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

HE ARA TĀMATA
CREATING GREAT PLACES
*Supporting our people*

Private Bag 752, Kaikohe 0440, New Zealand
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0800 920 029
fndc.govt.nz

# Application for 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 discussion

Have you met with a council Resource Consent representative to discuss this application prior to lodgement?
◯ **Yes** ☑ **No** ☑ **N/A**

Have you consulted Council's Infrastructure Officer regarding infrastructure capacity to service the development?
◯ **Yes** ☑ **No** ☑ **N/A**

Have you consulted the Roading Officer regarding any road to vest or departure from District Plan / Engineering standards?
◯ **Yes** ☑ **No** ☑ **N/A**

**Contact details of who and how to engage in pre lodgement discussions can be found on the Resource Consent pages of the FNDC website.*

## 2. Type of consent being applied for

*(more than one circle can be ticked):*

◯ **Land Use**
◯ **Fast Track (Land Use - Controlled Activity)**
◯ **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 3m³*
☑ **Subdivision**
◯ **Existing Use Certificate (s.139A)**
◯ **Consent under National Environmental Standard**
*(e.g. Assessing and Managing Contaminants in Soil)*
◯ **Other (please specify)** _____

## 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:** Tim Maples

**Email:**

**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:** Bay of Islands Planning att: Andrew McPhee

**Email:**

**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:** Bethanie Autumn Maples

**Property address/ location:**

Postcode

## 8. Application site details

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

**Name/s:**

**Site address/ location:** 2 Doves Bay Road
Kerikeri
Postcode 0230

**Legal description:** Lot 1 DP 529065 **Val Number:**

**Certificate of title:** 856637

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.

2 Lot subdivision

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**
- ◯ **Changing the use of a piece of land**
- ◯ **Disturbing, removing or sampling soil**
- ◯ **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**
- ◯ **Landslips**
- ◯ **Coastal Erosion**
- ◯ **Coastal Inundation**
- ◯ **Active Faults**
- ◯ **Liquefaction**
- ◯ **Tsunami**

*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**

If yes, please be advised that the timeframe will be suspended 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) Bethanie Maples

**Email:**

**Phone number:**

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

**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) Bethanie Maples

**Signature:**
(signature of bill payer)

Date 20/10/2026

## 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) Andrew McPhee

**Signature**

Date 27/10/2026

***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*

**Kerikeri House**
**Suite 3, 88 Kerikeri Road**
**Kerikeri**

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

27 October 2026

**To:** Far North District Council

**Matter:** Resource Consent Application – Proposed 2-Lot Subdivision, 2 & 8 Doves Bay Road, Kerikeri

Tim Maples seeks resource consent to subdivide the property at 2 & 8 Doves Bay Road, Kerikeri (Lot 1 DP 529065) into two allotments, in accordance with Subdivision Scheme Plan Ref. 5144, Rev B (19 October 2026), prepared by BOI Survey Ltd, as a **Discretionary activity** under the Proposed Far North District Plan – Appeals version (**PDP**, Rural Lifestyle Zone).

While the Operative Far North District Plan (**ODP**) zones the site General Coastal Zone, the PDP provisions that relate to this subdivision are not under appeal, so it is considered that they have full legal weight under s86F of the Resource Management Act 1991 (**RMA**).

This application is made on the understanding, for the reasons set out in Section 5 of this report, that the Rural Lifestyle Zone chapter and the Subdivision chapter thresholds as they apply to that zone already have full legal effect, notwithstanding that the Proposed Plan is not yet fully operative.

The Operative Plan is nevertheless assessed for completeness, including the Non-Complying status that would arise under it alone, which it is considered is no longer the consenting pathway.

The application is supported by the following information:

- Assessment of Environmental Effects
- **Appendix A** – Record of Title
- **Appendix B** – Subdivision Scheme Plan (Rev B)
- **Appendix C** – Geotechnical and Civil Site Suitability Reports

Regards

Andrew McPhee
Consultant Planner

## Applicant & Property Details

| | |
|---|---|
| **Applicant** | Tim Maples |
| **Address for Service** | Bay of Islands Planning Limited<br>Kerikeri House<br>Suite 3, 88 Kerikeri Road<br>Kerikeri<br>C/O – Andrew McPhee<br>andrew@bayplan.co.nz |
| **Legal Description** | Lot 1 DP 529065 |
| **Record of Title** | RT 856637 |
| **Physical Address** | 2 & 8 Doves Bay Road, Kerikeri |
| **Site Area** | 7.3123ha |
| **Scheme Plan** | BOI Survey Ltd, Ref. 5144, Rev B, 19 October 2026 |
| **Registered Owner** | Bethanie Autumn Maples |
| **District Plan Zone** | Rural Lifestyle Zone (PDP)<br>General Coastal Zone (ODP) |
| **Adjoining Zones** | Settlement Zone to the south and east of the indicative building platform.<br>Rural Lifestyle to the west.<br>Rural production to the north.<br>Natural Open Space to the south. |
| **Overlays / Features** | Coastal Environment.<br>High Natural Character.<br>Coastal Flood Hazard Area. |
| **Natural Hazards** | NRC Coastal Flood Hazard Zone |
| **Consent Notice** | Nil |
| **Archaeology** | NZAA site P05/21 recorded at the southern end of the property. |
| **NRC Overlays** | Coastal Environment (Regional Policy Statement) |
| **Soils** | LUC Class 6 |
| **Protected Natural Area** | DOC Protected Natural Area 'Rangitane Shrublands'<br>Vegetation to be cleared is regenerating scrub, not remnant forest, and the site is not identified as a Significant Natural Area. |

| | |
|---|---|
| **Kiwi Habitat** | The site lies within a high density kiwi area. |
| **HAIL** | Nil |
| **Appendices** | Appendix A – Record of Title (RT 856637)<br>Appendix B – Subdivision Scheme Plan (Rev B)<br>Appendix C – Geotechnical and Civil Site Suitability Reports |
| **Consultation** | Nil – not considered necessary |

# 1. Introduction and Purpose

Tim Maples seeks to subdivide the 7.3123ha property at 2 & 8 Doves Bay Road, Kerikeri, legally described as Lot 1 DP 529065, to create two allotments:

- Proposed Lot 1 - 1.0000ha; and
- Proposed Lot 2 - 6.3123ha balance lot.

This AEE has been prepared to satisfy the requirements of Section 88 and the Fourth Schedule of the RMA, and to assist the Council in its assessment of the application under Sections 104 and 104B of the RMA.

It has been prepared with reference to the final Scheme Plan (Rev B), the Geotechnical and Civil Site Suitability Reports, the Record of Title and the relevant provisions of the ODP, the PDP, the New Zealand Coastal Policy Statement 2010 (**NZCPS**) and the National Policy Statement for Indigenous Biodiversity 2023 (**NPS-IB**).

# 2. The Site and Surrounding Environment

### 2.1 Legal description and location

The site comprises Lot 1 DP 529065, held in one Record of Title, with a total area of 7.3123ha. It has frontage to Doves Bay Road, a narrow sealed local road that terminates as a single-lane road at a cul-de-sac approximately 250m south-east of the site's existing access.

The site is located on the western side of Doves Bay Road, approximately 140m south-east of the Opito Bay Road intersection.




*Figure 1: Aerial image (Source: Prover)*

## 2.2 Topography and physical characteristics

The site occupies a west-to-southwest facing slope descending approximately 60m from the Doves Bay Road ridgeline to the Kerikeri Inlet. Two existing dwellings, buildings and associated cleared curtilage occupy the middle of the site, accessed via existing driveways. Aside from this cleared area and a further cleared area at the eastern boundary corner (where proposed Lot 1 is located), the site is described in the geotechnical and civil reports as being covered in regenerating bush.

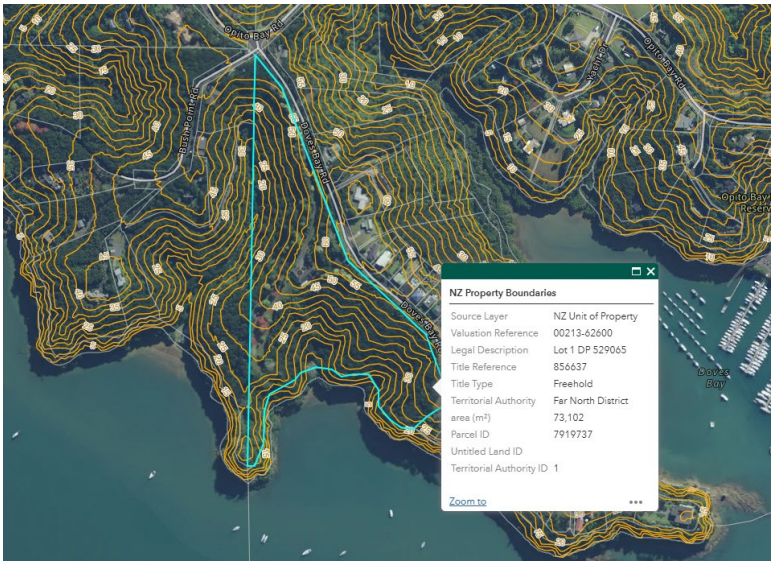



*Figure 2: Site topography (Source: NRC Maps)*

The proposed Lot 1 indicative building platform sits at the margin of the cleared area beside Doves Bay Road, on moderately sloping ground averaging approximately 10° to 14° and is well removed from the coastal cliff edge. Approximately 20m downslope of the indicative building platform, grades increase steeply, descending some 35m to the Kerikeri Inlet.

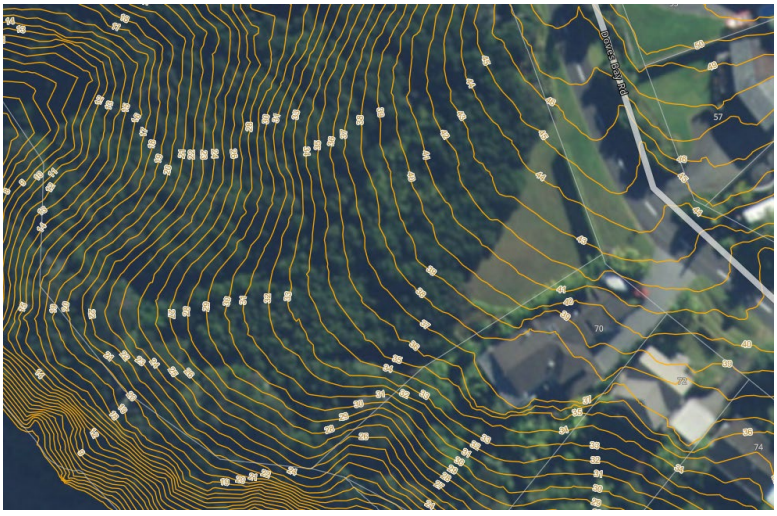



*Figure 3: Site topography in the location of Proposed Lot 1 (Source: NRC Maps)*

## 2.3 Vegetation

Outside the existing cleared areas, the site is vegetated in regenerating, secondary scrub rather than remnant forest. Vegetation clearance is not necessary to establish the 'indicative building platform', access and associated services on Lot 1. While it is acknowledged that a quantum of vegetation removal would be required if the entire 400m$^2$ indicative building platform was cleared, it would not exceed the applicable district plan permitted threshold for indigenous vegetation clearance outside remnant forest in the Rural Lifestyle Zone, being 250m$^2$ per site per calendar year. Pragmatically, 400m$^2$ is not a realistic figure needed to establish a dwelling on this property. It is appropriate to address infringements (if any) at the time a dwelling is proposed.

The site lies within the DOC Protected Natural Area 'Rangitane Shrublands' and a mapped high density kiwi area (Tareha Point), which are addressed in Section 7.2.

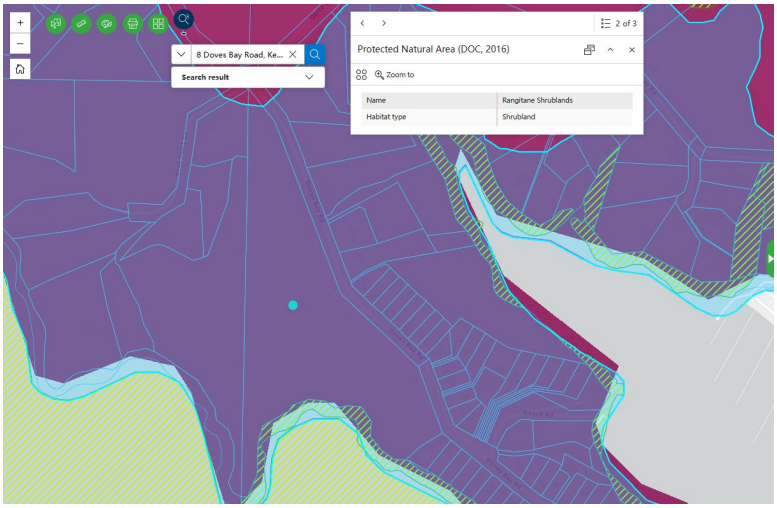



*Figure 4: DOC Protected Natural Area (Source: FNDC Maps)*

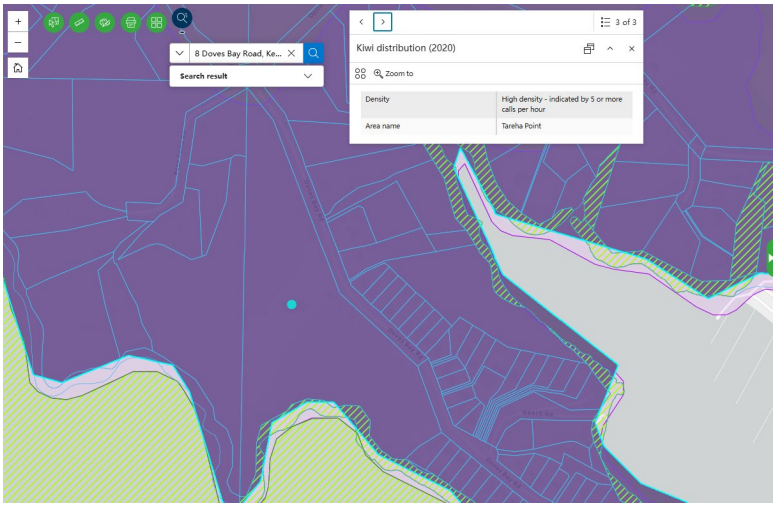



*Figure 5: Kiwi Distribution 2020 (Source: FNDC Maps)*

### 2.4 Geology and soils

The site is underlain by Waipapa Group sandstone/siltstone (Waipapa Terrane). Site investigations encountered 0.10–0.35m of topsoil over very stiff to hard clayey silt, classified as Category 4 soils for wastewater design purposes. The land is otherwise classified LUC Class 6 and is therefore not highly productive land. Groundwater was not encountered to the depths tested (refer **Appendix C**).

### 2.5 Natural hazards

The indicative building platform is assessed in the geotechnical report as a Moderate Stability Hazard Zone (FNDC Engineering Standards), with the steeper downslope land assessed as a High Stability Hazard Zone. The site is not mapped by FNDC or Northland Regional Council as being subject to erosion prone land, flooding or coastal erosion hazard in the location of the indicative building platform.

Only a negligible portion of the site boundary, abutting the marginal strip, is affected by a Coastal Flood Hazard overlay (refer Section 7.4). The LIM also records the site within an FNDC 'Poor Soakage' zone, which is addressed through the wastewater and stormwater design (Sections 7.5 and 7.6).

### 2.6 Services

The FNDC online GIS Water Services Map indicates no public reticulated water, wastewater or stormwater services are available to the property. Development of Lot 1 is therefore reliant on on-site water supply (rainwater collection) and on-site wastewater treatment and disposal, to be designed at building consent stage. The existing dwellings on proposed Lot 2 will continue to rely on their existing on-site systems, which are unaffected by, and outside the scope of, this subdivision application.

### 2.7 Coastal context

The site's southern boundary is separated from the Kerikeri Inlet by a marginal strip, which provides public access to and along the coastal marine area. Due to the presence of the marginal strip, neither proposed allotment adjoins the line of mean high water springs, and no further esplanade reserve or strip is required to be set aside from the subject land.

The site lies wholly within the mapped Coastal Environment under the PDP, and the majority of the site, save for areas around the cleared areas, is identified as a High Natural Character Area. This mapped area does not extend to or include the indicative building platform.

### 2.8 Surrounding environment

Proposed Lot 1 adjoins Doves Bay Road to the east, an existing dwelling and the Recreational Reserve to the south, the marginal strip to the south-west, and proposed Lot 2 to the north-west.

The land to the south and east of the indicative building platform is zoned Settlement (previously Coastal Residential under the ODP) and is developed at an urban residential density. Doves Bay Road is a low-volume, no-through road serving this settled coastal community.

## 3. Legal Description and Title

The site is legally described as Lot 1 DP 529065. There are no consent notices, covenants, or other registered instruments recorded on the Title.

## 4. Description of the Proposal

### 4.1 The subdivision

The Applicant proposes a 2-lot subdivision of the site in accordance with Scheme Plan Ref. 5144, Rev B, dated 19 October 2026 (refer **Appendix B**), comprising:

- Proposed Lot 1 – 1.0000ha, vacant. Lot 1 is a wedge-shaped allotment with frontage to Doves Bay Road. A 400m$^2$ (20m x 20m) indicative building platform is identified towards the eastern corner, beside the road and the existing cleared area, set back a minimum of 10m from boundaries. A new vehicle access/crossing is proposed from Doves Bay Road.
- Proposed Lot 2 – 6.3123ha, balance lot, retaining the existing dwellings, buildings, driveway, and existing on-site wastewater and stormwater systems, which are to remain in their current location and are not proposed to be altered, and do not form part of this application.

No dwelling or development is proposed as part of this application. Future development of Lot 1 will be the subject of separate building consent and, if required, resource consent in due course.

The subdivision itself will involve minor earthworks to form a new vehicle crossing and accessway from Doves Bay Road, well within the applicable permitted earthworks thresholds.

### 4.2 Servicing and access

Lot 1 will be self-serviced. Potable water will be by way of rainwater tanks (minimum 2 x 25,000L), wastewater by an on-site compliant system, and stormwater by tanks, swales and an erosion-protected dispersal outlet away from the steep downslope land.

Firefighting water storage in accordance with SNZ PAS 4509:2008 is proposed to be secured by way of a consent notice (Section 10), while electricity and telecommunications supply are not required at subdivision stage in the Rural Lifestyle Zone and will be arranged at the building consent stage.

The vehicle crossing will be constructed to FNDC Engineering Standards. Lot 2 retains its existing access and services.

# 5. Statutory and Planning Framework

### 5.1 Dual plan status – Operative District Plan and Proposed District Plan

The site is subject to two district plan documents which currently operate concurrently:

- The Operative Far North District Plan (**ODP**) - General Coastal Zone; and
- The Proposed Far North District Plan (**PDP**) - Rural Lifestyle Zone (**RLZ**) and lies within the Coastal Environment overlay.

The appeal status of the relevant PDP chapters, and the weight attributed to each under Section 104(1)(b) of the RMA, is understood as follows:

- Rural Lifestyle Zone chapter - not subject to appeal, save a new provision sought that is unrelated to this application. It can be afforded full weight for current provisions.
- Subdivision chapter - as it relates to the RLZ, including the SUB-S1 minimum allotment size thresholds and the SUB-S2 indicative building platform standard applicable to the 20m x 20m indicative building envelope, these are not subject to appeal and can be afforded full weight. The all-zones rules are addressed within this AEE regardless of their appeal status as the application is Discretionary overall and the matters they address are assessed fully in Section 7.
- Coastal Environment chapter - the appeal points concern specific provisions regulating vehicle access on beaches, mapping discrepancies, buildings and structures, and infrastructure and earthworks within Outstanding Natural Landscapes, none of which are relevant to this application. The Coastal Environment provisions that relate to this application are substantively not contested and can accordingly be afforded significant weight.
- Ecosystems and Indigenous Biodiversity chapter – this chapter remains under appeal in its entirety. The permitted vegetation clearance threshold in Rule IB-R3 (250m$^2$ per site per calendar year outside remnant forest, Rural Lifestyle Zone) is relied on in this AEE as the best available indication of Council's intended standard, notwithstanding that the chapter is not yet operative.
- Natural Hazards chapter – the appeal status is not material to this application, as the site is confirmed clear of natural hazard overlays in the location of the indicative building platform.
- Transport chapter - the majority of the chapter, including the access and vehicle crossing standards relevant to this application (TRAN-S2, TRAN-Table 9), is not subject to appeal and can be afforded full weight.

As the RLZ zoning and the Subdivision chapter provisions (SUB-R3, SUB-S1, SUB-S2) governing this application are beyond challenge and not subject to appeal, they are treated as operative pursuant to s86F of the RMA. While the ODP General Coastal Zone rules technically remain relevant until the PDP is formally made operative under Clause 20 of Schedule 1, in terms of weighting under s104(1)(b), the unappealed PDP framework carries dominant/determinative weight. For completeness, a precautionary s104D assessment is provided in Section 6.2.

### 5.2 Other statutory instruments

- New Zealand Coastal Policy Statement 2010 (**NZCPS**) – directs avoidance of significant adverse effects on natural character, protection from inappropriate subdivision, and management of coastal hazard risk (assessed in Section 8.1).
- National Policy Statement for Indigenous Biodiversity 2023 (**NPS-IB**) – requires identification and protection of Significant Natural Areas and management of effects on indigenous biodiversity. The site is not identified as an SNA, but it lies within the DOC Rangitane Shrublands Protected Natural Area and a high density kiwi area. The NPS-IB is addressed in Sections 7.2 and 8.2 on the basis that the vegetation and kiwi habitat are of ecological value.
- National Policy Statement for Natural Hazards 2025 – the geotechnical engineer's risk-based assessment confirms a 'Low-risk' rating for the indicative building platform.
- National Policy Statement for Highly Productive Land 2022 – not considered relevant as the land is LUC Class 6.
- Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 – addressed in Section 7.11.
- Regional Policy Statement for Northland (**RPS**) – its natural character, indigenous biodiversity, natural hazard and subdivision provisions are given effect through the NZCPS and the district plan provisions assessed in Sections 8 and 9.

No Northland Regional Council resource consents are required for this proposal.

## 6. Resource Consents Required and Activity Status

The following table summarises the district plan matters that are triggered by the proposal and the applicable activity status. Because two zonings currently apply concurrently, both the ODP and PDP status are shown.

*Table 1: ODP & PDP District Plan provisions*

| Matter | ODP (General Coastal Zone) | PDP (Rural Lifestyle Zone) |
|---|---|---|
| Minimum allotment size (subdivision) | 13.7.2.1(viii): subdivision is not a controlled activity in the General Coastal Zone. The minimum lot size is 20ha (restricted discretionary), with a discretionary pathway only by management plan (13.9.2).<br>Proposed Lots 1 (1.0000ha) and 2 (6.3123ha) do not comply and no management plan is proposed.<br>**Non-Complying but superseded by SUB-R3 / SUB-S1** | SUB-R3 / SUB-S1: Controlled if ≥2ha; Discretionary if ≥1ha.<br>Proposed Lot 1 (1.0000ha) meets the discretionary threshold;<br>Proposed Lot 2 (6.3123ha) complies with the controlled threshold.<br>This standard is not subject to appeal.<br>***Discretionary*** |
| Indicative building platform / allotment dimensions | 13.7.2.2: 30m x 30m square building envelope required in the General Coastal Zone.<br>**Superseded by PDP SUB-S2** | SUB-S2: the 400m$^2$ (20m x 20m) indicative building platform shown on the Scheme Plan complies.<br>This standard is not subject to appeal.<br>**Complies** |
| Subdivision within the Coastal Environment | Addressed by the General Coastal Zone provisions above. | SUB-R20: subdivision creating one or more additional allotments within the Coastal Environment (excluding Outstanding Natural Character Areas) is a Discretionary Activity.<br>No Outstanding Natural Character Area is mapped on the site.<br>***Discretionary*** |
| Subdivision within a Coastal Hazard Area | 12.4.6.3.1: development on land within a mapped Coastal Hazard 1 Area is discretionary only where supported by a suitably qualified coastal hazard report, otherwise non-complying.<br>The ODP status is already Non-Complying by reason of lot size.<br>**Non-Complying but superseded by SUB-R12** | SUB-R12: subdivision of a site within a Coastal Hazard Area is Restricted Discretionary provided all building platforms and associated access for each allotment are located wholly outside the spatial extent of the Coastal Hazard Area (RDIS-1).<br>The indicative building platform and the proposed access are both wholly outside the mapped Coastal Hazard Area.<br>Note: only a negligible, undeveloped portion of the site boundary (abutting the marginal strip) falls within it.<br>This rule is not subject to appeal.<br>***Restricted Discretionary*** |

| Matter | ODP (General Coastal Zone) | PDP (Rural Lifestyle Zone) |
|---|---|---|
| Land susceptible to instability | Chapter 13.10.2 assessment criteria (hazards) and s106 apply. | SUB-R8: Controlled where the building platform, access and services are wholly outside land susceptible to instability, otherwise Discretionary.<br>The platform is a Moderate Stability Hazard Zone with compliant factors of safety.<br>The very steep high hazard land is not required for the platform, access or services.<br>***Controlled*** |
| Esplanade reserve/strip | Chapter 13 esplanade assessment criteria apply generally where a new allotment adjoins MHWS. | SUB-S8 applies to allotments under 4ha adjoining the line of MHWS.<br>Lots 1 and 2 adjoin the existing marginal strip, not MHWS, so the standard is not triggered, and public access is already provided.<br>**Complies** |
| Indigenous vegetation clearance | Chapter 12.2 – clearance to be confined to establishing the indicative building platform and access, within normal permitted expectations for this scale of activity. 500m$^2$ generally permitted. | IB-R3: permitted, as clearance does not occur in remnant forest. While no clearance is required as part of the subdivision application, any future clearance can be kept within 250m$^2$ per site per calendar year.<br>**Complies** |
| Earthworks | Chapter 12 earthworks provisions apply within the coastal environment – minor works only, associated with the new access/crossing. | Earthworks and Coastal Environment chapter permitted activity thresholds apply. Minor works (if any) may be required to form the access/crossing and will be well within the identified thresholds.<br>**Complies** |
| Access / vehicle crossing | Chapter 15.1 – general access standards; sight distance and vehicle crossing standards apply. | TRAN-S2/TRAN-Table 9: minimum sight distance of 195m required for an 'Access and low volume' road at 100km/h posted speed. Available sight distance (66m north / 45m south-east) does not comply.<br>***Restricted Discretionary*** |
| Natural hazards (general) | Chapter 12.4 – Council to have regard to hazard information under s106. | Site confirmed clear of natural hazard overlays in the location of the indicative building platform.<br>**Complies** |

Other subdivision rules have been considered and, on the information reviewed, are not triggered:

- SUB-R9 and SUB-R10 (critical electricity line and National Grid);
- SUB-R11 (river flood hazard);
- SUB-R13 and SUB-R14 (heritage area overlay and scheduled heritage resource);
- SUB-R18 and SUB-R19 (outstanding natural landscapes and features, wetland, lake and river margins);
- SUB-R21 to SUB-R23 (mineral extraction, highly productive land and outstanding natural character).

The proposal's compliance with the remaining Subdivision standards is set out below.

*Table 2: Subdivision standards and future land use standards*

| Standard | Requirement | Assessment |
|---|---|---|
| SUB-S1 – Minimum allotment sizes | Rural Lifestyle zone: 2ha (controlled) / 1ha (discretionary). | Lot 1 (1.0000ha) meets the discretionary minimum.<br>Lot 2 (6.3123ha) meets both thresholds.<br>This standard is not subject to appeal.<br>***Discretionary (Lot 1)*** |
| SUB-S2 – Building platforms | Each allotment must accommodate a square building envelope of at least 20m x 20m (Rural Lifestyle zone) outside permitted boundary setbacks. | Lot 1 contains a 400m$^2$ (20m x 20m) indicative building platform set back a minimum of 10m from boundaries (Scheme Plan Rev B).<br>Lot 2 already contains the existing dwellings.<br>This standard is not subject to appeal.<br>**Complies** |
| SUB-S3 – Water supply | A means of water supply for every allotment where no reticulated supply is available, and sufficient firefighting water consistent with SNZ PAS 4509:2008. | No reticulated supply is available.<br>Lot 1 will be supplied by rainwater tanks (minimum 2 x 25,000L for potable use as per the Civil Site Suitability Report).<br>Firefighting water storage in accordance with SNZ PAS 4509:2008 can readily be accommodated within Lot 1 and is proposed to be secured by consent notice for the future dwelling.<br>Lot 2's existing supply is unaffected.<br>**Complies** |

| Standard | Requirement | Assessment |
|---|---|---|
| SUB-S4 – Stormwater management | Each allotment to have a means of stormwater disposal within its site; primary system 10% AEP, secondary 1% AEP, plus 20% for climate change; 50-year asset life. | The Civil Site Suitability Report confirms Lot 1 can manage stormwater from future roof and hardstand areas within the site (rainwater tanks, sealed overflow to an erosion-protected dispersal outlet, swales/silt traps), with discharge directed away from the steep downslope land. Detailed design can be applied at building consent stage.<br>**Complies** |
| SUB-S5 – Wastewater disposal | Where no reticulated connection is available, each allotment to have a means of on-site collection, treatment and disposal. | The Civil Site Suitability Report demonstrates feasibility of an AS/NZS 1547:2012 compliant system for a four-bedroom dwelling on Lot 1 (1,080L/day; 618m$^2$ disposal area plus 30% reserve). Lot 1 (1.0000ha) comfortably accommodates this.<br>Lot 2 retains its existing system.<br>**Complies** |
| SUB-S6 – Telecommunications and power | Applies to the zones listed in the standard. | The Rural Lifestyle zone is not a listed zone. Electricity and telecommunications supply will be arranged at building stage.<br>**Not applicable** |
| SUB-S7 – Easements | Easements to be provided where necessary for access, services and utilities. | Lot 1 has direct frontage to Doves Bay Road and Lot 2 retains its existing access. No shared accessway or easements are proposed.<br>**Complies** |
| SUB-S8 – Esplanades | A 20m esplanade reserve or strip where an allotment of less than 4ha adjoins the line of MHWS. | Lot 1 and Lot 2 adjoin a Marginal Strip, not the line of MHWS. The standard is not triggered and public access to and along the coast is already provided.<br>**Complies** |
| RLZ-R2 – Impermeable surfaces (future land use) | Maximum 12.5% or 2,500m$^2$, whichever is lesser. | Lot 1 is limited to 1,250m$^2$. The Civil Site Suitability Report confirms this is readily achievable for a single dwelling.<br>**Complies** |
| RLZ-R3 – Residential activity (future land use) | Permitted where site area per residential unit is at least 2ha, except a single residential unit on a site under 2ha. | A single dwelling on Lot 1 (1.0000ha) is permitted under the exception.<br>Lot 2 (6.3123ha) exceeds 2ha per unit.<br>**Capable of complying** |

### 6.1 Overall activity status

The application is considered a Discretionary Activity under the PDP, arising from the RLZ minimum allotment size threshold (SUB-S1) for proposed Lot 1 and SUB-R20.

