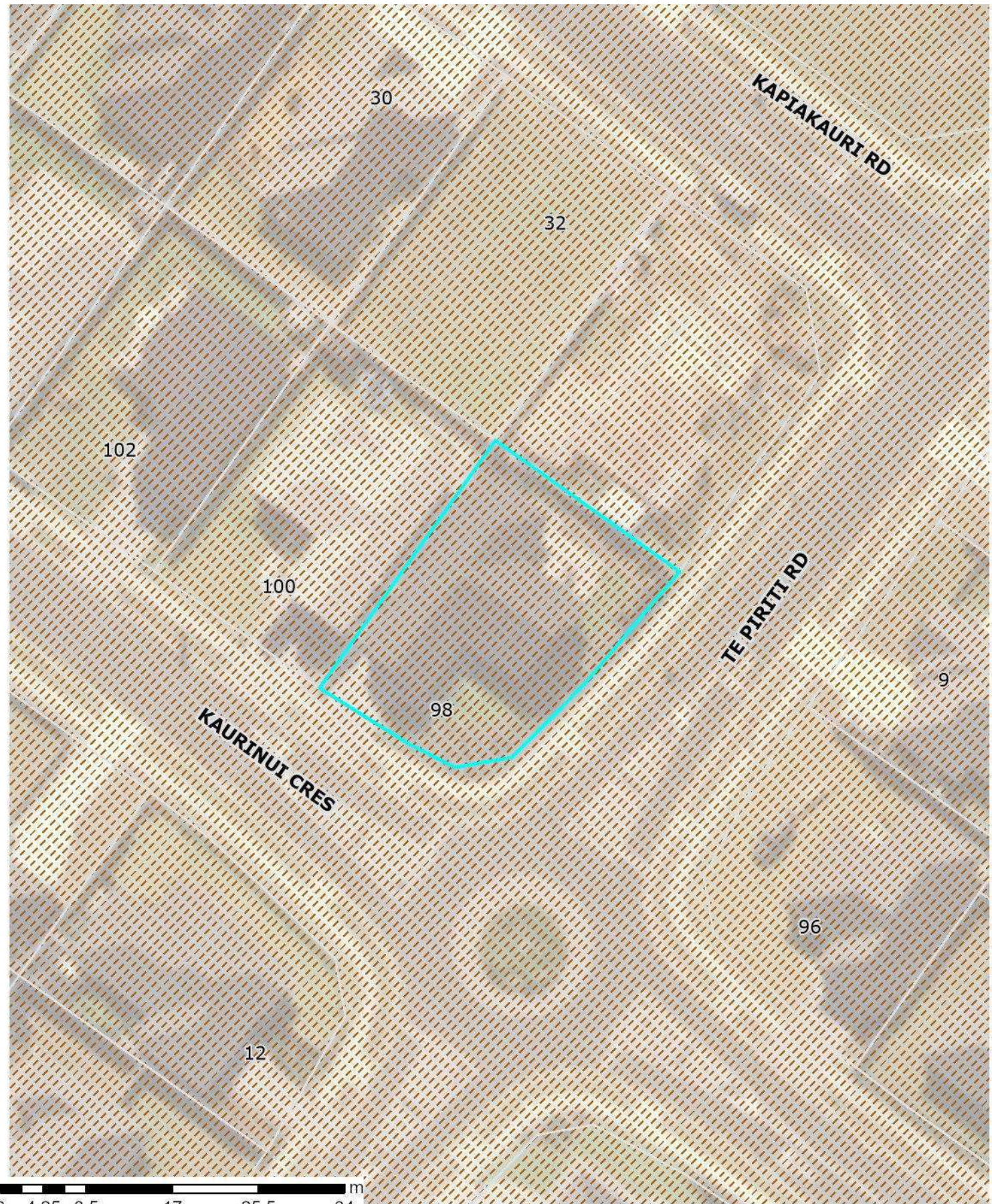
Scale 1:500



Information provided on this map forms part of Plan Change 1 – Natural Hazards.
To view the maps and see how the changes may affect the property please visit:
<https://www.wdc.govt.nz/Services/Planning/District-Plan-changes/Current-plan-changes>.

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Acid Sulphate Soil (Risk/Confirmed)



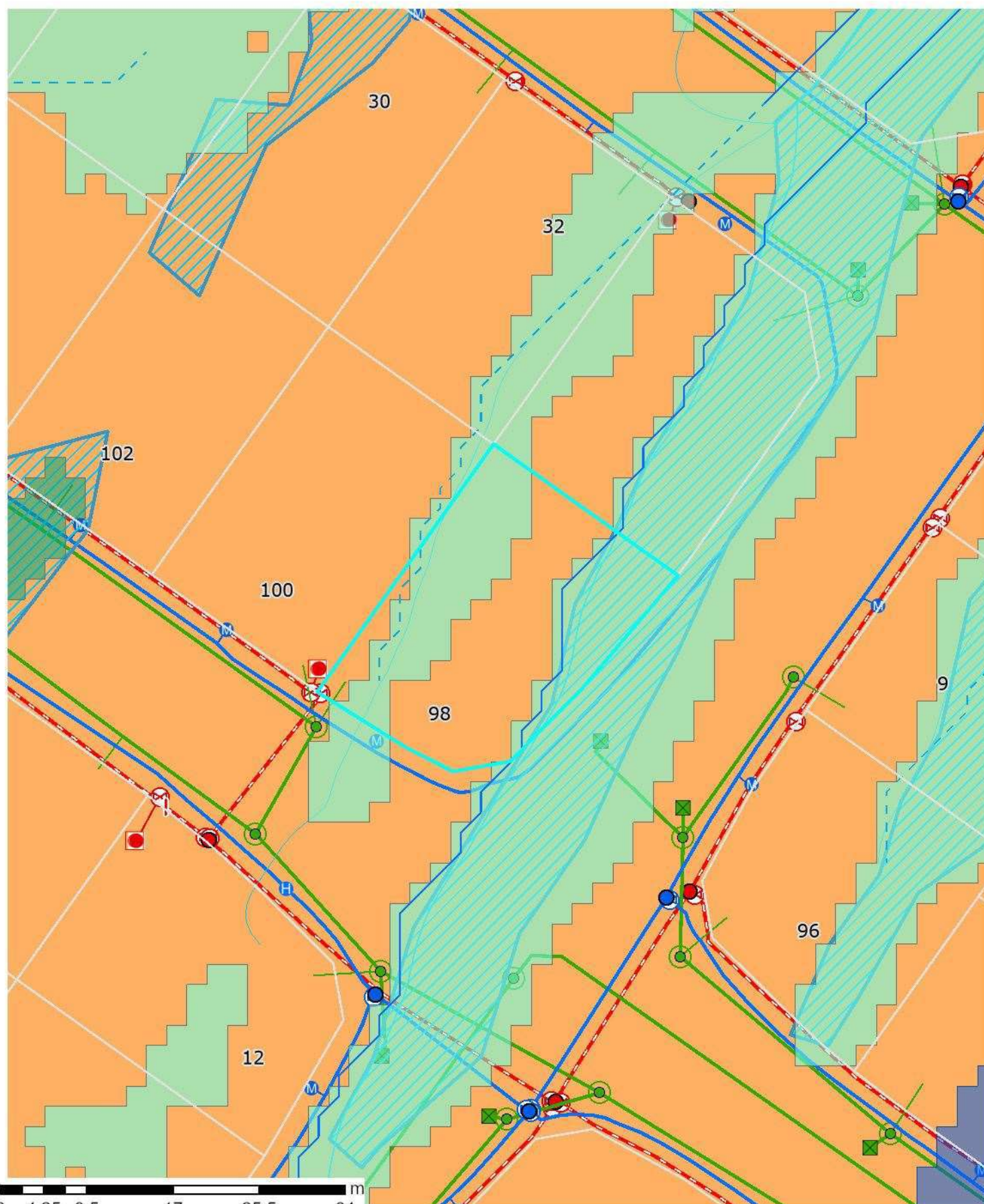
- Confirmed Acid Sulphate Soil
- Acid Sulphate Soil Risk

These soils, where present, can generate acidic groundwater and may require consideration with regard to land drainage and selection of building materials for buried structures.

12 August 2025
Scale 1:500



Water, Wastewater and Stormwater



This information is generalized and shows the approximate location of the Public pipeline services.
For digging, the As-Built engineering drawings must be used to accurately locate the services.
See WDC Customer Services.

