Te Kaunihera o Te Hiku o te Ika
Far North District Council

Office Use Only
Application Number:

Application for resource consent or fast-track resource consent

Or Associated Consent Pursuant to the Resource Management Act 1991 (RMA)) (If applying for a Resource Consent pursuant to Section 87AAC or 88 of the RMA, this form can be used to satisfy the requirements of Form 9). Prior to, and during, completion of this application form, please refer to Resource Consent Guidance Notes and Schedule of Fees and Charges — both available on the Council's web page.

1. Pre-Lodgement Meeting

Have you met with a council Resource Consent representative to discuss this application prior to lodgement?

◯ **Yes** ✔ **No**

2. Type of consent being applied for

(more than one circle can be ticked):

◯ **Land Use**

◯ **Fast Track Land Use***

◯ **Change of Consent Notice (s.221(3))**

◯ **Certificate of Compliance (s.139)**

◯ **Extension of time (s.125)**

◯ **Discharge:** Total voume = _____ m³
Note; volumes >3m³ requires NRC Consent.

✔ **Subdivision**

◯ **Existing Use Certicicate (s.139A)**

◯ **Consent under National Environmental Standard**
(e.g. Assessing and Managing Contaminants in Soil)

◯ **Other (please specify)** _____

**The fast track is for simple land use consents and is restricted to consents with a controlled activity status.*

3. Would you like to opt out of the fast track process?

◯ **Yes** ✔ **No**

4. Consultation

Have you consulted with Iwi/Hapū? ◯ **Yes** ✔ **No**

If yes, which groups have you consulted with? _____

Who else have you consulted with? _____

For any questions or information regarding iwi/hapū consultation, please contact:
The Resource Consents Planning Technicians, **planning_technicians@fndc.govt.nz**

5. Applicant details

Name/s: Hauhangaroa 1C Incorporation

Email: [redacted]

Phone number:

Postal address:
(or alternative method of service under section 352 of the act)

Have you been the subject of abatement notices, enforcement orders, infringement notices and/or convictions under the Resource Management Act 1991? ○ **Yes** ✔ **No**

If yes, please provide details.

6. Address for correspondence

Name and address for service and correspondence (if using an Agent write their details here)

Name/s: Steven Sanson - Bay of Islands Planning

Email: [redacted]

Phone number:

Postal address:
(or alternative method of service under section 352 of the act)

All correspondence will be sent by email in the first instance. Please advise us if you would prefer an alternative means of communication.

7. Details of property owner/s and occupier/s

Name and Address of the owner/occupiers of the land to which this application relates (where there are multiple owners or occupiers please list on a separate sheet if required)

Name/s: Refer attached Record of Titles

Property address/
location:

8. Application site details

Location and/or property street address of the proposed activity:

Name/s: Refer attached Record of Titles

Site address/ location: 2435 Horeke Road, Horeke

Postcode

Legal description: **Val Number:**

Certificate of title: NA93D/623 and NA93D/624

Please remember to attach a copy of your Certificate of Title to the application, along with relevant consent notices and/or easements and encumbrances (search copy must be less than 6 months old)

Site visit requirements:

Is there a locked gate or security system restricting access by Council staff? ◯ **Yes** ☑ **No**

Is there a dog on the property? ◯ **Yes** ☑ **No**

Please provide details of any other entry restrictions that Council staff should be aware of, e.g. health and safety, caretaker's details. This is important to avoid a wasted trip and having to re-arrange a second visit.

9. Description of the proposal

Please enter a brief description of the proposal here. Please refer to Chapter 4 of the *District Plan, and Guidance Notes*, for further details of information requirements.

Proposed subdivision in the Rural Production Zone

If this is an application for a Change or Cancellation of Consent Notice conditions (s.221(3)), please quote relevant existing Resource Consents and Consent Notice identifiers and provide details of the change(s), with reasons for requesting them.

The proposal has been prepared in accordance with the following version of the FNDC Engineering Standards:

◯ **2009** ☑ **2023**

10. Would you like to request public notification?

◯ **Yes** ☑ **No**

11. Other consent required/being applied for under different legislation

(more than one circle can be ticked):

◯ **Building Consent** Enter BC ref # here (if known)

◯ **Regional Council Consent (ref # if known)** Ref # here (if known)

◯ **National Environmental Standard Consent** Consent here (if known)

◯ **Other (please specify)** Specify 'other' here

12. National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health:

The site and proposal may be subject to the above NES. In order to determine whether regard needs to be had to the NES please answer the following:

Is the piece of land currently being used or has it historically ever been used for an activity or industry on the Hazardous Industries and Activities List (HAIL)? ☐ **Yes** ☑ **No** ☐ **Don't know**

Is the proposed activity an activity covered by the NES? Please tick if any of the following apply to your proposal, as the NESCS may apply as a result? ☑ **Yes** ☐ **No** ☐ **Don't know**

- ☑ **Subdividing land**
- ☐ **Disturbing, removing or sampling soil**
- ☐ **Changing the use of a piece of land**
- ☐ **Removing or replacing a fuel storage system**

13. Natural hazards (National Policy Statement for Natural Hazards 2025)

Is the site subject to known or potential natural hazards (for example, flooding, coastal inundation, erosion, or unstable land), as contemplated by the National Policy Statement for Natural Hazards 2025? ☐ **Yes** ☑ **No**

If yes, please identify the relevant natural hazard(s) by ticking the applicable box(es) below:

- ☐ **Flooding**
- ☐ **Active Faults**
- ☐ **Landslips**
- ☐ **Liquefaction**
- ☐ **Coastal Erosion**
- ☐ **Tsunami**
- ☐ **Coastal Inundation**

Please ensure all relevant technical reports are submitted with the application.

14. Assessment of environmental effects:

Every application for resource consent must be accompanied by an Assessment of Environmental Effects (AEE). This is a requirement of Schedule 4 of the Resource Management Act 1991 and an application can be rejected if an adequate AEE is not provided. The information in an AEE must be specified in sufficient detail to satisfy the purpose for which it is required. Your AEE may include additional information such as written approvals from adjoining property owners, or affected parties.

Your AEE is attached to this application ☑ **Yes**

15. Draft conditions:

Do you wish to see the draft conditions prior to the release of the resource consent decision? ☑ **Yes** ☐ **No**

IIf yes, please be advised that the timeframe will be suspended for 5 working days as per s107G of the RMA to enable consideration for the draft conditions.

16. Billing Details:

This identifies the person or entity that will be responsible for paying any invoices or receiving any refunds associated with processing this resource consent. Please also refer to Council's Fees and Charges Schedule.

Name/s: (please write in full) Hauhungaroa 1C Incorporation

Email:

Phone number:

Postal address:
(or alternative method of service under section 352 of the act)

[redacted]

Fees Information
An instalment fee for processing this application is payable at the time of lodgement and must accompany your application in order for it to be lodged. Please note that if the instalment fee is insufficient to cover the actual and reasonable costs of work undertaken to process the application you will be required to pay any additional costs. Invoiced amounts are payable by the 20th of the month following invoice date. You may also be required to make additional payments if your application requires notification.

Declaration concerning Payment of Fees
I/we understand that the Council may charge me/us for all costs actually and reasonably incurred in processing this application. Subject to my/our rights under Sections 357B and 358 of the RMA, to object to any costs, I/we undertake to pay all and future processing costs incurred by the Council. Without limiting the Far North District Council's legal rights if any steps (including the use of debt collection agencies) are necessary to recover unpaid processing costs I/we agree to pay all costs of recovering those processing costs. If this application is made on behalf of a trust (private or family), a society (incorporated or unincorporated) or a company in signing this application I/we are binding the trust, society or company to pay all the above costs and guaranteeing to pay all the above costs in my/our personal capacity.

Name: (please write in full) Hauhungaroa 1C Incorporation

Signature:
(signature of bill payer)

Date 22/05/2026

MANDATORY

17. Important Information:

Note to applicant
You must include all information required by this form. The information must be specified in sufficient detail to satisfy the purpose for which it is required.

You may apply for 2 or more resource consents that are needed for the same activity on the same form.

You must pay the charge payable to the consent authority for the resource consent application under the Resource Management Act 1991.

Fast-track application
Under the fast-track resource consent process, notice of the decision must be given within 10 working days after the date the application was first lodged with the authority, unless the applicant opts out of that process at the time of lodgement.

A fast-track application may cease to be a fast-track application under section 87AAC(2) of the RMA.

Privacy Information:
Once this application is lodged with the Council it becomes public information. Please advise Council if there is sensitive information in the proposal. The information you have provided on this form is required so that your application for consent pursuant to the Resource Management Act 1991 can be processed under that Act. The information will be stored on a public register and held by the Far North District Council. The details of your application may also be made available to the public on the Council's website, **www.fndc.govt.nz** These details are collected to inform the general public and community groups about all consents which have been issued through the Far North District Council.

18. Declaration

The information I have supplied with this application is true and complete to the best of my knowledge.

Name (please write in full) Walter Kingi

Signature

Date 22/05/2026

A signature is not required if the application is made by electronic means

See overleaf for a checklist of your information...

Checklist of your information

Please tick if information is provided

- ☑ Payment (cheques payable to Far North District Council)
- ☑ A current Certificate of Title (Search Copy not more than 6 months old)
- ☑ Details of your consultation with Iwi and hapū
- ☑ Copies of any listed encumbrances, easements and/or consent notices relevant to the application
- ☑ Applicant / Agent / Property Owner / Bill Payer details provided
- ☑ Location of property and description of proposal
- ☑ Assessment of Environmental Effects
- ☑ Written Approvals / correspondence from consulted parties
- ☑ Reports from technical experts (if required)
- ☑ Copies of other relevant consents associated with this application
- ☑ Location and Site plans (land use) AND/OR
- ☑ Location and Scheme Plan (subdivision)
- ☑ Elevations / Floor plans
- ☑ Topographical / contour plans

Please refer to Chapter 4 of the District Plan for details of the information that must be provided with an application. Please also refer to the RC Checklist available on the Council's website. This contains more helpful hints as to what information needs to be shown on plans.

16. Billing Details:

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Name/s: (please write in full) Hauhungaroa 1C Incorporation

Email: [redacted]

Phone number:

Postal address:
(or alternative method of service under section 352 of the act)

Fees Information
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Name: (please write in full) Hauhungaroa 1C Incorporation

Signature:
(signature of bill payer) [redacted] Date 22-May-2026

MANDATORY

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18. Declaration

The information I have supplied with this applicatio[redacted]est of my knowledge.

Name (please write in full) Walter Kingi

Signature [redacted] Date 22-May-2026

A signature is not required if [redacted]s

[redacted]hecklist of your information...

BAY OF ISLANDS PLANNING (2022) LIMITED

Kerikeri House
Suite 3, 88 Kerikeri Road
Kerikeri

Email – office@bayplan.co.nz Website - www.bayplan.co.nz

26 May 2026

Dear Team Leaders,

Re: Proposed Subdivision of Pt Lot 1 DP 13349 and Secs 7 & 8 Blk XI Mangamuka SD, Horeke

Our client, Hauhungaroa 1C Incorporation, seeks to undertake a subdivision at Horeke Road, Horeke. This application is necessitated by the discovery of a dwelling encroaching on the property and a historic 1922 road realignment error that restricted practical access.

The proposal involves a land exchange with the neighbouring estate to rectify these issues, creating lots.

Overall, the application is a **Non Complying Activity.**

Please do not hesitate to contact me should you require any further information.

Yours sincerely,

Steven Sanson
Consultant Planner

1. INTRODUCTION

The applicant, Hauhungaroa 1C Incorporation, seeks resource consent to undertake a subdivision at Horeke Road, Horeke.

The proposal is designed to rationalise land boundaries to resolve an existing unauthorised dwelling encroachment and rectify historic survey errors dating back to 1922 that currently restrict practical access to the site.

The neighbouring property has built an unauthorised dwelling which encroaches on the application site. This has persisted despite a 2023 High Court removal order. The proposed boundary adjustment here allows for the subdivision of Lot 3, but our clients should not be further impacted by any land use requirements resulting from the proposal.

The proposal involves a land exchange with the neighbouring property to create five lots (1 additional title), facilitating the continued management of plantation forestry and the establishment of a lifestyle severance. This Assessment of Environmental Effects (**AEE**) is supported by a Civil Site Suitability Report (**Appendix C**) and a Geotechnical Report (**Appendix D**).

The records of title are found in **Appendix A**.

Photos of the site are provided in **Appendix E**.

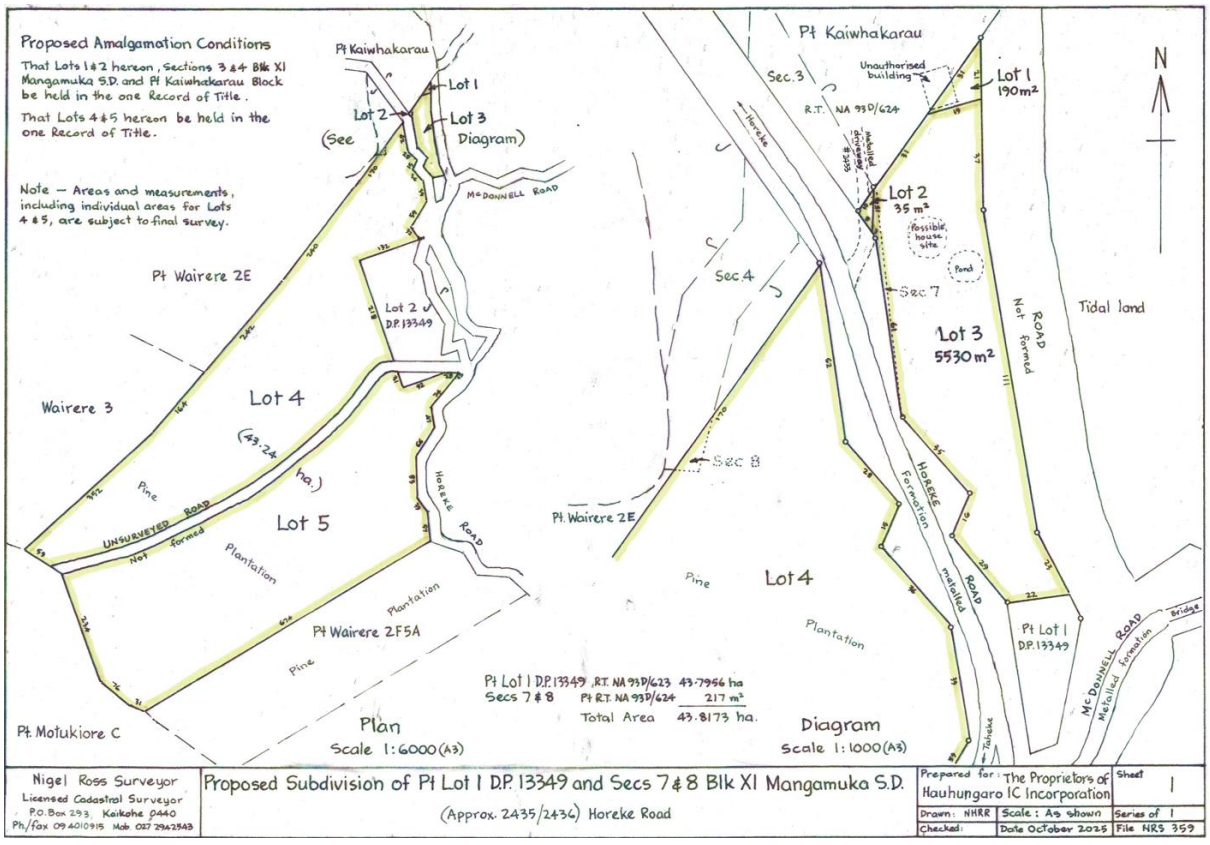


Figure 1 – Scheme Plan [Source: Nigel Ross Surveyor]

2. SITE & SURROUNDS

The subject sites are located on Horeke Road, Horeke, and are bisected by the road carriageway.

The western side of the landholdings comprise the primary forestry plantation blocks (Pt Wairere 2F5A and Pt Lot 1 DP 13349). On the eastern side the land contains a severance of Pt Lot 1 (approximately 0.5 ha). This area is unsuitable for forestry due to its size and configuration and is intended for lifestyle use.

Topography of the site is addressed in the Geotechnical Report in **Appendix D**.

The property boundaries are highly irregular due to a legacy of historic road realignments and closed road parcels (Sections 7 & 8) that were incorrectly allocated in the 1920s.

Under the Operative Far North District Plan (**ODP**), the sites are zoned Rural Production. Under the Proposed Far North District Plan (**PDP**), the same zoning applies.

The site is not influenced by any other overlays or zoning attributions save for small portions of coastal and river flooding. Soils on the site are Class 4 and 6.

There are no HAIL sites or biodiversity wetlands present.

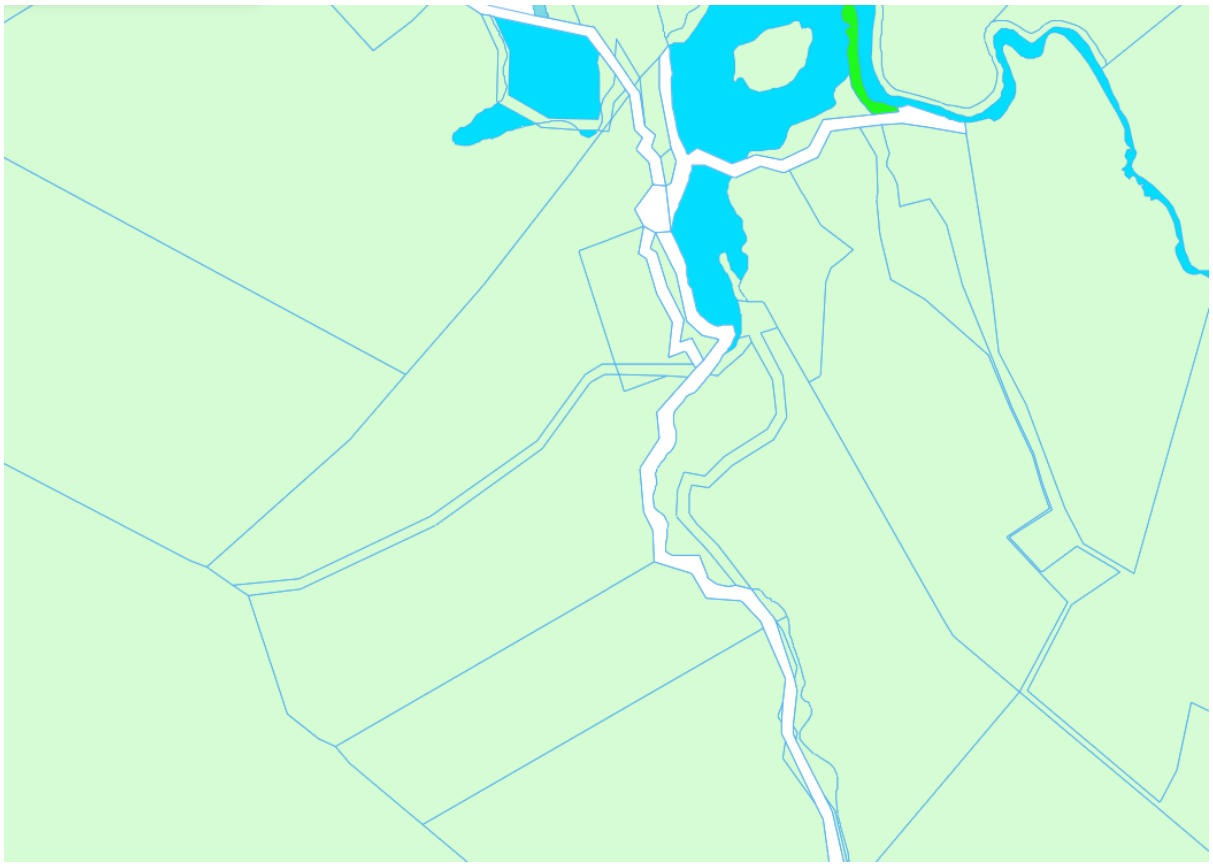


Figure 2 – Zoning ODP [Source: Far North Maps]

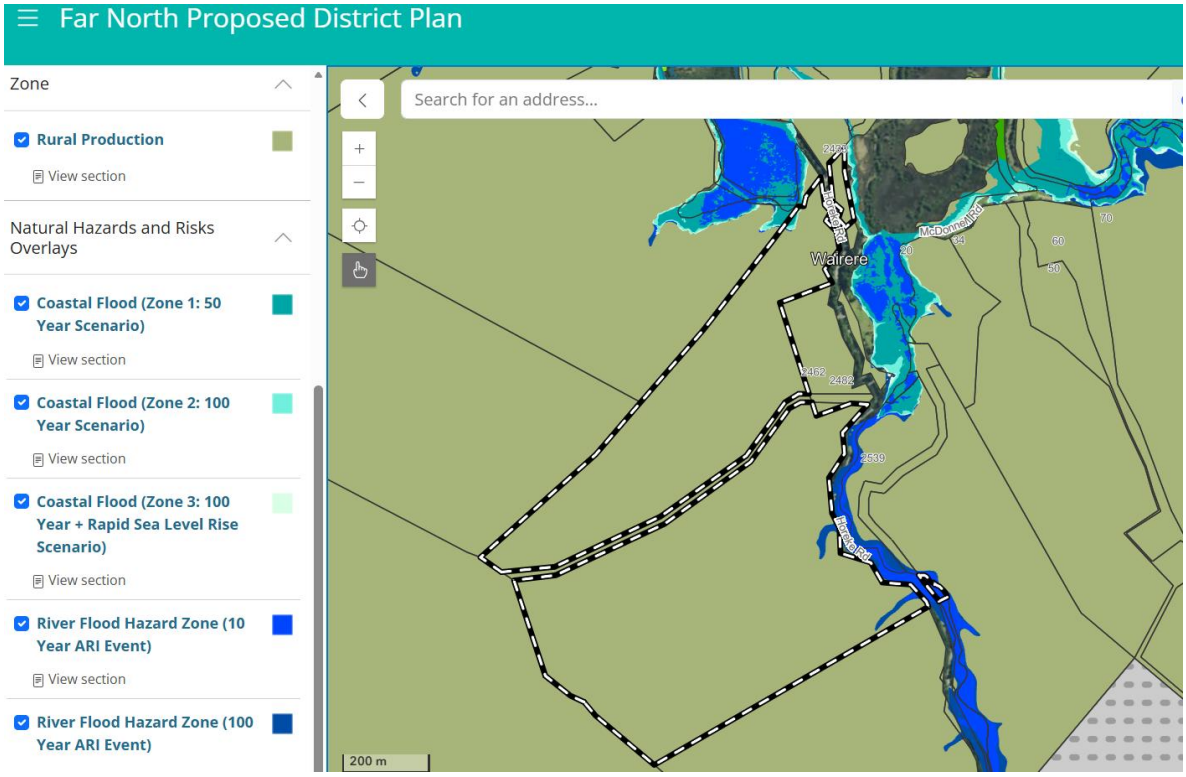


Figure 3 – Zoning PDP [Source: Far North Maps]

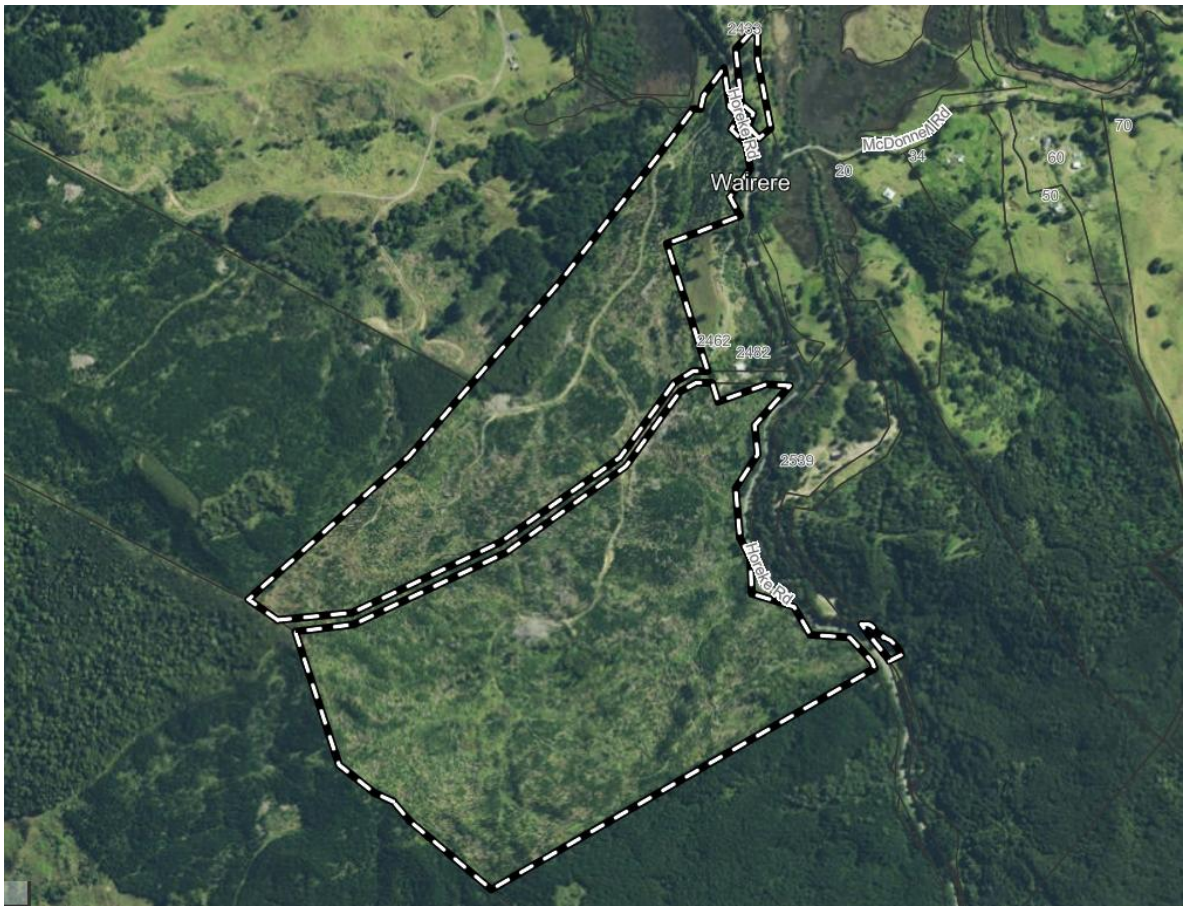


Figure 4 – Aerial [Source: Far North Maps]

3. RECORD OF TITLE, CONSENT NOTICES AND LAND COVENANTS

The records of title are provided in **Appendix A**. There are no consent notices applied to the titles.

4. DESCRIPTION OF THE PROPOSAL

The proposal is a comprehensive reorganisation of allotments across two titles to address legal and physical site constraints:

- Lot 1 (190m^2): To be transferred to the adjacent neighbour to resolve the encroachment of the unauthorised structure. The new boundary will sit approximately 0.5m from the southern wall of the dwelling. The creation of Lot 1 provides a permanent legal solution to an unauthorised dwelling encroachment that has persisted despite a 2023 High Court removal order.

- Lot 2 (35m^2): The northern triangle of Section 7, to be transferred to the neighbour to ensure their continued legal and physical access.

As a result, the site NA93D/624 currently at a size of 4.9639ha will enlarge to 4.9864ha in size.

- Lot 3 (5,530m^2): The remaining eastern severance to be developed as a lifestyle property. This lot includes a sliver of Section 7 to allow for shared access over an existing formed entrance.

- Lot 4: The primary forestry block, incorporating Section 8 to rectify the 1922 survey error.

- Lot 5: The remaining forestry area, currently separated from Lot 4 by an unformed legal road dating to 1893. Lots 4 and 5 are to be held in one Record of Title.

The proposal includes the formalisation of vehicle crossings and the provision for future on site wastewater and stormwater disposal for Lot 3, as detailed in the attached Civil Site Suitability Report (**Appendix C**).

5. REASONS FOR CONSENT

Tables below provide an assessment against the applicable ODP and PDP performance standards and identifies the reasons for resource consent. For the ODP these comprise the rules of the Part 2- Environment Provisions and the Part 3 - District Wide Rules. For the PDP these comprise of the rules with immediate legal effect.

ODP Standards

Table 1 – Rural Production Zone – Land Use Standards

Rule	Standards	Performance/Comments

Residential Intensity	Permitted – One unit per 12ha of land	Lot 3, 4 and 5 which are to remain owned by the applicant are vacant. **Complies**
Sunlight	Permitted - No part of any building shall project beyond a 45 degree recession plane as measured inwards from any point 2m vertically above ground level on any site boundary	Lot 3, 4 and 5 which are to remain owned by the applicant are vacant. **Complies**
Stormwater Management	Permitted - The maximum proportion of the gross site area covered by buildings and other impermeable surfaces shall be 15%.	Lot 3, 4 and 5 which are to remain owned by the applicant are vacant. **Complies**
Setback from Boundaries	Permitted - No building shall be erected within 10m of any site boundary;	Lot 3, 4 and 5 which are to remain owned by the applicant are vacant. **Complies**
Keeping of Animals		Not relevant to proposal. **Complies**
Noise		Not relevant to proposal. **Complies**
Building Height	Permitted - The maximum height of any building shall be 12m.	Lot 3, 4 and 5 which are to remain owned by the applicant are vacant. **Complies**
Helicopter Landing Area		Not relevant to proposal. **Complies**
Building Coverage	Permitted - Any new building or alteration/addition to an existing building is a permitted activity if the total Building Coverage of a site does not exceed 12.5% of the gross site area.	Lot 3, 4 and 5 which are to remain owned by the applicant are vacant. **Complies**
Scale of Activities	Permitted – The dwelling is exempt. For activities not including farming and plantation forestry 4 persons per site or 1 person per hectare of net site area, whichever is greater. Discretionary – Non compliance with the permitted standard where the activity is not either ancillary to farming or forestry.	Not relevant to proposal. **Complies**
Temporary Events		Not relevant to proposal. **Complies**

Table 2 – District Wide Standards

Rule	Standard	Performance/Comments
Natural and Physical Resources		
12.1 Landscape & Natural Features	12.1.6.1.1 Protection of Outstanding Landscape Features 12.1.6.1.2 Indigenous Vegetation Clearance in Outstanding landscapes 12.1.6.1.3 Tree Planting in Outstanding Landscapes 12.1.6.1.4 Excavation and/or filling within an outstanding landscape 12.1.6.1.5 Buildings within outstanding landscapes 12.1.6.1.6 Utility Services in Outstanding Landscapes	Not relevant to proposal. **Complies**
12.2 Indigenous Flora and Fauna	12.2.6.1.1 Indigenous Vegetation Clearance Permitted Throughout the District 12.2.6.1.2 Indigenous Vegetation Clearance in the rural Production and Minerals Zones 12.2.6.1.3 Indigenous Vegetation Clearance in the General Coastal Zone 12.2.6.1.4 Indigenous Vegetation Clearance in Other Zones	Not relevant to proposal. **Complies**
12.3 Earthworks	12.3.6.1.1 Excavation and/or filling, excluding mining and quarrying, in the Rural Production Zone or Kauri Cliffs Zone Permitted – Maximum of 5,000m^3 within a 12-month period and cannot be higher than 1.5m cut or fill.	Not relevant to proposal. **Complies**
12.4 Natural Hazards	12.4.6.1.1 Coastal Hazard 2 Area 12.4.6.1.2 Fire Risk to Residential Units	Not relevant to proposal. **Complies**
12.5 Heritage	12.5.6.1.1 Notable Trees 12.5.6.1.2 Alterations to/and maintenance of historic sites, buildings and objects 12.5.6.1.3 Registered Archaeological Sites	Not relevant to proposal. **Complies**

Rule	Standard	Performance/Comments
12.5A Heritage Precincts	There are no Heritage Precincts that apply to the site.	Not relevant to proposal. **Complies**
12.6 Air	Not applicable	Not relevant to proposal. **Complies**
12.7 Lakes, Rivers, Wetlands and the Coastline	12.7.6.1.1 Setback from lakes, rivers and the coastal marine area 12.7.6.1.2 Setback from smaller lakes, rivers and wetlands 12.7.6.1.4 Land Use Activities involving the Discharges of Human Sewage Effluent 12.7.6.1.5 Motorised Craft 12.7.6.1.6 Noise	Not relevant to proposal. **Complies**
12.8 Hazardous Substances		Not relevant to proposal. **Complies**
12.9 Renewable Energy and Energy Efficiency		Not relevant to proposal. **Complies**
Chapter 15 - Transportation standards		
Maximum daily one-way traffic movements - Rural Production	**Permitted** – 60 **Restricted discretionary** – 61 - 200	No new traffic is generated. **Complies**
Parking	**Permitted –** N/A	No new parking requirements result from the subdivision. **Complies**
Access	**Permitted** – Private access may serve a maximum of 8 household equivalents (80 vehicle movements) Crossings in accordance with engineering standards.	There is a brief sightline distance issues with the existing crossing which is a technical breach. **Discretionary**

Table 3 – Subdivision Standards

Subdivision Performance Standard	Comment
Rule 13.6.1 Definition of Subdivision of Land	The application meets the definition of subdivision as defined in the Resource Management Act 1991 (**RMA**).
Rule 13.6.2 Relevant Sections of Act	These are applied to the application.
Rule 13.6.3 Relevant Sections of the District Plan	These are applied to the application.
Rule 13.6.4 Other Legislation	There are no other pieces of legislation which are triggered by the proposal.
Rule 13.6.5 Legal Road Frontage	The site is accessed via Horeke Road.
Rule 13.6.6 Bonds	Not applicable
Rule 13.6.7 Consent Notices	There are no consent notices that apply to the site.
Rule 13.6.8 Subdivision consent before work commences	Minimal physical works will be required to complete the subdivision (if any).
Rule 13.6.9 Assessing Resource Consents	Council are likely to impose conditions to address effects of the proposal.
Rule 13.6.10 Joint Applications	Not applicable
Rule 13.6.11 Joint Hearings	Not applicable
Rule 13.6.12 Suitability for Proposed Land Use	The application sites are not affected by natural hazards and sufficient provision for legal and physical access to each of the allotments proposed are existing.
Rule 13.7.2.1 Boundary Adjustments	
Performance Standard	**Comment**
(a) –(f)	Whilst there is no change to the number and location and access to the lots, there is an increase in the number of certificates of title due to the separation of Lot 3 from the overall forestry block. **Rule not met**
Rule 13.7.2 Allotment Sizes, Dimensions and Other Standards	
Performance Standard	**Comment**
Rule 13.7.2.1 – Minimum Lot Sizes	Lots 1, 2, and 3 are significantly below the minimum lot sizes for the Rural Production zone. However, Lots 1 and 2 are to be transferred to the adjacent title with an overall size of 4.9864ha. Lot 4 and 5 are to be held in one Record of Title with a size of 43.24ha. Lot 3 is proposed to be 5,530m^2.

Subdivision Performance Standard	Comment
	Both respective titles are aged 1994. There are more than three lots in the subdivision, so Clause 2 which allows a 2,000m^2 minimum allotment and 1 4ha allotment is not possible. **Non Complying Activity**
Rule 13.7.2.2 – Allotment dimensions	The small exchange parcels (Lots 1 and 2) cannot accommodate this envelope. **Discretionary Activity**
Rule 13.7.2.3 - Amalgamation of land in a rural zone with land in an urban or coastal zone	Not applicable.
Rule 13.7.2.4 – Lots divided by zone boundaries	Not applicable.
Rule 13.7.2.5 - Sites divided by an outstanding landscape, outstanding landscape feature or outstanding natural feature	Not applicable
Rule 13.7.2.6 – Activities, Utilities, Roads and Reserves	Not applicable
Rule 13.7.2.7 – Savings as to previous approvals	Not applicable
Rule 13.7.2.8 – Proximity to Top Energy transmission lines	Not applicable
Rule 13.7.2.9 – Proximity to National Grid	Not applicable

PDP performance standards

These comprise relevant rules that have immediate effect under the PDP.

Table 4 – PDP Standards With Legal Effect

Proposed District Plan				
Matter	**Rule/Std Ref**	**Relevance**	**Compliance**	**Evidence**
Hazardous Substances Majority of rules relates to	Rule HS-R2 has immediate legal effect but only for a new significant	N/A	Yes	Not relevant to proposal. **Complies**

development within a site that has heritage or cultural items scheduled and mapped however Rule HS-R6 applies to any development within an SNA – which is not mapped	hazardous facility located within a scheduled site and area of significance to Māori, significant natural area or a scheduled heritage resource HS-R5, HS-R6, HS-R9			
Heritage Area Overlays (Property specific) This chapter applies only to properties within identified heritage area overlays (e.g. in the operative plan they are called precincts for example)	All rules have immediate legal effect (HA-R1 to HA-R14) All standards have immediate legal effect (HA-S1 to HA-S3)	N/A	Yes	Not relevant to proposal. **Complies**
Historic Heritage (Property specific and applies to adjoining sites (if the boundary is within 20m of an identified heritage item)). Rule HH-R5 Earthworks within 20m of a scheduled heritage resource. Heritage resources are shown as a historic item on the maps) This chapter applies to scheduled heritage resources – which are called heritage items in the map legend	All rules have immediate legal effect (HH-R1 to HH-R10) Schedule 2 has immediate legal effect	N/A	Yes	Not relevant to proposal. **Complies**
Notable Trees (Property specific) Applied when a property is showing	All rules have immediate legal effect (NT-R1 to NT-R9)	N/A	Yes	Not relevant to proposal. **Complies**

a scheduled notable tree in the map	All standards have legal effect (NT-S1 to NT-S2) Schedule 1 has immediate legal effect			
Sites and Areas of Significance to Māori (Property specific) Applied when a property is showing a site / area of significance to Maori in the map or within the Te Oneroa-a Tohe Beach Management Area (in the operative plan they are called site of cultural significance to Maori)	All rules have immediate legal effect (SASM-R1 to SASM-R7) Schedule 3 has immediate legal effect	N/A	Yes	Not relevant to proposal. **Complies**
Ecosystems and Indigenous Biodiversity SNA are not mapped – will need to determine if indigenous vegetation on the site for example	All rules have immediate legal effect (IB-R1 to IB-R5)	N/A	Yes	Not relevant to proposal. **Complies**
Activities on the Surface of Water	All rules have immediate legal effect (ASW-R1 to ASW-R4)	N/A	Yes	Not relevant to proposal. **Complies**
Earthworks all earthworks (refer to new definition) need to comply with this	The following rules have immediate legal effect: EW-R12, EW-R13 The following standards have immediate legal effect: EW-S3, EW-S5	Yes	Yes	Not relevant to proposal. **Complies**
Signs (Property specific) as rules only relate	The following rules have	N/A	Yes	Not relevant to proposal.

to situations where a sign is on a scheduled heritage resource (heritage item), or within the Kororareka Russell or Kerikeri Heritage Areas	immediate legal effect: SIGN-R9, SIGN-R10 All standards have immediate legal effect but only for signs on or attached to a scheduled heritage resource or heritage area			**Complies**
Orongo Bay Zone (Property specific as rule relates to a zone only)	Rule OBZ-R14 has partial immediate legal effect because RD-1(5) relates to water	N/A	Yes	Not relevant to proposal. **Complies**
Comments:				
No consents are required under the PDP.				

Overall, the application will be considered as a **Non Complying Activity**.

Clause 2(1)(d) of Schedule 4 of the RMA requires applicants to identify other activities of the proposal with the intention of capturing activities which need permission or licensing under other enactments. It is considered that no Regional Council authorisations are required to carry out the proposal.