- **Section 86F** - assessed under the ODP General Coastal Zone alone, a 1.0000ha lot falls below the 20ha minimum and is outside the management plan pathway, so the subdivision would be a Non-Complying Activity (Rule 13.7.2.1(viii)). However, as the RLZ zoning and the Subdivision chapter provisions (SUB-R3, SUB-S1, SUB-S2) governing this application are beyond challenge and not subject to appeal, they are treated as operative pursuant to s86F of the RMA. While the ODP General Coastal Zone rules technically remain on the books until the PDP is formally made operative under Clause 20 of Schedule 1, in terms of weighting under s104(1)(b), the unappealed PDP framework carries dominant/determinative weight. For completeness, a precautionary s104D assessment is provided in Section 6.2.

Where consent is required under more than one rule (subdivision, coastal environment, coastal hazard, and access), the application should be lodged as a single, bundled discretionary activity application in accordance with the 'How the Plan Works' bundling provisions in the PDP.

### 6.2 Section 104D – precautionary assessment

If, contrary to the submission above, the ODP Non-Complying status were treated as applying, the application would need to pass at least one of the two gateway tests in Section 104D(1) of the RMA. It is considered that the application passes both tests. The adverse effects on the environment are considered to be no more than minor (Section 7), and the application is not contrary to the objectives and policies of the ODP or the PDP (Section 9).

The Council would therefore be able to consider granting consent under Section 104B in either case.

## 7. Assessment of Environmental Effects

This section addresses the actual and potential effects of the proposal on the environment, in accordance with Section 104(1)(a) and Schedule 4 of the RMA.

### 7.1 Landscape, natural character and visual effects

The site lies wholly within the mapped Coastal Environment. The majority of the site, save for the existing cleared areas, is identified as a High Natural Character Area under the PDP. This mapped area does not extend to or include the indicative building platform, which is located at the eastern, road-facing corner of Lot 1 at the margin of the existing cleared area, well removed from the coastal margin.

Further, the location of the indicative building platform abuts the Settlement zone to the south and east, which in this location is akin to an urban residential density and provides a backdrop from the Inlet that is already low in natural character. No part of the site is identified as an Outstanding Natural Character Area, Outstanding Natural Landscape, or Outstanding Natural Feature.

As no building is proposed as part of this subdivision application, the indicative building platform is indicative only and demonstrates that a dwelling can be located on the site outside of the High Natural Character Area. Any future dwelling will be subject to the building height, colour and reflectivity and other standards of the PDP and, where those are not met, a separate consent process and potentially a landscape/visual assessment. This is not considered necessary at this juncture.

Given the location of the indicative building platform outside the mapped High Natural Character Area and its clustering adjacent to the lower-natural-character Settlement zone, the actual and potential adverse effects on landscape, natural character and visual amenity are considered no more than minor.

**7.2 Ecological effects – indigenous vegetation and kiwi habitat**

The site lies within the DOC Protected Natural Area 'Rangitane Shrublands' and within a mapped high density kiwi area. A Protected Natural Area is a non-statutory identification, and the site is not identified as a Significant Natural Area (SNA) on the District Plan maps.

The vegetation affected is regenerating secondary scrub, not remnant forest. This can be seen from a 2004 Google Earth image of the area identified in the location of the indicative building platform (see Figure below).



*Figure 6: Historic aerial image of Proposed Lot 1 (Source: Google Earth)*

While no vegetation removal is required to give effect to the subdivision, any future clearance to establish the indicative building platform on Lot 1 can be maintained within the applicable permitted activity threshold of 250m$^2$ per site per calendar year. The platform is sited at the margin of the existing cleared area beside the road, so the clearance is a very small proportion of the 7.3ha site and the large majority of the shrubland and kiwi habitat on both lots is retained.

The principal threats to kiwi are predation and disturbance from dogs, cats and mustelids rather than loss of a small area of regenerating scrub. The potential effect of the subdivision is that a future household on Lot 1 may keep domestic animals. That effect can be managed by a consent notice on both Lots 1 and 2. There is currently no consent notice that applies to the property in relation to kiwi protection, so the application of a consent notice condition on both titles will improve the status quo. That, alongside any future clearance being capable of remaining within the permitted threshold, ensures that any actual or potential adverse effects on indigenous vegetation and kiwi habitat will be no more than minor.

**7.3 Geotechnical and land stability effects**

The geotechnical assessment concludes that land instability is not a constraint on the proposed Lot 1 indicative building platform, provided that:

- all foundations are sited within the established indicative building platform and at least 17.0m from the crest of the coastal cliff to the south-southwest;
- no earthworks occur within the indicative building platform until a specific-design review is undertaken at building consent stage;
- bulk cut material is removed from site (not stockpiled on slopes >14°);
- vegetation clearance is confined to the indicative building platform; and
- stormwater runoff is directed away from the steep downslope land and appropriately controlled on site.

No visual signs of instability were observed within or around the platform and the historical aerial photography does not show any. Liquefaction risk is considered negligible. The geotechnical engineer has provided the section 106 RMA conclusion that no land or structure is likely to be subject to material damage from erosion, falling debris, subsidence or slippage, and that the subsequent use of the land is not likely to accelerate or worsen such damage.

Soils are Class H (highly expansive), requiring specific engineering design for foundations at building consent stage, which is a matter for the later building consent process. The LIM's generic ‘moderate potential’ notations for slippage and subsidence are not site-specific and are superseded by this site-specific assessment.

Subject to the recommendations above being secured by consent notice, the actual and potential adverse effects on land stability are considered no more than minor.

### 7.4 Natural hazards

A risk-based assessment against the NPS for Natural Hazards 2025 risk matrix has been undertaken by the geotechnical engineer for the indicative building platform, concluding a Low-risk rating for flooding, landslip, coastal erosion, coastal inundation, liquefaction, active faults and tsunami (the platform being inland and elevated approximately 39m above sea level). The site is not mapped by FNDC or NRC as being within a Coastal Flood Hazard Zone or Erosion Hazard Zone in the location of the indicative building platform.

A negligible portion of the site boundary, abutting the marginal strip, is affected by a Coastal Flood Hazard overlay, which brings SUB-R12 (subdivision of a site within coastal hazard areas) into play. As the indicative building platform and the proposed access are both sited wholly outside the spatial extent of that Coastal Hazard Area, RDIS-1 of SUB-R12 is met, and the matters of discretion are correspondingly narrow (essentially, whether the building platforms, access and services may be affected by inundation or erosion, the effects of the hazard on the intended use, and the need for mitigation works). None of those matters gives rise to concern.

Given the platform's substantial physical separation from the affected boundary strip, the actual and potential adverse effects arising from the site's coastal hazard status are considered less than minor, and the proposal does not increase coastal hazard risk.

The LIM also records ‘Poor Soakage’. That hazard relates to on-site effluent and stormwater disposal and is managed through the site-specific wastewater and stormwater design in the Civil Site Suitability Report (Sections 7.5 and 7.6). As no building is proposed at this stage, wildfire setbacks fall to be addressed, if relevant, at building consent stage. Firefighting water supply is addressed in Section 7.6.

Overall, the actual and potential adverse effects of natural hazards on this subdivision are considered no more than minor.

### 7.5 Earthworks and stormwater effects

Earthworks associated with this subdivision are limited to potentially minor works required to form the new vehicle access/crossing from Doves Bay Road, which will be well within the permitted activity earthworks thresholds of the District Plan. Standard erosion and sediment controls will be used during the works to avoid sediment reaching the coastal environment.

The civil report confirms Lot 1 has sufficient area to manage stormwater from future roof and hardstand areas (once a dwelling is built) via rainwater tanks and swales/silt traps, discharging to a suitably located and erosion-protected outlet away from the steep, unstable downslope land.

Given the very minor scale of the works and the availability of appropriate stormwater management on Lot 1, the actual and potential adverse effects of earthworks and stormwater are considered no more than minor.

### 7.6 Wastewater, water supply and servicing

No public water or wastewater services are available to the site. The civil engineer's assessment confirms that proposed Lot 1 (1.0000ha) contains ample undeveloped land to accommodate a future on-site wastewater system, designed in accordance with AS/NZS 1547:2012. The LIM's 'Poor Soakage' and 'medium risk' on-site wastewater model notations are addressed by that site-specific design, which will require secondary treatment and a conservative application rate. Given the size of Lot 1, final design of the wastewater disposal field can be confirmed at building consent stage.

Potable water will be provided by rainwater tanks (minimum 2 x 25,000L). Firefighting water storage consistent with SNZ PAS 4509:2008 can be accommodated within Lot 1 and can be secured by consent notice.

Electricity and telecommunications connections are not a requirement in the Rural Lifestyle zone and can be arranged at building stage.

The existing dwellings on proposed Lot 2 will retain their existing wastewater and stormwater systems in their current location. As this application relates only to the subdivision of the land, and Lot 2's existing services are not proposed to be altered, no further assessment of those existing systems is required as part of this application.

The actual and potential adverse effects on water supply, wastewater and servicing are considered no more than minor.

### 7.7 Traffic, transport and access effects

Proposed Lot 1 will be served by a new vehicle crossing from the western side of Doves Bay Road, to be constructed to FNDC Engineering Standards, secured as a condition of consent. Lot 2 retains its existing access and its traffic generation is unchanged.

One additional dwelling will generate traffic typically of the order of ten vehicle movements per day, which is considered negligible for this particular road in this location. Doves Bay Road carries a legal speed limit of 100km/h and is classified as an 'Access and low volume' road, for which the Engineering Standards specify a minimum sight distance of 195m. The available sight distance at the proposed access is approximately 66m to the north and 45m to the south-east, which does not comply with that numeric standard.

The Civil Site Suitability Report directly addresses this matter, concluding: "*Considering the constrained road geometry, residential environment, low traffic volumes and absence of through*

*traffic, the available sight distances are considered reasonable for the proposed low-volume residential access, subject to Council review and acceptance."*

Detailed access design, including construction to FNDC Engineering Standards, is appropriately addressed as a condition of subdivision consent. On this basis, the actual and potential adverse effects on traffic safety and access are considered no more than minor.

### 7.8 Esplanade reserves and public access

A Marginal Strip already exists along the site's coastal frontage. The proposed allotments adjoin that marginal strip rather than the line of mean high water springs, so the 20m esplanade requirement in SUB-S8 is not triggered, and no further esplanade reserve or strip is required to be set aside from proposed Lot 1 or Lot 2.

Public access to and along the coastal marine area is accordingly maintained, and no adverse effects on public access arise from this proposal.

### 7.9 Cultural and heritage effects

Given the discrete and limited scale of this 2-lot subdivision, and that no building is proposed, a cultural values assessment is not considered necessary.

The heritage GIS layer identifies a recorded archaeological site (NZAA ID P05/21) at the southern end of the narrow part of Proposed Lot 2, well removed from proposed Lot 1 and the indicative building platform. An accidental discovery advice note is proposed in any case.

The actual and potential adverse effects on cultural and heritage values are considered no more than minor.

### 7.10 Reverse sensitivity, rural character and amenity of adjoining properties

The proposal creates a second residential allotment within a zone (Rural Lifestyle) explicitly anticipating low-density residential activity of this scale. While the northern tip of the balance lot (Lot 2) is proximate to the Rural Production zone near the Opito Bay Road intersection, Proposed Lot 1 is located at the far south-eastern corner of the parent site, over 500m away and separated by regenerating bush and existing dwellings. It is therefore considered that reverse sensitivity effects are negligible.

The character and amenity of the immediate area, which already includes residential scale development along Doves Bay Road, is not expected to be materially altered by the addition of one further dwelling site. The subdivision does not create any adverse effects on the neighbouring property to the south. Any effects on privacy, outlook and shading from any future dwelling are managed through the RLZ height, 10m setback and recession plane standards at building stage.

The actual and potential adverse effects on rural character, reverse sensitivity and neighbouring amenity are considered no more than minor.

### 7.11 Contaminated soil

The LIM records no hazardous contaminants known on the property and no HAIL activity has been identified. The site contains two existing dwellings and regenerating bush. On that basis the NES for Assessing and Managing Contaminants in Soil to Protect Human Health is not triggered by the subdivision, and no adverse effects on human health arise.

### 7.12 Positive effects

- Provision of an additional residential allotment consistent with the anticipated density and character of the Rural Lifestyle Zone.
- Retention of the majority of the site's vegetation cover (the indicative building platform and any associated clearance for a dwelling at building consent stage represents a small proportion of the 7.3ha site).
- Consolidation of development beside the existing Settlement zone rather than in a sporadic coastal pattern.
- Economic and social benefit to the Applicant of realising the development potential of the land in a manner consistent with the anticipated zoning outcomes.

### 7.13 Cumulative effects

The proposal is a modest 2-lot subdivision in a locality already characterised by low-density coastal/rural residential development. The site directly abuts land zoned Settlement (previously the Coastal Residential Zone under the ODP), where the anticipated density of development is substantially greater than that proposed on this site. In that context, the incremental effect of one additional rural lifestyle allotment is considered negligible, and the actual and potential cumulative adverse effects are considered no more than minor.

## 8. Statutory Assessment

### 8.1 New Zealand Coastal Policy Statement 2010

The NZCPS objectives and the policies relevant to a subdivision in the coastal environment are assessed in Table 3. The proposal is considered consistent with them.

*Table 3: NZCPS objectives and policies assessment*

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| Objective 1 | Maintain or enhance the integrity, form, functioning and resilience of the coastal environment and its ecosystems. | The regenerating vegetation is retained other than future minor clearance within the permitted threshold when a dwelling is proposed at a later juncture.<br>No works are proposed in the coastal marine area.<br>**Consistent** |
| Objective 2 | Preserve natural character; protect natural features, landscape values and historic heritage. | The building platform is outside the mapped High Natural Character Area, inland and elevated, adjacent to Settlement zone development. No Outstanding Natural Character Area, ONL or ONF is affected. The recorded archaeological site is unaffected.<br>**Consistent** |
| Objective 3 | Take account of the principles of the Treaty of Waitangi; recognise kaitiakitanga and the relationship of tangata whenua with the coastal environment. | The proposal is a small-scale subdivision with no works in the coastal marine area and no effect on the recorded archaeological site. An accidental discovery advice note is proposed.<br>**Consistent** |
| Objective 4 | Maintain and enhance public open space and recreation qualities, and public access to and along the coast. | The existing marginal strip and adjoining Recreational Reserve continue to provide public access to and along the coast.<br>**Consistent** |
| Objective 5 | Ensure coastal hazard risks are managed, including by avoiding increases in risk. | The building platform and access are wholly outside the Coastal Hazard Area, inland and elevated ~39m above sea level. The subdivision does not increase coastal hazard risk.<br>**Consistent** |
| Objective 6 | Enable people and communities to provide for their wellbeing through appropriate subdivision, use and development within the limits of other objectives. | One additional rural lifestyle allotment is enabled in a location and form consistent with the zone and the surrounding settled pattern.<br>**Consistent** |
| Policy 2 | Recognise the Treaty and the role of tangata whenua in the management of the coastal environment. | See Objective 3 and Section 7.9.<br>**Consistent** |

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| Policy 3 | Adopt a precautionary approach where effects are uncertain, unknown or little understood but potentially significantly adverse. | No significant adverse effects are anticipated, and the geotechnical and civil investigations provide a sound basis for the effects assessment.<br>**Consistent** |
| Policy 6(1) | Consider the rate of development; encourage consolidation; avoid adverse visual impacts in sensitive areas; set back development from the coastal marine area; buffer areas of significant biodiversity. | The building platform is consolidated next to existing development, inland and set well back from the coastal marine area and not sited at the coastal edge.<br>**Consistent** |
| Policy 11 | Avoid adverse effects on threatened taxa and ecosystems; avoid significant adverse effects and avoid, remedy or mitigate other adverse effects on areas of predominantly indigenous vegetation. | The site lies within the Rangitane Shrublands PNA and a high density kiwi area but is not a scheduled SNA.<br>Any future clearance can be managed within the permitted threshold of regenerating scrub, not remnant forest, and kiwi are protected by consent notice.<br>Effects are considered no more than minor (Section 7.2).<br>**Consistent** |
| Policy 13 | Avoid adverse effects on outstanding natural character; avoid significant adverse effects and avoid, remedy or mitigate other adverse effects on natural character elsewhere. | No outstanding natural character area is affected. The building platform sits outside the High Natural Character Area.<br>Effects on natural character are considered no more than minor (Section 7.1).<br>**Consistent** |
| Policy 14 | Promote restoration or rehabilitation of natural character. | The subdivision does not preclude restoration. The retained regenerating vegetation continues to rehabilitate naturally.<br>**Consistent** |
| Policy 15 | Avoid adverse effects on outstanding natural features and landscapes; avoid significant adverse effects elsewhere. | No outstanding natural feature or landscape is affected.<br>Effects on the wider landscape are considered no more than minor.<br>**Consistent** |
| Policy 17 | Protect historic heritage from inappropriate subdivision, use and development. | The recorded archaeological site (NZAA P05/21) at the southern end of the property is remote from Lot 1 and the works. |

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| | | **Consistent** |
| Policies 18 and 19 | Maintain and enhance public open space and walking access to and along the coast. | No change to the existing marginal strip and reserve.<br>**Consistent** |
| Policies 22 and 23 | Control sedimentation; avoid adverse effects of discharges of contaminants (including wastewater and stormwater). | Earthworks are minor and confined to the access. Erosion and sediment control will apply.<br>Wastewater will be treated and disposed to land away from the coast.<br>Stormwater is dispersed on Lot 1 away from steep land.<br>**Consistent** |
| Policies 24 to 26 | Identify coastal hazards; avoid increasing risk in areas potentially affected over 100 years; avoid hard protection; protect natural defences. | No development is located within the mapped Coastal Flood Hazard Area, no hard protection is required, and the coastal vegetation buffer is retained.<br>**Consistent** |

### 8.2 National Policy Statement for Indigenous Biodiversity 2023

The objective of the NPS-IB is to maintain indigenous biodiversity so that there is at least no overall loss. The site is not identified as an SNA, but it lies within the Rangitane Shrublands Protected Natural Area and a high density kiwi area, so Policy 6 (protection of significant vegetation and habitats) and Policy 8 (maintaining indigenous biodiversity outside SNAs) are applied on a cautious basis.

Future clearance can be limited to the permitted threshold of regenerating scrub and the balance of the vegetation on both lots is retained, so there is not considered to be an overall loss of indigenous biodiversity. Kiwi are protected by the proposed consent notice. Policy 13 (restoration) is not compromised, the retained vegetation continues to regenerate.

### 8.3 National Policy Statement for Natural Hazards 2025

The geotechnical engineer's risk-based assessment confirms a Low-risk rating for the indicative building platform across all hazards considered. The negligible portion of the site affected by a Coastal Flood Hazard overlay is addressed through SUB-R12 (Section 6) and NZCPS Policy 25 and does not affect the platform or access.

## 9. District Plan Objectives and Policies Assessment

The proposal has been assessed against the objectives and policies of every chapter of the PDP and ODP engaged by the proposal, set out in the tables below. Each table identifies the objective or policy, summarises its direction, and records how the proposal relates to it. Objectives and policies that are not relevant to the proposal are grouped and marked 'Not engaged' so that the assessment is complete.

### 9.1 Proposed District Plan

The PDP chapters applicable to the proposal are the Rural Lifestyle Zone, Subdivision, Coastal Environment, Natural Hazards, Ecosystems and Indigenous Biodiversity, Transport and Infrastructure chapters.

*Table 4: Rural Lifestyle Zone*

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| RLZ-O1 | The zone is used predominantly for low density residential and small scale farming activities compatible with rural character and amenity values. | One additional low density residential allotment is created, consistent with the zone's predominant use.<br>**Consistent** |
| RLZ-O2 | The predominant character and amenity values of the zone include low density residential activity, smaller lot sizes than Rural Production, a general absence of urban infrastructure, low-volume rural roads, and vegetation, natural features and open space. | Lots of 1.0000ha and 6.3123ha reflect the smaller lot sizes anticipated. Services will be delivered on-site. Doves Bay Road is a low-volume no-through road. No vegetation removal is required through this application, however any future dwelling will retain the majority of the vegetation.<br>**Consistent** |
| RLZ-O3 | The role, function and character and amenity values of the zone are not compromised by incompatible activities. | The proposal introduces no incompatible activity.<br>**Consistent** |
| RLZ-O4 | Land use and subdivision does not compromise primary production in adjacent Rural Production zones. | While the northern tip of the balance lot (Lot 2) adjoins/is proximate to the Rural Production zone near the Opito Bay Road intersection, Proposed Lot 1 is located at the far south-eastern corner of the parent site, over 500m away and separated by regenerating bush and existing dwellings. Therefore, no reverse sensitivity effects on primary production activities arise.<br>**Consistent** |

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| RLZ-P1 | Enable low density residential activities whose design, scale and intensity manage adverse effects. | A single dwelling on Lot 1 is a permitted residential activity, and the platform is sited and sized to manage effects (Sections 7.1 to 7.4).<br>**Consistent** |
| RLZ-P2 | Avoid activities incompatible with the zone, including those contrary to the anticipated density or of urban form. | The density proposed meets the Rural Lifestyle discretionary minimum and the form is rural lifestyle, not urban.<br>**Consistent** |
| RLZ-P3 | Avoid or mitigate reverse sensitivity effects on adjacent Rural Production zone activities. | While the northern tip of the balance lot (Lot 2) adjoins/is proximate to the Rural Production zone near the Opito Bay Road intersection, Proposed Lot 1 is located at the far south-eastern corner of the parent site, over 500m away and separated by regenerating bush and existing dwellings. Therefore, no reverse sensitivity effects on primary production activities arise.<br>**Consistent** |
| RLZ-P4 | Consider (a) scale and character; (b) buildings; (c) zone interfaces; (d) on-site infrastructure capacity; (e) roading adequacy; (f) natural hazards; (g) heritage, cultural values, natural features and landscapes, indigenous biodiversity; (h) tangata whenua associations (TW-P6). | (a) consistent with scale and character;<br>(b) no building proposed, platform is indicative;<br>(c) 10m setbacks at the Settlement zone interface;<br>(d) on-site infrastructure confirmed feasible (7.5, 7.6);<br>(e) low-volume road, access to standard (7.7);<br>(f) 7.3 and 7.4;<br>(g) 7.1, 7.2 and 7.9; (h) 7.9.<br>**Consistent** |

*Table 5: Subdivision*

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| SUB-O1 | Subdivision results in efficient use of land that (a) achieves zone and overlay objectives, (b) contributes to local character, (c) avoids reverse sensitivity, (d) avoids incompatible land use patterns, (e) does not increase natural hazard risk, (f) manages adverse effects. | (a) and (d): meets the RLZ discretionary minimum and objectives;<br>(b) matches the settled pattern along Doves Bay Road;<br>(c) none arises; |

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| | | (e) platform and access are outside the hazard area, risk is not increased;<br>(f) effects are no more than minor.<br>**Consistent** |
| SUB-O2 | Subdivision provides for protection, restoration or enhancement of natural character of the coastal environment, areas of high and outstanding natural character, SNAs, sites and areas of significance to Māori and historic heritage. | The platform avoids the High Natural Character Area;<br>no SNA is identified;<br>the PNA and kiwi habitat are largely retained, and kiwi are protected by consent notice;<br>the recorded archaeological site is unaffected.<br>**Consistent** |
| SUB-O3 | Infrastructure is planned to service the subdivision in an integrated and efficient manner. | No reticulated infrastructure is available;<br>on-site water, wastewater and stormwater are demonstrated feasible.<br>**Consistent** |
| SUB-O4 | Subdivision is accessible and connected, including safe transport connections and esplanade where land adjoins the coastal marine area. | Lot 1 has direct road frontage and a new crossing to Council standard;<br>the marginal strip already provides coastal access.<br>**Consistent** |
| SUB-O5 and SUB-O6 | Protection of highly productive land; sequenced subdivision supported by infrastructure. | The site is not highly productive land (LUC Class 6) and the proposal creates no demand for new network infrastructure.<br>**Not Applicable** |
| SUB-P1, P2 and P10 | Boundary adjustments; subdivision for public works, reserves or access; subdivision of minor residential units. | The proposal is none of these.<br>**Not Applicable** |
| SUB-P3 | Provide for subdivision resulting in allotments that (a) are consistent with the planned environment of the zone, (b) comply with minimum allotment sizes, (c) are of adequate size and shape to contain a building platform, and (d) have legal and physical access. | (a) and (b) Lot 1 meets the discretionary minimum and Lot 2 both thresholds;<br>(c) SUB-S2 is met;<br>(d) both lots have legal road frontage and physical access.<br>**Consistent** |
| SUB-P4 | Manage subdivision design and layout in the General Residential, Mixed Use, | The site is in the Rural Lifestyle zone.<br>**Not engaged** |

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| | Medium Density Residential, Town Centre and Settlement zones. | |
| SUB-P5 | Require infrastructure to be provided in an integrated and comprehensive manner, including appropriate servicing. | Servicing is demonstrated for Lot 1 through the civil report;<br>Telecommunications and power are arranged at building stage.<br>**Consistent** |
| SUB-P6 | Require esplanade reserves or strips when subdividing specified allotment sizes adjoining the coast. | Not triggered because the marginal strip intervenes between the allotments and MHWS.<br>**Consistent** |
| SUB-P7 and SUB-P8 | Avoid rural lifestyle subdivision in the Rural Production zone unless specified outcomes are achieved; avoid subdivision compromising highly productive land. | Applies to the Rural Production zone only.<br>**Not Applicable** |
| SUB-P9 | Restrict rural residential subdivision in the Rural Lifestyle zone unless a management plan achieves superior environmental outcomes. | Lot 1 meets the 1ha Rural Lifestyle discretionary minimum in SUB-S1. It is not a sub-minimum or management plan subdivision, so the restriction is not applicable.<br>**Not Applicable** |
| SUB-P11 | Consider (a) reverse sensitivity; (b) consistency with scale, density and character; (c) buildings; (d) infrastructure capacity; (e) natural hazards; (f) heritage, natural character and biodiversity; (g) tangata whenua associations. | Each matter is addressed in Section 7 with effects found to be no more than minor.<br>**Consistent** |

*Table 6: Coastal Environment*

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| CE-O1 | The natural character of the coastal environment is preserved and protected from inappropriate land use and subdivision. | The platform lies outside the High Natural Character Area;<br>clearance is minor and within the permitted threshold;<br>no building is proposed at this juncture.<br>The subdivision is not inappropriate in this context.<br>**Consistent** |

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| CE-O2 | Land use and subdivision in the coastal environment is (a) integrated and coordinated, (b) compatible with surrounding land use, (c) avoids urban sprawl outside existing urban areas, (d) promotes restoration of natural character, (e) recognises the relationship of tangata whenua with ancestral lands. | (a) and (b) development sits beside the Settlement zone boundary;<br>(c) one additional lot adjoining an existing settled area is not sprawl;<br>(d) vegetation retained and regenerating;<br>(e) see Section 7.9.<br>**Consistent** |
| CE-O3 | Land use and subdivision in urban zones is of a scale consistent with existing built development. | The site is not in an urban zone.<br>**Not Applicable** |
| CE-P1 | Identify the extent of the coastal environment and areas of high and outstanding natural character. | The mapping has been identified. The site is in the coastal environment, and the majority is High (not Outstanding) Natural Character.<br>**Consistent** |
| CE-P2 and CE-P9 | Avoid adverse effects of subdivision on outstanding natural character, ONL and ONF; prohibit subdivision resulting in loss of outstanding natural character characteristics. | No outstanding natural character area, ONL or ONF is mapped on the site.<br>**Not Applicable** |
| CE-P3 | Avoid significant adverse effects and avoid, remedy or mitigate other adverse effects of subdivision on the characteristics and qualities of the coastal environment not identified as outstanding. | Applies to the High Natural Character Area. The indicative building platform is outside it and effects are no more than minor.<br>**Consistent** |
| CE-P4 | Preserve visual qualities and integrity of the coastal environment by consolidating subdivision around existing urban centres and settlements and avoiding sprawl or sporadic patterns. | The platform adjoins the Settlement zone and an existing dwelling, consolidating development at the road edge.<br>**Consistent** |
| CE-P5 to CE-P7 | Enable subdivision in urban zones; provide for farming; provide for Māori Purpose and Treaty Settlement land. | Not relevant to a Rural Lifestyle zone lifestyle subdivision on general title land.<br>**Not Applicable** |
| CE-P8 | Encourage restoration and enhancement of the natural character of the coastal environment. | Not precluded. Retention of regenerating vegetation supports natural restoration.<br>**Not inconsistent** |

*Table 7: Natural Hazards*

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| NH-O1 | Risks from natural hazards are managed, taking account of climate change effects. | A risk assessment against the NPS for Natural Hazards risk matrix rates all hazards Low for the indicative building platform, which is elevated ~39m above sea level.<br>**Consistent** |
| NH-O2 | Land use and subdivision does not increase risk from natural hazards. | Platform and access are outside the Coastal Hazard Area and the stability analysis shows no increase in risk.<br>**Consistent** |
| NH-O3 | New infrastructure is located outside identified natural hazard areas unless specified criteria are met. | On-site services for Lot 1 will be outside the hazard area.<br>**Consistent** |
| NH-O4 | Natural defences are protected and preferred to structural mitigation. | The coastal vegetation and cliff buffer is retained, and no hard protection is proposed.<br>**Consistent** |
| NH-P1 to NH-P3 | Map hazards; consider listed matters in assessing risk; take a precautionary approach. | Mapped hazards (coastal flood; land instability) have been identified and assessed by a suitably qualified engineer;<br>the matters in NH-P2 are addressed in Sections 7.3 and 7.4.<br>**Consistent** |
| NH-P5 | Require an assessment of risk prior to subdivision in areas subject to identified natural hazards. | The geotechnical report provides the required assessment including a section 106 conclusion and the NPS risk matrix.<br>**Consistent** |
| NH-P7 | In coastal hazard areas: (a) avoid locating building platforms in High Risk areas and, where practicable, outside other hazard areas; (d) avoid transferring risk; (e) minimise need for hard protection; (f) provide safe vehicle access; (g) locate services to minimise risk. | (a) the platform is wholly outside the Coastal Hazard Area;<br>(d) no risk is transferred;<br>(e) none required;<br>(f) access is from Doves Bay Road, outside the hazard area;<br>(g) services will be located inland.<br>**Consistent** |
| NH-P8 | Locate subdivision and land use to avoid land susceptible to land instability or mitigate the risks. | The platform is a Moderate Stability Hazard Zone with compliant factors of safety. The very steep High hazard land is avoided. |