12 August 2025

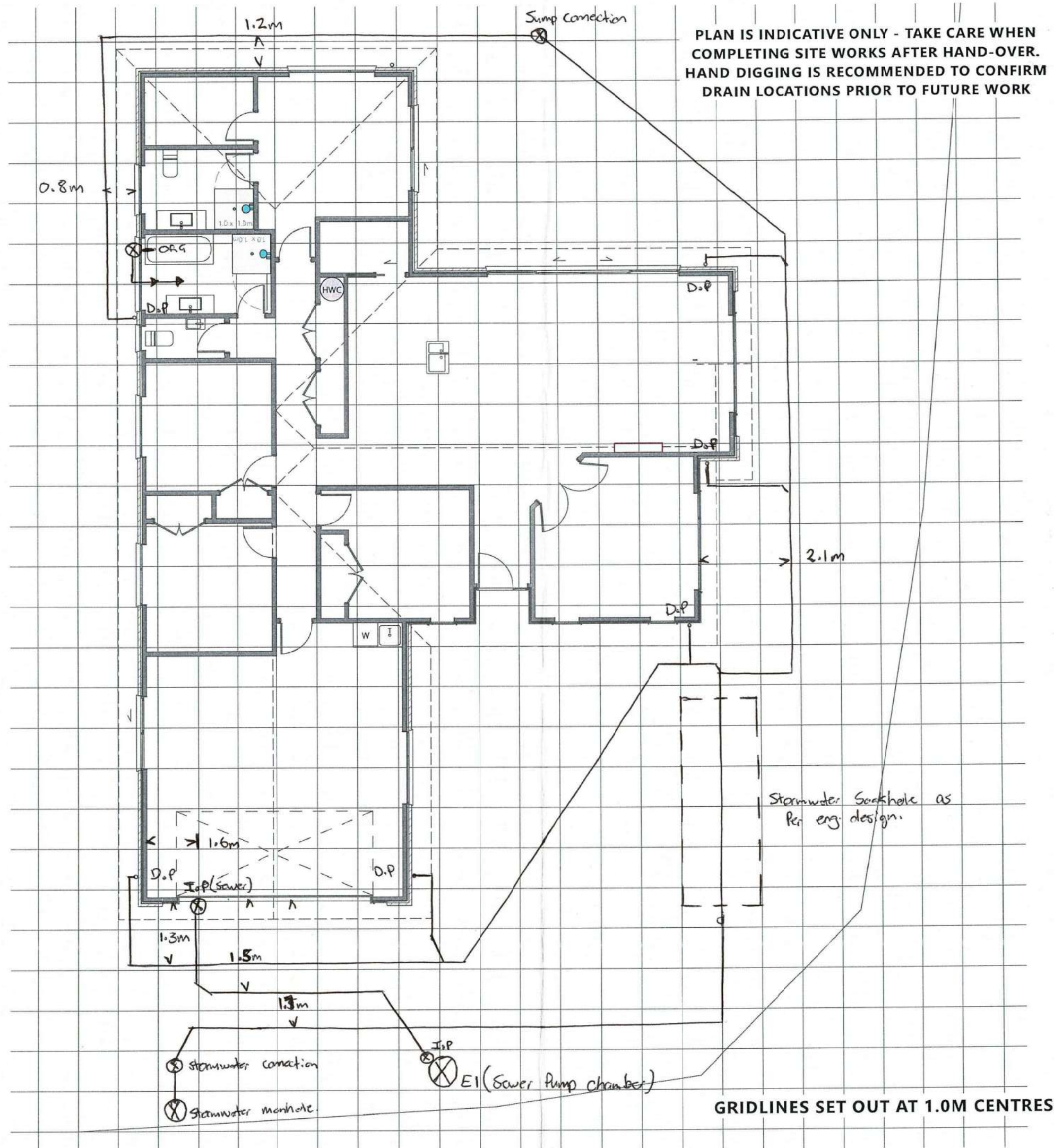
Scale 1:500



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Water, Wastewater and Stormwater – Map Legend

Water	Stormwater	Stormwater Catchment and Flood Management	Wastewater
Water Point Actuator WDC Private Backflow Device WDC Private Bore WDC Private End Structure WDC Private Fitting Node WDC Private Hydrant WDC Private Meter WDC Meter Manifold WDC Private Pump WDC Private Valve WDC RED Private Water Line Abandoned Pipe Trunk Main WDC Private Other Main WDC Private Process Pipework WDC Private Reticulation WDC Private Service Line WDC Private Water Area Chamber WDC Private Reservoir WDC Private	Stormwater Point End Structure WDC Private Fitting Node WDC Private GPT WDC Private Manhole WDC Private Pump WDC Private Stormwater Inlet WDC Private Valve WDC Private Stormwater Line Abandoned Pipe Culvert WDC Private Drainage WDC Private Main WDC Private Service Line WDC Private Surface Drain WDC Private Stormwater Area Basin WDC Private Chamber WDC Private	Stormwater Catchment and Flood Management Overland Flow Paths 2021 Modelled Catchment Flowpaths 2021 0.2 ha to 0.4 ha 0.4 ha to 1.0 ha 1.0 ha to 3.0 ha 3.0 ha to 100.0 ha 100.0 ha and above Surface Depression Ponding Areas 2021 0.200000 - 0.600000 m 0.600001 - 1.200000 m 1.200001 - 2.000000 m 2.000001 - 4.000000 m 4.000001 - 9.910000 m Overland Flow Paths 2017 Catchment Area 2017 0.2 - 1.0 Ha 1.0 - 2.0 Ha 2.0 - 5.0 Ha > 5.0 Ha Depression Storage Areas 2017 Depression Storage Areas	Wastewater Wastewater Point Backflow Device WDC Private End Structure WDC Private Fitting Node WDC Private Manhole WDC Private Meter WDC Private Motor Control Centre WDC Private Pump WDC Private Valve WDC Private Wastewater Line Abandoned Pipe Main Rising Main (Pressure) Sewer Gravity Main Private Other Process Pipework WDC Private Service Line WDC Private Wastewater Area Chamber WDC Private Pressure Sewer System Public Private



NEW HOME FOR:

RJK

Developments

SITE ADDRESS

Te Piriti Road
One Tree Point
Whangarei

PURCHASER SIGNATURE

Owner

Owner

Date

BUILDER SIGNATURE

Date

SITE INFORMATION

Lot Number

270

Site Area

602m²

Planning Zone

General Residential

DPS Number

TBC

Wind Zone

High

Corrosion Zone

D

Territorial Authority

WDC

JOB INFORMATION

GJG Job Number

390129

Job Last Published

Wednesday, 20 April 2022

DRAWING VERSION

Contract

CAD Technician/Designer

M Grew

Scale

1:100

Sheet

A208^{ED}

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Whangarei District Council
Private Bag 9023, Te Mai
Whangarei 0143
Ph:0-9-430 4200
Email: mailroom@wdc.govt.nz

Rates LIM Report

As at: Tuesday, 12 August, 2025

Property Number 172239
Legal Description LOT 270 DP 564989
Assessment Number 0029002137
Address 98 Kaurinui Crescent One Tree Point 0118
Record of Title(s) 1009387
Land Value \$330,000
Capital Value \$975,000
Date of Valuation 01-July-2024
Effective Date (used for rating purposes) 01-July-2025
Meter Location 7m from LHB, 4m behind kerb #98

Rates Breakdown (up to 30 June 2026)

Rates Charge	Charge Total
General Residential	\$962.71
Sewage Disposal - Residential	\$966.00
Stormwater	\$79.00
Uniform Annual General Charge	\$901.00
Regional Council Services	\$229.89
Regional Economic Development	\$10.03
Regional Emergency & Hazard Management	\$67.31
Regional Flood Infrastructure	\$41.66
Regional Land and Freshwater Management	\$99.86
Regional Pest Management	\$109.47
Regional Rescue Services	\$8.87
Regional Sporting Facilities	\$16.09
Regional Transport Rate	\$30.40
Annual Charge Total	\$3,522.29

Opening Balance as at 01/07/2025 **\$0.00**

Rates Instalments	Total
20/07/2025 Instalment	\$882.29
20/10/2025 Instalment	\$880.00
20/01/2026 Instalment	\$880.00
20/04/2026 Instalment	\$880.00
Rates Total	\$3,522.29

Balance to Clear **\$2,717.29**

Form 5

Building Consent - BC2200646

Section 51, Building Act 2004

Forum North, Private Bag 9023
Whangarei 0148, New Zealand
[P +64 430 4200](tel:+644304200)
[E mailroom@wdc.govt.nz](mailto:mailroom@wdc.govt.nz)
www.wdc.govt.nz

The Building

Street address of building:	98 Kaurinui Crescent One Tree Point 0118
Legal description of land where building is located:	LOT 270 DP 564989
Building name:	N/A
Location of building within site/block number:	N/A
Level/unit number:	N/A

The Owner

Name of owner:	RJK Development Limited
Contact person:	Derek Hulse
Mailing address:	132 Kara Road RD 9 Whangarei 0179
Street address/registered office:	N/A
Phone number:	Landline: N/A Mobile: 0212708282
Daytime:	N/A
After hours:	N/A
Facsimile number:	N/A
Email address:	N/A
Website:	N/A

First point of contact for communications with the building consent authority:
Sudfelt Construction Limited T/A GJ Gardner Homes; Mailing Address: 14 Percy Street
Kensington
Whangarei 0112; Phone: 094375666; Email: whangarei@gjgardner.co.nz

Building Work

The following building work is authorised by this building consent:
New Dwelling

This building consent is issued under section 51 of the Building Act 2004. This building consent does not relieve the owner of the building (or proposed building) of any duty or responsibility under any other Act relating to or affecting the building (or proposed building). This building consent also does not permit the

construction, alteration, demolition, or removal of the building (or proposed building) if that construction, alteration, demolition, or removal would be in breach of any other Act.