6. NOTIFICATION ASSESSMENT

Public Notification

The table below outlines the steps associated with public notification insofar as it relates to s95 of the Act.

Step 1	Mandatory public notification in certain circumstances	
S95A(3)(a)	Has the applicant requested that the application be publicly notified?	No
S95A(3)(b)	Is public notification required under section 95C?(after a request for further information)	TBC
S95A(3)(c)	Has the application been made jointly with an application to exchange recreation reserve land under section 15AA of the Reserves Act 1977.	No
Step 2	if not required by step 1, public notification precluded in certain circumstances	

S95A(5)(a)	Is the application for a resource consent for 1 or more activities and each activity is subject to a rule or national environmental standard that precludes public notification?	No
S95A(5)(b)	Is the application for a resource consent for 1 or more of the following, but no other, activities; (i) a controlled activity; (iii) a restricted discretionary, discretionary, or non-complying activity, but only if the activity is a boundary activity;	Yes
Step 3	if not precluded by step 2, public notification required in certain circumstances	
S95A(8)(a)	Is the application for a resource consent for 1 or more activities, and any of those activities is subject to a rule or national environmental standard that requires public notification.	No
S95A(8)(b)	Does the consent authority decides, in accordance with section 95D, that the activity will have or is likely to have adverse effects on the environment that are more than minor	TBC
Step 4	public notification in special circumstances	
S95A(9)	Do special circumstances exist in relation to the application that warrant the application being publicly notified.	No

The proposal does not meet the tests for mandatory public notification. The proposal is not precluded from public notification. There are not considered to be any special circumstances that warrant the application to be notified.

An assessment of effects is required to determine whether public notification is warranted, or not. This is undertaken below.

Limited notification

The table below outlines the steps associated with limited notification insofar as it relates to s95 of the Act.

Step 1	certain affected groups and affected persons must be notified	
S95B(2)(a)	Are there any affected protected customary rights groups?	No
S95B(2)(b)	Are there any affected customary marine title groups (in the case of an application for a resource consent for an accommodated activity)?	No
S95B(3)(a)	Is the proposed activity on or adjacent to, or may affect, land that is the subject of a statutory acknowledgement made in accordance with an Act specified in Schedule 11?	No
S95B(3)(b)	Is the person to whom the statutory acknowledgement is made is an affected person under section 95E?	No
Step 2	if not required by step 1, limited notification precluded in certain circumstances	
S95B(6)(a)	the application is for a resource consent for 1 or more activities, and each activity is subject to a rule or national environmental standard that precludes limited notification:	No

S95B(6)(b)	the application is for a controlled activity (but no other activities) that requires a resource consent under a district plan (other than a subdivision of land)	No
Step 3	if not precluded by step 2, certain other affected persons must be notified	
S95B(7)	If in the case of a boundary activity, whether an owner of an allotment with an infringed boundary is an affected person in accordance with s95E.	No
S95B(8)	If in the case of any other activity, a person is an affected person in accordance with section 95E.	TBA
Step 4	further notification in special circumstances	
S95B(10)	If special circumstances exist in relation to the application that warrant notification of the application to any other persons not already determined to be eligible for limited notification under this section.	No

Affected Person Determination

As the proposed activity does not trigger mandatory limited notification, nor is it precluded, an assessment of potential affected persons must be undertaken.

The consent authority has discretion to determine whether a person is an affected person. A person is affected if an activity's adverse effects are minor or more than minor to them.

An assessment of effects is required to determine whether limited notification is warranted, or not. This is undertaken below.

7. STATUTORY CONSIDERATIONS

Section 104B and s104D of the RMA governs the determination of applications for Non Complying Activities:

104B Determination of applications for discretionary or non-complying activities

After considering an application for a resource consent for a discretionary activity or non-complying activity, a consent authority—

(a) may grant or refuse the application; and

(b) if it grants the application, may impose conditions under section 108.

Section 104B: inserted, on 1 August 2003, by section 44 of the Resource Management Amendment Act 2003 (2003 No 23).

104D Particular restrictions for non-complying activities

(1) Despite any decision made for the purpose of notification in relation to adverse effects, a consent authority may grant a resource consent for a non-complying activity only if it is satisfied that either—

(a) the adverse effects of the activity on the environment (other than any effect to which section 104(3)(a)(ii) applies) will be minor; or

(b) the application is for an activity that will not be contrary to the objectives and policies of—

(i) the relevant plan, if there is a plan but no proposed plan in respect of the activity; or

(ii) the relevant proposed plan, if there is a proposed plan but no relevant plan in respect of the activity; or

(iii) both the relevant plan and the relevant proposed plan, if there is both a plan and a proposed plan in respect of the activity.

(2) To avoid doubt, section 104(2) applies to the determination of an application for a non-complying activity.

Section 104D: inserted, on 1 August 2003, by section 44 of the Resource Management Amendment Act 2003 (2003 No 23).

Section 104D(1): amended, on 18 October 2017, by section 144 of the Resource Legislation Amendment Act 2017 (2017 No 15).

Section 104D(1): amended, on 1 October 2009, by section 150 of the Resource Management (Simplifying and Streamlining) Amendment Act 2009 (2009 No 31).

Section 104D(1)(a): amended, on 1 October 2009, by section 150 of the Resource Management (Simplifying and Streamlining) Amendment Act 2009 (2009 No 31).

With respect to Non Complying Activities, a consent authority may grant or refuse the application and may impose conditions under section 108 of the RMA.

Section 104 of the RMA sets out matters to be considered when assessing an application for a resource consent.

104 Consideration of applications

(1) When considering an application for a resource consent and any submissions received, the consent authority must, subject to Part 2 and section 77M, have regard to–

(a) any actual and potential effects on the environment of allowing the activity; and

(ab) any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity; and

(b) any relevant provisions of—

(i) a national environmental standard:

(ii) other regulations:

(iii) a national policy statement:

(iv) a New Zealand coastal policy statement:

(v) a regional policy statement or proposed regional policy statement:

(vi) a plan or proposed plan; and

(c) any other matter the consent authority considers relevant and reasonably necessary to determine the application.

Assessment of Effects on the Environment (AEE)

The RMA (section 3) meaning of effect includes:

3 Meaning of effect

In this Act, unless the context otherwise requires, the term **effect** includes—

(a) any positive or adverse effect; and

(b) any temporary or permanent effect; and

(c) any past, present, or future effect; and

(d) any cumulative effect which arises over time or in combination with other effects—

regardless of the scale, intensity, duration, or frequency of the effect, and also includes—

(e) any potential effect of high probability; and

(f) any potential effect of low probability which has a high potential impact.

Section 104(2) of the RMA states that:

> *"when forming an opinion for the purposes of subsection (1)(a), a consent authority may disregard an adverse effect of the activity on the environment if a national environmental standard or the plan permits an activity with that effect."*

This is referred to as the "permitted baseline", which is based on the permitted performance standards and development controls that form part of a district plan. For an effects-based plan such as the Far North District Plan where specified activities are not regulated, determining the permitted baseline is a useful tool for determining a threshold of effects that are enabled by the zone.

In this instance, there are no permitted subdivisions / boundary adjustments.

Resolution of Encroachment and Historic Survey Errors

The primary driver of this application is the pragmatic resolution of historic and physical boundary issues. The creation of Lot 1 provides a permanent legal solution to an unauthorised dwelling encroachment that has persisted despite a 2023 High Court removal order.

Council may take a view that the subdivision results in consequential land use breaches, but it is my view that these should be followed up from a compliance perspective with that adjoining landowner who has promoted the need for this component of the subdivision, and not burden the applicant with also requiring consents for an activity it did not undertake or cause. Obviously the applicant is keen to move on from this matter since the High Court proceedings.

It is noted here that the applicant would not support any written approvals for the houseowner to be located where it is and supports Council compliance action to have it removed, in conjunction with the high court removal order.

Furthermore, the adjustment rectifies a 1922 road stopping error that effectively landlocked the eastern severance. By incorporating slivers of Sections 7 and 8, the applicant gains the only practical access to the lifestyle building site. These adjustments generate significant positive effects by clearing up historical title defects and reducing the potential for future cross-boundary disputes.

Vehicle Access and Safety

Historically, the 1922 road realignment severed practical access to the eastern portion of the applicant's land. The proposed subdivision remedies this by transferring a sliver of Section 7 to Lot 3, enabling legal, shared access over an existing formed entrance on Horeke Road.

While the access point provides the most logical entry to the site, the Civil Site Suitability Report identifies two areas requiring mitigation:

- Crossing Formation - There is localised damage to the existing crossing. The applicant accepts the engineer's recommendation that *"the existing crossing be repaired and reinstated to an appropriate standard... and upgraded as necessary to ensure compliance with Type 1A (light vehicle) requirements in accordance with the Far North District Council Engineering Standards (2023)."*

- Sight Distances - Horeke Road does not have a listed speed limit in the National Speed Limit Register, meaning a default 100 km/hr rural speed limit applies. Under FNDC Engineering Standards (2023), this requires a 210m sight distance, which the existing crossing cannot achieve.

Despite this technical non-compliance, the Civil Site Suitability Report (refer **Appendix C**) confirms that *"the existing access arrangement has been developed to provide the safest practicable outcome within the physical constraints of the site and surrounding road geometry."* Furthermore, the engineer notes that the 100 km/hr design speed is highly conservative, as *"vehicle operating speeds along Horeke Road are expected to be lower in practice due to the rural gravel road environment, alignment and road surface condition."*

To ensure ongoing safety, the applicant will adopt the mitigation measures outlined by the engineer, including upgrading the crossing surface, removing/trimming localised visibility obstructions where permitted, and maintaining low roadside batters.

Given the low traffic volumes and the conservative nature of the speed environment, any adverse effects on the safety and efficiency of the roading network will be less than minor.

Servicing (Wastewater, Stormwater and Water Supply)

The Civil Site Suitability Report prepared by Wilton Joubert confirms that the proposed lifestyle severance (Lot 3) can be adequately serviced on-site without creating adverse environmental effects.

Wastewater Disposal

There is currently no wastewater management system on Lot 3. To demonstrate feasibility, the engineering assessment was based on a moderate 4-bedroom residential dwelling. The report confirms that the lot has sufficient area to accommodate on-site wastewater disposal in accordance with AS/NZS 1547. Given the underlying subsoils, the engineer recommends secondary level treatment (or higher) utilising Pressure Compensating Dripper Irrigation (PCDI), though alternative trench or bed setups may be acceptable subject to specific design at the building consent stage.

Stormwater Management

The subject site is located immediately adjacent to the downstream end of the Wairere River, an area where receiving water levels are predominantly controlled by tidal influences rather than upstream runoff. The Civil Site Suitability Report notes that traditional on-site stormwater attenuation (detention) is not appropriate for this location; delaying runoff could result in peak flows from the site coinciding with peak flows from upstream areas, potentially contributing to localized water level increases. Instead, stormwater will be managed utilising Low Impact Design (LID) principles.

Potable Water Supply

Potable water will be supplied via roof catchments. The engineer recommends the installation of at least two 25,000L rainwater tanks per dwelling to satisfy the Countryside Living Toolbox requirements, with final storage and firefighting capacity to be confirmed at the building consent

stage.

Overall, the proposal demonstrates that Lot 3 can be entirely self-sufficient in terms of servicing, ensuring that adverse effects on water quality, soil stability, and downstream catchments remain less than minor.

Natural Hazards and Geotechnical Suitability

A Geotechnical investigation has been undertaken to confirm the suitability of the proposed lifestyle severance (Lot 3) for future residential development (**Appendix D**). The assessment confirms that the site is geotechnically stable and not subject to natural hazards that would preclude development, provided standard engineering recommendations are followed.

Slope Stability and Natural Hazards

The proposed building envelope within Lot 3 is situated on a stable profile. The geotechnical investigation found no evidence of recent or historical deep-seated instability, indicating that the risk of landslip or significant slope failure is negligible. Furthermore, due to the cohesive nature of the underlying soils and the absence of a shallow groundwater table, the site is not considered susceptible to liquefaction. Overall, the site is not subject to material damage from natural hazards, satisfying the requirements of Section 106 of the Resource Management Act.

Soil Profile and Foundation Suitability

Testing of the soil confirms that the site possesses adequate ultimate bearing capacity to support standard residential construction. Laboratory and field assessments have classified the near-surface soils as Class H (Highly Expansive). These soils are highly reactive to seasonal moisture changes, which can cause them to shrink and swell. To mitigate any adverse effects on future structures the report recommends that any future dwelling will require specific engineering design for its foundations to bridge the reactive surface layers and anchor into stable subsoils.

The geotechnical effects associated with the subdivision are therefore considered less than minor provided the recommendations in the geotechnical report are followed.

NES / NPS

The NES associated with soil contamination is not relevant. The sites are predominantly in a rural use and are not known to have a HAIL activity present.

The site is not coastal or urban, so those higher order documents are not relevant.

The sites do not have high class soils and the NPS on this matter is therefore not relevant.

The proposal does not affect wetlands, water quality or quantity, or indigenous biodiversity. Those NPS / NES are also not relevant.

Northland Regional Policy Statement

The subject site is within the Northland region and is subject to the governing objectives and policies of the operative Northland Regional Policy Statement - operative May 2016 (RPS). With

respect to any identified features, the site is not within any area of 'High' or 'Outstanding' Natural Character Area and is outside the Coastal Environment boundary.

Owing to the relevant characteristics of the site (considered earlier in the report) not all matters of the RPS are relevant when considered at a micro level. Those relevant matters are considered below.

Table 4 – Assessment of the Northland Regional Policy Statement

Objective / Policy	**Comment**
Integrated Catchment Management	The proposal incorporates Low Impact Design (LID) for stormwater and secondary treatment for wastewater, ensuring downstream receiving environments (Wairere River) are not adversely affected.
Region-Wide Water Quality	The engineering design confirms that on-site wastewater for proposed Lot 3 will utilise secondary level treatment to protect groundwater and local water quality.
Ecological Flows and Water Levels	Not relevant.
Indigenous Ecosystems & Biodiversity	Not relevant.
Enabling Economic Wellbeing	The proposal directly supports the Hauhungaroa 1C Incorporation to optimise their landholdings. It allows the sustainable management of their forestry blocks (Lots 4 & 5) while monetising a non-productive severance (Lot 3) and providing a legal solution to a historic boundary encroachment.
Economic Activities – Reverse Sensitivity and Sterilization	The subdivision logically separates the lifestyle block from the primary forestry blocks, permanently resolving an existing encroachment and preventing the future sterilisation of the productive forestry land.
Regionally Significant Infrastructure	Not relevant.
Efficient and Effective Infrastructure	Proposed Lot 3 will be entirely self-sufficient regarding potable water, wastewater, and stormwater disposal, placing no demand on reticulated public networks. Access is achieved via an existing, upgraded crossing.
Security of Energy Supply	Not relevant.
Use and Allocation of Common Resources	Not relevant.

Regional Form	The proposal maintains the established rural character of Horeke Road. The vast majority of the land remains in active rural production (forestry), while the single lifestyle lot is consistent with the surrounding rural-residential settlement pattern.
Tangata Whenua Role in Decision Making	The applicant, Hauhungaroa 1C Incorporation, is actively driving the development and rationalisation of their own land to support the economic and social wellbeing of their shareholders.
Natural Hazard Risk	Geotechnical and Civil reporting confirms the proposed building site on Lot 3 is geotechnically stable and not subject to coastal inundation, flooding, or deep-seated instability.
Natural Character, Outstanding Natural Features, Outstanding Natural Landscapes and Historic Heritage	Not relevant.

Overall, it is considered that the proposal is consistent with the operative RPS. It appropriately manages infrastructure and natural hazards while directly enabling the economic wellbeing and sustainable land management of Tangata Whenua.

ODP Objectives and Policies

The relevant objectives and policies of the Plan are those related to the Rural Production Zone and Subdivision Chapter.

Table 5 – Assessment of the Rural Production Zone ODP

Objectives	Assessment
8.6.3.1 To promote the sustainable management of natural and physical resources in the Rural Production Zone.	The proposal promotes sustainable management by enabling the continued productive use of the forestry blocks (Lots 4 & 5) while securing legal access and on-site servicing for a non-productive lifestyle severance (Lot 3).
8.6.3.2 To enable the efficient use and development of the Rural Production Zone in a way that enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety.	Resolving the 1922 road alignment error and the modern dwelling encroachment enables Hauhungaroa 1C Incorporation to efficiently manage their landholdings, directly providing for the economic and cultural wellbeing of their shareholders.
8.6.3.3 To promote the maintenance and enhancement of the amenity values of the	The adjustment maintains rural amenity by preserving the primary land use as

Rural Production Zone to a level that is consistent with the productive intent of the zone.	commercial forestry, while allowing a single rural-lifestyle lot that is entirely consistent with the established character of Horeke Road.
8.6.3.4 To promote the protection of significant natural values of the Rural Production Zone.	These significant natural values are not apparent on the site or in the immediate surrounds.
8.6.3.5 To protect and enhance the special amenity values of the frontage to Kerikeri Road between its intersection with SH10 and the urban edge of Kerikeri.	Not relevant.
8.6.3.6 To avoid, remedy or mitigate the actual and potential conflicts between new land use activities and existing lawfully established activities (reverse sensitivity) within the Rural Production Zone and on land use activities in neighbouring zones.	The primary purpose of creating Lot 1 is to permanently resolve an existing, physical cross-boundary conflict (the unauthorised dwelling). The lifestyle severance (Lot 3) is adequately separated from the forestry block to avoid reverse sensitivity effects.
8.6.3.7 To avoid remedy or mitigate the adverse effects of incompatible use or development on natural and physical resources.	The proposal remedies an existing incompatible use by formalizing the land area directly underneath the encroaching structure, severing it from the applicant's productive land.
8.6.3.8 To enable the efficient establishment and operation of activities and services that have a functional need to be located in rural environments.	Plantation forestry has a functional need to be located in the rural environment. The proposal ensures these operations can continue unhindered.
8.6.3.9 To enable rural production activities to be undertaken in the zone.	Lots 4 and 5 will continue to operate as large-scale commercial plantation forestry.
Policies	**Assessment**
8.6.4.1 That the Rural Production Zone enables farming and rural production activities, as well as a wide range of activities, subject to the need to ensure that any adverse effects on the environment, including any reverse sensitivity effects, resulting from these activities are avoided, remedied or mitigated and are not to the detriment of rural productivity.	The proposal supports rural productivity by rationalising the boundaries of a commercial forestry block. The administrative creation of Lot 1 mitigates the adverse effects of an existing encroachment without detracting from the overall productivity of the site.
8.6.4.2 That standards be imposed to ensure that the off site effects of activities in the Rural Production Zone are avoided, remedied or mitigated.	Technical reporting confirms that stormwater, wastewater, and access can be managed on-site without generating adverse off-site effects on neighbouring properties or the downstream catchment.
8.6.4.3 That land management practices that avoid, remedy or mitigate adverse effects on natural and physical resources be encouraged.	The continued use of the primary blocks for forestry represents an appropriate land management practice for the topography and soils.
8.6.4.4 That the type, scale and intensity of development allowed shall have regard to	The scale of development is limited to one additional lifestyle lot, which aligns with the

the maintenance and enhancement of the amenity values of the Rural Production Zone to a level that is consistent with the productive intent of the zone.	rural-residential settlement pattern observed along Horeke Road.
8.6.4.5 That the efficient use and development of physical and natural resources be taken into account in the implementation of the Plan.	The proposal represents a highly efficient rationalisation of land, fixing a 1922 survey defect that currently landlocks a portion of the applicant's property.
8.6.4.6 That the built form of development allowed on sites with frontage to Kerikeri Road between its intersection with SH10 and Cannon Drive be maintained as small in scale, set back from the road, relatively inconspicuous and in harmony with landscape plantings and shelter belts.	Not relevant.
8.6.4.7 That although a wide range of activities that promote rural productivity are appropriate in the Rural Production Zone, an underlying goal is to avoid the actual and potential adverse effects of conflicting land use activities.	The application directly addresses and resolves an existing conflicting land use (an unauthorised residential encroachment on forestry land) via a land exchange.
8.6.4.8 That activities whose adverse effects, including reverse sensitivity effects, cannot be avoided remedied or mitigated are given separation from other activities.	Separation is achieved by defining clear, logical boundaries between the lifestyle severance, the neighbouring estate, and the forestry operations.
8.6.4.9 That activities be discouraged from locating where they are sensitive to the effects of or may compromise the continued operation of lawfully established existing activities in the Rural Production zone and in neighbouring zones.	There are no actual or potential land use incompatibility effects resulting from the proposal.

Table 6 – Assessment of the Subdivision Chapter ODP

Objectives	Assessment
13.3.1 To provide for the subdivision of land in such a way as will be consistent with the purpose of the various zones in the Plan and will promote the sustainable management of the natural and physical resources of the District, including airports and the social, economic and cultural wellbeing of people and communities.	In this unique circumstance, the proposed adjustment is the most practical method to correct historical title defects and modern encroachments, allowing the applicant to sustainably manage their resources.
13.3.2 To ensure that subdivision of land is appropriate and is carried out in a manner that does not compromise the life-supporting capacity of air, water, soil or ecosystems, and that any actual or potential adverse effects on the environment which result directly or indirectly from subdivision, including reverse sensitivity effects, are avoided, remedied or mitigated.	The attached reports confirm that secondary treatment of wastewater and Low Impact Design stormwater management will ensure the life-supporting capacity of local soils and the adjacent Wairere River are not compromised.
13.3.3 To ensure that the subdivision of land does not jeopardise the protection of outstanding landscapes or natural features in the coastal environment.	Not relevant.
13.3.4 To ensure that subdivision does not adversely affect scheduled heritage resources through alienation of the resource from its immediate setting/context.	Not relevant.
13.3.5 To ensure that all new subdivisions provide a reticulated water supply and/or on-site water storage sufficient to meet the needs of the activities that will establish all year round.	On-site water storage (minimum 2x 25,000L rainwater tanks) will be provided for Lot 3, as reticulated water is not available.
13.3.6 To encourage innovative development and integrated management of effects between subdivision and land use which results in superior outcomes to more traditional forms of subdivision, use and development, for example the protection, enhancement and restoration of areas and features which have particular value or may have been compromised by past land management practices.	While not a traditional innovative development, the integrated boundary exchange is a creative, pragmatic solution to complex legal and physical constraints.
13.3.7 To ensure the relationship between Maori and their ancestral lands, water, sites, wahi tapu and other taonga is recognised and provided for.	The proposal directly recognizes this relationship by empowering the Hauhungaroa 1C Incorporation to rectify historic Crown survey errors (1922) and regain practical control and access over their ancestral lands.

Policies	Assessment
13.4.1 That the sizes, dimensions and distribution of allotments created through the subdivision process be determined with regard to the potential effects including cumulative effects, of the use of those allotments on: (a) natural character, particularly of the coastal environment; (b) ecological values; (c) landscape values; (d) amenity values; (e) cultural values; (f) heritage values; and (g) existing land uses.	The sizes and distribution of Lots 1 and 2 are dictated by the exact physical location of the existing structure and accessways, ensuring the proposal matches the reality on the ground.
13.4.2 That standards be imposed upon the subdivision of land to require safe and effective vehicular and pedestrian access to new properties.	The existing vehicle crossing on Horeke Road will be upgraded and maintained to Type 1A standards to ensure safe vehicular access, mitigating the technical shortfall in sight distances.
13.4.3 That natural and other hazards be taken into account in the design and location of any subdivision.	Geotechnical reporting confirms the building site is stable. The presence of Class H expansive soils is noted and will be mitigated through Specific Engineering Design at the building consent stage.
13.4.4 That in any subdivision where provision is made for connection to utility services, the potential adverse visual impacts of these services are avoided.	Servicing will be entirely on-site (rainwater, wastewater dispersal) with negligible visual impact.
13.4.5 That access to, and servicing of, the new allotments be provided for in such a way as will avoid, remedy or mitigate any adverse effects on neighbouring property, public roads, and the natural and physical resources of the site caused by silt runoff, traffic, excavation and filling and removal of vegetation.	Access is achieved via a shared entrance on Section 7, avoiding the need for new earthworks or vegetation clearance to form a new crossing on Horeke Road.
13.4.6 That any subdivision proposal provides for the protection, restoration and enhancement of heritage resources, areas of significant indigenous vegetation and significant habitats of indigenous fauna, threatened species, the natural character of the coastal environment and riparian margins, and outstanding landscapes and natural features where appropriate.	Not relevant.

13.4.7 That the need for a financial contribution be considered only where the subdivision would: (a) result in increased demands on car parking associated with non-residential activities; or (b) result in increased demand for esplanade areas; or (c) involve adverse effects on riparian areas; or (d) depend on the assimilative capacity of the environment external to the site.	Not relevant.
13.4.8 That the provision of water storage be taken into account in the design of any subdivision.	The Civil Site Suitability Report dictates the requirement for 50,000L of on-site water storage to adequately service the future dwelling on Lot 3.
13.4.9 That bonus development donor and recipient areas be provided for so as to minimise the adverse effects of subdivision on Outstanding Landscapes and areas of significant indigenous flora and significant habitats of fauna.	Not relevant.
13.4.10 The Council will recognise that subdivision within the Conservation Zone that results in a net conservation gain is generally appropriate.	Not relevant.
13.4.11 That subdivision recognises and provides for the relationship of Maori and their culture and traditions, with their ancestral lands, water, sites, waahi tapu and other taonga and shall take into account the principles of the Treaty of Waitangi.	The application enables Tangata Whenua (Hauhungaroa 1C Incorporation) to actively manage, rationalise, and derive economic benefit from their landholdings, honouring the principles of active protection and partnership.
13.4.12 That more intensive, innovative development and subdivision which recognises specific site characteristics is provided for through the management plan rule where this will result in superior environmental outcomes.	A management plan is not considered appropriate for this circumstance where a subdivision is proposed to rectify physical defects.

13.4.13 Subdivision, use and development shall preserve and where possible enhance, restore and rehabilitate the character of the applicable zone in regard to s6 matters, and shall avoid adverse effects as far as practicable by using techniques including: (a) clustering or grouping development within areas where there is the least impact on natural character and its elements such as indigenous vegetation, landforms, rivers, streams and wetlands, and coherent natural patterns; (b) minimising the visual impact of buildings, development, and associated vegetation clearance and earthworks, particularly as seen from public land and the coastal marine area; (c) providing for, through siting of buildings and development and design of subdivisions, legal public right of access to and use of the foreshore and any esplanade areas; (d) through siting of buildings and development, design of subdivisions, and provision of access that recognise and provide for the relationship of Maori with their culture, traditions and taonga including concepts of mauri, tapu, mana, wehi and karakia and the important contribution Maori culture makes to the character of the District (refer ***Chapter 2*** and in particular ***Section 2.5*** and Council's *"Tangata Whenua Values and Perspectives" (2004)*; (e) providing planting of indigenous vegetation in a way that links existing habitats of indigenous fauna and provides the opportunity for the extension, enhancement or creation of habitats for indigenous fauna, including mechanisms to exclude pests; (f) protecting historic heritage through the siting of buildings and development and design of subdivisions.	There are no relevant Section 6 matters that require specific mitigation in this scenario.
13.4.14 That the objectives and policies of the applicable environment and zone and relevant parts of ***Part 3*** of the Plan will be taken into account when considering the intensity, design and layout of any subdivision.	These have been comprehensively assessed in Table 5 above, demonstrating the proposal is appropriate for the zone.

The proposal is considered to be highly consistent with the aims and intents of both the Rural Production Zone and the Subdivision Chapter of the ODP.

PDP Objectives and Policies

Table 7 – Assessment of the Rural Production Zone PDP

Objectives	**Assessment**
RPROZ-01 The Rural Production zone is managed to ensure its availability for primary production activities and its long-term protection for current and future generations.	The vast majority of the applicant's landholdings (proposed Lots 4 and 5) are, and will continue to be, actively managed for plantation forestry (primary production).
RPROZ-02 The Rural Production zone is used for primary production activities, ancillary activities that support primary production and other compatible activities that have a functional need to be in a rural environment.	Plantation forestry is a primary production activity with a strict functional need to operate in the rural environment. The lifestyle severance (Lot 3) is a compatible rural-residential activity that responds to physical site constraints (severance by road).
RPROZ-03 Land use and subdivision in the Rural Production zone: a. protects highly productive land from sterilisation and enables it to be used for more productive forms of primary production; b. protects primary production activities from reverse sensitivity effects that may constrain their effective and efficient operation; c. does not compromise the use of land for farming activities, particularly on highly productive land; d. does not exacerbate any natural hazards; and e. is able to be serviced by on-site infrastructure.	The site does not contain highly productive land. Reverse sensitivity is avoided as Lot 3 is physically separated from the forestry blocks by Horeke Road. Engineering reports confirm there are no significant natural hazards and the site is capable of being fully serviced by on-site infrastructure.
RPROZ-04 The rural character and amenity associated with a rural working environment is maintained.	The subdivision maintains the dominance of the forestry operations. The single lifestyle lot is consistent with the established rural-residential settlement pattern along Horeke Road.
Policies	**Assessment**

RPROZ-P1 Enable primary production activities, provided they internalise adverse effects onsite where practicable, while recognising that typical adverse effects associated with primary production should be anticipated and accepted within the Rural Production zone.	The proposal directly enables primary production by securing the legal boundaries and access for the Incorporation's forestry blocks.
RPROZ-P2 Ensure the Rural Production zone provides for activities that require a rural location by: a. enabling primary production activities as the predominant land use; b. enabling a range of compatible activities that support primary production activities, including ancillary activities, rural produce manufacturing, rural produce retail, visitor accommodation and home businesses.	The predominant land use remains plantation forestry. The proposal represents an administrative mechanism to support this use by resolving historic defects.
RPROZ-P3 Manage the establishment, design and location of new sensitive activities and other non-productive activities in the Rural Production Zone to avoid where possible, or otherwise mitigate, reverse sensitivity effects on primary production activities.	The non-productive lifestyle severance (Lot 3) is logically positioned on land that is physically severed from the main forestry block by Horeke Road, providing a clear physical buffer that mitigates reverse sensitivity.
RPROZ-P4 Land use and subdivision activities are undertaken in a manner that maintains or enhances the rural character and amenity of the Rural Production zone, which includes: a. a predominance of primary production activities; b. low density development with generally low site coverage of buildings or structures; c. typical adverse effects such as odour, noise and dust associated with a rural working environment; and d. a diverse range of rural environments, rural character and amenity values throughout the District.	The proposed subdivision neither reduces nor increases rural amenity. It maintains a predominance of primary production and low-density development.

RPROZ-P5 Avoid land use that: a. is incompatible with the purpose, character and amenity of the Rural Production zone; b. does not have a functional need to locate in the Rural Production zone and is more appropriately located in another zone; c. would result in the loss of productive capacity of highly productive land; d. would exacerbate natural hazards; and e. cannot provide appropriate on-site infrastructure.	The proposal actively resolves an incompatible land use by permanently severing an unauthorized residential encroachment (Lot 1) from the applicant's productive land. On-site infrastructure has been proven feasible.
RPROZ-P6 Avoid subdivision that: a. results in the loss of highly productive land for use by farming activities; b. fragments land into parcel sizes that are no longer able to support farming activities, taking into account: i. the type of farming proposed; and ii. whether smaller land parcels can support more productive forms of farming due to the presence of highly productive land. iii. provides for rural lifestyle living unless there is an environmental benefit.	The proposal does not result in the loss of highly productive land. The fragmentation is not arbitrary; it is driven by historic survey errors (the 1922 road) and the physical bisection of the property by Horeke Road. Resolving these 100-year-old title defects and the modern encroachment provides a tangible environmental and administrative benefit.

RPROZ-P7 Manage land use and subdivision to address the effects of the activity requiring resource consent, including (but not limited to) consideration of the following matters where relevant to the application: a. whether the proposal will increase production potential in the zone; b. whether the activity relies on the productive nature of the soil; c. consistency with the scale and character of the rural environment; d. location, scale and design of buildings or structures; e. for subdivision or non-primary production activities: i. scale and compatibility with rural activities; ii. potential reverse sensitivity effects on primary production activities and existing infrastructure; iii. the potential for loss of highly productive land, land sterilisation or fragmentation f. at zone interfaces: i. any setbacks, fencing, screening or landscaping required to address potential conflicts; ii. the extent to which adverse effects on adjoining or surrounding sites are mitigated and internalised within the site as far as practicable; g. the capacity of the site to cater for on-site infrastructure associated with the proposed activity, including whether the site has access to a water source such as an irrigation network supply, dam or aquifer; h. the adequacy of roading infrastructure to service the proposed activity; i. Any adverse effects on historic heritage and cultural values, natural features and landscapes or indigenous biodiversity;	As detailed in Section 5 of this AEE, matters regarding scale, character, building location, infrastructure capacity, and reverse sensitivity have been comprehensively assessed and mitigated to a less than minor level. Tangata Whenua values are inherently supported as the applicant is a Māori Incorporation managing their ancestral lands.

j. Any historical, spiritual, or cultural association held by tangata whenua, with regard to the matters set out in Policy TW-P6.	

Table 8 – Assessment of the Subdivision Chapter PDP

Objectives	Assessment
SUB-01 Subdivision results in the efficient use of land, which: a. achieves the objectives of each relevant zone, overlays and district wide provisions; b. contributes to the local character and sense of place; c. avoids reverse sensitivity issues that would prevent or adversely affect activities already established on land from continuing to operate; d. avoids land use patterns which would prevent land from achieving the objectives and policies of the zone in which it is located; e. does not increase risk from natural hazards or risks are mitigates and existing risks reduced; and f. manages adverse effects on the environment.	The proposed adjustment is a highly efficient use of land to rectify a 1922 survey error and a modern encroachment. While there are technical land-use breaches (lot sizes), these are necessary to align the legal boundaries with the physical reality on the ground. The sites are largely clear of natural hazards.
SUB-02 Subdivision provides for the: a. Protection of highly productive land; and b. Protection, restoration or enhancement of Outstanding Natural Features, Outstanding Natural Landscapes, Natural Character of the Coastal Environment, Areas of High Natural Character, Outstanding Natural Character, wetland, lake and river margins, Significant Natural Areas, Sites and Areas of Significance to Māori, and Historic Heritage.	Not relevant. The site does not contain highly productive land, ONLs, or SNAs.

SUB-03 Infrastructure is planned to service the proposed subdivision and development where: a. there is existing infrastructure connection, infrastructure should provided in an integrated, efficient, coordinated and future-proofed manner at the time of subdivision; and b. where no existing connection is available infrastructure should be planned and consideration be given to connections with the wider infrastructure network.	Reticulated infrastructure is not available. The Civil Site Suitability Report confirms that Lot 3 can be fully serviced by planned on-site infrastructure (rainwater, PCDI wastewater, LID stormwater).
SUB-04 Subdivision is accessible, connected, and integrated with the surrounding environment and provides for: a. public open spaces; b. esplanade where land adjoins the coastal marine area; and c. esplanade where land adjoins other qualifying waterbodies.	These factors are not relevant in this instance.
Policies	**Assessment**
SUB-P1 Enable boundary adjustments that: a. do not alter: b. the degree of non compliance with District Plan rules and standards; c. the number and location of any access; and d. the number of certificates of title; and e. are in accordance with the minimum lot sizes of the zone and comply with access, infrastructure and esplanade provisions.	The proposal (Lots 1, 2, 4, & 5) technically alters titles and does not meet minimum lot sizes. However, this non-compliance is entirely unique and necessary to resolve an existing physical encroachment and restore legal access.
SUB-P2 Enable subdivision for the purpose of public works, infrastructure, reserves or access.	A core driver of this application is to secure legal access by transferring slivers of Sections 7 & 8 to bypass the 1922 road stopping error.

SUB-P3 Provide for subdivision where it results in allotments that: a. are consistent with the purpose, characteristics and qualities of the zone; b. comply with the minimum allotment sizes for each zone; c. have an adequate size and appropriate shape to contain a building platform; and d. have legal and physical access.	The proposal provides for these matters (save for minimum allotment sizes). The lifestyle severance (Lot 3) contains a stable building platform and establishes legal/physical access over an existing formed entrance.
SUB-P4 Manage subdivision of land as detailed in the district wide, natural environment values, historical and cultural values and hazard and risks sections of the plan.	These matters have been considered throughout the AEE.
SUB-P5 Manage subdivision design and layout in the General Residential, Mixed Use and Settlement zone to provide for safe, connected and accessible environments by a. minimising vehicle crossings that could affect the safety and efficiency of the current and future transport network; b. avoid cul-de-sac development unless the site or the topography prevents future public access and connections; c. providing for development that encourages social interaction, neighbourhood cohesion, a sense of place and is well connected to public spaces; d. contributing to a well connected transport network that safeguards future roading connections; and e. maximising accessibility, connectivity by creating walkways, cycleways and an interconnected transport network.	Not relevant.

SUB-P6 Require infrastructure to be provided in an integrated and comprehensive manner by: a. demonstrating that the subdivision will be appropriately serviced and integrated with existing and planned infrastructure if available; and b. ensuring that the infrastructure is provided is in accordance the purpose, characteristics and qualities of the zone.	The Geotechnical and Civil reports demonstrate the site can be appropriately serviced on-site in a manner consistent with the characteristics of the Rural Production zone.
SUB-P7 Require the vesting of esplanade reserves when subdividing land adjoining the coast or other qualifying waterbodies.	Not relevant.
SUB-P8 Avoid rural lifestyle subdivision in the Rural Production zone unless the subdivision: a. will protect a qualifying SNA in perpetuity and result in the SNA being added to the District Plan SNA schedule; and b. will not result in the loss of versatile soils for primary production activities.	While Lot 3 creates a lifestyle severance, it does not result in the loss of versatile soils. Furthermore, this is not a greenfield lifestyle subdivision, but rather the formalisation of a non-productive land fragment that is physically severed from the applicant's forestry block by Horeke Road.
SUB-P9 Avoid rural lifestyle subdivision in the Rural Production zone and Rural residential subdivision in the Rural Lifestyle zone unless the development achieves the environmental outcomes required in the management plan subdivision rule.	As noted above, the creation of Lot 3 is driven by existing physical constraints and the need to resolve historic survey defects, rather than a standard lifestyle development requiring a management plan.
SUB-P10 To protect amenity and character by avoiding the subdivision of minor residential units from principal residential units where resultant allotments do not comply with minimum allotment size and residential density.	Not relevant.

SUB-P11 Manage subdivision to address the effects of the activity requiring resource consent including (but not limited to) consideration of the following matters where relevant to the application: a. consistency with the scale, density, design and character of the environment and purpose of the zone; b. the location, scale and design of buildings and structures; c. the adequacy and capacity of available or programmed development infrastructure to accommodate the proposed activity; or the capacity of the site to cater for on-site infrastructure associated with the proposed activity; d. managing natural hazards; e. Any adverse effects on areas with historic heritage and cultural values, natural features and landscapes, natural character or indigenous biodiversity values; and f. any historical, spiritual, or cultural association held by tangata whenua, with regard to the matters set out in Policy TW-P6.	As assessed throughout this report, the location, scale, character, infrastructure capacity, and hazard mitigation for this subdivision have been confirmed as appropriate. The application actively supports Tangata Whenua (Hauhungaroa 1C Incorporation) in managing their ancestral lands.

In summary, the proposal achieves general conformity with the strategic intent of the PDP. While there is technical tension with policies regarding minimum lot sizes and rural lifestyle subdivisions (SUB-P8), the unique, site-specific necessity to resolve the 1922 road stopping error, formalise a physical road severance, and cure an existing dwelling encroachment overrides these generic rules.