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| | | **Consistent** |
| NH-P9 | Manage wildfire risk for vulnerable activities by setbacks, emergency access and firefighting water. | No building is proposed at this juncture. Firefighting water is addressed under SUB-S3 and a vehicle crossing to Council standard provides emergency access. Wildfire setbacks fall to be addressed at building stage.<br>**Consistent** |
| NH-P12 and NH-P13 | Protect natural features that buffer hazards; consider hard protection only in limited circumstances. | Natural features are retained and no hard protection is proposed.<br>**Consistent** |
| NH-P4, P6, P10, P11 and P14 | Structural mitigation assets; river flood hazard; infrastructure in hazard areas; flood schemes. | No river flood hazard area, structural mitigation asset, flood scheme or infrastructure within a hazard area is affected.<br>**Not Applicable** |

Table 8: Ecosystems and Indigenous Biodiversity

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| IB-O1 and IB-O2 | Significant indigenous vegetation and habitats are protected; indigenous biodiversity is managed to maintain extent and diversity while providing for wellbeing. | No SNA is identified, but the site is within the Rangitane Shrublands PNA and a high density kiwi area.<br>Any future clearance can be limited to the permitted threshold of regenerating scrub and the large majority of the habitat is retained, so extent and diversity are maintained.<br>**Consistent** |
| IB-O3 and IB-O4 | The relationship of tangata whenua with indigenous biodiversity and their role as kaitiaki, and landowners as stewards, are recognised. | Retention of the regenerating vegetation reflects landowner stewardship;<br>no taonga species have been identified as affected.<br>**Consistent** |
| IB-O5 | Restoration and enhancement of indigenous biodiversity is promoted and enabled. | Regeneration of retained vegetation continues;<br>nothing in the subdivision prevents restoration.<br>**Consistent** |

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| IB-P1 | Protection and restoration is done in a way that recognises the mana of tangata whenua as kaitiaki. | No effect on kaitiakitanga opportunities.<br>**Consistent** |
| IB-P2 | In the coastal environment: (a) avoid adverse effects on threatened and at-risk species, SNAs and significant habitat, and areas protected under other legislation; (b) avoid significant adverse effects and avoid, remedy or mitigate other adverse effects on areas of predominantly indigenous vegetation. | No SNA is identified on the site. Kiwi are an At-Risk species and the site is within a high density kiwi area.<br>The subdivision does not itself remove kiwi habitat of consequence, and a new consent notice controlling domestic animals avoids adverse effects on kiwi.<br>Any effect on regenerating predominantly indigenous scrub is limited to permitted-threshold clearance and is not significant.<br>**Consistent** |
| IB-P3 and IB-P5 | Policies for sites outside the coastal environment; management that does not unreasonably restrict primary production or infrastructure. | The site is within the coastal environment;<br>no primary production or infrastructure constraint arises.<br>**Not Applicable** |
| IB-P4 | Apply the effects management hierarchy where significant adverse effects are not otherwise avoided. | No significant adverse effects are anticipated.<br>**Not Applicable** |
| IB-P6 to IB-P10 | Promote restoration, non-regulatory methods, restoration through subdivision, pest management and eco-sourced planting. | The proposal does not rely on restoration benefits;<br>any future planting should use eco-sourced species and pest control is encouraged as an advice note.<br>**Not inconsistent** |

*Table 9: Transport*

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| TRAN-O1 and TRAN-O5 | The transport network is recognised as regionally significant infrastructure and is resilient to climate change. | Doves Bay Road is considered generally unaffected. One additional dwelling adds negligible demand.<br>**Not Applicable** |
| TRAN-O2 | Land use and transport planning are integrated to achieve a safe, efficient and well-connected network. | A single additional lot on an existing low-volume local road is an efficient pattern consistent with the zone.<br>**Consistent** |

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| TRAN-O3 | Parking, loading and access support land use and subdivision and ensure safe and efficient operation. | Lot 1 has direct frontage and space for compliant on-site access, manoeuvring and parking at building stage.<br>**Consistent** |
| TRAN-O4 | The network provides for safe and efficient movement of vehicular, cycle and pedestrian traffic. | Traffic generation from one dwelling is minimal and the road carries low volumes at low operating speeds.<br>**Consistent** |
| TRAN-P2 and TRAN-P3 | Maintain a safe, efficient network; manage subdivision layout, sightlines, access design (including emergency access), vehicular access, traffic volumes and cumulative effects. | The new crossing will be built to FNDC Engineering Standards. The sight distance shortfall (66m / 45m vs 195m) is addressed by the civil engineer, who concludes the distances are reasonable for a low-volume residential access given road geometry, no through traffic and low speeds, subject to Council review (Section 7.7).<br>**Consistent** |
| TRAN-P4 to TRAN-P6 | Parking design; integrated and diverse transport; high traffic generating activities. | Parking can be provided on-site at building stage;<br>the proposal is not a high traffic generator.<br>**Consistent** |
| TRAN-P7 | Consider traffic type and level, safety requirements, natural hazards, cumulative effects and tangata whenua associations. | Residential traffic of the order of ten movements per day;<br>no hazard affects the access;<br>cumulative effects are considered negligible.<br>**Consistent** |

*Table 10: Infrastructure*

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| I-O1 and I-O5 | Infrastructure is safe, efficient and resilient and its provision is integrated and coordinated at the time of subdivision. | Each lot will be serviced on-site and the services are demonstrated feasible at subdivision stage.<br>**Consistent** |
| I-O3 and I-P7 | Protect infrastructure from incompatible subdivision and reverse sensitivity effects. | The overlays that apply to the site (Coastal Environment, High Natural Character, Coastal Flood Hazard) include no infrastructure overlay.<br>**Not Applicable** |

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| I-P5 | Require coordination of infrastructure planning and delivery at the time of land use and subdivision. | Servicing for Lot 1 has been planned at subdivision stage by the civil engineer.<br>**Consistent** |
| I-P6 | Minimise adverse visual effects of infrastructure, including by undergrounding services when locating infrastructure in the coastal environment. | New electricity and telecommunications connections to Lot 1 are a matter for building consent.<br>**Consistent** |
| I-P10 and I-P15 | Encourage infrastructure in road corridors; consider earthworks, vegetation removal, stormwater and coastal values when assessing infrastructure effects. | Services will follow the road frontage where practicable;<br>Any earthworks or clearance for servicing will be very minor and form part of the permitted-threshold quantum.<br>**Consistent** |
| Remaining Infrastructure provisions | I-O2, I-O4, I-O6 to I-O9; I-P1 to I-P4, I-P8, I-P9, I-P11 to I-P14 and I-P16 to I-P21 (regionally significant infrastructure, National Grid, Māori Purpose zone, new technology, land drainage). | None applies to the proposal.<br>**Not Applicable** |

### 9.2 Operative District Plan

The ODP is assessed for completeness because the Council must have regard to it under s104(1)(b) while it remains operative. It is considered, for the reasons in Section 5.1, that the Rural Lifestyle Zone and Subdivision provisions of the PDP now govern, and that the ODP's Non-Complying outcome is not the governing consenting pathway.

In any event, the proposal is consistent with, and not contrary to, the ODP objectives and policies below. The ODP chapters engaged are Chapter 10 (Coastal Environment, including the General Coastal Zone), Chapter 12 (Natural and Physical Resources), Chapter 13 (Subdivision) and Chapter 15 (Traffic, Parking and Access).

*Table 11: ODP Chapter 10 – Coastal Environment and General Coastal Zone*

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| 10.3.1 and 10.4.1 | Avoid adverse effects from subdivision in the coastal environment, and only allow appropriate subdivision which (a) provides for natural character, (b) is of a location, scale and design that minimises effects, (c) has adequate services and | The subdivision is small in scale, located beside existing development, adequately serviced on-site, avoids more than minor effects on heritage, cultural values and vegetation, and retains public coastal access. |

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| | does not affect the roading network, (d) avoids more than minor effects on heritage, cultural values and significant vegetation and habitats, (g) provides for public access. | It is appropriate subdivision in terms of 10.4.1.<br>**Consistent** |
| 10.3.2 and 10.2.1 | Preserve the natural character of the coastline and coastal environment, significant indigenous vegetation, outstanding landscapes and open space and amenity values. | Natural character effects are no more than minor;<br>no outstanding landscape is affected and significant vegetation and kiwi habitat are largely retained and protected.<br>**Consistent** |
| 10.4.2 and 10.2.3 | Avoid sprawling or sporadic subdivision by consolidating development within or adjoining built-up areas. | Lot 1 adjoins existing residential development to the south and east.<br>**Consistent** |
| 10.4.3 and 10.4.12 | Maintain ecological values of significant coastal vegetation; minimise effects on natural character through building siting, intensity, colour, landscaping and access design. | Clearance is minor;<br>siting is inland, set back from the coast and adjoining existing development;<br>any dwelling remains subject to zone controls.<br>Access is limited to one additional crossing.<br>**Consistent** |
| 10.3.3, 10.4.5 and 10.4.8 | Engage with Māori and recognise their relationship with ancestral land and taonga; provide for access; avoid effects on that relationship. | See Section 7.9. No sites of significance are affected.<br>**Consistent** |
| 10.3.4, 10.3.5 and 10.4.4 | Maintain, enhance and secure public access to and along the coast. | Public access is retained via the marginal strip and reserve.<br>**Consistent** |
| 10.4.9 | Avoid, where practicable, areas where natural hazards could affect development or risk safety. | The indicative building platform and access avoid the coastal hazard area.<br>**Consistent** |
| 10.3.8, 10.4.10 and 10.4.11 | Ensure year-round water storage; minimise erosion, sediment and stormwater and wastewater runoff to the coastal marine area. | Rainwater storage is provided;<br>erosion controls apply to any minor earthworks;<br>on-site systems are designed to AS/NZS 1547.<br>**Consistent** |

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| 10.6.3.1 to 10.6.3.3 | General Coastal Zone objectives: appropriate subdivision consistent with preserving natural character; protect from inappropriate subdivision; meet foreseeable needs of future generations. | The proposal is appropriate in the manner described and provides for reasonably foreseeable residential need while preserving natural character.<br>**Consistent** |
| 10.6.4.1 to 10.6.4.6 | Compatible activities permitted; protect visual and landscape qualities; cluster development; minimise visual effects of vegetation clearance and earthworks; provide for public access; recognise Māori; control effects; design earthworks to suit landform. | Clustering is achieved at the road edge, clearance and earthworks are minor, and public access is retained.<br>**Consistent** |

*Table 12: ODP Chapter 12 – Natural and Physical Resources*

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| 12.1.3 and 12.1.4 (Landscape and Natural Features) | Protect outstanding landscapes and natural features; take account of visibility and ridgelines. | No outstanding landscape or feature is identified;<br>the platform is not on a ridgeline.<br>**Not engaged** |
| 12.2.3 and 12.2.4 (Indigenous Flora and Fauna) | Maintain the life-supporting capacity of ecosystems; protect significant indigenous vegetation and habitats (significance assessed against RPS criteria); provide for clearance of limited areas. | No scheduled significant area is identified, but the site is within a high density kiwi area, which the ODP treats as significant habitat. Limited clearance of regenerating scrub within the permitted threshold is provided for by Policy 12.2.4.4, and kiwi are protected through the consent notice.<br>**Consistent** |
| 12.4.3 and 12.4.4 (Natural Hazards) | Reduce threat of hazards; ensure development does not induce or exacerbate hazards; avoid effects from coastal hazards (12.4.4.6); account for sea level rise (12.4.4.4); control coastal subdivision so protection works are avoided (12.4.4.8). | Platform and access are outside the hazard area and elevated;<br>no hazard is induced;<br>no protection works are needed.<br>**Consistent** |
| 12.4.3.7 and 12.4.4.7 (Fire risk) | Avoid fire risk from residential units close to trees or areas without firefighting services. | Firefighting water storage is secured by consent notice;<br>separation from vegetation is addressed at building stage.<br>**Consistent** |

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| 12.5.3 (Heritage) | Protect archaeological, cultural and historic heritage values from inappropriate use, development and subdivision. | The recorded archaeological site is remote from the works;<br>an accidental discovery advice note applies.<br>**Consistent** |

*Table 13: ODP Chapter 13 – Subdivision*

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| 13.3.1 and 13.3.2 | Subdivision consistent with the zone purpose; avoids, remedies or mitigates effects including natural hazards and reverse sensitivity. | The Rural Lifestyle zone now governs;<br>effects are no more than minor and no hazard is created or accelerated.<br>**Consistent** |
| 13.3.3 and 13.4.6 | Do not jeopardise outstanding landscapes and natural features in the coastal environment; provide for protection of heritage, significant vegetation and natural character. | No outstanding landscape or natural feature is affected;<br>heritage is unaffected and kiwi habitat and threatened species are protected by the consent notice.<br>**Consistent** |
| 13.3.5 and 13.4.8 | Provide on-site water storage and stormwater management sufficient year-round. | Rainwater tanks and on-site stormwater management are provided for.<br>**Consistent** |
| 13.3.7 and 13.4.11 | Recognise the relationship of Māori with ancestral lands and the principles of the Treaty. | See Section 7.9.<br>**Consistent** |
| 13.3.8 and 13.3.10 | Ensure electricity supply and efficient provision of infrastructure. | Electricity supply to Lot 1 will be arranged at building stage.<br>**Consistent** |
| 13.4.1 | Determine allotment sizes with regard to effects on natural character, ecology, landscape, amenity, cultural, heritage values and existing land uses, including cumulative effects. | Section 7 addresses each value and finds effects no more than minor.<br>**Consistent** |
| 13.4.2 and 13.4.5 | Require safe and effective access; avoid effects of servicing and access on neighbours, roads, silt run-off and vegetation. | A new crossing to Council standard is proposed;<br>the sight distance shortfall is addressed in Section 7.7;<br>silt control applies to minor works.<br>**Consistent** |

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| 13.4.3 | Take natural and other hazards into account in subdivision design and location. | Hazards have been investigated and the lots are located and designed to avoid them.<br>**Consistent** |
| 13.4.4 | Avoid adverse visual impacts of utility services. | Services to Lot 1 will be addressed at building stage.<br>**Consistent** |
| 13.4.7 | Financial contributions only where specified demand or effects arise. | None of the listed circumstances arises.<br>**Consistent** |
| 13.4.13 and 13.4.14 | Cluster development where there is least impact on natural character, minimise visual impacts, provide public access, ensure hazards are not exacerbated and have regard to zone objectives. | Development is clustered at the road edge outside the High Natural Character Area, public access is provided, and no hazard is exacerbated.<br>**Consistent** |

*Table 14: ODP Chapter 15 – Traffic, Parking and Access*

| Ref. | Provision (summary) | Assessment / Comment |
|---|---|---|
| 15.1.3.1 and 15.1.3.5 | Minimise adverse effects of traffic; promote safe and efficient movement of vehicles, cycles and pedestrians. | Traffic from one additional dwelling is minimal on a low-volume no-through road.<br>**Consistent** |
| 15.1.3.4 and 15.1.4.6 | Provide appropriate access; regulate number, size, gradient and placement of access points to assist traffic safety. | One new access point is proposed to Council standard;<br>the sight distance shortfall is addressed in Section 7.7.<br>**Consistent** |
| 15.1.4.1 and 15.1.4.7 | Evaluate traffic effects; take account of cycle and pedestrian traffic. | Traffic effects are evaluated in Section 7.7 and are considered no more than minor.<br>**Consistent** |

### 9.3 Conclusion on objectives and policies

Overall, the proposal is consistent with the relevant objectives and policies of the PDP and, to the extent they remain relevant, of the ODP. The proposal is not contrary to any of them, and no objective or policy directing avoidance is engaged.

## 10. Conditions and Consent Notice Matters

Council will have regard to natural hazard and land stability risk under Section 106. The geotechnical engineer has provided the required section 106 conclusion (Section 7.3). Given the

geotechnical constraints identified and the coastal hazard matter addressed under SUB-R12 (Section 7.4), it is anticipated that consent, if granted, would be subject to conditions and/or a consent notice under Section 221 RMA addressing:

- survey plan and easements: the subdivision to be in accordance with Scheme Plan Rev B, with any necessary service or access easements shown on the survey plan;
- vehicle crossing: construction to FNDC Engineering Standards before the section 224(c) certificate, with standard erosion and sediment controls during the works;
- future building and earthworks limited to within the indicative building platform as shown on the approved plans, with foundations at least 17m from the cliff crest;
- specific engineering design of foundations at building consent stage, having regard to the Class H expansive soils identified;
- stormwater management in accordance with the recommendations of the civil engineer, with discharge directed away from the steep downslope land;
- on-site wastewater system design, installation and long-term maintenance in accordance with AS/NZS 1547:2012, secured by consent notice;
- rainwater tank potable supply (minimum 2 x 25,000L) and firefighting water storage in accordance with SNZ PAS 4509:2008, secured by consent notice;
- kiwi protection: a consent notice registered against the titles of both Lot 1 and Lot 2 prohibiting the keeping of cats, dogs, and mustelids on the allotments.

Advice notes:

- if any archaeological material is discovered, works must stop and Heritage New Zealand Pouhere Taonga must be contacted, and an authority may be required under the Heritage New Zealand Pouhere Taonga Act 2014.

## 11. Consultation

Given the discrete and limited scale of this 2-lot subdivision, and the absence of any identified affected parties, consultation has not been undertaken and is not considered necessary.

## 12. Assessment of Notification (Sections 95A–95E RMA)

Section 95A of the RMA sets out a series of steps for determining public notification:

- Step 1 – Mandatory public notification in certain circumstances. In respect of this application, the Applicant is not seeking public notification, nor is it subject to a mandatory notification requirement.

- Step 2 – Public notification precluded in certain circumstances. The application does not qualify.
- Step 3 – Public notification required in certain circumstances. This assessment of effects concludes that any adverse effects would be no more than minor (Section 7). The proposal is not subject to a rule or national environmental standard requiring notification. For these reasons, it is considered that the application can be processed without public notification.
- Step 4 – Public notification in special circumstances. It is considered that there are no unusual or exceptional circumstances that would warrant notification of this application.

Section 95B of the RMA sets out the equivalent steps for limited notification. Steps 1 and 2 are not engaged. No rule or national environmental standard requires or precludes limited notification, and no protected customary rights group, customary marine title group or statutory acknowledgement person has been identified as affected. At Step 3, the activity is not a boundary activity and no affected person is identified under Section 95E. The effects on the adjoining dwelling to the south and on users of the marginal strip are considered less than minor. As no building is proposed, the platform is set back 10m from boundaries, and public access along the coast is unchanged. At Step 4, there are no special circumstances.

On this basis, and pursuant to Sections 95A, 95B, 95D and 95E of the RMA, it is recommended that the application proceed without public or limited notification.

## 13. Part 2 Assessment (RMA)

The proposal is considered capable of achieving the purpose of the RMA (Section 5) – the sustainable management of natural and physical resources. The relevant provisions of Part 2 are addressed as follows:

- Section 6(a) (preservation of natural character of the coastal environment): relevant given the site's coastal location but not compromised. The mapped High Natural Character Area does not extend to the indicative building platform, no Outstanding Natural Character Area is present, and any clearance is confined to a permitted-threshold quantum of regenerating scrub.
- Section 6(b) (outstanding natural features and landscapes): not engaged; none is identified on the site.
- Section 6(c) (significant indigenous vegetation and significant habitats of indigenous fauna): the site lies within a Protected Natural Area and a high density kiwi area but is not a scheduled SNA. Clearance at building stage will be minor and can be achieved within the permitted threshold. The large majority of the habitat is retained, and kiwi are protected by the proposed consent notice, so the values are not compromised.

- Section 6(d) (public access to and along the coastal marine area): maintained by the existing marginal strip and Recreational Reserve.
- Section 6(e) and Section 8 (relationship of Māori with ancestral lands and the principles of the Treaty of Waitangi): the subdivision is small in scale, affects no site of significance, and the recorded archaeological site is unaffected.
- Section 6(f) (historic heritage): the recorded archaeological site at the southern end of the property is not affected.
- Section 6(h) (management of significant risks from natural hazards): the platform and access avoid the coastal hazard area and land instability is managed.
- Section 7(b), (c), (f) and (g) (efficient use of resources; amenity values; quality of the environment; finite characteristics of natural resources) and Section 7(i) (effects of climate change): the lot is efficient, amenity and environmental quality are maintained, and the platform's elevation ~39m above sea level provides resilience to sea level rise.

This Part 2 assessment is undertaken on the basis that the PDP Rural Lifestyle Zone and Subdivision chapter provisions govern the consenting pathway (Sections 5.1 and 6.1). The more restrictive, non-complying outcome that would otherwise arise under the ODP General Coastal Zone alone (Section 6) does not alter this Part 2 conclusion, as that ODP pathway is superseded for the reasons given at Section 5.1.

Having regard to sections 5 to 8 of the RMA, and the objectives and policies of the relevant statutory instruments and district plan provisions (Sections 8 and 9), the proposal is considered to achieve the sustainable management purpose of the RMA.

## 14. Conclusion

The proposed 2-lot subdivision of 2 & 8 Doves Bay Road, Kerikeri is consistent with the anticipated pattern of development for the Rural Lifestyle Zone under the Proposed District Plan.

The geotechnical and civil engineering assessments confirm the proposal is technically feasible, subject to standard subdivision-stage conditions and building-stage specific design.

The application is considered a Discretionary Activity, principally as a result of the proposed lot size for Lot 1 and the Coastal Environment subdivision rule (SUB-R20).

Although the equivalent provisions of the ODP's General Coastal Zone would, taken alone, render this subdivision a Non-Complying Activity (given the 20ha minimum lot size), that outcome is not considered the consenting pathway. It is considered that the corresponding PDP Rural Lifestyle Zone and Subdivision chapter provisions are not subject to appeal and have full legal effect under s86F of the RMA, and it is those provisions that apply. Even if the Operative Plan status were applied, the Section 104D gateway tests are satisfied.

The proposal is consistent with, and not contrary to, the relevant objectives and policies of the PDP and ODP, the NZCPS and the NPS-IB, and achieves the purpose of the RMA.

The actual and potential adverse effects of the activity on the environment are considered no more than minor.

It is recommended that resource consent be granted on a non-notified basis, subject to the conditions outlined in Section 10.

Kind regards



Andrew McPhee
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** **856637**

**Land Registration District** **North Auckland**

**Date Issued** 12 March 2019

**Prior References**
NA9D/307

---

**Estate** Fee Simple

**Area** 7.3123 hectares more or less

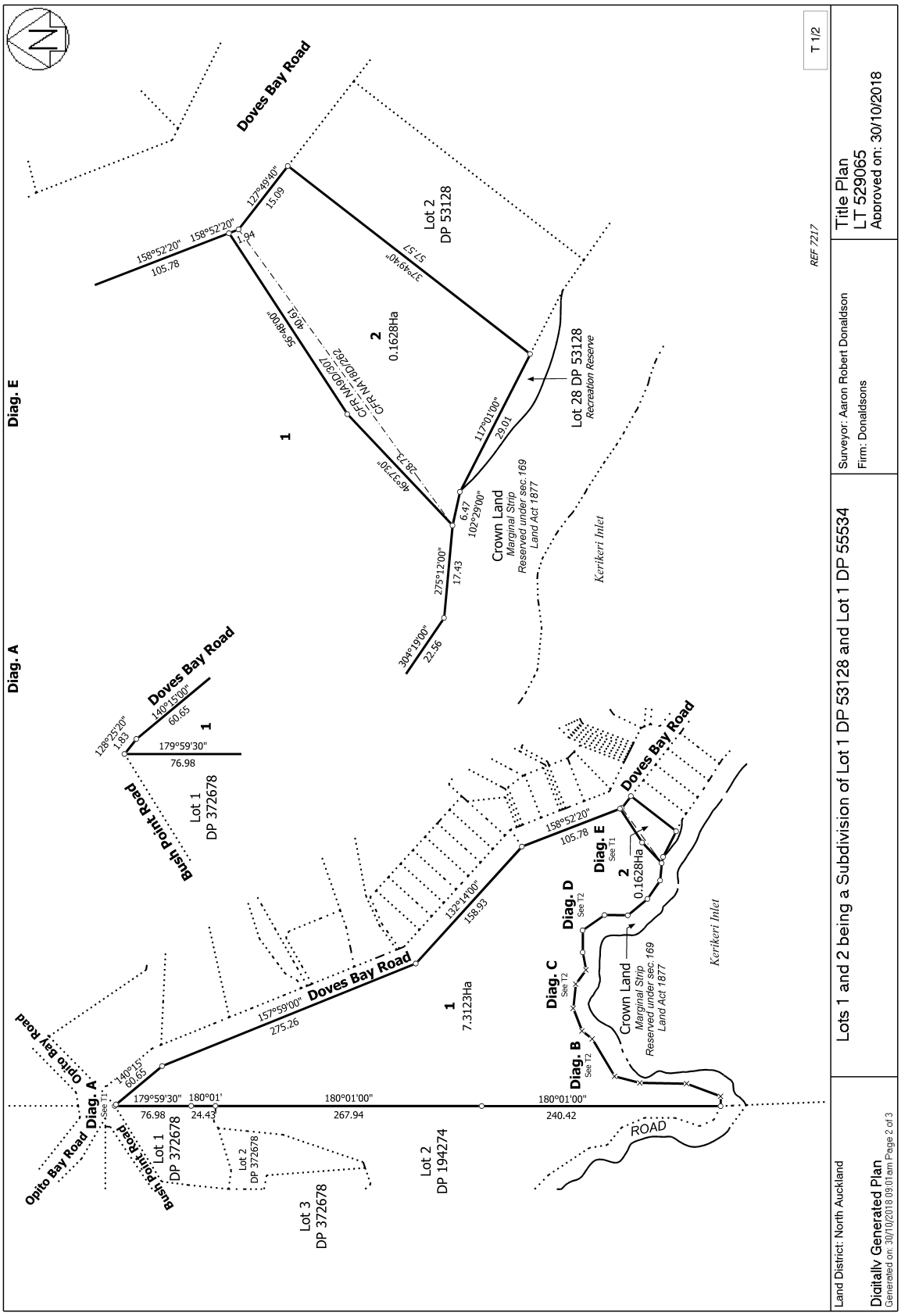
**Legal Description** Lot 1 Deposited Plan 529065

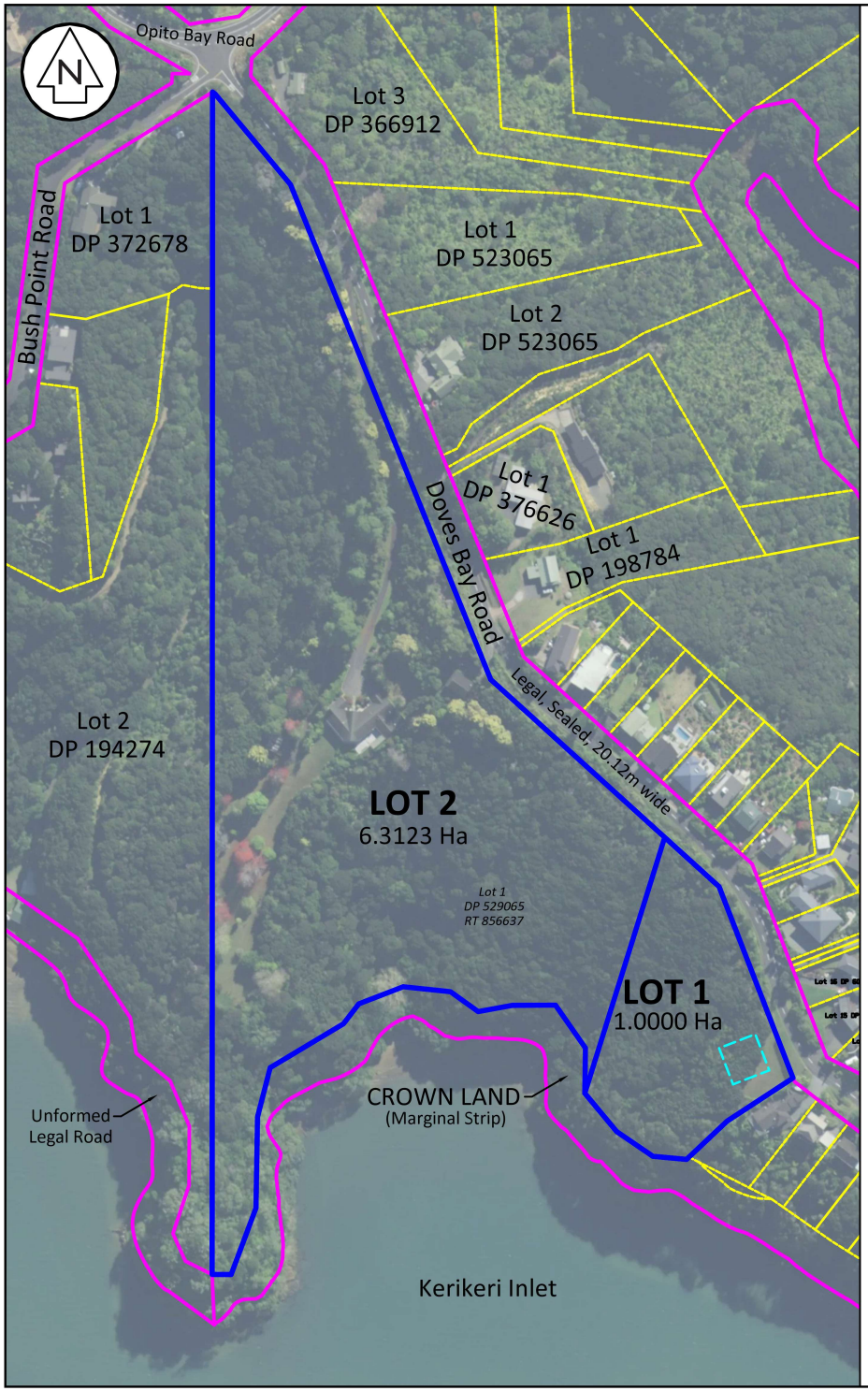
**Registered Owners**
Bethanie Autumn Maples