Conditions

This building consent is subject to the following conditions:

Section 90 - Inspections by Building Consent Authorities: (1) Every building consent is subject to the condition that agents authorised by the building consent authority for the purposes of this section are entitled, at all times during normal working hours or while building work is being done, to inspect-

- (a) land on which building work is being or is proposed to be carried out; and
- (b) building work that has been or is being carried out on or off the building site; and
- (c) any building.

(2) The provisions (if any) that are endorsed on a building consent in relation to inspection during the carrying out of building work must be taken to include the provisions of this section.

(3) In this section, inspection means the taking of all reasonable steps to ensure that building work is being carried out in accordance with a building consent.

Inspections

The following inspections are required:

- | | |
|----------------------|----------------------|
| • Prepour | • Wastepipes |
| • Floor Slab | • Framing / Pre-wrap |
| • Post Wrap / Cavity | • Half High Brick |
| • Preline Plumbing | • Preline Building |
| • Post Line | • Internal Membrane |
| • Drainage | • Final |

Documents Required

Wastepipes

- G13: Underslab plumbing as-built & plumbers details

Framing / Pre-wrap

- B1: Truss certification

Preline Building

- G12: Pipework pressure test documentation

Internal Membrane

- E3: Internal Waterproofing Membrane Installer Verification

Drainage

- E1: Stormwater drain leakage test and as-built plans
- G13: As-builts, drainlayer details, pipework test

Final

- G9: Energy works certificate

Compliance Schedule

A compliance schedule is not required for this building.

Attachments

Copies of the following documents are attached to this building consent:

Information page: Now you have your Building Consent

- Advice notes

Signature: Jamie Nikora

Position: Building Control Officer

On behalf of: Whangarei District Council

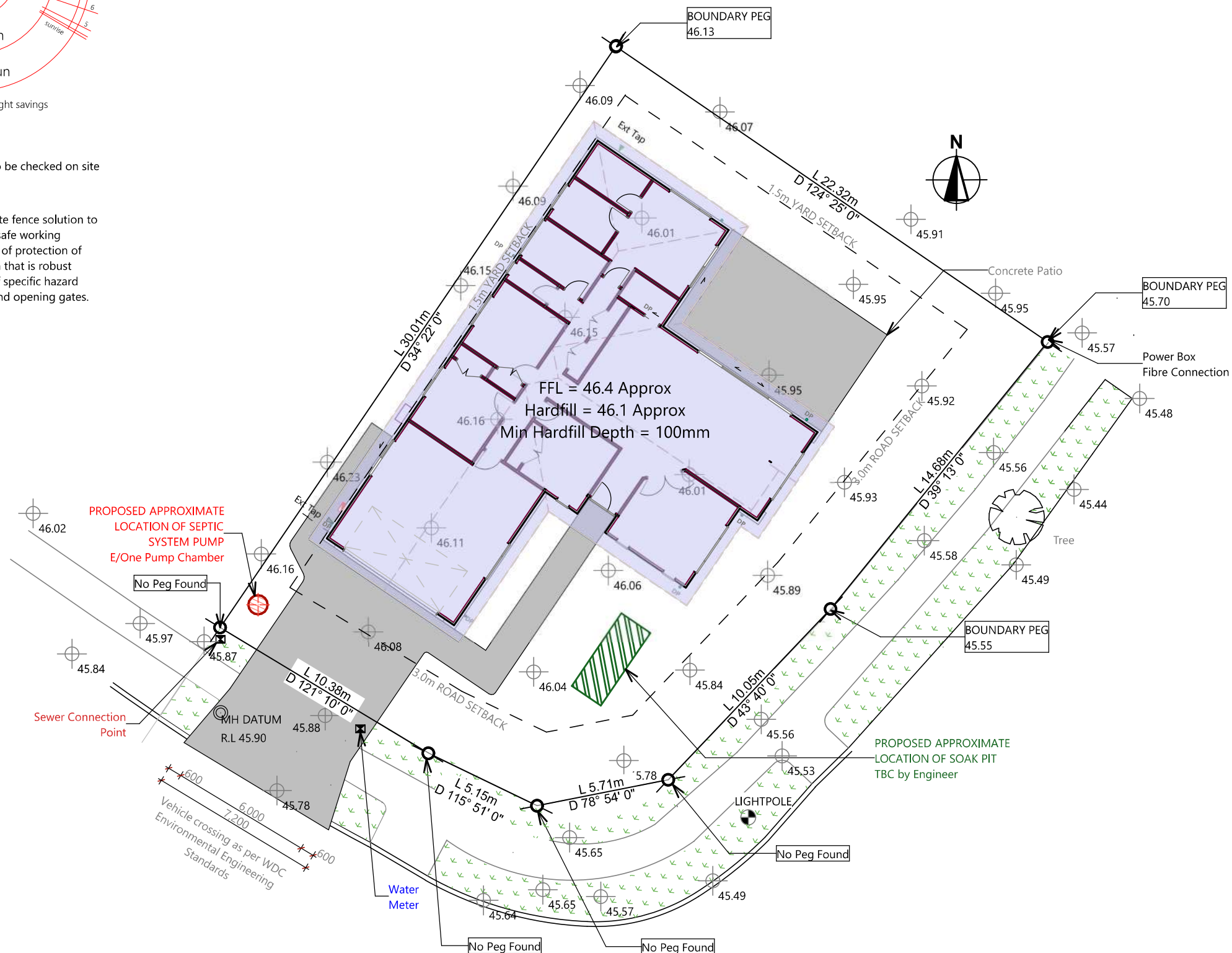
Issue Date: 21 June 2022

NOTE:

- All ground and floor levels to be checked on site before excavation commences
- Supply and install a stable, site fence solution to secure building site to achieve safe working environments and a high level of protection of public safety. Provide a system that is robust restricting access of children/if specific hazard arises, installed with bracing and opening gates.

ALL SITE INFO TBC ON RECEIPT OF TITLE AND IS SUBJECT TO CHANGE.

SEA SPRAY ZONE
ALL EXPOSED FIXINGS TYPE 304 SS



SITE CONCEPT ONLY. SUBJECT TO ENGINEERS APPROVAL.

G.J. GARDNER HOMES - NEW ZEALAND
Whangarei / Kaipara
09) 437 5666
14 Percy St, Whangarei
www.gjgardner.co.nz

NEW HOME FOR:

RJK Developments

SITE ADDRESS

**Te Piriti Road
One Tree Point
Whangarei**

PURCHASER SIGNATURE

Owner	Owner
-------	-------

Date _____

BUILDER SIGNATURE

Date _____

SITE INFORMATION

<u>Lot Number</u>	<u>DPS Number</u>
270	TBC
<u>Site Area</u>	<u>Wind Zone</u>
602m²	High
<u>Planning Zone</u>	<u>Corrosion Zone</u>
General Residential	D
	<u>Territorial Authority</u>
	WDC

MAX COVERAGE	MAX IMPERMEABLE
Site Area 602m²	Site Area
40%	60%
Max 241m ²	Max 361.2m ²

SITE COVERAGE		
Areas	m²	%
Area Over Frame	202	34%
Area Over Foundation	209	35%

SITE IMPERMEABLE		
Areas	m²	%
Roof Coverage	244.2	40.6%
Uncovered Concrete	81.8	13.6%
TOTAL	326.0	54.2%