Ultimately, the PDP has not yet progressed far enough through the Schedule 1 process to carry overriding weight compared to the ODP, under which the application comfortably aligns.

Section 104D – 'Gateway Test'

When dealing with non-complying activities, before granting an application Council must be satisfied that either the adverse effects of the activity on the environment will be minor (s104D(1)(a)), or the proposed activity will not be contrary to the objectives and policies of a proposed plan and/or plan (s104D(1)(b)).

This consideration for non-complying activities is commonly known as the 'threshold test' or the 'gateway test '. If either of the limbs of the test can be passed, then the application is eligible for approval, but the proposed activity must still be considered under s104. There is no primacy given to either of the two limbs, so if one limb can be passed then the 'test ' can be considered to be passed.

In this instance it has been demonstrated that both the effects of the proposal are less than minor and that there is positive consistency with all objective and policies of relevance to the proposal. Therefore, FNDC in this instance has both 'limbs' to appropriately decide in favour of this application.

8. PART II – RMA

Purpose

The proposal can promote the sustainable management of natural and physical resources on site, as the owners of the land are able to provide for their social and cultural wellbeing.

For the various reasons outlined above, the proposal is considered to meet the purpose of the RMA.

Matters of National Importance

In achieving the purpose of the RMA, a range of matters are required to be recognized and provided for. This includes:

a) the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:

b) the protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development:

c) the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:

d) the maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers:

e) the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga:

f) the protection of historic heritage from inappropriate subdivision, use, and development:

g) the protection of protected customary rights:

h) the management of significant risks from natural hazards.

In context, the relevant items to the proposal and have been recognised and provided for.

Other Matters

In achieving the purpose of the RMA, a range of matters are to be given particular regard. This includes:

(a) kaitiakitanga:

(aa) the ethic of stewardship:

(b) the efficient use and development of natural and physical resources:

(ba) the efficiency of the end use of energy:

(c) the maintenance and enhancement of amenity values:

(d) intrinsic values of ecosystems:

(e) [Repealed]

(f) maintenance and enhancement of the quality of the environment:

(g) any finite characteristics of natural and physical resources:

(h) the protection of the habitat of trout and salmon:

(i) the effects of climate change:

(j) the benefits to be derived from the use and development of renewable energy.

These matters have been given particular regard through the design of the proposal.

Treaty of Waitangi

The applicant, Hauhungaroa 1C Incorporation, is seeking to rationalise the boundaries of their ancestral landholdings to rectify historical Crown survey errors (the 1922 road realignment) and resolve a modern physical encroachment. By resolving these title defects and securing legal access to the eastern severance, the application enables Tangata Whenua to exercise tino rangatiratanga (self-determination) and practical control over their resources.

9. Conclusion

This subdivision is a necessary mechanism to correct historic survey errors and modern-day encroachments.

Supported by civil and site suitability engineering, the proposal ensures that the resulting lots are adequately serviced, legally accessed, and fit for purpose.

The actual and potential adverse effects are less than minor, and the proposal aligns with the strategic intent of the ODP.

We respectfully request that this application be processed on a non-notified basis and consent granted subject to standard conditions.

Please do not hesitate to contact me should you require any additional information.

Steven Sanson
Consultant Planner

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 **NA93D/623**

Land Registration District **North Auckland**

Date Issued 06 May 1994

Prior References
NA669/91

Estate Fee Simple

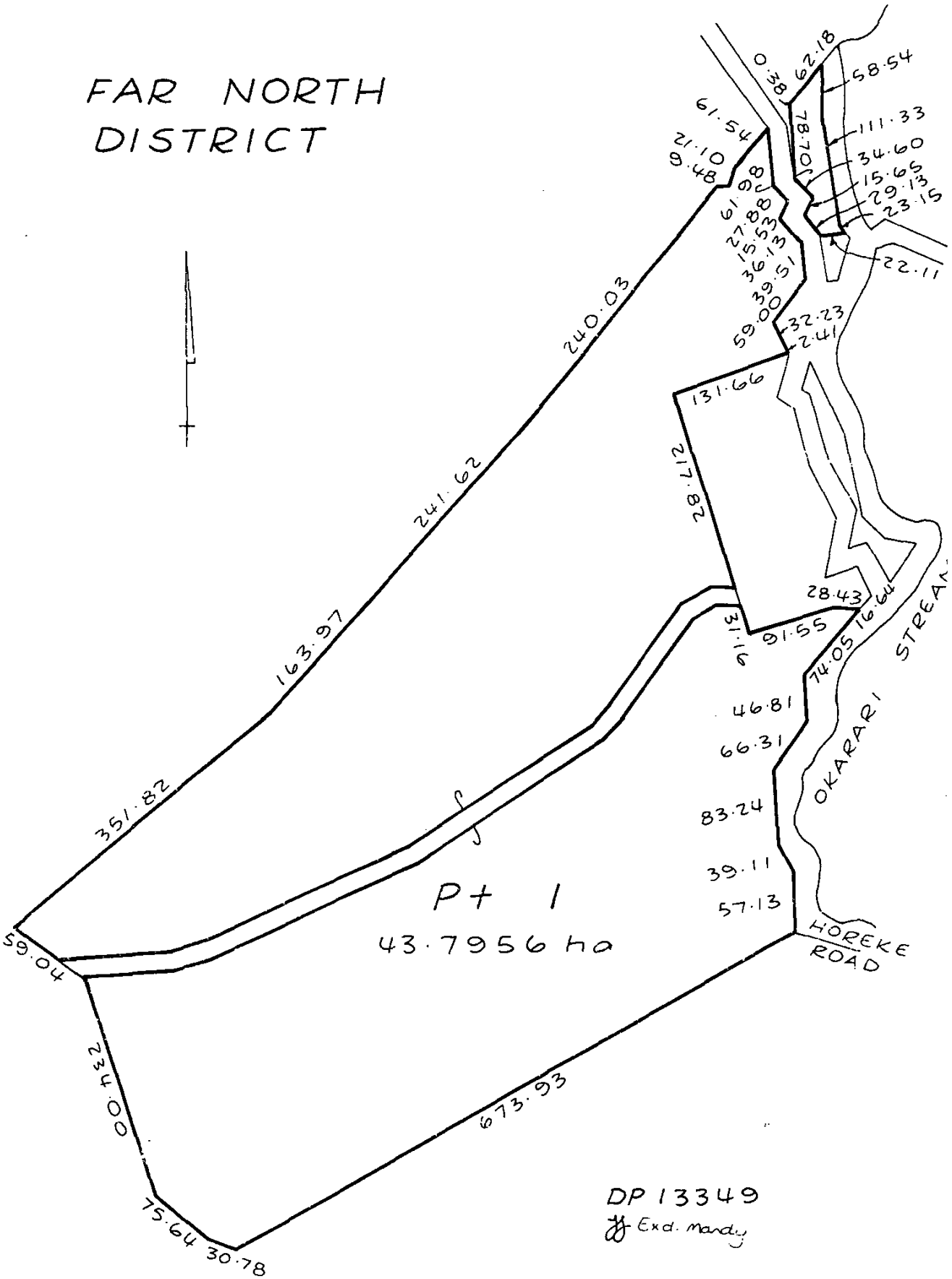
Area 43.7956 hectares more or less

Legal Description Part Lot 1 Deposited Plan 13349

Registered Owners
The Proprietors of Hauhungaroa 1C Incorporation

Interests

9258782.1 Notice pursuant to Section 195(2) Climate Change Response Act 2002 - 7.12.2012 at 3:12 pm


FAR NORTH
DISTRICT
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31.19
74.05
STREAM
46.81
66.31
OKARARI
351.82
83.24
39.11
57.13
Pt 1
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HOREKE
ROAD
59.04
40.32
673.93
75.64
30.78
DP 13349
Exd. Mandy

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

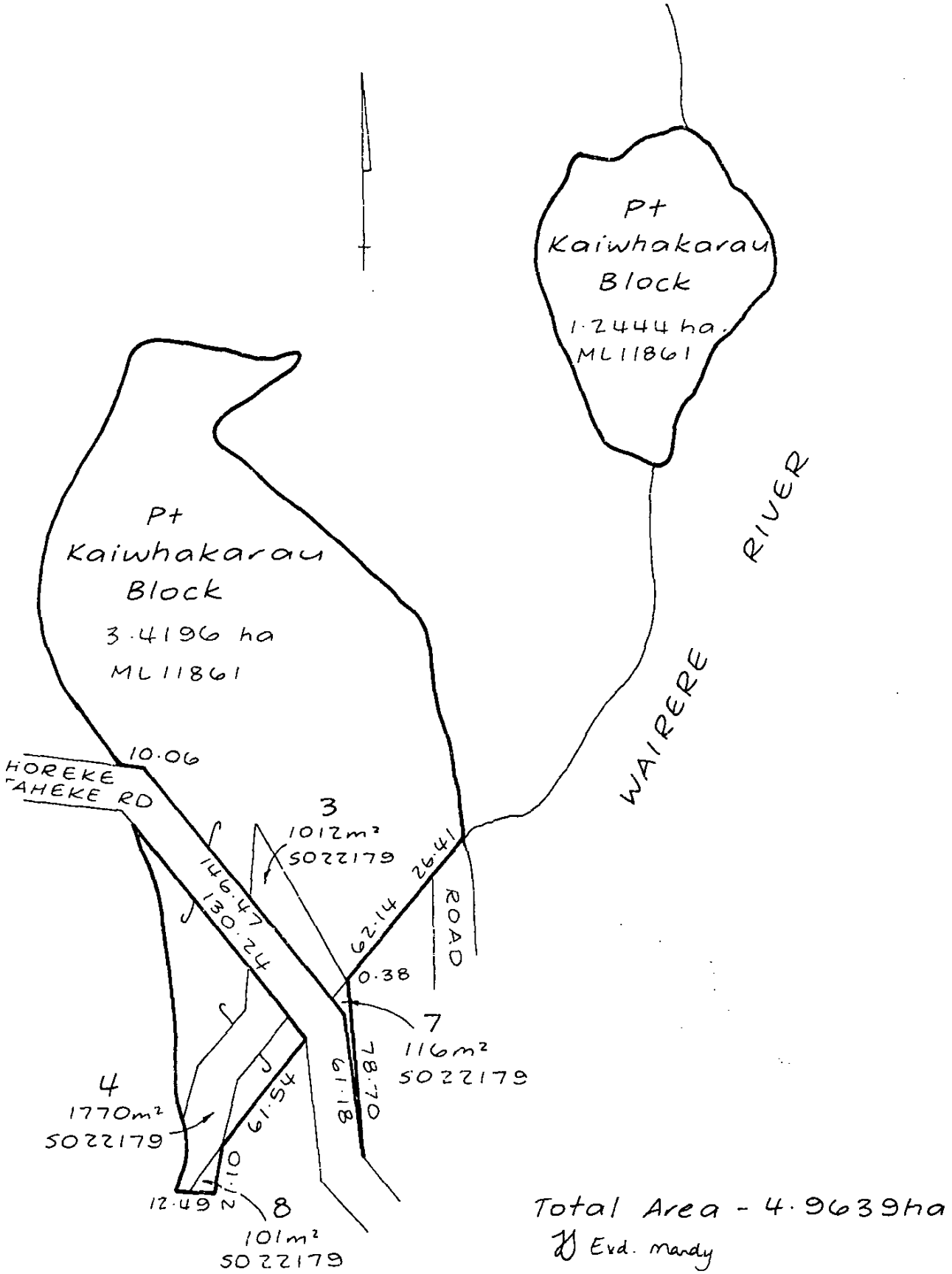
Identifier	**NA93D/624**
Land Registration District	**North Auckland**
Date Issued	06 May 1994

Prior References
NA694/22

Estate	Fee Simple
Area	4.9639 hectares more or less
Legal Description	Section 3-4 and Section 7-8 Block XI Mangamuka Survey District and Part Kaiwhakarau Block

Registered Owners
Patrick Howard Castle and Colin William Girven

Interests


Pt
Kaiwhakarau
Block
1·2444 ha.
ML 11861
RIVER
Pt
Kaiwhakarau
Block
3·4196 ha
ML 11861
WAIRERE
10.06
HOREKE
TAHEKE RD
3
1012m²
SO22179
146.47
130.24
62.14
26.41
ROAD
0.38
7
116m²
SO22179
78.70
61.18
4
1770m²
SO22179
61.54
21.10
12.49
8
101m²
SO22179
Total Area - 4·9639ha
Y Evd. Mandy

Proposed Amalgamation Conditions

That Lots 1 & 2 hereon, Sections 3 & 4 Blk XI Mangamuka S.D. and Pt Kaiwhakarau Block be held in the one Record of Title.

That Lots 4 & 5 hereon be held in the one Record of Title.

Note – Areas and measurements, including individual areas for Lots 4 & 5, are subject to final survey.

Pt Kaiwhakarau

Lot 1

Lot 2

Lot 3

(See Diagram)

McDONNELL ROAD

Pt Wairere 2E

Lot 2 D.P. 13349

Lot 4

Wairere 3

(43.24 ha.)

Pine

Lot 5

UNSURVEYED ROAD Not formed

Plantation

HOREKE ROAD

Pt Wairere 2F5A

Plantation

Pine

Pt. Motukiore C

Plan
Scale 1:6000 (A3)

Pt Kaiwhakarau

Sec. 3

Unauthorised building

R.T. NA 93D/624

Horeke

Metalled driveway #2433

Lot 1
190 m²

Lot 2
35 m²

Possible house site

Pond

Sec 7

Sec 4

Lot 3
5530 m²

ROAD Not formed

Tidal land

Sec 8

Pt. Wairere 2E

Pine

Lot 4

Plantation

HOREKE Formation metalled ROAD

Pt Lot 1 D.P. 13349

McDONNELL ROAD Metalled formation

Bridge

Tahoke

Diagram
Scale 1:1000 (A3)

N

Pt Lot 1 D.P. 13349 R.T. NA 93D/623 43.7956 ha
Secs 7 & 8 Pt R.T. NA 93D/624 217 m²
Total Area 43.8173 ha.

Nigel Ross Surveyor
Licensed Cadastral Surveyor
P.O. Box 293, Kaikohe 0440
Ph./fax 09 4010915 Mob. 027 2942543

Proposed Subdivision of Pt Lot 1 D.P. 13349 and Secs 7 & 8 Blk XI Mangamuka S.D.

(Approx. 2435/2436) Horeke Road

Prepared for: The Proprietors of Hauhungaro 1C Incorporation		Sheet 1
Drawn: NHRR	Scale: As shown	Series of 1
Checked:	Date October 2025	File NRS 359

Wilton Joubert Limited
09 527 0196
498 Hibiscus Coast Highway,
Orewa, Auckland, 0931

SITE	**Horeke Road, Horeke**
LEGAL DESCRIPTION	**Part Lot 1 DP 13349**
PROJECT	**Proposed Subdivision (Lot 3 for Assessment)**
CLIENT	**Hauhungaroa 1C Corporation**
REFERENCE NO.	**146504**
DOCUMENT	**Civil Site Suitability Report**
STATUS/REVISION NO.	**01– Resource Consent**
DATE OF ISSUE	**15 May 2026**

Report Prepared For	Email
Hauhungaroa 1C Corporation	te.mahau@xtra.co.nz

Authored by	**G.M. Brant** *(Be (Hons) Civil)*	Civil Engineer	gustavo@wjl.co.nz	
Reviewed & Approved by	**B. Steenkamp** *(CPEng, BEng Civil, CMEngNZ, BSc (Geology))*	Senior Civil Engineer	bens@wjl.co.nz	

1 EXECUTIVE SUMMARY

The following table is intended to be a concise summary which must be read in conjunction with the relevant report sections as referenced herein.

Legal Description:	Part Lot 1 DP 13349
Scope:	Civil Site Suitability Investigation: - Potable Water Recommendations (Lot 3) - Wastewater Assessment (Lot 3) - Stormwater Assessment (Lot 3) - Access Recommendations (Lot 3)
Development Proposals Supplied:	Subdivision Scheme Plan supplied by Nigel Ross Surveyor (Ref No: NRS 359, dated: October 2025)
District Plan Zone:	Rural Production Zone
Wastewater:	The following is an indicative PCDI wastewater design for a 4-bedroom dwelling – given the subsoils encountered we recommend Secondary Level Treatment or higher: Daily Wastewater Production: 1,080L/day Daily Application Rate: 2.8mm/day Disposal Area: 386m² Reserve Area: 116m² (30%) Recommendations for wastewater are provided in Section 6.
Stormwater Management – District Plan Rules:	Permitted Activity: 8.6.5.1.3 STORMWATER MANAGEMENT – The maximum proportion of the gross site area covered by buildings and other impermeable surfaces shall be 15%. Controlled Activity: 8.6.5.2.1 STORMWATER MANAGEMENT – The maximum proportion of the gross site area covered by buildings and other impermeable surfaces shall be 20%.
Stormwater Management:	To comply with the parameters of the Permitted Activity Rule (8.6.5.1.3), Lot 3 must not exceed an impermeable area of 829.5m². It is therefore expected that future development of Lot 3 will fall within the Permitted / Controlled Activity range. While the provision of attenuation for the impermeable areas exceeding the Permitted Activity threshold would normally apply for a development exceeding the Permitted Activity threshold, we do not believe that the attenuation of runoff resulting from future proposed impermeable areas on-site is appropriate due to the site's proximity to a coastal environment subject to tidal fluctuations and the site's position in the larger catchment. Stormwater mitigation / attenuation recommendations are provided in Section 7.

Access:

It is understood that Lot 3 will be serviced by an existing access point from Horeke Road. The existing vehicle crossing has been assessed in accordance with the Far North District Council Engineering Standards (2023).

The existing access point to service Lot 3 does not comply with FNDC's sight distance requirements and must therefore be reviewed by Council.

Access recommendations provided in Section 8.

2 SCOPE OF WORK

Wilton Joubert Ltd (WJL) was engaged by the client to undertake a civil site suitability assessment (potable water, wastewater, stormwater and access) of the above site, where we understand, it is proposed to subdivide the existing property into five individual allotments. Some amalgamation of land will also be undertaken and involve neighbouring Sections 7 & 8 Block XI Mangamuka SD that bound the northern end of the site.

Proposed Lots 1 & 2 are proposed to be amalgamated with neighbouring lots and are therefore excluded from this assessment.

Proposed Lots 4 & 5 are large balance lots with no development proposed at this stage and are therefore also excluded from this assessment.

Given the above, proposed Lot 3 is the focus of this assessment.

A Geotechnical Suitability Report (WJL Ref. 146503) has been completed for the proposed subdivision which should be read in conjunction with this report.

This report is intended only to support the Resource/Subdivision Consent application and does not replace the requirement for detailed engineering design and site-specific investigations at the Building Consent stage.

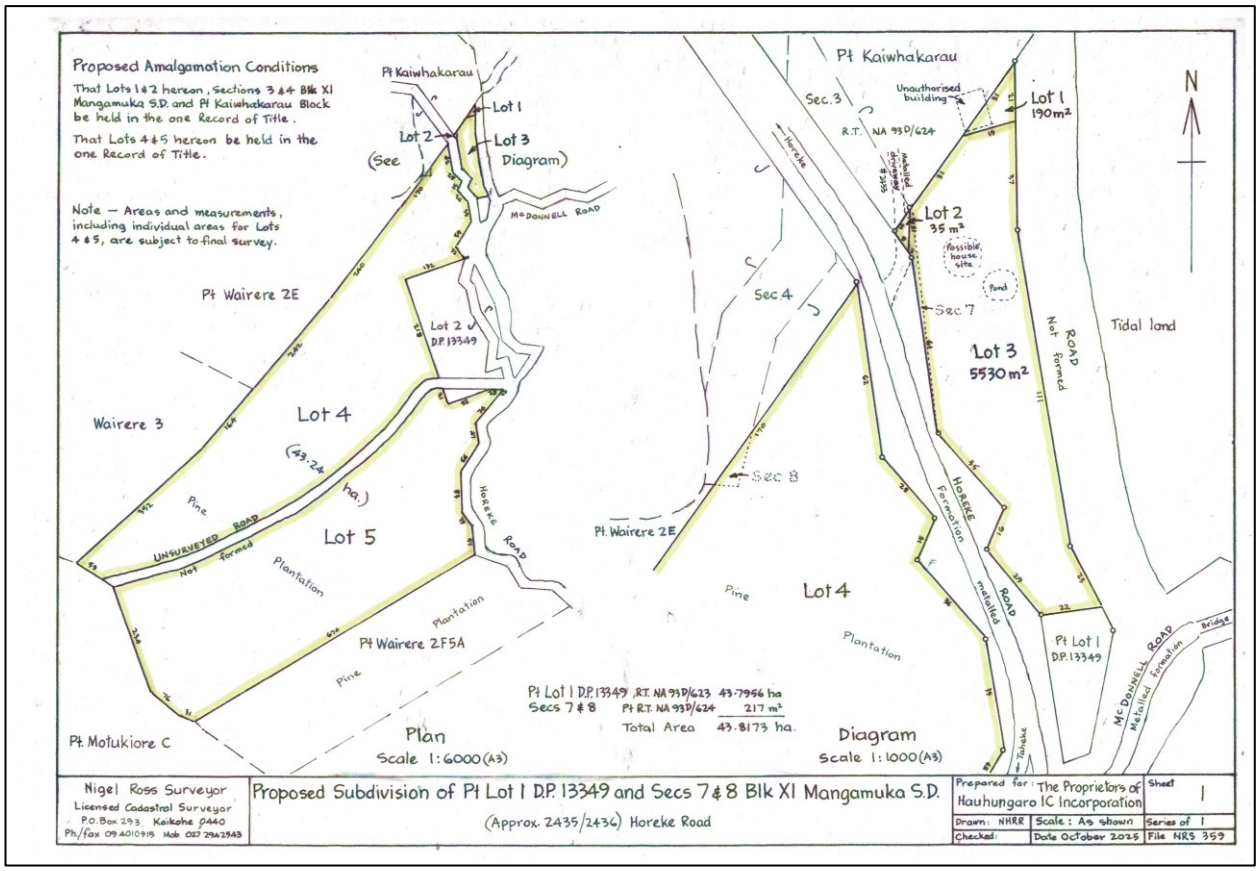


Figure 1: Snip of scheme plan prepared by Nigel Ross Surveyor (Ref No: NRS 359, dated: October 2025)

3 SITE DESCRIPTION

The proposed development will be created across the following property, which is located off the eastern side of Horeke Road, accessed 2km south of the Motukiore Road intersection.

The parent lot is legally described as Part Lot 1 DP 13349, Horeke Road, Horeke.

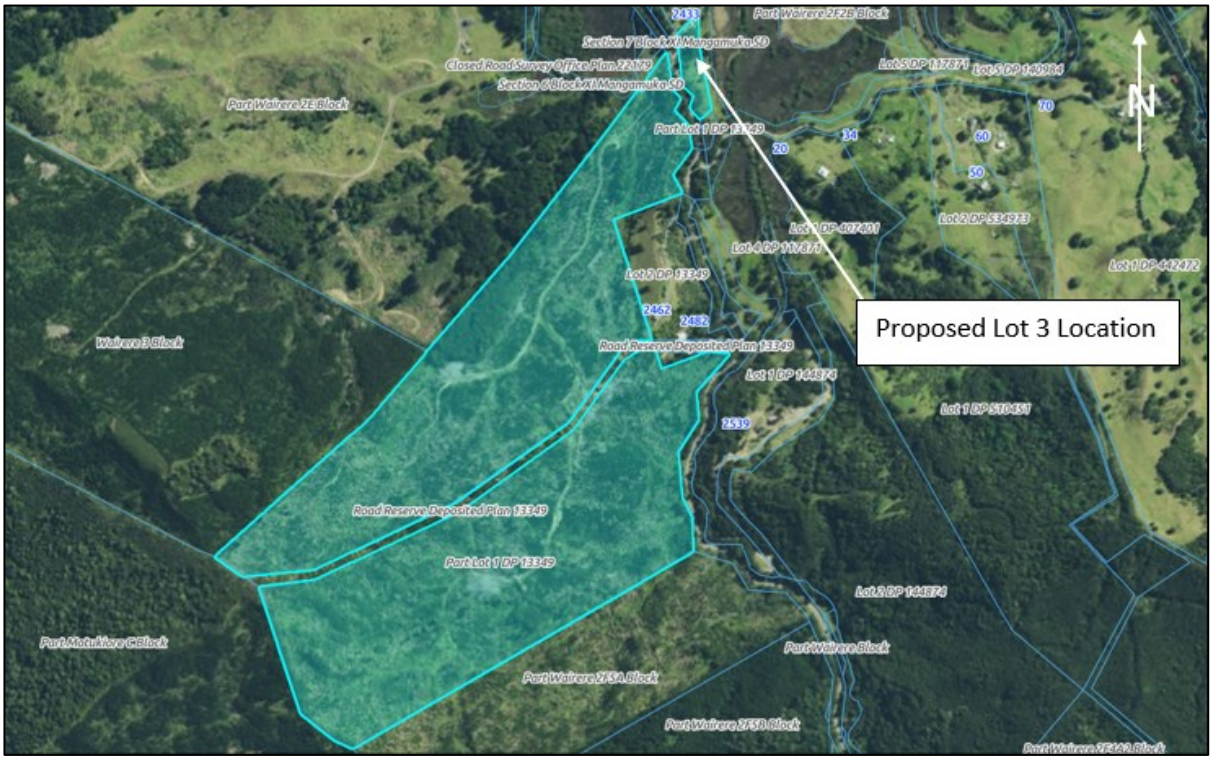


Figure 2: Aerial view with the subject property (parent lot) highlighted in cyan (from Far North District Council online GIS database)

The surface area of the subject site is approximately 48.3ha and largely covers forestry land off the western side of Horeke Road. The site is split at the northern corner by Horeke Road, with a small portion of the site covering an area of land off the eastern side of Horeke Road.

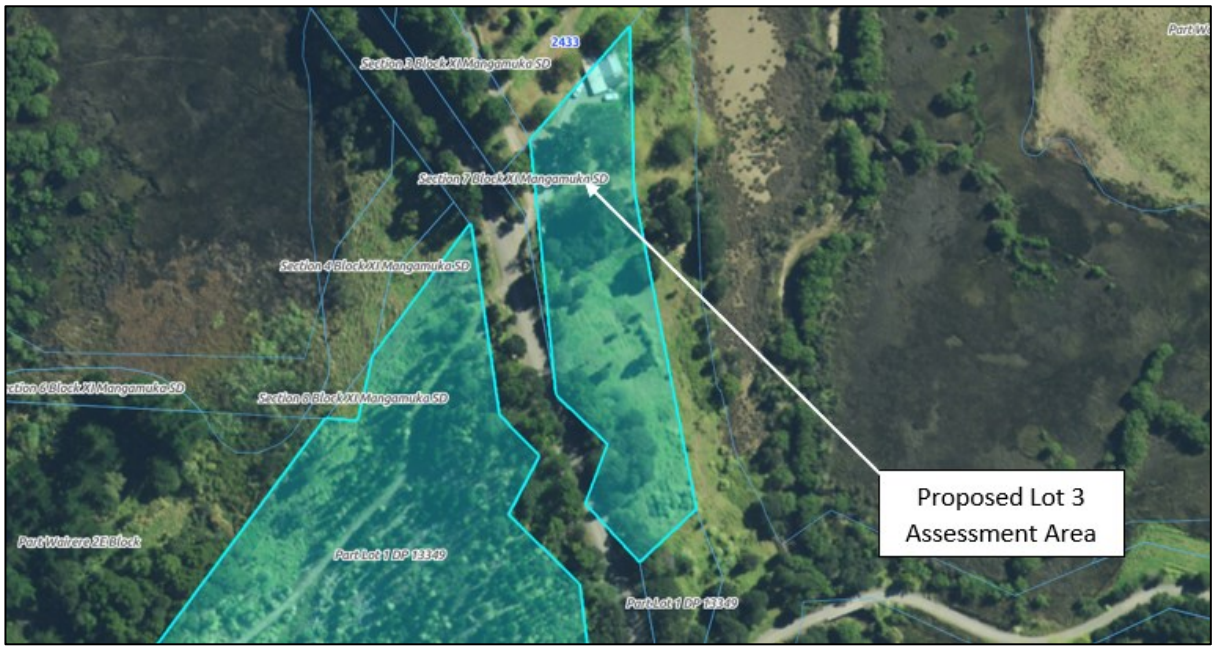


Figure 3: Aerial view with the subject property (parent lot) highlighted in cyan (from Far North District Council online GIS database)

The eastern portion of land is accessed via an aggregate driveway that traverses along the northern boundary. An existing dwelling is located near the northeastern corner and will be subject to a boundary adjustment during the creation of proposed Lot 1, resulting in the site being vacant of structures. The area is covered in pasture, with pockets of bush present at the northern and southwestern ends. A small pond is located at the base of the northern bush area.

Topographically speaking, the western portion of land is covered by an east facing, moderate to very steep sloping side flank that descends from Horeke Road. Crest land is present near the northwestern and middle of the western boundary. Inclinations reduce to gentle grades along the eastern boundary, ultimately sloping towards the Wairere River tidal environment approximately 20m downslope.

The Far North District Council (FNDC) on-line GIS Water Services Map indicates that public underground service connections are not available to the property.

4 PUBLISHED GEOLOGY

Reference to the New Zealand Geology Web Map hosted by GNS Science indicates that the site is dissected by a geological boundary that trends slightly northwest to southeast.

The surrounding influential western land is underlain by deposits of the **Punakitere Sandstone (Mangakahia Complex) in Northland Allochthon**. These deposits are approximately 95 to 75 million years in age and described as; "*Weakly to moderately indurated, alternating thin-to-thick-bedded, quartzofeldspathic sandstone and metasandstone.*".

The wider surrounding (low-lying) eastern land is underlain by deposits of **Pakihi Supergroup**, specifically being **Late Pleistocene to Holocene Estuary, River and Swamp Deposits**. These deposits are up to approximately 71 thousand years in age and described as; "*Unconsolidated to poorly consolidated sand, peat, mud and shell deposits (estuarine, lacustrine, swamp, alluvial and colluvial.*". Refer to GNS Science Website.

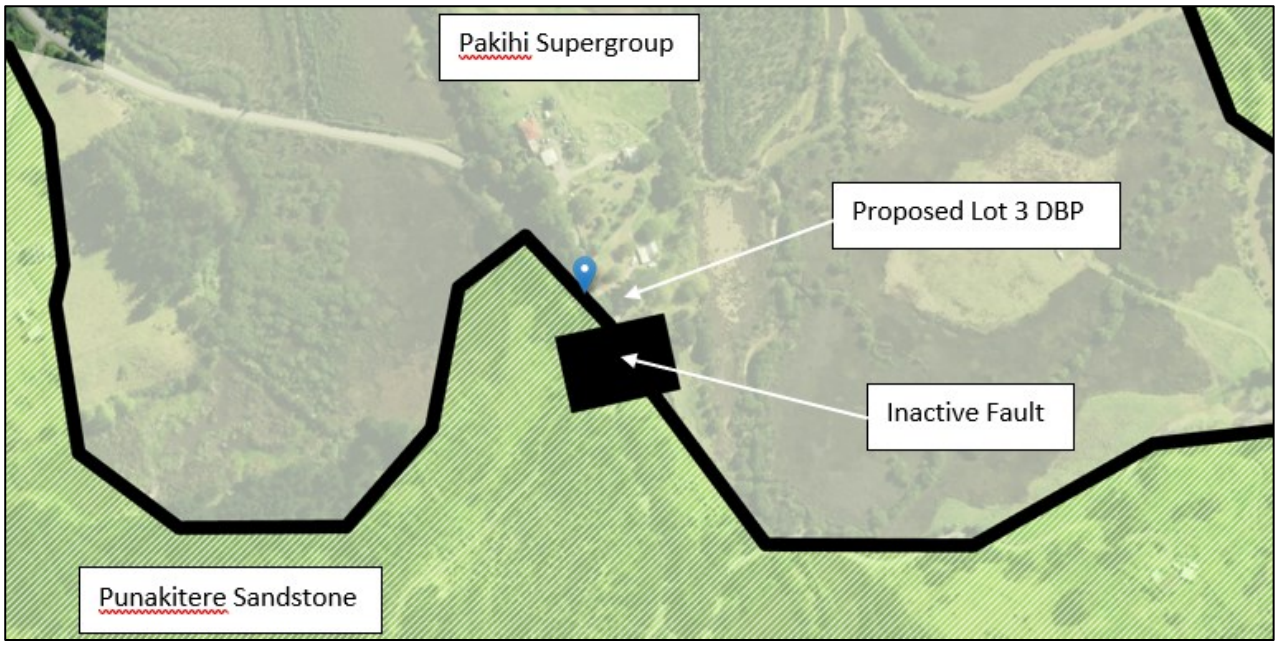


Figure 4: Screenshot aerial view from the New Zealand Geology Web Map

In addition to the above, hand auger testing was conducted by WJL within the subject site.

The subsoils encountered during WJL's fieldwork consisted predominantly of Clayey SILT, Silty CLAY and SILT. Approximately 100mm-200mm of TOPSOIL was overlying the investigated area. Groundwater was not observed to a tested depth of 2.9m below natural ground level. Refer to the appended 'BH Logs'.

Given the above, the site's subsoils have been classified as **Category 4** in accordance with AS/NZS 1547:2012.

5 POTABLE WATER SUPPLY

It is recommended that potable water be provided for by rainwater tanks in accordance with the Countryside Living Toolbox requirements. It is recommended to provide at least 2 x 25,000L tanks for potable water usage per lot / new dwelling. Final potable water storage, firefighting water supply requirements, tank configuration and treatment/filtration shall be confirmed at Building Consent stage by others.

6 WASTEWATER

No existing wastewater management system is present within proposed Lot 3. As such, a new site-specific design in accordance with the ASNZS: 1547 will be required by FNDC for any future development within the proposed lot.

6.1 DESIGN PARAMETERS

The following table is intended to be a concise summary of the design parameters, which must be read in conjunction with the relevant report sections as referenced herein.

The below wastewater design has been completed to show feasibility of on-site wastewater management within the proposed Lot 3. As no development proposals are available at this stage for the eventual residential development within the lot, our recommendations have been based on a moderate size dwelling containing 4 bedrooms.

Given the subsoils encountered during WJL's fieldwork investigation, we recommend secondary level treatment or higher for any new wastewater system within Lot 3.

Although dripper irrigation is recommended and shown below, alternative trench or bed setup with secondary level treatment may also be acceptable subject to specific design.

6.1.1 Summary of Preliminary Design Parameters for a PCDI Secondary Treatment System

Development Type:	Residential Dwellings
Effluent Treatment Level:	Secondary (<BOD5 20 mg/L, TSS 30 mg/L)
Fill Encountered in Disposal Areas:	Not encountered
Water Source:	Rainwater Collection Tanks
Site Soil Category (AS/NZS 1547:2012):	Category 4 – Clayey SILT / Silty CLAY / SILT – Moderate Drainage
Estimate House AS/NZS 1547:2012 Occupancy:	6 Persons
Loading Rate:	2.8mm/day – 20% reduction rate applied in accordance with AS/NZS 1547:2012 due to sloped topography. All future designs must consider the appropriate reduction rate based on the final field location.
Estimated Total Daily Wastewater Production:	1,080L/day
Typical Wastewater Design Flow Per Person:	Rainwater Supply: 180L/pp/day (water reduction fixtures may be utilised to lower the design flow)
Application Method:	Surface / Subsurface Laid PCDI Lines

Loading Method:	Dosed
Emergency Storage:	24 hours
Estimated Min. Disposal Area Requirement:	386m²
Required Min. Reserve Area:	116m² (30%)
Buffer Zone:	Anticipated to be required
Cut-off Drain:	Not anticipated based on current information, subject to confirmation at detailed design stage

6.2 REQUIRED SETBACK DISTANCES

The disposal and reserve areas must be situated outside the relevant exclusion areas and setbacks described within Table 9 of the PRPN: Exclusion areas and setback distances for on-site domestic wastewater systems:

Table 9 of the PRPN (Proposed Regional Plan for Northland)			
Feature	Primary treated domestic wastewater	Secondary treated domestic wastewater	Greywater
Exclusion areas			
Floodplain	5% AEP	5% AEP	5% AEP
Horizontal setback distances			
Identified stormwater flow paths (downslope of disposal area)	5 meters	5 meters	5 meters
River, lake, stream, pond, dam or wetland	20 meters	15 meters	15 meters
Coastal marine area	20 meters	15 meters	15 meters
Existing water supply bore	20 meters	20 meters	20 meters
Property boundary	1.5 meters	1.5 meters	1.5 meters
Vertical setback distances			
Winter groundwater table	1.2 meters	0.6 meters	0.6 meters

6.3 NORTHLAND REGIONAL PLAN ASSESSMENT

Any future wastewater disposal system should meet the compliance points below, stipulated within Section C.6.1.3 of the Proposed Regional Plan for Northland:

C.6.1.3 Other on-site treated domestic wastewater discharge– permitted activity
The discharge of domestic type wastewater into or onto land from an on-site system and the associated discharge of odour into air from the on-site system are permitted activities, provided:

#	Rule
1	The on-site system is designed and constructed in accordance with the Australian/New Zealand Standard. On-site Domestic Wastewater Management (AS/NZS 1547:2012), and
2	The volume of wastewater discharged does not exceed two cubic metres per day, and
3	The discharge is not via a spray irrigation system or deep soakage system, and
4	The slope of the disposal area is not greater than 25 degrees, and
5	The wastewater has received secondary or tertiary treatment and is discharged via a trench or bed in soil categories 3 to 5 that is designed in accordance with Appendix L of Australian/New Zealand Standard. On-site Domestic Wastewater Management (AS/NZS 1547:2012); or is via an irrigation line system that is:
	a) dose loaded, and
	b) covered by a minimum of 50 millimetres of topsoil, mulch, or bark, and
6	For the discharge of wastewater onto the surface of slopes greater than 10 degrees:
	a) the wastewater, excluding greywater, has received at least secondary treatment, and
	b) the irrigation lines are firmly attached to the disposal area, and
	c) where there is an up-slope catchment that generates stormwater runoff, a diversion system is installed and maintained to divert surface water runoff from the up-slope catchment away from the disposal area, and
	d) a minimum 10 metre buffer area down-slope of the lowest irrigation line is included as part of the disposal area, and
	e) the disposal area is located within existing established vegetation that has at least 80 percent canopy cover, or
	f) the irrigation lines are covered by a minimum of 100 millimetres of topsoil, mulch, or bark, and
7	the disposal area and reserve disposal area are situated outside the relevant exclusion areas and setbacks in Table 9: Exclusion areas and setback distances for on-site domestic wastewater systems, and
8	for septic tank treatment systems, a filter that retains solids greater than 3.5 millimetres in size is fitted on the outlet, and
9	the following reserve disposal areas are available at all times:
	a) 100 percent of the existing effluent disposal area where the wastewater has received primary treatment or is only comprised of greywater, or
	b) 30 percent of the existing effluent disposal area where the wastewater has received secondary treatment or tertiary treatment, and
10	the on-site system is maintained so that it operates effectively at all times and maintenance is undertaken in accordance with the manufacturer's specifications, and
11	the discharge does not contaminate any groundwater water supply or surface water, and
12	there is no surface runoff or ponding of wastewater, and

13	there is no offensive or objectionable odour beyond the property boundary.

We envision that there will be no issue meeting the Permitted Activity Status requirements outlined above.

Based on current observations, topography, and the subsoil conditions encountered during the investigation, Lot 3 appears to contain sufficient undeveloped natural ground to accommodate both primary and reserve wastewater disposal areas in accordance with AS/NZS 1547:2012. Final system sizing, configuration, and positioning will be confirmed through site-specific design and localized soil testing at the Building Consent stage.