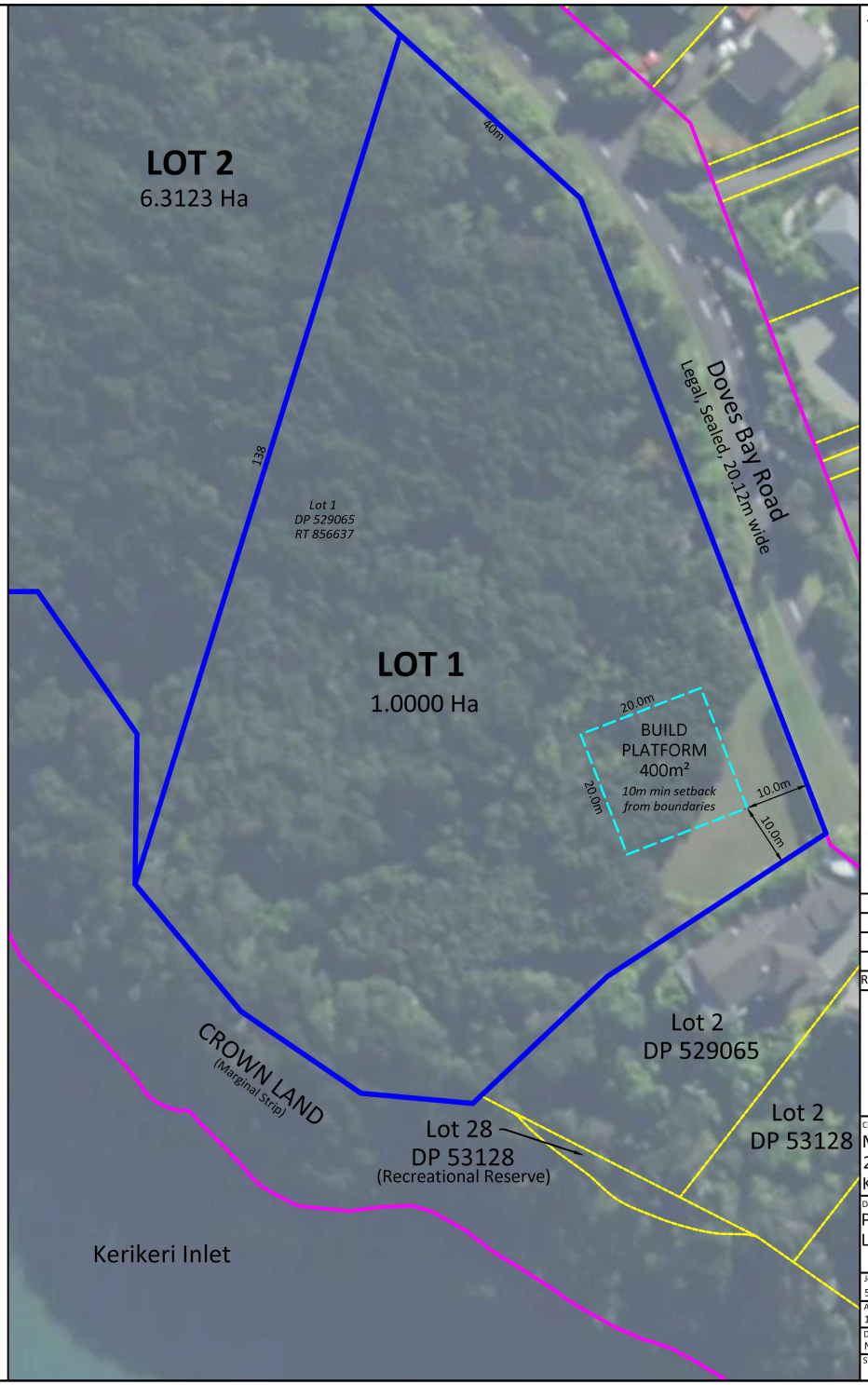
---

**Interests**

Appurtenant hereto is an electricity right and water supply rights created by Transfer C469817.1 - 8.4.1993 at 11.05 am


Doves Bay Road
Lot 2 DP 53128
Lot 28 DP 53128
Recreation Reserve
Crown Land
Marginal Strip
Reserved under sec.169
Land Act 1877
Kerikeri Inlet
Diag. E
Diag. A
Diag. B
Diag. C
Diag. D
Bush Point Road
Opito Bay Road
Lot 1 DP 372678
Lot 2 DP 372678
Lot 3 DP 372678
Lot 2 DP 194274
ROAD
Lots 1 and 2 being a Subdivision of Lot 1 DP 53128 and Lot 1 DP 55534
Title Plan
LT 529065
Approved on: 30/10/2018
Surveyor: Aaron Robert Donaldson
Firm: Donaldsons
Land District: North Auckland
Digitally Generated Plan
Generated on: 30/10/2018 09:01 am Page 2 of 3
T 1/2
REF 7217




NOTES:

1. THIS DRAWING HAS BEEN PREPARED SOLELY FOR THE USE INTENDED BY, AND AGREED WITH THE CLIENT AND MUST NOT BE USED FOR ANY OTHER PURPOSE.
2. BOI SURVEY LTD ACCEPTS NO RESPONSIBILITY FOR THIS PLAN OR DATA DEPICTED ON THIS PLAN BEYOND THE AGREED SCOPE OF WORK.
3. DO NOT SCALE OFF DRAWINGS.
4. ALL SERVICES & FEATURES ARE ILLUSTRATIVE AND INDICATIVE ONLY. TO BE VERIFIED ON SITE BEFORE PROCEEDING WITH WORKS.
5. BOUNDARIES ARE SUBJECT TO FINAL SURVEY.

COMPRISED IN RT: 856637
TOTAL AREA: 7.3123 Ha
COUNCIL: Far North District Council
ZONE: General Coastal

| Rev | Description | By | Date |
|---|---|---|---|
| B | Issue | SB | 19/10/26 |

BOI SURVEY LTD
55B Shepherd Road
Kerikeri 0230

tony@boisurvey.co.nz
021 376 267

Client & Site Address:
Maples
2 & 8 Doves Bay Road,
Kerikeri

Description:
PROPOSED SUBDIVISION OF
LOT 1 DP 529065

| | |
|---|---|
| Job No: 5144 | Drawing Ref: 5144 Doves Bay Rd Rev B |
| A3 Scale: 1:2500 | Co-Ord System: NZGD Mt Eden 2000 |
| Datum: NZVD 2016 | Origin: Not Specified |
| Sheet: 01 OF 01 | Rev: B |

DATE 19/10/26 FILE PATH: C:\2021\5.0021\44 2 COVES BAY ROAD\5.0021\44 2 COVES BAY ROAD\5.0021\44 2 COVES BAY ROAD

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

| | |
|---|---|
| **SITE** | **2 & 8 Doves Bay Road, Kerikeri** |
| **LEGAL DESCRIPTION** | **Lot 1 DP 529065** |
| **PROJECT** | **Proposed 2-Lot Subdivision (1 Lot for Assessment)** |
| **CLIENT** | **Timothy D.F. Maples** |
| **REFERENCE NO.** | **148880** |
| **DOCUMENT** | **Civil Site Suitability Report** |
| **STATUS/REVISION NO.** | **01– Resource Consent** |
| **DATE OF ISSUE** | **24 August 2026** |

| Report Prepared For | Email |
|---|---|
| Timothy D.F. Maples | timmaples@gmail.com |



| | | | | |
|---|---|---|---|---|
| **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:** | Lot 1 DP 529065 |
| **Lot Sizes:** | Proposed Lot 1 – 1.0000ha<br>Proposed Lot 2 – 6.3123ha (balance lot) |
| **Scope:** | Civil Site Suitability Investigation:<br>- Potable Water Recommendations (Lot 1)<br>- Wastewater Assessment (Lot 1)<br>- Stormwater Assessment (Lot 1)<br>- Access (Lot 1) |
| **Development Proposals Supplied:** | Subdivision Scheme Plan supplied by BOI SURVEY Ltd (Ref No: 5144, dated: 14.08.2026) |
| **District Plan Zone:** | Rural Lifestyle 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:<br>**Daily Wastewater Production:** 1,080L/day<br>**Daily Application Rate:** 1.75mm/day (includes 50% slope reduction)<br>**Disposal Area:** 618m²<br>**Reserve Area:** (30%)<br>Recommendations for wastewater are provided in Section 7. |
| **Stormwater Management – District Plan Rules:** | **Permitted Activity:** RLZ-R2 Impermeable Surface Coverage – The impermeable surface coverage of any site is no more than 12.5% or 2,500m², which ever is lesser. |
| **Stormwater Management:** | Impermeable surfaces within Lot 1 must not exceed 1,250m² to comply with RLZ-R2. Stormwater attenuation is not considered necessary due to the anticipated low impervious coverage and the site's proximity to the coastal receiving environment. Runoff must be directed to a suitable discharge location with appropriate erosion protection.<br>Stormwater management recommendations are provided in Section 8. |
| **Access:** | It is our understanding that proposed Lot 1 intends to utilise a new access point from the western side of Doves Bay Road.<br>It is recommended that all vehicle crossings are constructed in accordance with the Far North District Council Engineering Standards (2023), Sheet 21 Type 1A – Light Vehicles.<br>Available vehicle crossing location is not compliant with FNDC's sight distance requirements and are therefore subject to Council review.<br>Access recommendations provided in Section 9. |

## 2 SCOPE OF WORK

Wilton Joubert Ltd (WJL) was engaged by the client to undertake a civil site suitability assessment (wastewater, stormwater and access) to support a 2-lot subdivision of the subject site as per the supplied Scheme Plan Set prepared by BOI SURVEY Ltd (Ref No: 5144, dated: 14.08.2026).

The primary objective of this report is to provide civil assessments along with preliminary design recommendations pertaining to future residential development within vacant proposed Lot 1.

A Geotechnical Suitability Report (WJL Ref. 148879) has been completed for the proposed subdivision which should be read in conjunction with this report.

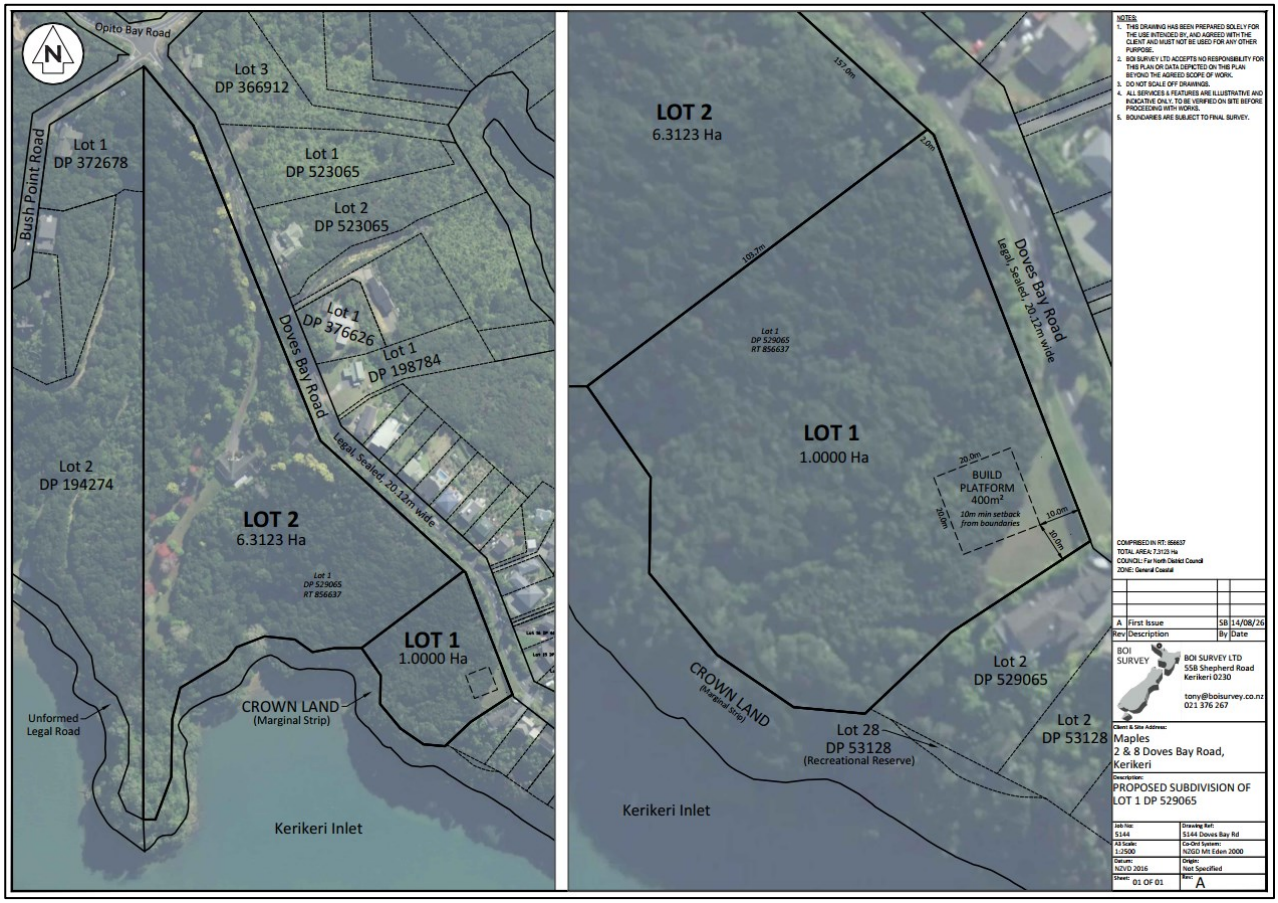



**Figure 1: Snip of scheme plan prepared by BOI SURVEY Ltd (Ref No: 5144, dated: 14.08.2026)**

This report is based on available information and concept-level design inputs and 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.

## 3 SITE DESCRIPTION

The proposed development will be constructed within the following property (the site) which covers the initially 600m stretch of land off the western side of Doves Bay Road:

- 2 & 8 Doves Bay Road, Kerikeri, legally described as Lot 1 DP 529065.




**Figure 2: 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 7.3ha and is currently accessed 140m southeast of the Opito Bay Road intersection via a chipseal and aggregate driveway from Doves Bay Road. The driveway directs to the southwest towards an existing residential development in the approximate middle of the site. Aside from minor cleared land around the residential development and along the eastern boundary corner, the site is covered in dense regenerating bush.

Broadly speaking, the site is essentially located on a west to southwest facing, moderate to very steeply sloping side flank that descends some 60m from the Doves Bay Road ridgeline down to the Kerikeri Inlet.

The FNDC online 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 Subdivision Scheme Plan supplied, we understand that it is proposed to subdivide the existing property into two individual allotments, comprising of proposed Lot 1 (1ha) and Lot 2 (6.3123ha). It is our understanding that future development of Lot 1 is proposed. Proposed Lot 2 will retain the existing dwelling and associated stormwater and on-site wastewater systems. Based on the available information, these systems are expected to remain wholly within the proposed Lot 2 boundaries and are not proposed to be altered. The existing systems may remain in service provided they continue to operate satisfactorily. If either system is found to be defective or no longer functioning adequately, it should be repaired or replaced as necessary.

## 5 PUBLISHED GEOLOGY

Reference to the New Zealand Geology Web Map hosted by GNS Science indicates that the site and wider surrounding land is underlain by deposits of the Waipapa Group Sandstone and Siltstone (Waipapa Terrane). These deposits are approximately 270 to 154 million years in age and described as; "*Massive to thin bedded, lithic volcaniclastic metasandstone and argillite, with tectonically enclosed basalt, chert and siliceous argillite.*". Refer to GNS Science Website.



*Figure 3: 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 and SILT. Approximately 100mm-350mm of TOPSOIL was overlying the investigated area. Groundwater was not observed to a tested depth of 3.8m 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.

## 6 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 new dwelling / lot. The type of tank and volume is for the client to confirm.

## 7 WASTEWATER

No existing wastewater management system is present within proposed Lot 1. 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 1.

### 7.1 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 1. As no development proposals are available at this stage for the eventual residential development within the proposed Lot 1, 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 proposed Lot 1.

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

### 7.1.1 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 / SILT – Moderate Drainage |
| Estimate House AS/NZS 1547:2012Occupancy: | 6 Persons |
| Estimated Slope Reduction (AS/NZS 1547:2012 Table M2): | 50% reduction |
| Loading Rate: | 1.75mm/day |
| Estimated Total Daily Wastewater Production: | 1,080L/day |
| Typical Wastewater Design Flow Per Person: | Rainwater Supply: 180L/pp/day (Estimated –water conservation devices may enable lower design flows) |
| Application Method: | Surface / Subsurface Laid PCDI Lines |
| Loading Method: | Dosed |
| Emergency Storage: | 24 hours |
| Estimated Min. Disposal Area Requirement: | 618m² |
| Required Min. Reserve Area: | 30% |
| Buffer Zone: | Required |
| Cut-off Drain: | Required |

## 7.2 REQUIRED SETBACK DISTANCES

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

| Table 9 of the RPN (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 |

## 7.3 NORTHLAND REGIONAL PLAN ASSESSMENT

Any future wastewater disposal system should meet the compliance points below, stipulated within Section C.6.1.3 of the 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, proposed Lot 1 contains 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.

# 8 STORMWATER MANAGEMENT

## 8.1 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 Lifestyle Zone.




*Figure 4: Snip of FNDC Maps showing site in Rural Lifestyle Zone*

The following Stormwater Management Rules Apply:

Permitted Activity: RLZ-R2 Impermeable Surface Coverage – The impermeable surface coverage of any site is no more than 12.5% or 2,500m², which ever is lesser.

To comply with the parameters of the Permitted Activity Rule (RLZ-R2), Lot 1 must not exceed an impermeable area of 1,250m².

Given the large lot sizes and low anticipated impervious coverage associated with rural residential development, the change in peak runoff characteristics is expected to be minor relative to the existing catchment response. Consequently, stormwater attenuation measures are not considered necessary. Furthermore, the site is located near the downstream extent of the catchment, immediately upslope of the coastal receiving environment. As there is limited downstream catchment area, infrastructure or flood-prone land between the site and the ultimate receiving environment, attenuation of runoff from the proposed lot is unlikely to provide a meaningful reduction in downstream peak flows or flood risk. Delaying discharge may instead cause site runoff to coincide more closely with the peak flow from the wider upstream catchment. Accordingly, attenuation is not considered necessary, provided runoff is conveyed to an appropriate discharge location with suitable erosion protection.

To appropriately mitigate stormwater runoff from 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.

## 8.2 PRIMARY STORMWATER

### 8.2.1 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).

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

### 8.2.2 Stormwater Runoff from Hardstand Areas

Stormwater runoff from future driveways / ROWs 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.

### 8.2.3 Stormwater Runoff Discharge Point

Discharge and overflow from future potable water tank(s) and any hardstand catchpits / silt traps should be directed to an appropriately sized dispersal device within Lot 1, 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.

In accordance with the Geotechnical Site Suitability Report (WJL Ref. 148879) stormwater runoff should not be discharged or directed to land directly downslope of the designated building platform. Stormwater runoff is recommended to be directed toward the northwest or southwest.

## 8.3 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.

## 8.4 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, (1) through (6). In respect of matters (1) through (6), we provide the following comments:

*SUB-S4 – Stormwater Management*

| | |
|---|---|
| *(1) All allotments shall be provided, within their site area, with a means for the disposal of collected stormwater from the roof of all potential or existing buildings and from all impermeable surfaces, in such a way so as to avoid or mitigate any adverse effects of stormwater runoff on receiving environments, including downstream properties.* | Lot 1 has sufficient land area to provide for the collection and disposal of stormwater generated from all potential roof and hardstand areas. Roof runoff will be collected and directed to rainwater tanks, with tank overflows conveyed via sealed pipes to an appropriately designed dispersal device or erosion-protected outlet within Lot 1. Stormwater runoff from hardstand areas should be collected by appropriately sized swales, silt traps or catchpits and conveyed to a suitable outlet.<br><br>All discharge points are to be located on stable ground, clear of buildings and wastewater disposal areas, and positioned in accordance with the recommendations of the Geotechnical Site Suitability Report. Appropriate dispersal and erosion-protection measures will avoid or mitigate scour, concentrated runoff and adverse effects on the receiving environment, adjoining land and downstream properties. Accordingly, Lot 1 can provide, within its site area, a suitable means of managing stormwater from potential future development. |
| *(2) The primary stormwater system is capable of conveying 10% AEP design storm events without surcharge;* | The primary stormwater system for future development within Lot 1 will comprise roof gutters, rainwater tanks, sealed pipework and, where required, swales, silt traps or catchpits serving hardstand areas. The system is to be hydraulically designed at the building consent stage to convey runoff from the 10% AEP design storm event without surcharge. The final design is to account for the anticipated impermeable area and demonstrate that all components, including inlets, pipes and discharge devices, have sufficient capacity. Given the size and topography of Lot 1, a compliant primary stormwater system is considered practicable. |
| *(3) The secondary stormwater system is capable of conveying the 1% AEP storm event within a defined path and without causing undue risk or damage to persons or property;* | The finished ground levels associated with future development must provide a defined secondary overland flow route(s) capable of safely conveying runoff from the 1% AEP storm event, including flows resulting from surcharge or blockage of the primary system. The secondary flow path must be directed away from building platforms, wastewater disposal areas and neighbouring properties, without causing undue risk, erosion or damage to people or property.<br><br>Where necessary, driveways, grassed areas or appropriately sized swales may form part of the secondary flow route(s). In accordance with the Geotechnical Site Suitability Report, secondary flows must not be directed to land immediately downslope of the designated building platform and should instead be conveyed toward the northwest or southwest to a suitable discharge location. |

| | |
|---|---|
| *(4) The stormwater system will not connect or be able to overflow to the wastewater network.* | The stormwater and wastewater systems will remain physically separate, with no connection or provision for stormwater to overflow into the on-site wastewater treatment or disposal system. The proposed stormwater disposal point will be located downslope of the effluent disposal area.<br><br>The final stormwater outlet must maintain the applicable separation distance from the effluent disposal area and be positioned so that stormwater discharge does not cause saturation, erosion or instability within the disposal field. |
| *(5) The primary, secondary and attenuation systems are designed to accommodate an additional 20% for climate change.* | The primary and secondary stormwater systems associated with future development must be designed to accommodate an additional 20% allowance for climate change. |
| *(6) The stormwater system is designed and constructed for an asset life of at least 50 years.* | The stormwater system must be designed and constructed for an asset life of at least 50 years. |

# 9 ACCESS

## 9.1 GENERAL

A basic access and vehicle crossing assessment has been completed for proposed Lot 1.

It is our understanding that proposed Lot 1 intends to utilise a new access point from the western side of Doves Bay Road. The vehicle crossing and accessway are assessed under the Far North District Council Engineering Standards (2023). Refer to the appended Site Plan (148880-C001) for access point locations.

## 9.2 VEHICLE CROSSINGS

It is recommended that the vehicle crossing is constructed in accordance with the Far North District Council Engineering Standards (2023), Sheet 21 Type 1A – Light Vehicles.

The crossing shall not obstruct any drainage facilities within the berm. Where the drain is shallow and only carries low rain flow, the crossing must pass through the drain. Where the drain is an unstable shape or carries significant rain flow the drain shall be piped under the crossing. Pipes and end treatments shall be sized appropriately for the catchment intercepted but shall be a minimum 300mmØ.

## 9.3 SIGHT DISTANCES

The NZTA National Speed Limit Register records a legal speed limit of 100km/hr for Doves Bay Road. The road is classified as an Access road, for which the Far North District Council Engineering Standards (2023), Sheet 4, specify a minimum sight distance of 195m.

The proposed Lot 1 access provides approximately 66m of sight distance to the north and 45m to the southeast and therefore does not comply with the specified sight-distance requirement. However, Doves Bay Road is a narrow, low-volume residential road with horizontal geometry that restricts vehicle speeds. Approximately 80m southeast of the proposed access, the road narrows to a single-lane section before terminating at a cul-de-sac. There is no through traffic, and vehicle operating speeds are therefore expected to be significantly lower than the legal speed limit.

Considering the constrained road geometry, residential environment, low traffic volumes and absence of through traffic, the available sight distances are considered reasonable for the proposed low-volume residential access, subject to Council review and acceptance. Any requirement for further assessment or mitigation will be at Council's discretion

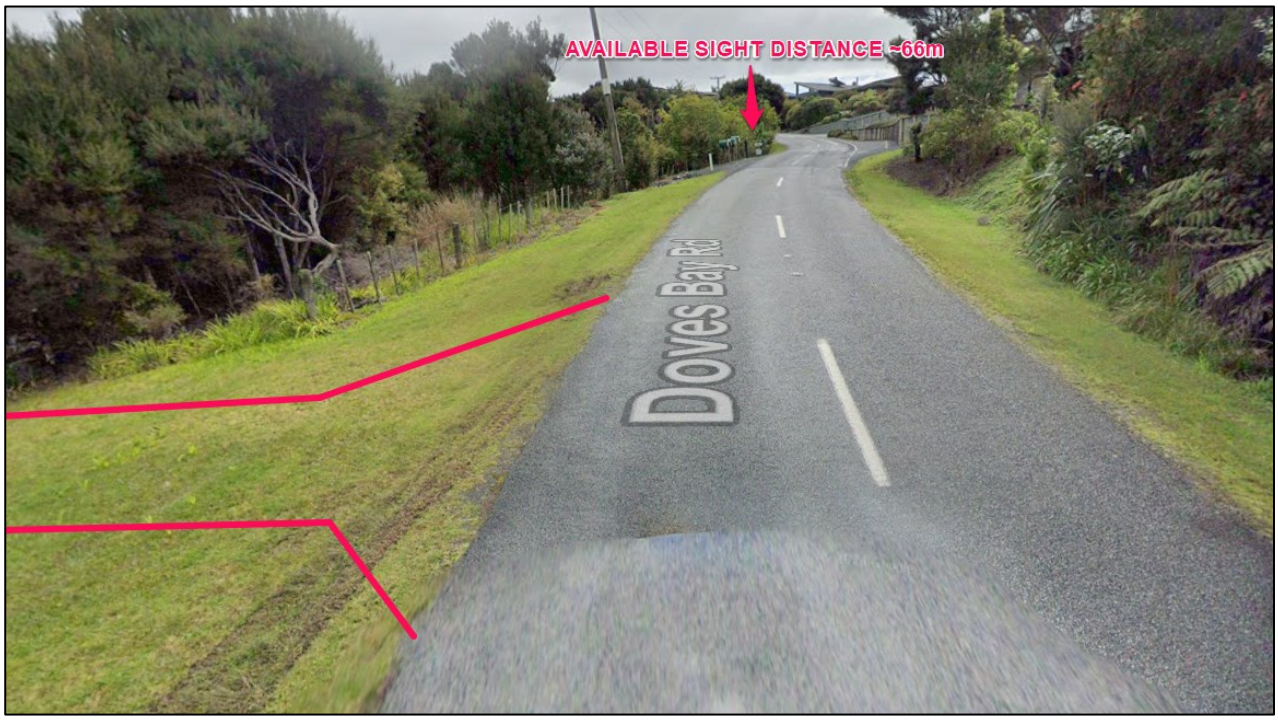



**Figure 5: Annotated photo showing available sight distance to the north**




**Figure 6: Annotated photo showing available sight distance to the southeast**

## 10 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.

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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)
- Construction Monitoring Sheet (1 sheet)

## 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 | AUG '26 | GMB | CIVIL SITE SUITABILITY REPORT |

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

**SERVICES NOTE**

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**RESOURCE CONSENT**

DESIGN / DRAWING SUBJECT TO ENGINEER'S APPROVAL

DRAWING TITLE: **SITE PLAN**

PROJECT DESCRIPTION: **CIVIL SITE SUITABILITY REPORT**

PROJECT TITLE: **LOT 1 DP 529065 2 & 8 DOVES BAY ROAD KERIKERI NORTHLAND**

| | |
|---|---|
| ORIGINAL DRAWING SIZE: A3 | OFFICE: OREWA |
| DRAWING SCALE: 1:500 | CO-ORDINATE SYSTEM: NOT COORDINATED |
| DRAWING NUMBER: 148880-C001 | ISSUE: 01 |

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# HAND AUGER : HA01

**JOB NO.:** 148879 **SHEET:** 1 OF 1

**START DATE:** 17/08/2026 **NORTHING:** **GRID:**

**CLIENT:** Timothy D.F. Maples **DIAMETER:** 50mm **EASTING:**

**PROJECT:** 2-Lot Subdivision (1 Lot for Assessment) **SV DIAL:** 1994 **ELEVATION:** Ground

**SITE LOCATION:** 2 & 8 Doves Bay Road, Kerikeri **FACTOR:** 1.41 **DATUM:**

**SOIL DESCRIPTION**

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, brown, wet. | TS | 0.0 | Groundwater Not Encountered | | | | | |
| Waipapa Group | NATURAL: Clayey SILT, occasional clasts, yellowish brown, very stiff, moist, low to moderate plasticity. | | 0.2 | | | | | | |
| | | | 0.4 | | 197+ | - | - | | |
| | | | 0.6 | | | | | | |
| | | | 0.8 | | 197+ | - | - | | |
| | 0.9m: Frequent clasts. | | 1.0 | | | | | | |
| | SILT, minor clay, frequent clasts, orangey brown with yellowish brown mottles, very stiff, moist, no to low plasticity. | | 1.2 | | 197+ | - | - | | |
| | 1.5m: Orangey brown with light grey mottles. | | 1.4 | | | | | | |
| | | | 1.6 | | 172 | 28 | 6.1 | | |
| | | | 1.8 | | | | | | |
| | | | 2.0 | | UTP | - | - | | |
| | 2.2m: Occasional black streaks. | | 2.2 | | | | | | |
| | | | 2.4 | | UTP | - | - | | |
| | | | 2.6 | | UTP | - | - | 8 | |
| | EOH: 2.60m - Too Hard To Auger | | 2.8 | | | | | 8 | |
| | | | 3.0 | | | | | 8 | |
| | | | 3.2 | | | | | 8 | |
| | | | 3.4 | | | | | 7 | |
| | | | 3.6 | | | | | 7 | |
| | | | 3.8 | | | | | 6 | |
| | | | 4.0 | | | | | 7 | |
| | | | 4.2 | | | | | 7 | |
| | | | 4.4 | | | | | 8 | |
| | | | 4.6 | | | | | 10 | |
| | | | 4.8 | | | | | 12 | |
| | | | 5.0 | | | | | 11 | |
| | | | 5.2 | | | | | 10 | |
| | | | 5.4 | | | | | 10 | |
| | | | 5.6 | | | | | 9 | |
| | | | 5.8 | | | | | 10 | |
| | | | | | | | | 11 | |
| | | | | | | | | 12 | |
| | | | | | | | | 13 | |
| | | | | | | | | 13 | |
| | | | | | | | | 14 | |
| | | | | | | | | 16 | |
| | | | | | | | | 18 | |
| | | | | | | | | 20+ | |