Concrete Areas: Trowel Finished with 5kg/m³ Black Oxide

Uncovered Areas	113.7m ²
Covered Areas	13m ²
TOTAL	126.7m²

JOB INFORMATION

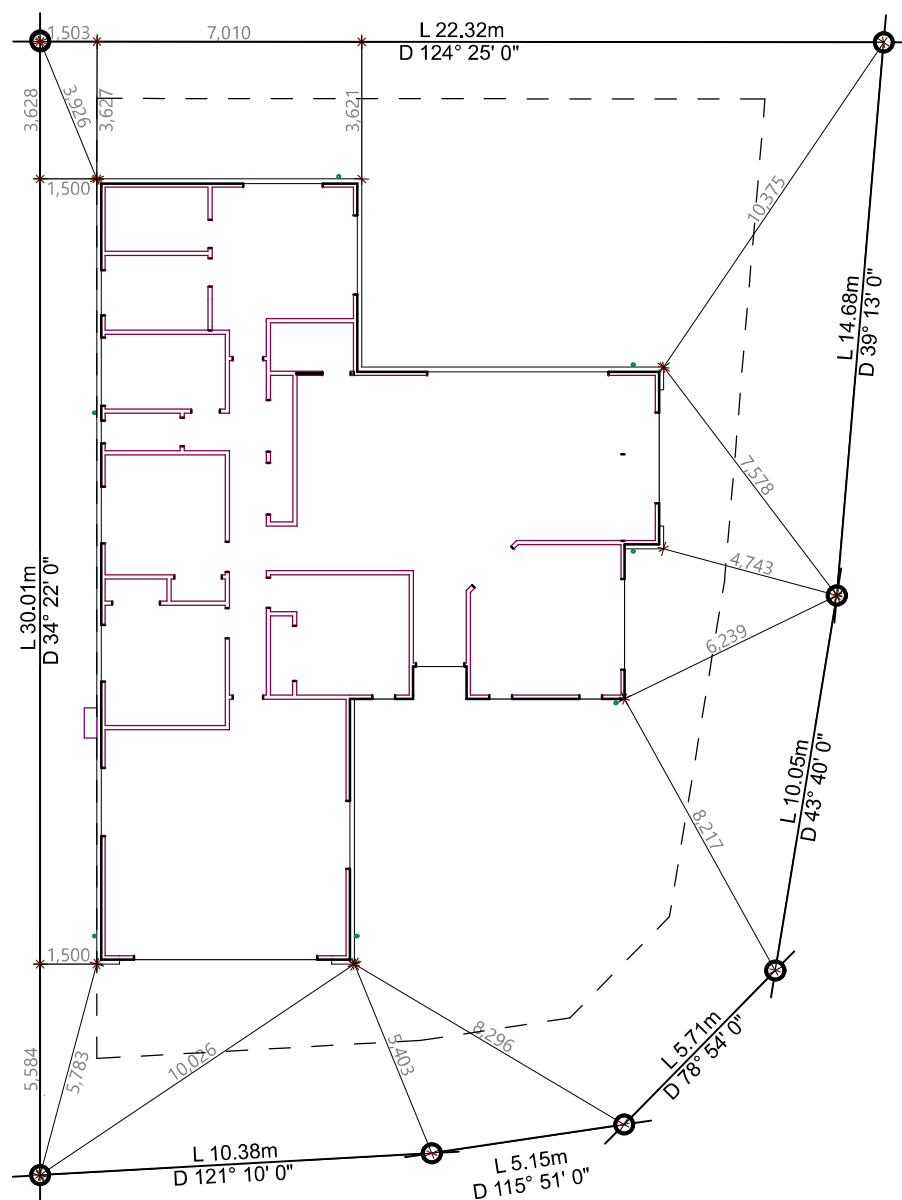
GJG Job Number Job Last Published
Thursday, 28 April 2022

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Contract

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M Grew
 Scale **A201**
1:200, 1:500

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RJK

Developments

Te Piriti Road

One Tree Point

Whangarei

PURCHASER SIGNATURE

Owner

Owner

Date _____

BUILDER SIGNATURE

Date _____

SITE INFORMATION

Lot Number

270

Site Area602m²

Planning Zone

General Residential

DPS Number

TBC

Wind Zone

High

Corrosion Zone

D

Territorial Authority

WDC

NOTE:

- All dimensions for setout are to Foundation

JOB INFORMATION

GJG Job NumberJob Last Published

Wednesday, 20 April 2022

390129

DRAWING VERSION

Contract

CAD Technician/Designer

Sheet

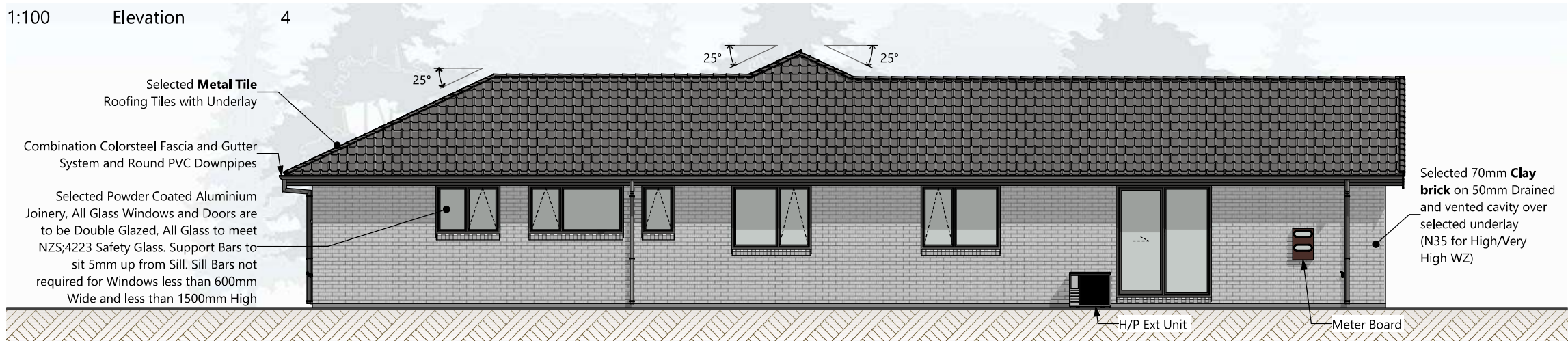
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Sheet **A202**^{ED}

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NEW HOME FOR:

RJK
Developments

SITE ADDRESS

Te Piriti Road
One Tree Point
Whangarei

PURCHASER SIGNATURE

Owner Owner

Date

BUILDER SIGNATURE

Date

SITE INFORMATION

Lot Number	DPS Number
270	TBC
Site Area	Wind Zone
602m²	High
Planning Zone	Corrosion Zone
General Residential	D
	Territorial Authority
	WDC

JOB INFORMATION

GJG Job Number Job Last Published
390129 Thursday, 28 April 2022

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Contract

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M Grew **A301**
Scale **ED**
1:100

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SUITABILITY REPORT

Kaurinui Crescent
One Tree Point
(Lot 270 DP 564989)

SUITABILITY REPORT

Kaurinui Crescent

One Tree Point

(Lot 270 DP 564989)

Report prepared for: GJ Gardner Homes - RJK Developments

Report prepared by: Codie Hay

Report reviewed by: Steve Turner

Report reference: 18221

Date: 28 April 2022



association of
consulting and
engineering

Issue	Details	Date
1	Draft	15 February 2022
2	Building Consent Issue	28 April 2022

Contents

1.0	Introduction	1
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3.0	Desk Study	2
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3.3	Subdivision Report	2
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6.2	Liquefaction	4
6.3	Expansive Soils	4
6.4	Acid Sulphate Soils	5
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Appendices

A	Drawings
B	Subsurface Investigations
C	Stormwater Attenuation Design and Details

SUITABILITY REPORT

Kaurinui Crescent, One Tree Point (Lot 270 DP 564989)

1.0 Introduction

RS Eng Ltd (RS Eng) has been engaged by GJ Gardner Homes, on behalf of their client, to investigate the suitability of their property (Lot 270 DP 564989) for residential construction. The purpose of this report is to assess the suitability of the building site making foundation, earthworks, and stormwater recommendations.

The client proposes to construct a four-bedroom single level dwelling founded on a RibRaft concrete slab.

2.0 Site Description

This property is located on the northern side of Kaurinui Crescent, on the western corner between Kaurinui Crescent and Te Piriti Road. The site has been developed as part of 'The Landing at Marsden: Stage 4' subdivision. The property is near level with ground coverage consisting of patchy grass.



Figure 1: View of property, Northern direction

3.0 Desk Study

3.1 Referenced/Reviewed Documents

The following documents have been referenced in this report:

- GNS – Geology of The Whangarei Area – Edbrooke & Brook – 2009.
- Cook Costello - *“The Landing Stage 4 & 5 Earthworks Completion Report”* dated 14 October 2021.
- Consent Notice – *“12201143.6.”*

3.2 Site Geology

The GNS 1:250,000 scale New Zealand Geology Web Map indicates that the property is located within an area that is underlain by Karioitahi Group, described as follows: *“Weakly cemented sand in fixed transverse dune ridges.”*

3.3 Subdivision Report

The underlying subdivision was reported on by Cook Costello in a report entitled *“The Landing Stage 4 & 5 Earthworks Completion Report”* dated 14 October 2021. The following recommendations were made in relation to the property in question:

- *“The test results indicate that the sites (once the peat / topsoil layer is removed) are suitable for standard foundations for buildings.*
- *If a shallow concrete strip footing or concrete slab on grade is to be used, any organic soil such as peat and topsoil in the building footprint is to be excavated and replaced with an engineered hard fill layer of compacted aggregate in accordance with NZS 4431 or AS 3798:2007.*
- *The Sandy material for all lots in Stage 4 & 5 is consistent with a Class A site as defined by AS 2870:2011 indicating little to no ground movement from moisture changes is expected.*
- *This means that the finished ground within the lots is suitable for the erection of buildings on “Good Ground” in terms of NZS 3604:2011 (Timber Framed Buildings) & NZS 4229:2013 (Concrete Masonry Buildings Not Requiring Specific Engineering Design) and related documents providing that:*
 - *Standard check of excavated foundations is carried out at time of construction.*
 - *Buildings subject to heavy loads or vibrations will require specific design.*
 - *Buildings not meeting the criteria for NZS3604:2011 and NZS4229:2013 will require specific design.*
- *An ultimate bearing capacity of 300kPa is available below any peat / topsoil that has been spread on site after the completion of the earthworks. To be noted that between 100 – 300 mm of topsoil has been spread throughout the site with an average of 200 mm.*
- *The site is consistent with Subsoil Class C – Shallow Soil sites as per NZS1170.5.*
- *Liquefaction potential is considered to be low. Little to no expression of liquefaction is expected within Stages 4 & 5 subdivision. Liquefaction analysis results are attached in Appendix 5. Up*

to 20 mm of settlements could be expected under the ULS earthquake case that are within the tolerance of the building code that is 25 mm over 6 m according to Clause B1/VM1 for static settlements.”