7 STORMWATER MANAGEMENT

7.1 ASSESSMENT CRITERIA

The stormwater assessment has been completed in accordance with the recommendations and requirements contained within the Far North District Engineering Standards and the Far North District Council District Plan.

As below, the site resides in a Rural Production Zone.

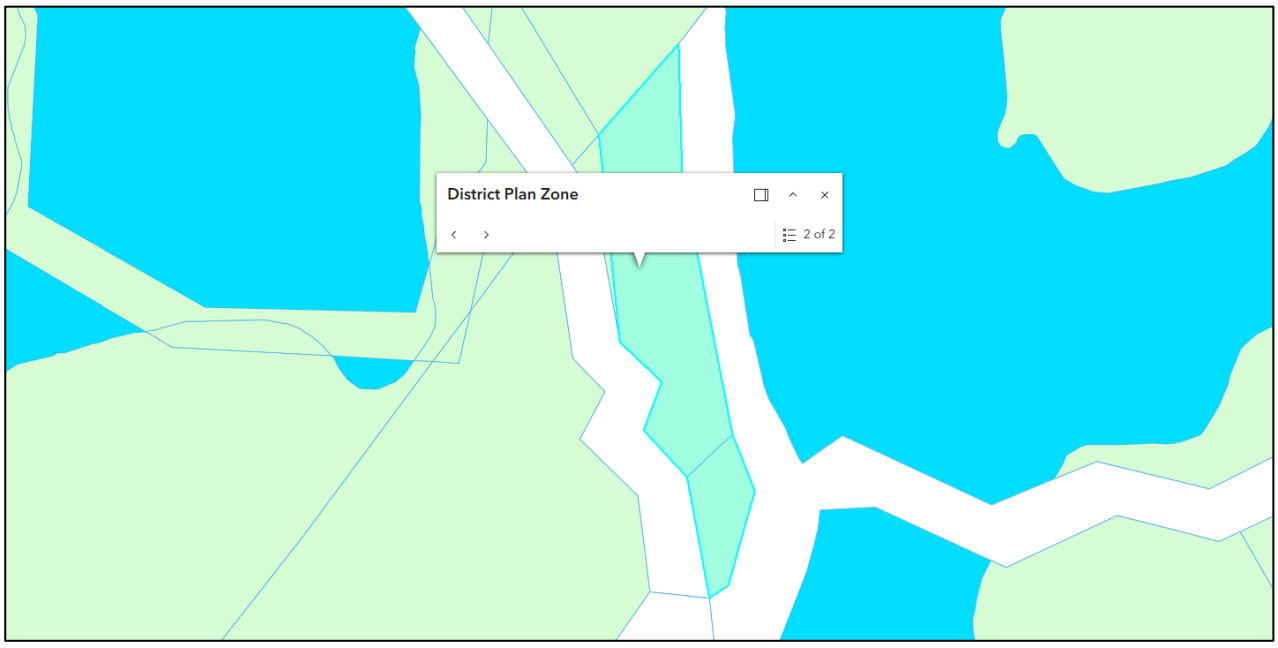


Figure 5: Snip of FNDC Maps showing site in Rural Production Zone

The following Stormwater Management Rules Apply:

Permitted Activity: 8.6.5.1.3 STORMWATER MANAGEMENT – The maximum proportion of the gross site area covered by buildings and other impermeable surfaces shall be 15%.

Controlled Activity: 8.6.5.2.1 STORMWATER MANAGEMENT – The maximum proportion of the gross site area covered by buildings and other impermeable surfaces shall be 20%.

To comply with the parameters of the Permitted Activity Rule (8.6.5.1.3), Lot 3 must not exceed an impermeable area of 829.5m². It is therefore expected that future development of Lot 3 should fall within the Permitted / Controlled Activity range.

The subject site is located immediately adjacent to the downstream end of the Wairere River which has been identified as being subject to coastal inundation (as mapped by the Northland Regional Council Natural Hazards Map). As such, the property is located in the downstream extent of the contributing catchment,

where receiving water levels are predominantly controlled by tidal influences rather than upstream runoff processes.

Any reduction or delay in peak flows achieved through on-site attenuation would have a negligible effect on downstream conditions, as discharge enters a tidally influenced receiving environment with substantial storage and conveyance capacity.

Furthermore, introducing attenuation in this location has the potential to alter the timing of runoff discharge relative to the wider catchment response. In a fully developed catchment, this could result in peak flows from the site coinciding with peak flows from upstream areas, thereby reducing any marginal benefit of attenuation and potentially contributing to localised increases in water levels.

While the provision of attenuation for the impermeable areas exceeding the Permitted Activity threshold would normally apply for a development exceeding the Permitted Activity threshold, we do not believe that the attenuation of runoff resulting from future proposed impermeable areas on-site is appropriate due to the factors above.

To appropriately mitigate stormwater runoff from the existing and future proposed impermeable areas, we recommend utilising Low Impact Design Methods as a means of stormwater management. Design guidance should be taken from 'The Countryside Living Toolbox' design document, and where necessary, 'Technical Publication 10, Stormwater Management Devices – Design Guidelines Manual' Auckland Regional Council (2003).

Stormwater management recommendations are provided below.

7.2 PRIMARY STORMWATER

7.2.1 Stormwater Runoff from Roof Areas

Stormwater runoff from the roof of any future buildings must be captured by a gutter system and conveyed to potable water tank(s) on the corresponding lot.

Discharge and overflow from the rainwater tanks should be directed to a discharge point as specified below via sealed pipes.

7.2.2 Stormwater Runoff from Hardstand Areas

Where driveways are formed perpendicular to the slope of the topography, the driveway may shed runoff to lower-lying grassed areas via even sheet flow, well clear of any structures. Runoff passed through grassed areas will be naturally filtered of entrained pollutants and will act to mitigate runoff by way of ground recharge and evapotranspiration.

Where even sheet flow is not practicable, concentrated flows must be managed with swales to prevent erosion/scouring. These should be sized to manage and provide capacity for secondary flows and mitigate flow velocity where appropriate. Swales are to direct runoff to silt traps with suitably sized grate / scruffy dome inlets, from which runoff may be piped to the discharge point.

Alternatively, if sealed, driveways may be formed to shed runoff to catchpits installed per E1 of the NZ Building Code. Runoff collected via catchpits is to be directed to an outlet as specified below via sealed pipes.

Due to water quality concerns, runoff resulting from hardstand areas should not be allowed to drain to any potable water tanks.

7.2.3 Stormwater Runoff Discharge Point

Discharge and overflow from future potable water tank(s) and any hardstand catchpits / silt traps should be directed an appropriately sized dispersal device within the respective lot, unless discharge is directed to an open channel, where an appropriate riprap outlet is required for erosion protection. The dispersal device or discharge point should be positioned on/in stable ground downslope of any buildings and wastewater disposal, with setbacks as per the relevant standards.

Stormwater runoff from the proposed development shall be conveyed via a piped system to discharge at the toe of the ridge, where gradients flatten and flows can be safely dispersed without causing erosion or instability.

In consideration of the highly expansive (Class H) soils identified in the Geotechnical Report, all stormwater conveyance systems traversing steeper slopes shall be designed to accommodate potential ground movement. Pipework should be installed at or near the ground surface, securely anchored, and aligned to follow the natural slope (i.e. non-linear / "snaking" alignment) to provide flexibility. Rigid, straight-line pipe installations are not recommended, as they are susceptible to damage from soil movement and differential settlement, particularly during periods of saturation.

The final outlet / dispersal location shall be reviewed in conjunction with the geotechnical recommendations to confirm that concentrated discharge will not adversely affect slope stability, cause scour, or discharge onto / through wastewater disposal areas.

7.3 SECONDARY STORMWATER

Where required, overland flows and any concentrated runoff from higher ground should be intercepted by means of shallow surface drains or small bunds near structures to protect these from both saturation and erosion.

7.4 DISTRICT PLAN ASSESSMENT

This section has been prepared to demonstrate the likely effects of the activity on stormwater runoff and the means of mitigating runoff.

In assessing an application under this provision, the Council will exercise discretion to review the following matters below, (a) through (r). In respect of matters (a) through (r), we provide the following comments:

13.10.4 – Stormwater Disposal

(a) Whether the application complies with any regional rules relating to any water or discharge permits required under the Act, and with any resource consent issued to the District Council in relation to any urban drainage area stormwater management plan or similar plan.	No discharge permits are required. No resource consent issued documents stipulating specific requirements are known for the subject site or are anticipated to exist.
(b) Whether the application complies with the provisions of the Council's "Engineering Standards and Guidelines" (2004) - Revised March 2009 (to be used in conjunction with NZS 4404:2004).	The application is deemed compliant with the provisions of the Council's "Engineering Standards and Guidelines" (2004) - Revised March 2009
(c) Whether the application complies with the Far North District Council Strategic Plan - Drainage.	The application is deemed compliant with the Far North District Council Strategic Plan - Drainage
(d) The degree to which Low Impact Design principles have been used to reduce site impermeability and to retain natural permeable areas.	Stormwater management should be provided for the subject lot by utilising Low Impact Design Methods. Guidance for design should be taken from 'The Countryside Living Toolbox' design document, and where necessary, *"Technical Publication 10, Stormwater Management Devices – Design Guidelines Manual" Auckland Regional Council (2003).* All roof runoff will be collected by rainwater tanks for conveyance to a safe outlet point. Hardstand areas should be shaped to shed to lower-lying grassed area via even sheet flow as

	passive mitigation, or to swales/catchpits for runoff conveyance to a safe outlet location.
(e) The adequacy of the proposed means of disposing of collected stormwater from the roof of all potential or existing buildings and from all impervious surfaces.	As above. Runoff from roof areas will be collected, directed to rainwater tanks and discharged in a controlled manner to a designated outlet, reducing scour and erosion. Hardstand areas should be shaped to shed runoff to lower-lying lawn areas as passive mitigation, or to swales/catchpits for runoff conveyance to a safe outlet location.
(f) The adequacy of any proposed means for screening out litter, the capture of chemical spillages, the containment of contamination from roads and paved areas, and of siltation.	Runoff from roof areas is free of litter, chemical spillages, or contaminants from roads. Hardstand areas should be shaped to shed runoff to lower-lying lawn areas as passive mitigation, or to swales/catchpits for runoff conveyance to a safe outlet location. Large downslope pasture areas and swales act as bio-filter strips to filter out entrained pollutants and catchpits/silt traps allow for the settlement of sediment.
(g) The practicality of retaining open natural waterway systems for stormwater disposal in preference to piped or canal systems and adverse effects on existing waterways.	No alteration to waterways is proposed.
(h) Whether there is sufficient capacity available in the Council's outfall stormwater system to cater for increased run-off from the proposed allotments.	Not applicable.
(i) Where an existing outfall is not capable of accepting increased run-off, the adequacy of proposals and solutions for disposing of run-off.	Not applicable.
(j) The necessity to provide on-site retention basins to contain surface run-off where the capacity of the outfall is incapable of accepting flows, and where the outfall has limited capacity, any need to restrict the rate of discharge from the subdivision to the same rate of discharge that existed on the land before the subdivision takes place.	Not applicable.

(k) Any adverse effects of the proposed subdivision on drainage to, or from, adjoining properties and mitigation measures proposed to control any adverse effects.	Outlet locations are to be determined during detailed design and are to be located such that there are no adverse effects on adjacent properties.
(l) In accordance with sustainable management practices, the importance of disposing of stormwater by way of gravity pipe lines. However, where topography dictates that this is not possible, the adequacy of proposed pumping stations put forward as a satisfactory alternative.	Not applicable.
(m) The extent to which it is proposed to fill contrary to the natural fall of the country to obtain gravity outfall; the practicality of obtaining easements through adjoining owners' land to other outfall systems; and whether filling or pumping may constitute a satisfactory alternative.	Not applicable.
(n) For stormwater pipes and open waterway systems, the provision of appropriate easements in favour of either the registered user or in the case of the Council, easements in gross, to be shown on the survey plan for the subdivision, including private connections passing over other land protected by easements in favour of the user.	Not applicable.
(o) Where an easement is defined as a line, being the centre line of a pipe already laid, the effect of any alteration of its size and the need to create a new easement.	Not applicable.
(p) For any stormwater outfall pipeline through a reserve, the prior consent of the Council, and the need for an appropriate easement.	Not applicable.
(q) The need for and extent of any financial contributions to achieve the above matters.	Not applicable.
(r) The need for a local purpose reserve to be set aside and vested in the Council as a site for any public utility required to be provided.	Not applicable.

8 ACCESS

8.1 GENERAL

A preliminary access and vehicle crossing assessment has been undertaken for the proposed subdivision. It is understood that Lot 3 will be serviced by an existing access point from Horeke Road. The existing vehicle crossing has been assessed in accordance with the Far North District Council Engineering Standards (2023).

Figure 6: Annotated snip of scheme plan showing existing vehicle crossing location

8.2 VEHICLE CROSSINGS

Visible surface deterioration and localised damage is present at the existing vehicle crossing. It is recommended that the existing crossing be repaired and reinstated to to an appropriate standard. As part of these works, the crossing width shall be reviewed and upgraded as necessary to ensure compliance with Type 1A (light vehicle) requirements in accordance with the Far North District Council Engineering Standards (2023).

8.3 SIGHT DISTANCES

Horeke Road's speed limit is not listed within the National Speed Limit Register. Accordingly, a default rural speed limit of 100 km/hr has been adopted for the purposes of this preliminary assessment in accordance with the Land Transport (Road User) Rule and standard New Zealand rural road speed limit provisions. As such, the Far North District Council Engineering Standards (2023) – Sheet 4 notes that the minimum required sight distances for the vehicle crossings is 210m.

While the available sight distances for the existing vehicle crossing do not comply with the Far North District Council Engineering Standards, the existing access arrangement has been developed to provide the safest practicable outcome within the physical constraints of the site and surrounding road geometry. Potential mitigation measures include upgrading the crossing to the applicable engineering standard, removing or trimming any localised visibility obstructions where permitted, and maintaining low roadside batters and open entrance treatments. In addition, the proposal is for a low-density rural-residential subdivision, such that traffic generation is expected to be relatively low. It is also noted that the adopted 100 km/hr design speed is considered conservative, as vehicle operating speeds along Horeke Road are expected to be lower in practice due to the rural gravel road environment, alignment and road surface condition. These matters should be considered by Council in its review of the existing vehicle crossing.

Figure 7: Annotated site photo from vehicle crossing show available sight distance to the north

Figure 8: Annotated site photo from vehicle crossing show available sight distance to the south

9 LIMITATIONS

This report has been prepared for the benefit of the Client for the purpose of supporting a Resource/Subdivision Consent application for the project described herein and within the agreed scope of engagement. The report may be submitted to the relevant Territorial Authority for that purpose.

The Territorial Authority may rely on this report for the purposes of assessing the Resource Consent application, subject to the scope, assumptions, and limitations described herein. Any material changes to the development proposal, site conditions, or design assumptions from those described in this report should be referred to Wilton Joubert Limited for review.

This report remains the intellectual property of Wilton Joubert Limited. No responsibility or liability is accepted for the use of this report by any third party, or for any purpose other than that for which it was prepared, unless expressly agreed in writing. Any party choosing to rely on this report does so at their own risk.

While this report may be used in support of regulatory approvals, it does not remove the requirement for detailed, site-specific investigations, assessments, or inspections that may be required at subsequent design or Building Consent stages, in accordance with standard engineering practice.

The conclusions and recommendations in this report are based on information available at the time of preparation and are dependent on appropriate implementation during construction. Variations in site conditions or construction practices may affect performance and should be reviewed by a suitably qualified and experienced engineer if encountered.

Yours faithfully,

WILTON JOUBERT LIMITED

Enclosures:

- Site Plan – C001 (1 sheet)
- Hand Auger Borehole Records (3 sheets)

NOTES:

1. SITE PLAN IS ONLY INDICATIVE FOR CONCEPT DESIGN. NO MEASUREMENTS MAY BE TAKEN FROM DRAWING.
2. ALL DIMENSIONS TO BE CHECKED ON SITE PRIOR TO CONSTRUCTION.
3. CONTOURS & LOCAL SERVICES ARE SHOWN INDICATIVELY ONLY.

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ISSUE / REVISION

No.	DATE	BY	DESCRIPTION
01	MAY '26	GMB	CIVIL SITE SUITABILITY REPORT

DESIGNED BY: GMB
DRAWN BY: GMB
CHECKED BY: BGS
SURVEYED BY: N/A

SERVICES NOTE

WHERE EXISTING SERVICES ARE SHOWN, THEY ARE INDICATIVE ONLY AND MAY NOT INCLUDE ALL SITE SERVICES. WILTON JOUBERT LTD DOES NOT WARRANT THAT ALL, OR INDEED ANY SERVICES ARE SHOWN. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE AND PROTECT ALL EXISTING SERVICES PRIOR TO AND FOR THE DURATION OF THE CONTRACT WORKS.

RESOURCE CONSENT

DESIGN / DRAWING SUBJECT TO ENGINEER'S APPROVAL

DRAWING TITLE: **SITE PLAN**

PROJECT DESCRIPTION: **CIVIL SITE SUITABILITY REPORT**

PROJECT TITLE: **PART LOT 1 DP 13349 HOREKE ROAD HOREKE NORTHLAND**

ORIGINAL DRAWING SIZE: A3
OFFICE: **OREWA**
DRAWING SCALE: **1:500**
CO-ORDINATE SYSTEM: NOT COORDINATED
DRAWING NUMBER: **146504-C001**
ISSUE: **01**

HAND AUGER : HA01

JOB NO.: 146503 **SHEET:** 1 OF 1

START DATE: 24/04/2026 **NORTHING:** **GRID:**

CLIENT: Hauhungaroa 1C Corporation **DIAMETER:** 50mm **EASTING:**

PROJECT: Proposed Subdivision (Lot 3 for Assessment) **SV DIAL:** 1994 **ELEVATION:** Ground

SITE LOCATION: Part Lot 1 DP 13349, Horeke Road, Horeke **FACTOR:** 1.41 **DATUM:**

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE: PEAK STRENGTH (kPa)	SHEAR VANE: REMOULD STRENGTH (kPa)	SHEAR VANE: SENSITIVITY	DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS
Topsoil	TOPSOIL, dark brown, moist.	TS	0.0	Groundwater Not Encountered					
Punakitere Sandstone (Mangakahia Complex) in Northland Allochthon	NATURAL: SILT, minor clay, frequent clasts, brown, very stiff, moist, no plasticity.		0.2						
			0.4		152	39	3.9		
	Clayey SILT, orangey brown, very stiff, moist, low plasticity.		0.6						
			0.8		147	56	2.6		
			1.0						
			1.2		130	54	2.4		
	SILT, some clay, occasional clasts, orangey brown with grey mottles, very stiff, moist, no to low plasticity.		1.4						
			1.6		116	45	2.6		
	2.0m: Trace sand, frequent clasts, occasional gravels, moist to wet.		2.0		178	42	4.2		
			2.2						
			2.4		118	54	2.2		
	Clayey SILT, grey with orangey brown streaks, very stiff, moist, low to moderate plasticity.		2.6						
	EOH: 2.80m - Too Hard To Auger		2.8		UTP	-	-	13	
			3.0					8	
								7	
			3.2					4	
								5	
			3.4					10	
								13	
			3.6					15	
								17	
			3.8					20+	

REMARKS

End of borehole @ 2.80m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: JEM

CHECKED BY: CSH

▼ Standing groundwater level

▽ GW while drilling

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HAND AUGER : HA02

JOB NO.: 146503 **SHEET:** 1 OF 1

START DATE: 24/04/2026 **NORTHING:** **GRID:**

CLIENT: Hauhungaroa 1C Corporation **DIAMETER:** 50mm **EASTING:**

PROJECT: Proposed Subdivision (Lot 3 for Assessment) **SV DIAL:** DR4802 **ELEVATION:** Ground

SITE LOCATION: Part Lot 1 DP 13349, Horeke Road, Horeke **FACTOR:** 1.39 **DATUM:**

TOPSOIL CLAY SAND PEAT FILL SILT GRAVEL ROCK

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE PEAK STRENGTH (kPa)	SHEAR VANE REMOULD STRENGTH (kPa)	SHEAR VANE SENSITIVITY	DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS
Topsoil	TOPSOIL, dark grey, wet to saturated.	TS	0.0	Groundwater Not Encountered					
Punakitere Sandstone (Mangakahia Complex) in Northland Allochthon	NATURAL: Silty CLAY, grey with orangey brown mottles, stiff, moist, moderate plasticity.		0.2						
	0.4m: Moderate to high plasticity.		0.4		75	25	3.0		
			0.6						
			0.8		58	25	2.3		
	1.1m: Occasional bluish grey seams, very stiff.		1.0						
			1.2		100	36	2.8		
	1.6m: 200mm lense of CLAY, trace to minor silt, stiff, high plasticity.		1.4		95	42	2.3		
	1.8m: Very stiff.		1.6						
			1.8						
	2.1m: Minor sand, occasional gravels, greyish blue with orangey brown and brown mottles.		2.0		117	53	2.2		
	CLAY, trace to minor silt, greyish blue with orangey brown and brown mottles, stiff, moist, high plasticity.		2.2						
	2.6m: Dark grey with blue and brown mottles.		2.4		78	50	1.6		
			2.6						
	Fine Gravelly SILT, dark bluish grey, hard, dry, no plasticity.		2.8		UTP	-	-		
	EOH: 2.90m - Too Hard To Auger		3.0		UTP	-	-	13	
			3.2					20+	
			3.4						
			3.6						
			3.8						

REMARKS

End of borehole @ 2.90m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: SJP

CHECKED BY: CSH

▼ Standing groundwater level

▽ GW while drilling

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HAND AUGER : HA03

JOB NO.: 146503 **SHEET:** 1 OF 1

START DATE: 24/04/2026 **NORTHING:** **GRID:**

CLIENT: Hauhungaroa 1C Corporation **DIAMETER:** 50mm **EASTING:**

PROJECT: Proposed Subdivision (Lot 3 for Assessment) **SV DIAL:** 1994 **ELEVATION:** Ground

SITE LOCATION: Part Lot 1 DP 13349, Horeke Road, Horeke **FACTOR:** 1.41 **DATUM:**

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE: PEAK STRENGTH (kPa)	SHEAR VANE: REMOULD STRENGTH (kPa)	SHEAR VANE: SENSITIVITY	DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS
Topsoil	TOPSOIL, dark brown, moist.	TS	0.0	Groundwater Not Encountered					
Punakitere Sandstone (Mangakahia Complex) in Northland Allochthon	NATURAL: SILT, minor clay, brown, very stiff, dry to moist, no plasticity. 0.5m: Orangey brown.		0.2						
			0.4		UTP	-	-		
			0.6						
	Clayey SILT, orangey brown with grey mottles, very stiff, moist, low plasticity.		0.8		197+	-	-		
			1.0						
			1.2		169	42	4.0		
	SILT, trace to minor clay, frequent clasts and occasional gravels, grey and brown with orangey brown streaks, very stiff to hard, dry, no plasticity.		1.4						
			1.6		UTP	-	-	13	
	EOH: 1.60m - Too Hard To Auger		1.8					20+	
			2.0						
			2.2						
			2.4						
			2.6						
			2.8						
			3.0						
			3.2						
			3.4						
			3.6						
			3.8						

SOIL DESCRIPTION

TOPSOIL CLAY SAND PEAT
FILL SILT GRAVEL ROCK

REMARKS

End of borehole @ 1.60m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: JEM

CHECKED BY: CSH

▼ Standing groundwater level

▽ GW while drilling

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SITE	**Horeke Road, Horeke**
LEGAL DESCRIPTION	**Part Lot 1 DP 13349 & Sec**
PROJECT	**Proposed Subdivision (Lot 3 for Assessment)**
CLIENT	**Hauhungaroa 1C Corporation**
REFERENCE NO.	**146503**
DOCUMENT	**Site Assessment Report**
STATUS/REVISION NO.	**FINAL – Issued for Resource Consent**
DATE OF ISSUE	**13 May 2026**

Report Prepared For	Email
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1. EXECUTIVE SUMMARY

The following table is intended to be a concise summary which must be read in conjunction with the relevant report sections as referenced herein.

Development Type:	Proposed subdivision (Lot 3 for Assessment).
Development Proposals Supplied:	Yes – Subdivision Scheme Plan.
NZS3604 Type Future Structure(s):	Assumed to be.
Geology Encountered:	Punakitere Sandstone (Mangakahia Complex) in Northland Allochthon.
Surficial Topsoil, Mulch & Buried Topsoil Encountered:	Yes – Surficial layers were encountered to a maximum depth of 0.20m below present ground level.
Overall Site Gradient in Proximity to Designated Building Platforms:	The western portion of the designated building platform (DBP) is covered by minor crest land, whilst the eastern portion is covered by moderate to very steep side flanks ranging 11° to 43°.
Site Stability Risk:	Our computer-based stability analysis indicates a Low Risk of Global Land Instability across the DBP provided that our recommendations within this report are adhered to. However, shallow soil movement (soil creep) is likely to be operating on slopes steeper than 1V:4H (14°), which can be mitigated by appropriate foundation design and construction.
Liquefaction Risk:	Negligible risk of liquefaction susceptibility.
Preliminary Foundation Design Recommendations:	All foundations located on or within 5.0m from slopes steeper than 14° should be SED to account for 2.0m of soil creep bpgl. Considering the DBP is generally covered by moderate to very steep sloping ground exceeding 14°, we generally envisage that most future foundations will need to be designed to account for creep in accordance with the above. All other foundations beyond the setback noted above should be embedded a minimum of 2.0m bpgl. Given the recommendation for deepened foundations, we consider that the risk of seasonal soil shrinkage and/or swelling will likely be appropriately mitigated. Soil creep, deepened foundations and retaining wall design parameters will be given during the development review phase once future development proposals have been finalised. Considering the recommendations given above, a future timber subfloor and pile/pole design is recommended within the DBP.
NZBC B1 Expansive Soil Classification:	Class H – Highly Expansive (ys = 78mm).
NZS1170.5:2004 Site Subsoil Classification:	Class C – Shallow soil stratigraphy.

Earthworks:	Due to the moderate to very steep sloping grades that generally cover the DBP, along with the likely requirement of soil creep piles across most of the DBP, we recommend no earthworks are undertaken across the DBP until future development proposals have been reviewed during the Building Consent stage. We recommend all proposed cuts and fills are supported by a SED retaining structure.
Consent Application Report Suitable for:	**Resource Consent.** A Geotechnical development review of future finalised development proposals is undertaken prior to submission for a Building Consent application. Depending on the future development proposals, the review could range from desktop assessment to further Geotechnical investigations and reporting. Soil creep, deepened foundation and retaining wall design parameters will be given during the development review phase.

2. INTRODUCTION

2.1. SCOPE OF WORK

Wilton Joubert Limited (WJL) was engaged by **Hauhungaroa 1C Corporation** (the Client) to undertake a geotechnical assessment of the above site, where we understand, it is proposed to subdivide the existing property into five individual allotments. Some amalgamation of land will also be undertaken and involve neighbouring Sections 7 & 8 Block XI Mangamuka SD that bound the northern end of the site.

The primary objective of this report is to provide Geotechnical assessments along with preliminary design recommendations pertaining to future residential development within vacant proposed Lot 3.

It is our understanding that this report will be submitted to support a Resource Consent application for the proposed subdivision development.

2.2. SUPPLIED INFORMATION

At the time of preparing this report, we were supplied with a Subdivision Scheme Plan depicting the proposed development, dated October 2025 (Ref: NRS 359), prepared by Nigel Ross Surveyor.

Any revision of the Subdivision Scheme Plan supplied with geotechnical implications should be referred to us for review.

3. SITE DESCRIPTION

The proposed development will be created across the following property (the site), which is located off the eastern side of Horeke Road, accessed 2km south of the Motukiore Road intersection:

- Part Lot 1 DP 13349, Horeke Road, Horeke.

The site is shown on our appended Site Plan (Drawing No. 146503-G600) and in Figure 1 below.

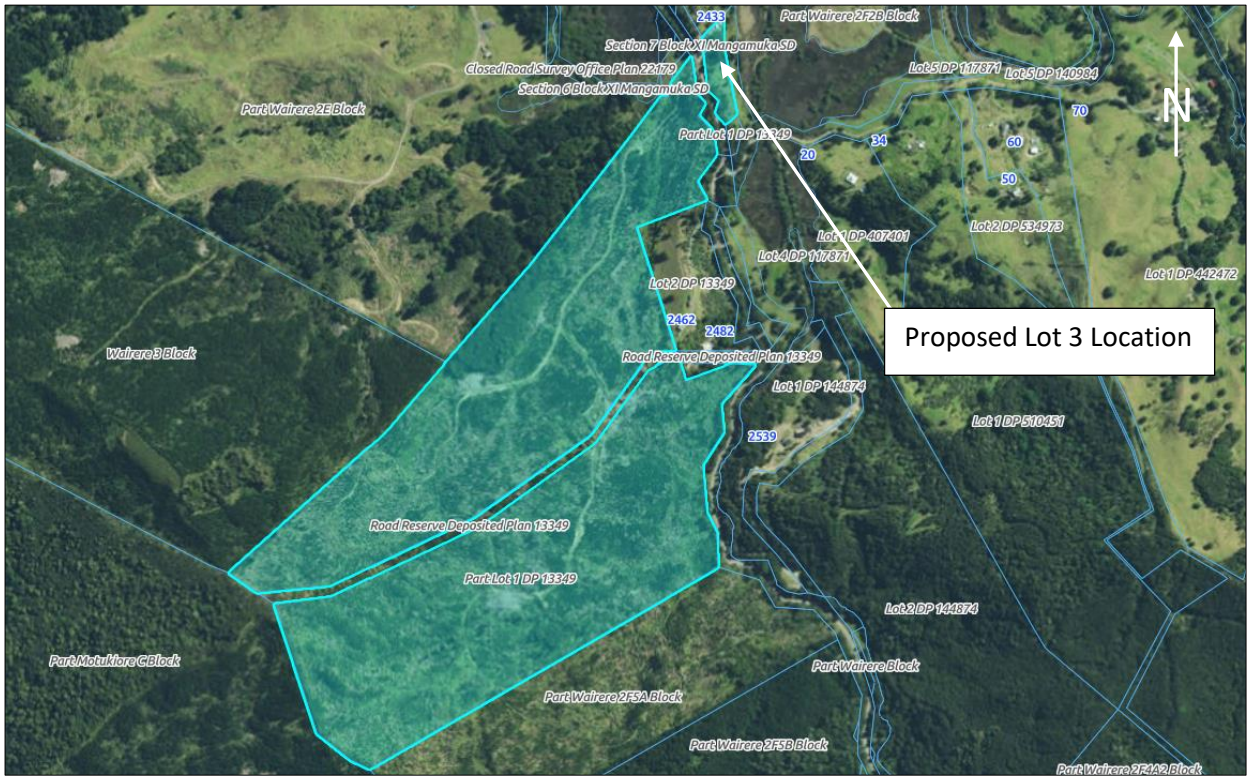


Figure 1: Aerial view with the subject property highlighted in cyan (from Far North District Council's online GIS database).

The surface area of the subject site is approximately 48.3ha and largely covers forestry land off the western side of Horeke Road. The site is split at the northern corner by Horeke Road, with a small portion of the site covering an area of land off the eastern side of Horeke Road.

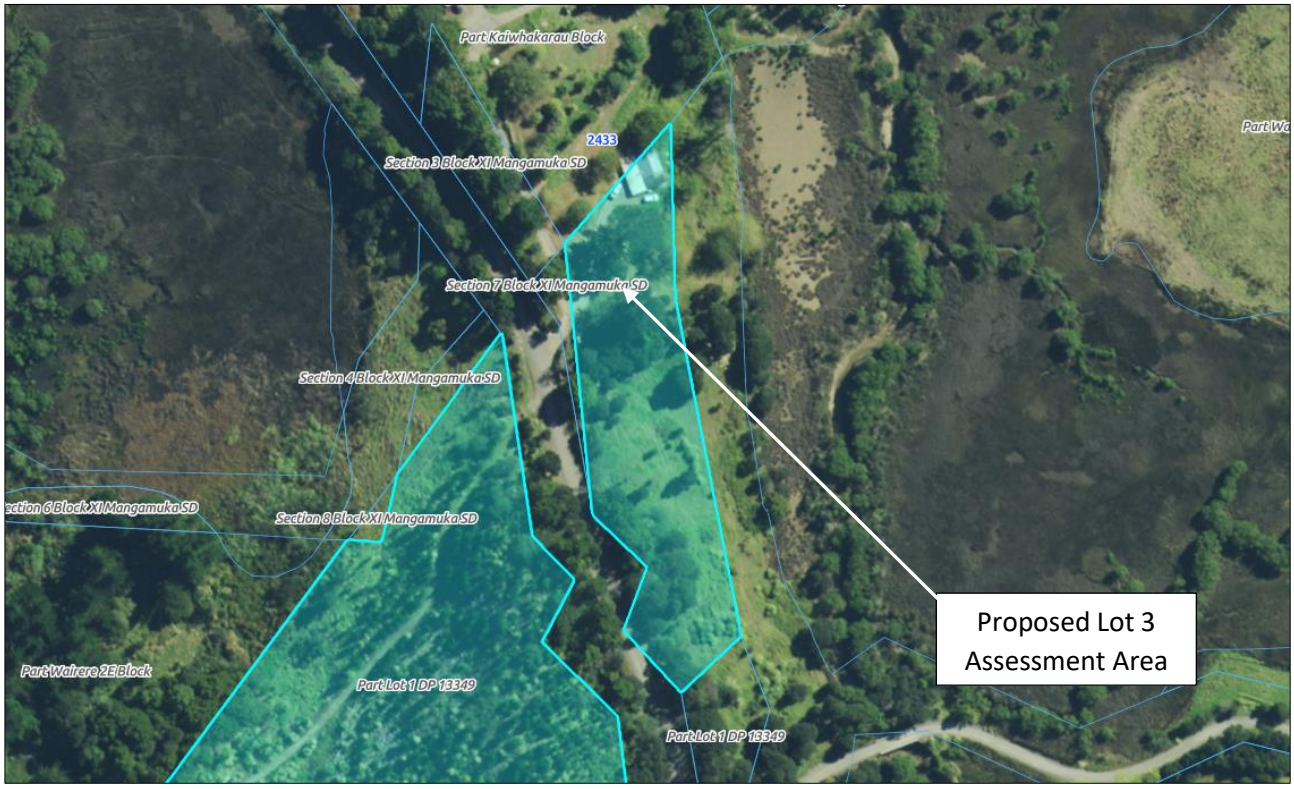


Figure 2: Aerial view with the subject property highlighted in cyan (from Far North District Council's online GIS database).

The eastern portion of land is accessed via an aggregate driveway that traverses along the northern boundary. An existing dwelling is located near the northeastern corner and will be subject to a boundary adjustment during the creation of proposed Lot 1, resulting in the site being vacant of structures. The area is covered in pasture, with pockets of bush present at the northern and southwestern ends. A small pond is located at the base of the northern bush area.

Topographically speaking, the western portion of land is covered by an east facing, moderate to very steep sloping side flank that descends from Horeke Road. Crest land is present near the northwestern and middle of the western boundary. Inclinations reduce to gentle grades along the eastern boundary, ultimately sloping towards the Wairere River tidal environment approximately 20m downslope.

The Far North District Council (FNDC) on-line GIS Water Services Map indicates that public underground service connections are not available to the property.

4. DEVELOPMENT PROPOSALS

Based on our review of the preliminary Subdivision Scheme Plan supplied, we understand that it is proposed to subdivide the existing property into five individual allotments. Some amalgamation of land will also be undertaken and involves neighbouring Sections 7 & 8 Block XI Mangamuka SD that bound the northern end of the site.

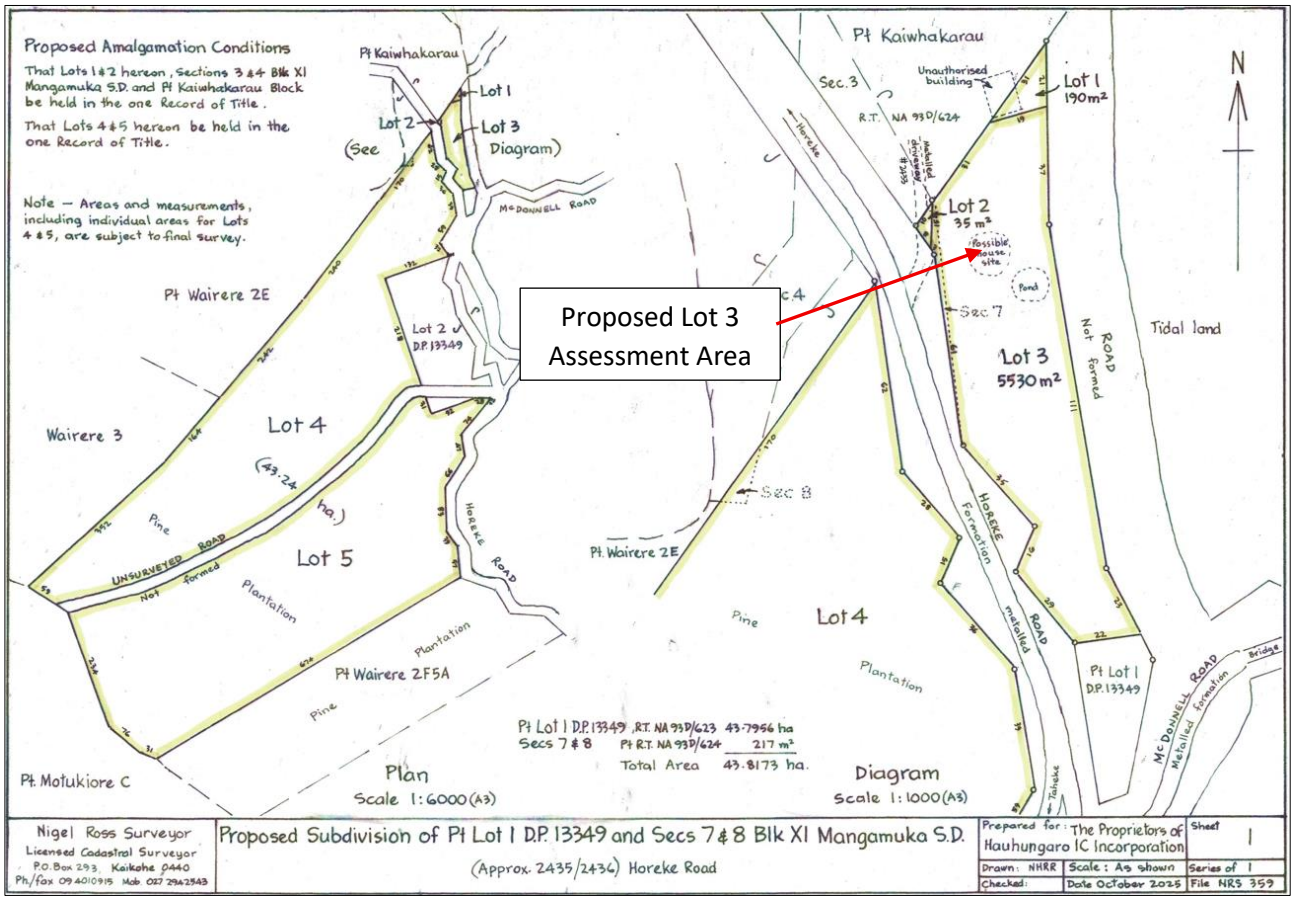


Figure 3: Subdivision Scheme Plan depicting the proposed development (from Nigel Ross Surveyor).