**REMARKS**

End of borehole @ 2.60m (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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# HAND AUGER : HA02

**JOB NO.:** 148879 **SHEET:** 1 OF 1

**START DATE:** 17/08/2026 **NORTHING:** **GRID:**

**CLIENT:** Timothy D.F. Maples **DIAMETER:** 50mm **EASTING:**

**PROJECT:** 2-Lot Subdivision (1 Lot for Assessment) **SV DIAL:** DR4802 **ELEVATION:** Ground

**SITE LOCATION:** 2 & 8 Doves Bay Road, Kerikeri **FACTOR:** 1.39 **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 | MULCH, moist.<br>TOPSOIL, brown, moist. | TS | 0.2 | | | | | | |
| Waipapa Group | NATURAL: Clayey SILT, yellowish brown with occasional orange mottles, very stiff, dry to moist, low to moderate plasticity. | | 0.4 | Groundwater Not Encountered | 128 | 33 | 3.9 | | |
| | | | 0.6 | | | | | | |
| | | | 0.8 | | 195+ | - | - | | |
| | SILT, some clay, orangey brown with occasional white and pink mottles, very stiff, dry to moist, low plasticity. | | 1.0 | | | | | | |
| | 1.2m: Minor to some clay, orangey brown with reddish brown and white mottles, moist, no to low plasticity. | | 1.2 | | 195+ | - | - | | |
| | 1.5m: Reddish brown and orangey brown with white mottles and thin dark brown seams, moist to wet. | | 1.4 | | | | | | |
| | | | 1.6 | | 128 | 25 | 5.1 | | |
| | 2.0m: Stiff. | | 1.8 | | | | | | |
| | | | 2.0 | | 86 | 14 | 6.1 | | |
| | | | 2.2 | | | | | | |
| | | | 2.4 | | 86 | 14 | 6.1 | | |
| | 2.7m: 100mm lense of fine gravelly SILT, moist, very stiff, no plasticity. | | 2.6 | | | | | | |
| | 2.8m: MInor clay, frequent clasts, light brown with grey and brown mottles, very stiff, moist, no plasticity. | | 2.8 | | 195+ | - | - | | |
| | | | 3.0 | | | | | | |
| | | | 3.2 | | 195+ | - | - | | |
| | | | 3.4 | | | | | | |
| | | | 3.6 | | UTP | - | - | | |
| | EOH: 3.80m - Too Hard To Auger | | 3.8 | | UTP | - | - | 7 | |
| | | | 4.0 | | | | | 7 | |
| | | | | | | | | 6 | |
| | | | 4.2 | | | | | 6 | |
| | | | | | | | | 7 | |
| | | | 4.4 | | | | | 7 | |
| | | | | | | | | 8 | |
| | | | 4.6 | | | | | 9 | |
| | | | | | | | | 10 | |
| | | | 4.8 | | | | | 10 | |
| | | | | | | | | 10 | |
| | | | 5.0 | | | | | 12 | |
| | | | | | | | | 12 | |
| | | | 5.2 | | | | | 13 | |
| | | | | | | | | 14 | |
| | | | 5.4 | | | | | 14 | |
| | | | | | | | | 14 | |
| | | | 5.6 | | | | | 16 | |
| | | | | | | | | 20+ | |
| | | | 5.8 | | | | | | |

**REMARKS**

End of borehole @ 3.80m (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:** SJP

**CHECKED BY:** CSH

▼ Standing groundwater level

▽ GW while drilling

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# HAND AUGER : HA03

**JOB NO.:** 148879 **SHEET:** 1 OF 1

**START DATE:** 17/08/2026 **NORTHING:** **GRID:**

**CLIENT:** Timothy D.F. Maples **DIAMETER:** 50mm **EASTING:**

**PROJECT:** 2-Lot Subdivision (1 Lot for Assessment) **SV DIAL:** 1994 **ELEVATION:** Ground

**SITE LOCATION:** 2 & 8 Doves Bay Road, Kerikeri **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, brown, wet. | TS | 0.0 | Groundwater Not Encountered | | | | | |
| Waipapa Group | NATURAL: Clayey SILT, occasional clasts, yellowish brown with occasional orange and white mottles, very stiff, moist to wet, low plasticity. | | 0.2 | | | | | | |
| | | | 0.4 | | 172 | 37 | 4.6 | | |
| | 0.7m: Yellowish brown with grey mottles. | | 0.6 | | | | | | |
| | | | 0.8 | | 197+ | - | - | | |
| | 1.0m: Light grey with orangey brown mottles, low to moderate plasticity. | | 1.0 | | | | | | |
| | | | 1.2 | | 155 | 25 | 6.2 | | |
| | SILT, minor clay, frequent clasts, light grey with orangey brown mottles and occasional black streaks, very stiff, moist, no plasticity. | | 1.4 | | | | | | |
| | 1.6m: Very stiff to hard. | | 1.6 | | 197+ | - | - | | |
| | | | 1.8 | | | | | | |
| | | | 2.0 | | UTP | - | - | | |
| | 2.3m: Orangey brown with light grey and occasional black mottles, dry to moist. | | 2.2 | | | | | | |
| | | | 2.4 | | UTP | - | - | | |
| | 2.6m: Dry. | | 2.6 | | UTP | - | - | | |
| | | | 2.8 | | | | | | |
| | EOH: 2.80m - Too Hard To Auger | | 3.0 | | | | | 10 | |
| | | | | | | | | 10 | |
| | | | | | | | | 11 | |
| | | | 3.2 | | | | | 10 | |
| | | | | | | | | 8 | |
| | | | 3.4 | | | | | 7 | |
| | | | | | | | | 7 | |
| | | | 3.6 | | | | | 7 | |
| | | | | | | | | 12 | |
| | | | 3.8 | | | | | 16 | |
| | | | | | | | | 12 | |
| | | | 4.0 | | | | | 13 | |
| | | | | | | | | 13 | |
| | | | 4.2 | | | | | 17 | |
| | | | | | | | | 20+ | |
| | | | 4.4 | | | | | | |
| | | | 4.6 | | | | | | |
| | | | 4.8 | | | | | | |
| | | | 5.0 | | | | | | |
| | | | 5.2 | | | | | | |
| | | | 5.4 | | | | | | |
| | | | 5.6 | | | | | | |
| | | | 5.8 | | | | | | |

**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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## CONSTRUCTION MONITORING

Construction monitoring is when our engineer visits the site at key stages of construction to check that the work is being built in accordance with the consented engineering drawings and specifications.

We offer construction monitoring throughout the build to ensure compliance with consented designs. Our team works closely with your builder and site manager to keep the project running smoothly and ensure a quality result at each inspection stage.

### BOOKING INSPECTIONS

If your project requires construction monitoring, please contact us to book inspections at the required stages before work is covered.

Please book inspections with enough notice to avoid delays to your build.

### PS4

A PS4 (Producer Statement Construction Review) is a document issued by an engineer after construction monitoring has been completed for the relevant engineered works.

WILTON JOUBERT
Consulting Engineers

**CONTACT: 09 527 0196**

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Wilton Joubert Limited
185 Waipapa Road
Kerikeri 0230
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| | |
|---|---|
| **SITE** | **2 & 8 Doves Bay Road, Kerikeri** |
| **LEGAL DESCRIPTION** | **Lot 1 DP 529065** |
| **PROJECT** | **Proposed 2-Lot Subdivision (1 Lot for Assessment)** |
| **CLIENT** | **Timothy D.F. Maples** |
| **REFERENCE NO.** | **148879** |
| **DOCUMENT** | **Site Assessment Report** |
| **STATUS/REVISION NO.** | **FINAL - Issued for Resource Consent** |
| **DATE OF ISSUE** | **24 August 2026** |

| Report Prepared For | Email |
|---|---|
| **Timothy D.F. Maples** | timmaples@gmail.com |



| | | | | |
|---|---|---|---|---|
| Authored by | **S. Page** | Engineering Technician | shaun@wjl.co.nz |  |
| Reviewed by | **A. Brooke** *NZDE (Civil)* | Engineering Technician | aidan@wjl.co.nz |  |
| Approved by | **C. Hegedus** *BETech (Geotech) CPEng, CMEngNZ* | Senior Geotechnical Engineer | csaba@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.

| | |
|---|---|
| **Development Type:** | Proposed 2-Lot Subdivision (1 Lot for Assessment). |
| **Development Proposals Supplied:** | Yes – Subdivision Scheme Plan (1 sheet). |
| **NZS3604 Type Structure(s):** | Future structure is assumed to be. |
| **Geology Encountered:** | Waipapa Group. |
| **Topsoil & Mulch Encountered:** | Yes - Surficial layers of 0.10m to 0.35m thickness. |
| **Overall Site Gradient in Proximity to Development:** | The proposed Lot 1 designated building platform (DBP) is positioned on moderately sloping ground averaging approximately 10° to 14°. Approximately 10m to 15m downslope of the DBP, inclinations increase to very steep grades averaging between 26° and 51° that fall approximately 35m down to the inlet. Additionally, an approximate 20m high cliff bounds the coastline along the western and southwestern toe of the flank. |
| **Site Stability Risk:** | Our computer-based stability analysis indicates a Low Risk of Global Land Instability within the established DBP, provided that our recommendations within this report are adhered to. |
| **Liquefaction Risk:** | Negligible risk of liquefaction susceptibility. |
| **Suitable Foundation Type(s):** | Shallow foundations are suitable to support the proposed dwelling provided they are within the established DBP as indicated on our Site Plan and are minimum 17.0m away from the crest of the cliff to the south-southwest and designed to accommodate vertical movement of soil associated with Soil Reactivity **Class H – Highly Reactive**.<br><br>All foundations that are located within 5.0m from ground steeper than 1V:4H (14°) should be designed to account for 1.0m of soil creep below existing ground levels, plus an additional fill placed above. |
| **Shallow Soil Bearing Capacity:** | Yes – Natural Soils and Engineered Fill only.<br>Geotechnical Ultimate Bearing Capacity = 300kPa. |
| **NZBC B1 Expansive Soils Classification:** | Class H – Highly Expansive ($y_s$ = 78mm). |
| **Minimum Footing Embedment Depth:** | 0.9m below finished ground levels and 0.3m into competent natural ground and/or engineered fill, whichever is deeper. |

| | |
|---|---|
| **NZS1170.5:2004 Site Subsoil Classification:** | Class C – Shallow Soil stratigraphy. |
| **Earthworks:** | At this preliminary stage, we are not aware of any future earthwork proposals. Engineered cut-fill earthwork operations will be required to create a level building platform for any future concrete floor slab construction.<br><br>We recommended no earthworks are undertaken across the DBP until the future site-specific proposal has been Geotechnically reviewed during the Building Consent stage. The review will provide appropriate cut-fill parameters and/or limits and are strictly dependent on the proposal configuration.<br><br>Any bulk cut material should generally be removed from site and must not be stockpiled on ground steeper than 1V:4H (14°) downslope of the DBP.<br><br>Vegetation clearance should be confined to the DBP, and bulk clearance downslope is not recommended. |
| **Stormwater Control:** | Under no circumstances should concentrated overflows from any source discharge into or onto the ground in an uncontrolled fashion, especially directly to steeply sloping ground downslope of the DBP. Discharge to the northwest or southwest is recommended. |
| **Consent Application Report Suitable for:** | Resource Consent. Finalised future development proposals require Geotechnical review during the Building Consent stage. |
| **National Policy Statement:** | Refer to Section 8.6 for Risk Matrix Assessment Table. |

## 2. INTRODUCTION

### 2.1. SCOPE OF WORK

Wilton Joubert Limited (WJL) was engaged by **Timothy D.F. Maples** (the Client) to undertake a geotechnical assessment of ground conditions at the above site, where we understand, it is proposed to subdivide the existing property into two individual allotments.

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 1.

It is our understanding that this report will be submitted to support a Resource Consent application to the Far North District Council (FNDC) for the proposed subdivision development.

### 2.2. SUPPLIED INFORMATION

Our assessment is based on the following development proposals supplied:

- Subdivision Scheme Plan (1 sheet) dated 14 August 2026 (Ref: 5144), prepared by BOI Survey Ltd.

**The client has advised that there could possibly be a minor amendment to the boundary alignment along the eastern corner of proposed Lot 1; however, this is not anticipated to have an impact on the assessments of this report. 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 constructed within the following property (the site) which covers the initially 600m stretch of land off the western side of Doves Bay Road:

- 2 & 8 Doves Bay Road, Kerikeri, legally described as Lot 1 DP 529065.

The site is shown on our appended Site Plan (Drawing No. 148879-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 7.3ha and is currently accessed 140m southeast of the Opito Bay Road intersection via a chipseal and aggregate driveway from Doves Bay Road. The driveway directs to the southwest towards an existing residential development in the approximate middle of the site. Aside from minor cleared land around the residential development and along the eastern boundary corner, the site is covered in dense regenerating bush.

Broadly speaking, the site is essentially located on a west to southwest facing, moderate to very steeply sloping side flank that descends some 60m from the Doves Bay Road ridgeline down to the Kerikeri Inlet. The proposed Lot 1 assessment area is further described in Section 4 below.

The FNDC online 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 Subdivision Scheme Plan supplied, we understand that it is proposed to subdivide the existing property into two individual allotments, comprising of proposed Lot 1 (1ha) and Lot 2 (6.3123ha) as depicted in Figure 2 below. Proposed Lot 2 will contain the existing residential development in the approximate middle of the site and is excluded from our assessments.

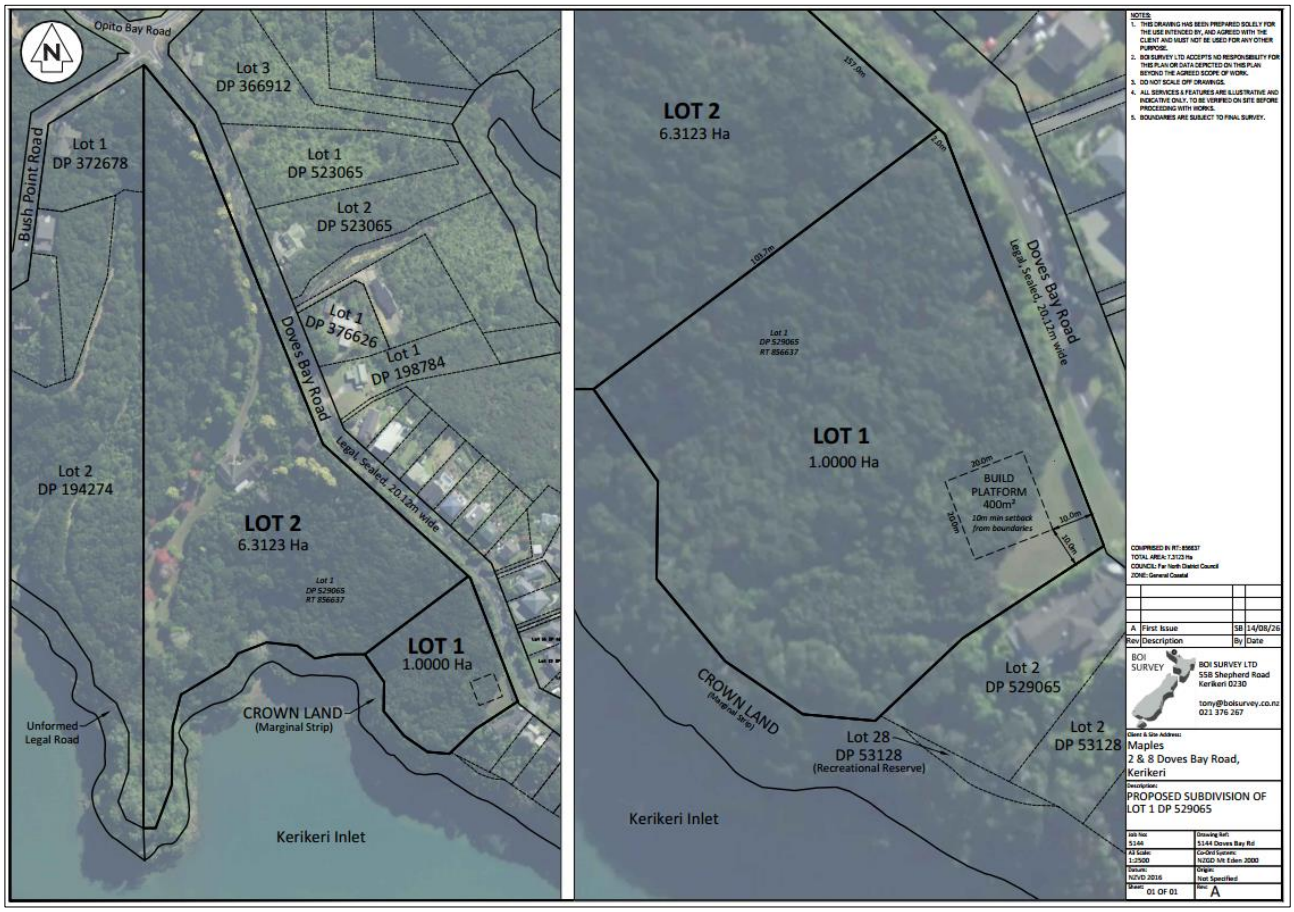



***Figure 2: Subdivision Scheme Plan depicting the proposed development (from BOI Survey Ltd).***

We have been engaged to provide geotechnical assessments along with preliminary design recommendations pertaining to future residential development within a 400m² (20m x 20m) designated building platform (DBP) towards the eastern boundary corner of proposed Lot 1, as depicted in Figure 2 above.

Topographically speaking, the DBP is positioned near Doves Bay Road on moderately sloping ground averaging approximately 10° to 14°. Approximately 10m to 15m downslope of the DBP, inclinations increase to very steep grades averaging between 26° and 51° that fall approximately 35m down to the Inlet. Additionally, an approximate 20m high cliff bounds the coastline along the western and southwestern toe of the flank.




***Figure 3: Aerial view with the subject property outlined in cyan (from Northland Regional Council's online GIS database).***

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.

At this preliminary stage, we are not aware of any future earthwork proposals. Engineered cut-fill earthwork operations will be required to create a level building platform for any future concrete floor slab construction.

As a result, our principal objectives were to investigate and assess the suitability of future 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 and wider surrounding land is underlain by deposits of the **Waipapa Group Sandstone and Siltstone (Waipapa Terrane)**. These deposits are approximately 270 to 154 million years in age and described as; "*Massive to thin bedded, lithic volcaniclastic metasandstone and argillite, with tectonically enclosed basalt, chert and siliceous argillite.*"

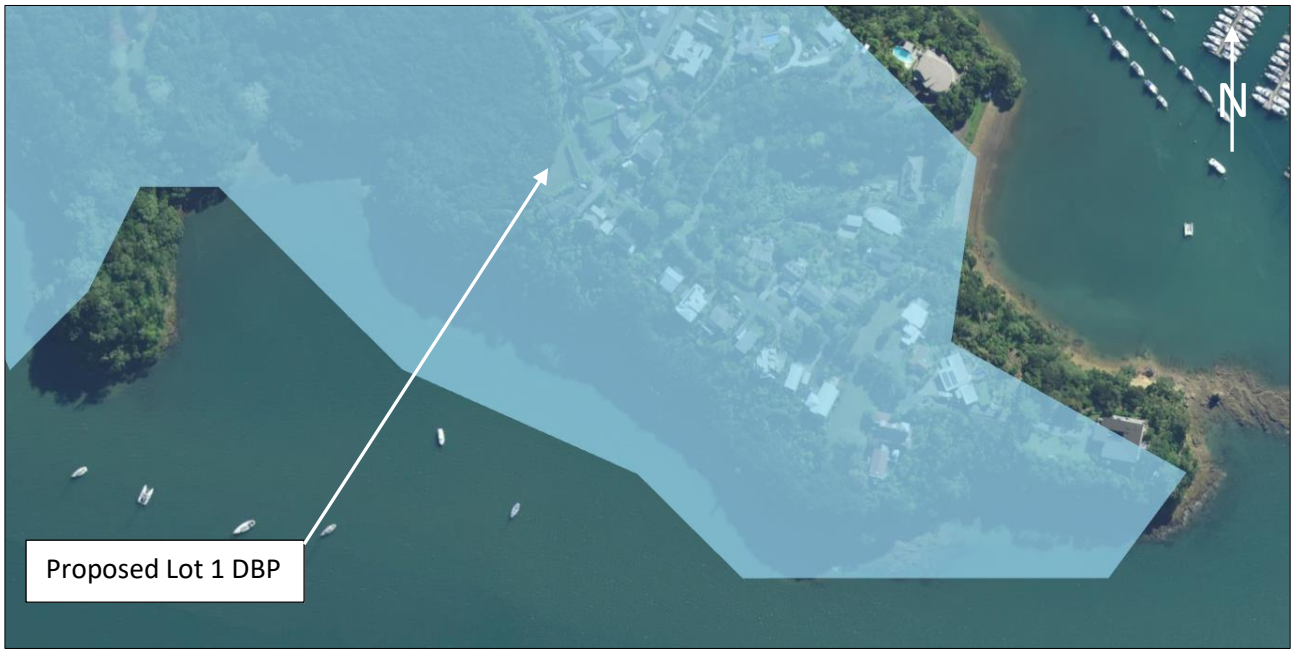



*Figure 4: Screenshot from New Zealand Geology Web Map hosted by GNS Science.*

## 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 1950 have been reviewed and compared to the present-day conditions.

In 1950, the site and surrounding land was covered in scrub and/or low-lying bush.

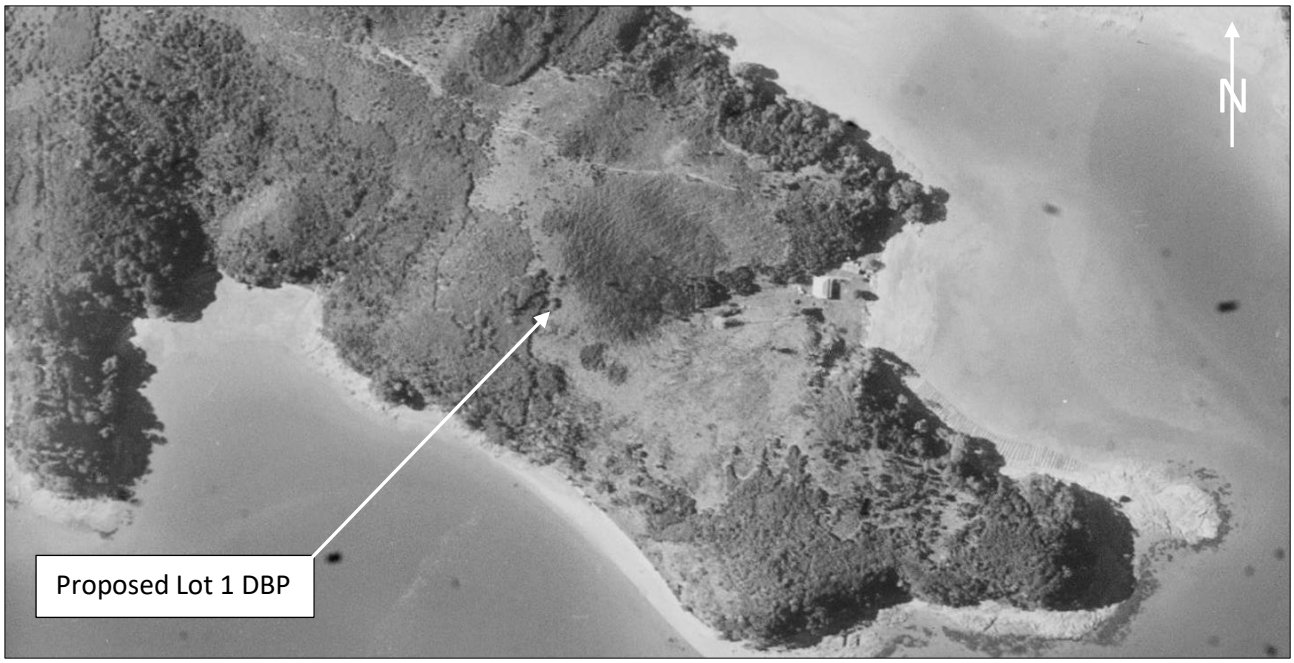



*Figure 5: Historical aerial photo from 1950 (Source: https://retrolens.co.nz).*

By 1968, Doves Bay Road had been formed and aside from the DBP area, the site had been planted in dense regenerating bush.




***Figure 6: Historical aerial photo from 1968 (Source: https://retrolens.co.nz).***

By 1979, the existing residential development had been constructed and the DBP had also been planted in dense regenerating bush. The adjoining property to the southeast of the DBP also contained an existing residential development.




***Figure 7: Historical aerial photo from 1979 (Source: https://retrolens.co.nz).***

At some point between 1979 and June 2004, bush had largely been removed from the DBP and land downslope; however, was reinstated by November 2011 and has essentially maintained the same ground conditions up until the present-day.




***Figure 8: Aerial photo from June 2004 (Source: Google Earth).***




***Figure 9: Aerial photo from November 2011 (Source: Google Earth).***

There were no visible significant geomorphological changes in the landscape or feature consistent with major ground instability, indicating a period of stable ground conditions between 1950 and 2026.

### 5.3. GEOMORPHOLOGY

Geomorphology of the slopes below the site is characterized by moderate to steep-sided incised gully to the north-northwest and rocky cliffs to the west and southwest descending from elevated, intact ridges. The cliff side slopes are generally inclined at very steep inclinations (up to 51°) where slightly to unweathered rock is exposed at the cliff wall as shown on our photos in Figure 10 below.



***Figure 10 – Site photo showing the toe of the cliff below the site, looking northwest (From WJL)***

The rocky cliff below the site has been formed by erosion of strong waves and surface water running down the cliff faces. The undercutting of the base of the cliff by wave quarrying induced the erosion of the rock by rock-fall and/or toppling, which happens on a slow time rate and depends on many factors such as rock structure, hydraulic action, climate conditions etc. Hard rock (such as the slightly to unweathered Waipapa Group) cliffs retreat less than 1cm per year.

The cliff top (site location) has been eroded by the general weathering processes (rainwater, wind, tree roots, chemical reaction etc.) and formed relatively deep residual soil strata with gently to moderately sloping surfaces which becomes steeply sloping closer to the crest of the cliff. The edges of the crest can be mobilised by shallow seated ground movements within the soil mass over the less weathered rock.

### 5.4. NATURAL HAZARDS

Reference has been made to the FNDC online GIS Hazard Maps and Engineering Standards (Version 0.6, dated: May 2023) for the following hazards on the site:

- Stability Hazard Zone, and
- Liquefaction.

The site is not identified by the FNDC or Northland Regional Council online GIS Hazard Maps as being susceptible to Flooding or Coastal Erosion.

#### 5.3.1. STABILITY HAZARD ZONE

In accordance with Section 2.3.3 of the FNDC Engineering Standards, the DBP is assessed as a Moderate Stability Hazard Zone, whilst the very steeply sloping wider downslope land is assessed as a High Stability Hazard Zone.

Please refer to Sections 8.1 to 8.3 further below for further detailed assessment of slope stability.

#### 5.3.2. LIQUEFACTION

The FNDC online GIS Hazards Map indicates the DBP is within an '*Unlikely*' Liquefaction Vulnerability Zone.

Please refer to Section 8.4 below for further detailed assessment of liquefaction.

#### 5.3.3. COASTAL EROSION

Coastal erosion hazard map does not indicate any risk of cliff regression. We anticipate, based on the rocky cliff face that the erosion rate is relatively slow (as discussed in Section 5.3 above). However, the top of the cliff where residual soils are present may experience shallow soil creep time to time and can contribute to the erosion of the cliff edges of the property.

## 6. GEOTECHNICAL INVESTIGATION

### 6.1. FIELDWORK

Our fieldwork, as shown on our appended Site Plan, was undertaken on 17 August 2026 and involved:

- Drilling 3 (no.) 50mm diameter hand auger boreholes (HA01 to HA03 inclusive) to refusal depths ranging between 2.6m and 3.8m below present ground level (bpgl), and
- Dynamic Cone Penetrometer (DCP-Scala) were undertaken through the base of each borehole to refusal depths ranging between 4.3m and 5.7m bpgl.

Additionally, we have drawn 2 (no.) appended Cross-sections A-A' and B-B' (Drawing Nos. 148879-G610 and 148879-G611), using 1.0m LiDAR contour data sourced from the Land Information New Zealand (LINZ) database to represent of the topography of the DBP and bounding influential slopes to the northwest and southwest.

### 6.2. CONE PENETRATION TEST (CPT)

As part of our geotechnical assessment, 1 (no.) Cone Penetration Test (CPT01) was undertaken to a refusal depth of 7.1m bpgl by Underground Investigation Limited on 18 August 2026.

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 stratum.

The CPT calibration sheets and results (6 sheets) are appended.

## 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), dated December 2005.

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

### 7.1. TOPSOIL

Surficial TOPSOIL and MULCH layers of 0.10m to 0.35m thickness were overlying all three boreholes.

### 7.2. NATURAL GROUND

The underlying natural deposits encountered were consistent with our expectations of Waipapa Group soils, comprising a residual crust of very stiff clayey SILT which extended to depths ranging between 1.0m and 1.4m bpgl, overlying stiff to hard SILT with some to minor clay until termination on harder deposits.

Measured in-situ, BS1377 adjusted peak Vane Shear Strengths within the boreholes ranged between 86kPa and greater than 195kPa and/or 197kPa, the latter two 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 each borehole returned blow counts that ranged from 6 to greater than 20 blows per 100mm penetration, indicating medium dense to very dense stratum at depth.

The ratio of peak to remoulded vane shear strength values measured within the boreholes ranged between 3.9 and 6.2, indicating the underlying subsoils are 'Moderately Sensitive' to 'Sensitive' subgrade.

Sensitive soil subgrades require protection from rain, wind, etc., and to avoid (or minimize) heavy construction traffic and vibrating plants.

### 7.3. GROUNDWATER

Groundwater was not encountered within any of the boreholes on the day of our investigation during the winter period. Additionally, groundwater was not encountered in CPT01.