3.4 Natural Hazard

The Whangarei District Council has not designated an instability hazard zone on this property. Given the underlying geology and low slope angle we consider that the building area is subject to a low instability hazard, defined as follows: *“Erosion or landslide morphology is not apparent. Not considered to be at risk of instability. May, however, be at risk as a result of natural events, or development. Steeper slopes may be subject to soil creep.”*

4.0 Field Investigation

A technician from this office visited the property on 2 February 2022 to undertake a walkover inspection and subsoil investigations including two Scala Penetrometer tests and two hand augers. The walkover inspection did not observe any signs of concern at the building site in relation to the proposal.

Two hand augers were excavated to depths of 2.0m and 1.2m below ground level (BGL). The subsoils generally consisted of a shallow depth of topsoil overlying dense to very dense sand with some silt at a tested depth of 2.0m. Groundwater was not encountered in the investigations.

The Scala Penetrometer tests were performed around the building area. The tests recorded 7 to 20 blows per 100mm, generally increasing in blow counts per 100mm with depth to a maximum depth of 1.0m BGL.

5.0 Subsoil Conditions

Interpretation of subsurface conditions are based on the investigations shown on the drawings in Appendix A. The conditions are summarised below;

- Topsoil was encountered to an approximate depth of 0.2m.
- Subsoils consisted of dense to very dense sand with minor silt to a tested depth of 2.0m.
- Groundwater was not encountered in the investigations to a tested depth of 2.0m. RS Eng assess groundwater not likely to be within 5m below ground level.
- The underlying sand at the building platform can be classified as 'good ground' in terms of the NZS3604 definition.

6.0 Geotechnical Assessment

6.1 Slope Stability

The property and surrounding area are located on near level topography with subsoil investigations encountering dense sand at the building area. On this basis, RS Eng Ltd considers the risk of slope instability on the property as a result of the proposed works to be low provided the recommendations within this report are adhered to.

6.2 Liquefaction

Cook Costello have stated that *"Liquefaction potential is considered to be low. Little to no expression of liquefaction is expected within Stages 4 & 5 subdivision. Liquefaction analysis results are attached in Appendix 5. Up to 20 mm of settlements could be expected under the ULS earthquake case that are within the tolerance of the building code that is 25 mm over 6 m according to Clause B1/VM1 for static settlements."* On this basis RS Eng consider the risk of liquefaction to be low.

6.3 Expansive Soils

The sand encountered on-site is determined to be non-expansive. Cook Costello have stated *"The sandy material for all lots in Stage 4 & 5 is consistent with a Class A site as defined by AS2870:2011 indicating little to no ground movement from moisture changes is expected"*, RS Eng Ltd conclude that the soils are considered to be Class A as per AS2870.

6.4 Acid Sulphate Soils

The WDC have zoned this property to be within an area at risk of acid sulphate soils. Sulphates have been deposited in these areas during the last significant sea level rise. When reacted with oxygen under the right conditions (generally areas with high groundwater tables), the sulphates can become acidic, which in turn can cause problems with the concrete components of structures beneath ground level.

The following paragraph has been extracted from a report completed by Opus International Consultants Ltd 2016, entitled: “*Waipu – Nova Scotia Acid Sulphate Soil Management Plan.*” This summary is considered an accurate representation of most sites subject to potential acidic soils.

“If footings are excavated in acid sulphate soils, then a small amount of acid may be generated in the soil around those footings. Once the concrete is poured in, the alkalinity in the concrete would be likely to react with the acidity in the soil and neutralise it (generally resulting in a negligible unnoticeable amount of concrete corrosion in the process). Once the footings and slab are in place, the soil is then cut off from further oxygen supply.”

We concur with the above statement. Additionally, the proposed raft slab will essentially be founded atop existing ground level which will not likely ever come into contact with potentially acidic soils which can only occur within the range of seasonal groundwater fluctuation. Given that groundwater was not encountered within 2.0m below ground level in the investigations, RS Eng therefore consider the risk of damage to foundations as a result of acid sulphate soils to be low.

7.0 Stormwater Assessment

The stormwater attenuation system designed for the subdivision development incorporates attenuation ponds which restrict outflow to the Whangarei Harbour by storing runoff volumes and releasing flows at a controlled rate to offset peak discharge flows through the existing pipe reticulation networks.

This stage of the Landing subdivision has allowed for a total of 45% impervious site coverage on each residential property when designing the attenuation ponds and any additional impervious areas exceeding 45% required attenuation in line with the Whangarei District Council (WDC) Environmental Engineering Standards (EES).

The proposed dwelling is to have impervious roof and drive areas of 244.2m² and 81.8m², respectively. This equates to a total impervious area of 326m² (54.2%), exceeding the allowable 45% impervious area by 54m² (9%).

The Whangarei District Council (WDC) Environmental Engineering Standards (EES) requires attenuation of stormwater runoff from any increase in impervious areas so that post development peak flows are less than 80% of pre-development. The WDC EES specifies that the flows be attenuated for the 20% and 1% Annual Exceedance Probability (AEP) events.

It is proposed to direct stormwater runoff from part of the roof (allowing for 54m²) of the new dwelling into a stormwater storage pit with restricted outlets which reduce the peak flows to predevelopment levels. The overflow from the stormwater storage pit shall be piped to the WDC connection at the property. All remaining roof area (not including the 54m² portion) and driveway shall be collected where possible and piped directly to the WDC connection.

The pre-development and post-development runoff was modelled with HydroCAD. The United States Department of Agriculture Technical Release 55 (TR55) Type 1A method was adopted for calculating the run-off flow, using rainfall flows from HIRDS 4 (High Intensity Rainfall Design System, NIWA) and allowing for 20% climate change as required by WDC EES. The subsoils have been determined as sand, designated as Group B soils with poor grass cover, from WDC EES. Table 1 includes a summary of the stormwater modelling. Refer to Appendix C for further details.

Table 1: Summary of HydroCAD Calculations

Stormwater Attenuation Design Summary				
	Pre-development		Post-development	
Permeable Area (m ²) Grassed	54		0	
Impervious Area (m ²) Roof	0		54	
Peak flow l/s	20% AEP	1% AEP	20% AEP	1% AEP
			+20%	+20%
From surfaces	0.31	0.70	0.57	1.03
80% (design flows reqd.)	0.25	0.56		
Total attenuated flows			0.25	0.54
Tank storage required			1.1m ³	2.1m ³
Attenuation Storage Pit Summary				
Material	65 – 40 Washed Graded Chip			
	Base Area		Depth	
Pit Dimensions	4.0m x 2.0m		0.8m	
	Diameter		Height from Top of Storage Pit	
Primary Orifice	14mm		0.8m	
Secondary Orifice	13mm		0.43m	

Confirmation of the connection depth shall be sought from a drainlayer prior to the storage pit construction, this may dictate the size of the storage pit.

8.0 Engineering Recommendations

8.1 Site Subsoil Class

In accordance with NZS 1170.5:2004, Section 3.12.3 the site has been assessed for its Site Subsoil Class. Based on the observation listed above RS Eng considers the site soils lie within Site Class C "Shallow Soil Site."

8.2 Earthworks

To form access to and create a level building platform for the dwelling minor earthworks are proposed. To suitably develop the building area, we recommend as follows:

- The building area and driveway should be shaped to assist in stormwater runoff and avoid ponding of surface water.
- Topsoil will need to be removed from the building area before replacement with a minimum 100mm compacted granular hardfill layer extending 0.5m beyond the building envelope.
- Cut and fill batters should be sloped at angles less than 1V to 3H.
- Site works shall generally be completed in accordance with NZS4431.

8.3 Shallow Foundations

It is proposed to construct a timber framed type dwelling on a RibRaft floor slab. To suitably found the proposed dwelling the following is recommended;

- A standard RibRaft slab can be used provided it is placed on a minimum of 100mm compacted granular hardfill extending 0.5m beyond the building envelope.
- Isolated NZS 3604 type pile foundations should be extended a minimum of 0.5m below cleared ground level.

Notwithstanding the recommendations of this report, for specific design of shallow foundations RS Eng has assessed the following:

- 300kPa Ultimate Bearing Capacity (Geotechnical Ultimate)
- 150kPa Dependable Bearing Capacity (Ultimate Limit State)
- 100kPa Allowable Bearing Capacity (Serviceability Limit State)

9.0 Construction Monitoring and Producer Statements

RS Eng recommend a suitably experienced Chartered Professional Engineer monitor the construction of the following works:

- Stripped site once all topsoil and unsuitable material has been removed.
- Hardfill compaction where depth exceeds 300mm.

Any works not inspected will be excluded from future producer statements (PS4) to be issued by RS Eng. In any event, where doubt exists regarding inspections, this office should be contacted for advice, and provided with reasonable notice of inspections.