We have been engaged to provide geotechnical assessments along with preliminary design recommendations pertaining to future residential development within a 300m² designated building platform (DBP) at the northern end of proposed Lot 3, as identified by the Client (see Figure 3 above) and depicted on our appended Site Plan. The western portion of the DBP is covered by crest land, whilst the eastern portion is covered by moderate to very steep side flanks ranging 11° to 43°. Additionally, a small pond is located at the toe of the southeastern flank.

For the purposes of this report, we have assumed any future development will comprise of a lightweight building, designed and constructed to apply loads generally in keeping with the requirements of NZS3604:2011.

As a result, the principal objectives were to investigate and assess the suitability of foundation options for the site subsoils, not only primarily in terms of bearing capacity, but also for slope stability and differential foundation movement.

5. DESKTOP STUDY

5.1 GEOLOGY

Reference to the New Zealand Geology Web Map hosted by GNS Science indicates that the site is dissected by a geological boundary that trends slightly northwest to southeast.

The surrounding influential western land is underlain by deposits of the **Punakitere Sandstone (Mangakahia Complex) in Northland Allochthon**. These deposits are approximately 95 to 75 million years in age and described as; "*Weakly to moderately indurated, alternating thin-to-thick-bedded, quartzofeldspathic sandstone and metasandstone*."

The wider surrounding (low-lying) eastern land is underlain by deposits of **Pakihi Supergroup**, specifically being **Late Pleistocene to Holocene Estuary, River and Swamp Deposits**. These deposits are up to approximately 71 thousand years in age and described as; "*Unconsolidated to poorly consolidated sand, peat, mud and shell deposits (estuarine, lacustrine, swamp, alluvial and colluvial*."

A south to north trending inactive fault is also depicted as ceasing near the middle of the site.

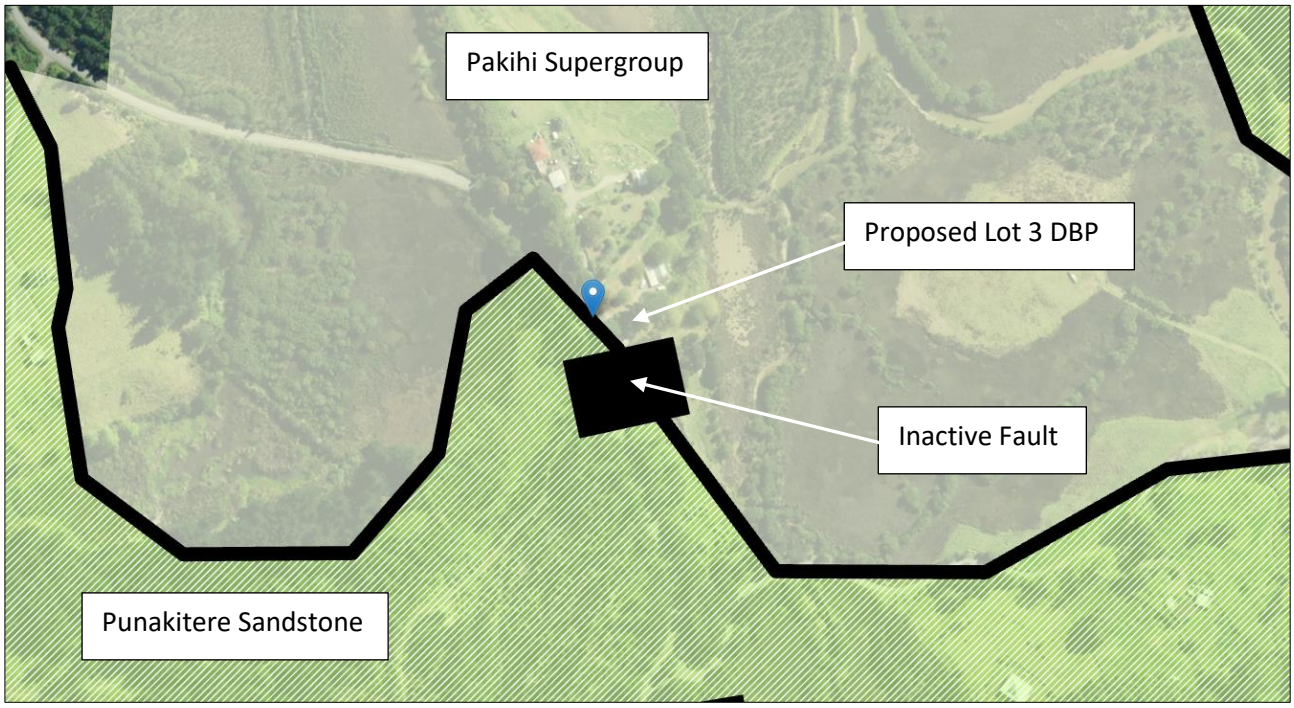


Figure 4: Screenshot from the New Zealand Geology Web Map hosted by GNS Science.

5.2 HISTORICAL AERIAL PHOTGRAPHY REVIEW

A historical aerial photography review was undertaken to evaluate any slope instability features or changes in landform at the property. Aerial images from 1942 have been reviewed and compared to the present-day conditions of 2026.

In 1942, the site largely displayed similar conditions as the present day; however, pockets of bush were concentrated to the eastern boundary with minimal coverage on the western boundary. By 1968, the site was largely cleared of bush and remained in a similar appearance up until 1987. After this point, the site has been replanted throughout the years and contained its existing site coverage since at least 2010.

There were no visible significant geomorphological changes in the landscape or obvious features consistent with major ground instability, indicating a period of stable ground conditions between 1942 and 2026, as shown in Figures 5 and 6 below.

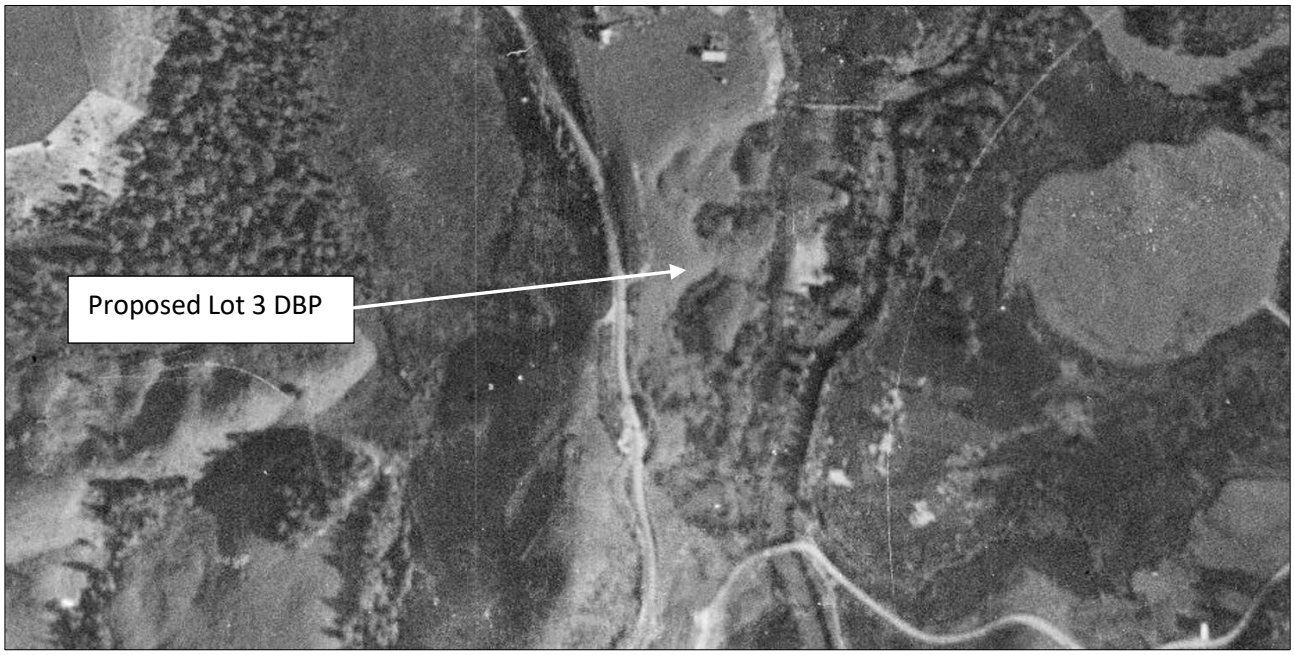


Figure 5: Historical aerial photograph from 1942 (Source: https://retrolens.co.nz).

Figure 6: Historical aerial photograph from December 2010 (Source: Google Earth Pro).

6. GEOTECHNICAL INVESTIGATION

6.1. FIELDWORK

Our fieldwork, as shown on our appended Site Plan, was undertaken on 24 April 2026 and involved:

- Drilling 3 (no.) 50mm diameter hand auger boreholes (HA01 to HA03 inclusive) to refusal depths ranging between 1.6m and 2.9m below present ground level (bpgl), and
- Dynamic Cone Penetrometer (DCP-Scala) tests were undertaken from the base of each borehole to refusal depths ranging between 1.8m and 3.8m bpgl.

6.2. CONE PENETRATION TEST

As part of our geotechnical assessment, a single Cone Penetration Test (CPT01) was carried out to a refusal depth of 7.165m bpgl by Underground Investigation Limited.

The CPT probes were pushed into the ground at a constant rate of approximately 20mm per second. The sensors of the probe produced continuous, analogue data of cone resistance (qc), sleeve friction (fs) and pore water pressure (u2). The CPT testing refused (high tip failure and anchor failure) at 7.165m bpgl due to an inferred very dense stratum present.

7. GEOTECHNICAL FINDINGS

The soil sample arisings from the boreholes were logged generally in accordance with the *"Field Description of Soil and Rock",* New Zealand Geotechnical Society (NZGS), December 2005.

The following is a summary of the ground conditions encountered in our investigations. Please refer to the appended logs for greater detail.

7.1. TOPSOIL

Surficial topsoil was encountered in all boreholes to a maximum depth of 0.20m bpgl.

7.2. NATURAL GROUND

The underlying natural deposits encountered were consistent with our expectations of Punakitere Sandstone (Mangakahia Complex) in Northland Allochthon deposits, indicating the mapped geological boundary in Figure 4 above extends slightly further to the east.

The underlying subsoil profile comprised of a residual soil crust of stiff to very stiff, clayey SILT, silty CLAY, CLAY and SILT that extended to depths ranging between 1.4m to 2.8m bpgl, overlying hard, fine gravelly SILT and SILT with minor to trace of clay.

Measured in-situ BS1377 adjusted peak Vane Shear Strengths ranged between 58kPa and greater than 197kPa, the latter being where soil strength was in excess of the shear vane capacity, or the vane could not penetrate the soil (UTP).

DCP-Scala testing below the base of the boreholes largely returned blow counts that ranged from 7 to 20 blows per 100mm penetration, indicating dense to very dense stratum underlies the site at depth (i.e., inferred completely weathered rock). Isolated blow counts of 4 and 5 were measured between depths of 3.2m and 3.3m bpgl in HA01.

The ratio of peak to remoulded vane shear strength values measured within the boreholes ranged between 1.6 and 4.2, indicating the underlying subgrade subsoils are 'Insensitive to Sensitive' subgrade.

Sensitive soil sites require to protect the subgrade from rain, wind, etc., and to avoid (or minimise) construction traffic and vibrating plants.

7.3. GROUNDWATER

Groundwater was not encountered in any of the boreholes on the day of our investigation. Groundwater was not measured in CPT01, with dry conditions encountered at a depth of 7.1m bpgl.

7.4. SUMMARY TABLE

The following table summarises our inferred stratigraphic profiling:

Table 1: Stratigraphic Summary Table

Investigation Hole ID	Termination Depth (m)	Depth to Base of Surficial Topsoil (m)	Vane Shear Strength Range within Natural Ground (kPa)	DCP-Scala Refusal Termination Depth Below Borehole Base (m)	DCP-Scala Blow Count Range Per 100mm Penetration within Natural Ground	Standing Groundwater Depth (m)
HA01	2.8 (1)	0.10	116 - UTP	3.8	4 – 20+	NE
HA02	2.9 (1)	0.20	58 - UTP	3.1	13 – 20+	NE
HA03	1.6 (1)	0.10	169 – 197+ / UTP	1.8	13 – 20+	NE

Table Note: (1) Too dense to auger. NE= Not encountered.

7.5. EXPANSIVE SOILS

Naturally occurring, seasonal moisture variations are a strong characteristic of most Upper North Island soils, which typically results in plastic soil masses swelling during winter months and then shrinking during summer months. Such volumetric changes in foundation soils (broadly termed 'Expansive Soils) vary according to clay mineralogy and geology and can be a significant risk to buildings.

In this instance, in the absence of laboratory testing, but instead adopting the visual-tactile method as per AS2870, considering the high clay content present within the residual soil crust, we have adopted a conservative primary classification estimate of the soils underlying the site as follows:

- NZBC B1 Expansive Soil Class H
- Upper Limit of Characteristic surface movement (y_s) 78mm

Effects of expansive soils for future foundations will need to be mitigated by way of specific engineering design (SED).

8. GEOTECHNICAL ASSESSMENTS

As appropriate to the site conditions, we have carried out the following geotechnical analyses:

- Qualitative and quantitative slope stability, and
- Liquefaction susceptibility and triggering assessments.

8.1. QUALITATIVE SLOPE STABILITY

The western portion of the DBP is covered by crest land, whilst the eastern portion is covered by moderate to very steep side flanks ranging 11° to 43°. Additionally, a small pond is located at the toe of the southeastern flank.

Our assessment has also considered the following:

- Stiff to hard soils of the Northland Allochthon encountered during our investigations,
- DCP-Scala testing below the base of the boreholes generally indicating dense to very dense stratum (underlies the site at depth (i.e., inferred completely weathered rock),
- Groundwater was not encountered in any of the boreholes on the day of our investigation. Groundwater was not measured in CPT01, with dry conditions encountered at a depth of 7.1m bpgl,
- There are no known active faults traversing through or close to the site, and
- No visual signs of global instability were observed at the time of our investigation; however, soil creep was evident across slope inclinations exceeding 1V:4H (14°). A review of historical aerial photography also confirms the absence of any obvious global instability.

8.2. QUANTITATIVE SLOPE STABILITY

Appended Cross-sections A-A' and B-B' (Drawing Nos. 146503-G610 and 146503-G611) were drawn using LiDAR contour data sourced from the Land Information New Zealand (LINZ) database to represent the topography of the DBP and influential northeastern and southeastern flanks, as depicted on our appended Site Plan.

Slope stability analyses were undertaken on the more critical northeastern Cross-section B-B', using computer program Slide 2, by Rocscience Limited. Theoretical non-circular (composite) surfaces were assessed using the Spencer and GLE / Morgenstern-Price methods.

An assumed Uniformly Distributed Load (UDL) of 10kPa was applied to represent the surcharge load of a future dwelling.

The stability analyses have been undertaken for existing conditions (moderate groundwater), worst-case ground conditions (elevated groundwater) and extreme scenarios (seismic loading).

A Peak Ground Acceleration (PGA) value of 0.19g (ULS) was used for the 500-year seismic event, with an effective earthquake magnitude of 6.5 as recommended by the NZGS (Earthquake Geotechnical Engineering Practice Module 1, Dated: November 2021).

Back Analysis:

Using the inferred original ground surface of Cross-section B-B' assuming a groundwater level at ground surface (fully saturated ground conditions), we have carried out back analyses based on our experience of the geology, along with measured soil and estimated rock strengths within the borehole and CPT01 locations, to determine the minimum effective stress parameters to achieve a safety factor of ≈1.0.

Table 2: Stability Analysis Results – Back Analysis

Section	Design Conditions	Factor of Safety (FoS)	
		Targeted	Calculated
B-B'	Inferred original ground surface, groundwater at ground surface	~1.0	1.0

Undrained soil strength parameters (no friction angle) were used to model the extreme conditions of a seismic event.

The soil strength parameters used in the stability assessment are shown in Table 3 below:

Table 3: Effective Shear Stress (Shear Strength) Parameters

Soil Parameters	Weathered Northland Allochthon Soils	Less Weathered Northland Allochthon Soils	Inferred Very Dense Stratum
Unit Weight, γ (kN/m3)	17	18	20
Effective Cohesion c' (kPa)	5	6	8
Friction Angle, ϕ' (°)	25	30	35
Undrained (no ϕ') Su	40	100	200

We have adopted the following scenarios:

1. **Moderate Groundwater Level**: Long-term stability when modelling the existing ground conditions and assumed a groundwater level at a depth of approximately 3.0m to 7.0m below the building site.

   Factor of Safety (FoS) required >1.5.

2. **Elevated Groundwater Level**: Transient (medium-term) stability when modelling the worst-case scenario and assumed a raised groundwater level at a depth of approximately 0.0m to 3.0m below building site.

   FoS required >1.3.

3. **Seismic Loading**. Short-term stability when modelling extreme ground conditions under a 500-year seismic event and assumed a moderate groundwater level at a depth of approximately 3.0m to 7.0m below the building site.

   FoS required >1.1.

A summary of the calculated minimum FoS against failure across the existing DBP ground conditions for each of the above scenarios is shown in Table 4 below:

Table 4: Stability Analysis Results – Existing Ground Conditions

Section	Design Conditions	FoS within the DBP		Compliance
		Required	Calculated	
B-B'	Moderate Groundwater, plus Surcharge Load	≥1.5	1.63	Yes
	Elevated Groundwater, plus Surcharge Load	≥1.3	1.37	Yes
	Moderate Groundwater, plus Surcharge Load, plus Seismic Load	≥1.1	1.94	Yes

We have modified our slope stability model to include loading from a future dwelling, with a summary of the calculated FoS values across the DBP given in Table 5 below:

Table 5: Stability Analysis Results – Post-Development (Proposed)

Section	Design Conditions	FoS within the DBP		Compliance
		Required	Calculated	
B-B'	Moderate Groundwater, plus Surcharge Load	≥1.5	<1.50	Fail
	Elevated Groundwater, plus Surcharge Load	≥1.3	<1.3	Fail
	Moderate Groundwater, plus Surcharge Load, plus Seismic Load	≥1.1	>1.1	Yes

Marginal unsatisfactory FoSs are present along the eastern leading-edge of the DBP. However, these failure curves are considered to be shallow in nature which can be appropriately mitigated by deepened foundations.

We subsequently modelled the installation of deepened foundations extending to a minimum depth of 2.0m bpgl, with a summary of the calculated FoS values across the DBP provided in Table 6 below.

Table 6: Stability Analysis Results – Post-Development (Minimum 2.0m Deep Foundations)

Section	Design Conditions	FoS within the DBP		Compliance
		Required	Calculated	
A-A'	Moderate Groundwater, plus Surcharge Load	≥1.5	>1.5	Yes
	Elevated Groundwater, plus Surcharge Load	≥1.3	>1.3	Yes
	Moderate Groundwater, plus Surcharge Load, plus Seismic Load	≥1.1	>1.1	Yes

8.3. SHALLOW SOIL MOVEMENT (SOIL CREEP)

Soil Creep is the slow downslope movement of upper soil horizons, usually confined to the uppermost 1.0m to 2.0m of soil likely to be operating on slopes steeper than 1V:4H (14°) in Northland Allochthon geological settings. The soil movement generally in the order of millimetres per year and the rate and depth are a product of the combination of the following conditions:

- Slope length,
- Slope angle,
- Stormwater runoff,
- Groundwater fluctuations,
- Soil expansivity,
- Vegetation,
- Surcharge loads,
- Cut/fill earthworks (if not retained).

Generally speaking, soil creep becomes mobilised on slopes steeper than 1V:4H (14°) largely as a cyclical phenomenon arising out of seasonal variations in moisture content of surficial soils, generally resulting in soil shrinkage during the dry summer months and swelling during wet winter months. It is generally considered that in the dry seasons, the soils shrink, and tension cracks are formed, sometimes with some minor down-slope movement. When it rains, those cracks fill with water, which not only softens the adjacent soils, but also exerts hydrostatic lateral pressures on the sides of the cracks. As the desiccated soils absorb this free water, they swell and exert further lateral pressures on the adjacent block of soil. This cyclic action leads to the formation of "minor slump terracettes".

Across the entire DBP, we consider there to be a risk of instability on slopes steeper than 14° by way of long-term incremental loss of lateral support caused by soil creep to around a depth of 2.0m bpgl.

8.4. SLOPE STABILITY CONCLUSION

The analyses indicate that satisfactory FoSs are available for the global stability of the DBP under all conditions, provided:

- All foundations located on or within 5.0m from slopes steeper than 14° are designed to account for 2.0m of soil creep bpgl, and
- All other foundations are deepened to a minimum embedment of 2.0m bpgl.

Our slope stability assessment outputs (10 sheets) are appended.

8.5. LIQUEFACTION SUSCEPTIBILITY

Liquefaction is the loss of effective strength of a cohesionless soil (typically sand) due to pore-water pressures generated during a seismic event (earthquake). The partial or complete loss of effective strength of loose, saturated soils can result in vertical settlement and/or horizontal movement (lateral spreading) of the ground.

A commonly accepted definition is: 'Areas susceptible to liquefaction generally correspond with geologically young deposits (less than 10,000 years) located in relatively flat areas close to active or abandoned waterways, in coastal or estuarine areas, and/or areas of uncompacted or poorly compacted fill.'

We have carried out liquefaction susceptibility assessments in order to identify the risk of ground damage during a seismic event, based on the following items:

- The FNDC online GIS Hazard Map categorises both DBPs as being within '*Undetermined*' Liquefaction Vulnerability areas. The wider low-lying Wairere River tidal environment to the east is categorised as a '*Possible*' Liquefaction Vulnerability area,
- Stiff to hard soils of the Northland Allochthon encountered during our investigations,
- DCP-Scala testing below the base of the boreholes generally indicating dense to very dense stratum,
- Groundwater was not encountered in any of the boreholes on the day of our investigation. Groundwater was not measured in CPT01, with dry conditions encountered at a depth of 7.1m bpgl,
- The DBP is situated on an elevated flank above the lower-lying flood plain environment, set no less than approximately RL7.0m New Zealand Vertical Datum (NZVD) with good water-shedding characteristics,
- There are no known active faults traversing through or close to the site,
- Soils of the Northland Allochthon underlie the site (minimum geological age of +75 million years).

8.6. LIQUEFACTION TRIGGERING

Assessment of liquefaction induced free field settlement at the site has been carried out in general accordance with MBIE guidelines and using specialised software 'Cliq 3.0' developed by Geologismiki Limited.

Liquefaction assessments were carried out using the Boulanger & Idriss (2014) method and the Zhang et al (2002) procedure to determine possible ground subsidence across the site during an earthquake.

The analysis has been performed using the on-site CPT01 data, with an assumed conservative groundwater level of 3.0m during a seismic event. A free face of 11m in height and 45m in length from the DBP down to the Wairere River tidal environment was adopted to estimate lateral displacement.

Design earthquake scenarios of Serviceability Limit State (SLS) and Ultimate Limit State (ULS) were considered using earthquake magnitudes and peak ground accelerations outlined in Table 7 below. Peak Ground Acceleration (PGA) values were used with effective earthquake magnitudes as recommended by the NZGS (Earthquake Geotechnical Engineering Practice Module 1, Dated: November 2021).

Table 7: Design Earthquake Scenarios

Location	25-year return period SLS1		500-year return period ULS1 (ULS2)	
	a_{max}	M	a_{max}	M
Whangārei	0.03	5.8	0.13 (0.19)	5.8 (6.5)

Table Note: a_{max}= Peak Ground Acceleration, M= Earthquake Magnitude

The overall plots of the liquefaction triggering analysis (3 sheets) are appended to this report and the detailed results are shown in Figures 7 to 10 below.

The results in Figure 7 below show that the liquefaction induced settlement is zero for 25-year (SLS) and 500-year (ULS1) return periods, and a maximum of approximately 3mm for a 500-year (ULS2) return period.

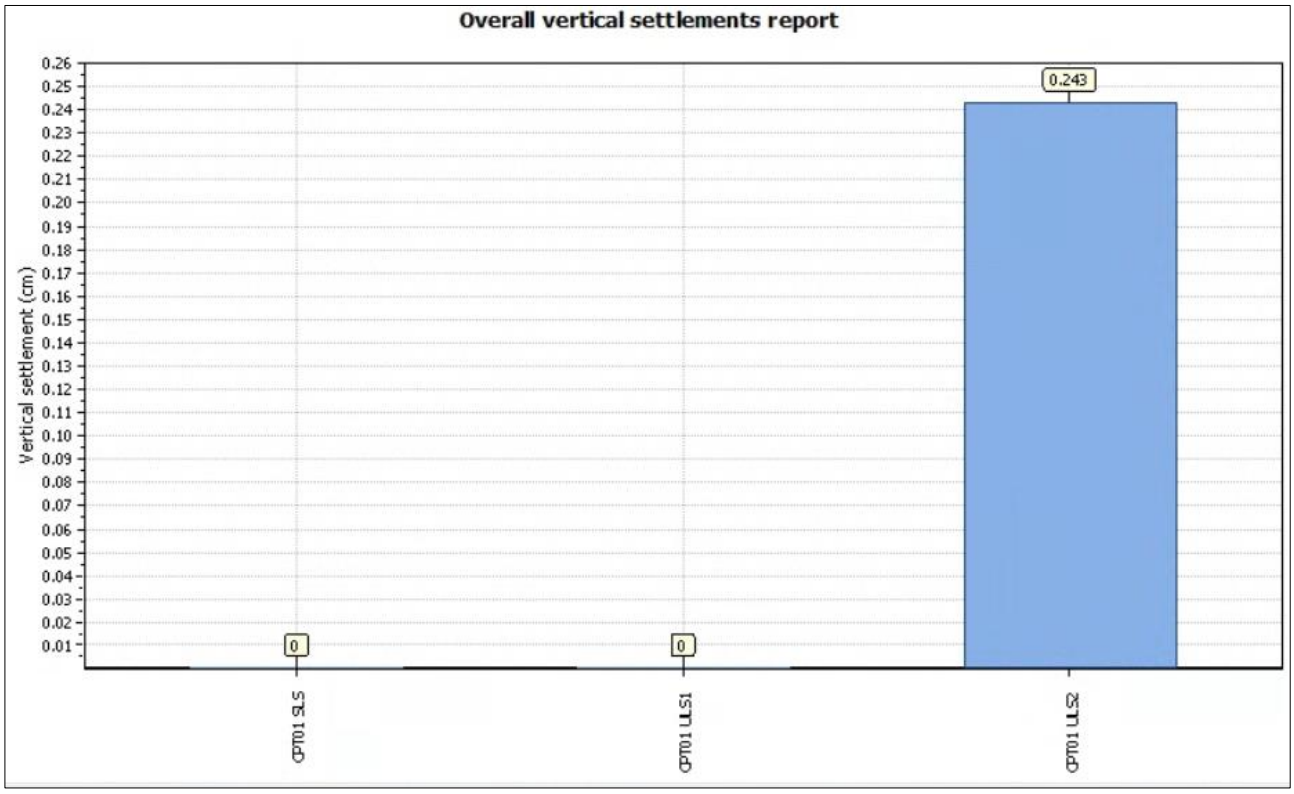


Figure 7: Overall Earthquake-Induced Free-Field Settlements.

The Liquefaction Potential Index (LPI) and the Liquefaction Severity Number (LSN) are indicators to assess the damage potential of liquefaction that may occur during a seismic event. The LPI plots indicate a low risk of liquefaction potential for all return periods, whilst the LSN plots indicate a little to no expression of liquefaction for all return periods. These plots are shown in Figures 8 and 9 below.

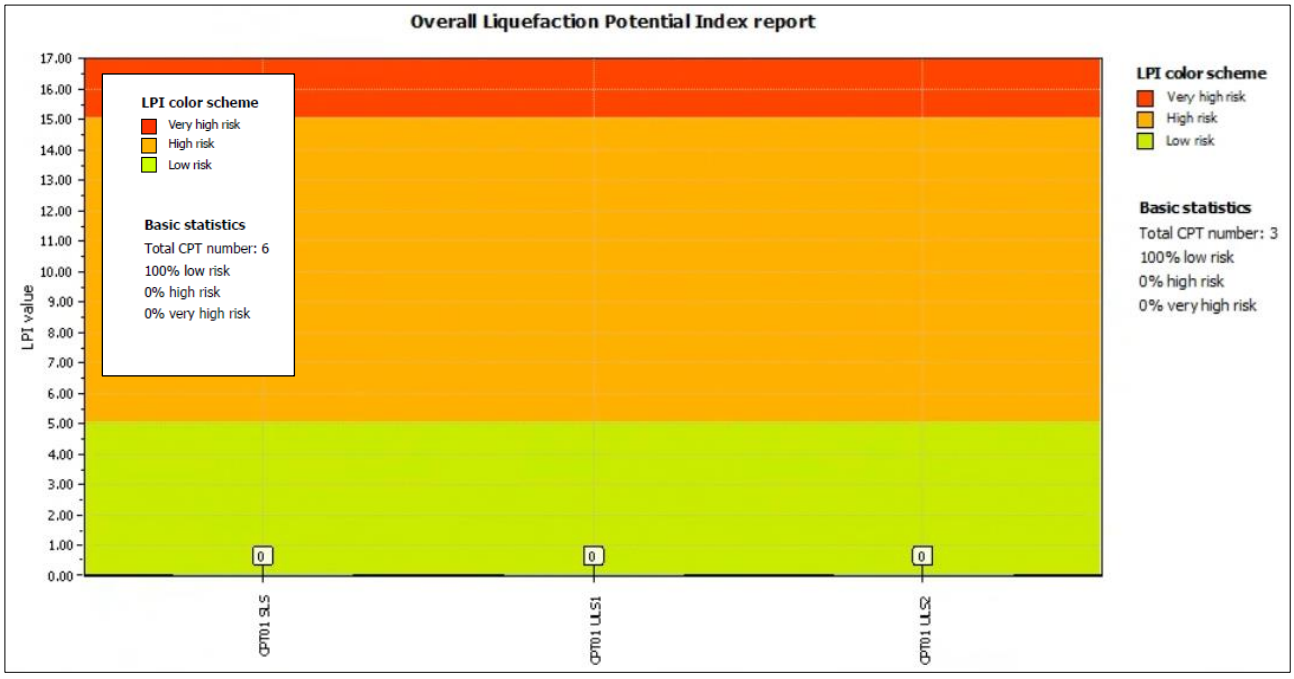


Figure 8: Overall Liquefaction Potential Index (LPI).

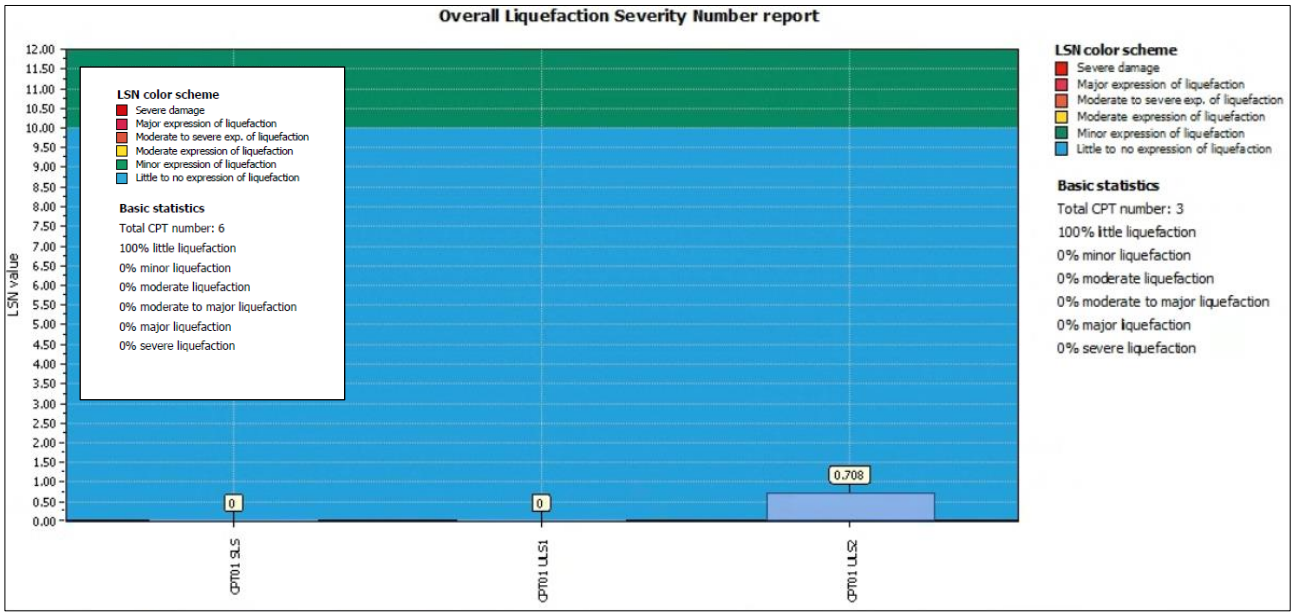


Figure 9: Overall Liquefaction Severity Number (LSN).

The Overall Lateral Displacement results indicate the lateral spreading by a ULS1 and ULS2 seismic event is approximately 1mm and 13mm respectively, as shown in Figure 10 below.

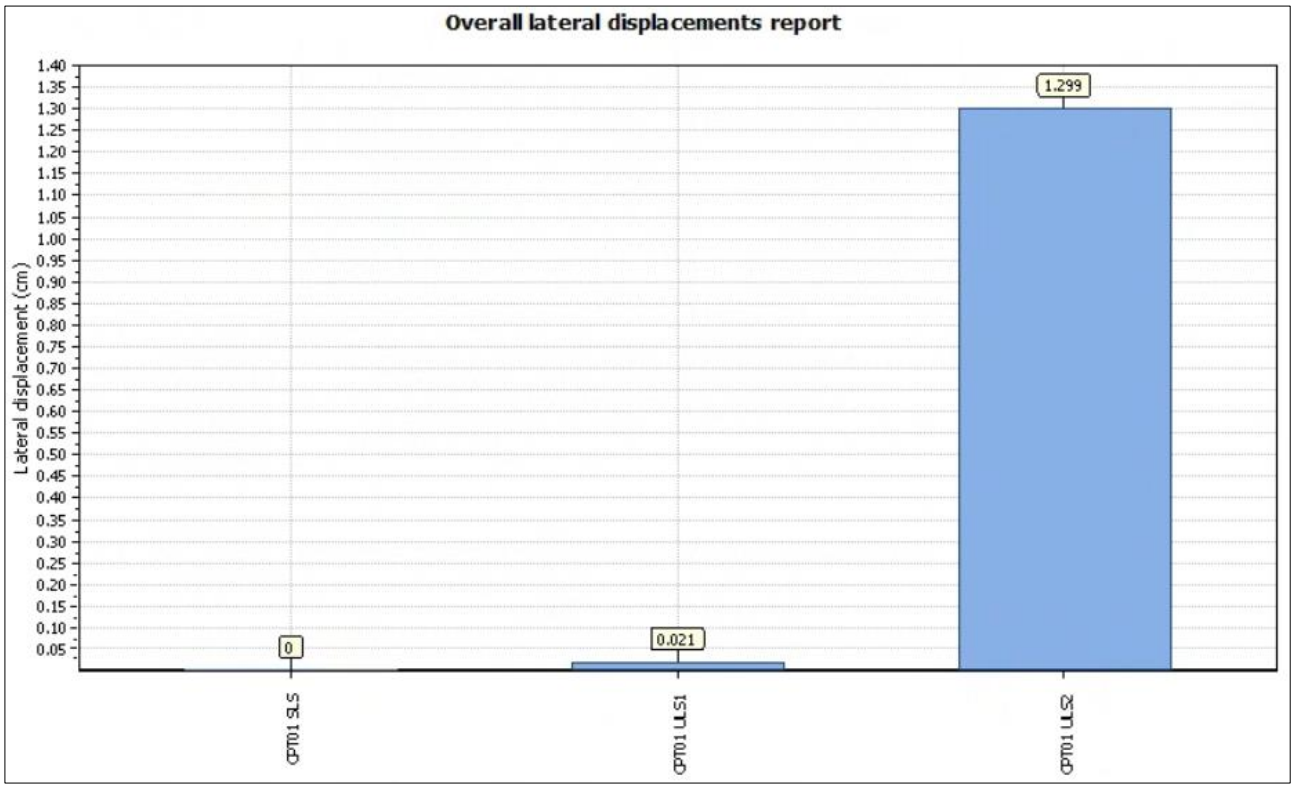


Figure 10: Overall Lateral Displacement.

8.7. LIQUEFACTION ASSESSMENT CONCLUSION

Based on our triggering assessment, we conclude that the soils across the DBP have a negligible risk of liquefaction susceptibility and liquefaction induced ground damage is consequently unlikely.

9. CONCLUSIONS AND RECOMMENDATIONS

Based on our observations, site survey, record research, hand auger borehole and CPT investigation and in-situ testing as described herein, we consider on reasonable grounds that this report can be submitted to the Territorial Authority in support of a Resource Consent application for subdividing the subject site, substantiating that in terms of section 106 of the Resource Management Act and its current amendments, either:

a) No land in respect of which the consent is sought, nor any structure on that land, is, nor is likely to be subject to material damage by erosion, falling debris, subsidence, or slippage from any source, or

b) No subsequent use that is likely to be made of the land is likely to accelerate, worsen, or result in material damage to that land, other land, or structure, by erosion, falling debris, subsidence, or slippage from any source.

Therefore, we consider that the proposed Lot 3 DBP should be generally suitable for future residential construction in terms of NZS3604:2011, provided:

- The recommendations of this report are adhered to,
- A Geotechnical development review of future finalised development proposals is undertaken prior to submission for a Building Consent application. Depending on the future development proposals, the review could range from desktop assessment to further Geotechnical investigations and reporting, and
- Alternate building site locations may be applicable; however, any proposed construction beyond the assessed DBP must be subject to site-specific investigations and assessments.

9.1 PRELIMINARY FOUNDATION DESIGN RECOMMENDATIONS

All foundations located on or within 5.0m from slopes steeper than 14° should be SED to account for 2.0m of soil creep bpgl. Considering the DBP is generally covered by moderate to very steep sloping ground exceeding 14°, we generally envisage that most future foundations will need to be designed to account for creep in accordance with the above.

All other foundations beyond the setback noted above should be embedded a minimum of 2.0m bpgl. Given the recommendation for deepened foundations, we consider that the risk of seasonal soil shrinkage and/or swelling will likely be appropriately mitigated.

Soil creep, deepened foundations and retaining wall design parameters will be given during the development review phase once future development proposals have been finalised.

Considering the recommendations given above, a future timber subfloor and pile/pole design is recommended within the DBP.

9.2 NZS1170.5:2004 SITE SUBSOIL CLASSIFICATION

We consider the proposed Lot 3 DBP to be underlain with a Class C – Shallow Soil stratigraphy.

9.3 SITE EARTHWORKS

Due to the moderate to very steep sloping grades that generally cover the DBP, along with the likely requirement of soil creep piles across most of the DBP, we recommend no earthworks are undertaken across the DBP until future development proposals have been reviewed during the Building Consent stage. We recommend all proposed cuts and fills are supported by a SED retaining structure.

All earthworks should be undertaken in accordance with the following standards:

- NZS4431:2022 "Code of Practice for Earth Fill Residential Development" &
- Section 2 "Earthworks & Geotechnical Requirements" of NZS4404:2010 "Land Development and Subdivision Infrastructure" &
- FNDC Engineering Standards (Version 0.6, dated 2023).