### 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 & Mulch (m) | Vane Shear Strength Range within Natural Ground (kPa) | DCP-Scala Refusal Depth Below Borehole Base (m) | DCP-Scala Blow Count Range Per 100mm Penetration | Groundwater Depth (m) |
|---|---|---|---|---|---|---|
| **HA01** | 2.6 (1) | 0.10 | 172 - 197+ / UTP | 5.1 | 6 – 20+ | NE |
| **HA02** | 3.8 (1) | 0.35 | 86 - 195+ / UTP | 5.7 | 6 – 20+ | NE |
| **HA03** | 2.8 (1) | 0.15 | 155 - 197+ / UTP | 4.3 | 7 – 20+ | NE |

Table Note: (1) Too hard 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, without any laboratory testing, but instead adopting the visual-tactile method as per AS2870, considering the high clay content and low to moderately plastic nature of the residual soil crust, we have adopted the following conservative primary classification estimate of the site subsoils as follows:

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

Effects of expansive soils for the future construction will require mitigation by way of a specific engineering design (SED). Preliminary foundation design recommendations are given in the appropriate Conclusion and Recommendation sections below.

## 8. GEOTECHNICAL ASSESSMENT

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

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

### 8.1. QUALITATIVE SLOPE STABILITY

Our assessment has considered the following:

- The DBP is positioned on moderately sloping ground averaging approximately 10° to 14°. Approximately 10m to 15m downslope of the DBP, inclinations increase to very steep grades averaging between 26° and 51° that fall approximately 35m down to the Inlet. Additionally, an approximate 20m high cliff bounds the coastline along the western and southwestern toe of the flank.
- Very stiff to hard soils of Waipapa Group encountered during our investigations.

- CPT testing indicates relatively shallow (approximately at depth of 7.0m bpgl) rock of the Waipapa Group undelain the site.
- Slightly to unweathered rock outcrops at the toe of the coastline cliff below the DBP.
- Groundwater was not present within any of the boreholes on the day of our investigation during the winter period. Additionally, groundwater was not encountered in CPT01.
- There are no known active faults traversing through or close to the DBPs.
- No visual signs of ground instability were observed within the DBP or immediate surrounding land at the time of our investigation. A review of historical aerial photography confirms the absence of any obvious slope instability.
- The land downslope of the DBP is covered in very dense regenerating bush.

## 8.2. QUANTITATIVE SLOPE STABILITY

Slope stability analyses were undertaken on both Cross Section A-A' and 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 residential development.

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, along 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 for Cross Section B-B' and assuming a groundwater level at ground surface (i.e., fully saturated ground conditions), we carried out back analyses based on our experience of the geology along with measured soil and estimated rock strengths within the CPT and our test locations, to determine the minimum effective stress parameters to achieve a Factor of Safety (FoS) close to 1.0.

***Table 2: Stability Analysis Results – Back Analysis***

| Section | Design Conditions | FoS | |
|---|---|---|---|
| | | Targeted | Calculated |
| **A-A'** | Groundwater at ground surface | ~1.0 | 0.75 |
| **B-B'** | Groundwater at ground surface | ~1.0 | 0.85 |

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 | Waipapa Group Soils | Weathered Waipapa Group Rock |
|---|---|---|
| **Unit Weight, γ (kN/m3)** | 18 | 20 |
| **Effective Cohesion c' (kPa)** | 5 | 15 |
| **Friction Angle, ϕ' (°)** | 32 | 40 |
| **Undrained (no ϕ') Su** | 60 | 300 |

We have adopted the following scenarios:

1. **Moderate Groundwater Level**. Long-term stability when modelling the existing ground conditions and assuming a groundwater level at a depth of approximately 7.0m below the DBP.

   Factor of Safety (FoS) required >1.5

2. **Elevated Groundwater Level**. Transient (medium-term) stability when modelling the worst-case scenario and assuming a raised groundwater level at a depth of approximately 2.5m below the DBP.

   FoS required >1.3.

   It is important to consider that the computer model conservatively does not assess the further beneficial effects of very dense vegetation cover across the wider land downslope of the DBP, such as root binding and negative pore water pressure generated by the vegetation.

   Also, construction of the future development and sealed surfaces is expected to intercept and redirect stormwater in a controlled fashion, such that ponding of rainwater and infiltration into the ground that would otherwise create extremely elevated groundwater conditions is highly unlikely. Additionally, groundwater was also not encountered in any of the boreholes or CPT01 on the day of investigations. As a result, it is anticipated that groundwater levels are likely to remain deeper than modelled, hence the elevated groundwater scenario represents a 'sensitivity' check.

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

   FoS required >1.1.

A summary of the calculated minimum FoS against failure across the DBP for each of the above scenarios is shown in Table 4 and 5 below:

*Table 4: Stability Analysis Results – Post-Development (Proposed)*

| Section | Design Conditions | FoS within 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 |

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

| Section | Design Conditions | FoS within DBP | | Compliance |
|---|---|---|---|---|
| | | Required | Calculated | |
| B-B' | Moderate Groundwater, plus Surcharge Load | ≥1.5 | >1.46 | Yes, Marginal* |
| | Elevated Groundwater, plus Surcharge Load | ≥1.3 | >1.3 | Yes |
| | Moderate Groundwater, plus Surcharge Load, plus Seismic Load | ≥1.1 | >1.1 | Yes |

* FoS requirement is satisfied where building platform is located minimum 17maway from the crest of the cliff to the south-southwest as indicated on the appended Cross Section B – B'.

### 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 Waipapa Group geological settings. This 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."

### 8.4. SLOPE STABILITY CONCLUSIONS

Based on our qualitative and quantitative assessments above, land instability is not considered to be a constraint or risk to the proposed Lot 1 DBP, provided that:

- All foundations supporting the proposed dwelling are within the establised DBP as indicated on our Site Plan and are at least 17.0m away from the crest of the cliff to the south-southwest.
- No earthworks are undertaken across the DBP until the future site-specific proposal has been geotechnically reviewed during the Building Consent stage. The review will provide appropriate cut-fill parameters and/or limits and are strictly dependent on the proposal configuration,
- Any bulk cut material should generally be removed from site and must not be stockpiled on ground steeper than 1V:4H (14°) downslope of the DBP,
- Vegetation clearance should be confined to the DBP, and bulk clearance downslope is not recommended, and
- All stormwater run-off from the development must be appropriately managed and controlled on-site. At no stage should run-off be directed to steeply sloping ground downslope of the DBP. Discharge to the northwest or southwest is recommended.

Our slope stability assessment outputs (8 sheets) are appended to this report.

### 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.' None of these characteristics apply to this site.

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:

- Very stiff to hard cohesive soils of Waipapa Group encountered during our investigations.
- The toe of the coastline cliff below the DBP is covered by a deep layer of rock outcrop.
- Groundwater was not present within any of the boreholes on the day of our investigation during the winter period. Additionally, groundwater was not encountered in CPT01.
- The DBP is positioned on an elevated flank, set no less than approximately RL39m New Zealand Vertical Datum (NZVD), with good water-shedding characteristics.
- There are no known active faults traversing through or close to the site.

- Soils and inferred rock of the Waipapa Group underlie the site (minimum geological age +154My).

## 8.6. LIQUEFACTION ASSESSMENT CONCLUSION

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

## 8.7. NATIONAL POLICY STATEMENT CONCLUSION

In accordance with Appendix 1 of the National Policy Statement (NPS) for Natural Hazards 2025 (December 2025), we have undertaken a natural hazard risk assessment for the proposed Lot 1 DBP using the risk matrix presented in Figure 1 of the NPS. The adopted risk matrix is shown in Figure 11 below.

**Figure 1: Risk matrix**

| Consequence Level | Likelihood Level: Almost Certain | Very Likely | Likely | Possible | Unlikely | Rare | Very Rare |
|---|---|---|---|---|---|---|---|
| ARI (years) | up to 10 | 10-20 | 20-50 | 50-100 | 100-500 | 500-5000 | > 5000 |
| AEP | 10% or more | 10% to 5% | 5% to 2% | 2% to 1% | 1% to 0.2% | 0.2% to 0.02% | < 0.02% |
| Catastrophic | Very High | Very High | Very High | High | Medium | Medium | Medium |
| Major | Very High | Very High | High | High | Medium | Medium | Medium |
| Moderate | High | High | High | Medium | Medium | Low | Low |
| Minor | Medium | Medium | Medium | Medium | Low | Low | Low |
| Negligible | Low | Low | Low | Low | Low | Low | Low |

**Note:** The top end of the likelihood range includes the top end year, that is: Likely = over 20 years and up to and including 50 years.

***Figure 11: Appendix 1 Risk Matrix from the NPS for Natural Hazards 2025.***

A summary of our assessment findings for the design-life of a future structure within the DBP is presented in Table 6 below:

***Table 6: Risk Matrix Assessment Table***

| Natural Hazard | Likelihood Level | Consequence Level | Natural Hazard Risk | Explanation |
|---|---|---|---|---|
| Flooding | Very Rare | Negligible | Low | DBP is elevated and not within a Flood Hazard Zone |
| Landslips | Rare | Minor | Low | Refer Sections 8.1 to 8.4 above |
| Coastal Erosion | Very Rare | Negligible | Low | DBP is inland and not within a Coastal Erosion Hazard Zone |

| Natural Hazard | Likelihood Level | Consequence Level | Natural Hazard Risk | Explanation |
|---|---|---|---|---|
| Coastal Inundation | Very Rare | Negligible | Low | DBP is inland, elevated and not within a Coastal Flood Hazard Zone |
| Active Faults | Very Rare | Negligible | Low | As per the GNS Science Active Fault Web Map, the northernmost active fault is near Clevedon, Auckland |
| Liquefaction | Very Rare | Negligible | Low | Refer Sections 8.4 and 8.5 above |
| Tsunami | Very Rare | Negligible | Low | DBP is inland and elevated 39m above sea level |

Based on the above, 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 1 DBP should generally be suitable for future residential construction in terms of NZS3604:2011, provided:

- The recommendations of this report are adhered to,
- A geotechnical development review of the future finalised development proposal 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 investigation and reporting, and
- Any proposed construction beyond the assessed DBP must be subject to site-specific investigations and assessments.

## 9. CONCLUSIONS AND RECOMMENDATIONS

On the basis of our assessments as described herein, we confirm that we have considered both foundation and ground stability risks, and are of the Professional Opinion that the subject development as described above should not be exposed to unsatisfactory Geotechnical Risk, subject to the following requirements:

### 9.1. PRELIMINARY FOUNDATION DESIGN RECOMMENDATIONS

Shallow foundations are suitable to support the proposed dwelling provided they are within the establised DBP as indicated on our Site Plan and are minimum 17.0m away from the crest of the cliff to the south-southwest and designed to accommodate vertical movement of soil associated with Soil Reactivity **Class H – Highly Reactive.**

All foundations that are located within 5.0m from ground steeper than 1V:4H (14°) should be designed to account for 1.0m of soil creep below existing ground levels, plus an additional fill placed above.

The following bearing capacity values are considered to be appropriate for the design of shallow foundations, subject to founding directly on or within competent natural ground and/or engineered fill, for which careful future Geo-Professional inspections of the subgrade should be undertaken to check that underlying ground conditions are in keeping with our expectations:

***Table 7: Bearing Capacity Values***

| Parameters | Waipapa Group Soils & Engineered Fill |
|---|---|
| **Geotechnical Ultimate Bearing Capacity** | 300 kPa |
| **ULS Dependable Bearing Capacity (Φ=0.5)** | 150 kPa |

When finalising the development proposals, it should be checked that all foundations lie outside 45° envelopes rising up from:

- 0.50m below the invert of service trenches, and/or
- the toe of adjacent retaining walls,

unless such foundation details are found by SED to be satisfactory. Deeper foundation embedment or piles may be required for any surcharging foundations.

Given that the soils are not considered to lie within the definition of "*Good Ground*" in accordance with NZS3604:2011, the design of shallow foundations is no longer covered by NZS3604:2011. Care must be taken to mitigate against the potential seasonal shrinkage and swelling effects of expansive foundation soils on both superstructures and floors. We therefore recommend SED should be undertaken by a qualified engineer for the design of the proposed foundations.

All footings should be embedded a minimum of 0.9m below finished ground levels and 0.3m into competent natural ground and/or engineered fill, whichever is deeper.

### 9.2. NZS1170.5:2004 SITE SUBSOIL CLASSIFICATION

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

### 9.3. SITE EARTHWORKS

At this preliminary stage, we are not aware of any future earthwork proposals. Engineered cut-fill earthwork operations will be required to create a level building platform for any future concrete floor slab construction.

We recommended no earthworks are undertaken across the DBP until the future site-specific proposal has been Geotechnically reviewed during the Building Consent stage. The review will provide appropriate cut-fill parameters and/or limits and are strictly dependent on the proposal configuration.

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”, and
- The FNDC Engineering Standards (Version 0.6, dated May 2023).

### 9.4. GENERAL SITE WORKS

We stress that any and all works 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 moderate to 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 future building footprint to protect the platform from both saturation and erosion. Water collected in interceptor drains should be diverted away from the future building site to appropriate disposal points. All stormwater runoff from new roof 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 to steeply sloping ground downslope of the DBP. Discharge to the northwest or southwest is recommended.

## 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 future developments.

We recommend that all designs for the future on-site wastewater system are undertaken by an Engineer experienced in on-site wastewater disposal.

## 12. UNDERGROUND SERVICES

The FNDC online 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 FUTURE GEOTECHNICAL ASSESSMENT

Once architectural and foundation design drawings for the future development proposal 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 Building Consent application.

This report has been commissioned solely for the benefit of our Client, **Timothy D.F. Maples,** 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:

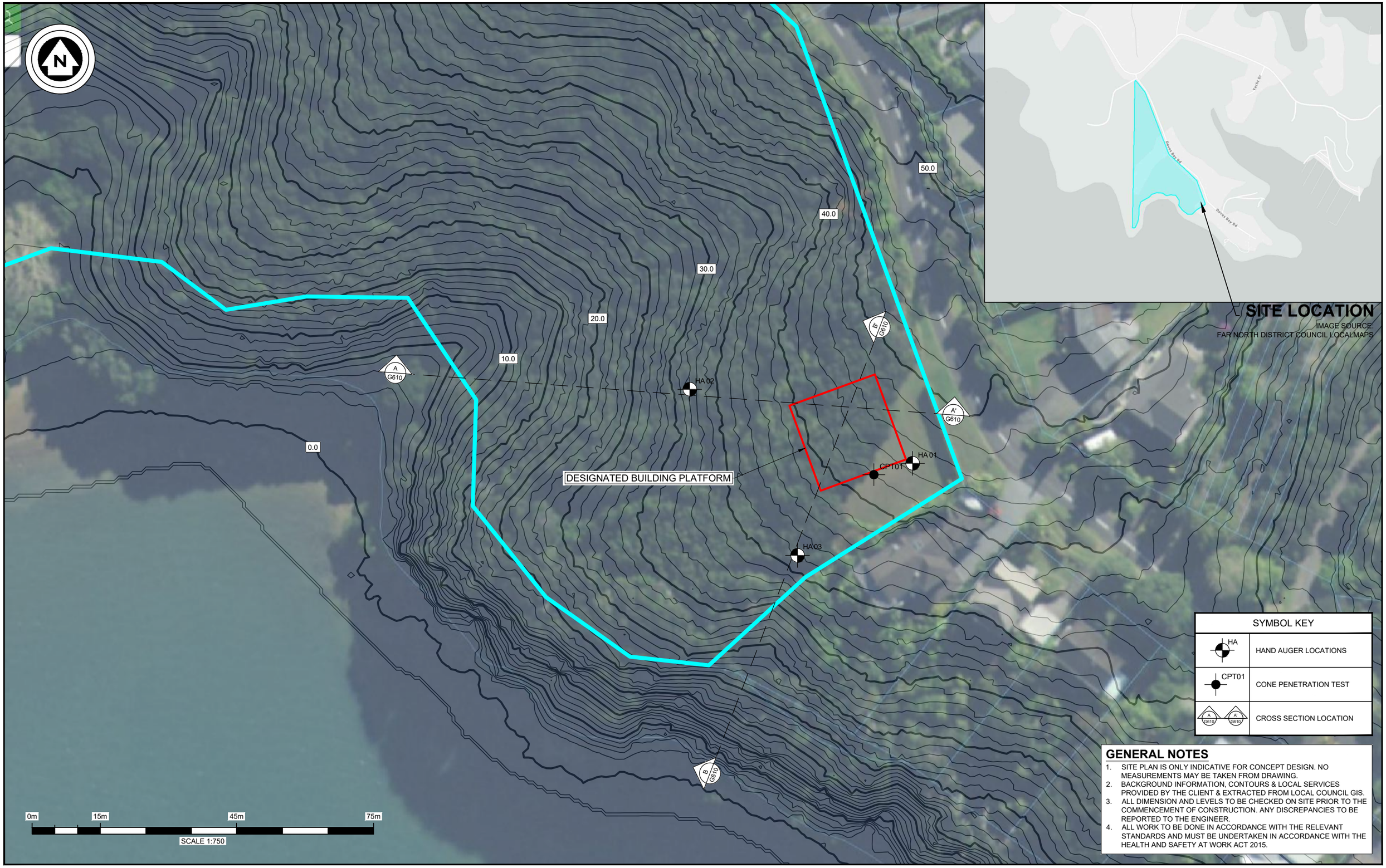
Site Plan and Cross-sections (3 sheets)

Hand Auger Borehole Records (3 sheets)

CPT Calibration Sheet & Results (6 sheets)

Slope Stability Assessment Outputs (8 sheets)

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

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SURVEYED BY:

SERVICES NOTE
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GEOTECHNICAL
DESIGN / DRAWING SUBJECT TO ENGINEER'S APPROVAL

DRAWING TITLE: SITE PLAN

PROJECT DESCRIPTION: PROPOSED SUBDIVISION

PROJECT TITLE:
LOT 1 DP 529065
2 & 8 DOVES BAY ROAD
KERIKERI
NORTHLAND

| ORIGINAL DRAWING SIZE: | OFFICE: |
|---|---|
| A3 | WHANGAREI |
| DRAWING SCALE: | CO-ORDINATE SYSTEM: |
| 1:750 | NOT COORDINATED |
| DRAWING NUMBER: | ISSUE: |
| 148879-G600 | A |

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A
WEST

A'
EAST

**KEY:**

HA 01 — HAND AUGER LOCATION

WT — GROUNDWATER

GWNE — NO GROUNDWATER

DCP - SCALA PENETROMETER TEST

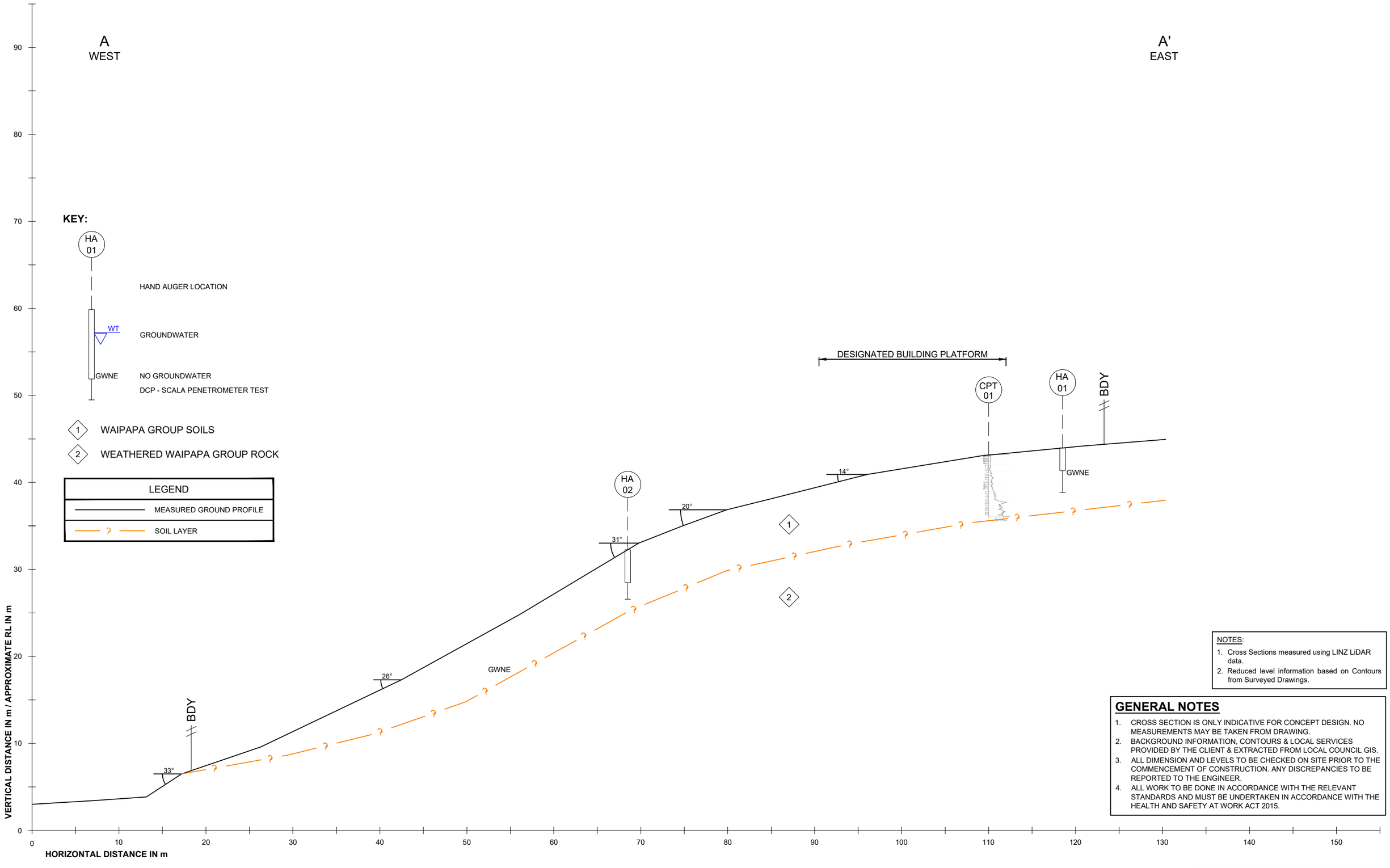
1 — WAIPAPA GROUP SOILS

2 — WEATHERED WAIPAPA GROUP ROCK

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.

## GENERAL NOTES

1. CROSS SECTION 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
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Northland: 09 945 4188 Auckland: 09 527 0196
Christchurch: 021 824 063 Wanaka: 03 443 6209
www.wiltonjoubert.co.nz


**ISSUE / REVISION**

| No. | DATE | BY | DESCRIPTION |
|---|---|---|---|
| A | AUG 2026 | A.B | ISSUED WITH GEOTECHNICAL REPORT |

DESIGNED BY:

DRAWN BY: A.B

CHECKED BY:

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**GEOTECHNICAL**

DESIGN / DRAWING SUBJECT TO ENGINEER'S APPROVAL

DRAWING TITLE: **CROSS SECTION**

PROJECT DESCRIPTION: **PROPOSED SUBDIVISION**

PROJECT TITLE: **LOT 1 DP 529065 2 & 8 DOVES BAY ROAD KERIKERI NORTHLAND**

| ORIGINAL DRAWING SIZE: | OFFICE: |
|---|---|
| A3 | WHANGAREI |
| DRAWING SCALE: | CO-ORDINATE SYSTEM: |
| 1:400 | NOT COORDINATED |
| DRAWING NUMBER: | ISSUE: |
| 148879-G610 | A |

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B
SOUTHWEST

B'
NORTHEAST

**KEY:**

HA 01 — HAND AUGER LOCATION

WT — GROUNDWATER

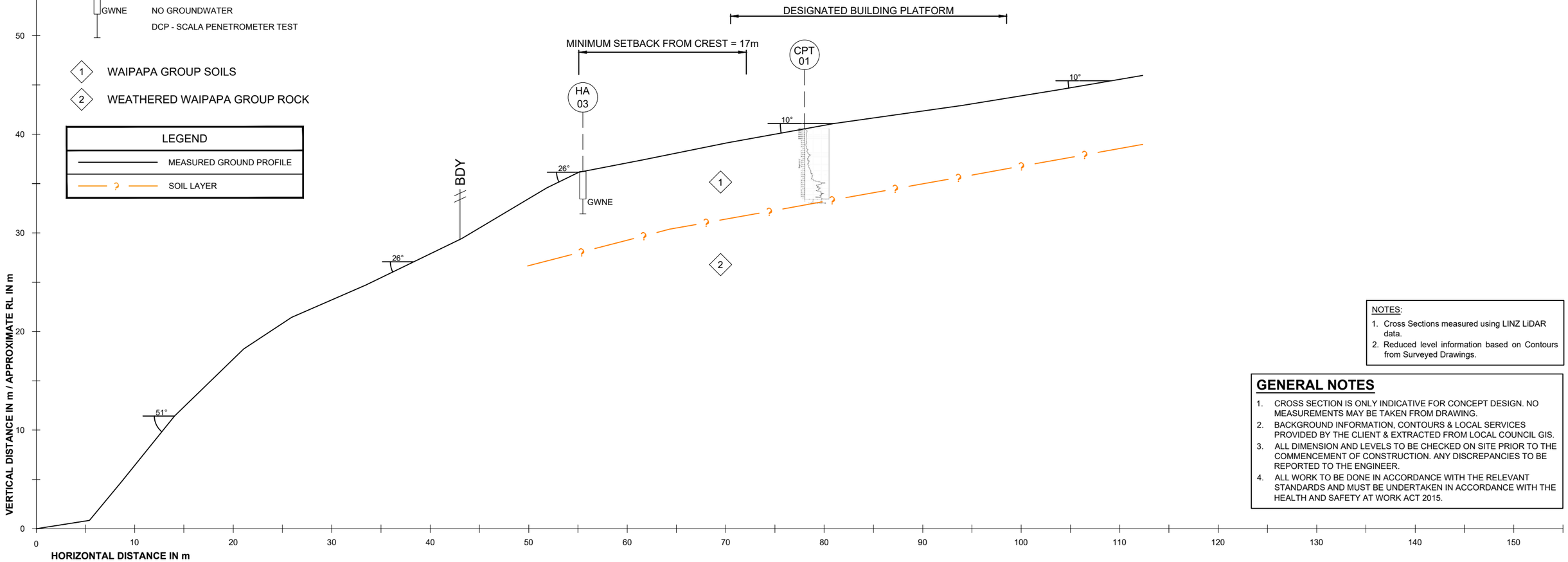
GWNE — NO GROUNDWATER

DCP - SCALA PENETROMETER TEST

1 — WAIPAPA GROUP SOILS

2 — WEATHERED WAIPAPA GROUP ROCK

| 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.