10.0 Conclusions

It is the conclusion of RS Eng Ltd that the building area is suitable for the proposal provided the recommendations and limitations stated within this report are adhered to.

RS Eng Ltd also concludes that subject to the recommendations of this report, in terms of Section 72 of the Building Act 2004;

(a) the building work to which an application for a building consent relates will not accelerate, worsen, or result in slippage or subsidence on the land on which the building work is to be carried out or any other property; and

(b) the land is neither subject to nor likely to be subject to slippage or subsidence.

11.0 Limitations

This report has been prepared solely for the benefit of our client and the Whangarei District Council. The purpose is to determine the engineering suitability of the proposed dwelling, in relation to the material covered by the report. The reliance by other parties on the information, opinions or recommendations contained therein shall, without our prior review and agreement in writing, do so at their own risk.

Recommendations and opinions in this report are based on data obtained as previously detailed. The nature and continuity of subsoil conditions away from the test locations are inferred and it should be appreciated that actual conditions could vary from those assumed. If during the construction process, conditions are encountered that differ from the inferred conditions on which the report has been based, RS Eng should be contacted immediately.

Construction site safety is the responsibility of the builder/contractor. The recommendations included herein should not be construed as direction of the contractor's methods, construction sequencing or procedures. RS Eng can provide recommendations if specifically engaged to, upon request.

This report does not address matters relating to the National Environmental Standard for Contaminated Sites, and if applicable separate advice should be sought on this matter from a suitably qualified person.

RS Eng advise our clients that it is Whangarei District Council policy to not accept engineering report, dated more than two years prior to the application date.

Prepared by:



Codie Hay
Engineering Technician

RS Eng Ltd

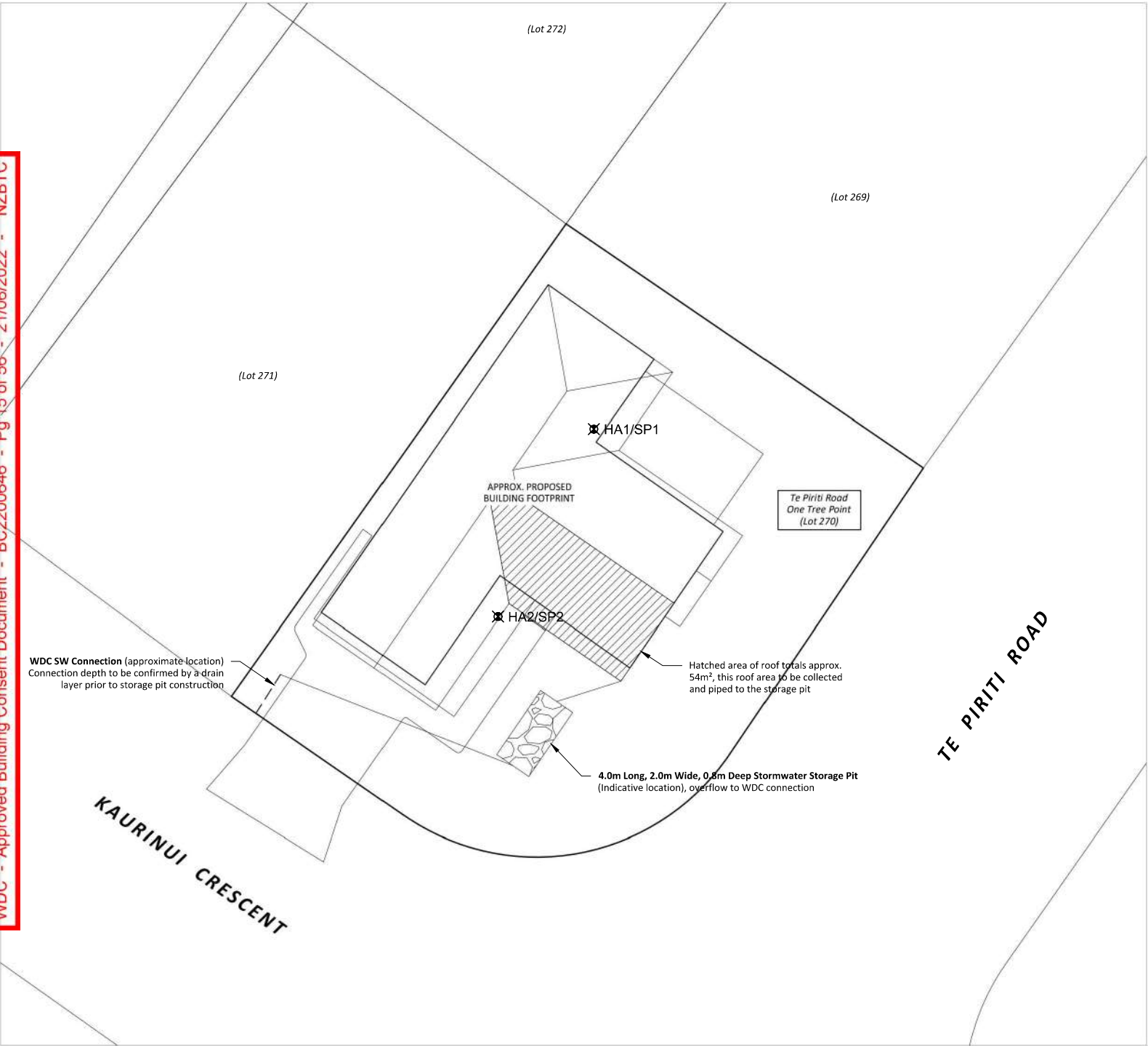
Reviewed by:



Steve Turner
Director
BE(Civil), CPEng, IntPE(NZ), CMEngNZ

Appendix A

Drawings



SITE PLAN
1:200

NOTES:

- If any part of these documents are unclear, please contact RSEng Ltd.
- This plan is copyright to RSEng Ltd and should not be reproduced without prior permission.



KEY

- ✕ Hand Auger Location
- ⊕ Scala Penetrometer Location

		RS Eng Ltd 09 438 3273 office@RSEng.co.nz 2 Seaview Road, Whangarei 0110							
Title PROPOSED DWELLING SUITABILITY REPORT SITE INVESTIGATIONS									
Client RJK DEVELOPMENT									
Location TE PIRITI ROAD ONE TREE POINT									
<table border="1"><tr><td>03/02/2022</td><td>A</td><td>Original Issue</td></tr><tr><td>Date</td><td>Rev</td><td>Notes</td></tr></table>				03/02/2022	A	Original Issue	Date	Rev	Notes
03/02/2022	A	Original Issue							
Date	Rev	Notes							
Scale 1:200		Original A3	Rev A						
Drawn MYH	Approved ST	File # 18221	Sheet 1						



Form 7 Code Compliance Certificate

Section 95, Building Act 2004

Forum North, Private Bag 9023
Whangarei 0148, New Zealand
[P +64 430 4200](tel:+644304200)
[E mailroom@wdc.govt.nz](mailto:mailroom@wdc.govt.nz)
www.wdc.govt.nz

The Building

Street address of building: 98 Kaurinui Crescent, One Tree Point 0118
Legal description of land where building is located: LOT 270 DP 564989
Building name: N/A
Location of building within site/block number: N/A
Level/unit number: N/A
Current, lawfully established, use: 2.0 Housing: 2.0.2 Detached Dwelling with 4 occupants
Year first constructed: 2022

The Owner

Name of owner: RJK Development Limited
Contact person: Derek Hulse
Mailing address: 132 Kara Road, RD 9, Whangarei
Street address/registered office: N/A
Phone number: Landline: N/A Mobile: 0212708282
Daytime: Landline: N/A Mobile: 0212708282
After hours: Landline: N/A Mobile: 0212708282
Facsimile number: N/A
Email address: N/A
First point of contact for communications with the council/building consent authority:
Sudfelt Construction Limited T/A GJ Gardner Homes; Mailing Address: 14 Percy Street
Kensington
Whangarei 0112; Phone: 094375666; Email: whangarei@gjgardner.co.nz

Building Work

Building consent number: BC2200646
Description: New Dwelling
Issued by: Whangarei District Council

Code Compliance

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

Signature: Aaron Brown

Position: Senior Building Control Officer
On behalf of: Whangarei District Council
Date: 12 May 2023

In reply please quote PU221210
Or ask for PU221210 - appointment

1 June 2022

Sudfelt Construction Limited – GJ Gardner Homes Whangarei
P O Box 8046
Kensington
Whangarei 0145

Dear Sir/Madam

Public Utility Service Application No. PU221210

Site Address: 10 Te Piriti Road, One Tree Point - Lot 270

The application at the above address has been approved as at **31/05/2022**.

Conditions:

- The work shall be undertaken by **certified drainlayer approved to install and commission the pressure sewer product** by an approved pressure sewer product supplier.
- The pumping unit to be installed shall be **an approved pressure sewer product supplied by an approved supplier**. This includes the tank, pump and the alarm panel.
- The pumping unit shall be commissioned by the technology supplier or their agent.
- Installation shall be in accordance with the Environmental Engineering Standards
- Consent from the Waste and Drainage Engineering Officer is required to use compression couplings.