9.4 GENERAL SITE WORKS

We stress that all work should be undertaken in a careful and safe manner so that Health and Safety is not compromised, and that suitable Erosion and Sediment control measures should be put in place. Any stockpiles placed should be done so in an appropriate manner so that land stability and/or adjacent structures are not compromised.

Furthermore:

- All works must be undertaken in accordance with the Health and Safety at Work Act 2015,
- Any open excavations should be fenced off or covered, and/or access restricted as appropriate,
- **Crests above steeply sloping ground should be isolated, and heavy plant should be kept away from these areas**,
- The location of all services should be verified at the site prior to the commencement of construction.
- The Contractor is responsible at all times for ensuring that all necessary precautions are taken to protect all aspects of the works, as well as adjacent properties, buildings and services, and
- Should the contractor require any site-specific assistance with safe construction methodologies, please contact WJL for further assistance.

9.5 LONG-TERM FOUNDATION CARE & MAINTENANCE

The recommendations given above to mitigate the risk of expansive soils, do not necessarily remove the risk of external influences affecting the moisture in the subgrade supporting the foundations.

All owners should also be aware of the detrimental effects that significant trees can have on building foundation soils, viz:

- Their presence can induce differential consolidation settlements beneath foundations through localised soil water deprivation, or conversely
- Foundation construction too soon after their removal can result in soil swelling and raising foundations as the soils rehydrate.

To this end, care should be taken to avoid:

- Having significant trees positioned where their roots could migrate beneath the house foundations, and
- Constructing foundations on soils that have been differentially excessively desiccated by nearby trees, whether still existing, or recently removed.

We recommend that homeowners make themselves familiar with the appended Homeowners' Guide published by CSIRO, with particular emphasis on maintenance of drains, water pipes, gutters and downpipes.

10. STORMWATER & SURFACE WATER CONTROL

Uncontrolled stormwater flows must not be allowed to run onto or over site slopes, or to saturate the ground, so as to adversely affect slope stability or foundation conditions.

Overland flows and similar runoff such as from any higher ground should be intercepted by means of shallow surface drains and/or small bunds and be directed away from the building footprints to protect the building platform from both saturation and erosion. Water collected in interceptor drains should be diverted away from the building site to an appropriate disposal point. All stormwater runoff from roofs and paved areas should be collected in sealed pipes and be discharged to a Council approved stormwater system.

Under no circumstances should concentrated overflows from any source discharge into or onto the ground in an uncontrolled fashion, especially directly onto moderate to very steep sloping ground.

11. ON-SITE WASTEWATER DISPOSAL

No reticulated sanitary sewer is available for the site; therefore, an on-site wastewater treatment and disposal system will be required to service a future development.

We recommend that all designs for future on-site wastewater systems should be carried out by an Engineer experienced in on-site wastewater disposal.

12. UNDERGROUND SERVICES

The FNDC on-line GIS Water Services Map indicates that public underground service connections are not available to the property. Other underground services, public or private, mapped, or unmapped, of any type could be also present.

A thorough service-search should be carried out prior to commencement of any excavations to locate the exact locations of the underground services.

13. DRAWING REVIEW OR FURTHER GEOTECHNICAL ASSESSMENT

Once development and foundation design drawings for the future development at proposed Lot 3 have been finalised, the drawings should be referred to us for review to verify that the recommendations contained in this report have been incorporated into the design.

Depending on the future development proposals, the review could range from desktop assessment to further Geotechnical investigation and reporting.

Recommended Geotechnical site inspections and testing will be given during the development review phase.

14. LIMITATIONS

We anticipate that this report is to be submitted to Council in support of a Resource Consent application.

This report has been commissioned solely for the benefit of our Client**, Hauhungaroa 1C Corporation,** in relation to the project as described herein, and to the limits of our engagement, with the exception that the local Territorial Authority may rely on it to the extent of its appropriateness, conditions and limitations, when issuing the subject consent. Any variations from the development proposals as described herein as forming the basis of our appraisal should be referred to us for further evaluation. Copyright of Intellectual Property remains with WJL, and this report may NOT be used by any other entity, or for any other proposals, without our written consent. Therefore, no liability is accepted by this firm or any of its directors, servants, or agents, in respect of any other geotechnical aspects of this site, nor for its use by any other person or entity, and any other person or entity who relies upon any information contained herein does so entirely at their own risk.

Where other parties may wish to rely on it, whether for the same or different proposals, this permission may be extended, subject to our satisfactory review of their interpretation of the report.

Although this report may be submitted to a local authority in connection with an application for a consent, permission, approval, or pursuant to any other requirement of law, this disclaimer shall still apply and require all other parties to use due diligence where necessary and does not remove the necessity for the normal inspection of site conditions and the design of foundations as would be made under all normal circumstances.

Thank you for the opportunity to provide our service on this project, and if we can be of further assistance, please do not hesitate to contact us.

Yours faithfully,

WILTON JOUBERT LIMITED

Appendices:

WJL Site Plan and Cross-sections (3 sheets)

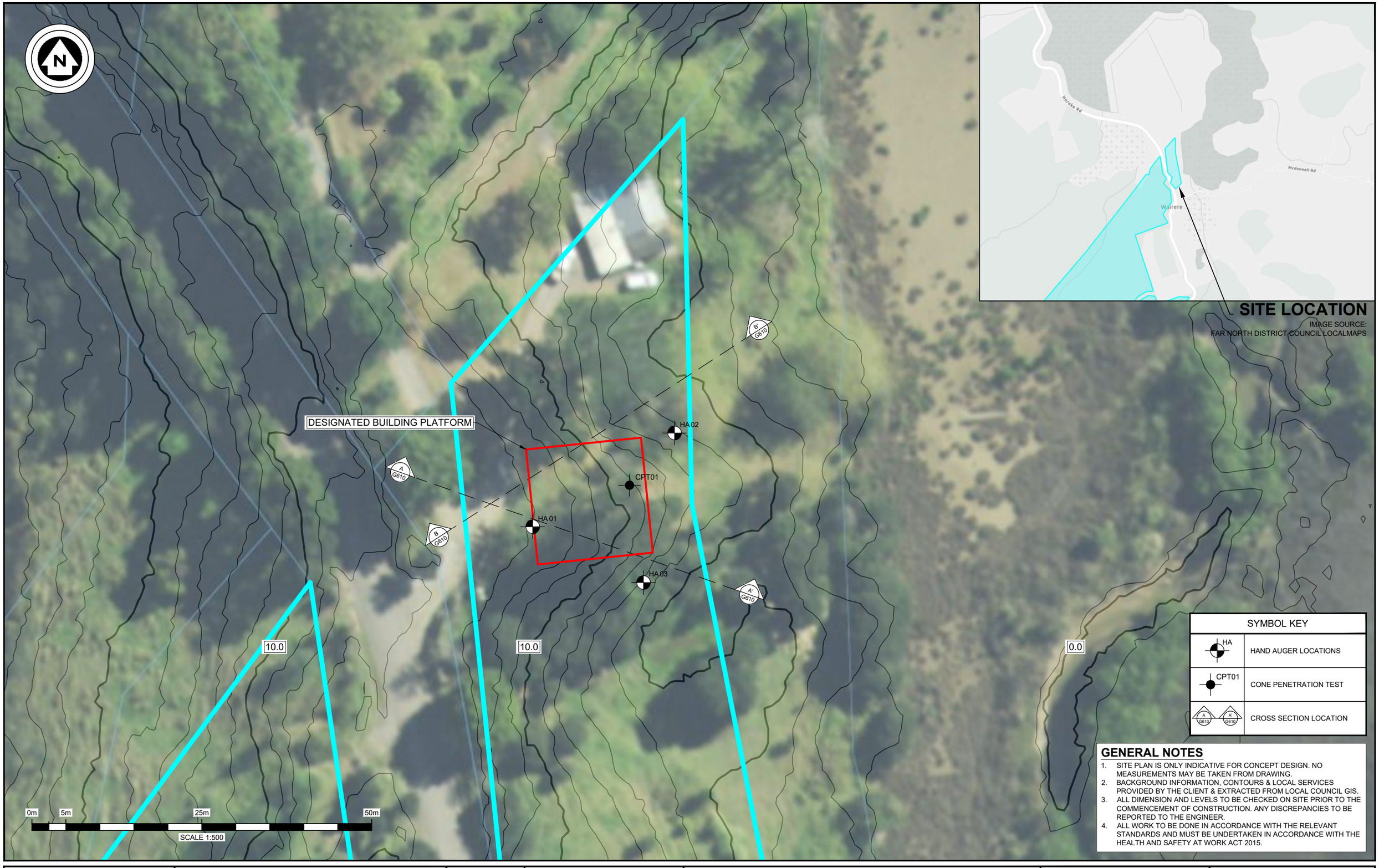
Hand Auger Borehole Records (3 sheets)

Slope Stability Assessment (10 sheets)

CPT Calibration & Results (6 sheets)

Liquefaction Assessment (3 sheets)

'*Foundation Maintenance and Footing Performance*' homeowner's guide, published by CSIRO (4 sheets)



SITE LOCATION

IMAGE SOURCE:
FAR NORTH DISTRICT COUNCIL LOCALMAPS

SYMBOL KEY	
HA	HAND AUGER LOCATIONS
CPT01	CONE PENETRATION TEST
A G610 / A' G610	CROSS SECTION LOCATION

GENERAL NOTES

1. SITE PLAN IS ONLY INDICATIVE FOR CONCEPT DESIGN. NO MEASUREMENTS MAY BE TAKEN FROM DRAWING.
2. BACKGROUND INFORMATION, CONTOURS & LOCAL SERVICES PROVIDED BY THE CLIENT & EXTRACTED FROM LOCAL COUNCIL GIS.
3. ALL DIMENSION AND LEVELS TO BE CHECKED ON SITE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER.
4. ALL WORK TO BE DONE IN ACCORDANCE WITH THE RELEVANT STANDARDS AND MUST BE UNDERTAKEN IN ACCORDANCE WITH THE HEALTH AND SAFETY AT WORK ACT 2015.

WILTON JOUBERT
Consulting Engineers
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Christchurch: 021 824 063 Wanaka: 03 443 6209
www.wiltonjoubert.co.nz

ISSUE / REVISION

No.	DATE	BY	DESCRIPTION
A	MAY 2026	A.B	ISSUED WITH GEOTECHNICAL REPORT

DESIGNED BY:
DRAWN BY: A.B
CHECKED BY:
SURVEYED BY:

SERVICES NOTE
WHERE EXISTING SERVICES ARE SHOWN, THEY ARE INDICATIVE ONLY AND MAY NOT INCLUDE ALL SITE SERVICES. WILTON JOUBERT LTD DOES NOT WARRANT THAT ALL, OR INDEED ANY SERVICES ARE SHOWN. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE AND PROTECT ALL EXISTING SERVICES PRIOR TO AND FOR THE DURATION OF THE CONTRACT WORKS.

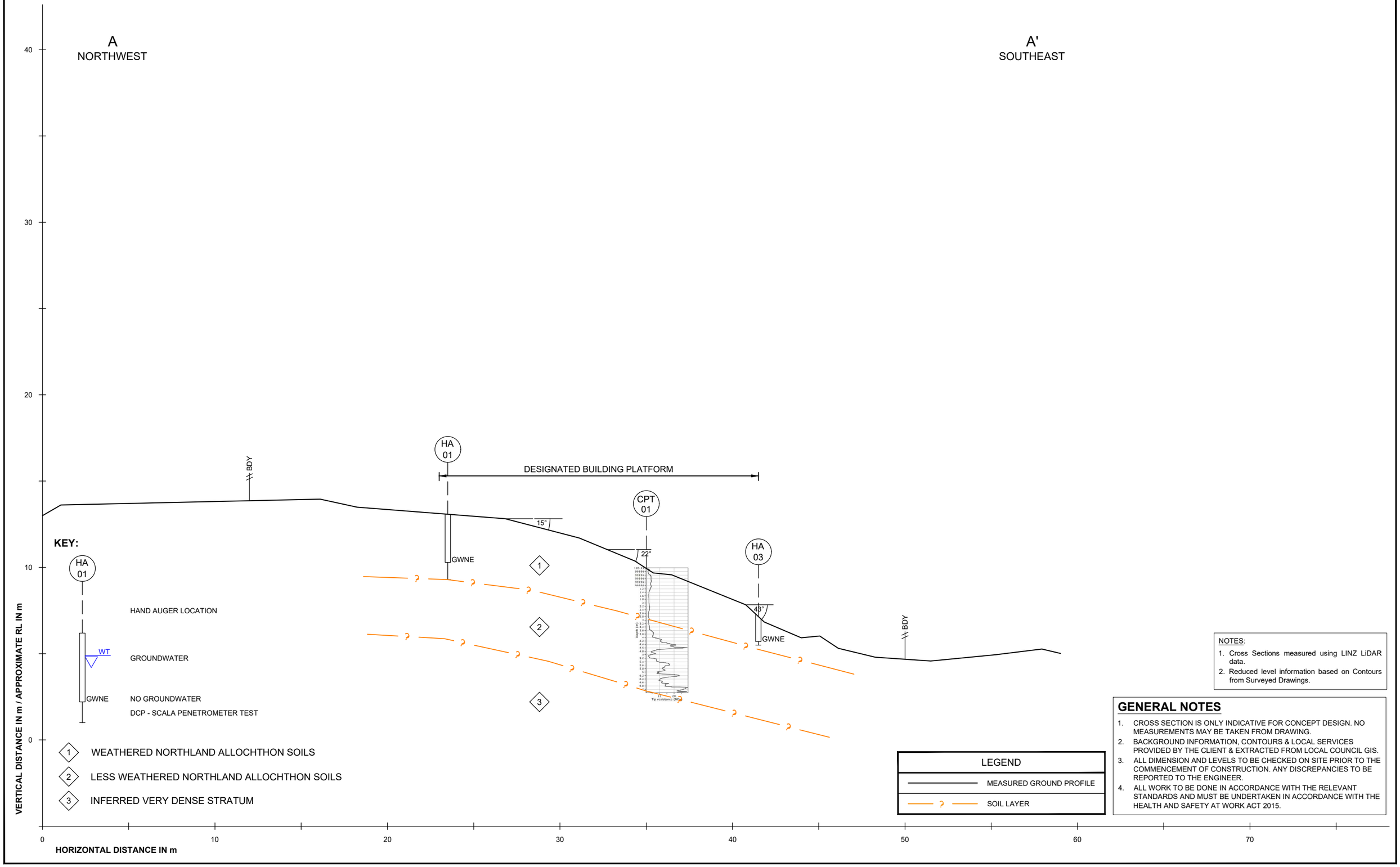
GEOTECHNICAL
DESIGN / DRAWING SUBJECT TO ENGINEER'S APPROVAL

DRAWING TITLE:
SITE PLAN

PROJECT DESCRIPTION:
PROPOSED SUBDIVISION (LOT 3 FOR ASSESSMENT)

PROJECT TITLE:
PART LOT 1 DP 13349
HOREKE ROAD
HOREKE
NORTHLAND

ORIGINAL DRAWING SIZE:	OFFICE:
A3	WHANGAREI
DRAWING SCALE:	CO-ORDINATE SYSTEM:
1:500	NOT COORDINATED
DRAWING NUMBER:	ISSUE:
146503-G600	A



NOTES:

1. Cross Sections measured using LINZ LiDAR data.
2. Reduced level information based on Contours from Surveyed Drawings.

GENERAL NOTES

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ISSUE / REVISION

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A	MAY 2026	A.B	ISSUED WITH GEOTECHNICAL REPORT

DESIGNED BY:
DRAWN BY: A.B
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SURVEYED BY:

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GEOTECHNICAL

DESIGN / DRAWING SUBJECT TO ENGINEER'S APPROVAL

DRAWING TITLE:
CROSS SECTION A-A'

PROJECT DESCRIPTION:
PROPOSED SUBDIVISION (LOT 3 FOR ASSESSMENT)

PROJECT TITLE:
**PART LOT 1 DP 13349
HOREKE ROAD
HOREKE
NORTHLAND**

ORIGINAL DRAWING SIZE:	OFFICE:
A3	WHANGAREI
DRAWING SCALE:	CO-ORDINATE SYSTEM:
1:200	NOT COORDINATED
DRAWING NUMBER:	ISSUE:
146503-G610	A

B
SOUTHWEST

B'
NORTHEAST

KEY:

HA 01 — HAND AUGER LOCATION

WT — GROUNDWATER

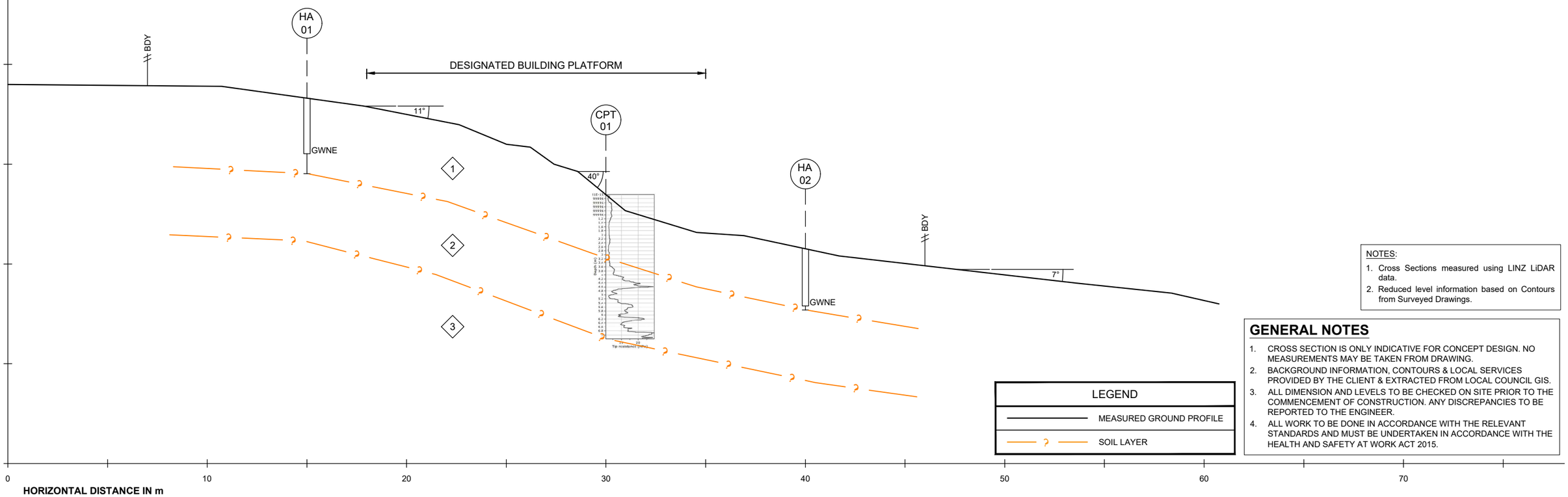
GWNE — NO GROUNDWATER

DCP - SCALA PENETROMETER TEST

1 — WEATHERED NORTHLAND ALLOCHTHON SOILS

2 — LESS WEATHERED NORTHLAND ALLOCHTHON SOILS

3 — INFERRED VERY DENSE STRATUM



LEGEND

- MEASURED GROUND PROFILE
- SOIL LAYER

NOTES:

1. Cross Sections measured using LINZ LiDAR data.
2. Reduced level information based on Contours from Surveyed Drawings.

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ISSUE / REVISION			
No.	DATE	BY	DESCRIPTION
A	MAY 2026	A.B	ISSUED WITH GEOTECHNICAL REPORT

DESIGNED BY:
DRAWN BY: A.B
CHECKED BY:
SURVEYED BY:

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GEOTECHNICAL
DESIGN / DRAWING SUBJECT TO ENGINEER'S APPROVAL

DRAWING TITLE:
CROSS SECTION B-B'

PROJECT DESCRIPTION:
PROPOSED SUBDIVISION (LOT 3 FOR ASSESSMENT)

PROJECT TITLE:
PART LOT 1 DP 13349
HOREKE ROAD
HOREKE
NORTHLAND

ORIGINAL DRAWING SIZE:	OFFICE:
A3	WHANGAREI
DRAWING SCALE:	CO-ORDINATE SYSTEM:
1:200	NOT COORDINATED

DRAWING NUMBER: **146503-G611**
ISSUE: **A**

HAND AUGER : HA01

JOB NO.: 146503 **SHEET:** 1 OF 1

START DATE: 24/04/2026 **NORTHING:** **GRID:**

CLIENT: Hauhungaroa 1C Corporation **DIAMETER:** 50mm **EASTING:**

PROJECT: Proposed Subdivision (Lot 3 for Assessment) **SV DIAL:** 1994 **ELEVATION:** Ground

SITE LOCATION: Part Lot 1 DP 13349, Horeke Road, Horeke **FACTOR:** 1.41 **DATUM:**

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE: PEAK STRENGTH (kPa)	SHEAR VANE: REMOULD STRENGTH (kPa)	SHEAR VANE: SENSITIVITY	DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS
Topsoil	TOPSOIL, dark brown, moist.	TS	0.0	Groundwater Not Encountered					
Punakitere Sandstone (Mangakahia Complex) in Northland Allochthon	NATURAL: SILT, minor clay, frequent clasts, brown, very stiff, moist, no plasticity.		0.2						
			0.4		152	39	3.9		
	Clayey SILT, orangey brown, very stiff, moist, low plasticity.		0.6						
			0.8		147	56	2.6		
			1.0						
			1.2		130	54	2.4		
	SILT, some clay, occasional clasts, orangey brown with grey mottles, very stiff, moist, no to low plasticity.		1.4						
			1.6		116	45	2.6		
			1.8						
	2.0m: Trace sand, frequent clasts, occasional gravels, moist to wet.		2.0		178	42	4.2		
			2.2						
			2.4		118	54	2.2		
	Clayey SILT, grey with orangey brown streaks, very stiff, moist, low to moderate plasticity.		2.6						
			2.8						
	EOH: 2.80m - Too Hard To Auger				UTP	-	-	13	
			3.0					8	
								7	
			3.2					4	
								5	
			3.4					10	
								13	
			3.6					15	
								17	
			3.8					20+	

REMARKS

End of borehole @ 2.80m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: JEM

CHECKED BY: CSH

▼ Standing groundwater level

▽ GW while drilling

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Website: www.wiltonjoubert.co.nz

HAND AUGER : HA02

JOB NO.: 146503 **SHEET:** 1 OF 1

START DATE: 24/04/2026 **NORTHING:** **GRID:**

CLIENT: Hauhungaroa 1C Corporation **DIAMETER:** 50mm **EASTING:**

PROJECT: Proposed Subdivision (Lot 3 for Assessment) **SV DIAL:** DR4802 **ELEVATION:** Ground

SITE LOCATION: Part Lot 1 DP 13349, Horeke Road, Horeke **FACTOR:** 1.39 **DATUM:**

TOPSOIL CLAY SAND PEAT FILL SILT GRAVEL ROCK

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE PEAK STRENGTH (kPa)	SHEAR VANE REMOULD STRENGTH (kPa)	SHEAR VANE SENSITIVITY	DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS
Topsoil	TOPSOIL, dark grey, wet to saturated.	TS	0.0	Groundwater Not Encountered					
Punakitere Sandstone (Mangakahia Complex) in Northland Allochthon	NATURAL: Silty CLAY, grey with orangey brown mottles, stiff, moist, moderate plasticity.		0.2						
	0.4m: Moderate to high plasticity.		0.4		75	25	3.0		
			0.6						
			0.8		58	25	2.3		
	1.1m: Occasional bluish grey seams, very stiff.		1.0						
			1.2		100	36	2.8		
	1.6m: 200mm lense of CLAY, trace to minor silt, stiff, high plasticity.		1.4		95	42	2.3		
	1.8m: Very stiff.		1.6						
			1.8						
	2.1m: Minor sand, occasional gravels, greyish blue with orangey brown and brown mottles.		2.0		117	53	2.2		
	CLAY, trace to minor silt, greyish blue with orangey brown and brown mottles, stiff, moist, high plasticity.		2.2						
	2.6m: Dark grey with blue and brown mottles.		2.4		78	50	1.6		
			2.6						
	Fine Gravelly SILT, dark bluish grey, hard, dry, no plasticity.		2.8		UTP	-	-		
	EOH: 2.90m - Too Hard To Auger		3.0		UTP	-	-	13	
			3.2					20+	
			3.4						
			3.6						
			3.8						

REMARKS

End of borehole @ 2.90m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: SJP

CHECKED BY: CSH

▼ Standing groundwater level

▽ GW while drilling

WILTON JOUBERT Consulting Engineers

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Website: www.wiltonjoubert.co.nz

HAND AUGER : HA03

JOB NO.: 146503 **SHEET:** 1 OF 1

START DATE: 24/04/2026 **NORTHING:** **GRID:**

CLIENT: Hauhungaroa 1C Corporation **DIAMETER:** 50mm **EASTING:**

PROJECT: Proposed Subdivision (Lot 3 for Assessment) **SV DIAL:** 1994 **ELEVATION:** Ground

SITE LOCATION: Part Lot 1 DP 13349, Horeke Road, Horeke **FACTOR:** 1.41 **DATUM:**

TOPSOIL CLAY SAND PEAT FILL SILT GRAVEL ROCK

STRATIGRAPHY	SOIL DESCRIPTION	LEGEND	DEPTH (m)	WATER	SHEAR VANE PEAK STRENGTH (kPa)	SHEAR VANE REMOULD STRENGTH (kPa)	SHEAR VANE SENSITIVITY	DCP - SCALA (Blows / 100mm)	COMMENTS, SAMPLES, OTHER TESTS
Topsoil	TOPSOIL, dark brown, moist.								
Punakitere Sandstone (Mangakahia Complex) in Northland Allochthon	NATURAL: SILT, minor clay, brown, very stiff, dry to moist, no plasticity.		0.2	Groundwater Not Encountered					
	0.5m: Orangey brown.		0.4		UTP	-	-		
	Clayey SILT, orangey brown with grey mottles, very stiff, moist, low plasticity.		0.6						
			0.8		197+	-	-		
			1.0						
			1.2		169	42	4.0		
	SILT, trace to minor clay, frequent clasts and occasional gravels, grey and brown with orangey brown streaks, very stiff to hard, dry, no plasticity.		1.4						
			1.6		UTP	-	-	13	
	EOH: 1.60m - Too Hard To Auger		1.8					20+	
			2.0						
			2.2						
			2.4						
			2.6						
			2.8						
			3.0						
			3.2						
			3.4						
			3.6						
			3.8						

REMARKS

End of borehole @ 1.60m (Target Depth: 5.00m)

NZGS Definition of Relative Density for Coarse Grain soils: VL - Very Loose; L - Loose; MD - Medium Dense; D - Dense; VD - Very Dense

LOGGED BY: JEM

CHECKED BY: CSH

▼ Standing groundwater level

▽ GW while drilling

WILTON JOUBERT Consulting Engineers

185 Waipapa Road, Kerikeri 0295
Phone: 09-945 4188
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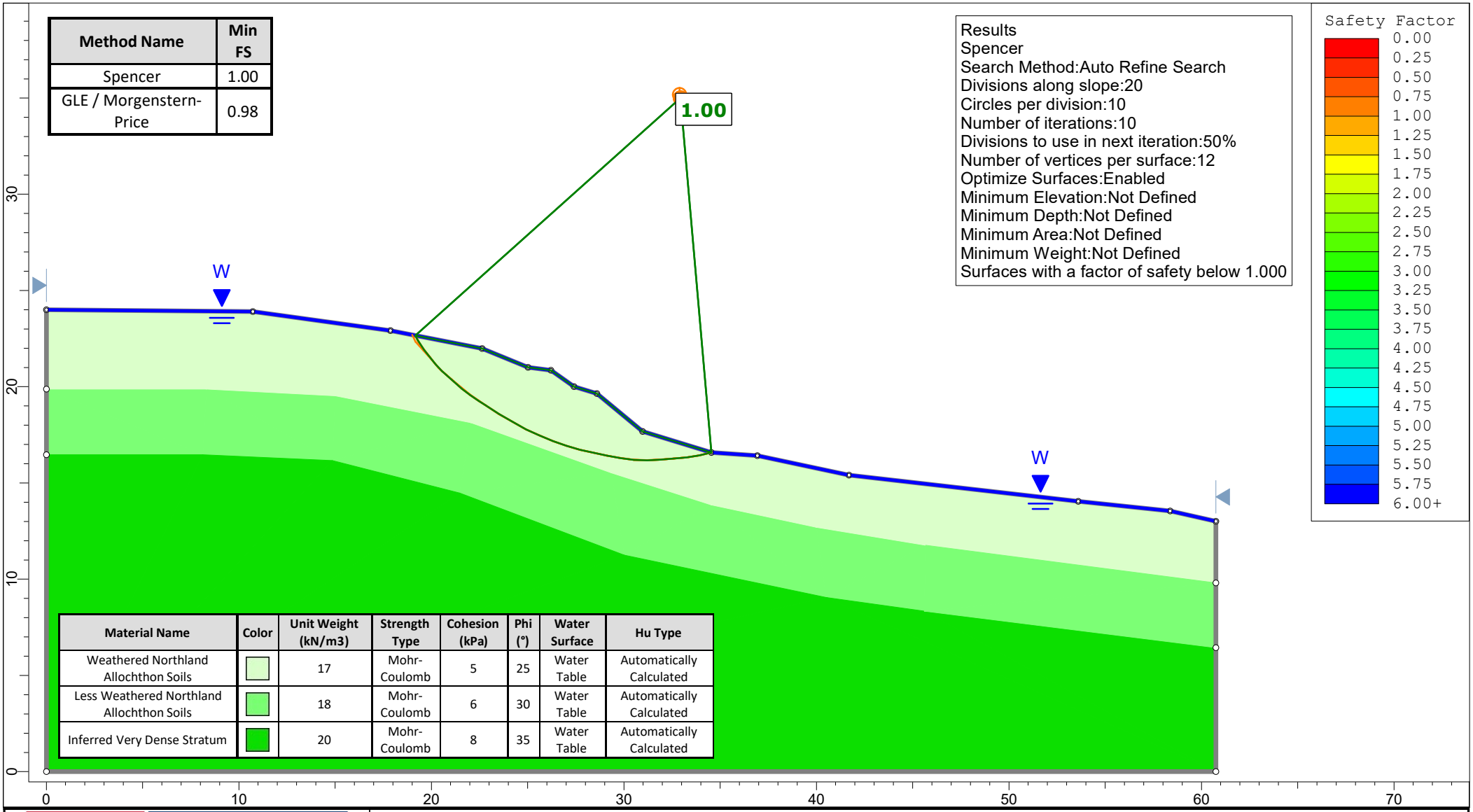
Method Name	Min FS
Spencer	1.00
GLE / Morgenstern-Price	0.98

Results
Spencer
Search Method:Auto Refine Search
Divisions along slope:20
Circles per division:10
Number of iterations:10
Divisions to use in next iteration:50%
Number of vertices per surface:12
Optimize Surfaces:Enabled
Minimum Elevation:Not Defined
Minimum Depth:Not Defined
Minimum Area:Not Defined
Minimum Weight:Not Defined
Surfaces with a factor of safety below 1.000

Safety Factor
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
2.25
2.50
2.75
3.00
3.25
3.50
3.75
4.00
4.25
4.50
4.75
5.00
5.25
5.50
5.75
6.00+

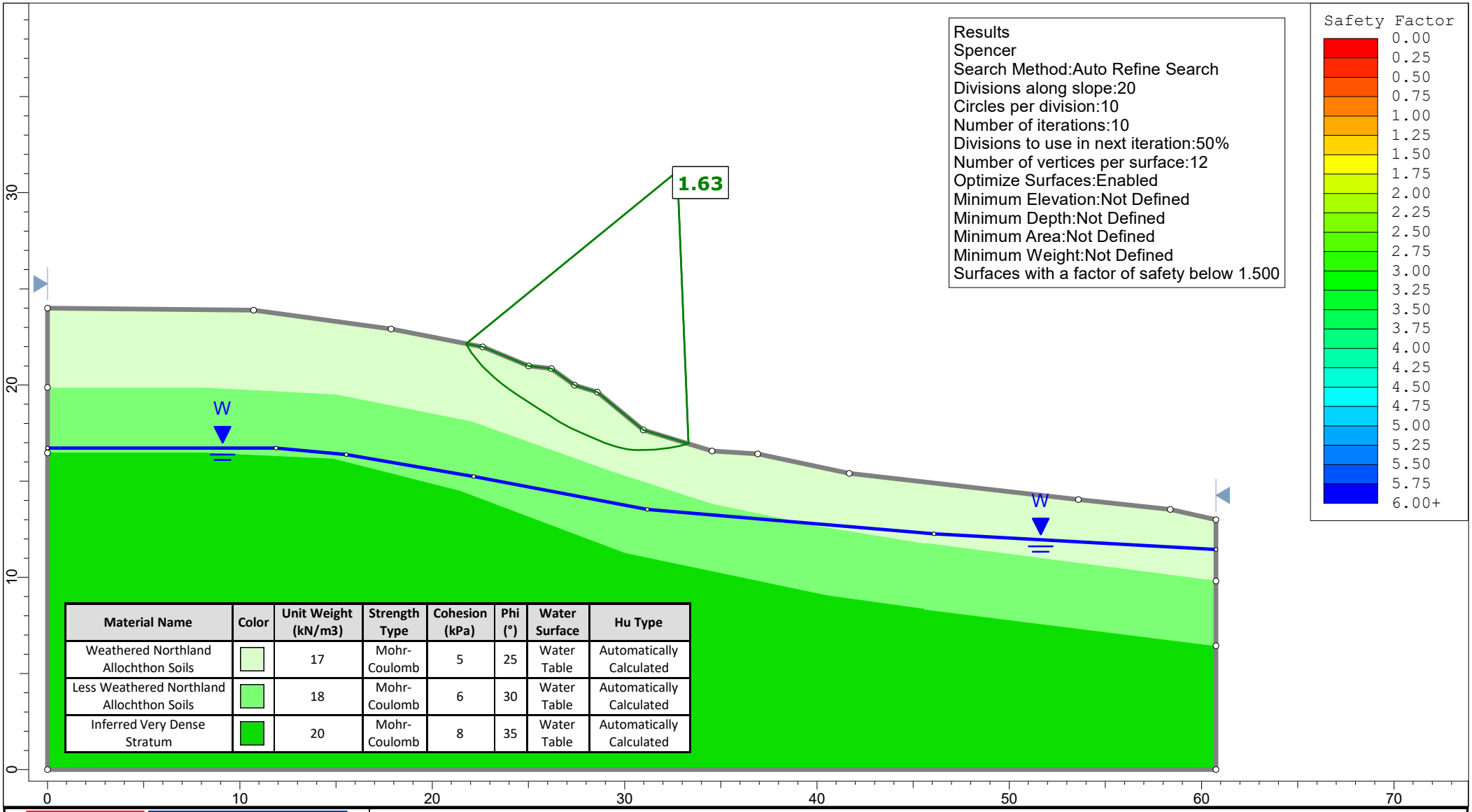


Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface	Hu Type
Weathered Northland Allochthon Soils		17	Mohr-Coulomb	5	25	Water Table	Automatically Calculated
Less Weathered Northland Allochthon Soils		18	Mohr-Coulomb	6	30	Water Table	Automatically Calculated
Inferred Very Dense Stratum		20	Mohr-Coulomb	8	35	Water Table	Automatically Calculated

WILTON JOUBERT
Consulting Engineers

SLIDEINTERPRET 9.040

Project	146503 - Horeke Road, Horeke		
Group	Cross Section B - B'	Scenario	Surficial Groundwater Level
Drawn By	A.B	Company	Wilton Joubert Limited
Date	7/05/2026	File Name	146503 - BB - Back Analysis.slmd



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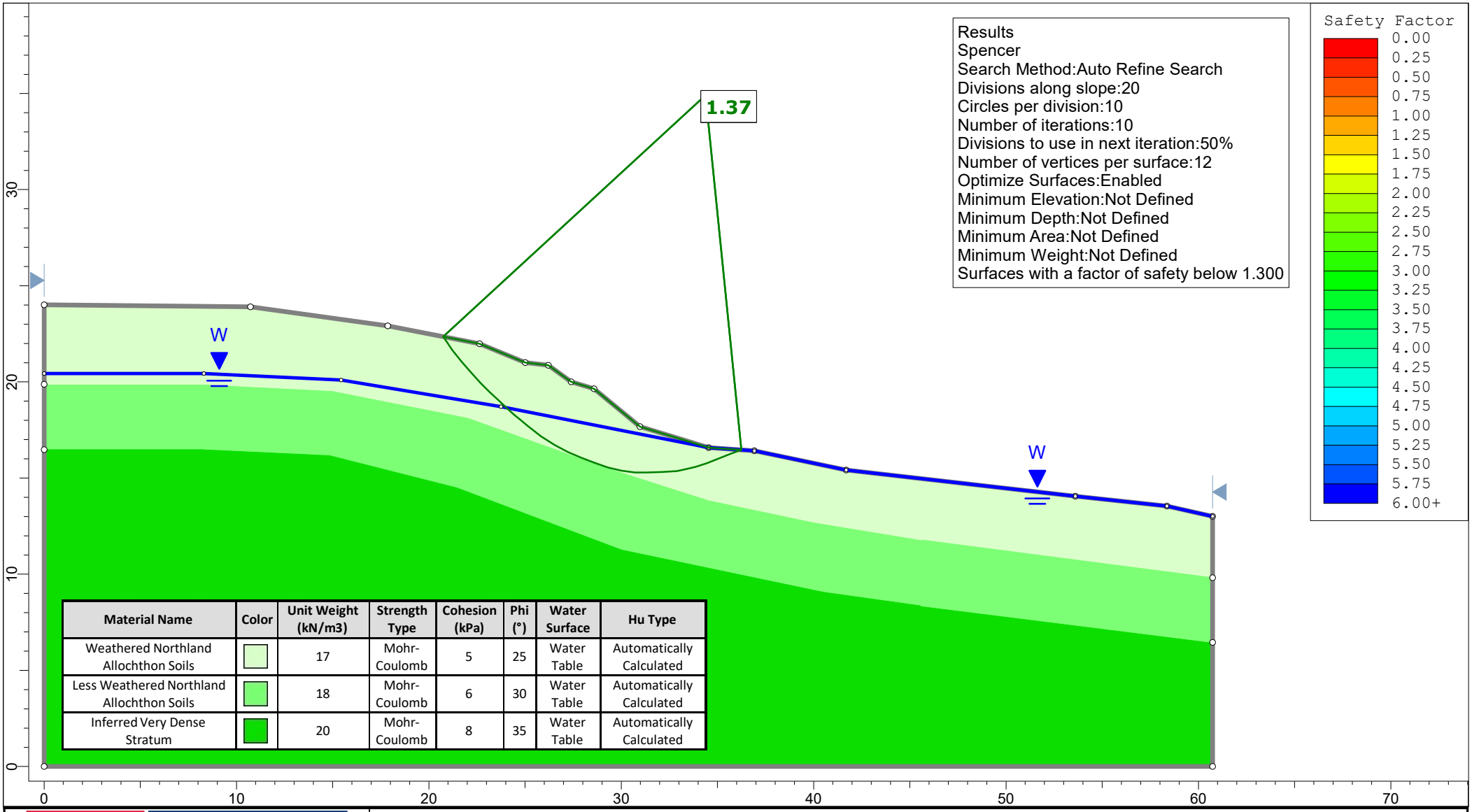
Inferred Very Dense Stratum		20	Mohr-Coulomb	8	35	Water Table	Automatically Calculated