## GENERAL NOTES

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| ISSUE / REVISION | | | |
|---|---|---|---|
| No. | DATE | BY | DESCRIPTION |
| A | AUG 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**

PROJECT DESCRIPTION: **PROPOSED SUBDIVISION**

PROJECT TITLE:
**LOT 1 DP 529065**
**2 & 8 DOVES BAY ROAD**
**KERIKERI**
**NORTHLAND**

| ORIGINAL DRAWING SIZE: | OFFICE: |
|---|---|
| A3 | WHANGAREI |
| DRAWING SCALE: | CO-ORDINATE SYSTEM: |
| 1:400 | NOT COORDINATED |

DRAWING NUMBER: 148879-G611
ISSUE: A

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# HAND AUGER : HA01

**JOB NO.:** 148879 **SHEET:** 1 OF 1

**START DATE:** 17/08/2026 **NORTHING:** **GRID:**

**CLIENT:** Timothy D.F. Maples **DIAMETER:** 50mm **EASTING:**

**PROJECT:** 2-Lot Subdivision (1 Lot for Assessment) **SV DIAL:** 1994 **ELEVATION:** Ground

**SITE LOCATION:** 2 & 8 Doves Bay Road, Kerikeri **FACTOR:** 1.41 **DATUM:**

**SOIL DESCRIPTION**

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, brown, wet. | TS | 0.0 | Groundwater Not Encountered | | | | | |
| Waipapa Group | NATURAL: Clayey SILT, occasional clasts, yellowish brown, very stiff, moist, low to moderate plasticity. | | 0.2 | | | | | | |
| | | | 0.4 | | 197+ | - | - | | |
| | | | 0.6 | | | | | | |
| | | | 0.8 | | 197+ | - | - | | |
| | 0.9m: Frequent clasts. | | 1.0 | | | | | | |
| | SILT, minor clay, frequent clasts, orangey brown with yellowish brown mottles, very stiff, moist, no to low plasticity. | | 1.2 | | 197+ | - | - | | |
| | 1.5m: Orangey brown with light grey mottles. | | 1.4 | | | | | | |
| | | | 1.6 | | 172 | 28 | 6.1 | | |
| | | | 1.8 | | | | | | |
| | | | 2.0 | | UTP | - | - | | |
| | 2.2m: Occasional black streaks. | | 2.2 | | | | | | |
| | | | 2.4 | | UTP | - | - | | |
| | | | 2.6 | | UTP | - | - | 8 | |
| | EOH: 2.60m - Too Hard To Auger | | 2.8 | | | | | 8 | |
| | | | 3.0 | | | | | 8 | |
| | | | 3.2 | | | | | 8 | |
| | | | 3.4 | | | | | 7 | |
| | | | 3.6 | | | | | 7 | |
| | | | 3.8 | | | | | 6 | |
| | | | 4.0 | | | | | 7 | |
| | | | 4.2 | | | | | 7 | |
| | | | 4.4 | | | | | 8 | |
| | | | 4.6 | | | | | 10 | |
| | | | 4.8 | | | | | 12 | |
| | | | 5.0 | | | | | 11 | |
| | | | 5.2 | | | | | 10 | |
| | | | 5.4 | | | | | 10 | |
| | | | 5.6 | | | | | 9 | |
| | | | 5.8 | | | | | 10 | |
| | | | | | | | | 11 | |
| | | | | | | | | 12 | |
| | | | | | | | | 13 | |
| | | | | | | | | 13 | |
| | | | | | | | | 14 | |
| | | | | | | | | 16 | |
| | | | | | | | | 18 | |
| | | | | | | | | 20+ | |

**REMARKS**

End of borehole @ 2.60m (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

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Phone: 09-945 4188
Email: jobs@wjl.co.nz
Website: www.wiltonjoubert.co.nz

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# HAND AUGER : HA02

**JOB NO.:** 148879 **SHEET:** 1 OF 1

**START DATE:** 17/08/2026 **NORTHING:** **GRID:**

**CLIENT:** Timothy D.F. Maples **DIAMETER:** 50mm **EASTING:**

**PROJECT:** 2-Lot Subdivision (1 Lot for Assessment) **SV DIAL:** DR4802 **ELEVATION:** Ground

**SITE LOCATION:** 2 & 8 Doves Bay Road, Kerikeri **FACTOR:** 1.39 **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 | MULCH, moist.<br>TOPSOIL, brown, moist. | TS | 0.2 | | | | | | |
| Waipapa Group | NATURAL: Clayey SILT, yellowish brown with occasional orange mottles, very stiff, dry to moist, low to moderate plasticity. | | 0.4 | Groundwater Not Encountered | 128 | 33 | 3.9 | | |
| | | | 0.6 | | | | | | |
| | | | 0.8 | | 195+ | - | - | | |
| | SILT, some clay, orangey brown with occasional white and pink mottles, very stiff, dry to moist, low plasticity. | | 1.0 | | | | | | |
| | 1.2m: Minor to some clay, orangey brown with reddish brown and white mottles, moist, no to low plasticity. | | 1.2 | | 195+ | - | - | | |
| | 1.5m: Reddish brown and orangey brown with white mottles and thin dark brown seams, moist to wet. | | 1.4 | | | | | | |
| | | | 1.6 | | 128 | 25 | 5.1 | | |
| | 2.0m: Stiff. | | 1.8 | | | | | | |
| | | | 2.0 | | 86 | 14 | 6.1 | | |
| | | | 2.2 | | | | | | |
| | | | 2.4 | | 86 | 14 | 6.1 | | |
| | 2.7m: 100mm lense of fine gravelly SILT, moist, very stiff, no plasticity. | | 2.6 | | | | | | |
| | 2.8m: MInor clay, frequent clasts, light brown with grey and brown mottles, very stiff, moist, no plasticity. | | 2.8 | | 195+ | - | - | | |
| | | | 3.0 | | | | | | |
| | | | 3.2 | | 195+ | - | - | | |
| | | | 3.4 | | | | | | |
| | | | 3.6 | | UTP | - | - | | |
| | EOH: 3.80m - Too Hard To Auger | | 3.8 | | UTP | - | - | 7 | |
| | | | 4.0 | | | | | 7 | |
| | | | | | | | | 6 | |
| | | | 4.2 | | | | | 6 | |
| | | | | | | | | 7 | |
| | | | 4.4 | | | | | 7 | |
| | | | | | | | | 8 | |
| | | | 4.6 | | | | | 9 | |
| | | | | | | | | 10 | |
| | | | 4.8 | | | | | 10 | |
| | | | | | | | | 10 | |
| | | | 5.0 | | | | | 12 | |
| | | | | | | | | 12 | |
| | | | 5.2 | | | | | 13 | |
| | | | | | | | | 14 | |
| | | | 5.4 | | | | | 14 | |
| | | | | | | | | 14 | |
| | | | 5.6 | | | | | 16 | |
| | | | | | | | | 20+ | |
| | | | 5.8 | | | | | | |

**REMARKS**

End of borehole @ 3.80m (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:** SJP

**CHECKED BY:** CSH

▼ Standing groundwater level

▽ GW while drilling

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Consulting Engineers

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# HAND AUGER : HA03

**JOB NO.:** 148879 **SHEET:** 1 OF 1

**START DATE:** 17/08/2026 **NORTHING:** **GRID:**

**CLIENT:** Timothy D.F. Maples **DIAMETER:** 50mm **EASTING:**

**PROJECT:** 2-Lot Subdivision (1 Lot for Assessment) **SV DIAL:** 1994 **ELEVATION:** Ground

**SITE LOCATION:** 2 & 8 Doves Bay Road, Kerikeri **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, brown, wet. | TS | 0.0 | Groundwater Not Encountered | | | | | |
| Waipapa Group | NATURAL: Clayey SILT, occasional clasts, yellowish brown with occasional orange and white mottles, very stiff, moist to wet, low plasticity. | | 0.2 | | | | | | |
| | | | 0.4 | | 172 | 37 | 4.6 | | |
| | 0.7m: Yellowish brown with grey mottles. | | 0.6 | | | | | | |
| | | | 0.8 | | 197+ | - | - | | |
| | 1.0m: Light grey with orangey brown mottles, low to moderate plasticity. | | 1.0 | | | | | | |
| | | | 1.2 | | 155 | 25 | 6.2 | | |
| | SILT, minor clay, frequent clasts, light grey with orangey brown mottles and occasional black streaks, very stiff, moist, no plasticity. | | 1.4 | | | | | | |
| | 1.6m: Very stiff to hard. | | 1.6 | | 197+ | - | - | | |
| | | | 1.8 | | | | | | |
| | | | 2.0 | | UTP | - | - | | |
| | 2.3m: Orangey brown with light grey and occasional black mottles, dry to moist. | | 2.2 | | | | | | |
| | | | 2.4 | | UTP | - | - | | |
| | 2.6m: Dry. | | 2.6 | | UTP | - | - | | |
| | | | 2.8 | | | | | | |
| | EOH: 2.80m - Too Hard To Auger | | 3.0 | | | | | 10 | |
| | | | | | | | | 10 | |
| | | | | | | | | 11 | |
| | | | 3.2 | | | | | 10 | |
| | | | | | | | | 8 | |
| | | | 3.4 | | | | | 7 | |
| | | | | | | | | 7 | |
| | | | 3.6 | | | | | 7 | |
| | | | | | | | | 12 | |
| | | | 3.8 | | | | | 16 | |
| | | | | | | | | 12 | |
| | | | 4.0 | | | | | 13 | |
| | | | | | | | | 13 | |
| | | | 4.2 | | | | | 17 | |
| | | | | | | | | 20+ | |
| | | | 4.4 | | | | | | |
| | | | 4.6 | | | | | | |
| | | | 4.8 | | | | | | |
| | | | 5.0 | | | | | | |
| | | | 5.2 | | | | | | |
| | | | 5.4 | | | | | | |
| | | | 5.6 | | | | | | |
| | | | 5.8 | | | | | | |

**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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Consulting Engineers

185 Waipapa Road, Kerikeri 0295
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# CPT Client Engagement / Quote Request

| Project Details | | Date | 18/08/2026 |
|---|---|---|---|
| Project Name | Proposed Development | Job Identifier | WJL 2 Doves Bay Rd |
| Project Address | 2 Doves Bay Road | | |
| 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 | 20Kn |
| Any Deviations From Common Setup | | Reaction Restraint | Screw Anchor |
| Cone Penetrometer | | Cone Penetrometer Type | Digital Nova Cone |
| 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 | CPT01 | Job Identifier | WJL 2 Doves Bay Rd |
| Test Date | 18/08/2026 | Operator | CG/TF |
| Cone Serial Number | 5801 | Battery Voltage Start | 6.32 |
| Cone Area Ratio | 0.843 | Start Recording | 9:44:00 AM |
| Probe Radius | 0.0177 | Finish Recording | 10:08:00 AM |
| Date of First Push Current Calibration | 17/01/2025 | Measured Ground Water Depth | EOB 6.95m, dry |
| Metres To Next Calibration | 189 | Total Penetration Depth (m) | 7.147 |
| Depth of Predrill | 0 | Test ended due to: | ☑ High Tilt<br>☑ High Tip Pressure<br>☐ High Friction<br>☐ High Pore Pressure<br>☐ High Total load<br>☐ Danger of Rods Buckling<br>☐ Target Depth<br>☑ Anchor Failure |
| Depth at Start of Test | 0 | | |
| Anchor Depth (Left) | 1.5 > 2.5 | | |
| Anchor Depth (Right) | 1.5 > 2.5 | | |

## Zero Value Change % FSO

| | Point Resistance | Pore Pressure | Sleeve Friction |
|---|---|---|---|
| Zero Shift Since First Push Current Calibration | 0.03% | 0.03% | 0.36% |
| End of test with tip loosened | 0.02% | 0.00% | 0.26% |

## Dissipation Testing

| Test No | Depth (m) | Duration (secs) | Comments |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

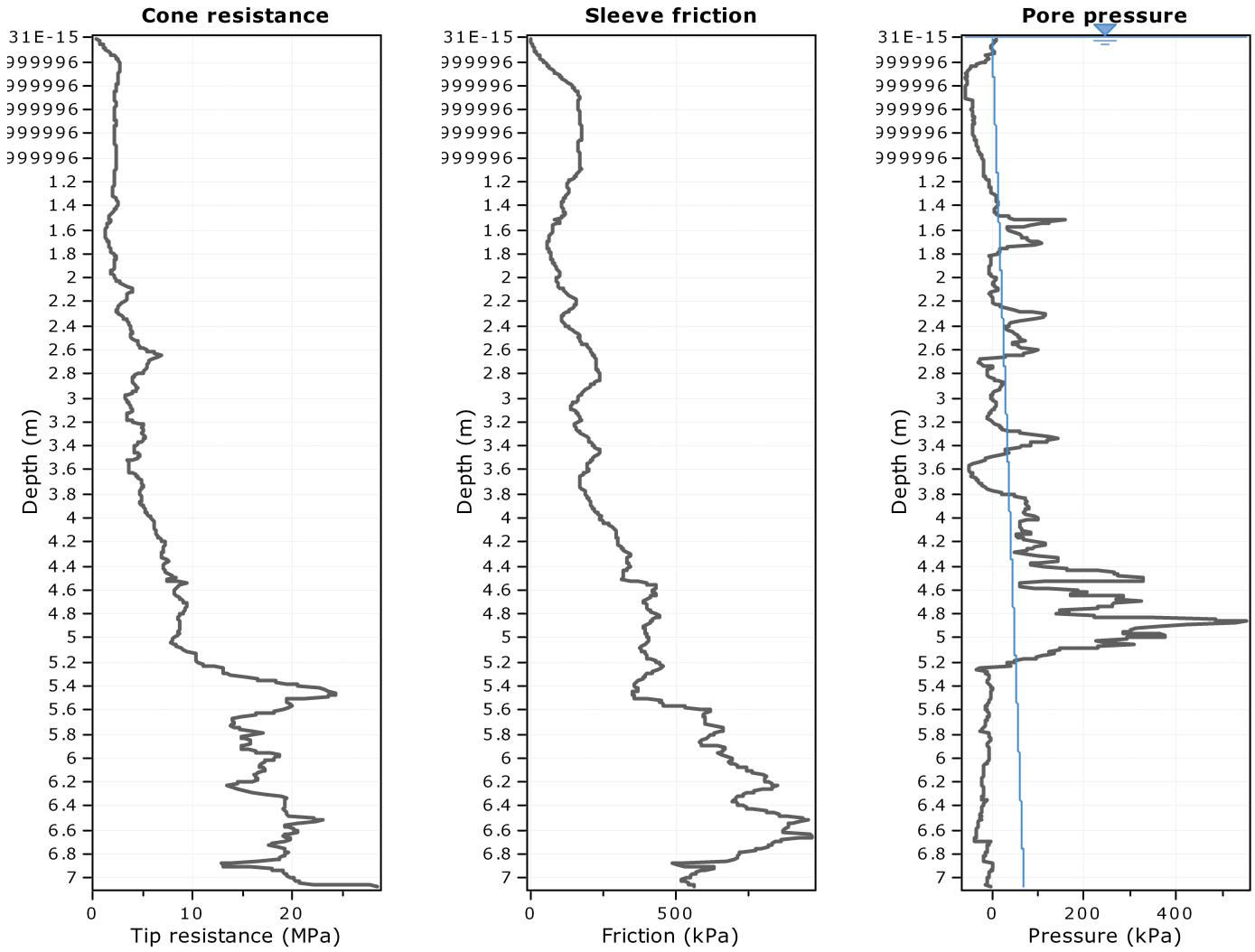
## Notes and Comments

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

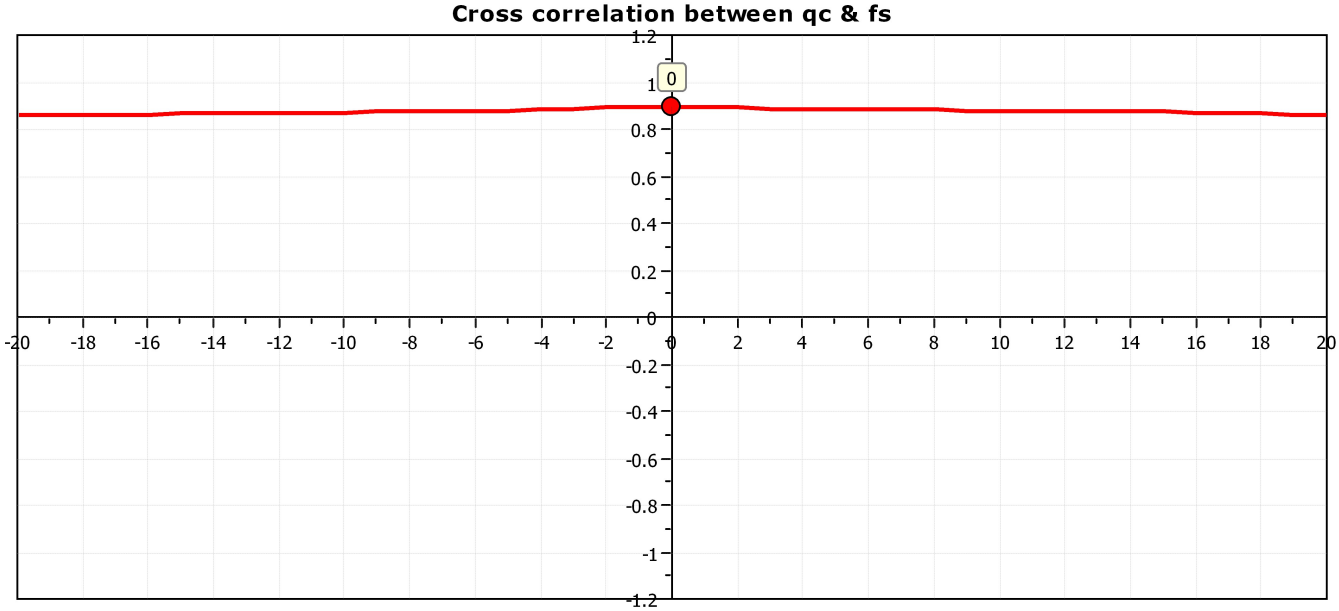
**Underground Investigation Ltd**
Cone Penetration Testing
craig@undergroundinvestigation.co.nz
+64211473249

**CPT: CPT01**
Total depth: 7.07 m, Date: 8/18/2026
Surface Elevation: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

**Project:**
**Location:**



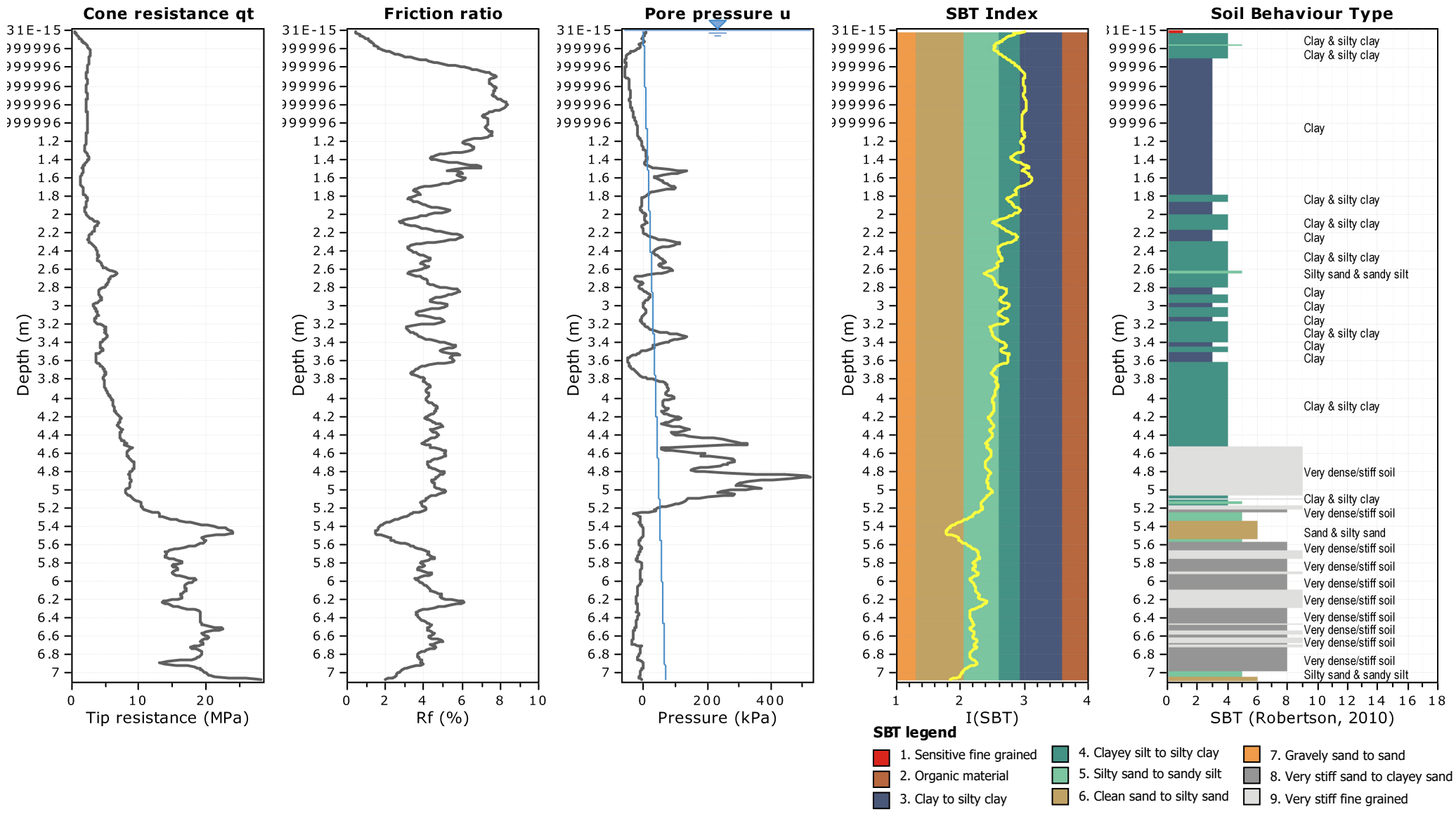

The plot below presents the cross correlation coeficient between the raw qc and fs values (as measured on the field). X axes presents the lag distance (one lag is the distance between two sucessive CPT measurements).



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

**CPT: CPT01**
Total depth: 7.07 m, Date: 8/18/2026
Surface Elevation: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

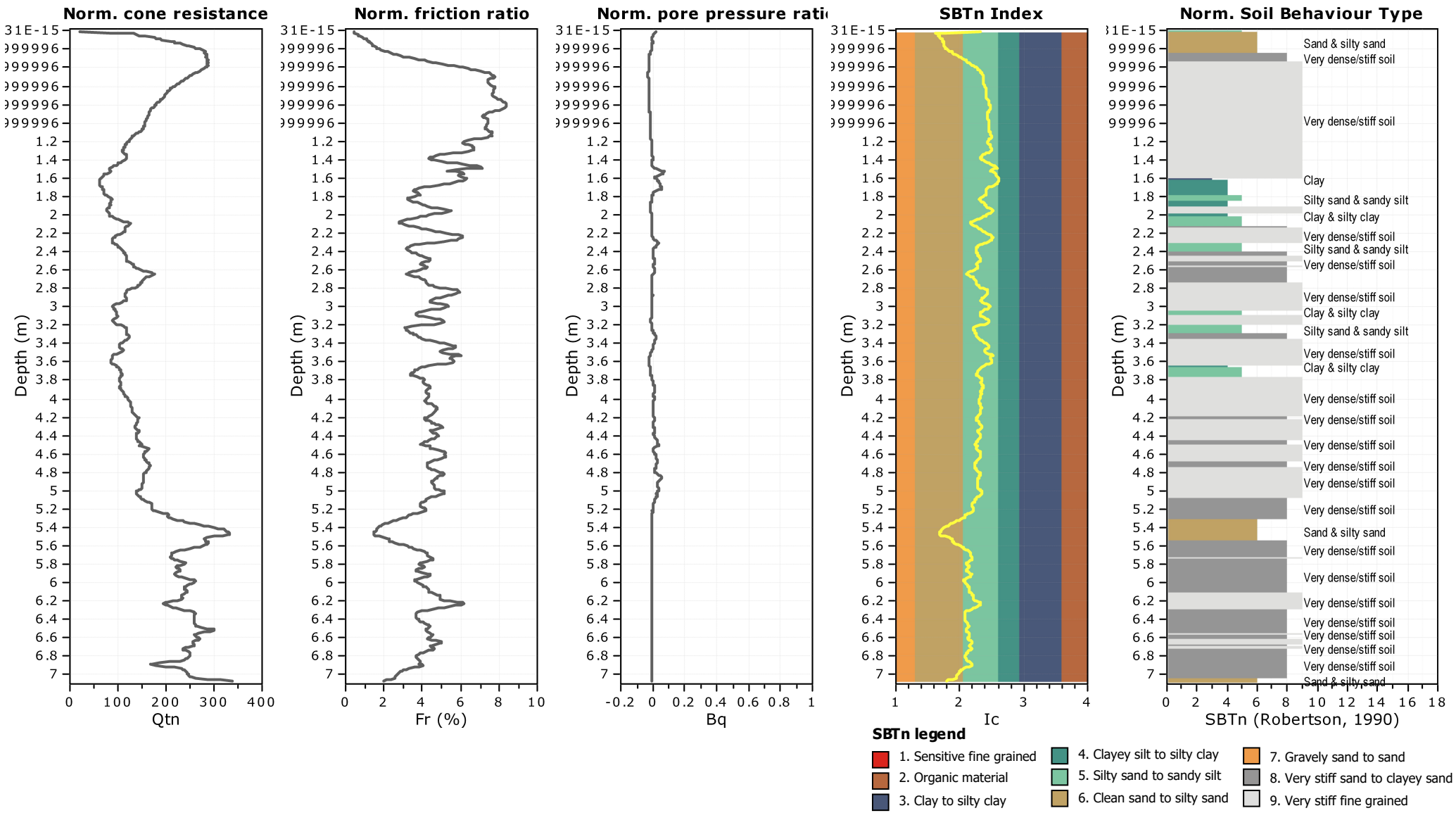
**Project:**
**Location:**

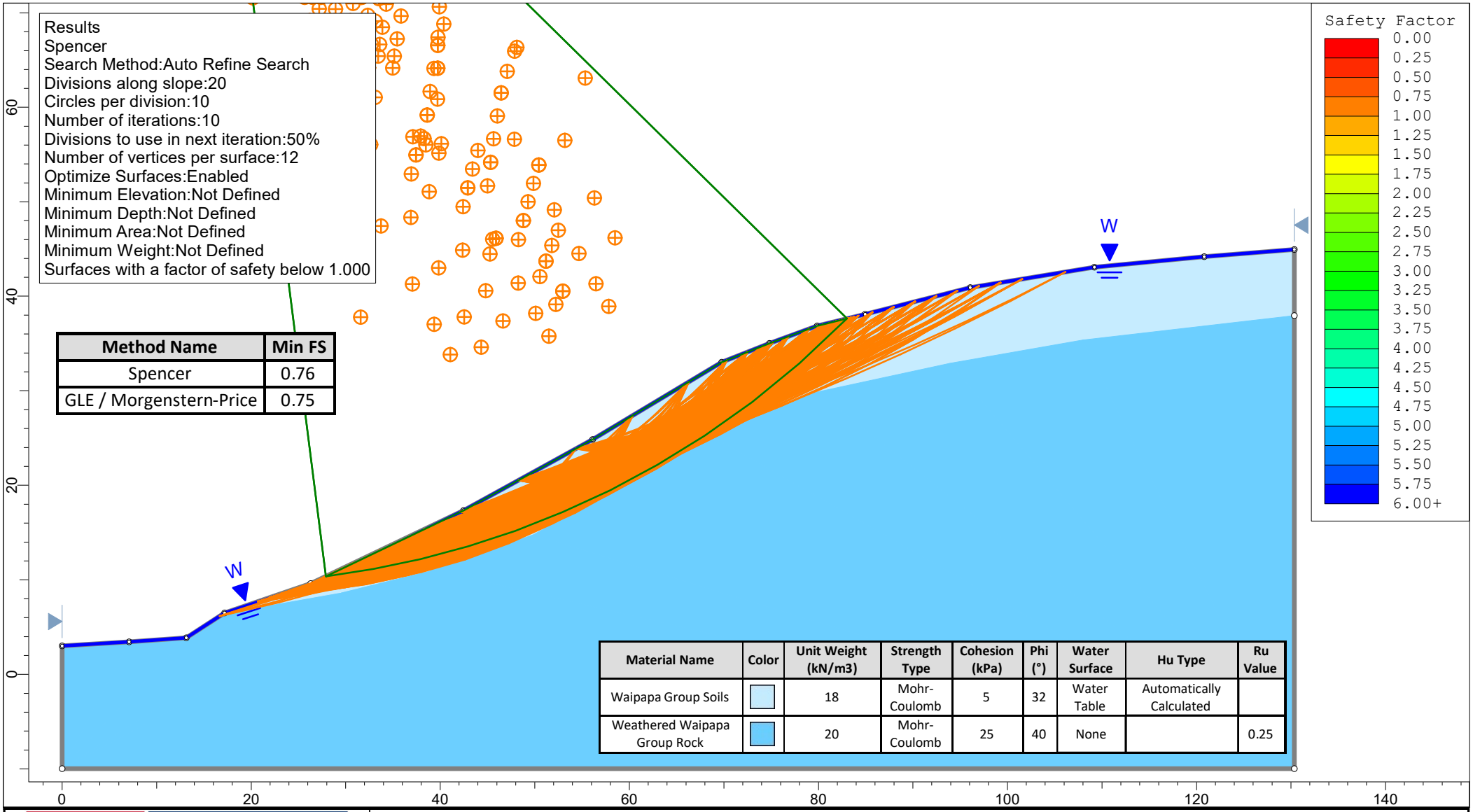


**Underground Investigation Ltd**
Cone Penetration Testing
craig@undergroundinvestigation.co.nz
+64211473249

**CPT: CPT01**
Total depth: 7.07 m, Date: 8/18/2026
Surface Elevation: 0.00 m
Coords: X:0.00, Y:0.00
Cone Type:
Cone Operator:

**Project:**
**Location:**






| Method Name | Min FS |
|---|---|
| Spencer | 0.76 |
| GLE / Morgenstern-Price | 0.75 |

| Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kPa) | Phi (°) | Water Surface | Hu Type | Ru Value |
|---|---|---|---|---|---|---|---|---|
| Waipapa Group Soils | | 18 | Mohr-Coulomb | 5 | 32 | Water Table | Automatically Calculated | |
| Weathered Waipapa Group Rock | | 20 | Mohr-Coulomb | 25 | 40 | None | | 0.25 |

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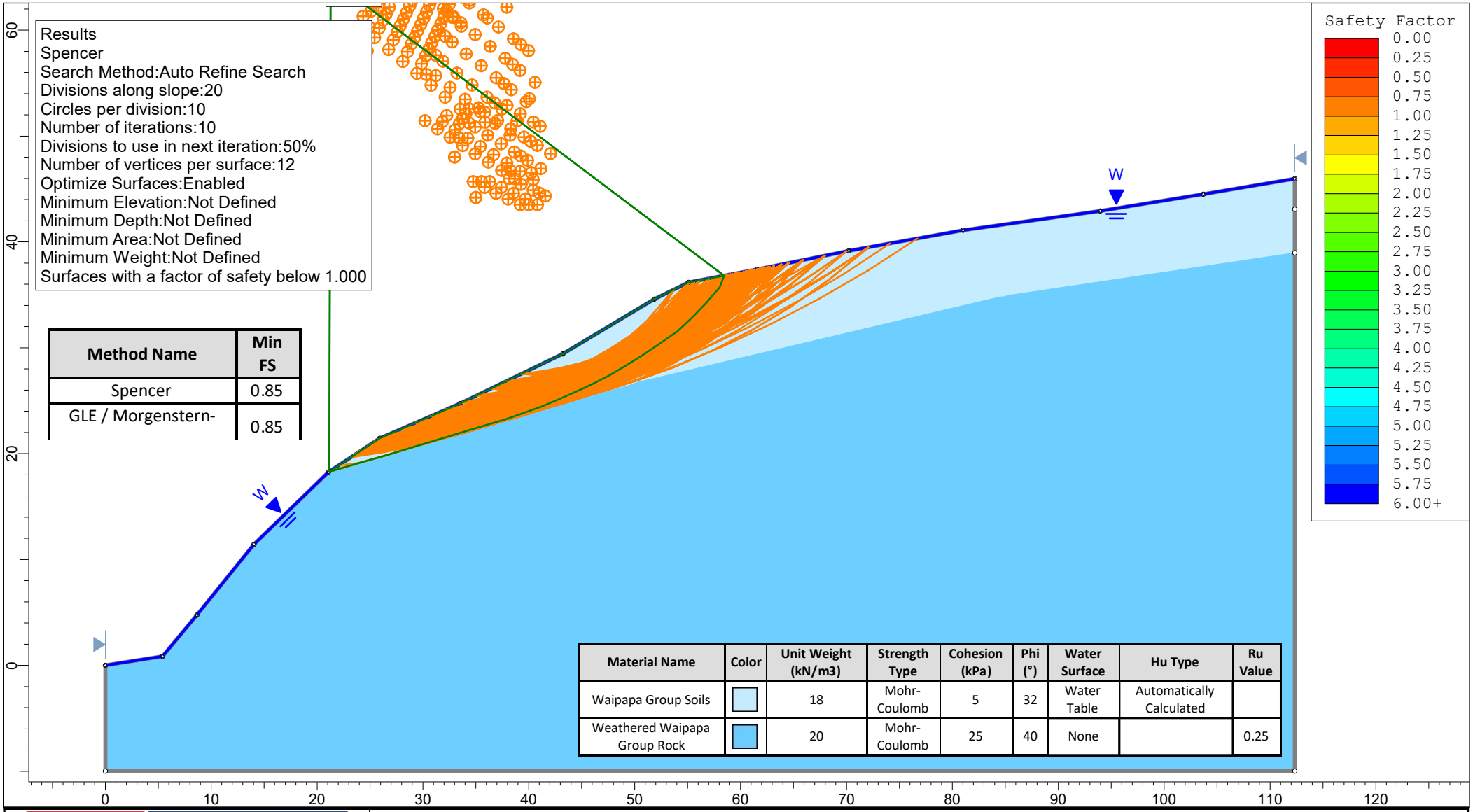
| | | | |
|---|---|---|---|
| Project | 148879 - 2 & 8 Dove Road | | |
| Group | Cross Section A-A' - Sensitivity Analysis | Scenario | Surficial Groundwater Level |
| Drawn By | A.B | Company | Wilton Joubert Limited |
| Date | 20/08/2026 | File Name | 148879 - AA - Sensitivity Analysis - CsH.slmd |




| Method Name | Min FS |
|---|---|
| Spencer | 0.85 |
| GLE / Morgenstern- | 0.85 |

| Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kPa) | Phi (°) | Water Surface | Hu Type | Ru Value |
|---|---|---|---|---|---|---|---|---|
| Waipapa Group Soils | | 18 | Mohr-Coulomb | 5 | 32 | Water Table | Automatically Calculated | |
| Weathered Waipapa Group Rock | | 20 | Mohr-Coulomb | 25 | 40 | None | | 0.25 |