The following information shall be supplied to Council within one month after the commissioning of the new pressure sewer pumping unit.

- Final As-built plans. The as built plan will have to comply with the Council's Environmental Engineering Standards.
- Technology supplier's commissioning checklist.
- Proof of warranty for pump equipment (minimum 24 months warranty period).
- Information for installation testing e.g pump chamber waterproof test.

The applicant must arrange for the Waste and Drainage Engineering Officer to carry out an inspection prior to backfilling the new drainage and pump unit a minimum of 48 hours ahead of time required. To arrange for an inspection please contact us on Council's main number **09 430 4200** to ensure that the request reaches the appropriate person.

Final sign off for the Public Utility consent will occur after the passing of Council's inspection, and provision of approved as built plans provided that:

Engineering Standards and any **Special Conditions** are complied with as noted above.

Please keep this letter and the approved plans on site, as the contractor and the inspector will require verification of Council's approval. Thank you.

Yours faithfully

Infrastructure and Services Support Assistant



SEA SPRAY ZONE
ALL EXPOSED FIXINGS TYPE 304 SS

G.J. GARDNER HOMES - NEW ZEALAND
Whangarei / Kaipara
09) 437 5666
14 Percy St. Whangarei
www.gjgardner.co.nz

Developments

**Te Piriti Road
One Tree Point
Whangarei**

PURCHASER SIGNATURE	
Owner	Owner

BUILDER SIGNATURE

SITE INFORMATION

<u>Lot Number</u>	<u>DP5 Number</u>
270	TBC
<u>Site Area</u>	<u>Wind Zone</u>
602m ²	High
<u>Planning Zone</u>	<u>Corrosion Zone</u>
General Residential	D
	Territorial Authority
	WDC

MAX COVERAGE Site Area 602m ² 40% Max 241m ²	MAX IMPERMEABLE Site Area 60% Max 361.2m ²
--	---

SITE COVERAGE		
Areas	m²	%
Area Over Frame	202	34%
Area Over Foundation	209	35%

SITE IMPERMEABLE		
Areas	m²	%
Roof Coverage	244.2	40.6%
Uncovered Concrete	81.8	13.6%
TOTAL	326.0	54.2%

Concrete Areas: Trowel Finished with 5kg/m³ Black Oxide	
Uncovered Areas	113.7m ²
Covered Areas	13m ²
TOTAL	126.7m²

GJG Job Number Job Last Published
 Thursday, 28 April 2022

390129

DRAWING VERSION

Contract

CAD Technician/Designer Sheet ED

M Grew

Scale
1:200, 1:500

A201

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Under no circumstances may these drawings be
reproduced in any form without the written
permission of G.J. Gardner Homes.

Signature

Date.....31/05/2022

- All ground and floor levels to be checked on site before excavation commences

- Supply and install a stable, site fence solution to secure building site to achieve safe working environments and a high level of protection of public safety. Provide a system that is robust restricting access of children/ if specific hazard arises, installed with bracing and opening gates.

E-One Pump

Boundary-Kit

Approx 900

Approx 1300

SITE CONCEPT ONLY. SUBJECT TO ENGINEERS APPROVAL.



FORUM NORTH PRIVATE BAG 9023, WHANGAREI, NEW ZEALAND TELEPHONE 09 430 4200 FAX 09 438 7632

Issue Document

VEHICLE CROSSING PERMIT APPLICATION NO: VC220117
Whangarei District Council Public Places ByLaw
Received: 26 May 2022
Issued: 30 June 2022

Applicant

RJK Developments Limited
132 Kara Road
RD 9
Whangarei 0179

Agent

Sudfelt Construction Limited – GJ Gardner Homes Whangarei

Site Information

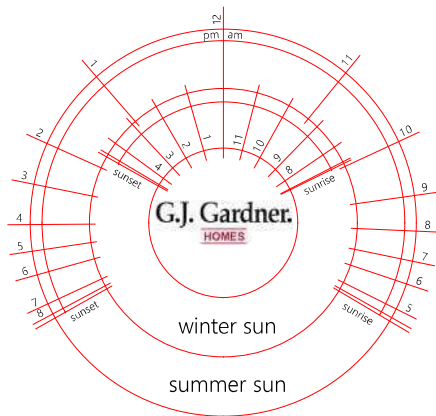
Property ID: 172239
Street Address: 98 Kaurinui Crescent
One Tree Point 0118
Legal Description: LOT 270 DP 564989

Project Information

THIS IS A VEHICLE CROSSING PERMIT APPLICATION ONLY

Fees

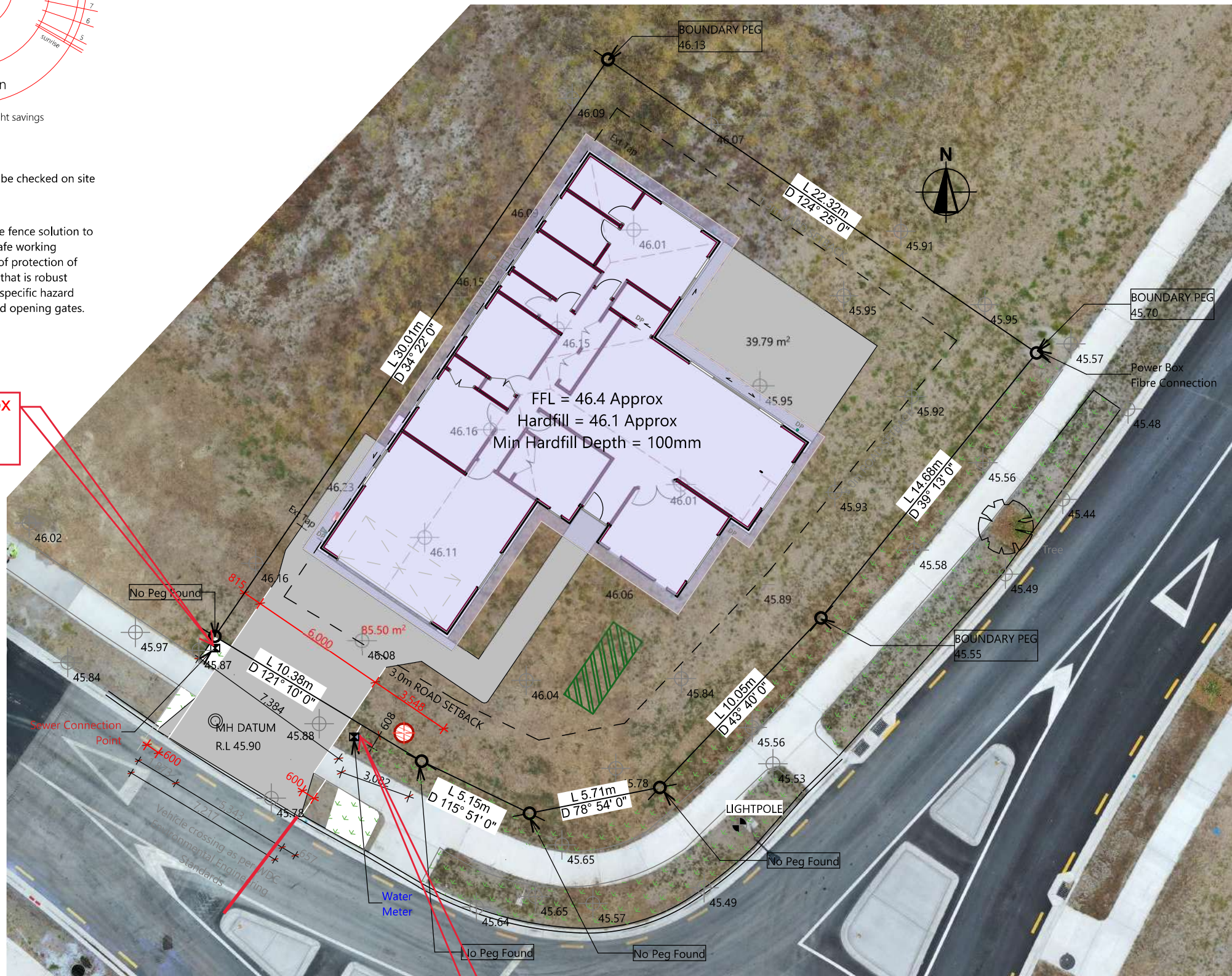
COUNCIL'S TOTAL CHARGES FOR THIS VEHICLE CROSSING PERMIT
ARE: \$428.00
PAYMENTS RECEIVED TO DATE: 30/06/2022 AMOUNT: \$428.00



NOTE:

- All ground and floor levels to be checked on site before excavation commences
- Supply and install a stable, site fence solution to secure building site to achieve safe working environments and a high level of protection of public safety. Provide a system that is robust restricting access of children/if specific hazard arises, installed with bracing and opening gates.

Need cast iron box for sewer connection valve



APPROVED

Signed:

Date: 27/06/2022

CUSTOMER

ALL SITE INFO TBC ON RECEIPT OF TITLE AND IS SUBJECT TO CHANGE.