WILTON JOUBERT
Consulting Engineers

SLIDEINTERPRET 9.040

Project	146503 - Horeke Road, Horeke		
Group	Cross Section B - B' - Proposed	*Scenario*	Measured Groundwater Level
Drawn By	A.B	*Company*	Wilton Joubert Limited
Date	11/05/2026	*File Name*	146503 - BB.slmd



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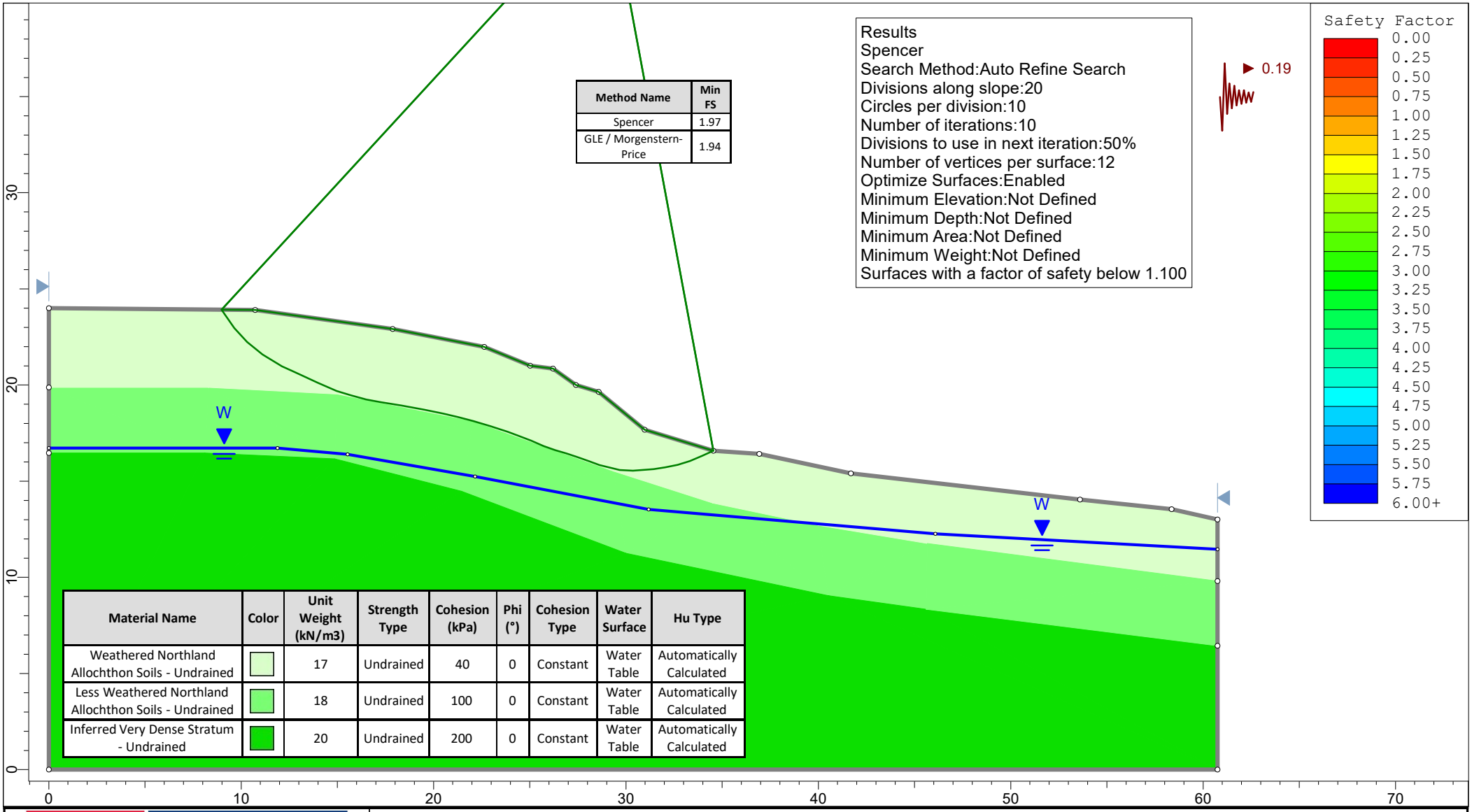
WILTON JOUBERT
Consulting Engineers

SLIDEINTERPRET 9.040

Project	146503 - Horeke Road, Horeke		
Group	Cross Section B - B' - Proposed	*Scenario*	Elevated Groundwater Level
Drawn By	A.B	*Company*	Wilton Joubert Limited
Date	11/05/2026	*File Name*	146503 - BB.slmd



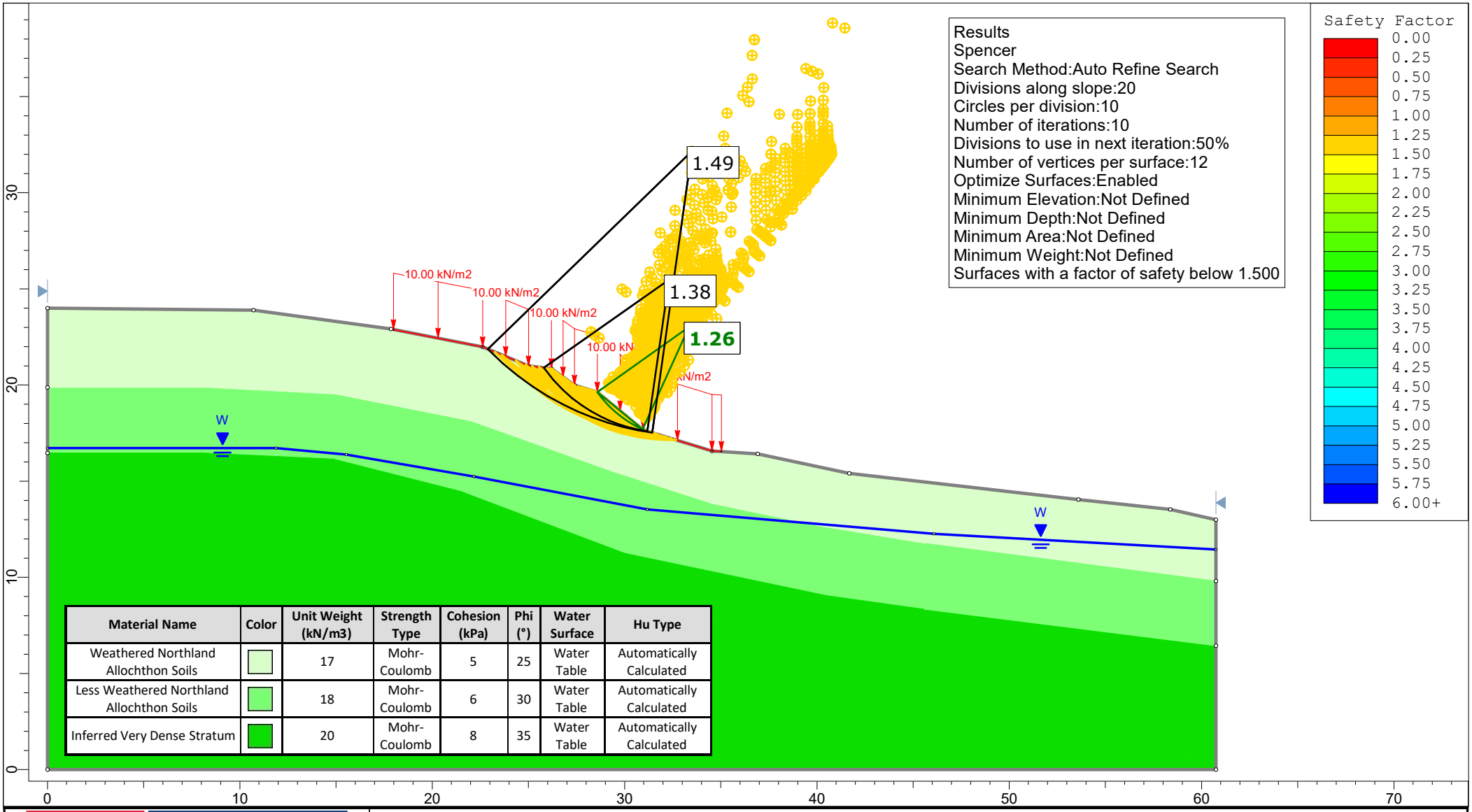
Method Name	Min FS
Spencer	1.97
GLE / Morgenstern-Price	1.94

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Cohesion Type	Water Surface	Hu Type
Weathered Northland Allochthon Soils - Undrained		17	Undrained	40	0	Constant	Water Table	Automatically Calculated
Less Weathered Northland Allochthon Soils - Undrained		18	Undrained	100	0	Constant	Water Table	Automatically Calculated
Inferred Very Dense Stratum - Undrained		20	Undrained	200	0	Constant	Water Table	Automatically Calculated

WILTON JOUBERT
Consulting Engineers

SLIDEINTERPRET 9.040

Project	146503 - Horeke Road, Horeke		
Group	Cross Section B - B' - Proposed	*Scenario*	Measured Groundwater Level - Seismic
Drawn By	A.B	*Company*	Wilton Joubert Limited
Date	11/05/2026	*File Name*	146503 - BB.slmd



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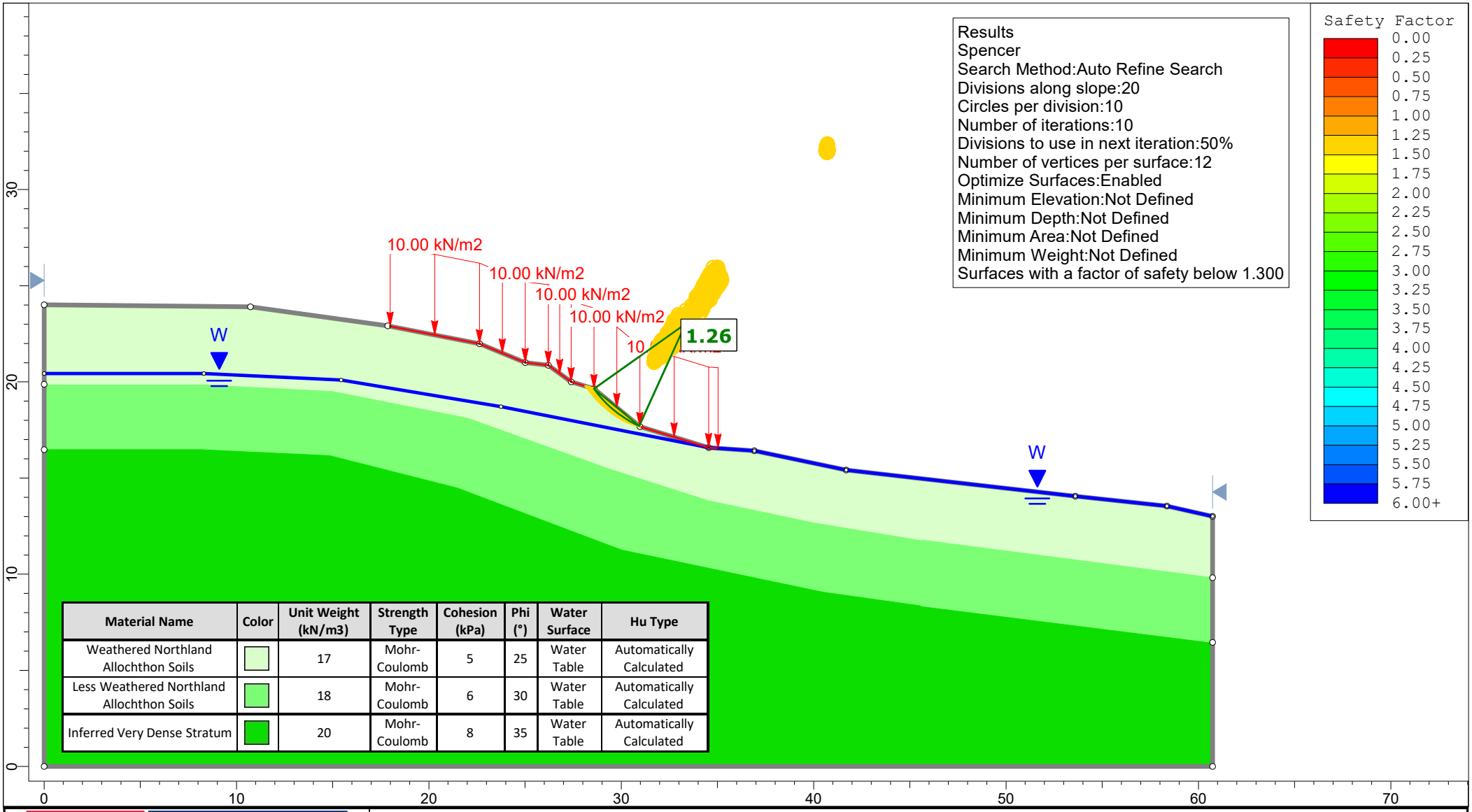
WILTON JOUBERT
Consulting Engineers

SLIDEINTERPRET 9.040

Project	146503 - Horeke Road, Horeke		
Group	Cross Section B - B' - Proposed	Scenario	Measured Groundwater Level
Drawn By	A.B	Company	Wilton Joubert Limited
Date	8/05/2026	File Name	146503 - BB.slmd



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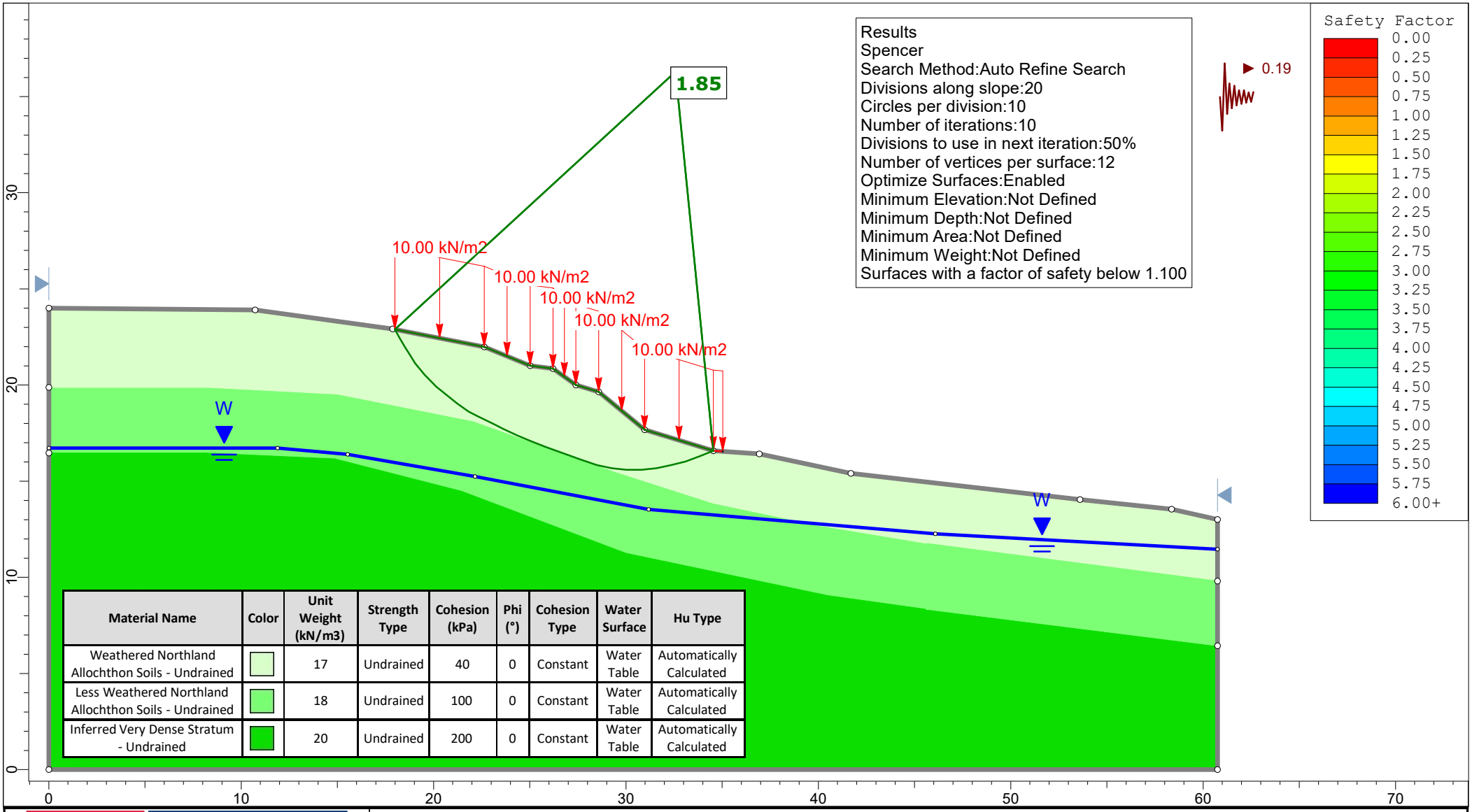
WILTON JOUBERT
Consulting Engineers

SLIDEINTERPRET 9.040

Project	146503 - Horeke Road, Horeke		
Group	Cross Section B - B' - Proposed	*Scenario*	Elevated Groundwater Level
Drawn By	A.B	*Company*	Wilton Joubert Limited
Date	8/05/2026	*File Name*	146503 - BB.slmd



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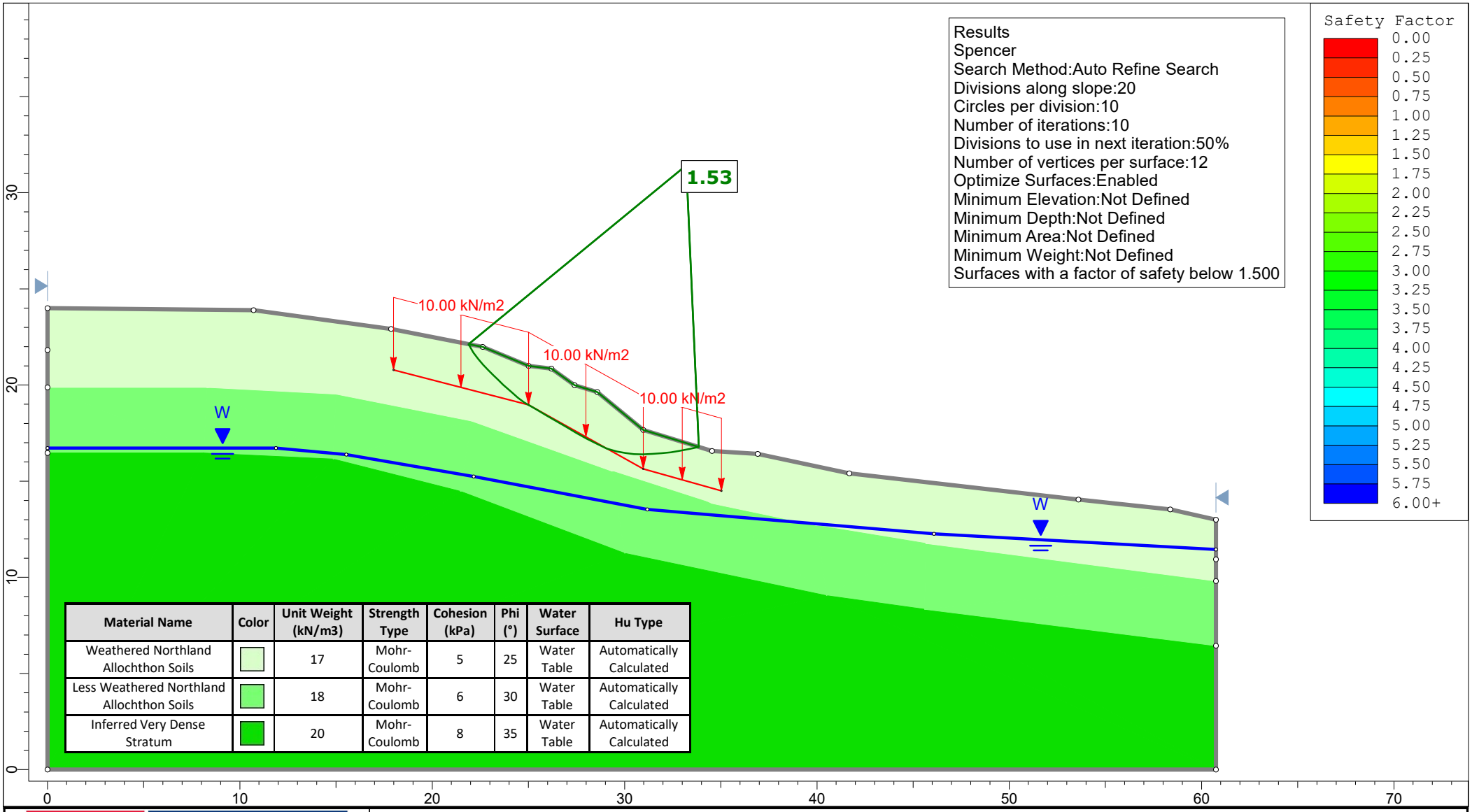
WILTON JOUBERT
Consulting Engineers

SLIDEINTERPRET 9.040

Project	146503 - Horeke Road, Horeke		
Group	Cross Section B - B' - Proposed	*Scenario*	Measured Groundwater Level - Seismic
Drawn By	A.B	*Company*	Wilton Joubert Limited
Date	8/05/2026	*File Name*	146503 - BB.slmd



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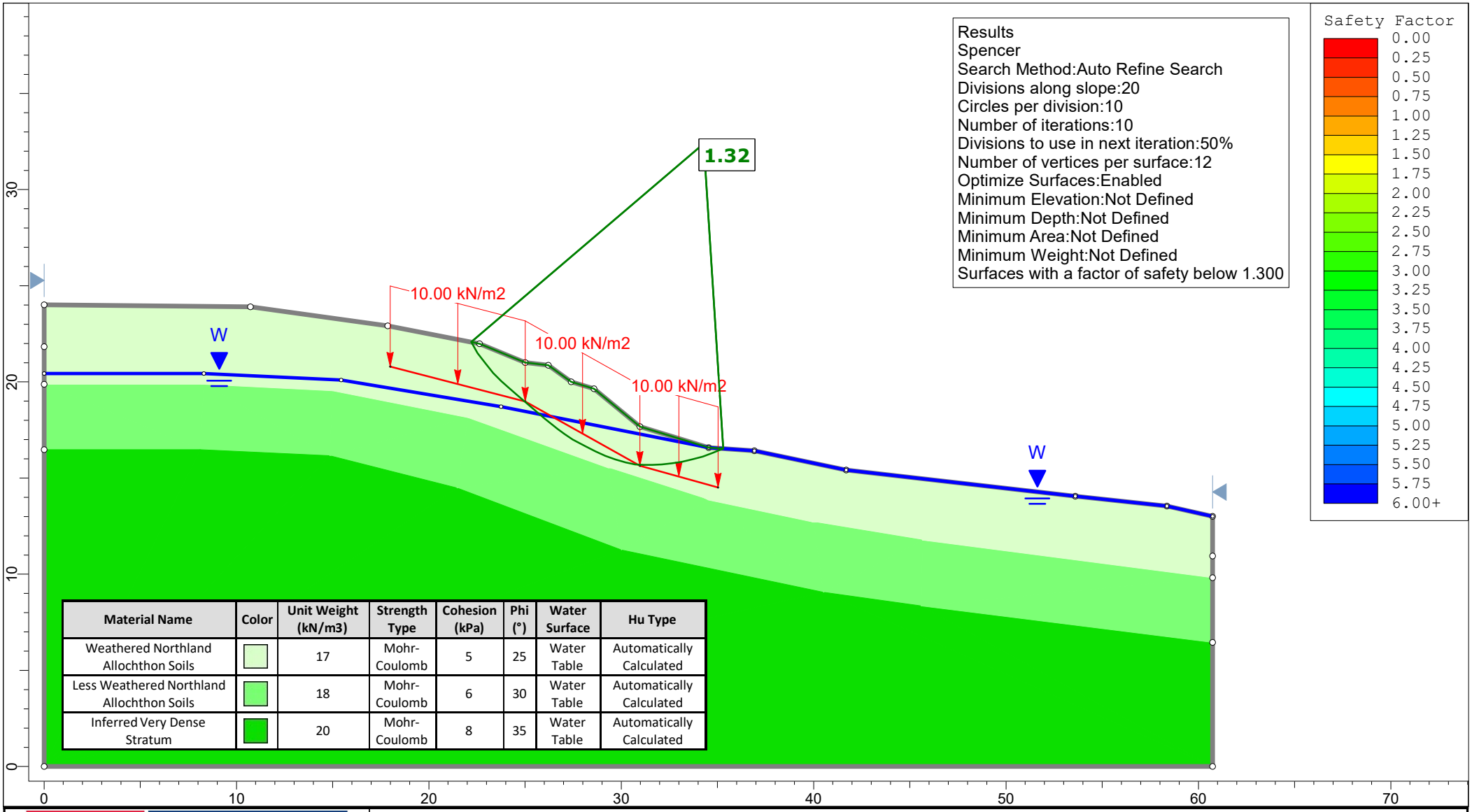
Consulting Engineers

SLIDEINTERPRET 9.040

Project	146503 - Horeke Road, Horeke		
Group	Cross Section B - B' - Proposed	*Scenario*	Measured Groundwater Level
Drawn By	A.B	*Company*	Wilton Joubert Limited
Date	11/05/2026	*File Name*	146503 - BB.slmd



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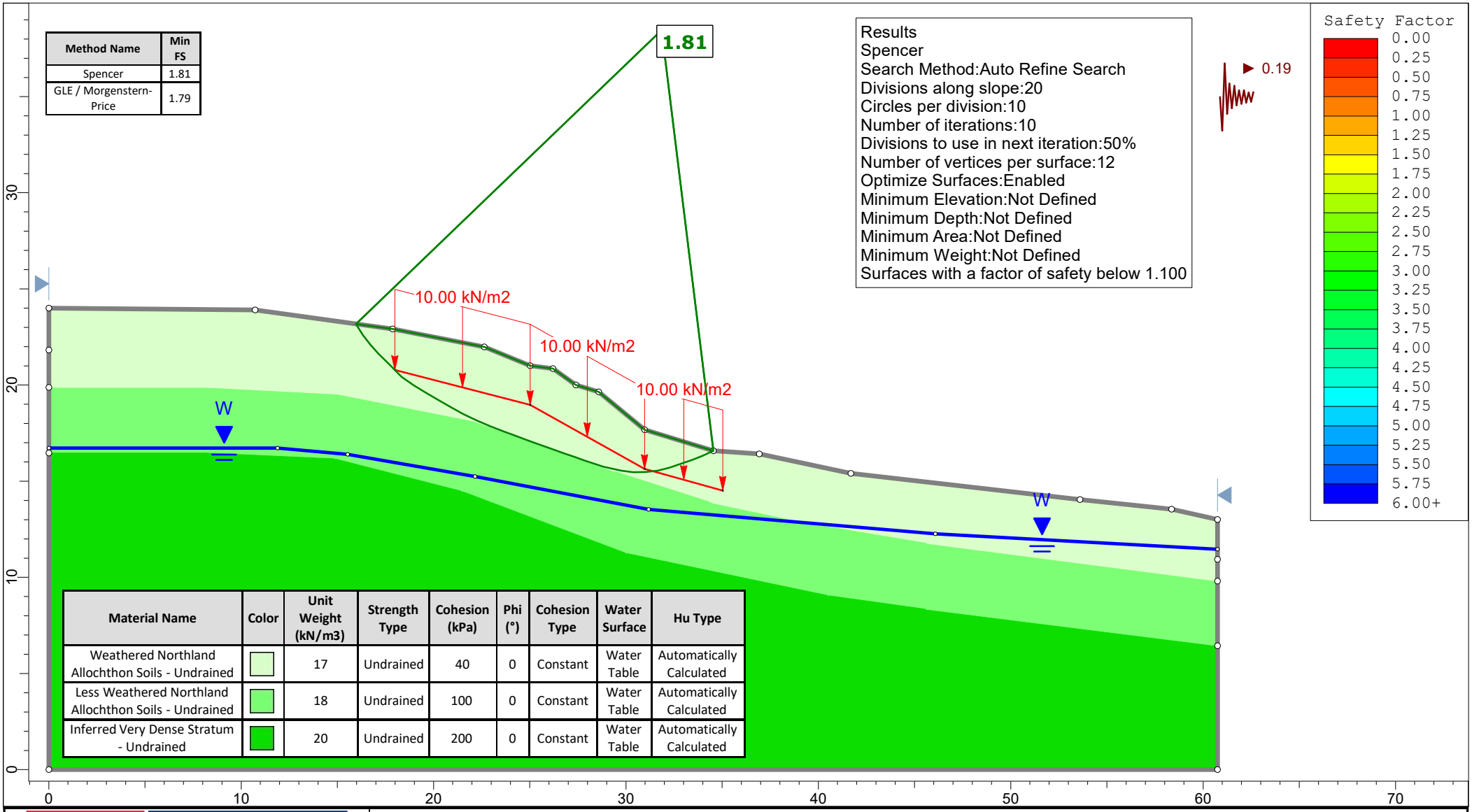
WILTON JOUBERT
Consulting Engineers

SLIDEINTERPRET 9.040

Project	146503 - Horeke Road, Horeke		
Group	Cross Section B - B' - Proposed	*Scenario*	Elevated Groundwater Level
Drawn By	A.B	*Company*	Wilton Joubert Limited
Date	11/05/2026	*File Name*	146503 - BB.slmd



Method Name	Min FS
Spencer	1.81
GLE / Morgenstern-Price	1.79

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Cohesion Type	Water Surface	Hu Type
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WILTON JOUBERT
Consulting Engineers

SLIDEINTERPRET 9.040

Project	146503 - Horeke Road, Horeke		
Group	Cross Section B - B' - Proposed	*Scenario*	Measured Groundwater Level - Seismic
Drawn By	A.B	*Company*	Wilton Joubert Limited
Date	11/05/2026	*File Name*	146503 - BB.slmd

CPT Client Engagement / Quote Request

Project Details		Date	21/04/2026
Project Name	Proposed Development	Job Identifier	WJL 4233 Horeke Rd
Project Address	4233 Horeke Rd		
Engineering Consultant Company Name	Wilton Jubert Ltd	Engineering Project Manager	Shaun Page
Email		Mobile	
Client Name		Client Contact Details	

Test Requirements - CPT		Preferred Job Completion Date	
Target No of CPT Tests Required	1	Maximum Test Depth Required	20m/Refusal
No of CPT Tests Required Through Pavement or Other Hard Surface		Type and Thickness of Hard Surface	
Other Requirements Outside Standard Greenfield Testing			

Please note: Service clearance is to be provided by the client or their agents and details are to be provided to the CPT operator prior to Underground Investigation Ltd commencing work. Any delays due to service clearance or H&S approvals will be at the clients expense and may reduce the amount of testing being able to be completed in the working day.

Test Requirements - Dissipation Testing		Please List Test No and Approximate Target Depth of Dissipation	
Test No	Depth	Test No	Depth

Please note: In order to provide useful dissipation data, UIL recommends carrying out at least one CPT prior to carrying out dissipation in order to select appropriate depths for testing. It is preferred if the Geotechnical Engineer for the project discusses this with the CPT operator after completion of the initial testing.

Any Other Site Requirements

UNDERGROUND INVESTIGATION

CPT Equipment Information

CPT Rig Type	Geotech AB - Georig 220	Maximum Push Capacity	10/09/2025
Any Deviations From Common Setup		Reaction Restraint	RSE Whirinaki
Cone Penetrometer	RS Eng	Cone Penetrometer Type	Matthew Jacobson
Manufacturer	Geotech AB	Load Cell Configuration	Compresion
Tip Area	10cm	Pore Pressure Type	U_2
Full Scale Output of Sensors	q_c : 100 MPa	f_s : 1 MPa	u_2 : 2 MPa
Calibration Test Class	13	Saturation Method	20/Refusal
Temprature Sensor	No	Data Interval	10mm
Temprature Conditioning	Cone Warmer set to 20° C	Typical Cone Temprature at Start of Test	16-20° C
Any Deviations From Above			

UNDERGROUND INVESTIGATION

CPT Test Information

Test Hole Number	CPT101	Job Identifier	WJL 4233 Horeke Rd
Test Date	21/04/2026	Operator	CG/TF
Cone Serial Number	5708	Battery Voltage Start	6.45
Cone Area Ratio	0.849	Start Recording	9:37:00 AM
Probe Radius	0.0177	Finish Recording	9:50:00 AM
Date of First Push Current Calibration	21/11/2024	Measured Ground Water Depth	EOB 7.1m dry
Metres To Next Calibration	56	Total Penetration Depth (m)	7.165
Depth of Predrill	0	Test ended due to:	☐ High Tilt ☑ High Tip Pressure ☐ High Friction ☐ High Pore Pressure ☐ High Total load ☐ Danger of Rods Buckling ☐ Target Depth ☑ Anchor Failure
Depth at Start of Test	0		
Anchor Depth (Left)	1.5		
Anchor Depth (Right)	1.5		

Zero Value Change % FSO

	Point Resistance	Pore Pressure	Sleeve Friction
Zero Shift Since First Push Current Calibration	0.11%	0.05%	0.08%
End of test with tip loosened	0.02%	0.05%	0.44%

Dissipation Testing

Test No	Depth (m)	Duration (secs)	Comments

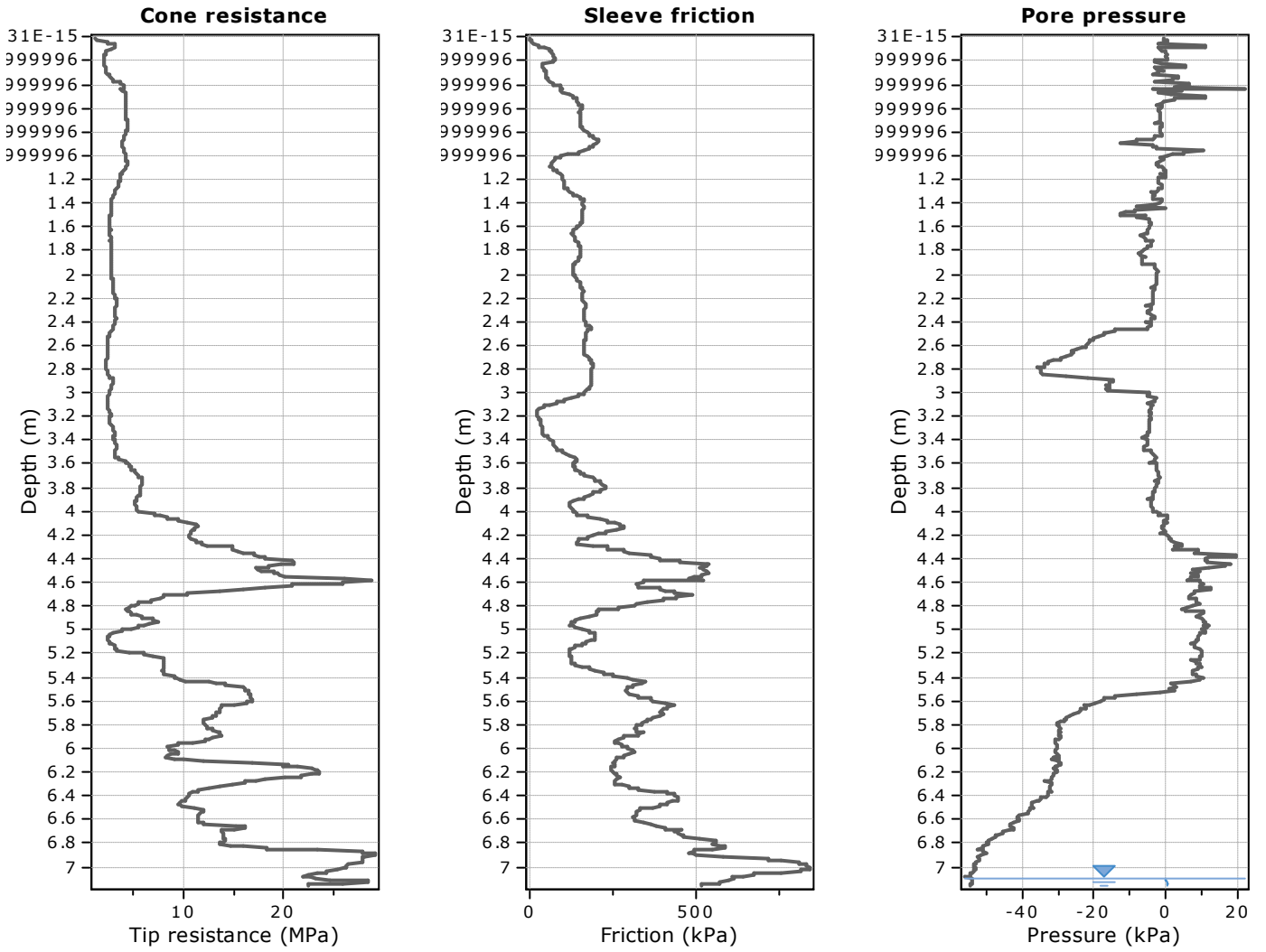
Notes and Comments

Data loss (typically at rod change points). Either deleted or averaged	qc	fs	u

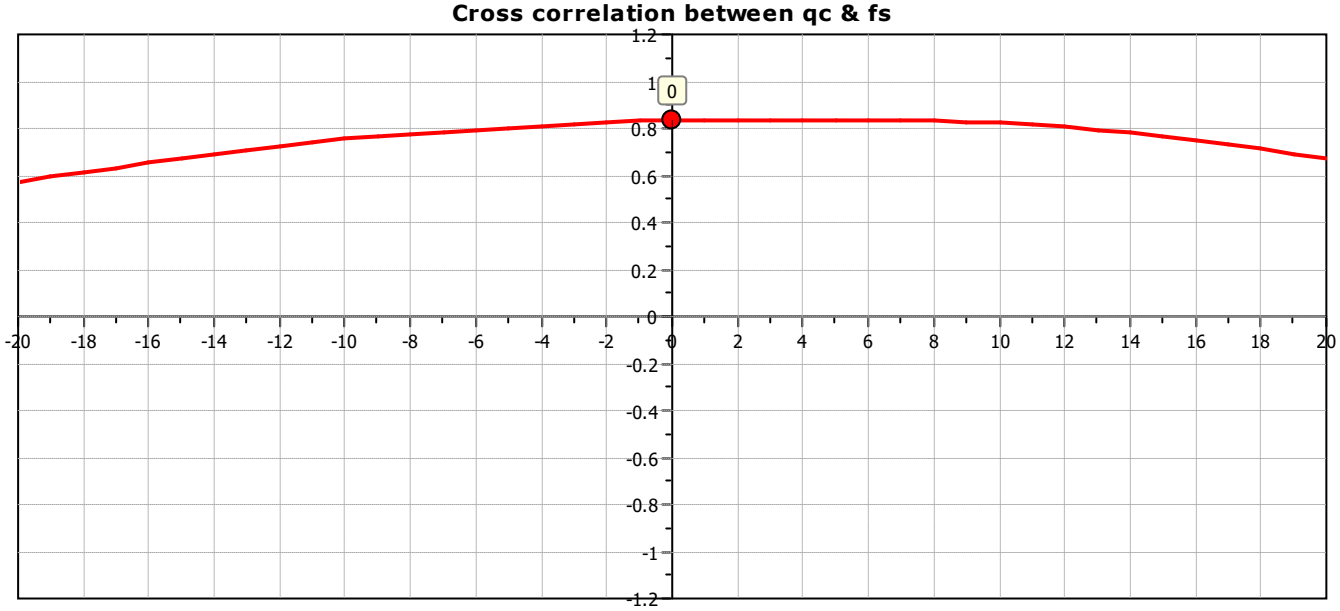
Underground Investigation Ltd
Cone Penetration Testing
craig@undergroundinvestigation.co.nz
+64211473249

CPT: CPT01
Total depth: 7.16 m, Date: 4/22/2026
Surface Elevation: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

Project:
Location:



The plot below presents the cross correlation coeficient between the raw qc and fs values (as measured on the field). X axes presents the lag distance (one lag is the distance between two sucessive CPT measurements).