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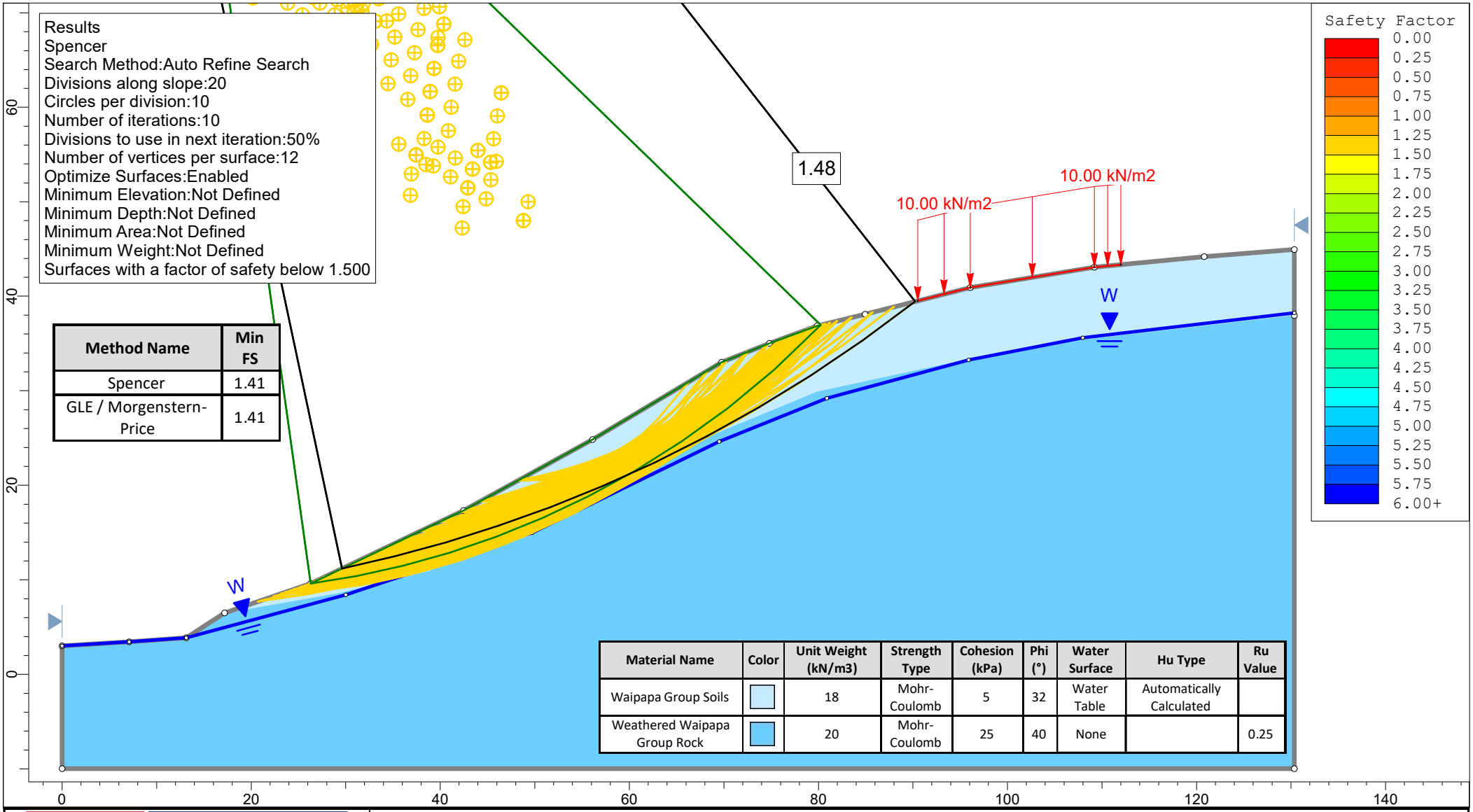
| | | | |
|---|---|---|---|
| Project | 148879 - 2 & 8 Dove Road | | |
| Group | Cross Section B-B' - Sensitivity Analysis | Scenario | Surficial Groundwater Level |
| Drawn By | A.B | Company | Wilton Joubert Limited |
| Date | 20/08/2026 | File Name | 148879 - BB - Sensitivity Analysis.slmd |




| Method Name | Min FS |
|---|---|
| Spencer | 1.41 |
| GLE / Morgenstern-Price | 1.41 |

| Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kPa) | Phi (°) | Water Surface | Hu Type | Ru Value |
|---|---|---|---|---|---|---|---|---|
| Waipapa Group Soils | | 18 | Mohr-Coulomb | 5 | 32 | Water Table | Automatically Calculated | |
| Weathered Waipapa Group Rock | | 20 | Mohr-Coulomb | 25 | 40 | None | | 0.25 |

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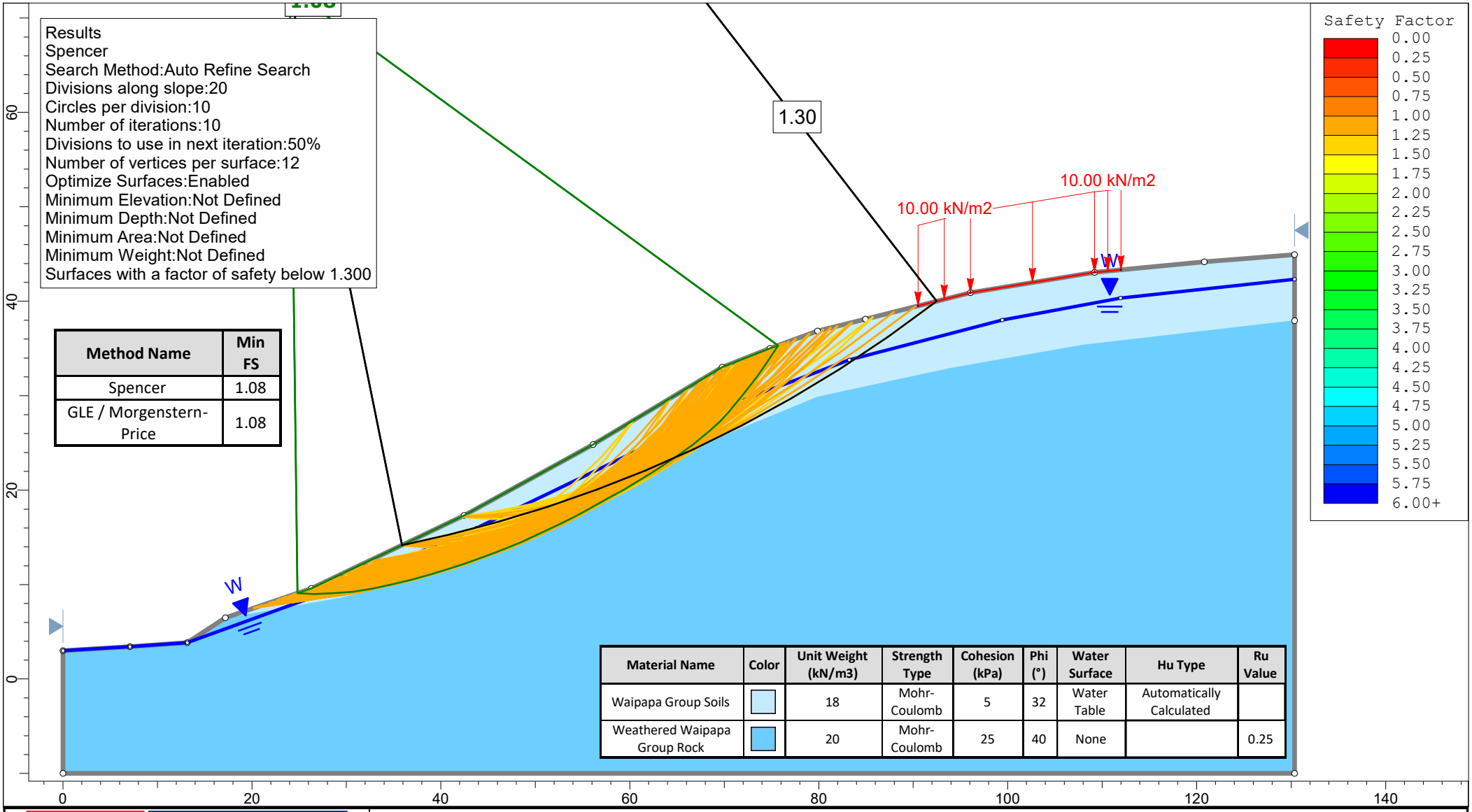
| | | | |
|---|---|---|---|
| Project | 148879 - 2 & 8 Dove Road | | |
| Group | Cross Section A-A' - Proposed | Scenario | Measured Groundwater Level |
| Drawn By | A.B | Company | Wilton Joubert Limited |
| Date | 20/08/2026 | File Name | 148879 - AA.slmd |




| Method Name | Min FS |
|---|---|
| Spencer | 1.08 |
| GLE / Morgenstern-Price | 1.08 |

| Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kPa) | Phi (°) | Water Surface | Hu Type | Ru Value |
|---|---|---|---|---|---|---|---|---|
| Waipapa Group Soils | | 18 | Mohr-Coulomb | 5 | 32 | Water Table | Automatically Calculated | |
| Weathered Waipapa Group Rock | | 20 | Mohr-Coulomb | 25 | 40 | None | | 0.25 |

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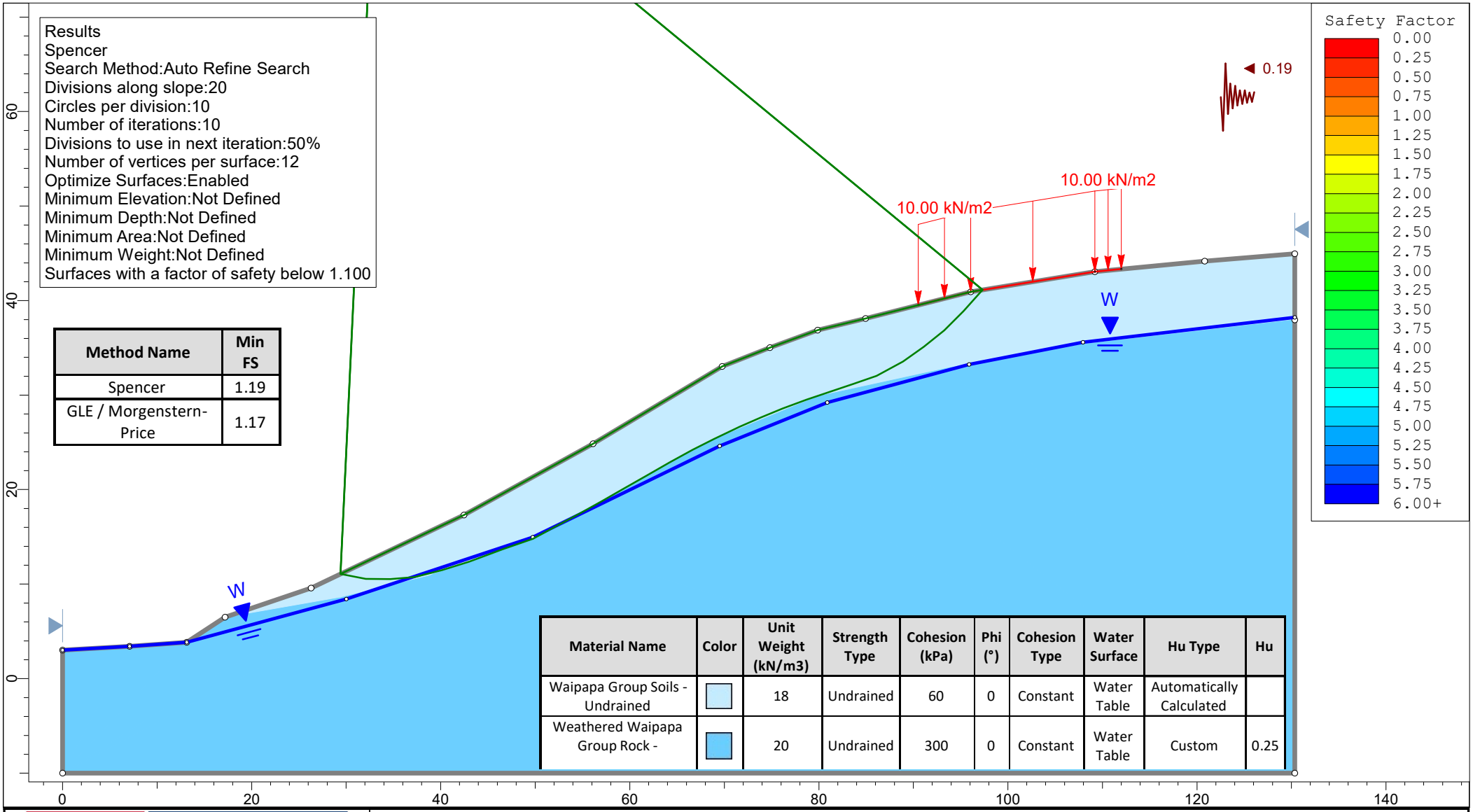
| | | | |
|---|---|---|---|
| Project | 148879 - 2 & 8 Dove Road | | |
| Group | Cross Section A-A' - Proposed | Scenario | Elevated Groundwater Level |
| Drawn By | A.B | Company | Wilton Joubert Limited |
| Date | 20/08/2026 | File Name | 148879 - AA.slmd |




| Method Name | Min FS |
|---|---|
| Spencer | 1.19 |
| GLE / Morgenstern-Price | 1.17 |

| Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kPa) | Phi (°) | Cohesion Type | Water Surface | Hu Type | Hu |
|---|---|---|---|---|---|---|---|---|---|
| Waipapa Group Soils - Undrained | | 18 | Undrained | 60 | 0 | Constant | Water Table | Automatically Calculated | |
| Weathered Waipapa Group Rock - | | 20 | Undrained | 300 | 0 | Constant | Water Table | Custom | 0.25 |

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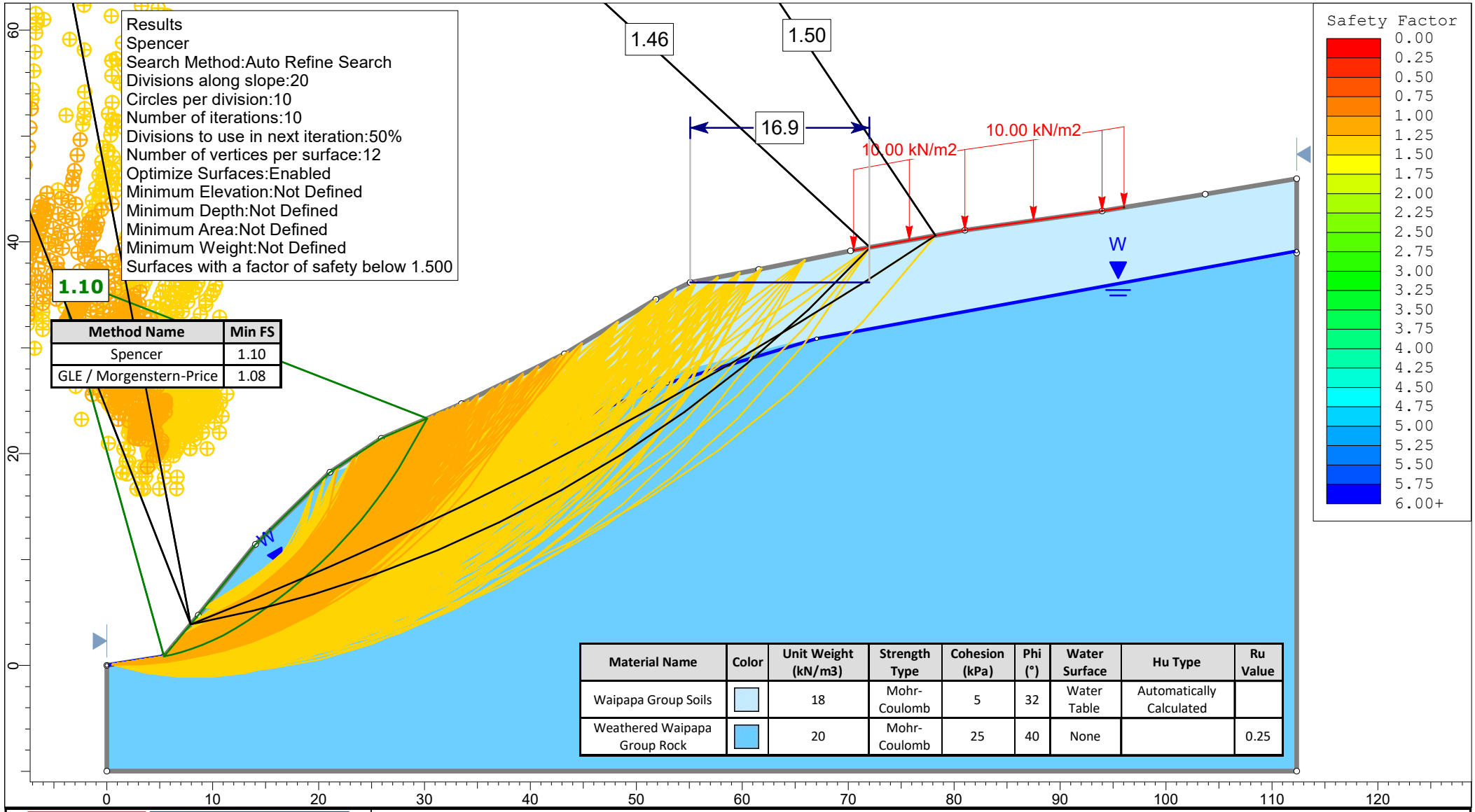
| | | | |
|---|---|---|---|
| Project | 148879 - 2 & 8 Dove Road | | |
| Group | Cross Section A-A' - Proposed | Scenario | Measured Groundwater Level - Seismic |
| Drawn By | A.B | Company | Wilton Joubert Limited |
| Date | 20/08/2026 | File Name | 148879 - AA.slmd |




| Method Name | Min FS |
|---|---|
| Spencer | 1.10 |
| GLE / Morgenstern-Price | 1.08 |

| Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kPa) | Phi (°) | Water Surface | Hu Type | Ru Value |
|---|---|---|---|---|---|---|---|---|
| Waipapa Group Soils | | 18 | Mohr-Coulomb | 5 | 32 | Water Table | Automatically Calculated | |
| Weathered Waipapa Group Rock | | 20 | Mohr-Coulomb | 25 | 40 | None | | 0.25 |

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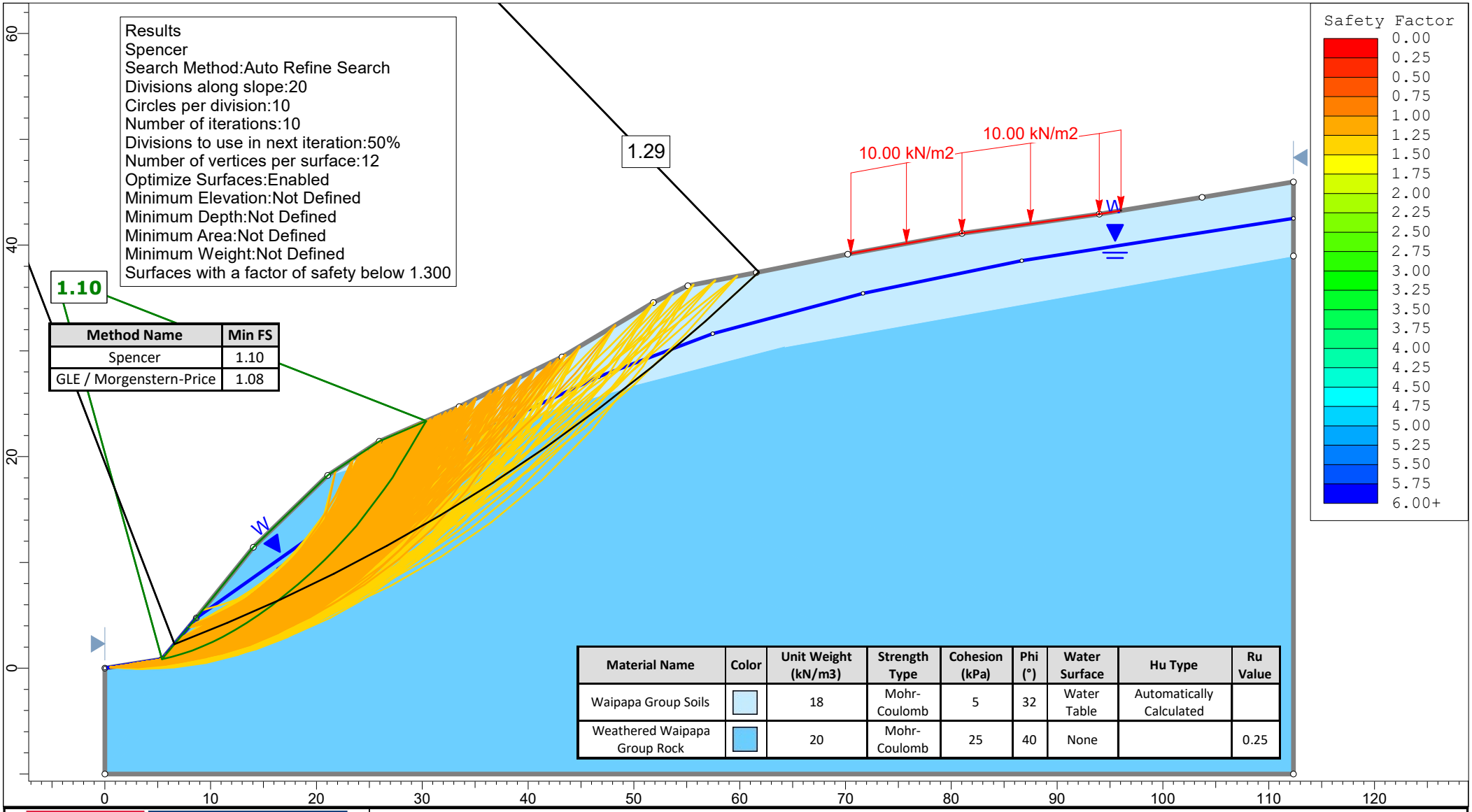
| | | | |
|---|---|---|---|
| Project | 148879 - 2 & 8 Dove Road | | |
| Group | Cross Section B-B' - Proposed | Scenario | Measured Groundwater Level |
| Drawn By | A.B | Company | Wilton Joubert Limited |
| Date | 20/08/2026 | File Name | 148879 - BB.slmd |




| Method Name | Min FS |
|---|---|
| Spencer | 1.10 |
| GLE / Morgenstern-Price | 1.08 |

| Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kPa) | Phi (°) | Water Surface | Hu Type | Ru Value |
|---|---|---|---|---|---|---|---|---|
| Waipapa Group Soils | | 18 | Mohr-Coulomb | 5 | 32 | Water Table | Automatically Calculated | |
| Weathered Waipapa Group Rock | | 20 | Mohr-Coulomb | 25 | 40 | None | | 0.25 |

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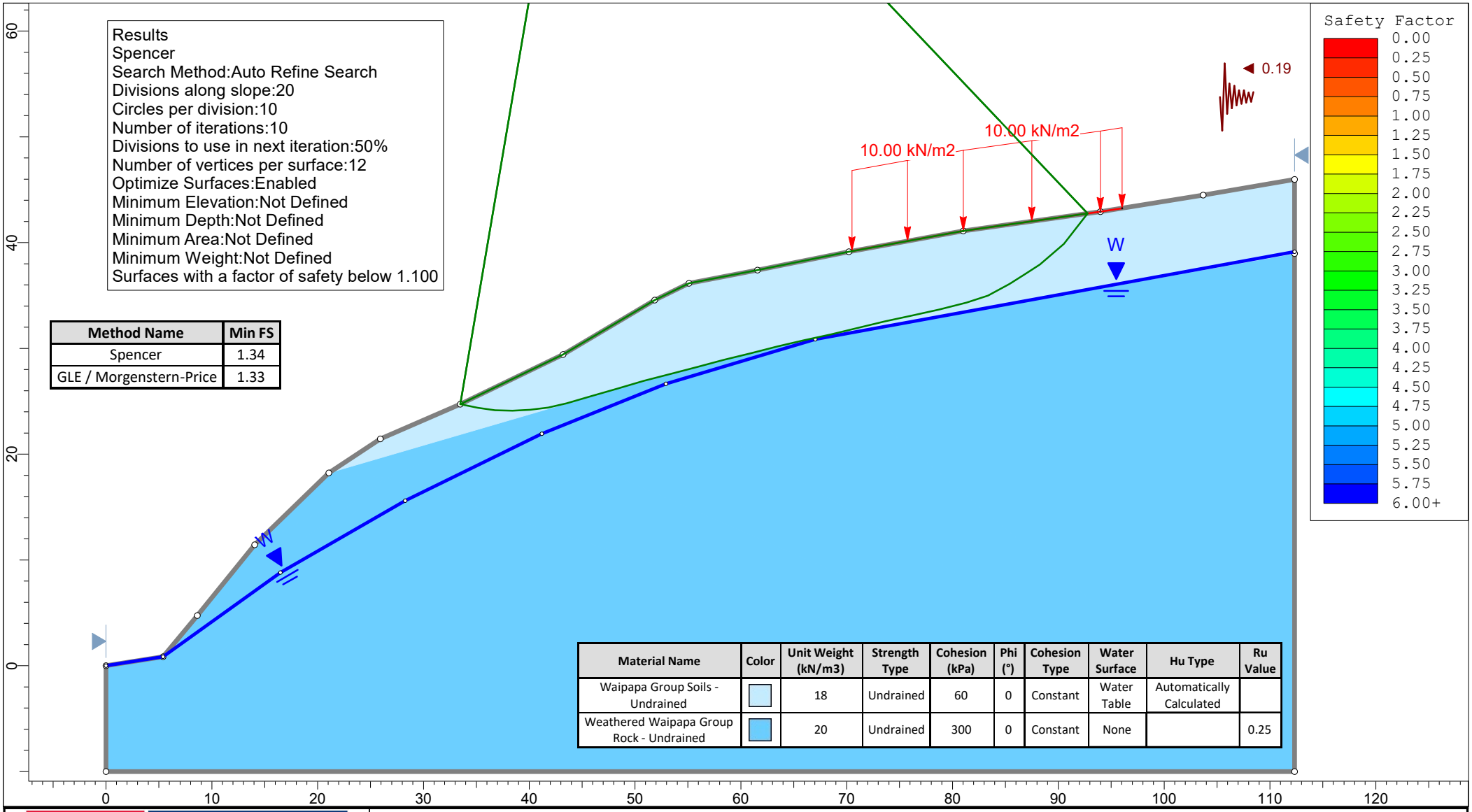
| | | | |
|---|---|---|---|
| Project | 148879 - 2 & 8 Dove Road | | |
| Group | Cross Section B-B' - Proposed | Scenario | Elevated Groundwater Level |
| Drawn By | A.B | Company | Wilton Joubert Limited |
| Date | 20/08/2026 | File Name | 148879 - BB.slmd |




| Method Name | Min FS |
|---|---|
| Spencer | 1.34 |
| GLE / Morgenstern-Price | 1.33 |

| Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kPa) | Phi (°) | Cohesion Type | Water Surface | Hu Type | Ru Value |
|---|---|---|---|---|---|---|---|---|---|
| Waipapa Group Soils - Undrained | | 18 | Undrained | 60 | 0 | Constant | Water Table | Automatically Calculated | |
| Weathered Waipapa Group Rock - Undrained | | 20 | Undrained | 300 | 0 | Constant | None | | 0.25 |

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| | | | |
|---|---|---|---|
| *Project* | 148879 - 2 & 8 Dove Road | | |
| *Group* | Cross Section B-B' - Proposed | *Scenario* | Measured Groundwater Level - Seismic |
| *Drawn By* | A.B | *Company* | Wilton Joubert Limited |
| *Date* | 20/08/2026 | *File Name* | 148879 - BB.slmd |

# 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 |

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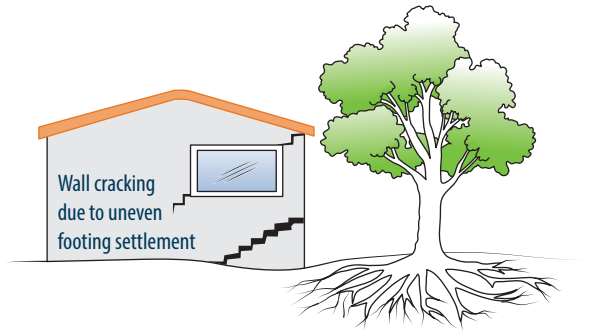


**FIGURE 1** Trees can cause shrinkage and damage.

- 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

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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.

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**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.

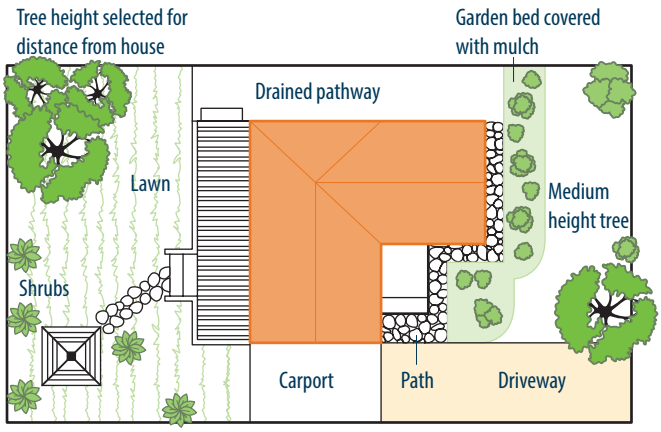


**FIGURE 2** Gardens for a reactive site.

### 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.

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