SEA SPRAY ZONE
ALL EXPOSED FIXINGS TYPE 304 SS

G.J. Gardner. HOMES

G.J. GARDNER HOMES - NEW ZEALAND
Whangarei / Kaipara
09) 437 5666
14 Percy St, Whangarei
www.gjgardner.co.nz

NEW HOME FOR:

RJK
Developments

SITE ADDRESS

Te Piriti Road
One Tree Point
Whangarei

PURCHASER SIGNATURE

Owner Owner

Date

BUILDER SIGNATURE

Date

SITE INFORMATION

Lot Number	DPS Number
270	TBC
Site Area	Wind Zone
602m ²	High
Planning Zone	Corrosion Zone
General Residential	D
	Territorial Authority
	WDC

MAX COVERAGE	MAX IMPERMEABLE
Site Area 602m ²	Site Area
40% Max 241m ²	60% Max 361.2m ²

SITE COVERAGE	Areas	m ²	%
Area Over Frame		202	34%
Area Over Foundation		209	35%

SITE IMPERMEABLE	Areas	m ²	%
Roof Coverage		244.2	40.6%
Uncovered Concrete		81.8	13.6%
TOTAL		326.0	54.2%

Concrete Areas: Trowel Finished with
5kg/m³ Black Oxide

Uncovered Areas	113.7m ²
Covered Areas	13m ²
TOTAL	126.7m ²

JOB INFORMATION

GJG Job Number Job Last Published
390129 Friday, 3 June 2022

DRAWING VERSION

Contract

CAD Technician/Designer Sheet

M Grew

Scale
1:200, 1:500

A201

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permission of G.J. Gardner Homes.

SITE CONCEPT ONLY. SUBJECT TO ENGINEERS APPROVAL.

Fast Track - Public Utility Service Application
20mm Water Meter Only (DOMESTIC ONLY)

PU **221265**

General Guidance

- All other connection types require a 'standard' public utility works application
- All fields must be completed or N/A as appropriate
- The applicant must be the owner of the land, or the lease holder, or a person who has agreed to unconditionally purchase or lease the land
- If a Backflow Preventer is required with the water meter (see application requirements), please complete a 'standard' public utility works application.

Owner / Applicant

Full Name RJK Development Ltd
Postal address 132 Kara Rd, Whangarei Post code _____
Phone 021 270 8282 Mobile _____
Email derek@drainsunlimited.co.nz

Agent Authorisation (If required)

As the agent you accept responsibility to pass all Council's correspondence to the applicant as appropriate. If fees are not paid by the agent, charges will remain the responsibility of the owner.

Full Name/ Company Name Sudfelt Construction Limited - GJ Gardner Homes Whangarei
Position/ Title _____

Contact Details

Postal address P O Box 8046, Kensington, Whangarei Post code 0145
Phone 09 437 5666 Mobile _____
Email whangarei@gjgardner.co.nz

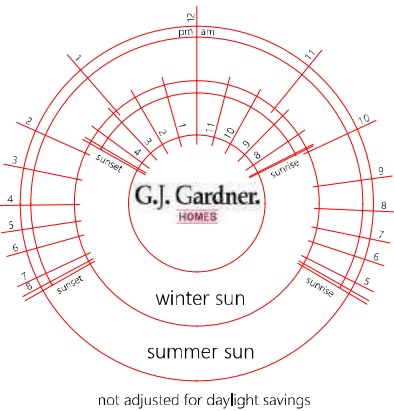
Signature _____ Date _____

Site Address

Street/Road Number 98 Street/Road Name Kaurinui Crescent
Town or Area 10 Lot Te Piripiri Road, One Tree Point
DP 270 DP 564989

Office Use Only

Property ID: 172239
LLP number: 132680 Date: 13/06/2022
Related Consents: BC2200646



NOTE:

- All ground and floor levels to be checked on site before excavation commences

- Supply and install a stable, site fence solution to secure building site to achieve safe working environments and a high level of protection of public safety. Provide a system that is robust restricting access of children/if specific hazard arises, installed with bracing and opening gates.

ALL SITE INFO TBC ON RECEIPT OF TITLE AND IS SUBJECT TO CHANGE.

SEA SPRAY ZONE
ALL EXPOSED FIXINGS TYPE 304 SS



WATER SERVICES APPROVED

Signed *RTB* Date 17/06/2022

SITE CONCEPT ONLY. SUBJECT TO ENGINEERS APPROVAL.

G.J. Gardner. HOMES

G.J. GARDNER HOMES - NEW ZEALAND
Whangarei / Kaipara
09) 437 5666
14 Percy St, Whangarei
www.gjgardner.co.nz

Plans

NEW HOME FOR:

RJK

Developments

SITE ADDRESS

Te Piriti Road
One Tree Point
Whangarei

PURCHASER SIGNATURE

Owner

Owner

Date

BUILDER SIGNATURE

Date

SITE INFORMATION

Lot Number	DPS Number
270	TBC
Site Area	Wind Zone
602m²	High
Planning Zone	Corrosion Zone
General Residential	D
	Territorial Authority
	WDC

MAX COVERAGE	MAX IMPERMEABLE
Site Area 602m²	Site Area
40%	60%
Max 241m²	Max 361.2m²

SITE COVERAGE		
Areas	m ²	%
Area Over Frame	202	34%
Area Over Foundation	209	35%

<i>SITE IMPERMEABLE</i>		
Areas	m²	%
Roof Coverage	244.2	40.6%
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Concrete Areas: Trowel Finished with
5kg/m³ Black Oxide

Uncovered Areas	113.7m²
Covered Areas	13m²
TOTAL	126.7m²

JOB INFORMATION

GJG Job Number Job Last Published
390129 Friday, 3 June 2022

DRAWING VERSION

Contract

CAD Technician/Designer Sheet

M Grew

Scale

1:200, 1:500

A201

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The information displayed is schematic only and serves as a guide. It has been compiled from Whangarei District Council records and is made available in good faith but its accuracy or completeness is not guaranteed.

12 August 2025
Scale 1:500

Parcel Information is sourced from the Land Information New Zealand (LINZ) Data Service.
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Operative District Plan – Map Legend

District-Wide Matters

Energy, Infrastructure and Transport

- Airport Runway
- Indicative Road
- National Road
- Regional Road
- Arterial Road
- Primary Collector Road
- Secondary Collector Road
- Low Volume Road
- Access Road
- Strategic Road Protection Area
- Strategic Railway Protection Line
- National Grid Tower
- Northpower Tower CEL-Cat1
- National Grid Line
- Northpower Overhead Critical Line Cel-Cat1
- Northpower Critical Overhead Lines CEL
- Northpower Critical Underground Lines CEL

Hazards and Risks

- Coastal Erosion Hazard 1
- Coastal Erosion Hazard 2
- Flood Susceptible Areas
- Mining Hazard Area 1
- Mining Hazard Area 2
- Mining Hazard Area 3

Historical and Cultural Values

- Notable Tree Overlay
- Heritage Item Overlay
- Heritage Area Overlay
- Sites of Significance to Maori
- Areas of Significance to Maori

Natural Environment Values

- Esplanade Priority Area
- Coastal Marine Area (CMA) boundary
- Goat Control Areas
- Outstanding Natural Feature
- Outstanding Natural Landscape

General District-Wide Matters

- Air Noise Boundary
- Outer Control Boundary
- Helicopter Hovering Area
- Noise Control Boundary Overlay
- Rail noise alert area
- Rail vibration alert area
- QRA Quarrying Resource Area
- QRA Mining Area
- QRA Buffer Area
- QRA 500m Indicative Setback
- Coastal Environment Overlay
- Outstanding Natural Character Area
- High Natural Character Area

Area Specific Matters

- Designation
- Precinct
- Development Area

Residential Zones

- Large Lot Residential Zone
- Low Density Residential Zone
- General Residential Zone
- Medium Density Residential Zone

Rural Zones

- Rural Production Zone
- Rural Lifestyle Zone
- Settlement Zone Residential Sub-Zone
- Settlement Zone Centre Sub-Zone
- Settlement Zone Industry Sub-Zone

Commercial and Mixed Use Zones

- Local Centre Zone
- Neighbourhood Centre Zone
- Commercial Zone
- Mixed Use Zone
- Town Centre Zone
- City Centre Zone

Industrial Zones

- Light Industrial Zone
- Heavy Industrial Zone

Open Space and Recreation Zones

- Natural Open Space Zone
- Open Space Zone
- Sport and Active Recreation Zone

Special Purpose Zones

- Airport Zone
- Future Urban Zone
- Fonterra Kauri Milk Processing SRIZ – Ancillary Irrigation Farms
- Hospital Zone
- Port Zone
- Ruakaka Equine Zone
- Shopping Centre Zone
- Strategic Rural Industries Zone
- Waterfront Zone

The information displayed is schematic only and serves as a guide.

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The Whangarei District Council district plan GIS data was created at a specific point in time.

Land parcel Information is sourced from the Land Information New Zealand (LINZ) Data Service. The LINZ land parcel information may be updated by LINZ at any time from that time, which may result in misalignments with Whangarei District Council information.

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