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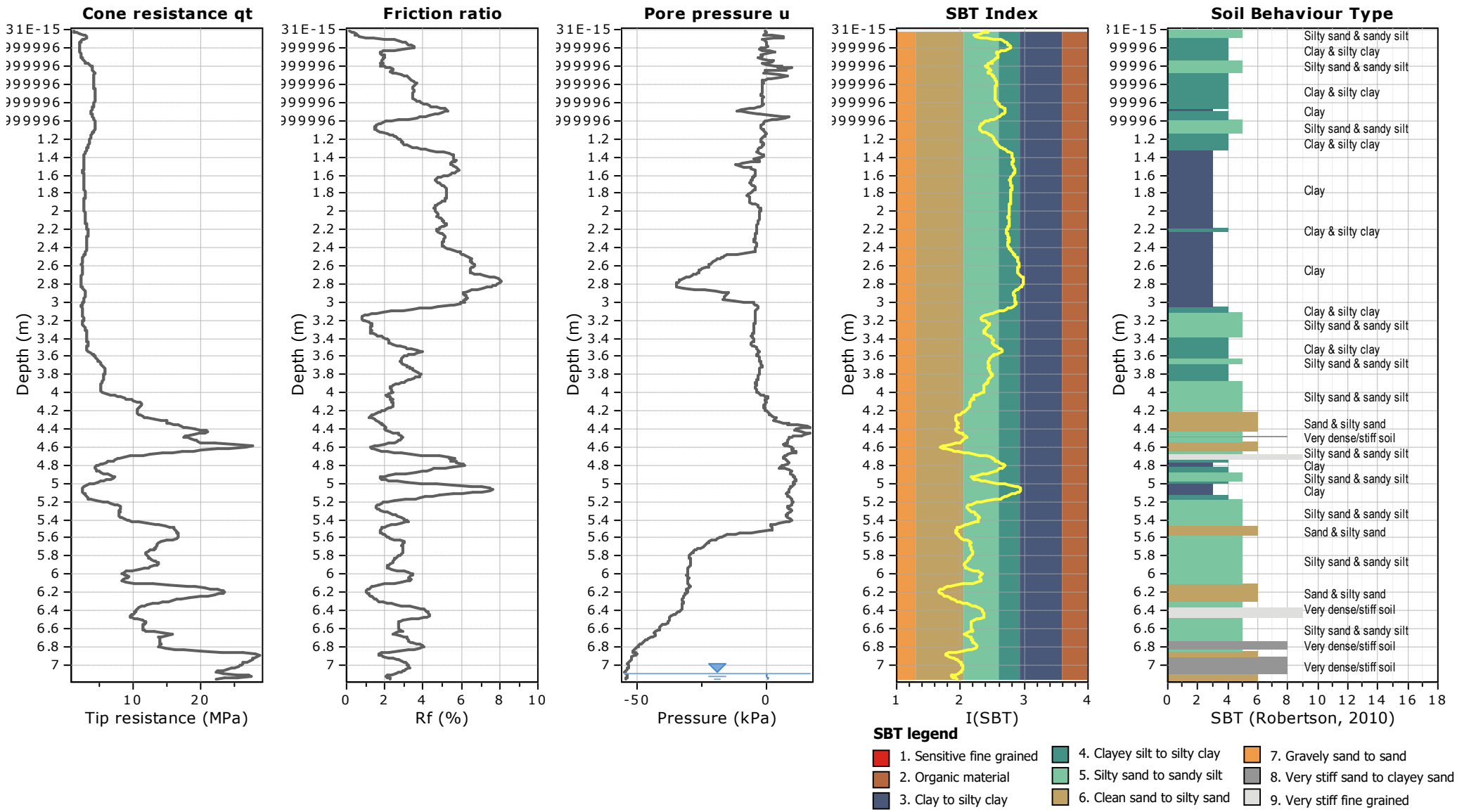

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Cone Penetration Testing
craig@undergroundinvestigation.co.nz
+64211473249

CPT: CPT01
Total depth: 7.16 m, Date: 4/22/2026
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Coords: X:0.00, Y:0.00
Cone Type:
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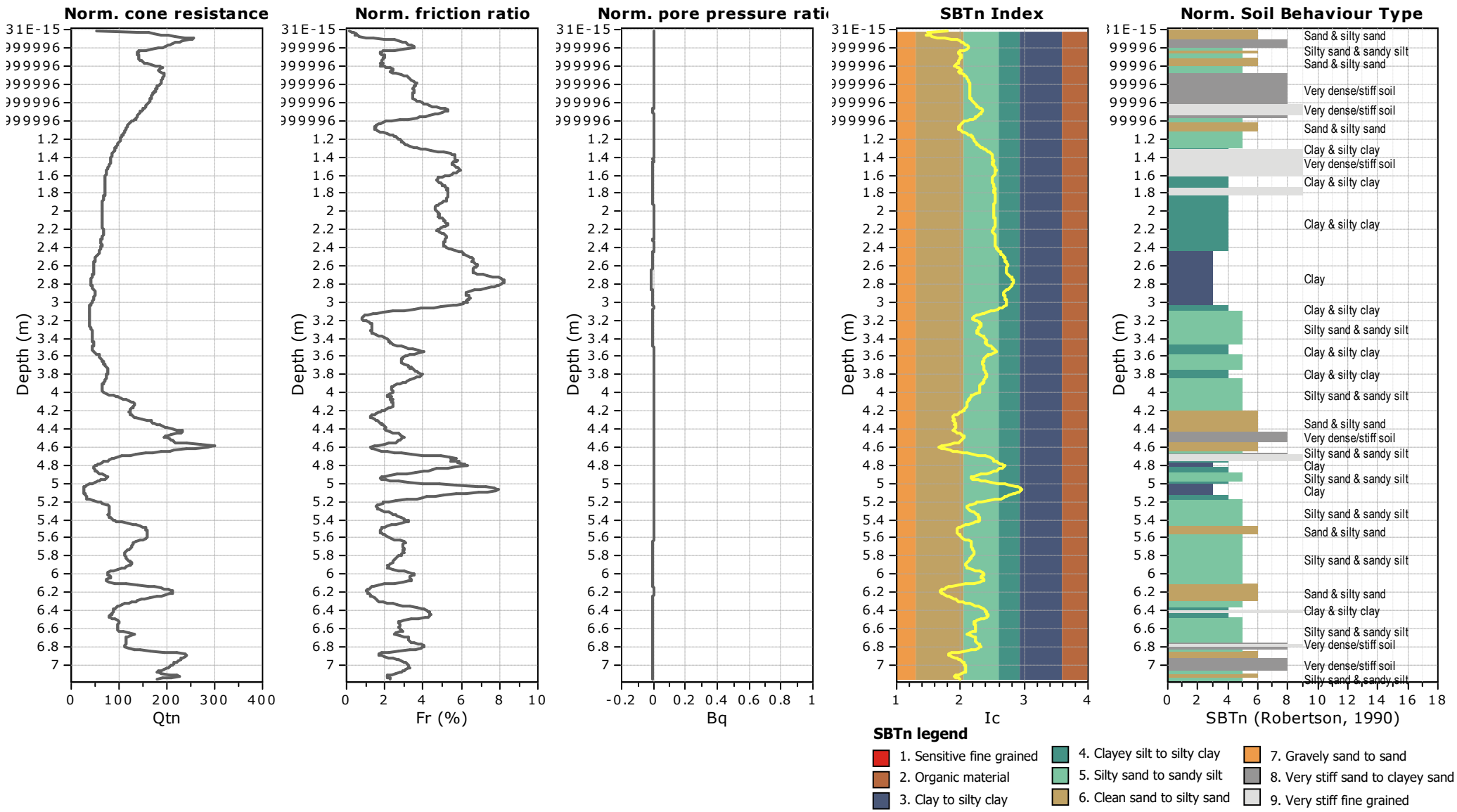
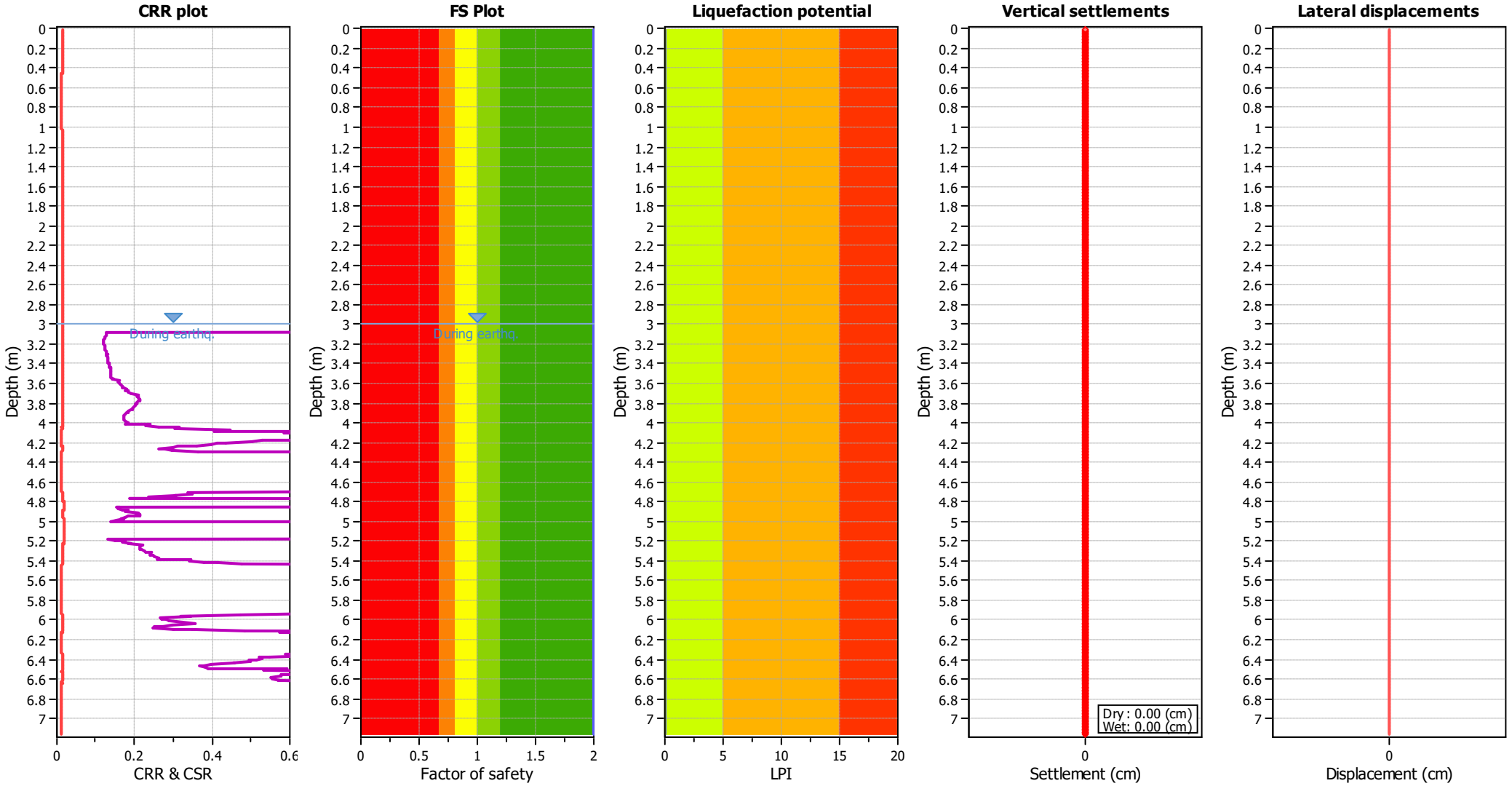


Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	3.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.03	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	7.10 m	Fill height:	N/A	Limit depth:	10.00 m

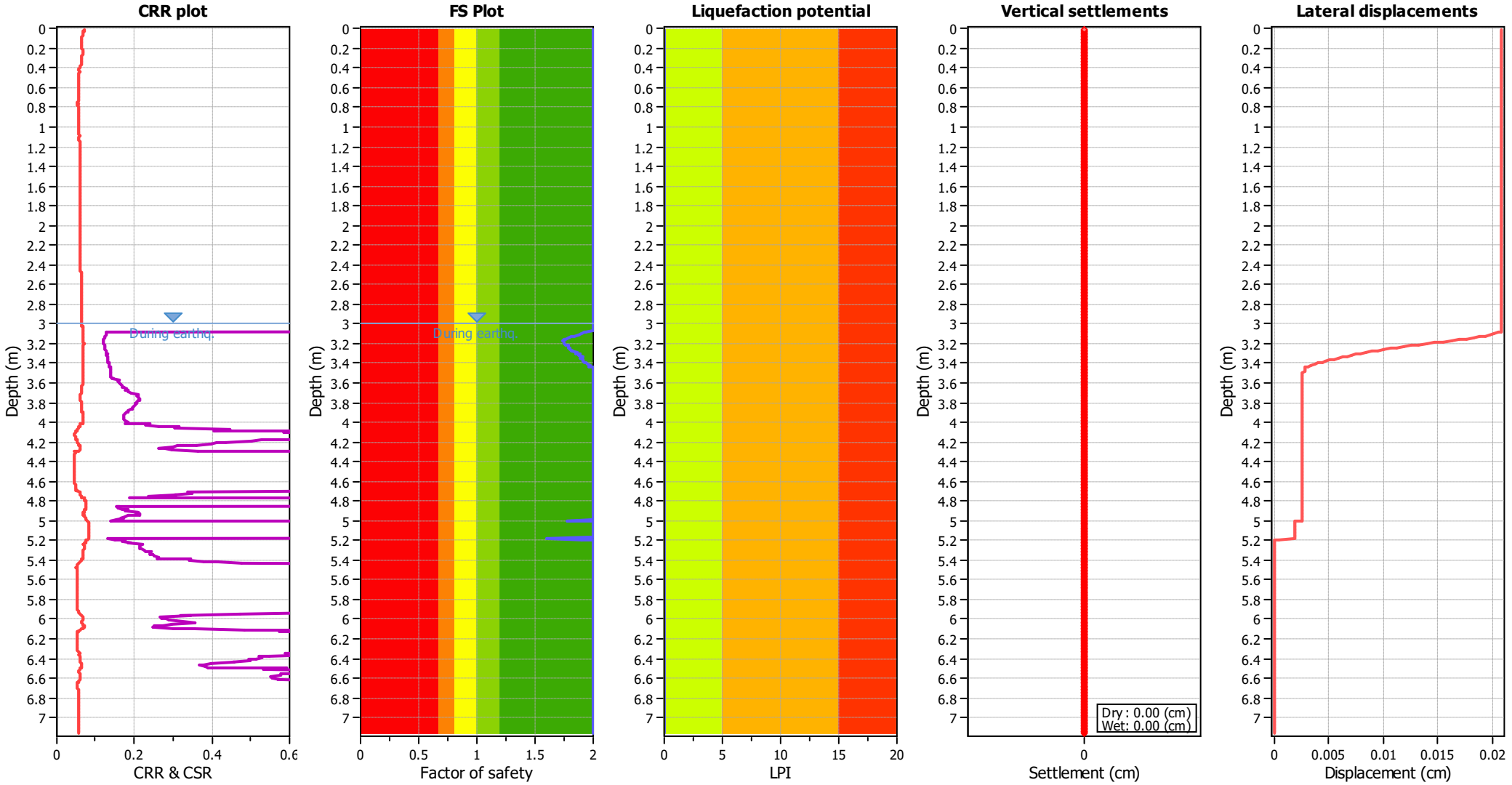
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	3.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.13	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	7.10 m	Fill height:	N/A	Limit depth:	10.00 m

F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
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LPI color scheme

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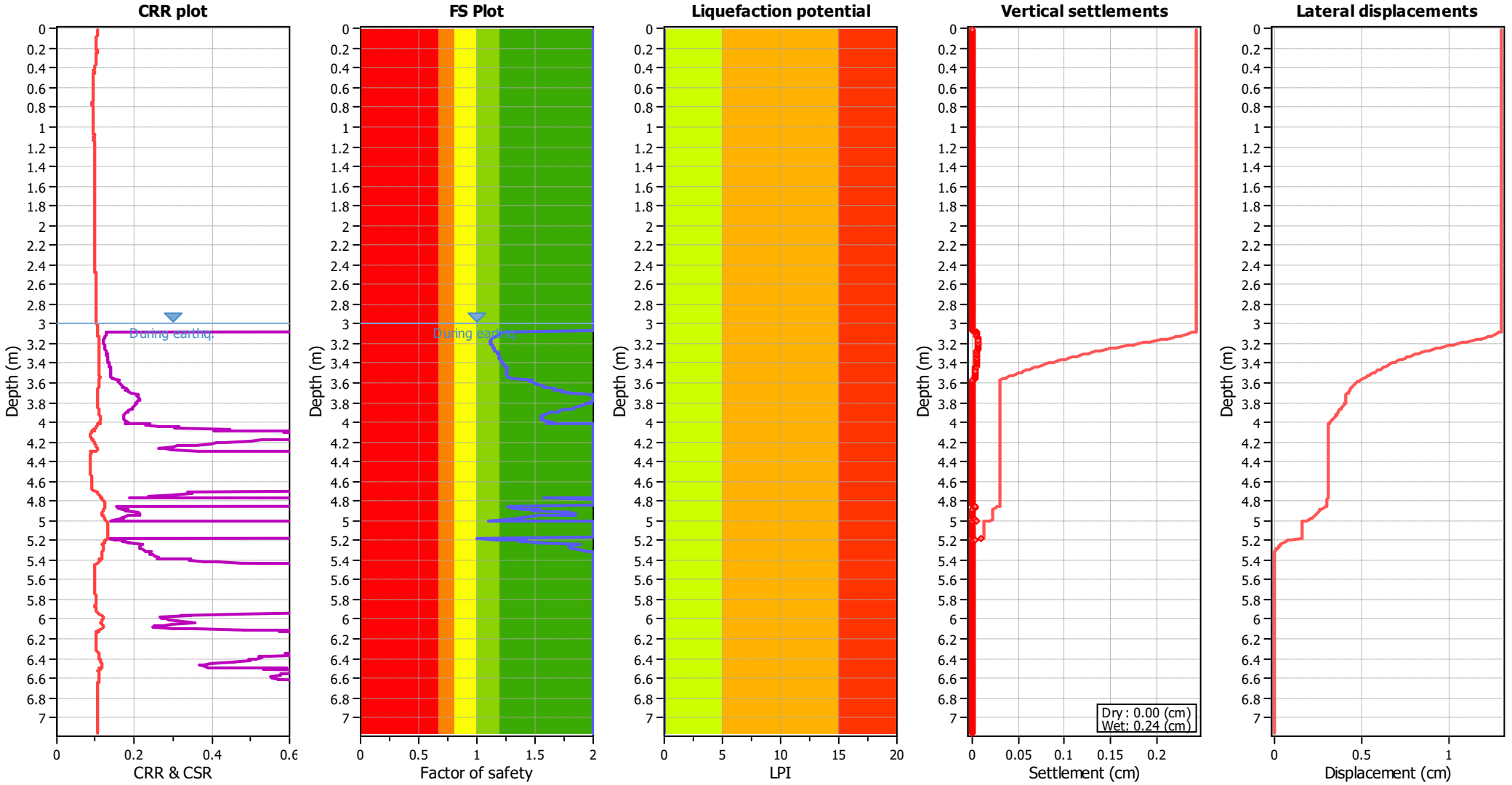
Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	3.00 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.19	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	7.10 m	Fill height:	N/A	Limit depth:	10.00 m

F.S. color scheme

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- Very likely to liquefy
- Liquefaction and no liq. are equally likely
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LPI color scheme

- Very high risk
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FOUNDATION MAINTENANCE AND FOOTING PERFORMANCE

Preventing soil-related building movement

This Building Technology Resource is designed as a homeowner's guide on the causes of soil-related building movement, and suggested methods to prevent resultant cracking.

Buildings can and often do move. This movement can be up, down, lateral or rotational. The fundamental cause of movement in buildings can usually be related to one or more problems in the foundation soil. It is important for the home owner to identify the soil type in order to ascertain the measures that should be put in place in order to ensure that problems in the foundation soil can be prevented, thus protecting against building movement. Generally soil classification is provided by a geotechnical report.

SOIL TYPES

The types of soils usually present under the topsoil in land zoned for residential buildings can be split into two approximate groups – granular and clay. Quite often, foundation soil is a mixture of both types. The general problems associated with soils having granular content are usually caused by erosion. Clay soils are subject to saturation and swell/shrink problems.

As most buildings suffering movement problems are founded on clay soils, there is an emphasis on classification of soils according to the amount of swell and shrinkage they experience with variations of water content. Table 1 below is a reproduction of Table 2.1 from Australian Standard AS 2870-2011, Residential slabs and footings.

CAUSES OF MOVEMENT

SETTLEMENT DUE TO CONSTRUCTION

There are two types of settlement that occur as a result of construction:

- Immediate settlement occurs when a building is first placed on its foundation soil, as a result of compaction of the soil under the weight of the structure. The cohesive quality of clay soil mitigates against this, but granular (particularly sandy) soil is susceptible.
- Consolidation settlement is a feature of clay soil and may take place because of the expulsion of moisture from the soil or because of the soil's lack of resistance to local compressive or shear stresses. This will usually take place during the first few months after construction but has been known to take many years in exceptional cases.

These problems may be the province of the builder and should be taken into consideration as part of the preparation of the site for construction.

EROSION

All soils are prone to erosion, but sandy soil is particularly susceptible to being washed away. Even clay with a sand component of say 10% or more can suffer from erosion.

SATURATION

This is particularly a problem in clay soils. Saturation creates a bog-like suspension of the soil that causes it to lose virtually all of its bearing capacity. To a lesser degree, sand is affected by saturation because saturated sand may undergo a reduction in volume, particularly imported sand fill for bedding and blinding layers. However, this usually occurs as immediate settlement and should normally be the province of the builder.

SEASONAL SWELLING AND SHRINKAGE OF SOIL

All clays react to the presence of water by slowly absorbing it, making the soil increase in volume (see table below, from AS 2870). The degree of increase varies considerably between different clays, as does the degree of decrease during the subsequent drying out caused by fair weather periods. Because of the low absorption and expulsion rate, this phenomenon will not usually be noticeable unless there are prolonged rainy or dry periods, usually of weeks or months, depending on the land and soil characteristics.

The swelling of soil creates an upward force on the footings of the building, and shrinkage creates subsidence that takes away the support needed by the footing to retain equilibrium.

SHEAR FAILURE

This phenomenon occurs when the foundation soil does not have sufficient strength to support the weight of the footing. There are two major post-construction causes:

- Significant load increase.
- Reduction of lateral support of the soil under the footing due to erosion or excavation.

In clay soil, shear failure can be caused by saturation of the soil adjacent to or under the footing.

TREE ROOT GROWTH

Trees and shrubs that are allowed to grow in the vicinity of footings can cause foundation soil movement in two ways:

- Roots that grow under footings may increase in cross-sectional size, exerting upward pressure on footings.

TABLE 1. GENERAL DEFINITIONS OF SITE CLASSES.

Class	Foundation
A	Most sand and rock sites with little or no ground movement from moisture changes
S	Slightly reactive clay sites, which may experience only slight ground movement from moisture changes
M	Moderately reactive clay or silt sites, which may experience moderate ground movement from moisture changes
H1	Highly reactive clay sites, which may experience high ground movement from moisture changes
H2	Highly reactive clay sites, which may experience very high ground movement from moisture changes
E	Extremely reactive sites, which may experience extreme ground movement from moisture changes

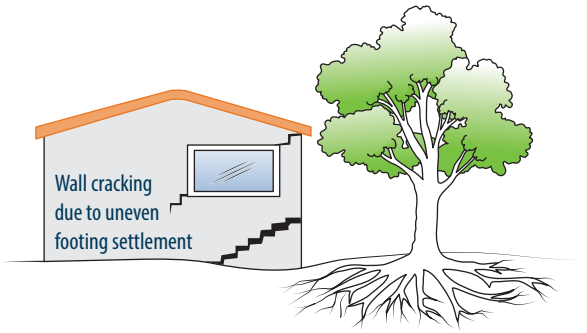

FIGURE 1 Trees can cause shrinkage and damage.

- Roots in the vicinity of footings will absorb much of the moisture in the foundation soil, causing shrinkage or subsidence.

UNEVENNESS OF MOVEMENT

The types of ground movement described above usually occur unevenly throughout the building's foundation soil. Settlement due to construction tends to be uneven because of:

- Differing compaction of foundation soil prior to construction.
- Differing moisture content of foundation soil prior to construction.

Movement due to non-construction causes is usually more uneven still. Erosion can undermine a footing that traverses the flow or can create the conditions for shear failure by eroding soil adjacent to a footing that runs in the same direction as the flow.

Saturation of clay foundation soil may occur where subfloor walls create a dam that makes water pond. It can also occur wherever there is a source of water near footings in clay soil. This leads to a severe reduction in the strength of the soil which may create local shear failure.

Seasonal swelling and shrinkage of clay soil affects the perimeter of the building first, then gradually spreads to the interior through absorption. The swelling process will usually begin at the uphill extreme of the building, or on the weather side where the land is flat. Shrinkage usually begins on the side of the building where the sun's heat is greatest.

EFFECTS OF UNEVEN SOIL MOVEMENT ON STRUCTURES

EROSION AND SATURATION

Erosion removes the support from under footings, tending to create subsidence of the part of the structure under which it occurs. Brickwork walls will resist the stress created by this removal of support by bridging the gap or cantilevering until the bricks or the mortar bedding fail. Older masonry has little resistance. Evidence of failure varies according to circumstances and symptoms may include:

- Step cracking in the mortar beds in the body of the wall or above/below openings such as doors or windows.
- Vertical cracking in the bricks (usually but not necessarily in line with the vertical beds or perpends).

Isolated piers affected by erosion or saturation of foundations will eventually lose contact with the bearers they support and may tilt or fall over. The floors that have lost this support will become bouncy, sometimes rattling ornaments etc.

SEASONAL SWELLING/SHRINKAGE IN CLAY

Swelling foundation soil due to rainy periods first lifts the most exposed extremities of the footing system, then the remainder of the perimeter footings while gradually permeating inside the building footprint to lift internal footings. This swelling first tends to create a dish effect, because the external footings are pushed higher than the internal ones.

The first noticeable symptom may be that the floor appears slightly dished. This is often accompanied by some doors binding on the floor or the door head, together with some cracking of cornice mitres. In buildings with timber flooring supported by bearers and joists, the floor can be bouncy. Externally there may be visible dishing of the hip or ridge lines.

As the moisture absorption process completes its journey to the innermost areas of the building, the internal footings will rise. If the spread of moisture is roughly even, it may be that the symptoms will temporarily disappear, but it is more likely that swelling will be uneven, creating a difference rather than a disappearance in symptoms. In buildings with timber flooring supported by bearers and joists, the isolated piers will rise more easily than the strip footings or piers under walls, creating noticeable doming of flooring.

As the weather pattern changes and the soil begins to dry out, the external footings will be first affected, beginning with the locations where the sun's effect is strongest. This has the effect of lowering the external footings. The doming is accentuated, and cracking reduces or disappears where it occurred because of dishing, but other cracks open up. The roof lines may become convex.

Doming and dishing are also affected by weather in other ways. In areas where warm, wet summers and cooler dry winters prevail, water migration tends to be toward the interior and doming will be accentuated, whereas where summers are dry, and winters are cold and wet, migration tends to be toward the exterior and the underlying propensity is toward dishing.

MOVEMENT CAUSED BY TREE ROOTS

In general, growing roots will exert an upward pressure on footings, whereas soil subject to drying because of tree or shrub roots will tend to remove support from under footings by inducing shrinkage.

COMPLICATIONS CAUSED BY THE STRUCTURE ITSELF

Most forces that the soil causes to be exerted on structures are vertical – i.e. either up or down. However, because these forces are seldom spread evenly around the footings, and because the building resists uneven movement because of its rigidity, forces are exerted from one part of the building to another. The net result of all these forces is usually rotational. This resultant force often complicates the diagnosis because the visible symptoms do not simply reflect the original cause. A common symptom is binding of doors on the vertical member of the frame.

EFFECTS ON FULL MASONRY STRUCTURES

Brickwork will resist cracking where it can. It will attempt to span areas that lose support because of subsided foundations or raised points. It is therefore usual to see cracking at weak points, such as openings for windows or doors.

In the event of construction settlement, cracking will usually remain unchanged after the process of settlement has ceased.

With local shear or erosion, cracking will usually continue to develop until the original cause has been remedied, or until the subsidence has completely neutralised the affected portion of footing and the structure has stabilised on other footings that remain effective.

In the case of swell/shrink effects, the brickwork will in some cases return to its original position after completion of a cycle, however it is more likely that the rotational effect will not be exactly reversed, and it is also usual that brickwork will settle in its new position and will resist the forces trying to return it to its original position. This means that in a case where swelling takes place after construction and cracking occurs, the cracking is likely to at least partly remain after the shrink segment of the cycle is complete. Thus, each time the cycle is repeated, the likelihood is that the cracking will become wider until the sections of brickwork become virtually independent.

With repeated cycles, once the cracking is established, if there is no other complication, it is normal for the incidence of cracking to stabilise, as the building has the articulation it needs to cope with the problem. This is by no means always the case, however, and monitoring of cracks in walls and floors should always be treated seriously.

Upheaval caused by growth of tree roots under footings is not a simple vertical shear stress. There is a tendency for the root to also

exert lateral forces that attempt to separate sections of brickwork after initial cracking has occurred.

The normal structural arrangement is that the inner leaf of brickwork in the external walls and at least some of the internal walls (depending on the roof type) comprise the load-bearing structure on which any upper floors, ceilings and the roof are supported. In these cases, it is internally visible cracking that should be the main focus of attention, however there are a few examples of dwellings whose external leaf of masonry plays some supporting role, so this should be checked if there is any doubt. In any case, externally visible cracking is important as a guide to stresses on the structure generally, and it should also be remembered that the external walls must be capable of supporting themselves.

EFFECTS ON FRAMED STRUCTURES

Timber or steel framed buildings are less likely to exhibit cracking due to swell/shrink than masonry buildings because of their flexibility. Also, the doming/dishing effects tend to be lower because of the lighter weight of walls. The main risks to framed buildings are encountered because of the isolated pier footings used under walls. Where erosion or saturation causes a footing to fall away, this can double the span which a wall must bridge. This additional stress can create cracking in wall linings, particularly where there is a weak point in the structure caused by a door or window opening. It is, however, unlikely that framed structures will be so stressed as to suffer serious damage without first exhibiting some or all of the above symptoms for a considerable period. The same warning period should apply in the case of upheaval. It should be noted, however, that where framed buildings are supported by strip footings there is only one leaf of brickwork and therefore the externally visible walls are the supporting structure for the building. In this case, the subfloor masonry walls can be expected to behave as full brickwork walls.

EFFECTS ON BRICK VENEER STRUCTURES

Because the load-bearing structure of a brick veneer building is the frame that makes up the interior leaf of the external walls plus perhaps the internal walls, depending on the type of roof, the building can be expected to behave as a framed structure, except that the external masonry will behave in a similar way to the external leaf of a full masonry structure.

WATER SERVICE AND DRAINAGE

Where a water service pipe, a sewer or stormwater drainage pipe is in the vicinity of a building, a water leak can cause erosion, swelling or saturation of susceptible soil. Even a minuscule leak can be enough to saturate a clay foundation. A leaking tap near a building can have the same effect. In addition, trenches containing pipes can become watercourses even though backfilled, particularly where broken rubble is used as fill. Water that runs along these trenches can be responsible for serious erosion, interstrata seepage into subfloor areas and saturation.

Pipe leakage and trench water flows also encourage tree and shrub roots to the source of water, complicating and exacerbating the problem. Poor roof plumbing can result in large volumes of rainwater being concentrated in a small area of soil:

- Incorrect falls in roof guttering may result in overflows, as may gutters blocked with leaves etc.
- Corroded guttering or downpipes can spill water to ground.
- Downpipes not positively connected to a proper stormwater collection system will direct a concentration of water to soil that is directly adjacent to footings, sometimes causing large-scale problems such as erosion, saturation and migration of water under the building.

SERIOUSNESS OF CRACKING

In general, most cracking found in masonry walls is a cosmetic nuisance only and can be kept in repair or even ignored. Table 2 below is a reproduction of Table C1 of AS 2870-2011.

AS 2870-2011 also publishes figures relating to cracking in concrete floors, however because wall cracking will usually reach the critical point significantly earlier than cracking in slabs, this table is not reproduced here.

PREVENTION AND CURE

PLUMBING

Where building movement is caused by water service, roof plumbing, sewer or stormwater failure, the remedy is to repair the problem. It is prudent, however, to consider also rerouting pipes away from the building where possible and relocating taps to positions where any leakage will not direct water to the building vicinity. Even where gully traps are present, there is sometimes sufficient spill to create erosion or saturation, particularly in modern installations using smaller diameter PVC fixtures. Indeed, some gully traps are not situated directly under the taps that are installed to charge them, with the result that water from the tap may enter the backfilled trench that houses the sewer piping. If the trench has been poorly backfilled, the water will either pond or flow along the bottom of the trench. As these trenches usually run alongside the footings and can be at a similar depth, it is not hard to see how any water that is thus directed into a trench can easily affect the foundation's ability to support footings or even gain entry to the subfloor area.

GROUND DRAINAGE

In all soils there is the capacity for water to travel on the surface and below it. Surface water flows can be established by inspection during and after heavy or prolonged rain. If necessary, a grated drain system connected to the stormwater collection system is usually an easy solution.

It is, however, sometimes necessary when attempting to prevent water migration that testing be carried out to establish watertable height and subsoil water flows. This subject may be regarded as an area for an expert consultant.

PROTECTION OF THE BUILDING PERIMETER

It is essential to remember that the soil that affects footings extends well beyond the actual building line. Watering of garden plants, shrubs and trees causes some of the most serious water problems.

For this reason, particularly where problems exist or are likely to occur, it is recommended that an apron of paving be installed around as much of the building perimeter as necessary. This paving should extend outwards a minimum of 900 mm (more in highly reactive soil) and should have a minimum fall away from the building of 1:60. The finished paving should be no less than 100 mm below brick vent bases.

It is prudent to relocate drainage pipes away from this paving, if possible, to avoid complications from future leakage. If this is not practical, earthenware pipes should be replaced by PVC and backfilling should be of the same soil type as the surrounding soil and compacted to the same density.

Except in areas where freezing of water is an issue, it is wise to remove taps in the building area and relocate them well away from the building – preferably not uphill.

It may be desirable to install a grated drain at the outside edge of the paving on the uphill side of the building. If subsoil drainage is needed this can be installed under the surface drain.

CONDENSATION

In buildings with a subfloor void, such as where bearers and joists support flooring, insufficient ventilation creates ideal conditions for condensation, particularly where there is little clearance between the floor and the ground. Condensation adds to the moisture already present in the subfloor and significantly slows the process of drying out. Installation of an adequate subfloor ventilation system, either natural or mechanical, is desirable.

TABLE 2. CLASSIFICATION OF DAMAGE WITH REFERENCE TO WALLS.

Description of typical damage and required repair	Approximate crack width limit	Damage category
Hairline cracks	<0.1 mm	0 – Negligible
Fine cracks which do not need repair	<1 mm	1 – Very Slight
Cracks noticeable but easily filled. Doors and windows stick slightly.	<5 mm	2 – Slight
Cracks can be repaired and possibly a small amount of wall will need to be replaced. Doors and windows stick. Service pipes can fracture. Weathertightness often impaired.	5–15 mm (or a number of cracks 3 mm or more in one group)	3 – Moderate
Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows. Window and door frames distort. Walls lean or bulge noticeably, some loss of bearing in beams. Service pipes disrupted.	15–25 mm but also depends on number of cracks	4 – Severe

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Warning: Although this Building Technology Resource deals with cracking in buildings, it should be said that subfloor moisture can result in the development of other problems, notably:

- Water that is transmitted into masonry, metal or timber building elements causes damage and/or decay to those elements.
- High subfloor humidity and moisture content create an ideal environment for various pests, including termites and spiders, and mould.
- Where high moisture levels are transmitted to the flooring and walls, an increase in the dust mite count can ensue within the living areas. Dust mites, as well as dampness in general, can be a health hazard to inhabitants, particularly those who are abnormally susceptible to respiratory ailments.

THE GARDEN

The ideal vegetation layout is to have lawn or plants that require only light watering immediately adjacent to the drainage or paving edge, then more demanding plants, shrubs and trees spread out in that order.

Overwatering due to misuse of automatic watering systems is a common cause of saturation and water migration under footings. If it is necessary to use these systems, it is important to remove garden beds to a completely safe distance from buildings.

EXISTING TREES

Existing trees may cause problems with the upheaval of footings by their roots, or shrinkage from soil drying. If the offending roots are subsidiary and their removal will not significantly damage the tree, they should be severed and a concrete or metal barrier placed vertically in the soil to prevent future root growth in the direction of the building. Soil drying is a more complex issue and professional advice may be required before considering the removal or relocation of the tree.

INFORMATION ON TREES, PLANTS AND SHRUBS

State departments overseeing agriculture can give information regarding root patterns, volume of water needed and safe distance from buildings of most species. Botanic gardens are also sources of information.

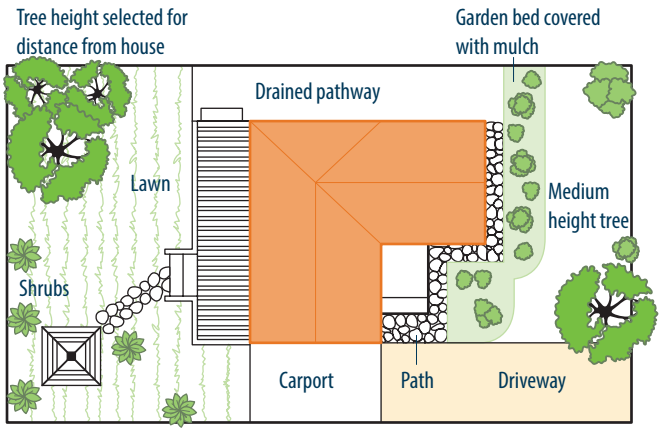

FIGURE 2 Gardens for a reactive site.

EXCAVATION

Excavation around footings must be properly engineered. Soil supporting footings can only be safely excavated at an angle that allows the soil under the footing to remain stable. This angle is called the angle of repose (or friction) and varies significantly between soil types and conditions. Removal of soil within the angle of repose will cause subsidence.

REMEDIATION

Where erosion has occurred that has washed away soil adjacent to footings, soil of the same classification should be introduced and compacted to the same density. Where footings have been undermined, augmentation or other specialist work may be required. Remediation of footings and foundations is generally the realm of a specialist consultant.

Where isolated footings rise and fall because of swell/shrink effect, the home owner may be tempted to alleviate floor bounce by filling the gap that has appeared between the bearer and the pier with blocking. The danger here is that when the next swell segment of the cycle occurs, the extra blocking will push the floor up into an accentuated dome and may also cause local shear failure in the soil. If it is necessary to use blocking, it should be by a pair of fine wedges and monitoring should be carried out fortnightly.